APPENDIX A – AGENCY COORDINATION

Agency Scoping Letters and Agency Contact List
Cooperating Agency Invitations and Responses
Agency Scoping Meeting Presentation – October 1, 2018
Agency Scoping Meeting Notes and Sign-In Sheet; October 1, 2018
Agency Responses

MoDOT

Kansas City District
Brian Kidwell, P. E.,District Engineer

Missouri Department of Transportation

600 Northeast Colbern Rd.
Lee's Summit, Missouri 64086
816.607.2280
Fax: 816.622.6550

September 14, 2018

AGENCY CONTACT

Subject: U.S. 169-Buck O'Neil Bridge Environmental Study
Jackson and Clay Counties, Missouri
MoDOT Job No. 4S3085
Initiation of the NEPA Process and Invitation to Agency Scoping Meeting

Dear [AGENCY CONTACT]:

The Federal Highway Administration (FHWA), in cooperation with the Missouri Department of Transportation (MoDOT) and the City of Kansas City, Missouri (KCMO), are initiating the environmental study to evaluate alternatives that would improve the transportation infrastructure at the U.S. 169 crossing of the Missouri River. This study will assess possible options to improve mobility, connectivity, and accessibility across the Missouri River.

Project Background: The Buck O'Neil Bridge, one of five highway crossings of the Missouri River within KCMO, is an important link in the overall highway network of the region. The bridge, constructed in 1956, is considered eligible for listing on the National Register of Historic Places. MoDOT is currently rehabilitating the bridge to extend its useful life. This short-term rehabilitation project should be completed in December 2018.

In January 2018, the Mid America Regional Council (MARC), KCMO, and MoDOT completed a Planning and Environmental Linkages (PEL) Study to evaluate options for improving travel and connectivity in the region. The PEL process engaged residents, stakeholders, neighborhood groups, government and transportation officials in defining improvements that would address near- and long-term transportation needs. The PEL identified the need to address the structural and operational issues of the Buck O'Neil Bridge and river crossing. MoDOT and KCMO identified this need as a priority, and requested an environmental classification for a portion of the U.S. 169 corridor from FHWA.

The current environmental study will use the information collected and input received during the PEL process to further assess the potential impacts and benefits of a variety of options for an improved river crossing.

Agency Scoping Meeting: The FHWA, MoDOT, and KCMO invite your designated agency representative to participate in an agency scoping meeting to be held on **Monday, October 1, 2018 at 11 a.m.** A face-to-face meeting will be conducted at MARC, 600 Broadway, Suite 200, Kansas City, Missouri 64105. A Skype/Webex link will also be provided for those participants unable to attend in person. The meeting is anticipated to last approximately 90 minutes.

The study team will present an overview of the study process including the information being pulled forward from the PEL, and the anticipated milestones and schedule to complete the study. Meeting materials and a summary of the input received will be sent to participants following the meeting.

Response Requested: We request that your agency confirm your intent to participate in the meeting via email to Gerri Doyle, MoDOT Transportation Planning Coordinator, Gerri.Doyle@modot.mo.gov no later than **Wednesday, September 26, 2018**. If needed, a link to the Skype/Webex presentation will be sent prior to the meeting. We would appreciate receiving any input or comments to be considered in the study process by October 15, 2018.

Your participation in this study is appreciated. If you have any questions regarding this invitation, please contact Gerri Doyle at 816-607-2261.

Sincerely,

Brian Kidwell, P.E.
District Engineer

Cc: Cecilia Tapia, Director USEPA Region 7
Raegan Ball, FHWA
Matt Burcham, MoDOT
Wes Minder, KCMO
Julie Sarson, Burns & McDonnell
Shari Cannon-Mackey, Burns & McDonnell

US-169/Buck O'Neil Bridge Environmental Study (4S3085)
Agency Scoping Letter Mailing List

Name	Title	Agency	Address 1	Address 2	City State zip
Mr. Josh Tap	NEPA Program Manager	USEPA Region 7	11201 Renner Boulevard		Lenexa, KS 66219
Mr. Mark Schenkelberg		FAA Central Region	Airports Division (ACE-600), Room 364	901 Locust Street	Kansas City, MO 64106-2325
Ms. Cecilia Tapia		USEPA Region 7	Environmental Services Division	11201 Renner Boulevard	Lenexa, KS 66219
Mr. Eric Washburn	Commander	U.S. Coast Guard, 8th District	1222 Spruce Street	Suite 2, 102D	St. Louis, MO 63103-2832
Ms. Karen Herrington	Field Supervisor	USFWS Columbia Ecological Services Field Office	101 Park DeVille Drive, Suite A		Columbia, MO 65203-0057
Colonel Douglas B. Guttormsen,		USACE Kansas City District	600 Federal Building	601 E. 12th Street	Kansas City, MO 64106
Mr. Mark Frazier, Regulatory Branch		USACE Kansas City District	600 Federal Building	601 E. 12th Street	Kansas City, MO 64106
Mr. Jorge Lugo-Camacho		USDA NRCS	Parkade Center, Suite 250	601 Business Loop 70 West	Columbia, MO 65203
Mr. Ken Sessa		Federal Emergency Management Agency	9221 Ward Parkway, Suite 300		Kansas City, MO. 64114-3372
Mr. David Thomson, Program Leader		U.S. Department of the Interior, National Park Service	601 Riverfront Drive		Omaha, NE 68102-4226
Mr. Mokhtee Ahmad		Federal Transit Administration	901 Locust Street	Suite 404	Kansas City, MO 64106
Mr. Darrell J. Tisor		Federal Railroad Administration	901 Locust Street, Suite 464		Kansas City, MO 64106
Mr. Rob Hunt		Missouri Department of Natural Resources	P.O. Box 176		Jefferson City, MO 65102
Mr. Ron Walker		State Emergency Management Agency	P.O. Box 116		Jefferson City, MO 65102
Ms. Toni M. Prawl, PhD		MDNR State Historic Preservation Officer	P.O. Box 176		Jefferson City, MO 65102
Ms. Sarah Vanderfeltz	Federal Assistance Clearinghouse	Office of Administration	P.O. Box 809		Jefferson City, MO 65102
Ms. Jennifer K. Campbell	Policy Coordination	Missouri Department of Conservation	P.O. Box 180		Jefferson City, MO 651012
Mr. Ron Achelphol		Mid-America Regional Council	600 Broadway	Suite 200	Kansas City, MO 64105
Mr. Jade Liska		Kansas City Aviation Department	601 Brasilia Avenue		Kansas City, MO 64153
Mr. Ralph Davis		KCMO Public Works	414 East 12th Street		Kansas City, MO 64106
Mr. Tom Gerend		Kansas City Streetcar Authority	600 East 3rd Street		Kansas City, MO 64106
Mr. Richard Jarrold		Kansas City Area Transportation Authority	1200 East 18th Street		Kansas City, MO 64108
Mr. Joe Perry		Kansas City Port Authority	300 Wyandotte, Suite 100		Kansas City MO 64105
Mr. Mark McHenry		Kansas City Parks and Recreation Department	4600 East 63rd Street		Kansas City, MO 64130
Mr. Bradley Wolf		Kansas City Historic Preservation Commission	414 East 12th Street		Kansas City, MO 64106
Mr. Will Akin		Clay County Emergency Coordinator	12 South Water Street		Liberty, MO 64068
Mr. Kipp Jones		Clay County Floodplain Administrator	234 West Shrader, Suite C		Liberty, MO 64068
Mr. James F. Connelly		Jackson County Emergency Coordinator	635 Woodland, #2107		Kansas City, MO 64106
Mr. James Haake		Jackson County Floodplain Administrator	414 East 12th Street		Kansas City, MO 64106

U.S. Department of Homeland Security

United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314)269--2434
Fax: (314)269-2737
Email: allan.o.monterroza@uscg.mil

16591.1/366.2 MOR
November 20, 2018

Mr. Gerri Doyle
Planning Coordinator
Missouri Department of Transportation
600 Northeast Colbern Rd.
Lee's Summit, MO 64086

Subj: PROPOSED BROADWAY AVENUE BRIDGE REPLACEMENT, MILE 366.2, MISSOURI RIVER

Dear Mr. Doyle:

This is in reply to the your letter dated October 29, 2018 inviting us to be a cooperating agency for the proposed bridge project mile 366.2, Missouri River.

The General Bridge Act of 1946 requires that the location and plans for bridges over navigable waters of the United States be approved by the Commandant, U.S. Coast Guard prior to commencing construction. The Missouri River is considered to be a navigable waterway of the United States for bridge administration purposes at the bridge site.

Applications for bridge permits should be addressed to Commander (dwb), Eighth Coast Guard District, 1222 Spruce Street, St. Louis, Missouri 63103-2832, Attention: Bridge Branch. To assist you in submitting a bridge permit application, the Bridge Permit Application Guide can be found at the following link: http://www.uscg.mil/hq/cg5/cg551/BPAG_Page.asp. The application must be supported by sufficient information to permit a thorough assessment of the impact of the bridge and its immediate approaches on the environment. We recommend that the impacts of procedures for constructing cofferdams, sand islands, and falsework bents, etc., that will be employed to build the bridge or modify the existing bridge as well as the removal of the old bridge be discussed. The environmental document should also contain data on the number, size and types of vessels currently using the waterway. This information should be compared with past and projected future trends on the use of the waterway.

It is our understanding the Federal Highway Administration has assumed the role as the lead federal agency and will serve as lead federal agency for the National Environmental Policy Act and other environmental laws such as the National Historic Preservation Act, Threatened and Endangered Species Act and the Invasive Species Act. We agree to serve as a Cooperating Agency for the project from a navigation standpoint. We should be given the opportunity to review the environmental document. Our review and recommendations on the vertical and horizontal clearance requirements and pier placement for river traffic will be coordinated with Missouri Department of Transportation, Bridge and Structure Division office.

Subj: PROPOSED BROADWAY AVENUE BRIDGE REPLACEMENT, 16591.1/366.2 MOR MILE 366.2, MISSOURI RIVER NOVEMBER 20, 2018

We appreciate the opportunity to comment on the project in this early stage. You can contact Mr. Allan Monterroza at the above telephone number if you have questions regarding our comments or requirements.

Sincerely,

ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BUILDING
601 E. 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

December 20, 2018

Regulatory Branch
(NWK-2017-00293)

Mr. Perry J. Allen, Assistant District Engineer
Missouri Department of Transportation
600 Northeast Colbern Road
Lee's Summit, Missouri 64086

Dear Mr. Allen:

This is in response to your recent letter, requesting the Regulatory Branch, Kansas City District U.S. Army Corps of Engineers (Corps) to be a cooperating agency in the U.S. 169-Buck O'Neil Bridge Environmental Study. The letter was received on November 2, 2018. The U.S. 169-Buck O'Neil Bridge is located in Sections 27, 31 and 32, Township 50 north, Range 33 west, in Kansas City, Clay and Jackson Counties, Missouri.

The Corps will be a cooperating agency in the U.S. 169-Buck O'Neil Bridge Environmental Study.

Any work or structures in, over, or under a navigable water of the United States require prior authorization from the Corps of Engineers under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). The Missouri River has been determined to be a navigable water. Also, Section 404 of the Clean Water Act (33 USC 1344), which is administered under Federal regulations 33 CFR 320-332, provides the Corps of Engineers with regulatory jurisdiction over all waters of the United States. These provisions require prior authorization from the Corps of Engineers for the discharge of dredged or fill material in waters of the United States, including wetlands.

Also, future coordination may be necessary with the Corps, Kansas City District if the proposed project impacts federally constructed levees or the Missouri River Bank Stabilization and Navigation Project. Review and authorization pursuant to 33 USC 408 may be required. The point of contact for Section 408 reviews in the Kansas City District is Mr. Aaron Williams, who may be reached at (816) 389-4915. Please also be aware that if authorization is required pursuant to 33 USC 408, this authorization must be granted before a decision on the requested Section 404/10 permit can be made.

Thank you for the opportunity to be a cooperating agency. This project has been assigned Regulatory file number NWK-2017-00293 by our office. Please reference this number in all comments and/or inquiries to our office relating to this project. If you have any questions concerning this matter, please feel free to write or contact Ms. Kailey Jones at (816) 389-2123 or by email at kailey.j.jones@usace.army.mil.

Sincerely,

David R. Hibbs
Regulatory Program Manager
Regulatory Branch

cc (electronically):
Ms. Gerri Doyle, MoDOT

Cannon-Mackey, Shari

Subject: FW: U.S. 169-Buck O'Neil Bridge Environmental Study: Invitation to be a Cooperating Agency

From: Tener, Scott (FAA) <scott.tener@faa.gov>
Sent: Thursday, November 14, 2019 11:22 AM
To: Peters, Taylor (FHWA) <taylor.peters@dot.gov>; Schenkelberg, Mark (FAA) <mark.schenkelberg@faa.gov>
Cc: raegan.ball.dot.gov <raegan.ball@dot.gov>; Matthew Burcham <Matthew.Burcham@modot.mo.gov>; Mary B. Miller <Mary.Miller@modot.mo.gov>; Kevin Irving (FHWA Emergency Contact #1) <kevin.irving@dot.gov>; todd.madison@faa.gov; 'Melissa W. Cooper' <Melissa.Cooper@kcmo.org>; 'Cannon-Mackey, Shari' <scannonmackey@burnsmcd.com>; rodney.joel@faa.gov; jim.johnson@faa.gov
Subject: RE: U.S. 169-Buck O'Neil Bridge Environmental Study: Invitation to be a Cooperating Agency

Mr. Ball,

Thank you for the invitation to be a Cooperating Agency for the U.S. 169-Buck O'Neil Bridge Environmental Study. Since replacement of the Buck O'Neil bridge and airport access appear to be intrinsically linked, we accept the invitation to be a Cooperating Agency. We look forward to continuing our participation with this project.

Please let me know if you have any questions,

Scott Tener
Environmental Specialist

FAA Central Region Airports Division
901 Locust St., Room 364
Kansas City, Missouri 64106-2325
T 816.329.2639 | F 816.329.2611
http://www.faa.gov/airports/central/

From: Peters, Taylor (FHWA) <taylor.peters@dot.gov>
Sent: Thursday, November 14, 2019 10:19 AM
To: Schenkelberg, Mark (FAA) <mark.schenkelberg@faa.gov>; Tener, Scott (FAA) <scott.tener@faa.gov>
Cc: Ball, Raegan (FHWA) <raegan.ball@dot.gov>; Matthew Burcham <Matthew.Burcham@modot.mo.gov>; mary.miller@modot.mo.gov; Irving, Kevin (FHWA) <Kevin.Irving@dot.gov>
Subject: U.S. 169-Buck O'Neil Bridge Environmental Study: Invitation to be a Cooperating Agency

Hello Mr. Schenkelberg,

Please see attached FHWA's invitation to be a cooperating agency for the Buck O'Neil Bridge Environmental Assessment.

Thank you,

Taylor R. Peters
Environmental Protection Specialist
Missouri Division Office
Federal Highway Administration
3220 W. Edgewood, Suite H
Jefferson City, Missouri 65109

U.S. Department of Transportation
Federal Highway Administration

Missouri Division
11/14/2019

3220 W. Edgewood, Suite H
Jefferson City, Missouri 65109
(573) 636-7104
Fax (573) 636-9283
Missouri.FHWA@fhwa.dot.gov

In Reply Refer To:
HAD-MO

Mr. Mark Schenkelberg, Planning Team Lead
Federal Aviation Administration, Central Region
901 Locust Street, Room 364
Kansas City, Missouri 64106-2325

Subject: U.S. 169-Buck O'Neil Bridge Environmental Study
Jackson and Clay Counties, Missouri
MoDOT Job No. 4S3085
Invitation to be a Cooperating Agency

Dear Mr. Schenkelberg:

In October 2018, the Federal Highway Administration (FHWA), in cooperation with the Missouri Department of Transportation (MoDOT) and the City of Kansas City, Missouri (KCMO), initiated the environmental study to evaluate alternatives to improve the transportation infrastructure at the U.S. 169 crossing of the Missouri River. As a Federal agency with special expertise in the area of aviation and airspace, and as an agency with jurisdiction by law over funding matters and a potential land release from the Charles B. Wheeler Downtown Airport (downtown airport), the FHWA requests that you reconsider our invitation to participate in this study as a Cooperating Agency.

The FAA has supported the Kansas City Aviation Department in providing valuable guidance during the scoping process and in the development and consideration of alternatives that would improve access into the downtown airport. It is our understanding based on your ongoing coordination with MoDOT and their consultant that the FAA intends to use the environmental document prepared for the proposed action to support FAA actions and decisions that would assist in implementing the proposed project. These actions would include but not be limited to:

- Revision and unconditional approval of the Airport Layout Plan to depict the proposed improvements.
- Approve the Kansas City Aviation Department's request for the release of property permitting the sale and disposal of airport property or change in land use from aeronautical to non-aeronautical to support the proposed improvements.
- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction of the proposed project.
- Make determinations through the aeronautical study process regarding obstructions to navigable airspace during and after construction of the proposed project.

In consideration of your role, FHWA has agreed to include a separate chapter within the environmental document focused on the alternatives considered and resulting impacts on the airport property. This format should support your review and anticipated adoption of the document and FHWA's environmental decision in accordance with Section 8-2 of FAA Order 1050.1F.

Your partnership in this study is appreciated and I look forward to discussing your involvement as a cooperating agency or in another appropriate capacity in order to advance this project. If you have any questions regarding this invitation, please contact me at 573-638-2620.

Sincerely,

Raegan Ball
Program Development Team Leader

Cc: Scott Tener, FAA Central Region
Matt Burcham, MoDOT
Mary Miller, MoDOT
Melissa Cooper, KCAD
Wes Minder, KCMO
Julie Sarson, Burns & McDonnell
Shari Cannon-Mackey, Burns & McDonnell

From:	scott.tener@faa.gov
To:	Gerri A. Doyle
Cc:	todd.madison@faa.gov
Subject:	Invitation to Become a Cooperating Agency: U.S. 169-Buck O"Neil Bridge Environmental Study - MoDOT Job No. 4S3085
Date:	Monday, November 5, 2018 1:04:32 PM

Mr. Doyle,

Thank you for the invitation, but we are declining to be a cooperating agency for the subject project. Please continue to work with the Kansas City Aviation Department to ensure that your project is compatible with airport operations.

As a reminder, The project may require formal notice and review for airspace considerations under 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. To determine if you need to file with FAA, go to http://oeaaa.faa.gov and click on the "Notice Criteria Tool" found at the left-hand side of the page.

Several items may need to be checked such as any roads, objects, and temporary construction equipment (e.g. bridge structure, light poles, cranes) that exceed the notice criteria.

For transportation projects involving long routes, multiple locations will need to be checked. We recommend checking the route at 1-mile intervals and at increases in elevation (e.g. natural rise, bridges & overpasses).

If after using the tool, you determine that filing with FAA is required, we recommend a 120-day notification to accommodate the review process and issue our determination letter. Proposals may be filed at http://oeaaa.faa.gov. More information on this process may be found at: http://www.faa.gov/airports/central/engineering/part77/

Please let me know if you have any questions,

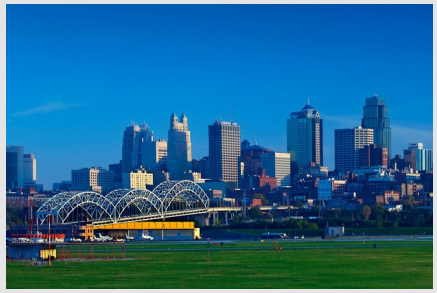
Scott Tener
Environmental Specialist

FAA Central Region Airports Division
901 Locust St., Room 364
Kansas City, Missouri 64106-2325
T 816.329.2639 | F 816.329.2611
http://www.faa.gov/airports/central/

US 169/Buck O'Neil Bridge Environmental Study

AGENCY SCOPING MEETING | OCTOBER 1, 2018







Agenda

- Introductions
- Project Description
- Project Background and Study Area
- Purpose and Need
- Alternatives Under Consideration
- Key Issues
- Schedule and Next Steps

Project Description

US 169/Buck O'Neil Bridge Environmental Study

Environmental study to evaluate improvement of the US 169 crossing over the Missouri River in KCMO

Lead Federal Agency – Federal Highway Administration

Co-Lead Agencies –

- Missouri Department of Transportation (MoDOT)
- City of Kansas City, MO (KCMO)

This environmental study is building on information developed during the ***Beyond the Loop PEL***

https://www.modot.org/buck-oneil-bridge-environmental-study

Project Background

Planning and Environmental Linkages (PEL) Study

BEYOND THE LOOP

Exploring the Future of the Broadway/O'Neil Bridge and North Loop

Sponsors – MARC, KCMO, and MoDOT

PEL Study Area – US-169/I-70/I-35/I-29/I-670 in Jackson and Clay counties, MO and Wyandotte County, KS

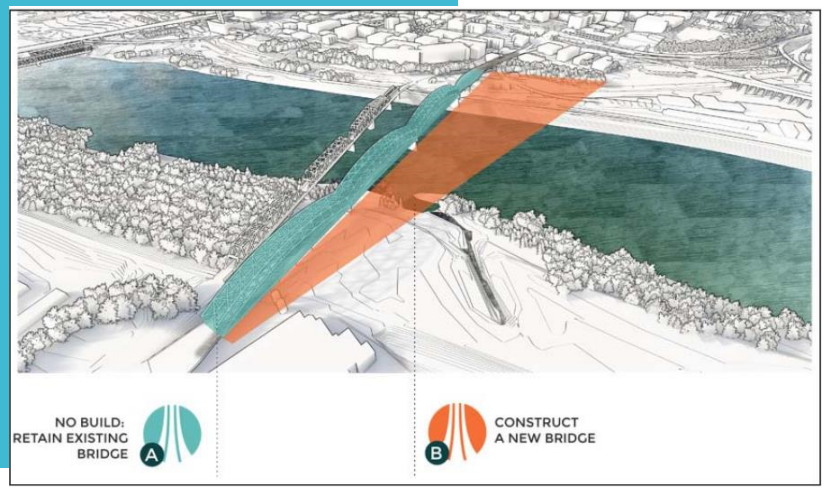
Purpose – assess existing conditions, identify anticipated problem areas, and develop and evaluate transportation improvements to reduce congestion, enhance connectivity, and improve the safety of US 169 and I-70 within the PEL study area.

Data collected during the PEL will be used in this study.

www.beyondtheloopkc.com

Project Background

Initial River Bridge Strategies



BEYOND THE LOOP

Exploring the Future of the Broadway/O'Neil Bridge and North Loop

Table 5.2 - Missouri River Bridge Initial Strategy Recommendations

	Strategy	Description	Status
Rehabilitate the Existing O'Neil Bridge (No-Build Condition)	A1	Rehabilitation of the existing bridge as currently programmed would consist of a $52 million project and would restore the structure to satisfactory physical condition, and would extend the expected life of the bridge an additional 35 years	Advanced
Western Alignment	A2	Approximate 28-degree skew from perpendicular to the navigation channel. Most direct connection to I-35.	Advanced
Central Alignment	A3	Approximate 21-degree skew from perpendicular to the navigation channel. Approximately halfway between the existing bridge at Broadway and I-35 at the west side of the loop.	Advanced
Eastern Alignment	A4	Approximate 10-degree skew from perpendicular to the navigation channel. Location adjacent to existing bridge. Requires reconfiguration of existing Broadway interchange	Advanced
New Bridge with Rehabilitation and Re-purposed O'Neil Bridge	A5	Construction of a new bridge at either the previously described A2 or A3 locations, combined with the rehabilitation of the existing bridge.	Screened Out
Combination New Bridge with New Railroad Bridge	A6	Construction of a structure that combines a new highway bridge with a replacement of the existing Hannibal Bridge that carries the BNSF railway.	Screened Out

Project Background

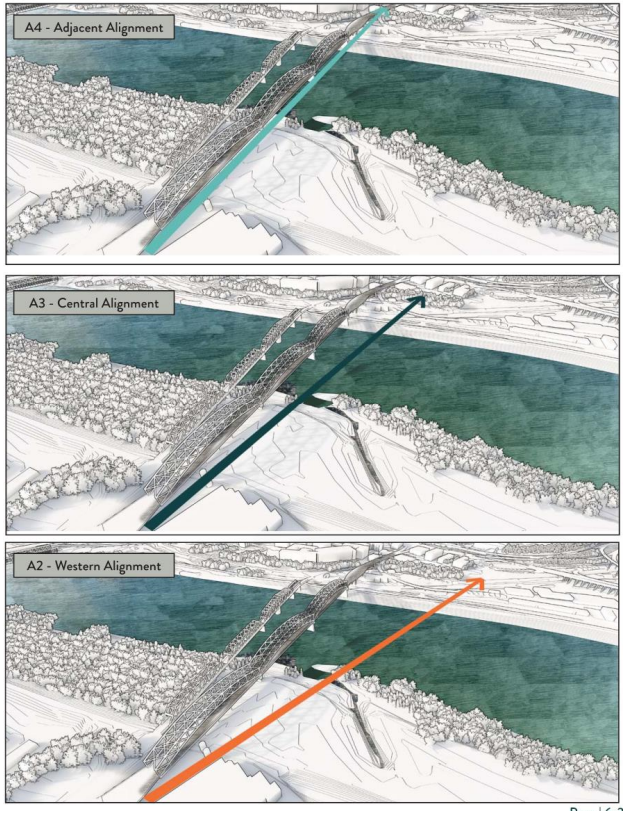
Reasonable River Bridge Crossing Locations carried forward from PEL

BEYOND THE LOOP

Exploring the Future of the Broadway/O'Neil Bridge and North Loop

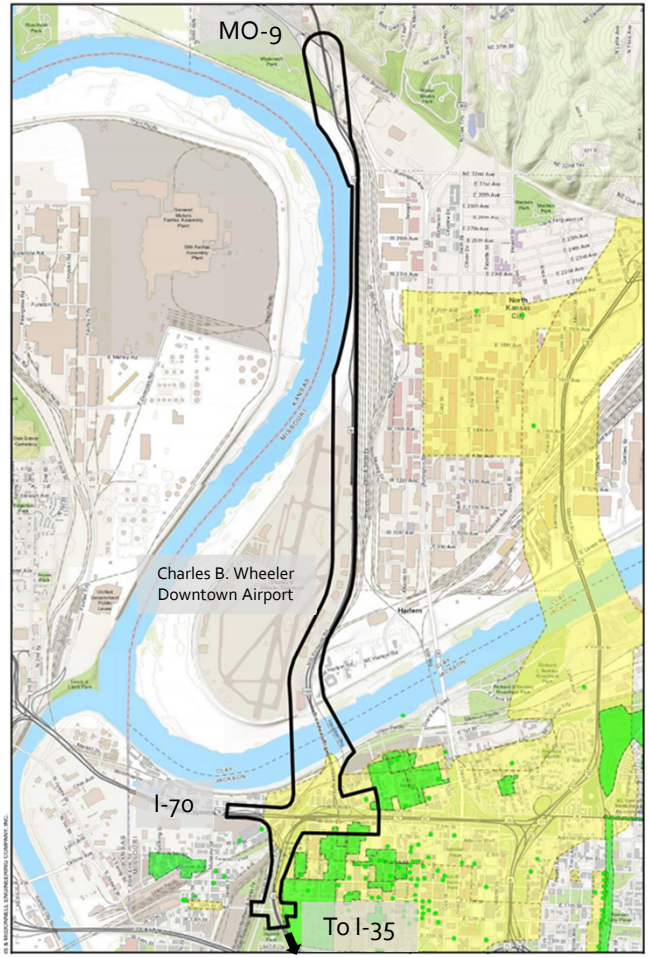
Table 6.1 - Missouri River Bridge (Crossing Location) Evaluation Matrix

		River Bridge Crossing Location Strategies			
		Rehab Existing (No-Build)	A2 Western Alignment	A3 Central Alignment	A4 Adjacent Alignment
Needs	Improve Physical Conditions	○	●	●	◕
	Optimize System Performance	○	◑	◑	◑
	Improve Safety & Security	○	◑	◑	◑
Goals	Improve Transportation Choices	◔	◕	◕	◕
	Improve Economic Vitality & Placemaking	◕	◑	◑	◕
	Improve Sustainability - Right of Way Impacts	◑	◑	◔	◕
	Feasibility	○	◔	◑	◕
	Affordability	$	$$$	$$$	$$$



Study Area

Corridor of independent utility identified in the PEL



Buck O'Neil Bridge

- Triple arch bridge, opened to traffic in 1956; tolled crossing until 1991
- Nearly 50,000 vehicles cross the bridge per day
- Eligible for listing on the National Register of Historic Places
- Its age and condition create an on-going need for costly maintenance and scheduled repairs
- Lacks bicycle/pedestrian accommodations
- Undergoing minor rehabilitation that should be completed by December 2018





Purpose & Need

Purpose:

- *The purpose of the proposed Project is to facilitate the safe movement of people and goods along US 169 while improving mobility, connectivity, and accessibility across the Missouri River.*

Needs to be addressed by the proposed action:

- *Maintain infrastructure – address the physical condition of the historic Buck O'Neil Bridge*
- *Maintain a reliable regional transportation linkage across the Missouri River – accommodate existing and future local and regional traffic*
- *Improve the operational and safety performance of the Missouri River crossing for all transportation modes*

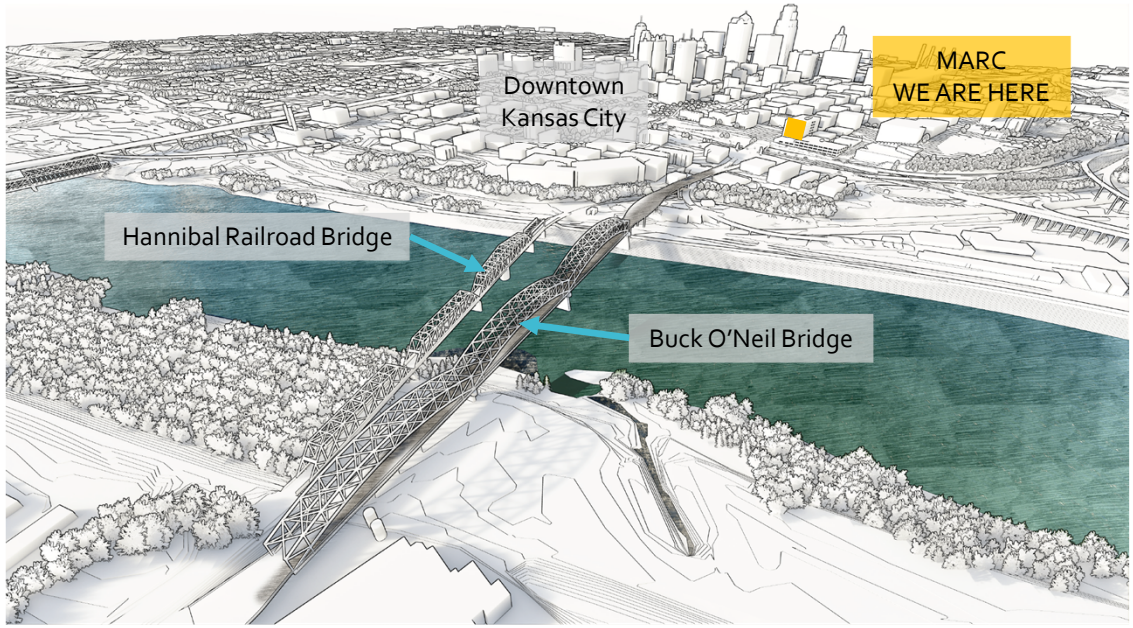
Purpose & Need

Objectives:

- *Provide transportation infrastructure and capacity to support local and regional economic growth*
- *Connect to and complement existing key transportation networks to support anticipated growth and development*
- *Support mode choice that would contribute to improved quality of life and maintain regional air quality attainment*
- *Improve bicycle and pedestrian network connections between Downtown, River Market District, North Kansas City, and the Downtown Airport*

Alternatives Under Consideration

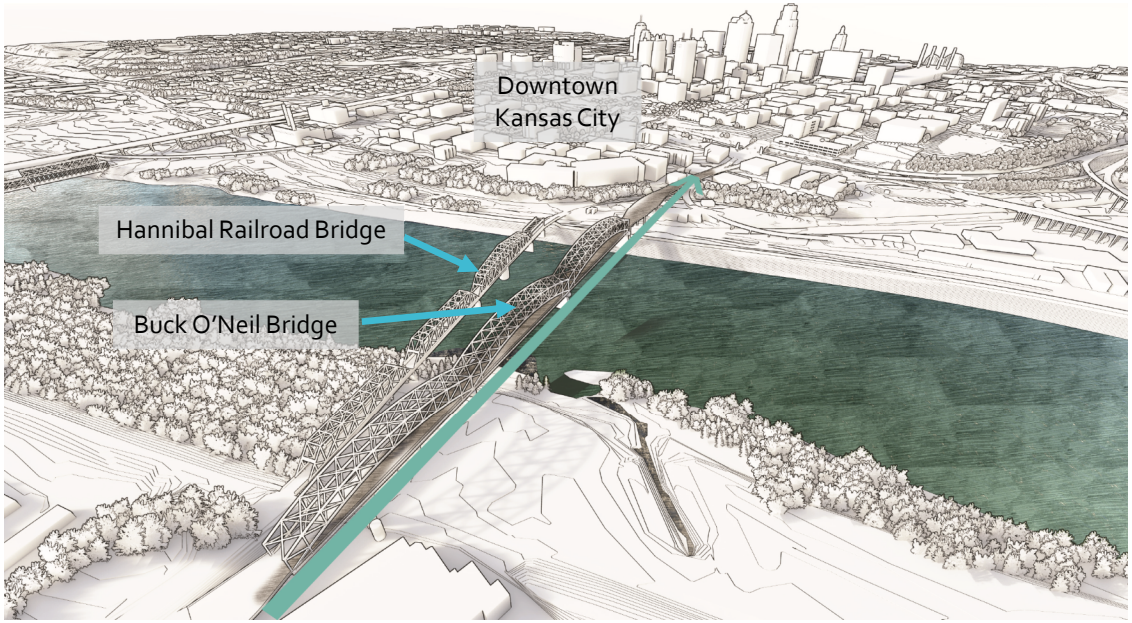
No Build and Major Rehabilitation



No Build	No new transportation improvements would be implemented beyond those improvements planned or programmed in local/state plans. Include on-going maintenance (current bridge short-term rehab) and other actions by MoDOT/KCMO.
Major Rehabilitation	Major rehabilitation of the Buck O'Neil Bridge in addition to other planned or programmed transportation infrastructure improvements in local/state plans.

Alternatives Under Consideration

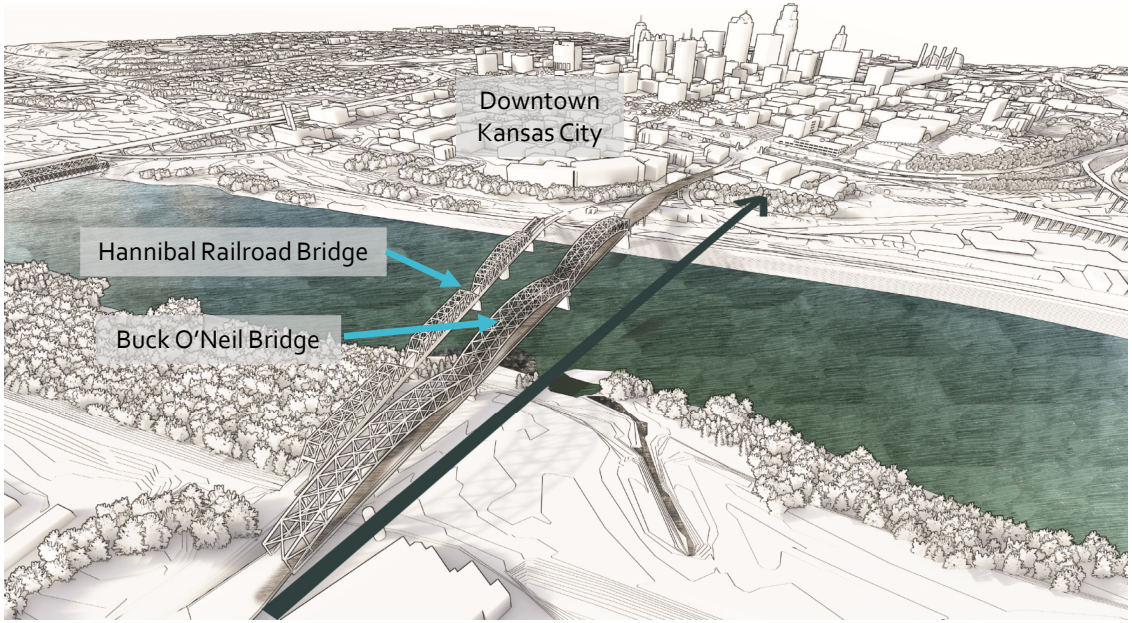
New Crossing Constructed Adjacent to Existing Alignment



New Crossing Adjacent	Construction of a new river crossing on an alignment west of and adjacent to the existing bridge identified in the PEL. Construction of this crossing would require removal of the existing Buck O'Neil Bridge and removal or modification of associated structures/roadways.

Alternatives Under Consideration

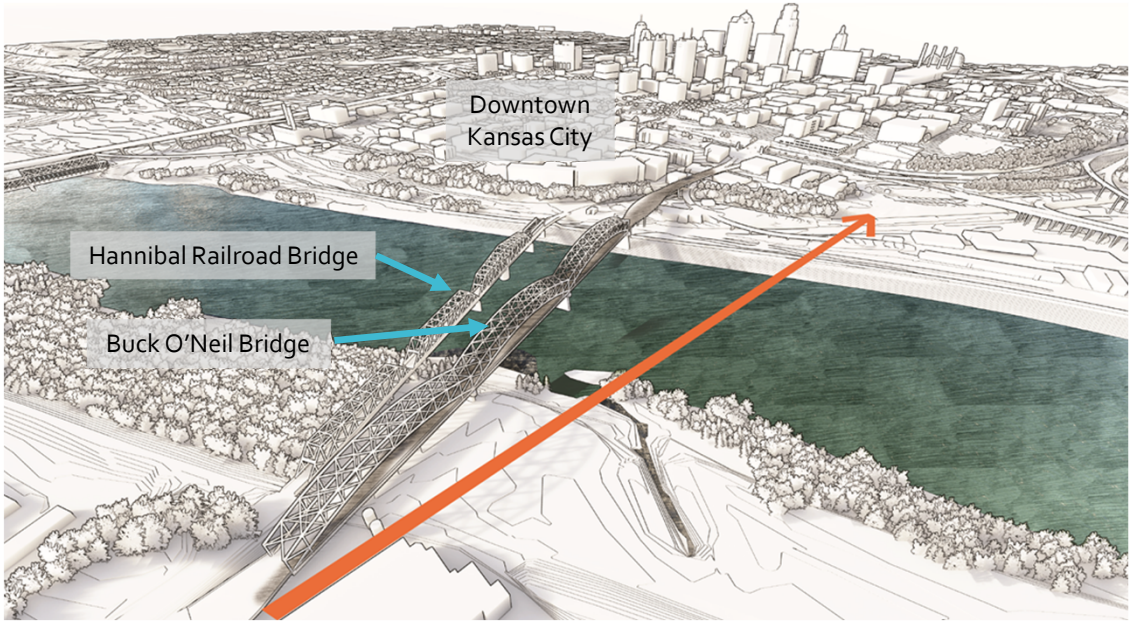
New Crossing Constructed on a Central Alignment



New Crossing Center	Construction of a new river crossing along a central alignment identified in the PEL. Construction of this crossing would require removal of the existing Buck O'Neil Bridge and removal or modification of associated structures/roadways.

Alternatives Under Consideration

New Crossing Constructed on a Western Alignment



New Crossing West	Construction of a new river crossing along a western alignment identified in the PEL. Construction of this crossing would require removal of the existing Buck O'Neil Bridge and removal or modification of associated structures/roadways.

Key Issues

Section 106 and Section 4(f) of the DOT Act

4 Steps:

1. Establish area of potential effect
2. Identify resources and their significance
3. Determine effects
4. Resolve effects through coordination with agencies and the public









Upper Left – Hannibal Bridge
Upper Right – Ermine Case Park/Clark's Point
Lower Right – Landmark Lofts
Lower Left – TWA Building
Photos courtesy of AHR, LLC

Key Issues


Hazardous Materials – past industrial and railroad uses
Displacements and Relocations
Noise and Vibration – proximity to residences and public lands
River Crossing – Section 9 Permit, Section 10, 404 Permits
Visual Effects – historic districts and public spaces
Floodplain and Levees
Airspace – proximity to flight paths, structure height, lighting
River Navigation

Schedule


Major Milestones
Kick-Off
Press Release
9/25/18
Public
Meeting
1/8/19
Location Public
Hearing
8/13/19
NTP
NTP
8/20/18
SHPO/FHWA
Concurrence
12/21/18
Section 4(f)
Submittal
4/8/19
NOA
Published
7/25/19
Anticipated
NEPA
Decision
12/20/19
Aug 2018
Oct 2018
Dec 2018
Feb 2019
Apr 2019
Jun 2019
Aug 2019
Oct 2019
Dec 2019

Next Steps

Agency Input Requested

- *Resource information*
- *Studies needed, review processes*
- *Permits or authorizations*

Agency input requested by **October 15, 2018** to:

Gerri.Doyle@modot.mo.gov

Gerri Doyle, MoDOT Transportation Planning Coordinator
600 NE Colbern Road
Lee's Summit, Missouri 64086

US 169/Buck O'Neil Bridge Environmental Study
MoDOT Job No. 4S3085

Comments & Questions

Comments & Questions

Thank you for attending!

Meeting Notes

US 169 Buck O'Neil Bridge Environmental Study

Meeting Subject: Agency Scoping Meeting
Meeting Date: October 1, 2018 Meeting Start Time: 11:00 AM
Meeting Location: Mid-America Regional Council (MARC) Office, Kansas City, MO

1. Introductions – See attached sign in sheet.
2. Project Description – This study, anticipated to be an Environmental Assessment, will evaluate improvements to the US169 crossing of the Missouri River. Lead Federal agency is FHWA. Bridge owner is MoDOT; co-lead agencies are MoDOT and City of KCMO.
3. Project Background
    a. Transition from Planning & Environmental Linkages (PEL) study – Our environmental study will build on information gathered from the Beyond the Loop PEL study. It could employ three segments of independent utility from the PEL study – Missouri River Bridge/Interchange, West Bottoms access and Charles B. Wheeler Downtown Airport access. It will not include the I-70 North Loop segment or the MO-9 segment. The solutions proposed for the segments included in the study cannot preclude future implementation/construction of actions/projects within the excluded segments.
    b. Initial strategies considered in the PEL to address the river crossing included rehabilitation of the existing bridge and replacement options. Public survey overwhelmingly favored constructing a new bridge (average score of 9, on a scale from 0 for prefer to keep the existing bridge and 10 for prefer to build a new bridge). 1,600 responses were received online and 500 in person at public meetings.
4. Study Area – The logical termini for project impacts are US169/MO-9 north of the airport and 12th Street/I-35 on the west side of the loop. The traffic analysis area is significantly larger than the study area.
5. Existing Bridge – Built in 1956 and carries nearly 50,000 vehicles per day. No bicycle and pedestrian access. Undergoing short-term rehabilitation; should be complete by December 2018.
6. Purpose and Need
    a. Purpose - To facilitate the safe movement of people and goods along US169 while improving mobility, connectivity, and accessibility across the Missouri River.
    b. Needs – see presentation slide for supporting verbiage
7. Alternatives under Consideration – each alternative will have competing impacts that will be evaluated through the study process

a. No Build – bridge after 2018 rehabilitation, with on-going maintenance
b. Major Rehabilitation – significant reconstruction to extend service life approximately 35 years; requires two-year bridge closure
c. Replacement in Like and Kind – adjacent alignment, most difficult connectivity to I-35, some Broadway improvements possible
d. Build New Crossing Central – more significant ROW impacts
e. Build New Crossing West – more challenging railroad and airspace encroachments

8. Key Issues – displacements and relocations, Section 106 and Section 4(f) properties, visual effects, airspace and proximity to flight paths, river navigation, floodplains and levees
9. Schedule – Public Meeting January 2019, Notice of Availability published July 2019, Location Public Hearing August 2019, anticipated NEPA decision December 2019
10. Next Steps – **Agency input requested by October 15, 2018 to Gerri Doyle at MoDOT.**
11. Other Discussion Items
    a. A question was asked about the North Loop segment from the PEL. This set of alternatives, which included consolidating/compressing/reclassifying a portion of I-70, will not be included in the environmental study discussed today.
    b. A similar question was asked about Woodswether access to the West Bottoms. This segment from the PEL will be included in the environmental study discussed today.
    c. The physical constraints at the airport were described by Melissa Cooper and Scott Tener – airspace restrictions for the permanent bridge and construction conditions, electrical service to the airport under the existing bridge, impact to airport ROW require FAA approval. Long lead time for submittal review will be required. Preliminary approval can be provided from conceptual drawings.
    d. A general dialogue followed about the potential for this project to be delivered using the design-build method. Conceptual-level plans could be developed prior to the proposal phase. The concept plans would be then be used for pre-permitting submittals to agencies. Agency responses could then be released to design-build teams. Additional communication could occur during the proposal development phase if additional information is requested by the teams.
    e. Ron Achelpohl asked if there were plans to continue the dialogue from the PEL with the joint bridge committee (Northland Chamber, Downtown Council, KC Chamber of Commerce) about the aesthetic features of any improvements, and specifically the tie to Buck O'Neil. Wes Minder said that there has been internal discussion at KCMO to address aesthetics and the City's intended commitment on this project.
    f. It was clarified that the initial assumption for this study is to conclude with an Environmental Assessment rather than an Environmental Impact Statement.

g. David Hibbs described a “one voice” approach for responses from USACE. The intent is to facilitate/streamline the communication coming from regulatory, navigation, levee safety, etc.
h. There was discussion about the possibility for in-road electric charging capability to be incorporated into any new construction.
i. Joe Perry of Port KC described an increase in river navigation in recent years. There was discussion about following requirements of the USCG. Navigation channel closure is not typically allowed except during bridge demolition operations.
j. A question was asked about the potential width of a new bicycle and pedestrian facility on the bridge. Julie Sarson described that 10 feet clear was used on the new Fairfax Bridge just upstream. Ron Achelpohl suggested that would be the minimum expectation for this project.

Attachments:

- Sign-In Sheets
- Meeting Presentation

Meeting Attendance Sheet

US169 Buck O'Neil Bridge Environmental Study

Meeting Subject: Agency Scoping Meeting
Meeting Date: October 1, 2018
Meeting Location: Mid-America Regional Council (MARC) Office, Kansas City, MO

Meeting Start Time: 11:00 AM

Name	Title	Organization	Phone	Email
✓ Gerri Doyle	Transportation Planning Coordinator	MoDOT	816-607-2261	Gerri.Doyle@modot.mo.gov
✓ Mike Landvik	Transportation Planning Coordinator	MoDOT	816-607-2256	Michael.Landvik@modot.mo.gov
✓ Matt Burcham	Senior Environmental Specialist	MoDOT	573-526-6679	Matthew.Burcham@modot.mo.gov
✓ Wes Minder	City Manager's Office Plan Implementation Manager	KCMO	816-513-6977	Wes.Minder@kcmo.org
✓ Taylor Peters	Environmental Protection Specialist	FHWA	573-638-2621	taylor.peters@dot.gov
✓ Julie Sarson	Project Manager	BMcD	816-276-1593	jsarson@burnsmcd.com
Shari Cannon-Mackey	Environmental Department Manager	BMcD	512-872-7132	scannonmackey@burnsmcd.com
✓ Danny Rotert	Senior Public Involvement Strategist	BMcD	816-627-4786	drotert@burnsmcd.com
Melissa Cooper	Charles B. Wheeler Downtown Airport Manager	KCAD	816 859 7610	Melissa.cooper@kcmo.org
PERRY ALLEN	ADE	MoDOT	816-813-1502	PERRY.ALLEN@MODOT.MO.ORG
SCOTT TENER	ENV. SPECIALIST	FAA	816-329-2639	scott.tener@faa.gov
James Haake	FLOODPLAIN ADMINISTRATOR KCMO	CITY OF KCMO	816-513-1544	james.haake@kcmo.org

Meeting Attendance Sheet

US169 Buck O'Neil Bridge Environmental Study

Meeting Subject: Agency Scoping Meeting
Meeting Date: October 1, 2018
Meeting Location: Mid-America Regional Council (MARC) Office, Kansas City, MO

Meeting Start Time: 11:00 AM

Name	Title	Organization	Phone	Email
Ron Achelpohl	Dir. Transp & Env.	MARC	816 474 4240	rona@marc.org
David Hibbs	Reg. Prog. Mgr.	COE	816 389-3136	david.r.hibbs@usace.army.mil
Richard JARROLD	V.P. Planning + Dev.	KCATA	8163460356	DJARROLD@KCATA.ORG
Joe Perry	V.P Development	Port KC	816 559-3728	jperry@portkc.com
Martin Rivarola	Asst. Director Transp	MARC	8167018257	mrivarola@marc.org
Wes Minder	KCMO	¢	8165136977	wes.minder@kcmo.org
Griffin Smith	MoDOT	Dist. Pl Mgr	8166072108	griffin.smith@modot.mo.gov
On Phone				
Amber Tilley	NEPA Reviewer	EPA Region 7	913 551 7565	tilley.amber@epa.gov
Allen Monterroza	Bridge Mgmt. Specialist	USCG	314 269 2434	Allen.O.Monterroza@uscg.mil
Eric Hashburn	Commander	USCG	314 269 2300	Eric.Hashburn@uscg.mil

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

OCT 22 2018

Gerri Doyle
Transportation Planning Coordinator
Missouri Department of Transportation
600 Northeast Colbern Rd.
Lee's Summit, MO 64086

Dear Ms. Doyle:

The Missouri Department of Natural Resources (Department) appreciates the opportunity to review the materials for the US 169-Buck O'Neil Bridge Environmental Study. The Department offers the following general comments for consideration.

Geology and Geospatial Data

If a full Geologic Assessment is required for a project, the Missouri Geological Survey can be contacted directly at 800-361-4827. Other maps showing natural and cultural resources can be found at http://dnr.mo.gov/gis/.

Karst Topography

Springs, sinkholes, and caves are features on the landscape associated with karst topography that can act as direct conduits of surface water and pollutants to groundwater. As such, extra precaution should be taken to minimize disturbance of land in or around these features, and to avoid the introduction of pollutants to sensitive groundwater resources. Karst areas may also present the possibility of potential collapse.

Wells

Wells can act as conduits of pollutants to groundwater resources. Abandoned wells should be plugged prior to any land disturbance, and care should be taken to utilize appropriate best management practices (BMPs) to protect any currently operating wells. For more information on locating and plugging wells, please visit the link below for the Department's Wellhead Protection Section webpage or contact the Department's Geological Survey Program directly. https://dnr.mo.gov/geology/geosrv/wellhd/.

Water Protection

Best Management Practices

Best management practices should be utilized during project activities to limit the amount of sediment and other pollutants entering waters of the state, and to protect the water's chemical,

physical, and biological characteristics. These practices include, but are not limited to, conducting work during low flow conditions whenever possible, keeping heavy equipment out of the water, and taking all necessary precautions to avoid the release of fuel or other waste products to streams and other waters. In addition, the Department encourages the preservation of existing riparian or buffer areas around each water resource to limit the amount of sediments or other pollutants entering the water. Any stream banks, riparian corridors, lake shores, or wetlands denuded of vegetation should be stabilized and re-vegetated as soon as is practicable.

Watershed Conditions

Public Drinking Water:

Proposed project personnel should be aware of nearby Public Drinking Water Districts. Work associated with any project should take into consideration the protection of surface and groundwater public drinking water supplies, implementing appropriate BMPs as necessary. For additional information regarding source water protection, please contact Mr. Ken Tomlin of the Department's Public Drinking Water Branch at 573-526-0269.

Designated Uses

Water Bodies with Specific Designated Uses:

Water bodies are assigned specific designated uses according to State of Missouri Water Quality regulations at 10 CSR 20-7.031(2). These waters are protected by numeric water quality criteria outlined in 10 CSR 20-7.031(5) and Table A, as well as general water quality criteria outlined at 10 CSR 20-7.031(4). Designated uses include the following:

- Protection and propagation of fish, shellfish and wildlife – warm water habitat (WWH)
- Human health protection (HHP)
- Irrigation (IRR)
- Livestock and wildlife protection (LWP)
- Secondary contact recreation (SCR)
- Whole body contact recreation – Category B (WBC-B)
- Protection and propagation of fish, shellfish and wildlife – cool water habitat (CLH)
- Drinking water supply (DWS)
- Industrial water supply (IND)
- Human health protection (HHP)
- Irrigation (IRR)
- Livestock and wildlife protection (LWP)
- Secondary contact recreation (SCR)
- Whole body contact recreation – Category A (WBC-A)

Water Bodies without Specific Designated Uses:

Water bodies that are not assigned specific designated uses are still protected by general water quality criteria outlined at 10 CSR 20-7.031(4), and are subject to the acute toxicity criteria of Tables A and B, as well as whole effluent toxicity conditions.

Sensitive Waters

Table C, Waters Designated for Cold Water Habitat:
Missouri's waters designated for Cold Water Habitat can be found at 10 CSR 20-7.031 Table C, and Table H, with associated criteria at 10 CSR 20-7.031 Table A.

Table D, Outstanding National Resource Waters:
There shall be no lowered water quality in Outstanding National Resource Waters, as designated in 10 CSR 20-7.031 Table D.

Table E, Outstanding State Resource Waters:
There shall be no lowered water quality in Outstanding State Resource Waters, as designated in 10 CSR 20-7.031 Table E.

Table F, Metropolitan No-Discharge Streams:
Project personnel should maintain compliance with 10 CSR 20-7.031(7) for any land disturbance activities that are within a Metropolitan No-Discharge stream's watershed. Discharge to metropolitan no-discharge streams is prohibited, except as specifically permitted at 10 CSR 20-7.031(7). These exceptions include uncontaminated cooling water, permitted stormwater discharges in compliance with permit conditions, and excess wet-weather bypasses not interfering with designated uses.

Table I, Biocriteria Reference Locations:
Biocriteria reference locations are water body segments used in the development of water quality standards and the assessment of aquatic life protection due to their high degree of biological integrity. Reference water locations for some aquatic habitat types can be found in 10 CSR 20-7.031 Table I. These waters should be protected in order to maintain their reference status.

Table J, Losing Streams:
A losing stream is defined as a stream that distributes 30 percent or more of its flow during low flow periods through permeable geologic material into a bedrock aquifer. These features are associated with karst topography, which underlies much of the state, and can act as conduits of pollutants to groundwater resources. Please contact the Department's Missouri Geological Survey at 800-361-4827 for more information or to determine if the project will cross or impact any losing streams. If losing streams are located in the project area, additional precautions and BMPs should be put in place to protect sensitive water resources. Losing streams are protected by effluent regulations at 10 CSR 20-7.015(1)(B)3 and (4) and Water Quality Standards at 10 CSR 20-7.031(1)(N), (5)(C) and (13).

303(d) Impaired and 305(b) Threatened Waters:
Waters assessed by the Department as threatened or impaired could potentially be impacted by projects. Project personnel should ensure that activities related to the project do not cause an increase in the pollutants impairing these waters nor re-suspend any pollutants that might be bound to sediment. Additional information can be found by contacting the Department's Water Protection Program at 573-526-1446 or by vising the link below.
http://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm

Waters with Approved Total Maximum Daily Loads (TMDL):

Impairments should not be made worse by this project's activities. The Department staff may require extra protections when developing permits or certifications in order to comply with TMDL load and wasteload allocations. Additional information can be found by contacting the Department's Water Protection Program at 573-526-1446 or by visiting the link below.
http://www.dnr.mo.gov/env/wpp/tmdl/index.html

Permitting Obligations

Clean Water Act Sections 401 and 404:

A Clean Water Act Section 404 Permit Authorization from the U.S. Army Corps of Engineers (USACE), and Section 401 Water Quality Certification from the Department may be required for projects that have the potential to discharge fill or dredged material into a jurisdictional water of the United States. More information about these permits can be found at the following links.
https://www.epa.gov/cwa-404/section-404-permit-program
http://dnr.mo.gov/env/wpp/401/

If discharge into water has occurred, or will occur, project personnel should immediately contact the appropriate USACE District (link below) and the Department's Operating Permits Section at 573-522-4502 for more information.
http://www.mvr.usace.army.mil/Portals/48/docs/regulatory/MORegBound.pdf

Mitigation

An alternatives analysis would need to be submitted prior to any impacts to jurisdictional waters as part of the avoidance and minimization measures that precede mitigating unavoidable impacts. Mitigation for wetlands should be in conformance with the *Missouri Wetland Mitigation Method*, http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/mitigation/2017-11-17_MWMM.pdf while mitigation for streams should be in conformance with *Missouri Stream Mitigation Method*, http://www.mvm.usace.army.mil/Portals/51/docs/regulatory/May_2013_Missouri_Stream_Mitigation_Method.pdf. Any mitigation plans must be in conformance with the *Compensatory Mitigation for Losses of Aquatic Resources,* https://www.epa.gov/cwa-404/compensatory-mitigation. This rule establishes a hierarchy for mitigation, with the purchase of credits from a mitigation bank at the top of that hierarchy. The rule also emphasizes in-kind and in-watershed mitigation; to go outside the watershed may result in a higher credit purchase calculation. The applicant should receive mitigation plan approval from the Department prior to certification.

Land Disturbance

Acquisition of a Section 401 Certification should not be interpreted to mean that the requirements for other permits are replaced or superseded, including Clean Water Act Section 402 National Pollutant Discharge Elimination System Permits. Work disturbing an area of one acre or more requires issuance of a land disturbance permit prior to any earth work. Disturbance to valuable resource waters, including springs, sinkholes and losing streams, could require additional conditions or a site-specific permit.

Information and application for online land disturbance permits are located at http://www.dnr.mo.gov/env/wpp/epermit/help.htm. Questions regarding permit requirements may be directed to the appropriate Department Regional Office https://dnr.mo.gov/regions/.

Hazardous Waste
Information on hazardous waste and petroleum tanks can be found at https://dnr.mo.gov/ESTART/.

Solid Waste
In case the construction work involves any excavation, the Department's technical bulletin "Managing Solid Waste Encountered during Excavation Activities" has been developed to assist project planners. It provides general disposal requirements for of any unexpected buried waste. The bulletin can be found on the Department's web site at http://dnr.mo.gov/pubs/pub2192.htm.

Air Pollution
Open Burning Requirements:
The open burning of refuse and trade waste is restricted according to 10 CSR 10-6.045. Permits are required in order to open burn certain wastes, mainly only clean woody material. Construction, demolition, and trade waste cannot be open burned. Brush from land clearing activities may be burned if the burning is conducted outside the city limits or greater than 200 yards from the nearest residence. Otherwise, a burn permit is required.

Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin:
Any activities that might produce particulate matter should be controlled, according to 10 CSR 10-6.170, so the particulate matter does not migrate beyond the property boundary.

Historic Preservation
It is suggested that project personnel check with the Department's State Historic Preservation Office (SHPO) to determine if a Section 106 Review is needed. Information on the Section 106 Review can be found on the Department's we site at https://dnr.mo.gov/shpo/sectionrev.htm.

We appreciate the opportunity to provide comments for the proposed project. If you have any questions or need clarification, please contact me at the Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102 or by phone at 573-522-2656. Thank you.

Sincerely,

DEPARTMENT OF NATURAL RESOURCES

Rob Hunt
Planning Coordinator

RH/man

APPENDIX B – ALTERNATIVES DEVELOPMENT AND SCREENING

Appendix B-1 – Alternatives Development and Screening

Appendix B-2 – Traffic Operational and Safety Analysis

Appendix B-3 – Screening Matrices

Appendix B-1
Alternatives Development and Screening

1.0 Introduction

This memorandum supports *Chapter 2.0 Alternatives Considered*, and provides a detailed description of the initial alternatives, the reasonable alternatives, and the process used to screen alternatives. The alternatives were developed to respond to the project's Purpose and Need and the effectiveness of each alternative was measured against a set of performance criteria. The successful alternatives were then advanced for further evaluation as reasonable alternatives while the unsuccessful alternatives were eliminated from further consideration.

2.0 Strategies from the PEL

The Planning and Environmental Linkages (PEL) study developed and evaluated a "universe of strategies", which included a range of possible build solutions within the PEL study area. The PEL study area included five geographical segments, referred to as "segments of independent utility." Three of these are included for further evaluation as a part of this study: Area A – Missouri River Bridge and Interchange, Area C – Charles B. Wheeler Downtown Airport and Area D – West Bottoms.

2.1 Missouri River Bridge and Interchange

In addition to a No-Build option, three build strategies were recommended to be carried forward into an environmental study. Each build strategy included the removal of the existing Buck O'Neil Bridge:

- West River Bridge Alignment
- Central River Bridge Alignment
- Adjacent River Bridge Alignment

2.2 Charles B. Wheeler Downtown Airport

In addition to a No-Build option, two auxiliary improvements were recommended to be constructed and three build strategies were recommended to be carried forward into an environmental study:

- Auxiliary Improvement at Central Access Location
- Auxiliary Improvement at North Access Location
- Half Diamond Interchange at Harlem Road
- Half Diamond Interchange at Harlem Road with Split at Richards Road
- Half Diamond Interchange with New Access to Harlem

2.3 West Bottoms

In addition to a No-Build option, three build strategies were recommended to be carried forward into an environmental study. Each build strategy included the removal of the existing Woodswether Bridge:

- Improvements to roadways along Woodswether, Mulberry and Forrester
- Improvements to roadways along Woodswether, Wyoming and Forrester
- New Bridge from 4th Street to Woodswether

3.0 Initial Range of Alternatives

A range of alternatives was developed to meet the Purpose and Need identified for the proposed action. The alternatives used the recommended strategies from the PEL as a starting point for additional evaluation. Additional alternatives were developed to supplement the recommended strategies from the PEL, and all are included for discussion in this section.

The intent of the proposed action to be described and evaluated 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. The proposed action of improving the service life of the river bridge may involve the two related actions of airport access and West Bottoms access. These related actions and are also included for discussion in this section.

3.1 No-Build

The short-term rehabilitation project completed by MoDOT in 2018 addressed only the most critical repairs and extended the life of the bridge by 5 to 7 years. The existing Buck O'Neil Bridge can remain in service until 2025. Only scheduled maintenance to the bridge would occur. This alternative does not provide bicycle/pedestrian accommodations. No improvement of US-169 north of the river and no improvement to existing access points into the airport would occur. No improvements to I-35 access would be made. In 2025, major rehabitilitation, replacement or removal of the existing bridge will be required.

Although the No-Build alternative does not satifsy the Purpose and Need for this project, it is carried forward for use as a comparison for the reasonable alternatives in accordance with NEPA requirements.

3.2 Major Rehabilitation of Existing Bridge

The rehabilitation study performed by MoDOT in 2015 indicated that a major rehabilitation of the Buck O'Neil Bridge could extend the life of the bridge by 30-40 years. The major rehabilitation would include removal and replacement of the concrete deck, as well as significant structural repairs. A major rehabilitation would allow the existing Buck O'Neil Bridge to remain in place for an extended period.

A major rehabilitation could incorporate a narrow bicycle/pedestrian facility on one side of the bridge as shown in Figure B-1-1. Because of the limited width between the arches, only a 5' clear width can be provided. A 10' clear width is typically preferred. It is possible to construct a separated facility for bicycles and pedestrians on the exterior of the arch, but this would be highly challenging from a structural and cost standpoint.

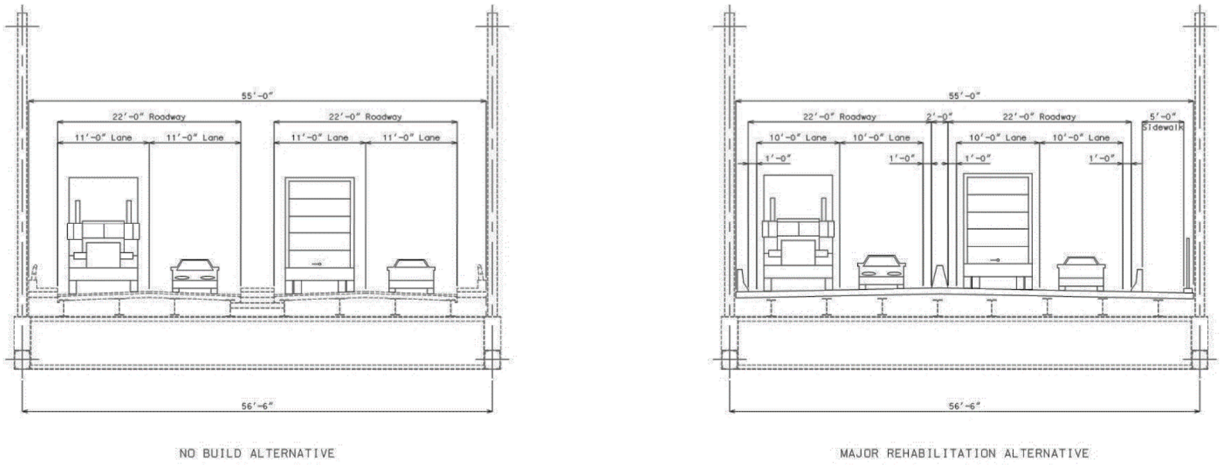


Figure B-1-1: Cross Sections of No-Build and Major Rehabilitation Alternatives

Rehabilitation of the arch main spans and the north and south approach spans would occur as part of this alternative. No improvements to existing access points into the airport and no improvements to I-35 access would be made. At some point after 2055, replacement or removal of the existing bridge will be required.

Because of the initial cost of the major rehabilitation (more than $50 million) and the reduced service life gained by this rehabilitation (30-40 years), this alternative is not carried forward for additional consideration.

3.3 Major Rehabilitation of Existing Arch Spans and Replacement of Approach Spans

This alternative is like the previous alternative but provides major rehabilitation of the existing arch spans only. The arch spans are the most iconic visual element of the Buck O'Neil Bridge and could be rehabilitated in place in conjunction with the complete replacement of the approach spans.

Like the alternative above, a 5-foot clear bicycle/pedestrian facility could be added to the arch spans and 30-40 years of service life would be gained. The new approach spans would include a wider shared use path for bicycles/pedestrians and would be designed for 100 years of service life. Some improvements would be made to the access points into the airport and at the intersection of 5th Street and Broadway Boulevard.

Because of the initial cost (more than $60 million) and the reduced service life for the arch spans gained by this rehabilitation (30-40 years), this alternative is not carried forward for additional consideration.

3.4 Major Rehabilitation of Existing Bridge plus New Bridge

This alternative is like the Major Rehabilitation alternative with the addition of a new river bridge. This alternative allows the existing Buck O'Neil Bridge to remain in place for 30-40 years after a major rehabilitation. In addition, a new river bridge would be constructed to carry additional lanes adjacent to the existing bridge. The new river bridge would include accommodations for a 10' shared use path. Some improvements would be made to the access points into the airport and at 5th Street and Broadway. Additional improvements would be made to tie the new river bridge lanes into the regional roadway system at the south end of the project. At the north end of the river bridges, the new bridge and the existing bridge must converge in a highly constrained area between the airport and the railroad.

Challenges with this alternative include the impacts to the waterway. The United Stated Coast Guard (USCG) has initially indicated that new bridge piers would not be required to line up with the existing bridge piers if they were to remain in place. The navigation channel runs along the south bank of the river and the new and existing piers will allow for river navigation. New piers north of the navigation channel can be spaced to economize the structure span and type. However, when new piers are constructed at a location offset from existing piers to remain in place, additional hydraulic blockage of the channel occurs. This can cause a "rise" condition in the river and obtaining floodplain certification from the Missouri State Emergency Management Agency (SEMA) could be a challenge. Typically, a "no rise" condition is met when new piers are constructed on an optimized span layout and the existing piers are removed. If the existing piers remain in place and are offset from the new piers, hydraulic mitigation measures must be investigated and must meet approval of the United Stated Army Corps of Engineers (USACE). If the new crossing was constructed with piers in alignment with the existing piers, hydraulic mitigation may not be required but the longer bridge spans required to match the arch spans would increase the cost substantially.

Because of the initial cost for a major rehab and a new bridge, the reduced service life for the arch spans after rehabilitation and the potential hydraulic impacts, this alternative is not carried forward for additional consideration.

3.5 Construct New River Crossing in "Like-and-Kind" on Existing or Adjacent Alignment

A replacement river bridge in "like and kind" provides a new crossing similar in configuration to the existing Buck O'Neil Bridge. Minor improvements to mobility would be made to the corridor for the airport access and at 5th Street and Broadway. The existing Buck O'Neil Bridge would be removed.

This alternative would provide a 10-foot wide shared use path on the bridge. Impacts to right-of-way would be similar for an alignment adjacent to or on the existing alignment. Limited width currently exists between buildings near 3rd Street and Broadway and impacts to structures would be required for either alignment to provide standard lane and shoulder widths and a shared use path on the new bridge. An alignment adjacent to the existing alignment would allow the new crossing to be constructed while the existing crossing remains in service.

Because of the limited improvements in mobility gained by this configuration, this alternative is not carried forward for additional consideration.

3.6 Construct New River Crossing on West Alignment with Direct Connection to I-35

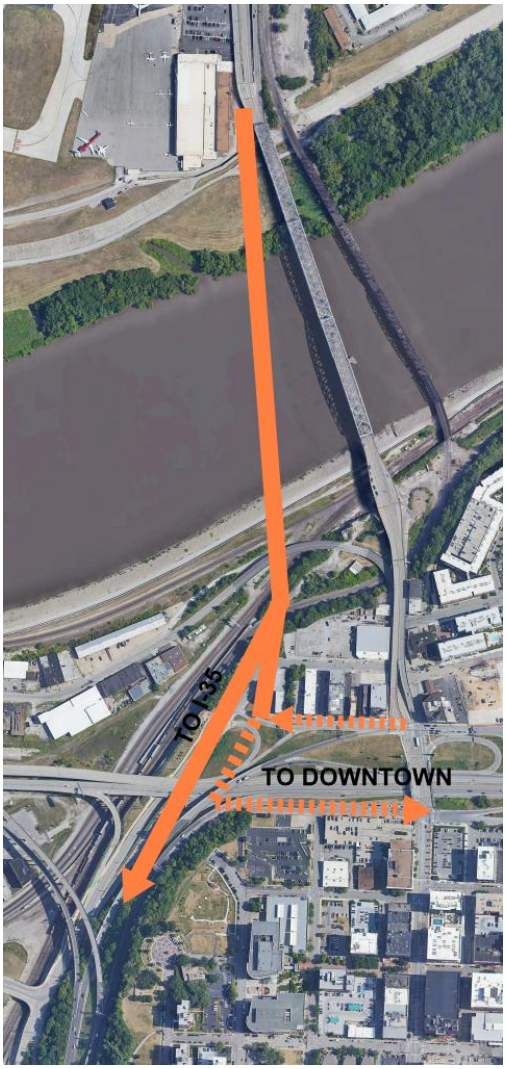


Figure B-1-2: New Bridge on West Alignment with Direct Connection to I-35

A new bridge constructed on a west alignment would cross the river at about a 25-degree skew to perpendicular (Figure B-1-2). The orientation of the river bridge aligns with the northwest corner of the interstate loop and the I-35 corridor. This orientation hinges at a point between the railroad and the airport building near the north end of the existing arch spans. This alternative requires the longest river bridge of all the alternatives and the longest navigation span over the channel because of the larger skew to the river. In addition, this alternative is nearest to the airspace for the airport approach.

The connection to downtown is made with ramps connecting to 5th Street or to 5th/6th Streets. The direct flyover ramp connection to I-35 is made along the west edge of the River Market near Beardsley Road. Impacts occur along a corridor near the west edge of the River Market. A 10-ffot wide shared use path would be provided from 5th Street to the new bridge.

Additional improvements and impacts are required along the northwest corner of the interstate loop and along I-70 with the use of a direct connection, to improve mobility and reduce congestion on the regional network.

This alternative advanced for additional consideration as a reasonable alternative.

3.7 Construct New River Crossing on Central Alignment with Direct Connection to I-35



Figure B-1-3: New Bridge on Central Alignment with Direct Connection to I-35

A new bridge constructed on a central alignment would cross the river at about a 15-degree skew to perpendicular (Figure B-1-3). The orientation of the river bridge falls between the Broadway corridor and the northwest corner of the interstate loop, creating a "split" configuration. Like the west alternative, this orientation hinges at a point between the railroad and the airport building near the north end of the existing arch spans. This alternative requires a slightly longer river bridge than the existing bridge and a slightly longer navigation span over the channel because of the larger skew to the river.

The connection to downtown is made with ramps on or adjacent to the Broadway corridor. The direct flyover ramp connection to I-35 is made along the west edge of the River Market near Beardsley Road. Impacts occur along a split corridor near Broadway and at the west edge of the River Market. A 10-foot wide shared use path would be provided from 5th and Broadway to the new bridge.

Additional improvements and impacts are required along the northwest corner of the interstate loop with the use of a direct connection, to improve mobility and reduce congestion on the regional network.

This alternative advanced for additional consideration as a reasonable alternative.

3.8 Construct New River Crossing on Adjacent Alignment with or without Direct Connection to I-35

A new bridge constructed on an adjacent alignment would cross the river at about a 10-degree skew to perpendicular, like the existing Buck O'Neil Bridge. The 2nd Hannibal Railroad Bridge just downstream and east of the existing bridge crosses the river perpendicularly and swings open at its center pivot pier. This swing span precludes the location of a new Buck O'Neil Bridge east of its existing location.

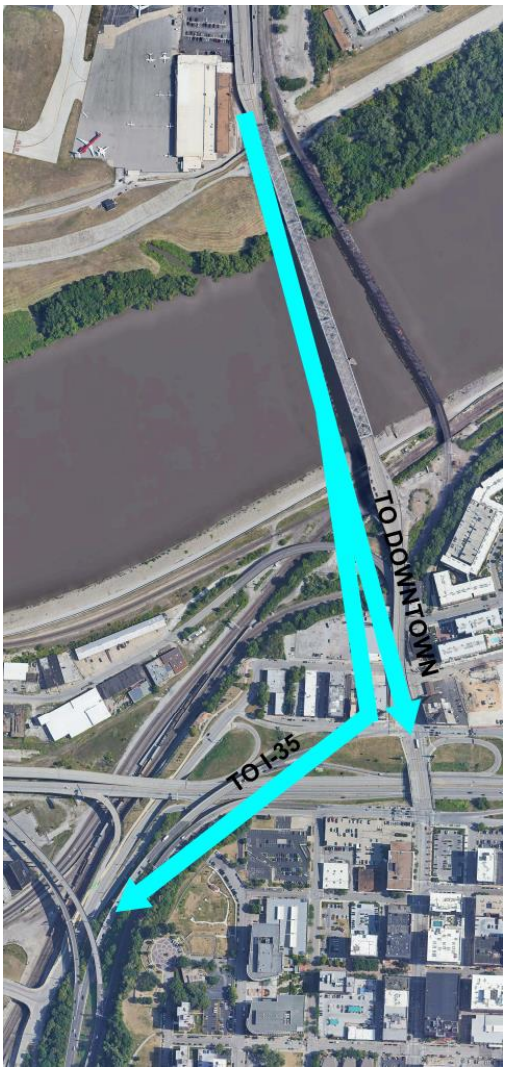


Figure B-1-4: New Bridge Adjacent to the Existing Alignment with or without Direct Connection to I-35

The orientation of the river bridge aligns closer to the existing bridge and the Broadway corridor (Figure B-1-4). This orientation hinges at a point between the railroad and the airport building near the north end of the existing arch spans and provides a crossing roughly parallel to the existing crossing. This alternative requires the shortest river bridge and the shortest navigation span over the channel because of the minimal skew to the river.

The connection to downtown is made with ramps on or adjacent to the Broadway corridor. The improved connection to I-35 is also made on or adjacent to the Broadway corridor. Impacts occur along the Broadway corridor. A 10-foot wide shared use path would be provided from 5th and Broadway to the new bridge.

Three options exist within this alternative:

- Additional lanes provided at 5th & Broadway without a direct connection to I-35
- Additional lanes provided at 5th & Broadway with provision for future direct connection to I-35
- A configuration similar to existing conditions at 5th & Broadway plus construction of a direct connection to I-35

The option without a direct connection to I-35 adds lanes to the existing configuration to improve mobility. The option with a direct connection to I-35 is achieved with the use of elevated flyover lanes. The option with future provision for a direct connection is a hybrid of the two. Additional improvements and impacts are required along the northwest corner of the interstate loop with or without the use of a direct connection, to improve mobility and reduce congestion on the regional network.

This alternative advanced for additional consideration as a reasonable alternative.

4.0 Reasonable Build Alternatives

MoDOT anticipates using a design-build process to select a contracting team for this project. MoDOT will include information on multiple alternative design concepts in addition to the Preferred Alternative for evaluation by design-build teams. An acceptable alternative design, other than the Preferred Alternative, may be identified and selected by the successful design-build team. Future coordination with FHWA may be needed to evaluate and update this document based on changes to the proposed improvements identified for the project.

Multiple concepts were studied for each reasonable build alternative and are summarized in this section. Variations to the proposed configuration may occur as a part of the design-build solution.

4.1 West Alternative

Multiple ramp configurations were studied for the south segment of the West Alternate with direct connection to I-35, conceptually shown in Figure B-1-5. All concepts significantly impact the local street grid. A solution that facilitates compatibility with the north loop options in the PEL is preferred, such as the desire to maintain the existing ramps from 5th Street to WB I-70 and SB I-35. Directing local traffic northbound from 5th Street to the bridge and southbound from the bridge to 6th Street facilitates the use of 5th and 6th as one-way collector roads if the north loop is altered at some point in the future.

All options shown in Figure 4-1 have geometric challenges or limitations such as tight truck turning radius movements and steep vertical grades. In addition, each concept would require additional traffic analysis to optimize the signal timing at each intersection to minimize congestion.



Figure B-1-5: Ramp Concepts for West Alignment with Direct Connection to I-35

The option with one-way connections along 5th and 6th Street shown in Figure B-1-6 moves forward for additional consideration as a part of the West Alternative.

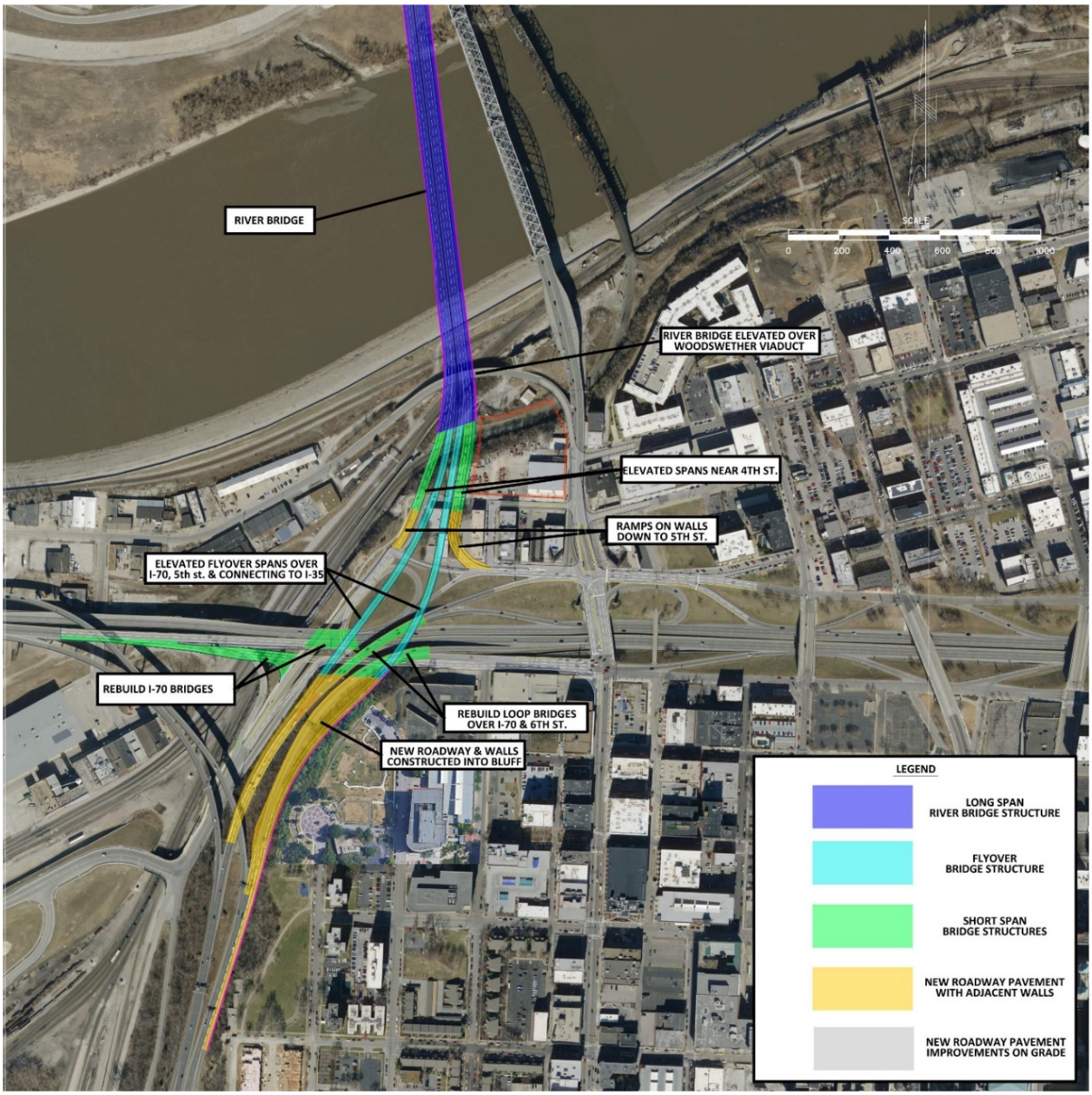


Figure B-1-6: West Alternative with Direct Connection to I-35

This option allows 5th and 6th Streets to remain one-way and does not restrict ramp movements on the west side of Broadway from 5th Street to I-70 and I-35. To facilitate the southbound movement from the bridge to 6th Street, new turning lanes are created under I-70, which requires the replacement of the I-70 Bridges over Beardsley Road. The EB I-70 ramp onto 6th Street is reconstructed with a new bridge over the railroad tracks to connect directly to Beardsley Road. A 15'-0" vertical clearance can be provided between Beardsley Road and the I-70 Overpass but a 6 percent vertical grade is required from Beardsley Road to Broadway along 6th Street, in order to meet the existing intersection surface. To facilitate this grade, short walls will be constructed along 6th Street which may limit access to property owners and Washington Street. In addition, if two lanes of truck turning movements are provided from eastbound 6th Street to southbound Broadway, the parking garage on that corner will be impacted.

4.2 Central Alternative

Multiple ramp configurations were studied for the south segment of the Central Alternative with direct connection to I-35, two of which are conceptually shown in Figure B-1-7. The crossover ramps and gore areas may require complex bridge framing over the floodwall and railroad tracks at the south end of the river.

The concept shown on the left of Figure B-1-7 minimizes structure length by ramping down to 4th Street with the downtown lanes at grade but the required roadway geometry includes tight reverse curvature. The flyover lanes are elevated above the SB downtown lanes. This scheme requires a separation of the roadways on the river bridge and requires a left exit from SB US-169 to SB I-35.

The concept shown on the right also requires three separated roadways on the river bridge: the southbound lanes, a single northbound I-35 flyover lane and the northbound downtown lanes. This adds structure width overall but allows for the optimization of horizontal and vertical geometry. The northbound lane from I-35 would meet the adjacent northbound lanes at some point across the river but must allow for that traffic to exit at Harlem Road for access to the airport.



Figure B-1-7: Ramp Concepts for Central Alignment with Direct Connection to I-35

The option with the northbound and southbound roadways separated as shown in Figure B-1-8 moves forward for additional consideration as a part of the Central Alternative.

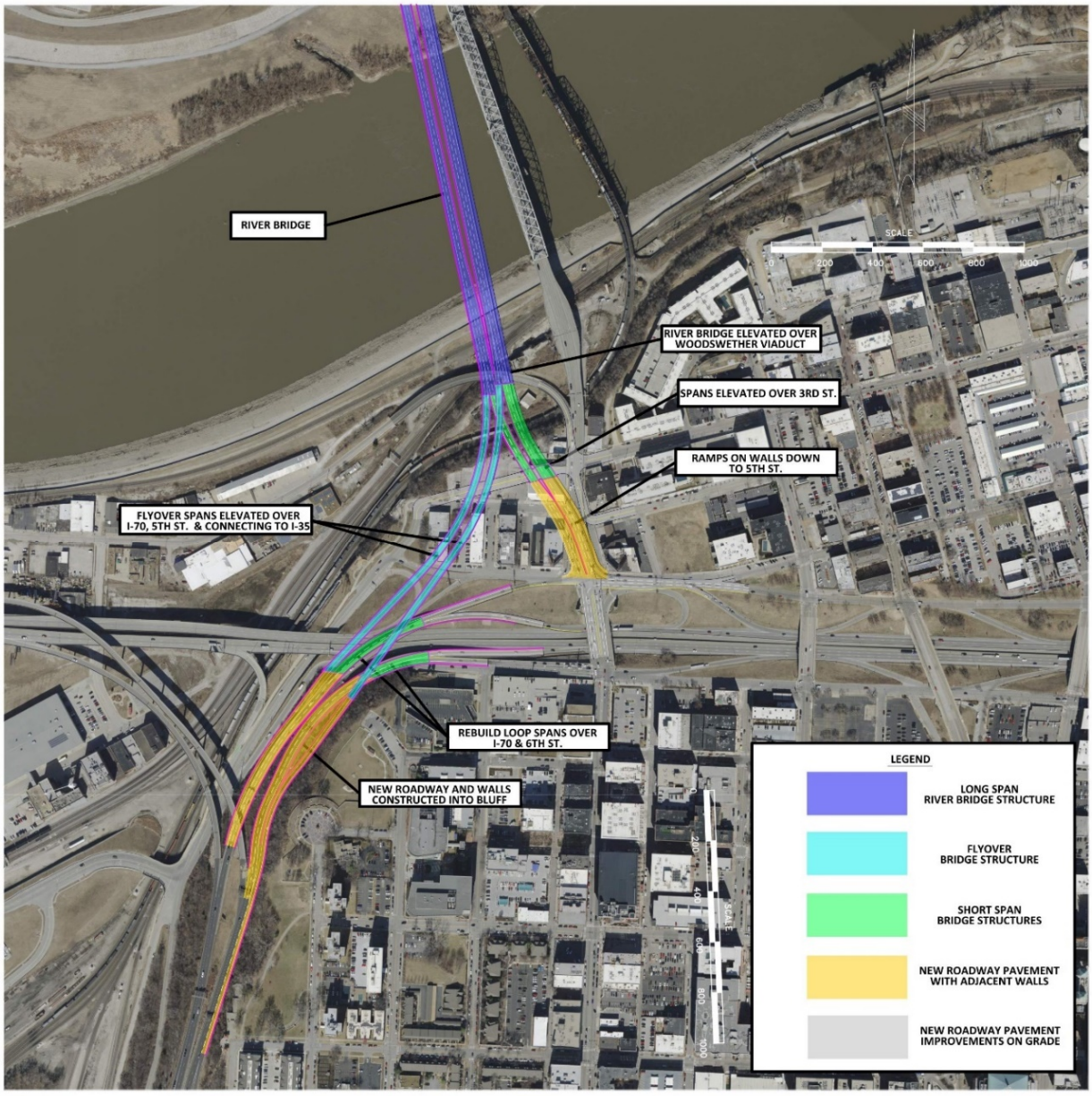


Figure B-1-8: Central Alternative with Direct Connection to I-35

This option simplifies the river bridge framing by minimizing the curvature on the long spans. The northbound lanes are elevated above the southbound lanes, which facilitates the tie-ins to the flyover structures south of the river. North of the river, the northbound and southbound roadways meet at a point south of the floodwall, facilitating the connection to Harlem Road. Northbound I-35 traffic has direct access to the airport using the ramp at Harlem Road.

4.3 Adjacent Alternative

Multiple ramp configurations were studied for the south segment of the Adjacent Alternate with direct connection to I-35, conceptually shown in Figure B-1-9. This alternative complicates the connection to Woodswether and the local street grid. The first concept shown in Figure B-1-9 allows for an intersection at 3rd Street and Broadway. This is not desirable because of the high traffic volume on Broadway. The second concept shown in Figure B-1-9 elevates the flyover lanes on the inside of the roadway. This requires a left exit from SB US-169 to SB I-35. Both configurations include ramps with a 35 mph design speed which is less than the desired 45 mph design speed provided in the Central Alternative.



Figure B-1-9: Ramp Concepts for Adjacent Alignment with Direct Connection to I-35

The options with and without a direct flyover connection to I-35 require similar footprints but provide very different traffic patterns and lane configurations at 5th Street/6th Street and Broadway. Options with a direct flyover connection, with provision for a future direct flyover connection and without a direct flyover connection were presented to the public for additional consideration as different options within one initial alternative.

The concept without direction connection shown in Figure B-1-10 includes an expanded intersection at 5th and Broadway and additional ramp lanes to and from I-35.

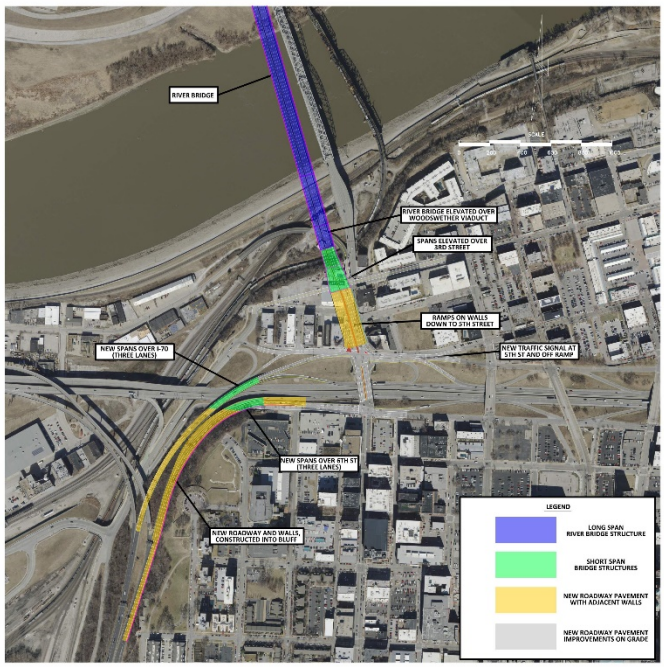


Figure B-1-10: Concept for Adjacent Alignment without Direct Connection to I-35 (Option 1)

The concept with direction connection shown in Figure B-1-11 requires a large footprint and additional impacts near Woodswether, large gored areas on the river bridge and complex vertical geometry.

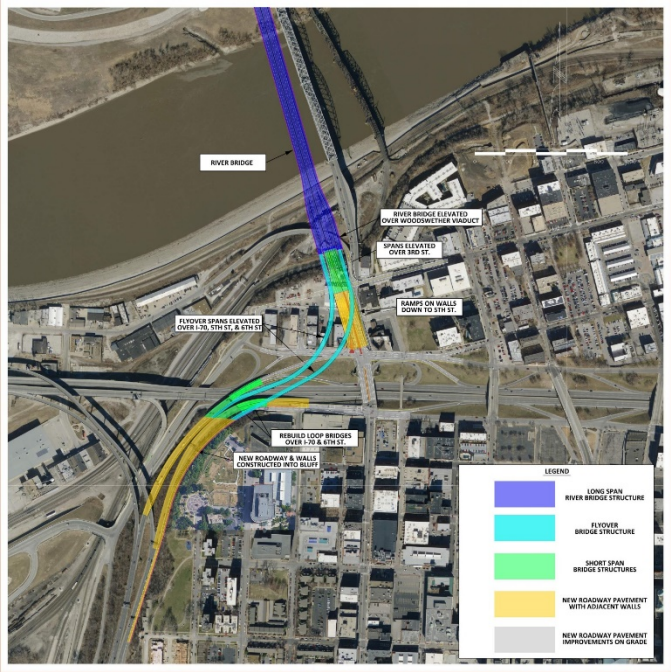


Figure B-1-11: Concept for Adjacent Alignment with Direct Connection to I-35 (Option 2)

The option with the northbound and southbound roadways separated as shown in Figure B-1-12 moves forward for additional consideration as a part of the Adjacent Alternative.

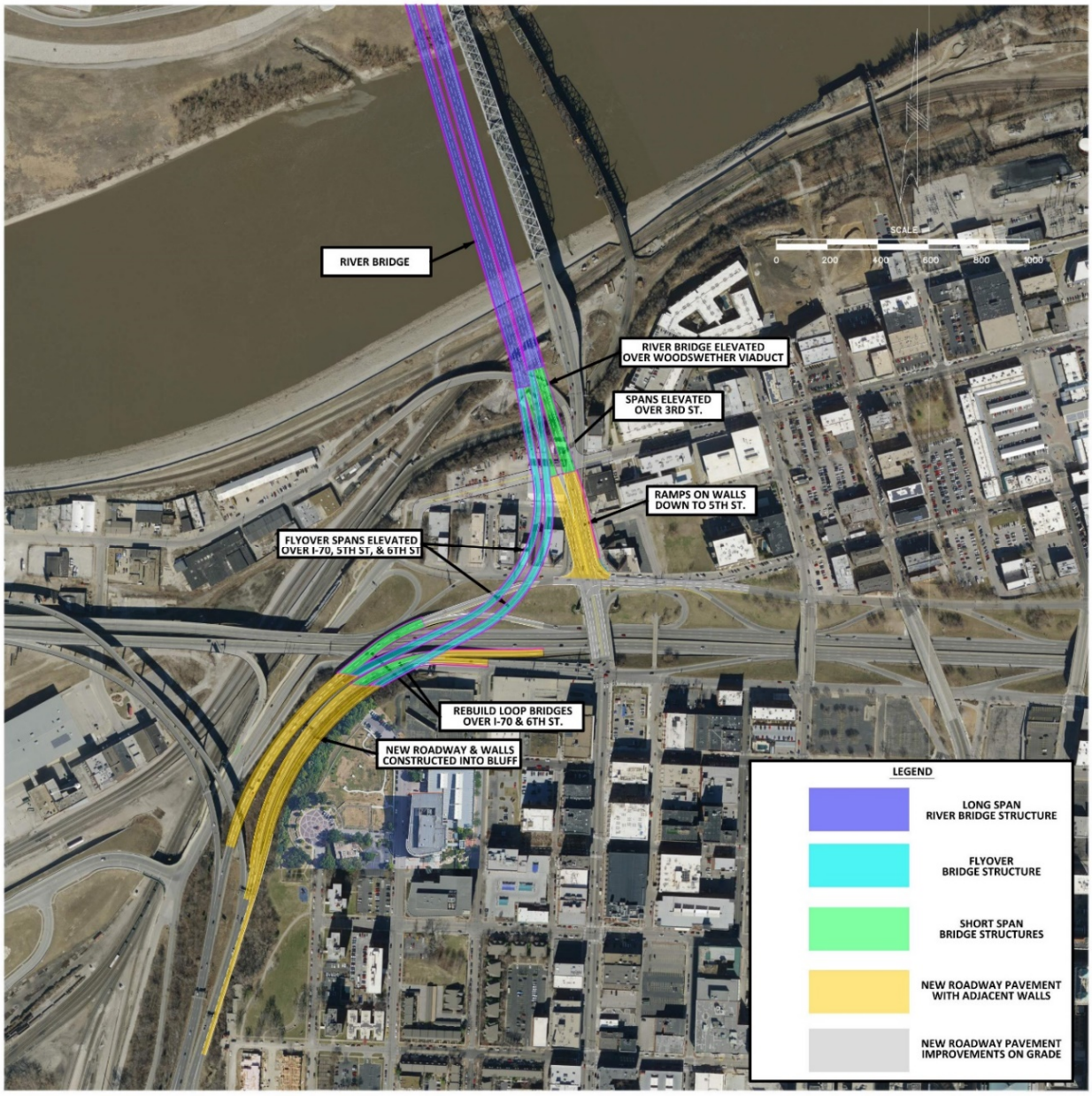


Figure B-1-12: Adjacent Alternative with Direct Connection to I-35 (Option 3)

This option closely resembles the Central Alternative because it includes crossover ramps to simplify the river bridge framing and to minimize the curvature on the long spans. The northbound lanes are elevated above the southbound lanes, which facilitates the tie-ins to the flyover structures south of the river. North of the river, the northbound and southbound roadways meet at a point south of the floodwall, facilitating the connection to Harlem Road. Northbound I-35 traffic has direct access to the airport using the ramp at Harlem Road. The ramps in this configuration require a 35 mph design speed which is less than the desired 45 mph design speed provided in the Central Alternative.

4.4 Charles B. Wheeler Downtown Airport

Discussions with the Kansas City Aviation Department (KCAD) during the PEL established airport access requirements for the project. The existing access configuration includes:

- Existing at Harlem Road - NB into airport, NB out of airport, SB out of airport
- Existing at center, referred to as the "right-in, right-out" – SB into airport, SB out of airport
- Existing at north end – SB into airport, NB out of airport

The proposed access configuration removes the SB out of airport movement at Harlem Road and moves this to a loop ramp at the north end. This modified configuration provides the access redundancy required by KCAD:

- Proposed at Harlem Road – NB into airport, NB out of airport
- Proposed at center – SB into airport, SB out of airport
- Proposed at north end – SB into airport, NB out of airport, SB out of airport

4.4.1 Proposed North End Improvements

The north end of the airport is a highly constrained area, bounded on the west side by the levee and the east side by the railroad. Improvement options are limited. The existing NB out of airport ramp to NB US-169 travels beneath a bridge carrying the SB lanes of US-169. This bridge is in relatively good condition and does not warrant replacement at this time. The proposed improvements include the relocation and lengthening of the SB ramp into the airport and a new loop ramp to allow traffic SB onto US-169 as shown in Figure B-1-13.

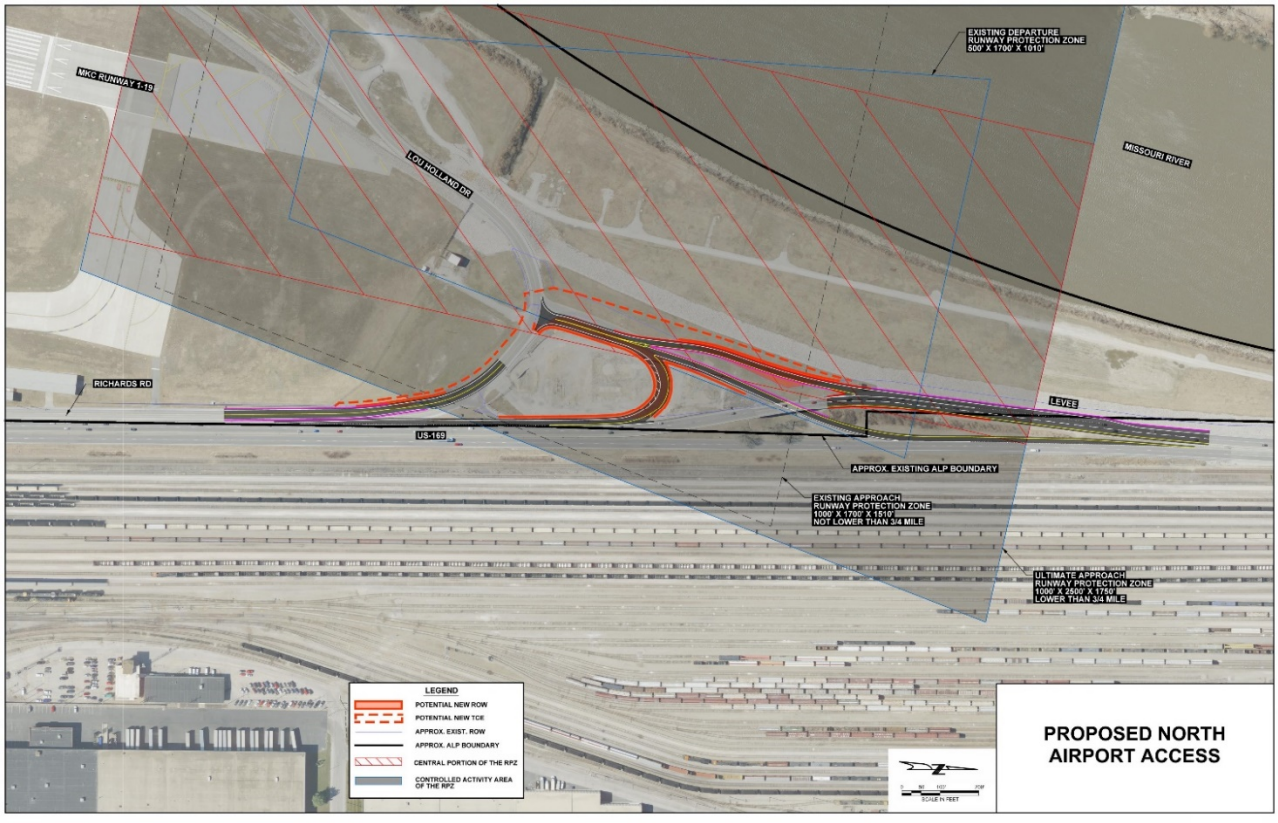


Figure B-1-13: Proposed North End Access

All improvements are constructed on the landside of the levee and will need to be permitted with the levee sponsor and the USACE. In addition, improvements are within the runway protection zone and the end of Runway 1-19. Specific construction activities in this area will be in close coordination with KCAD and FAA.

4.4.2 Improved Central and Harlem Road Access – Interchange Concepts

Within this configuration, several options were studied for each location. To improve airport access, the Harlem Road and center access locations were combined into an interchange design with the three options shown in Figure B-1--14:

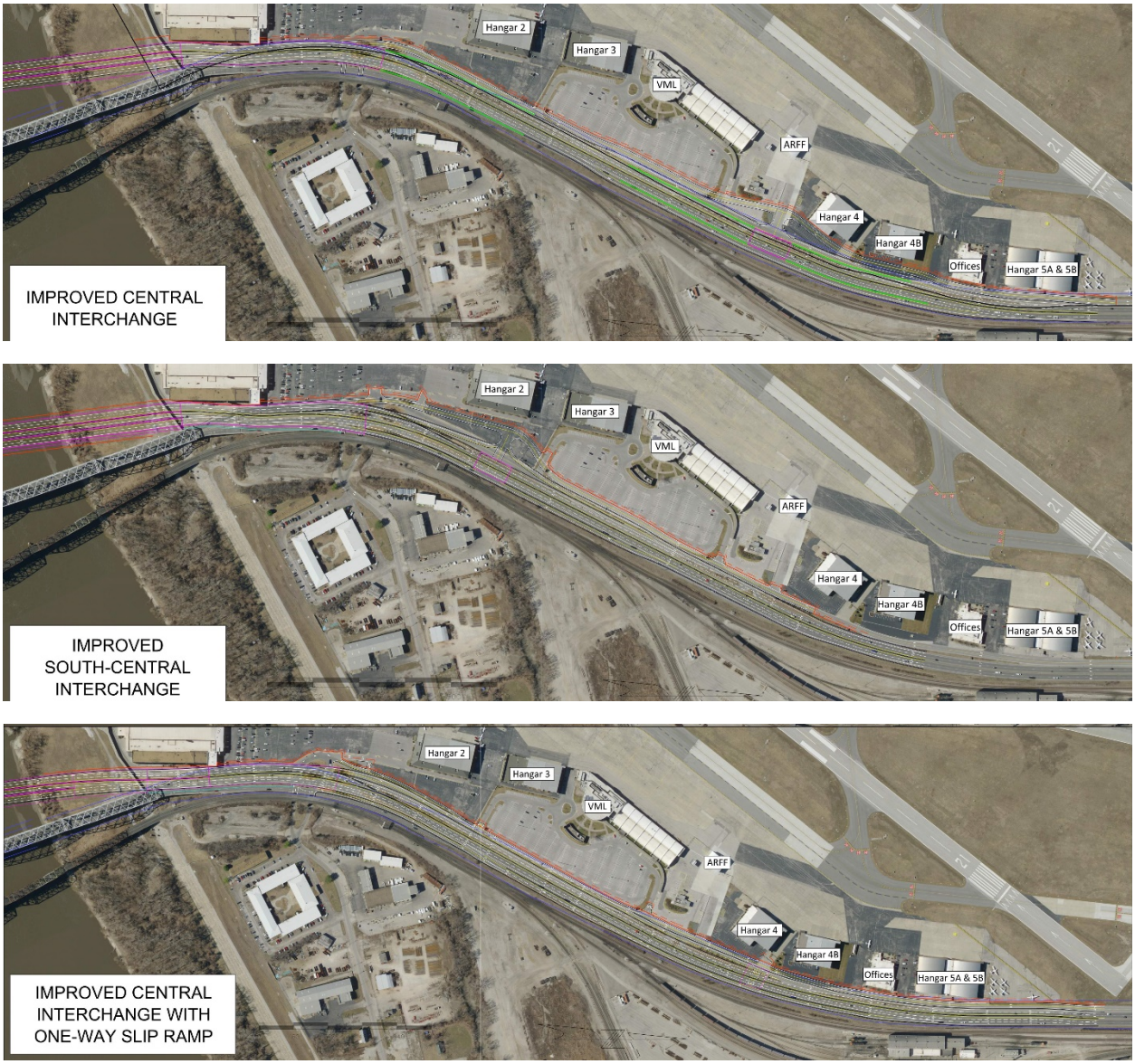


Figure B-1-14: Interchange Concepts Combining Central and Harlem Road Access

- Improved Central Interchange – Provides an interchange with an elevated span near Hangar 4 and the ARFF facility. This option minimizes impacts to parking at the airport terminal building but reduces the parking at Hangar 4 and the buildings north of Hangar 4. In addition, loading dock access in the front of Hangar 4 would be severely limited. These impacts are not desirable, and this concept was not carried forward.

- Improved South-Central Interchange – Provides an interchange with an elevated span near Hangar 2. This option minimizes impacts to parking at the terminal building and Hangar 4. However, the parking and airside fenced security area in front of Hangar 2 are nearly completed removed. These impacts are not desirable, and this concept was not carried forward.
- Improved Central Interchange with One-Way Slip Ramp – Provides an interchange using a slip ramp configuration and an elevated span near Hangar 4 and 4B. This option provides the least impact to airport land use acreage overall and to parking. Richards Road carries one-way traffic for a portion of the slip ramp travel, routing traffic to the east side of US-169. The minimal impacts are ideal, but the improvements are required to extend north of Hangar 5A and 5B. Airside restrictions prevent improvements from encroaching into this space. This concept was not carried forward.

4.4.3 Central and Harlem Road Access – Braid Concepts

To simplify the separation of local and regional traffic, a braided ramp concept was studied on the north side of the river, including various access configurations at the airport, one of which is shown in Figure B-1-15. Separating the traffic at the north end simplifies the bridge geometry at the south end for the central and adjacent alternatives. Southbound travelers are directed towards downtown or I-35 near the south end of the airport. Northbound travelers from I-35 fly over all lanes and remain elevated adjacent to the railroad until touching down at grade. NB I-35 travelers are not able to access the airport from the flyover ramp with this concept. Travelers from NB I-35 to the airport would be required to use the Broadway downtown exit and then travel through the traffic signal at 5th Street, like today. This was not desirable to the airport stakeholders.



Figure B-1-15: Braid Concepts Combining Central and Harlem Road Access

In addition, the challenges with a braid at the north end are like those at the south end – the area is highly constrained, and the required geometry is complex. One advantage to this concept is that the spans required at the north end are shorter and less costly than the south end spans over the railroads. However, there is an increase in the square footage of new structure required to be built and maintained in the future.

Because it does not provide direct access from NB I-35 and because of the added structure maintenance costs, the north end braid concept was not carried forward.

4.4.4 Proposed Central and Harlem Road Access Improvements

To minimize impacts to land use acreage and parking at the airport, a configuration like the existing configuration is proposed as shown in Figure B-1-16. Improvements are made at the Harlem Road ramps and at the central right-in, right-out lanes. Direct access to the airport for NB I-35 travelers is provided.

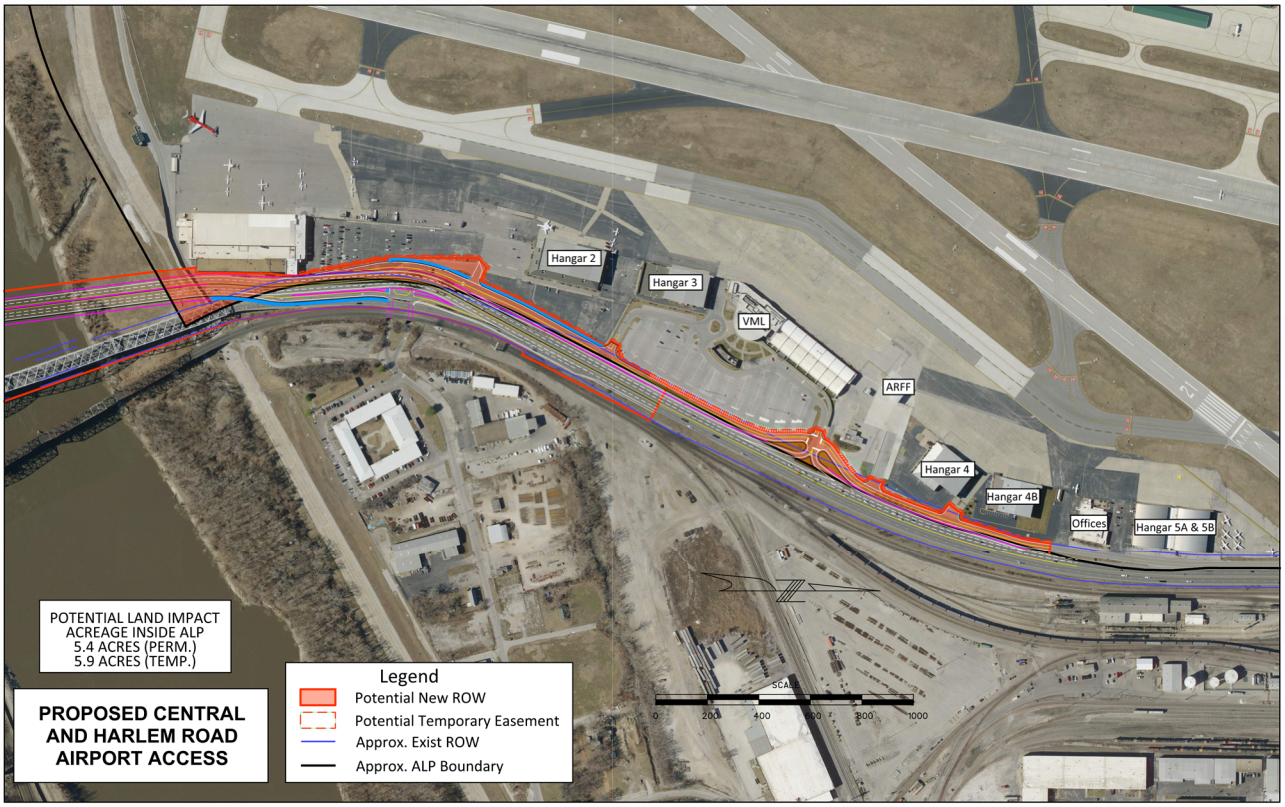


Figure B-1-16: Proposed Central and Harlem Road Access Improvements

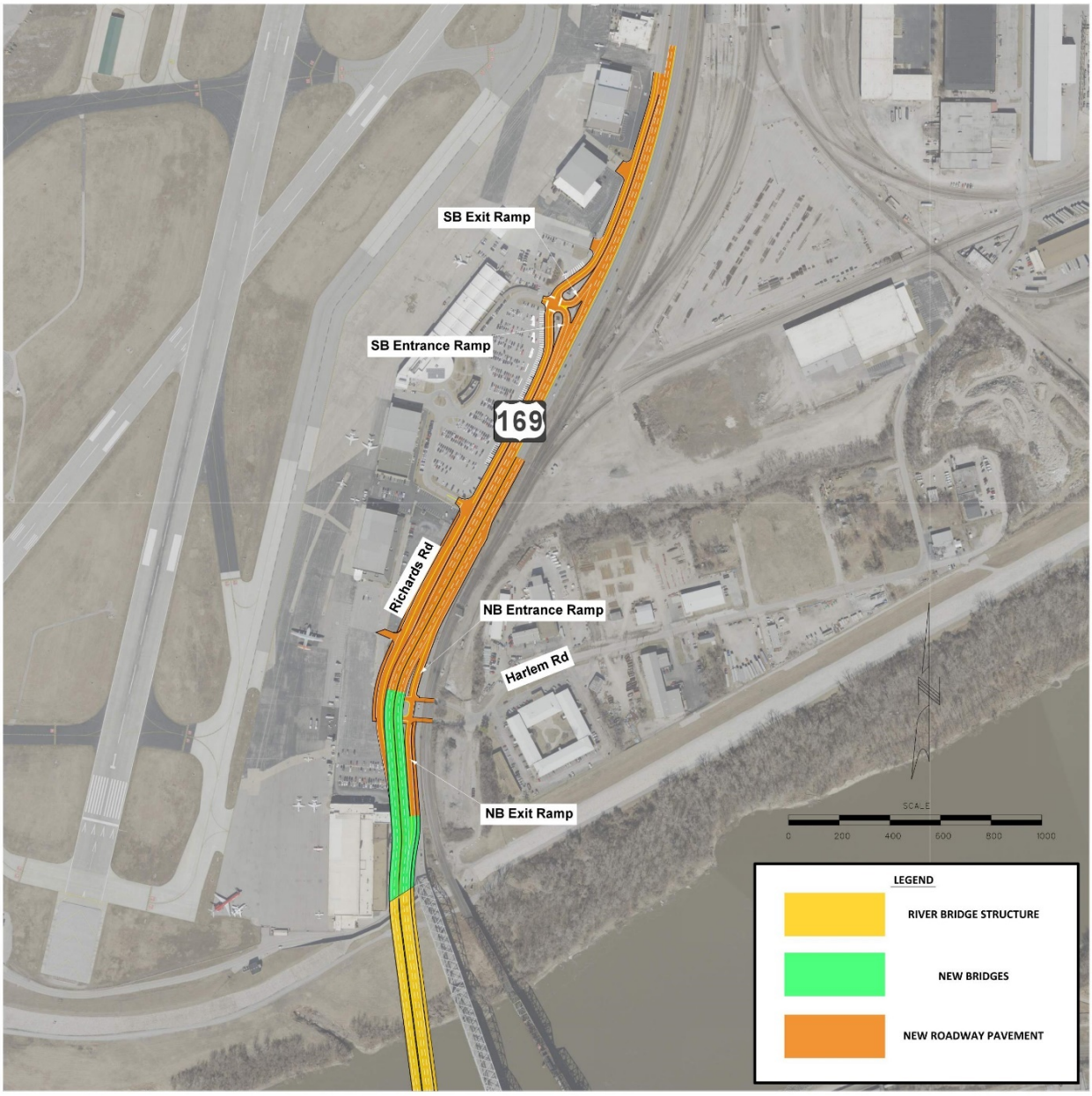


Figure B-1-17: Proposed Central and Harlem Road Access Improvements

4.5 West Bottoms Connection Via Woodswether

The existing Woodswether Road connection to the West Bottoms, comprised of two bridges over the BNSF and UP railroads as shown in Figure B-1-18, was identified for removal in the PEL. Two options involving a longer route via Beardsley Road to Forrester Avenue were included in the strategies carried forward.

However, in order to address concerns from stakeholders along Woodswether, the City of Kansas City, Missouri (KCMO) has determined that maintaining a direct access to the West Bottoms along Woodswether Road is desired and is included as part of this study. Because the cost of a replacement viaduct may prevent its inclusion in this project at this time, alternatives under consideration will be required to maintain the existing Woodswether Bridges in place.

In addition, a third bridge called the Broadway-under-Broadway Bridge, shown in Figure B-1-18, must also remain in place. This structure over the BNSF railroad sits directly under the Buck O'Neil Bridge and is used by KCMO to access critical utility connections.

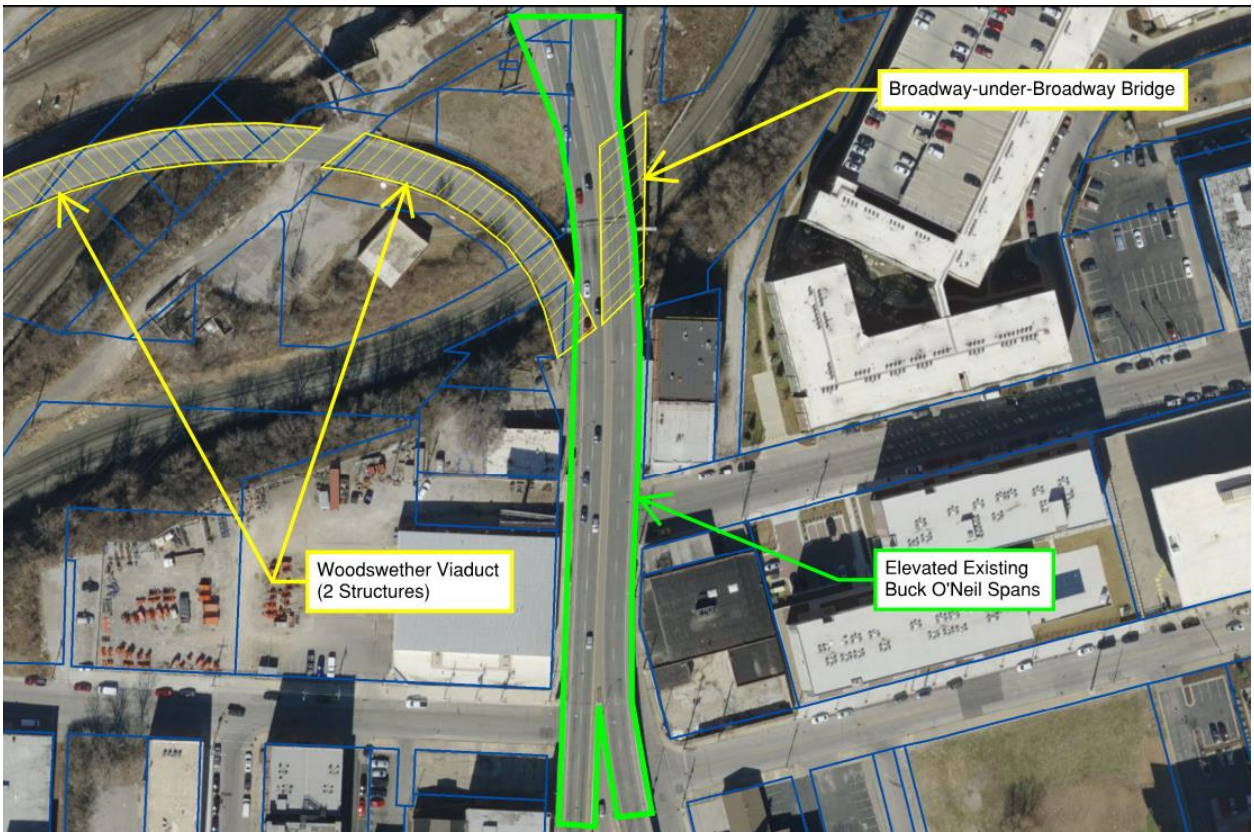


Figure B-1-18: Existing Bridges to Remain in Place near Woodswether/West Bottoms Access

If funding is identified by KCMO in the near future, one or all these structures could be replaced as a part of this project. The impacts due to these replacements are included in the alternative footprints and the evaluation matrix.

5.0 Detailed Evaluation Matrix - Qualitative/Quantitative Screening against Performance Measures

NEEDS	PERFORMANCE MEASURES		PERFORMANCE CRITERIA	Unit of Measure	NO BUILD	NEW BRIDGE with DIRECT CONNECT TO I-35 West	NEW BRIDGE with DIRECT CONNECT TO I-35 Central	NEW BRIDGE without DIRECT CONNECT TO I-35 Adjacent Option 1	NEW BRIDGE with future DIRECT CONNECT TO I-35 Adjacent Option 2	NEW BRIDGE with DIRECT CONNECT TO I-35 Adjacent Option 3
INFRASTRUCTURE	CONDITION	POTENTIAL TO IMPROVE USEFUL LIFE OF FACILITY	Service Life of River Bridge	Years	Replace/Rehab in 2025	100	100	100	100	100
			Area of New Bridges Constructed	Area (SF)	0	430,000	381,000	304,000	304,000	404,000
			Area of New Roadways Constructed on Walls	Area (SF)	0	192,000	221,000	229,000	229,000	243,000
			Removal Area of Existing "Poor" Bridges	Area (SF)	0	223,000	223,000	223,000	223,000	223,000
			Removal Area of Existing "Fair" Bridges	Area (SF)	0	65,000	29,000	29,000	29,000	29,000
			Removal of Roadways on Walls	Area (SF)	0	108,000	108,000	108,000	108,000	108,000
	GEOMETRY	POTENTIAL TO IMPROVE/PROVIDE DESIRED GEOMETRY	Examples: Horizontal Curvature, Vertical Profile, Design Speed, Truck Turning Movements	1-5 (Best to Worst)	5	3	1	3	3	2
MOBILITY	TRAFFIC CONGESTION	TOTAL PEAK VEHICLE HOURS TRAVELED	Entire Analysis Area, 2025 AM Peak Hour	Vehicle Hours	2,894	3,127	3,099	3,121	3,121	3,107
			Entire Analysis Area, 2025 PM Peak Hour	Vehicle Hours	3,478	3,594	3,435	3,515	3,515	3,450
		NETWORK AVERAGE SPEED	Average Travel Speed, 2025 AM Peak Hour	MPH	39	39	39	39	39	39
			Average Travel Speed, 2025 PM Peak Hour	MPH	34	36	37	37	37	37
			Average Travel Speed, 2045 AM Peak Hour	MPH	35	34	35	35	35	35
			Average Travel Speed, 2045 PM Peak Hour	MPH	20	29	30	30	30	30
	TRAVEL TIMES	TOTAL PEAK HOUR TRAVEL TIME	Entire Analysis Area, 2025	Travel Time (Total hh:mm:ss)	1:19:13	1:12:11	1:00:49	1:01:44	1:01:44	1:01:09
		US169 (at MO-9) TO I-35 (at 20th Street)	SB at 2025 AM Peak Hour	Travel Time (Min.)	10:57	09:10	09:01	08:56	08:56	09:14
			NB at 2025 PM Peak Hour	Travel Time (Min.)	14:55	07:45	07:04	08:13	08:13	07:12
		US169 (at MO-9) TO BROADWAY (at 7th St)	SB at 2025 AM Peak Hour	Travel Time (Min.)	09:21	07:57	07:24	07:29	07:29	07:26
			NB at 2025 PM Peak Hour	Travel Time (Min.)	05:41	05:40	05:20	05:30	05:30	05:20
		US169 (at MO-9) TO I-70 (at Charlotte)	SB at 2025 AM Peak Hour	Travel Time (Min.)	11:02	09:18	08:47	08:37	08:37	08:48
			NB at 2025 PM Peak Hour	Travel Time (Min.)	07:50	09:49	06:29	06:42	06:42	06:27
		US169 (at MO-9) TO I-70 (at River Bridge)	SB at 2025 AM Peak Hour	Travel Time (Min.)	10:43	10:58	08:47	08:38	08:38	08:49
			NB at 2025 PM Peak Hour	Travel Time (Min.)	08:44	11:35	07:56	07:39	07:39	07:52
	TRAFFIC VOLUME & LEVEL OF SERVICE AT 5th ST & BROADWAY		2025 AM Peak Hour/Level of Service	Vehicles/LOS	4,071 / F	1,382 / E	2,868 / B	5,694 / E	5,694 / E	2,857 / B
			2025 PM Peak Hour/Level of Service	Vehicles/LOS	3,458 / C	3,129 / C	3,846 / B	6,347 / B	6,347 / B	3,824 / A
	TRAFFIC VOLUME & LEVEL OF SERVICE AT 6th ST & BROADWAY		2025 AM Peak Hour/Level of Service	Vehicles/LOS	2,805 / B	2,769 / F	2,707 / B	3,408 / B	3,408 / B	2,697 / B
			2025 PM Peak Hour/Level of Service	Vehicles/LOS	3,394 / E	3,075 / D	3,043 / C	3,936 / C	3,936 / C	3,003 / B

NEEDS	PERFORMANCE MEASURES		PERFORMANCE CRITERIA		Unit of Measure	NO BUILD	NEW BRIDGE with DIRECT CONNECT TO I-35 West	NEW BRIDGE with DIRECT CONNECT TO I-35 Central	NEW BRIDGE without DIRECT CONNECT TO I-35 Adjacent Option 1	NEW BRIDGE with future DIRECT CONNECT TO I-35 Adjacent Option 2	NEW BRIDGE with DIRECT CONNECT TO I-35 Adjacent Option 3
ACCESSIBILITY	ENHANCE REGIONAL FREIGHT HUBS	DOWNTOWN AIRPORT	Connectivity to regional network		1-5 (Best to Worst)	3	1	1	1	1	1
		PORT KC	Connectivity to regional network		1-5 (Best to Worst)	3	1	1	1	1	1
	SUPPORT CONNECTION TO LOCAL DESTINATIONS	RIVER MARKET	Connectivity to local street grid		1-5 (Best to Worst)	2	1	2	3	3	3
		WEST BOTTOMS	Connectivity to local street grid		1-5 (Best to Worst)	2	1	2	3	3	3
	IMPROVE BICYCLE/PEDESTRIAN ACCOMMODATIONS		Width of accommodation on river bridge		Width (Feet)	No Accommodation	10	10	10	10	10
			Connectivity to existing networks/trails		1-5 (Best to Worst)	5	1	1	1	1	1
			Connectivity to local street grid		1-5 (Best to Worst)	5	1	2	3	3	2
	EASE OF IMPLEMENTATION WITH OTHER PEL STRATEGIES		For the North Loop and MO-9 segments of independent utility		1-5 (Best to Worst)	5	1	1	4	3	1
SAFETY	DRIVER SAFETY	MINIMIZE CRASH RATES	VISSIM Surrogate Safety Analysis – 2025 Comparative Crash Exposure Rates over No-Build for Lane Change/Quick Decel/Freeway & Arterial Conflicts	AM	(+) % Worse (-) % Better	0% / 0% / 0%	14% / -6% / 34%	9% / 0% / 17%	13% / -2% / 45%	13% / -2% / 45%	9% / 0% / 17%
				PM		0% / 0% / 0%	-5% / -25% / 6%	-6% / -64% / -16%	-2% / -56% / 0%	-2% / -56% / 0%	-6% / -64% / -16%
		MINIMIZE CONFLICT POINTS	Total number of conflict points – Merge/Diverge/Crossing		Count	64 / 67 /74	70 / 72 / 89	60 / 61 / 82	63 / 63 / 92	63 / 63 /92	60 / 61 / 82
			Number of crossing conflict points - High-High/High-Low		Count	31 / 2	23 / 15	19 / 19	46 / 2	46 / 2	19 /19
	IMPROVE/IMPLEMENT SAFETY STRATEGIES		Key Strategies from MoDOT Safety Blueprint: Improve Geometry, Reduce Conflicts and Crossings, Expand Shoulders, Ped Crossings		1-5 (Best to Worst)	5	3	2	3	3	2

NEEDS	PERFORMANCE MEASURES		PERFORMANCE CRITERIA	Unit of Measure	NO BUILD	NEW BRIDGE with DIRECT CONNECT TO I-35 West	NEW BRIDGE with DIRECT CONNECT TO I-35 Central	NEW BRIDGE without DIRECT CONNECT TO I-35 Adjacent Option 1	NEW BRIDGE with future DIRECT CONNECT TO I-35 Adjacent Option 2	NEW BRIDGE with DIRECT CONNECT TO I-35 Adjacent Option 3
ENVIRONMENT	PROMOTE QUALITY PLACES		Visual character and aesthetics	1-5 (Best to Worst)	1	2	3	4	4	5
	COMMUNITY IMPACTS	ROW IMPACTS	Residential acquisitions and relocations	Number of Residences	0	0	0	0	0	1
			Commercial acquisitions and relocations	Number of Businesses	0	4	7	4	4	5
			Number of billboards to acquire	Count	0	1	4	3	3	3
			If left in place, level of impacts to property access, parking, etc.	1-5 (Least to Greatest Impacts)	1	5	2	3	3	3
		EJ/LEP POPULATIONS DEMOGRAPHICS	Residential	Number of Residences	0	0	0	0	0	0
			Commercial	Number of Businesses	0	0	0	0	0	0
	PROTECT CULTURAL/NATURAL RESOURCES	CULTURAL RESOURCES	NHRP resources (or potentially eligible resources) impacted	Count	0	1	1	1	1	1
			Documented archeology sites	Count	0	0	0	0	0	0
		NATURAL RESOURCES	Park Right-of-Way Acquired	Acres	0.0	1.23	1.23	1.23	1.23	1.23
			Wetlands Impacted	Acres	0.0	12.3	10.7	8.9	8.9	8.9
			Floodplain (100-year) Impacted	Acres	0.0	14.4	12.4	10.6	10.6	10.6
	PUBLIC HEALTH	HAZARDOUS MATERIAL SITES	Hazmat sites affected	Count	0	0	0	0	0	0
		AIR QUALITY	Impacts on air quality	1-5 (Least to Greatest Impacts)	3	3	3	3	3	3
		NOISE IMPACTS	Impacts to sensitive receivers	1-5 (Least to Greatest Impacts)	3	3	3	3	3	3
CONSTRUCTABILITY	RAILROAD ISSUES		Difficulty of Construction in the Vicinity & RR Easement Acquisition	1-5 (Least to Greatest Difficulty)	1	4	3	3	3	3
	AIRPORT ISSUES		Impacts due to Construction; Airspace conflicts/height restrictions	1-5 (Least to Greatest Impacts)	1	4	3	3	3	3
	UTILITY ISSUES		Relocation and impacts due to construction (water, sewer, overhead electric, pipeline)	1-5 (Least to Greatest Impacts)	1	3	3	3	3	3
	MAINTENANCE OF TRAFFIC DURING CONSTRUCTION		Minimize US-169 closure during construction	1-5 (Best to Worst)	1	2	3	4	4	4
			Minimize I-35 closure during construction	1-5 (Best to Worst)	1	3	3	3	3	3
			Minimize I-70 closure during construction	1-5 (Best to Worst)	1	4	2	2	2	2
	FLEXIBITLITY FOR DESIGN-BUILD PROPOSERS			1-5 (Best to Worst)	5	3	1	3	3	3
	CONSTRUCTION COST		Planning Level Cost Estimate	Dollars	Replace/Rehab in 2025	$230-250M	$210-230M	$180-200M	$180-200M	$210-230M

5.1 Description of Performance Measures

INFRASTRUCTURE

Condition – Removal of Poor bridges is more favorable than removal of Fair bridges. New bridges (more square footage) increases future maintenance costs. Construction and future maintenance of new roadways on walls is more favorable than construction and future maintenance of new bridges.

Geometry – All build alternatives improve conditions over No-Build. Tighter turning radius, double truck turn lanes and lower ramp speed are examples of less favorable geometry conditions.

MOBILITY

Traffic Congestion – System-wide performance measures during peak hours help to determine if an alternative adequately services traffic volumes. More vehicle hours traveled and higher travel speeds are more favorable results for system-wide traffic congestion. Year 2025 is used to compare the performance of the build alternatives; Year 2045 is provided as a reference point only. In Year 2045, bottlenecks elsewhere in the system impact the comparative results.

Travel Times – Shorter travel times for the most significant origin and destination movements are more favorable.

Traffic Volumes and Level of Service – Lower traffic volumes at these intersections are more favorable. Higher LOS – A is highest, F is lowest – is more favorable. However, LOS is not an ideal measure because of the discrepancy between the traffic modeling results and the reality, due to the closeness of the two signalized intersection as well as the extent of the intersection queues.

ACCESSIBILITY

Enhance Regional Freight Hubs – All build alternatives similarly improve the regional connectivity by providing a new river crossing.

Support Connection to Local Destinations – Build alternatives that maintain or improve the local street grid are more favorable for local connectivity.

Improve Bicycle/Pedestrian Accommodations – All build alternatives provide similar accommodation on the bridge and connectivity to the local bicycle network. Build alternatives with multi-lane pedestrian crossings are less favorable.

Ease of Implementation with Other PEL Strategies – All build alternatives allow for implementation of MO-9 segment strategies. Build alternatives with direct connections to I-35 are more favorable for implementation of the North Loop segment strategies.

SAFETY

Minimize Crash Rates – Positive percentages represent an increase in the crash exposure rate over No-Build and negative percentages represent a decrease. The No-Build alternative appears to perform better than some of the build scenarios due to the lower number of vehicles and thus the lower likelihood of a conflict.

Minimize Conflict Points – Comparison of conflict points categorized by type and volume. Crossing conflicts potentially increase the severity of crashes over other types of conflicts. High-volume movement crossing with high-volume movement and high-volume movement crossing with low-volume movement potentially increase the severity of crashes.

Improve/Implement Safety Strategies – Key safety improvement strategies related to crash trends in the project area are weighted based on potential of implementation.

ENVIRONMENT

Promote Quality Places – Removal of existing bridge decreases visual character. Construction of flyover ramps within local street network decreases visual character.

Community Impacts, Cultural/Natural Resources, Public Health – Impacts as quantified in Chapter 4 of this document.

CONSTRUCTIBILITY

Railroad, Airport and Utility Issues – West Alternative slightly more challenging for railroad and airspace encroachment. All other build alternatives similar.

Maintenance of Traffic during Construction – West Alternative requires additional closure of I-70. Central and Adjacent Alternatives require various levels of closure for US-169/Broadway.

Flexibility for Design-Build Proposers – The Central Alternative provides the most flexibility for design-build proposers which could result in a decrease in cost or an increase in project scope.

Construction Cost – Cost estimates are a range for construction only. Project management, utility relocations, right-of-way, construction oversight and other associated costs are not included.

1.0 Introduction

This memorandum supports *Chapter 2.0 Alternatives Considered*, and provides an overview of the existing and future No Build traffic and safety conditions, as well as the future conditions for the Build Alternatives. Additional traffic modeling assumptions, analysis data and safety parameters can be found in the Access Justification Report (AJR).

1.1 Existing Roadway System Performance

System-wide performance measures were developed to assess existing travel conditions for comparison of performance between all modeled scenarios. Table B-2-1 lists the existing system-wide metrics for both the AM and PM peak hour and include:

- Total Number of Processed Vehicles,
- Vehicle Miles Traveled (VMT),
- Vehicle Hours Traveled (VHT),
- Average Vehicle Speed

Table B-2-1: Existing Roadway System Performance

Network Results	Volume Processed		Speed		VMT		VHT	
	AM	PM	AM	PM	AM	PM	AM	PM
			Avg (mph)	Avg (mph)	(veh-mi)	(veh-mi)	(Veh-hr)	(Veh-hr)
Existing	39,838	41,096	42	39	111,560	116,245	2,661	2,968

Level of Service (LOS) information was calculated for the existing roadway network and traffic volumes on roadway segments near the proposed access modification from the traffic model. Table B-2-2 includes a summary of the Level of Service for both the AM and PM peak periods.

Table B-2-2: Existing Roadway Segment Level of Service Summary

Roadway Segment	Existing
I-35 NB at 6th Street Off-Ramp	B (F)
I-35 NB at I-70 On-Ramp	C (B)
I-35 SB at 5th Street On-Ramp	E (C)
I-70 WB at I-35 SB Ramp	E (D)

Existing conditions bottlenecks are summarized below to serve as a baseline for future analysis year comparisons.

- Southbound US-169 (AM Peak) – Extends approximately 0.75 miles from 5th Street at Broadway Boulevard. (Figure B-2-1 – queue heading south on US-169 to 5th Street at the north end of Buck O'Neil Bridge).

- Northbound I-35 to Northbound US-169 (PM Peak) – Extends approximately 0.5 miles from 6th Street signal at Broadway Boulevard (Figure B-2-2 – View from 12th Street of spillback from 6th Street onto northbound I-35).



Figure B-2-1 – Southbound US-169 (AM)



Figure B-2-2 – Northbound I-35 (PM)

- Southbound I-35/Westbound I-70 queue to Broadway Boulevard at 5th Street (PM Peak) – Extends approximately 0.25 miles to the Delaware Bridge overpass. (Figure B-2-3 - View from Main Street of spillback from 5th Street into I-70 westbound weaving area).

Figure B-2-3 – Westbound Ramp to 5th Street (PM)



Signalized intersections in relation to proposed alternatives were studied for change in performance and LOS. Existing signalized intersections of 5th Street and 6th Street at Broadway Boulevard serve as primary access between US-169 and I-35/I-70 in the current configuration. Table B-2-3 provides LOS information for the existing signalized intersections.

Table B-2-3: Existing Signalized Intersection Performance

Signalized Intersection	Existing
	LOS AM (PM)
5th St & Broadway Blvd	F (B) *
6th St & Broadway Blvd	B (D) *

(*See following discussion on Intersection LOS)

The intersections of 5th and 6th Street and Broadway operate as a single unit in coordination. LOS performance of the signalized intersections is directly tied to the interaction of the heaviest trip movements traveling through the coordinated pair and traffic queues forming at the initial traffic signal. Southbound US-169 during the morning peak period and northbound I-35 trips during evening peak period are the predominant movements entering the signalized intersection pair and have the longest delay. Although the existing signal at 6th Street and Broadway Boulevard indicates a LOS D, public perception of intersection performance is poor due to a nearly 94 second delay for the primary movement and extent of primary intersection queues (Figure B-2-4).

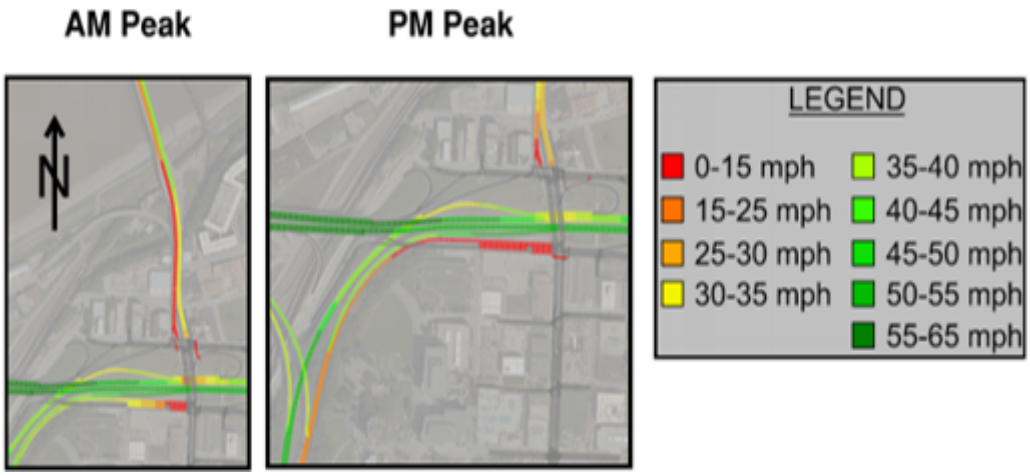


Figure B-2-4: Existing Travel Speeds at 5th and 6th Street Traffic Signals

1.2 Existing Safety Conditions

Multiple measures of safety were used to assess the current safety conditions within the project study area. Measures include determining existing system crash rates, crash type, and crash severity.

1.2.1 Existing Crash Rates

Crash rate data was obtained and analyzed from the MoDOT Transportation Management System (TMS) for the project area on the interstate system and on the other federally designated highway system (US routes). Table B-2-4 shows the crash rate over the past five-year period (2013 to 2017) for the interstate system statewide, within the MoDOT Kansas City District, Jackson County, and segments of I-35 and I-70 in the project areas.

Table B-2-4: Interstate Crash Rate Comparison for Study Area

Area	5-Year Crash Rate (100 MVMT)*
Statewide (Interstate)	93
District (Interstate)	97
Jackson County (Interstate)	102
I-35 Northbound / I-70 Eastbound	801
I-35 Southbound / I-70 Westbound	689

* Million Vehicle Miles Traveled

I-35 and I-70 within the study area experience a significantly higher crash rate than similar facilities across the state. I-35 and I-70 in the study area contain closely spaced interchanges, heavy congestion, short weave areas, left-hand ramps, and poor lane continuity which are likely contributing factors to the elevated crash rate.

US-169 within the study area exceeds the crash rate of similar facilities across that state, within Jackson County, and MoDOT's Kansas City District (Table B-2-5). US-169's narrow shoulders, sharp horizontal curvature, heavy congestion and left-hand entry ramp are likely contributing factors to the elevated crash rate.

Table B-2-5: US Highway Crash Rate Comparison for Study Area

Area	5-Year Crash Rate (100 MVMT)*
Statewide (US Highway)	116
District (US Highway)	121
Jackson County (US Highway)	126
US-169 SB	225
US-169 NB	345

* Million Vehicle Miles Traveled

1.2.2 Existing Crash Severity

Existing crash statistics and trends were reviewed for the five-year period from 2013 through 2017. Crash statistics shown include a subset of the overall safety study area used for the environmental document and are focused on the functional area of the proposed access modification (Figure B-2-5).

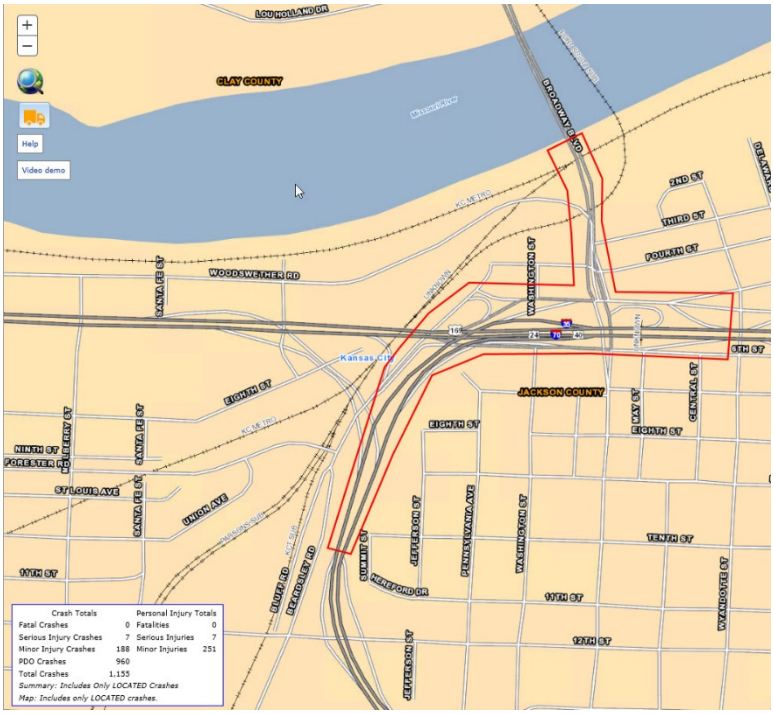


Figure B-2-5: Crash Study Area for Access Report

Table B-2-6 shows the total number of crashes and the severity of the crashes occurring within the study area for 2013-2017.

Table B-2-6: Project Area Crash Severity Summary

Year	Fatal	Disabling Injury	Minor Injury	Property Damage Only	Total
2013	0	2	26	125	153
2014	0	0	24	176	200
2015	0	0	25	175	200
2016	0	3	58	170	231
2017	0	2	36	177	215

Several intersections and segments within the project have been identified by MoDOT as having high severity rankings. These rankings are compiled annually utilizing the latest 3 years of crash data available. The intersection of 5th Street and Broadway Boulevard, the merge point of the Broadway Boulevard northbound on-ramp with I-35 southbound/I-70 westbound, US-169 north of Harlem Road, and both I-35 and I-70 are designated high crash locations. Figure B-2-6 illustrates locations of high crash intersections and roadway hotspots.

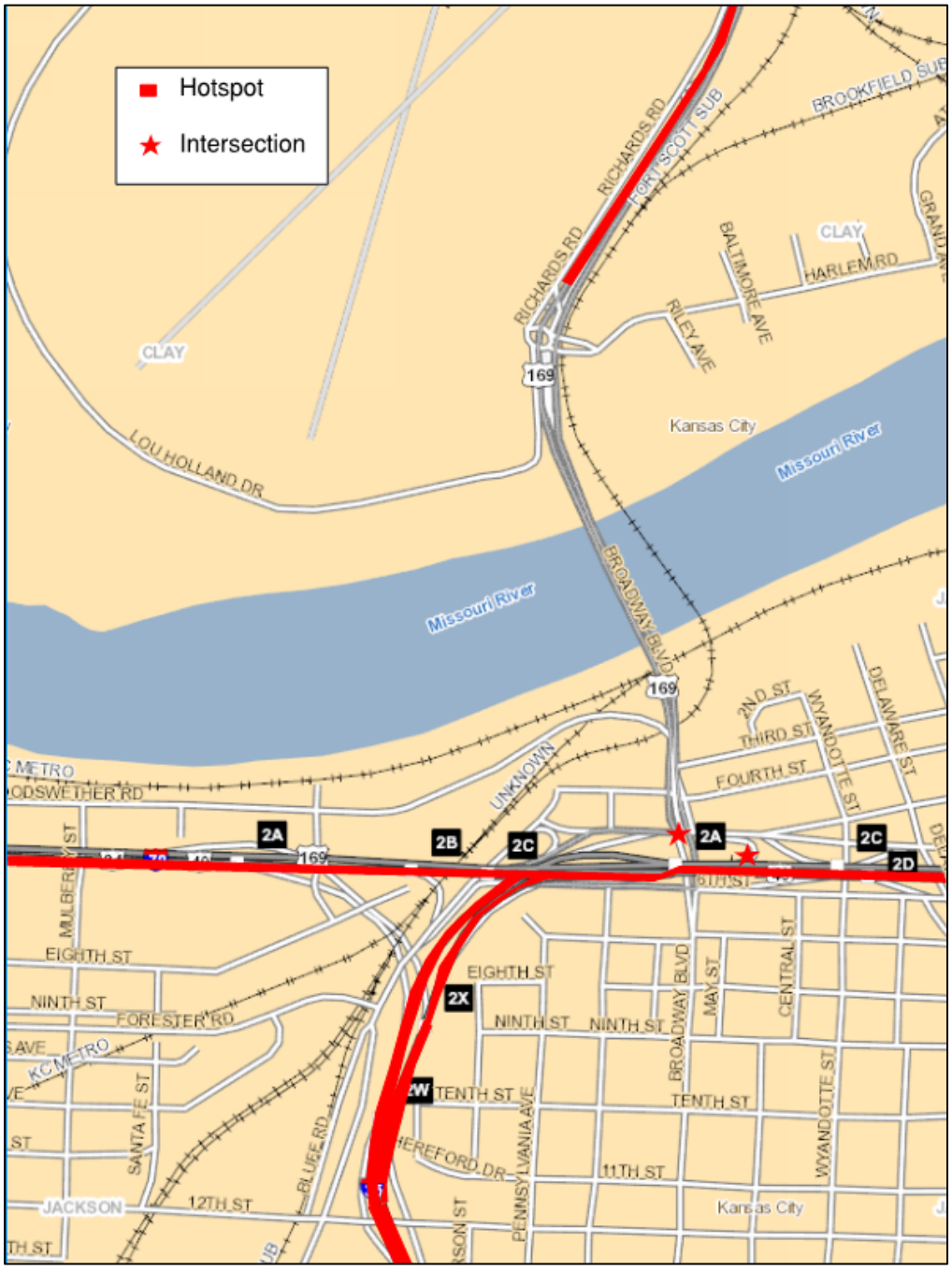


Figure B-2-6: High Crash Intersections and Roadway Segments in Project Area

1.3 Future No-Build Traffic Conditions

System-wide performance measures were developed for the proposed open to traffic year of 2025 and designated design year of 2045. Table B-2-7 illustrates the changes in the network results from the existing conditions to the two future No-Build scenarios.

Table B-2-7: Existing and Future No-Build System-Wide Performance Measures

Network Results	Volume Processed		Speed		VMT		VHT	
	AM	PM	AM	PM	AM	PM	AM	PM
			Avg (mph)	Avg (mph)	(veh-mi)	(veh-mi)	(Veh-hr)	(Veh-hr)
Existing	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
2045 No-Build	43,820	36,386	35	21	120,471	99,558	3,475	5,866

LOS information was calculated for the existing roadway network using existing, 2025, and 2045 traffic volumes for select roadway segments near the proposed access modification from the traffic model. Table B-2-8 includes a summary of the Level of Service for both the AM and PM peak periods. Improvements in future year LOS reflect traffic queues outside of the listed roadway segments limiting approaching traffic. A full listing of segment LOS results is detailed in Appendix D of the Access Justification Report.

Table B-2-8: Existing and Future Roadway Segment Level of Service Summary

Roadway Segment	Existing	2025 No-Build	2045 No-Build
	LOS	LOS	LOS
NB I-35 - 6th St Off-Ramp	B (F)	B (F)	B (F)
NB I-35 - I-70 On-Ramp	C (B)	C (B)	D (F)
SB I-35 - 5th St On-Ramp	E (C)	E (D)	E (C)
WB I-70 - SB I-35 Ramp	E (D)	F (E)	F (D)

Bottlenecks for 2045 No-Build scenario were analyzed in comparison with the existing system. The following conditions were observed in the VISSIM models.

- Southbound US-169 (AM Peak) – Experiences an approximately 450 percent increase in queue length (Figure B-2-7).
- Northbound I-35 (PM Peak) – Extends south of the I-35/Interstate 670 interchange (Figure B-2-8).
- Southbound I-35/Westbound I-70 queue to Broadway Boulevard at 5th Street (PM Peak) – Queue lengths remain similar to existing conditions.

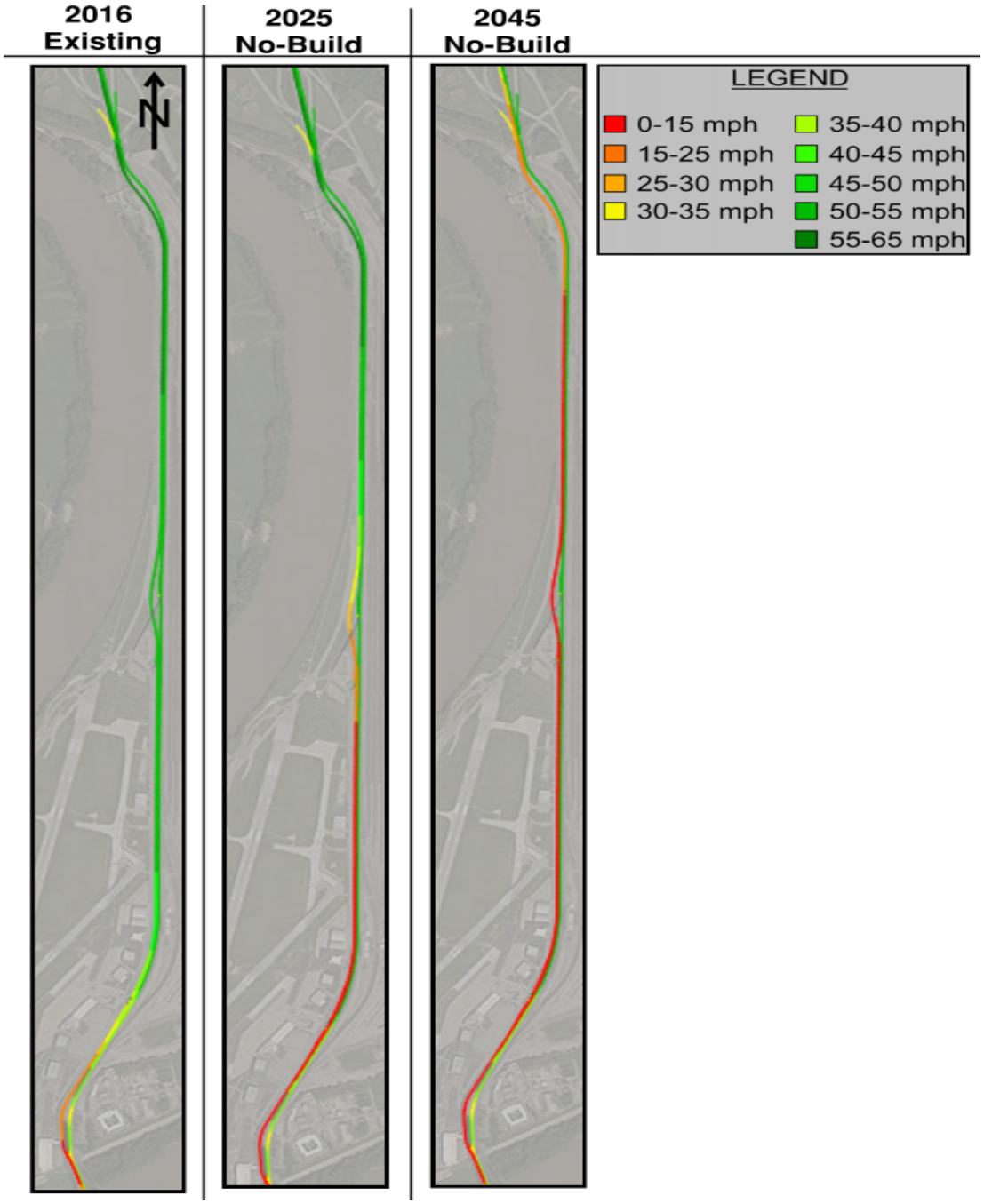


Figure B-2-7: US-169 Southbound Existing and Projected Travel Speeds (AM Peak)

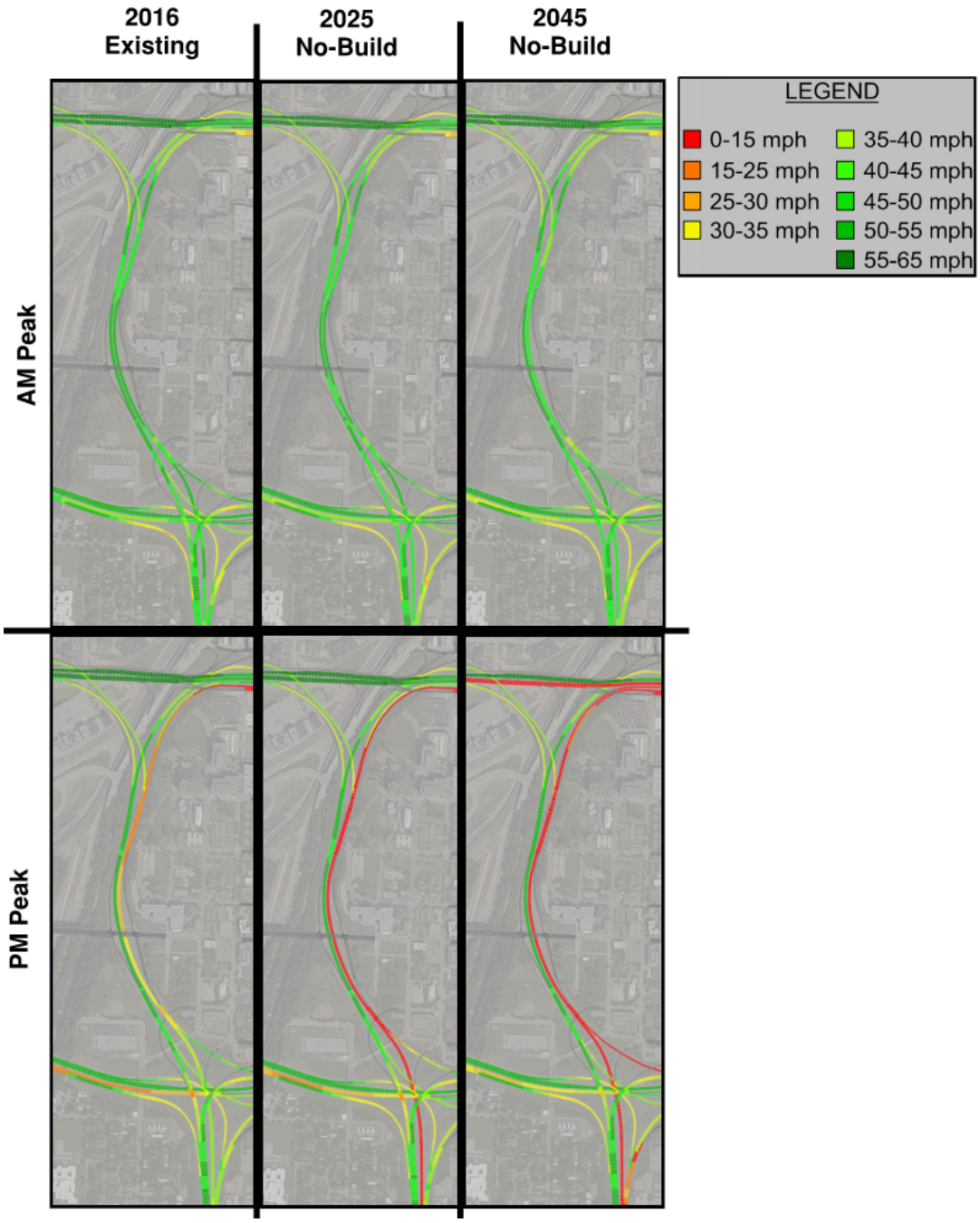


Figure B-2-8: I-35 Existing and Projected Travel Speeds (AM and PM Peak)

Outside of the functional area of the US-169 and I-35/I-70 interchange but within the limits of the study and Downtown Interstate Loop, the 2045 No-Build scenario during the evening peak hour projects a system capacity failure in northeast corner. The confluence point of I-70 eastbound and US-71 southbound in the PM Peak projects a capacity failure which will extend throughout the clockwise direction of the downtown loop (Figure B-2-9). Southbound US-169 morning peak hour queues are expected to extend outside of the analysis area limits in year 2045 in No-Build condition, and northbound I-35 evening peak hour queues are expected to extend outside of the analysis area limits in year 2025 No-Build condition.

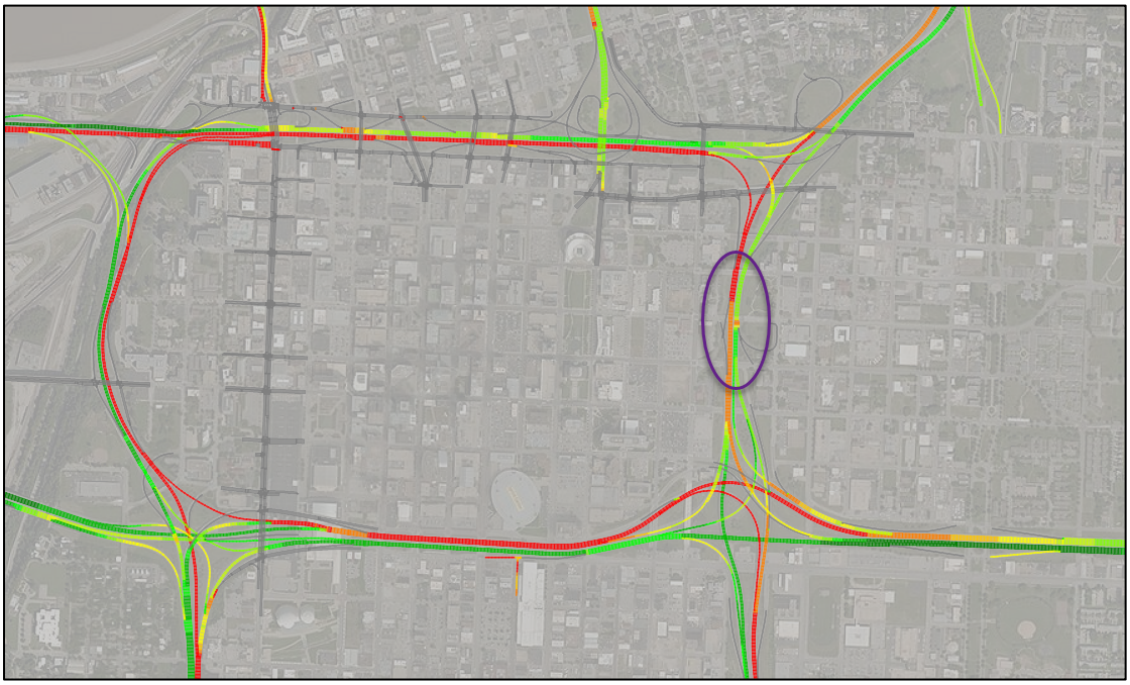


Figure B-2-9: Location of Anticipated Capacity Failure for Downtown Loop in 2045 PM Peak

Similarly, LOS indication for the signalized intersections at 5th Street and 6th Street at Broadway Boulevard were developed, and changes in performance are shown in Table B-2-9.

Table B-2-9: Existing and Future No-Build Signalized Intersection Performance

Signalized Intersection	Existing	2025 No-Build	2045 No-Build
	LOS AM (PM)	LOS AM (PM)	LOS AM (PM)
5th St & Broadway Blvd	F (B)*	F (C)*	F (C)*
6th St & Broadway Blvd	B (D)*	B (E)*	B (F)*

(*See following discussion on Intersection LOS)

The intersections of 5th and 6th Street and Broadway operate as a single unit in coordination. Level of Service performance of the signalized intersections is directly tied to the interaction of the heaviest trip movements traveling through the coordinated pair and traffic queues forming at the initial traffic signal. Southbound US-169 during the morning peak period and northbound I-35 trips during evening peak period are the predominant movements entering the signalized intersection pair and have the longest delay. public perception of intersection performance is poor due to long delays for the primary movement and extent of primary intersection queues (Figure B-2-10).

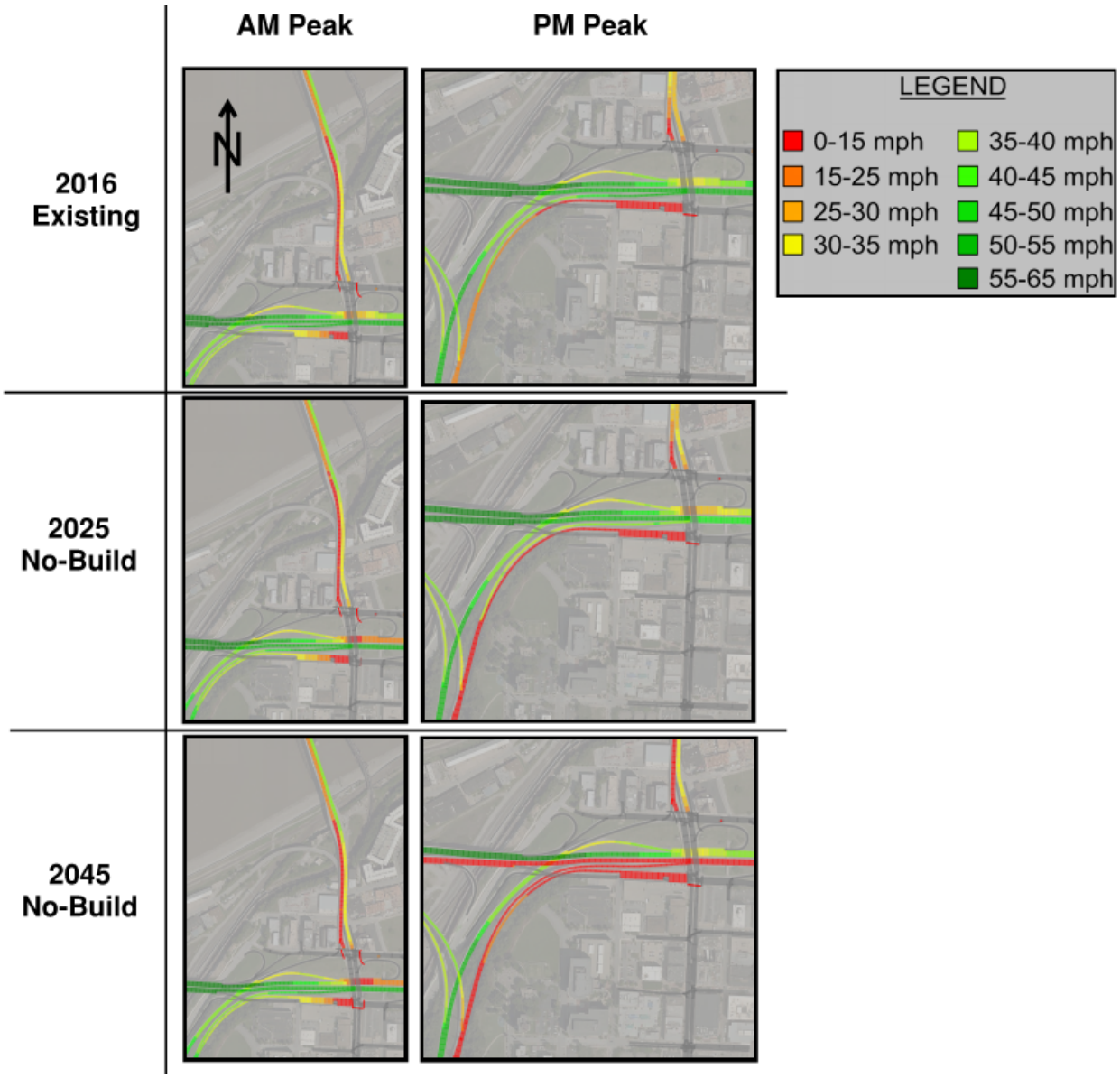


Figure B-2-10: Travel Speeds and Projected Traffic Queues at the 5th and 6th Street Signalized Intersections

Performance measures reflecting travel conditions are expected to degrade in the study area by the designated 2045 design year if no interchange configuration improvements are made. Travel speeds for the design year in comparison with existing are projected to reduce by 17 percent during morning peak travel, and 46 percent during the peak afternoon travel period. Modeling projections indicate that, by the design year 2045, system capacity failures will occur in the northeast corner of the Downtown Interstate Loop during the PM Peak travel period.

1.4 Future No-Build Safety Conditions

VISSIM Safety Surrogate Metrics, a predictive tool used to assess operational was used to measure operational safety of No-Build conditions. The predictive tool utilizes anticipated travel demand scenarios generated for 2025 and 2045.

1.4.1 VISSIM Surrogate Safety Assessment

VISSIM surrogate metrics were developed to provide additional safety measurements in evaluation of alternatives. VISSIM surrogate metrics analyze movements required to navigate the road system within a study area and evaluate exposure to vehicle crashes. The metrics presented provide comparison percentages to reflect a decrease or increase between existing conditions and a future condition such as increased traffic or revisions to the roadway system. Movements including lane changes, reacting to bottlenecks and reduction in operational speed, and conflicting merge points for arterial and freeway facilities were evaluated. Surrogate metrics were measured from VISSIM utilizing the procedures documented within the AJR.

The table below notes the predictive percentage change for each movement. The percentage reflects an increase in the predicted number of movements in 2025 and 2045 compared to the existing conditions.

Table B-2-10: 2025 and 2045 No-Build VISSIM Safety Surrogate Metrics

Scenario	Lane Changes AM(PM)	Quick Deceleration AM(PM)	Freeway & Arterial Conflicts AM(PM)
2025 No-Build	0 (15.6)	46.7(96.2)	2.2(23.1)
2045 No-Build	15.5(38.6)	160(1430)	34.8(67.3)

1.5 Future Build Traffic Conditions

Three separate comparisons assessing safety were compiled for the three reasonable build alternatives and Adjacent Alternative (Option 1).

1.5.1 Future Build Network

Additional documentation in the AJR discusses calibration of the existing conditions model, the process developed for projecting future travel demand, and model adjustments conducted for inclusion of other regional improvements.

Four future build analysis models were prepared using VISSIM microsimulation software. Origin and destination information from the Dynameq model was used to develop the alternative volumes and identify any routing or volumes shifts to the network for build years of 2025 and 2045. The four future build models include:

- West Alternative
- Central Alternative
- Adjacent Alternative (Option 1)
- Adjacent Alternative (Option 3)

Adjacent Alternative (Option 1) was determined to be an eliminated as a reasonable alternative. Generation of the 2025 and 2045 future build models for Adjacent Alternative (Option 1) allowed the study team to compare system-wide performance and fully assess performance differences between the range of reasonable

alternatives which all included a direct connection to I-35 and maintaining the existing connection and use of an expanded at-grade intersection at 5th Street and Broadway Boulevard.

1.5.2 Future Traffic Operations

All reasonable build alternatives involve rebuilding the Buck O'Neil Bridge west of its current location as well as providing direct connection between I-35 and US-169. All identified build alternatives remove the northbound Broadway Boulevard loop ramp to southbound I-35/westbound I-70.

System-wide performance measures were utilized to compare traffic impacts between all reasonable build scenarios and Adjacent Alternative (Option 1) are shown in the table below. System-wide metrics were assessed for each respective peak hour and include:

- Total Number of Processed Vehicles,
- Average Vehicle Speed,
- Vehicle Miles Traveled (VMT),
- Vehicle Hours Traveled (VHT).

Table B-2-11: 2025 and 2045 Network-Wide Performance Metrics for Processed Vehicles

Network Results	Peak Hour		Speed				VMT		VHT	
	AM	PM	AM		PM		AM	PM	AM	PM
			Avg (mph)	Std (mph)	Avg (mph)	Std (mph)	(veh-mi)	(veh-mi)	(Veh-hr)	(Veh-hr)
Existing	39,838	41,096	41.98	0.87	39.34	0.97	111,560	116,245	2,661	2,968
2025 No-Build	40,479	41,927	39.43	0.8	34.13	1.23	113,827	117,451	2,894	3,478
2025 Build Central	42,794	44,161	39.45	0.75	37.35	1.08	121,908	127,483	3,099	3,435
2025 Build Adjacent (Option 1)	42,805	44,062	39.27	0.64	36.5	1.07	122,271	127,357	3,121	3,515
2025 Build Adjacent (Option 3)	42,773	44,143	39.38	0.79	37.21	1.06	121,985	127,540	3,107	3,450
2025 Build West	42,860	43,990	39.24	0.83	35.78	1.15	122,341	127,358	3,127	3,594
2045 No-Build	43,820	36,386	34.92	0.61	20.53	1.27	120,471	99,558	3,475	5,866
2045 Build Central	43,695	43,645	34.74	0.83	30.14	1.43	124,216	127,463	3,602	4,321
2045 Build Adjacent (Option 1)	43,734	43,645	34.51	0.84	30.07	1.25	125,123	127,678	3,654	4,333
2045 Build Adjacent (Option 3)	43,647	43,563	34.47	0.62	30.02	1.94	123,959	127,310	3,618	4,343
2045 Build West	43,756	43,640	34.08	0.63	28.66	1.18	124,072	127,688	3,664	4,567

Assessing the total number of vehicles processed aids in determining whether an alternative adequately processes input vehicles in comparison to being held off-model due to queuing. All year 2025 and 2045 alternatives studied showed the roadway network servicing increased or similar traffic volumes compared with the No-Build.

The signalized intersection of 5th Street and 6th Street at Broadway were assessed across all identified alternatives for future year scenarios. The Build West Alternative adds two signalized intersections associated to connections between the proposed bridge alignment with connecting interstates. Signalization is added at the southbound I-35/westbound I-70 off ramp to 5th Street as well as the added connection from the US-169 southbound off ramp to Beardsley Road at 6th Street. Level of Service performance metrics for all signalized intersections are shown for 2025 and 2045 in the tables below.

Table B-2-12: 2025 Signalized Intersection LOS AM (PM)

Signalized Intersection	2025 No-Build	2025 Build Central	2025 Build Adjacent (Option 1)	2025 Build Adjacent (Option 3)	2025 Build West
5th St & Broadway Blvd	F (C)	B (B)	E (B)	B (A)	E (C)
6th St & Broadway Blvd	B (E)	B (C)	B (C)	B (B)	F (D)
6th St & Beardsley Rd	-	-	-	-	F (C)
5th St & I-35/I-70 Off Ramp	-	-	B (C)	-	B (F)

Table B-2-13: 2045 Signalized Intersection LOS AM (PM)

Signalized Intersection	2025 No-Build	2025 Build Central	2025 Build Adjacent (Option 1)	2025 Build Adjacent (Option 3)	2025 Build West
5th St & Broadway Blvd	F (C)	B (A)	F (B)	B (B)	B (C)
6th St & Broadway Blvd	B (F)	B (C)	B (C)	B (C)	B (E)
6th St & Beardsley Rd	-	-	-	-	C (F)
5th St & I-35/I-70 Off Ramp	-	-	B (C)	-	B (F)

The use of direct connecting ramps between I-35 and US-169 result in significant reduction in traffic volumes at the intersections of 5th Street & 6th Street at Broadway Boulevard, despite these routes servicing increased traffic demand. The tables below detail traffic volumes processed at each intersection for 2025 and 2045.

Table B-2-14: Total 2025 Intersection Processed Volume Results AM(PM)

Signalized Intersection	Volume	2025 No-Build	2025 Build Central	2025 Adjacent (Option 1) Alternative	2025 Adjacent (Option 3) Alternative	2025 Build West
5th St & Broadway Blvd	Overall	4,071 (3,458)	2,868 (3,846)	5,694 (6,347)	2,857 (3,824)	1,382 (3,129)
6th St & Broadway Blvd	Overall	2,805 (3,394)	2,707 (3,043)	3,408 (3,936)	2,697 (3,003)	2,769 (3,075)

Table B-2-15: Total 2045 Intersection Processed Volume Results AM(PM)

Signalized Intersection	Volume	2045 No-Build	2045 Build Central	2045 Adjacent (Option 1) Alternative	2045 Adjacent (Option 3) Alternative	2045 Build West
5th St & Broadway Blvd	Overall	4,279 (2,589)	2,738 (3,836)	5,680 (6,312)	2,710 (3,820)	1,769 (3,213)
6th St & Broadway Blvd	Overall	2,935 (1,699)	2,639 (2,974)	3,361 (3,514)	2,619 (2,946)	2,794 (2,897)

The following figures illustrate a comparison of travel speeds and anticipated queue lengths resulting from the modeled conditions for the No-Build and Preferred Alternative. All reasonable alternatives, as well as the Build Adjacent (Option 1) alternative, result in similar highway speed performance. Comparison at the 5th and 6th Street Signalized intersections on Broadway Boulevard is shown. Comparison along US-169, and also along I-35 and the west side of downtown interstate loop are shown. With all reasonable alternatives, congestion is transferred from US-169 to I-35 along the West Loop, however, each reasonable alternative provides an overall improvement to travel speed. All reasonable alternatives, as well as the Build Adjacent (Option 1) alternative, do not relieve all congestion and any increase in capacity will result in further diversion of traffic to the studied corridors. Full illustration of travel speeds and anticipated queue lengths for other identified alternatives are shown in the AJR.

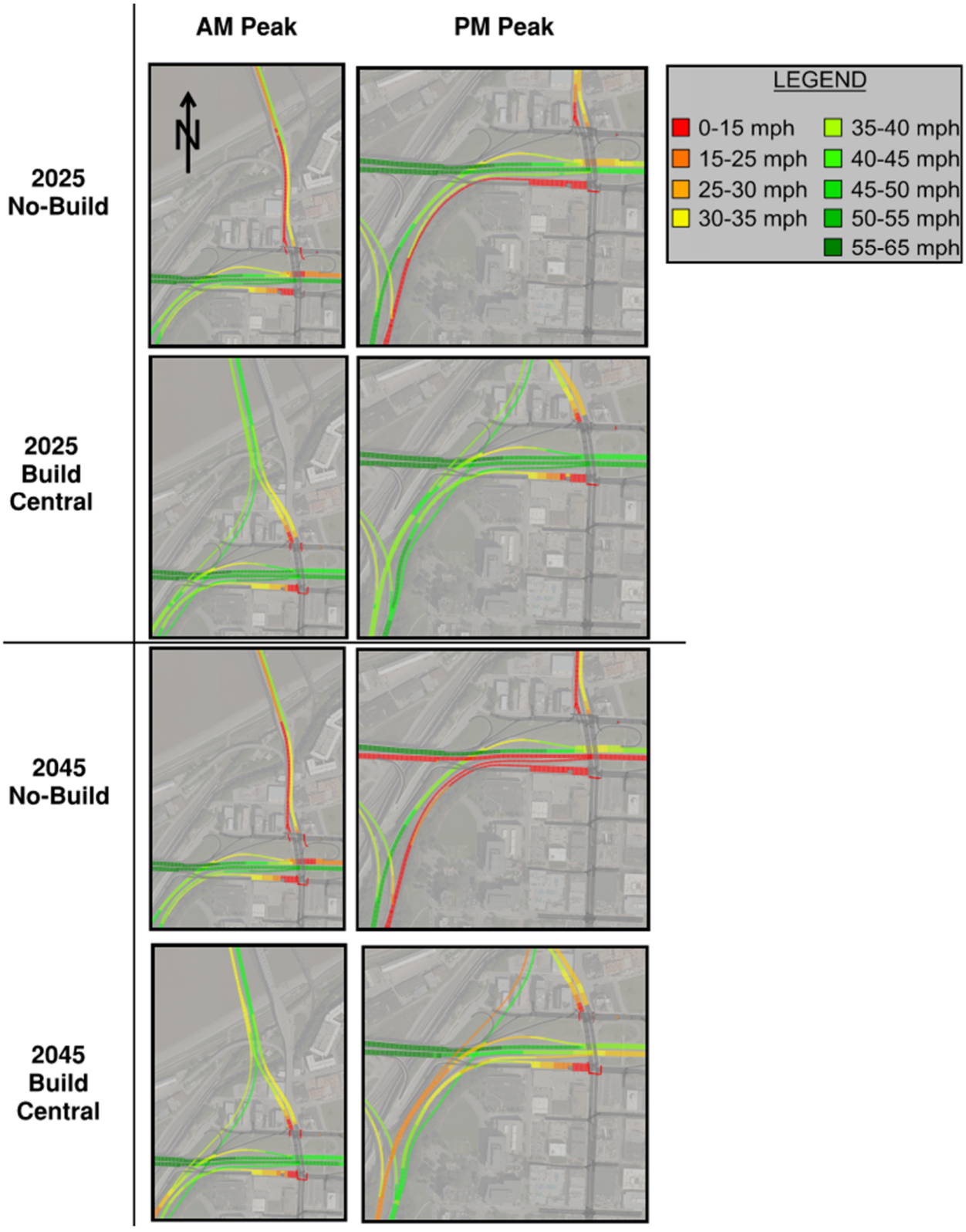


Figure B-2-14: Modeled Travel Speeds and Traffic Queues for 5th and 6th Street



Figure B-2-15: Modeled Travel Speeds and Traffic Queues for US-169 During AM Peak

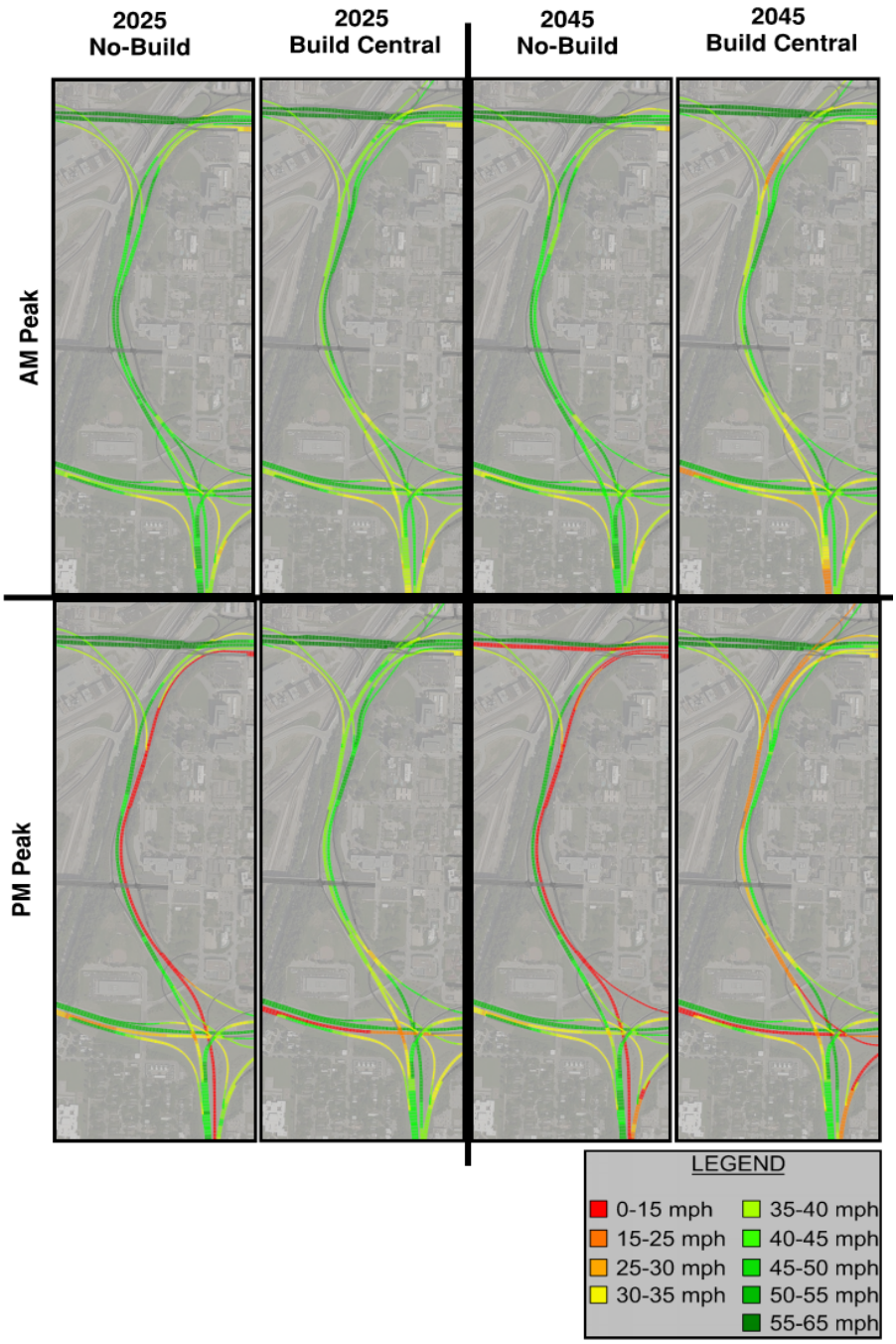


Figure B-2-16: Modeled Travel Speeds and Traffic Queues for I-35

The 2025 and 2045 Build Central PM models illustrate the positive effect on travel time near the proposed access. The figures also show continued deterioration in travel speed for other routes within the downtown interstate loop. This result is common among all build alternatives.

Travel time measurements were compiled for both regional and local travel paths to provide additional performance metrics between the No-Build alternative and identified alternatives for 2025 and 2045. The tables below depict the regional travel time results for 2025 and the regional travel times for 2045. The No-Build Alternative is used in each table as a baseline for comparison.

Table B-2-16: 2025 Regional Travel Time Comparisons

Regional Travel Times	No-Build	Build Central	Build Adjacent (Opt. 1)	Build Adjacent (Opt. 3)	Build West	No-Build	Build Central	Build Adjacent (Opt. 1)	Build Adjacent (Opt. 3)	Build West
	AM					PM				
(A) To U.S. 169 @ MO 9										
(B) Broadway @ 7th St	05:21	05:21	05:45	05:21	05:31	05:41	05:20	05:30	05:20	05:40
(C) I-35 @ 20th St	07:42	06:19	07:21	06:28	06:19	14:55	07:04	08:13	07:12	07:45
(B) To Broadway @ 7th St										
(A) U.S. 169 @ MO 9	09:21	07:24	07:29	07:26	07:57	04:46	04:45	04:48	04:45	06:12
(C) To I-35 @ 20th St										
(A) U.S. 169 @ MO 9	10:57	09:01	08:56	09:14	09:10	06:33	06:29	06:42	06:36	06:33

Color Legend
> + 1:00 min from No-Build
< + 1:00 ; > + 0:30 min from No-Build
< - 1:00 ; > - 0:30 min from No-Build
> - 1:00 min from No-Build

Table B-2-17: 2045 Regional Travel Time Comparisons

Regional Travel Times	No-Build	Build Central	Build Adjacent (Opt. 1)	Build Adjacent (Opt. 3)	Build West	No-Build	Build Central	Build Adjacent (Opt. 1)	Build Adjacent (Opt. 3)	Build West
	AM					PM				
(A) To U.S. 169 @ MO 9										
(B) Broadway @ 7th St	05:22	05:25	05:16	05:25	05:35	07:17	05:21	05:27	05:22	06:17
(C) I-35 @ 20th St	07:45	06:25	07:34	06:34	06:25	24:27	07:23	08:20	07:41	08:58
(B) To Broadway @ 7th St										
(A) U.S. 169 @ MO 9	12:13	09:29	08:57	10:06	11:10	16:23	06:14	05:19	06:11	11:04
(C) To I-35 @ 20th St										
(A) U.S. 169 @ MO 9	13:43	11:35	11:29	12:14	12:51	16:33	09:22	08:13	09:36	09:47

Color Legend
> + 1:00 min from No-Build
< + 1:00 ; > + 0:30 min from No-Build
< - 1:00 ; > - 0:30 min from No-Build
> - 1:00 min from No-Build

All reasonable alternatives resulted in excess of 30 seconds of travel time reduction and a majority in excess of 1-minute of travel time reduction to complete movements requiring connection of US-169 with I-35 along the west side of the downtown interstate loop.

1.6 Future Build Safety Conditions

Three separate comparisons assessing safety were compiled for the three reasonable build alternatives and Adjacent Alternative (Option 1).

1.6.1 Comparison of Alternatives using MoDOT's Safety Blueprint

MoDOT's "Missouri Blueprint ~ A Partnership Toward Zero Deaths" has identified key strategies to implement for improving safety. The identified alternatives were evaluated on the ability to implement each key safety strategy. Countermeasures from the Safety Blueprint were rated as either a "-" for not implemented, "O" for could be implemented, or "+" for implemented as part of each identified alternative.

Many of the strategies included in the Safety Blueprint are rated the same for all identified alternatives. The key strategies specific to this project are summarized in the table below. These are the strategies that differ between alternatives or are related to crash trends in the area of the project.

Table B-2-18: Project Specific Applicable Blueprint Strategies

Countermeasure	West	Central	Adjacent #1	Adjacent #3
Improve horizontal and vertical geometry	+	+	-	+
Promote systemic design solutions that reduce conflict points and minimize exposure at roadway crossings	-	+	-	+
Expand and improve shoulder treatments	+	+	+	+
Install pedestrian crossing islands	O	O	+	O

The entire list of the countermeasures in the Safety Blueprint and rating for each reasonable alternative are included in the AJR. Many countermeasures are similar between alternatives or are not applicable to this project.

1.6.2 Comparison of Alternatives using Conflict Points

Conflict points were analyzed to identify the number potential crash locations for each identified alternative. Potential crash locations can be divided into three conflict point types: merging, diverging, and crossing. Merging and diverging conflict points refer to leaving and entering lanes at an interchange and crossing points refer to moving across another direction of travel where the paths would cross at an angle. Collision types most often occurring at merging and diverging conflict points are rear-end and sideswipe collisions. Crossing conflict points can lead to angle collisions, traditionally resulting in more severe crashes as compared to rear-end or sideswipe collisions. A conceptual illustration is shown for a typical intersection in Figure B-2--17.

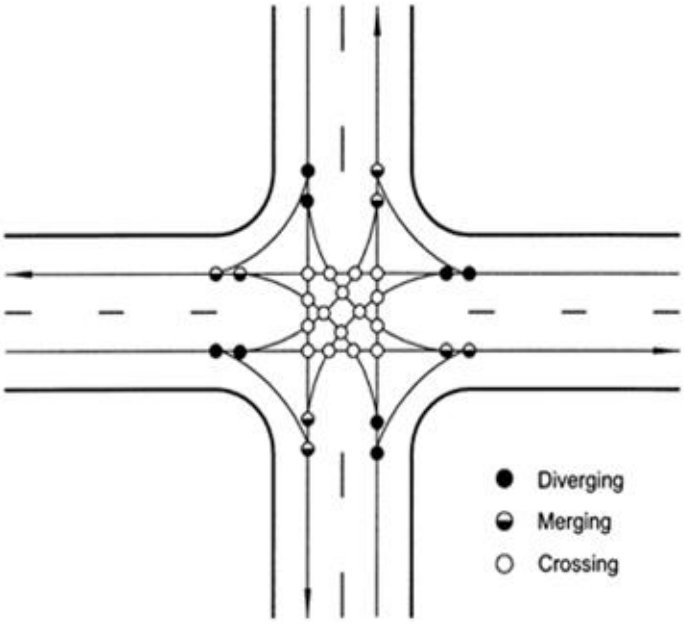


Figure B-2-17: Conflict Points and Types for a Standard Intersection

The table below shows the conflict point comparison results between the identified alternatives.

Table B-2-19: Comparison of Conflict Points Between Alternatives

Alternative	Conflict Point			
	Merge	Diverge	Crossing	Total
No-Build	64	67	74	205
West	70	72	89	231
Central	60	61	82	203
Adjacent (Option 1)	63	63	92	218
Adjacent (Option 3)	60	61	82	203

A further analysis was completed assessing crash exposure based upon traffic volumes entering each conflict point. Peak hour traffic volumes were summarized from the VISSIM model developed for each alternative. Each travelway was assigned a classification of either high or low based upon the maximum peak hour volume approaching a conflict point. Values for high peak hour approach volumes were established for conflicts at signalized intersections or conflicts occurring at other intersection types.

- Signalized Intersections - A value of 1,500 vehicles per hour was determined to be used as the break over point in determining high volume or low volume for travelways at signalized intersections.

- Non-Signalized Intersections - A 2,000 vehicle per hour threshold was established for determining whether an approach had a high or low volume classification.

Conflict points were compared by volume type (high-high, high-low, low-low) to give a better representation of the increase or decrease in safety for a given alternative. Table B-2-20 shows the summary of this analysis.

Table B-2-20: Conflict Point Analysis by Projected Traffic Volume

Alternative	Conflict Point				
	Merge	Diverge	Crossing	Total	
No-Build	18	21	31	70	High-High
West	17	19	23	59	
Central	12	13	19	44	
Adjacent (Option 1)	21	21	46	88	
Adjacent (Option 3)	12	13	19	44	
No-Build	13	13	2	28	High-Low
West	20	20	15	55	
Central	19	19	19	57	
Adjacent (Option 1)	13	13	2	28	
Adjacent (Option 3)	19	19	19	57	
No-Build	33	33	41	107	Low-Low
West	33	33	51	117	
Central	29	29	44	102	
Adjacent (Option 1)	29	29	44	102	
Adjacent (Option 3)	29	29	44	102	

The No-Build Alternative has 205 conflict points, and the two lowest build alternatives (Central and Adjacent Option 3) each have 203 conflict points. The No-Build option has a substantially larger number of high-high intersection conflict points – 70 for No-Build. 31 of the 70 conflict points in the No-Build Alternative are crossing points which traditionally lead to higher severity crash types than merging or diverging crashes. Minimizing high-high intersection conflict points could help decrease the number of crashes in a proposed alternative.

The West Alternative has the highest total number of conflict points at 231. The West alternative creates more intersections and local traffic utilizes 5th and 6th Streets rather than along Broadway Boulevard. The West Alternative creates more total conflict points but lowers the number of high-high conflict points from the existing condition by use of direct connections between I-35 and US-169.

Adjacent Alternative (Option 1) has 218 total number of conflict points. Adjacent Alternative (Option 1) maintains the interaction of traffic from US-169 to Interstate mixing with local traffic at the 5th and 6th Street intersections along Broadway Boulevard. The Adjacent Alternative (Option 1) has the 88 crossing points.

The Central Alternative and Adjacent (Option 3) have the least total number of conflict points at 203, and the fewest number of high-high conflict points with 44. Both the Central and Adjacent (Option 3) Alternatives have 19 high-high conflict points involving crossing movements, reducing exposure to high severity crash types.

The Central and Adjacent Option 3 Alternatives provide the fewest number of total conflict points and fewest number of high-high conflict points involving crossing movements. The West Alternative has the largest number of conflict points, but decreases the number of high-high conflict points in comparison with the No-Build.

1.6.3 Comparison Utilizing VISSIM

VISSIM surrogate safety metrics were developed to provide additional safety measurements in evaluation of alternatives. VISSIM surrogate safety metrics analyze movements required to navigate the road system within a study area and evaluate exposure to vehicle crashes. The metrics, described in Section 2, are presented in the table below for years 2025 and 2045 showing a percentage increase or decrease in the exposure rate metric of the identified alternatives compared with the No-Build for the corresponding analysis year.

Table B-2-21: Percentage Decrease or Increase in Surrogate Safety Exposure Rates

Scenario	Lane Changes AM(PM)	Quick Deceleration AM(PM)	Freeway & Arterial Conflicts AM (PM)
2025 Build Central	9.2(-5.9)	0.0(-63.9)	17.1(-15.6)
2045 Build Central	-1.5(-9.7)	-1.5(-56.1)	44.7(0.0)
2025 Build Adjacent (Option 1)	13.4(-1.6)	-6.1(-25.2)	34.1(6.3)
2045 Build Adjacent (Option 1)	4.3(-5.5)	-13.7(-89.5)	8.1(-27.6)
2025 Build West	14.1(-4.7)	-12.8(-88.2)	-12.8(-14.9)
2045 Build West	7.3(-1.3)	-12(-82.3)	22.6(5.8)

Surrogate safety data extracted from VISSIM analyses does not directly correlate to a number of expected crashes but serves as an exposure measure for vehicles in each scenario. Exposure rate metrics are normalized by considering the total processed traffic volume.

The No-Build option performs better than the scenarios for Freeway and Arterial Conflicts in every scenario except 2045 (PM) Build Central and Build Adjacent. This is potentially due to the lower number of vehicles and thus the lower likelihood of having a conflict.

- The total measured number of lane changes per vehicle for all identified alternatives will be less than the No-Build option in the PM Peak.
- The quick deceleration exposure rate for all identified alternatives decreases in comparison with the No-Build option.

The exposure rate for all identified alternatives is reduced for the lane change and quick deceleration in comparison with the No-Build alternative. These safety surrogate metrics consider driver behavior, as modeled in the traffic analysis software, but do not take environmental roadway characteristics into consideration. VISSIM safety surrogate metrics should be used in conjunction with other safety measurements. Additional detail on the VISSIM safety surrogate metrics and development is included in Appendix G – Safety Analysis of the Access Justification Report.

Performance measures reflecting travel conditions and the ability to process traffic volumes are expected to increase in the study area with the identified alternatives. Regional travel times for movements on US-169 crossing the Missouri River and connecting with I-35 are modeled to decrease with all identified alternatives. The Central and Adjacent (Option 3) Alternatives have fewer total conflict points than the No-Build. The Central, Adjacent (Option 3), and West Alternatives each have fewer crossing conflicts than the No-Build Alternative. All identified alternatives reduce crash exposure to lane changes and quick deceleration.

Appendix B-3
Screening Matrices

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

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

🔴 Does not satisfy the criteria (value = 1)
1 = Lowest Weight

🟡 Partially satisfies the criteria (value = 2)
2 = Moderate Weight

🟢 Fully satisfies the criteria (value = 3)
3 = Most Weight

PERFORMANCE CRITERIA	SCORING CRITERIA DESCRIPTION
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
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
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
Reduce crash rates and severity of crashes	QUALITATIVE
Minimizes local traffic flow conflicts	DIRECT CONNECTS REDUCE TRAFFIC VOLUMES AT 5TH/6TH INTERSECTION = GREEN
Improve/implement safety strategies	QUALITATIVE
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 5TH/6TH 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 (haz mat, noise, air quality)	ASSUME ALL RELATIVELY SIMILAR
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
Minimize construction costs, timeline, and risks	Dollars - <$200m = GREEN, $200m-$250m = YELLOW, >$250m = RED
Minimize acquisition and relocation costs	DOLLARS
"Meets my needs" (online public mtg Aug-Sep-2019)	# of RESPONSES - >700 = GREEN, 200-700 = YELLOW, <200 = RED

PERFORMANCE AREAS	NO BUILD		WEST ALTERNATIVE		CENTRAL ALTERNATIVE		ADJACENT ALTERNATIVE OPTION #1		ADJACENT ALTERNATIVE OPTION #2		ADJACENT ALTERNATIVE OPTION #3	
	Score		Score		Score		Score		Score		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
SCORE:	119		139		149		128		131		144	
ALTERNATIVE CARRIED FORWARD?	YES		YES		YES		NO		NO		YES	

🔴 Low score 🟡 Medium Score 🟢 High score

APPENDIX C – BIOLOGICAL RESOURCES

Windshield Bat Habitat Evaluation; September 24, 2019

IPac Response, USFWS; October 16, 2019

Section 7 Informal Consultation Request Letter, MoDOT to USFWS; October 22, 2019

USFWS "No Likely to Adverse Effect" Concurrence; November 14, 2019

Memorandum

BURNS McDONNELL

Date: September 24, 2019

To: Shari Cannon-Mackey

From: Josiah Maine

Subject: Windshield Bat Habitat Evaluation
US-169/Buck O'Neil Bridge Environmental Study; MoDOT 4S3085
Burns & McDonnell Project No. 109695

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) completed a preliminary windshield survey of the US-169/Buck O'Neil Bridge Project (Project). The Project is within the range of the Indiana bat (*Myotis sodalis*), northern long-eared bat (*Myotis septentrionalis*), and gray bat (*Myotis grisescens*). A detailed habitat assessment and assessment of impacts is not included in our current scope of work and was not conducted for these species at this time. However, Burns & McDonnell conducted a high-level evaluation of potential bat habitat from a vehicle on public roads.

A Burns & McDonnell biologist (Josiah Maine) visited the 392-acre Project area on September 5, 2019 and conducted a qualitative evaluation of the Project area from a vehicle on public roads. The Project area primarily includes commercial buildings and roads, although some roadside trees, upland forest, and a riparian forest also occur. Most of the scattered trees appeared to be small honey locusts and eastern redcedars that would not be suitable as bat roost trees; however, a detailed assessment of each tree was not conducted. The upland forest included a forested bluff within Ermine Case Junior Park along I-35 on the south side of the Missouri River. Some larger trees occurred within the upland forest, and the trees appeared to be primarily oaks and maples. The riparian forest area along the north side of the Missouri River was approximately 4 acres in size and includes several larger trees, including eastern cottonwood and other bottomland species. No obvious snags or potential roost trees were observed; however, only a small portion of the riparian area could be viewed from public roads. Some roosting habitat for northern long-eared bat could also be present on the existing bridge, particularly in the expansion joints; however, a detailed assessment of bridge roosting structure was not feasible due to the size and height of the bridge.

In order to adequately assess potential impacts to bat habitat and the potential need for presence/absence surveys or mitigation, a more detailed habitat assessment should be conducted on foot. The assessment should include trees and forested areas impacted by the Project, as well as a more detailed screening of potential roost structures under the bridge. If any potential habitat is present, presence/absence surveys and/or mitigation will likely be required.

Sincerely,
Josiah Maine
Environmental Scientist
Burns & McDonnell

Attachment
Figure 1 – Study Area



Figure 1
Study Area
Buck O'Neill Bridge Project
Jackson and Clay Counties, Missouri

Source: ESRI; NAIP Imagery; Burns & McDonnell Engineering Company, Inc.

Issued: 9/11/2019

Path: Z:\Clients\TRN\MODOT\109659_MODOT169EA\Studies\GeospatialDataFiles\ArcDocs\T&E\Figure 1 Study Area.mxd jjmaine 9/11/2019
COPYRIGHT © 2019 BURNS & McDONNELL ENGINEERING COMPANY, INC.

United States Department of the Interior

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

In Reply Refer To: October 16, 2019
Consultation Code: 03E14000-2020-SLI-0211
Event Code: 03E14000-2020-E-00519
Project Name: 4S3085 Clay/Jackson US 169 Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. N**ote that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Refer to the Midwest Region S7 Technical Assistance website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects: projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

Gray bats - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features particularly within stream corridors, riparian areas, or associated upland woodlots gray bats could be affected.

Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags 5 inches diameter at breast height (dbh) for Indiana bat, and 3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
- Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "No Effect" document also can be found on the S7 Technical Assistance website.

2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project other than bats (see #3 below) then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species through the S7 Technical Assistance website.

3. If IPac returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:

a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
b. Any activity in or near the entrance to a cave or mine;
c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
d. Construction of one or more wind turbines; or
e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "No Effect" document also can be found on the S7 Technical Assistance website.

If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the Range-wide Indiana Bat Summer Survey Guidelines.

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Karen Herrington

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
(573) 234-2132

Project Summary

Consultation Code: 03E14000-2020-SLI-0211

Event Code: 03E14000-2020-E-00519

Project Name: 4S3085 Clay/Jackson US 169 Bridge Replacement

Project Type: TRANSPORTATION

Project Description: Bridge replacement on new alignment over the Missouri River, 3.1 miles south of Rte. 9 and 0.1 mile north of I-70. Project involves bridge A4649. NEPA stage evaluation in progress. Alignment alternative to be selected.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.13109659400004N94.58698708616812W



Counties: Clay, MO | Jackson, MO

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Pallid Sturgeon *Scaphirhynchus albus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7162	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A

RIVERINE

- R2UBH

MoDOT

105 West Capitol Avenue
P.O. Box 270
Jefferson City, Missouri 65102

Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

October 22, 2019

Joshua Hundley
Columbia Ecological Services Field Office
101 Park Deville Drive
Suite A Columbia, MO 65203

Dear Mr. Hundley:

Subject: **Design - Environmental Section**
Clay/Jackson County, US 169
J4S3085 Bridges A4649
Missouri River Bridge Replacement
Section 7 Informal Consultation
Consultation Tracking Number: 03E14000-2020-SLI-0211

The Missouri Department of Transportation (MoDOT) acting as the representative of the FHWA is planning to replace bridge A4649 on new alignment over the Missouri River. MoDOT has determined that this project may affect, but is not likely to adversely affect pallid sturgeon. MoDOT is requesting that the Service review of the proposed activities, as described below, for concurrence with that determination. MoDOT considers this project to be a minor construction activity for purposes of consultation under Section 7 of the ESA.

The work will occur in Sections 10, 15, 22, 27, 31 and 32 in Township 50N, and Sections 5, and 6 in Township 49N, Range 33W; Kansas City Quadrangle, in Clay and Jackson County, Missouri (Appendix A: Project Location Map).

Project Description

In the fall of 2020, MoDOT and KCMO plan to replace bridge A4649 on new (likely central alternative) alignment over the Missouri River. This alignment, if selected, will also include construction of flyover spans connecting to Interstate 35 with new roadway and retaining wall being constructed in the bluff east of I-35; construction of ramps connecting US 169 to 5th Street; reconstruction of Interstate 70 loop span bridges; and removal of the existing US 169 (Buck O'Neil) bridge. (See Appendix B: Central alternative conceptual plans).

Construction activities in the Missouri River will likely include construction of drilled shaft support columns to support the new bridge spans across the river. Additional activities such as minor dredging of sediment; temporary bulkhead construction; and dewatering by cofferdam will likely be required for access to the construction area, facilitating material and equipment movement.

These proposed improvements focus on the following areas of greatest concern (from draft purpose and need statement):

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 separates local and regional traffic and minimizes local traffic conflicts
- Improve the operational and safety performance of the Missouri River crossing for all transportation modes

Project History:

MoDOT has previously consulted with the Service to perform US 169 bridge rehabilitation activities within the Missouri River channel to ensure the safety, stability and reliability of the bridge for the traveling public. According to 2010-2015 USGS bathymetric survey data, the Missouri River had developed a large scour hole at pier two of bridge A4649, which was proposed to be remediated as part of the 2018 Buck O'Neil Bridge rehabilitation project (See Appendix C: USGS Bathymetric Survey Data).

T&E:
This project has been screened using IPAC and an official species list was obtained on October 16, 2019 (Consultation Tracking Number: 03E14000-2020-SLI-0211). The following species list was generated:

- Pallid sturgeon
- Gray, Indiana, and northern long-eared bats

There are no critical habitats within the project area. There are two records of pallid sturgeon within the project area based on a review of the MDC Natural Heritage Database (NHD) and USGS telemetry data. These records from May 2008 are located mid channel and show that this species at least move through the project area. In accordance with the ESA, MoDOT has made "no effect" determinations for gray, Indiana and northern long-eared bats and a "may affect, not likely to adversely affect" determination pallid sturgeon.

Gray, Indiana and northern long-eared bats: Gray bats are cave obligate species year-round, and Indiana and northern long-eared bats winter in caves and spend summer in forested areas of the state. Review of MDC Heritage database (current to March 2019) and the MO Speleological Survey cave information (current to April 2019) indicate that there are no records of these species or caves near the project. There will be up to 5.69 acres of tree clearing and grubbing required for this project. There will be no impact to caves as part of the bridge replacement project. A habitat assessment was conducted by MoDOT Environmental and Burns and McDonnell Staff on October 9, 2019 (See Appendix D: Site Photographs). The forested area north of the river was comprised of cottonwood (*Populus deltoides*), white mulberry (*Morus alba*) and black willow (*Salix nigra*). Forested areas south of the river were mainly comprised of elm (*Ulmus spp.*), tree of heaven (*Ailanthus altissima*), and Amur honeysuckle (*Lonicera maackii*) and sumac (Rhus spp.) No suitable bat habitat was observed

within any of the parcels that will be cleared for this project. Additionally, the US 169 bridge and surrounding bridges were checked for signs of bat usage near the abutments and areas near pier caps. The underside of the bridges and abutments showed no signs of bat usage (staining or guano). In accordance with the ESA, MoDOT has made no effect determinations the three listed bat species.

Pallid Sturgeon: Pallid sturgeons are mainly bottom feeders extracting their food consisting of small fishes and invertebrates from the river bottoms. They are mainly found within the Missouri and Mississippi River and their preferred habitats consist of strong currents in the main river channels with firm sand substrates. Reasons for pallid sturgeon decline include the creation of impoundments and deep uniform channels. Pallid sturgeons prefer a diversity of depths and velocities. The area to be potentially impacted by the bridge replacement provides little habitat potential for pallid sturgeons. A spur dike on the north bank of the Missouri River extends into the channel west of the proposed new US 169 bridge. This creates an area of slow water velocity and sand deposition directly behind the spur dike. Pier two of the existing bridge is directly downstream of the tip of this spur dike. Pier one is located on the south bank outside of the channel thalweg. Permanent impacts within the area of suitable habitat from the bridge replacement are expected to be minimal should the pier placement mimic the existing configuration. Temporary impacts from bridge construction and removal are not expected to change bottom elevations of the Missouri River.

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' upstream and 165' downstream of the bridge. These data indicate that pallid sturgeon at least move through the area (See Appendix F: USGS Pallid Sturgeon Data). Additionally, there are also 2 records for sturgeon chub, a Species of Conservation Concern in Missouri, within 0.28 miles upstream and 0.37 miles downstream of the project location.

Because of the limited impacts to suitable habitat from the bridge replacement, MoDOT is asking for concurrence from the Service for a "may affect, not likely to adversely affect" determination for pallid sturgeon. Please do not hesitate to contact me with any questions or concerns at (573) 526-6675.

Sincerely,

Caleb Knerr

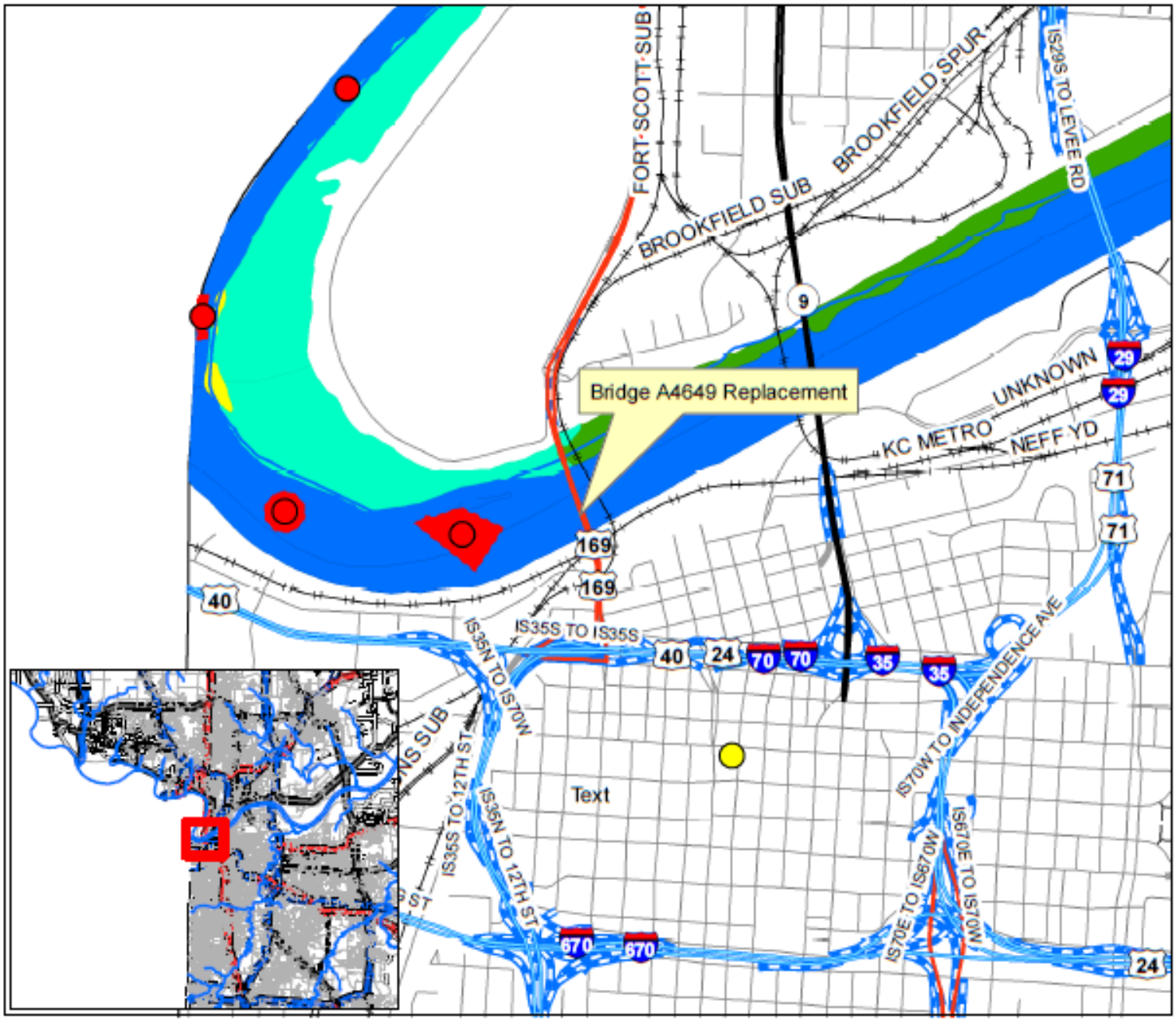
Caleb Knerr
MoDOT, Environmental Specialist

Appendix List

Appendix A: Project Location Map
Appendix B: Project Plans
Appendix C: USGS Bathymetric Survey Data
Appendix D: Site Photographs
Appendix F: USGS Pallid Sturgeon Data Removed at request of USFWS

Appendix A

Project Location (NWI) Map



Legend

- Federal endangered
- Federal threatened
- State endangered
- T&E Polygon
- staterivers
- statestreams
- Forested Wetland
- Emergent Wetland
- Scrub-Shrub Wetland
- Open Water (Ponds, Lakes, etc.)

Clay/Jackson US 169
Bridge A4649 Replacement
Missouri River
Section 7 Consultation

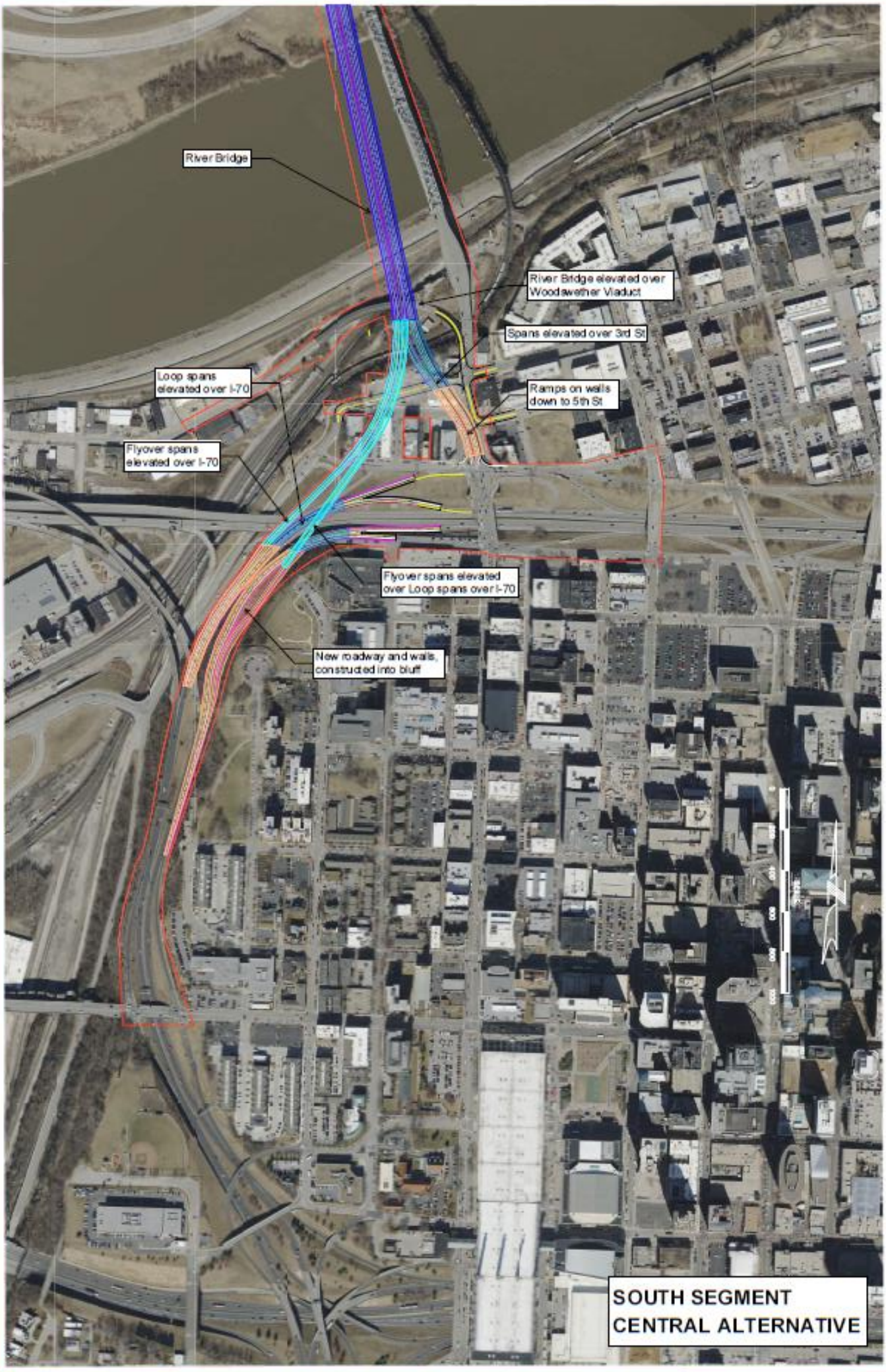
N

0 0.25 0.5 1 1.5 Miles

MoDOT

Appendix B

Project Plans


River Bridge
River Bridge elevated over Woodswether Viaduct
Spans elevated over 3rd St
Loop spans elevated over I-70
Ramps on walls down to 5th St
Flyover spans elevated over I-70
Flyover spans elevated over Loop spans over I-70
New roadway and walls constructed into bluff
SOUTH SEGMENT
CENTRAL ALTERNATIVE



Central Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI, Google Earth, Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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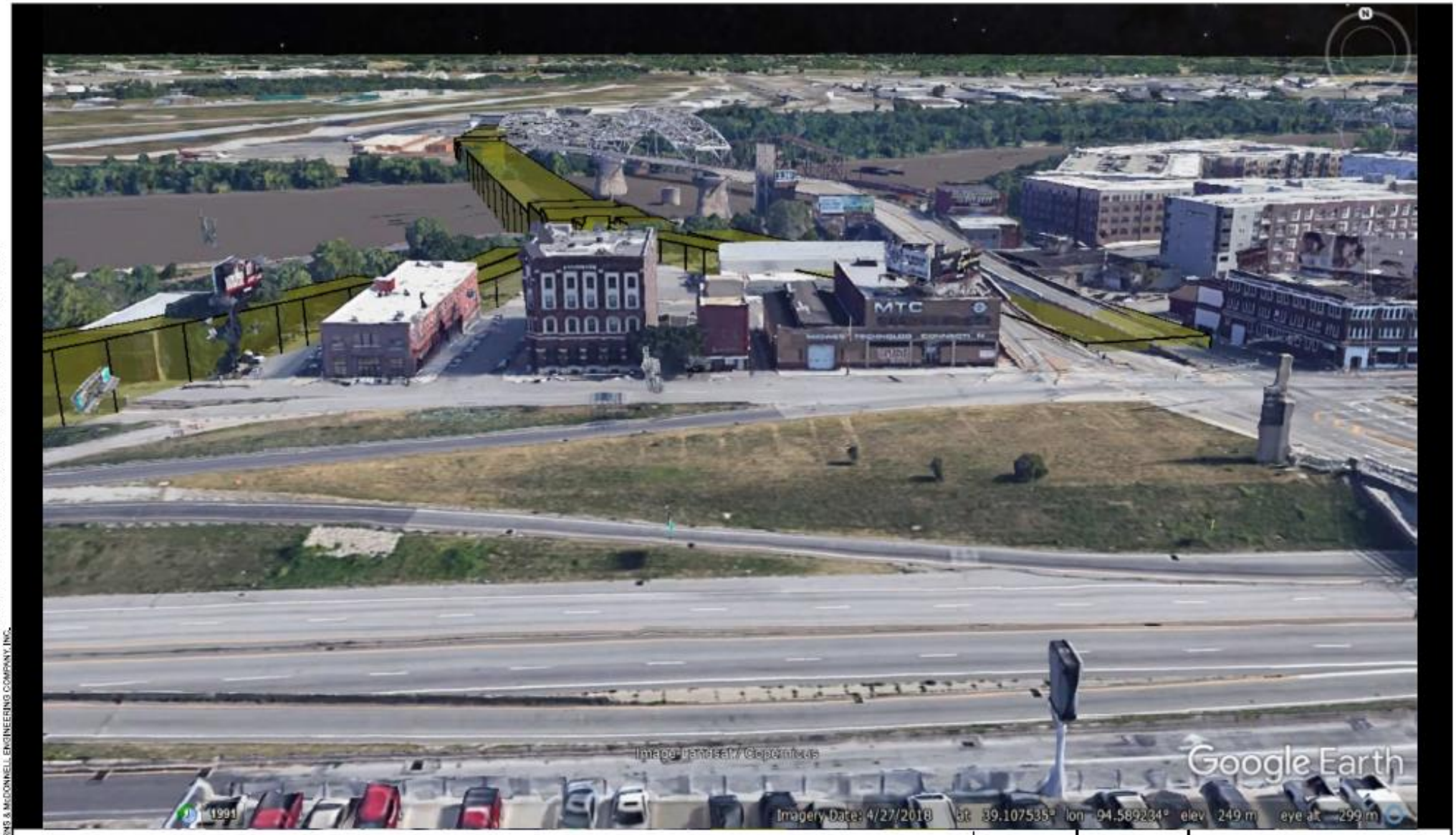

Central Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Appendix C

USGS Bathymetric Survey Data

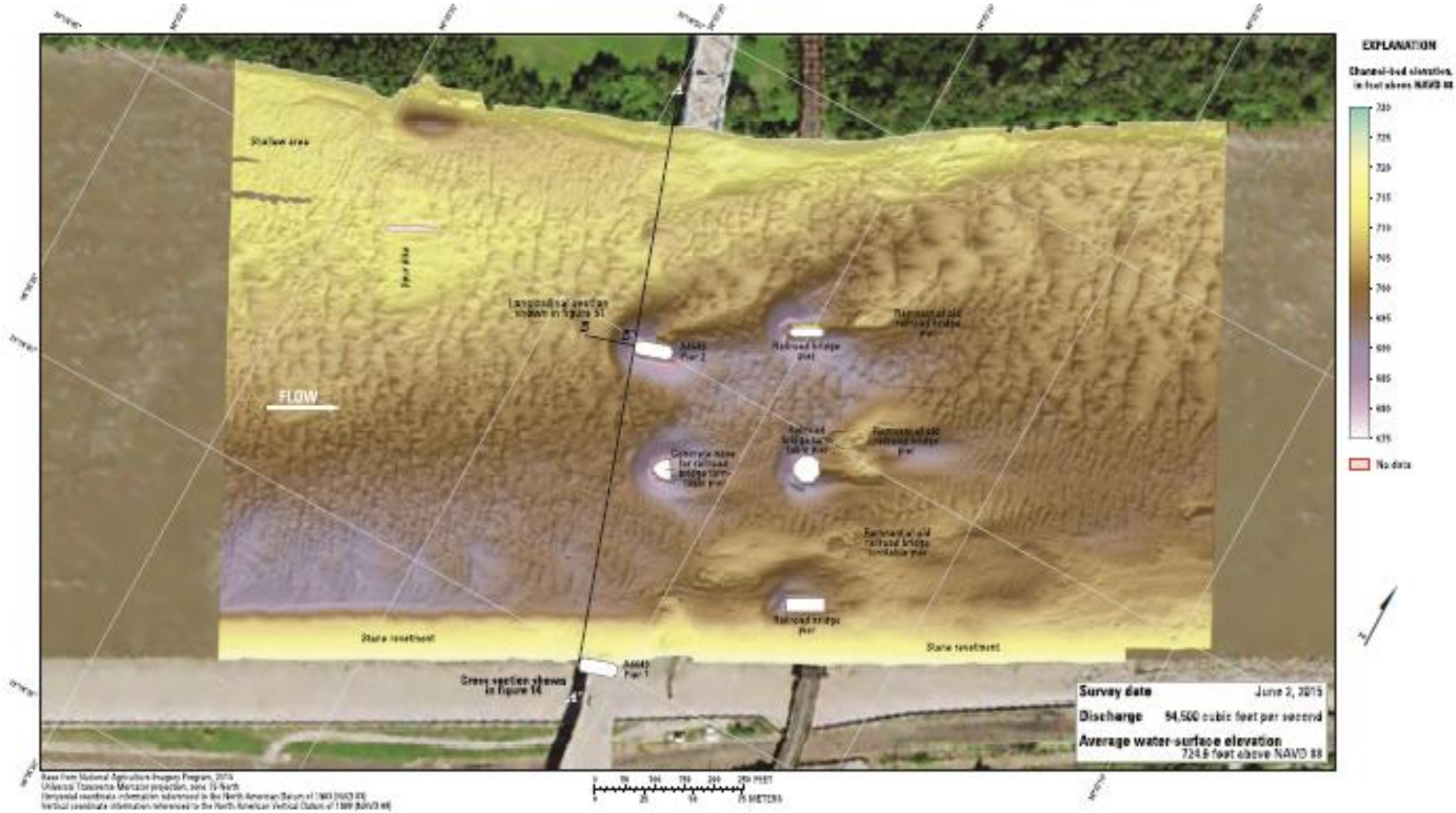


Figure 12. Bathymetric survey of the Missouri River channel near structure A4646 on U.S. Highway 169 in Kansas City, Missouri.

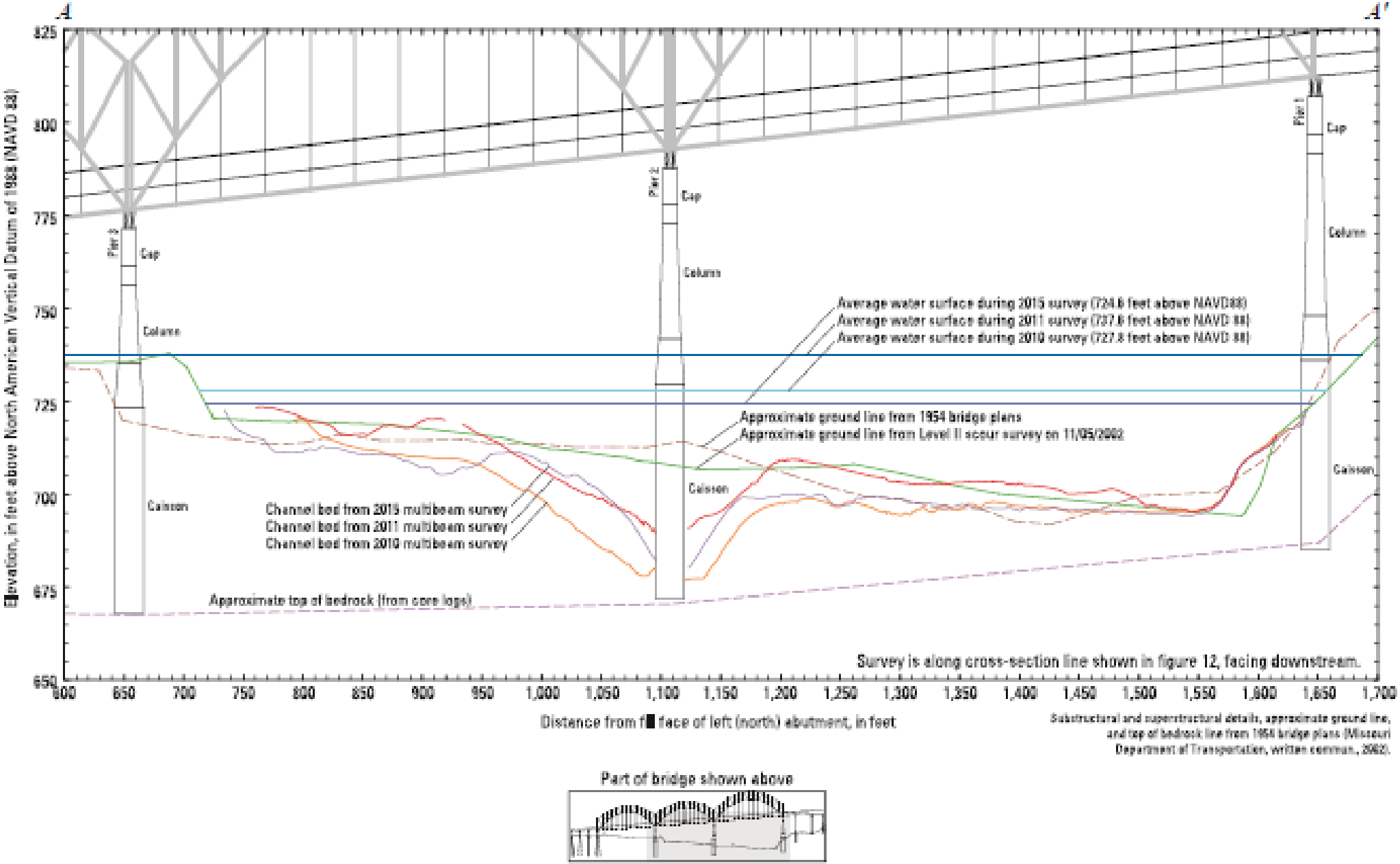


Figure 14. Key features, substructural and superstructural details, and surveyed channel bed of structure A4649 on U.S. Highway 169 crossing the Missouri River in Kansas City, Missouri.

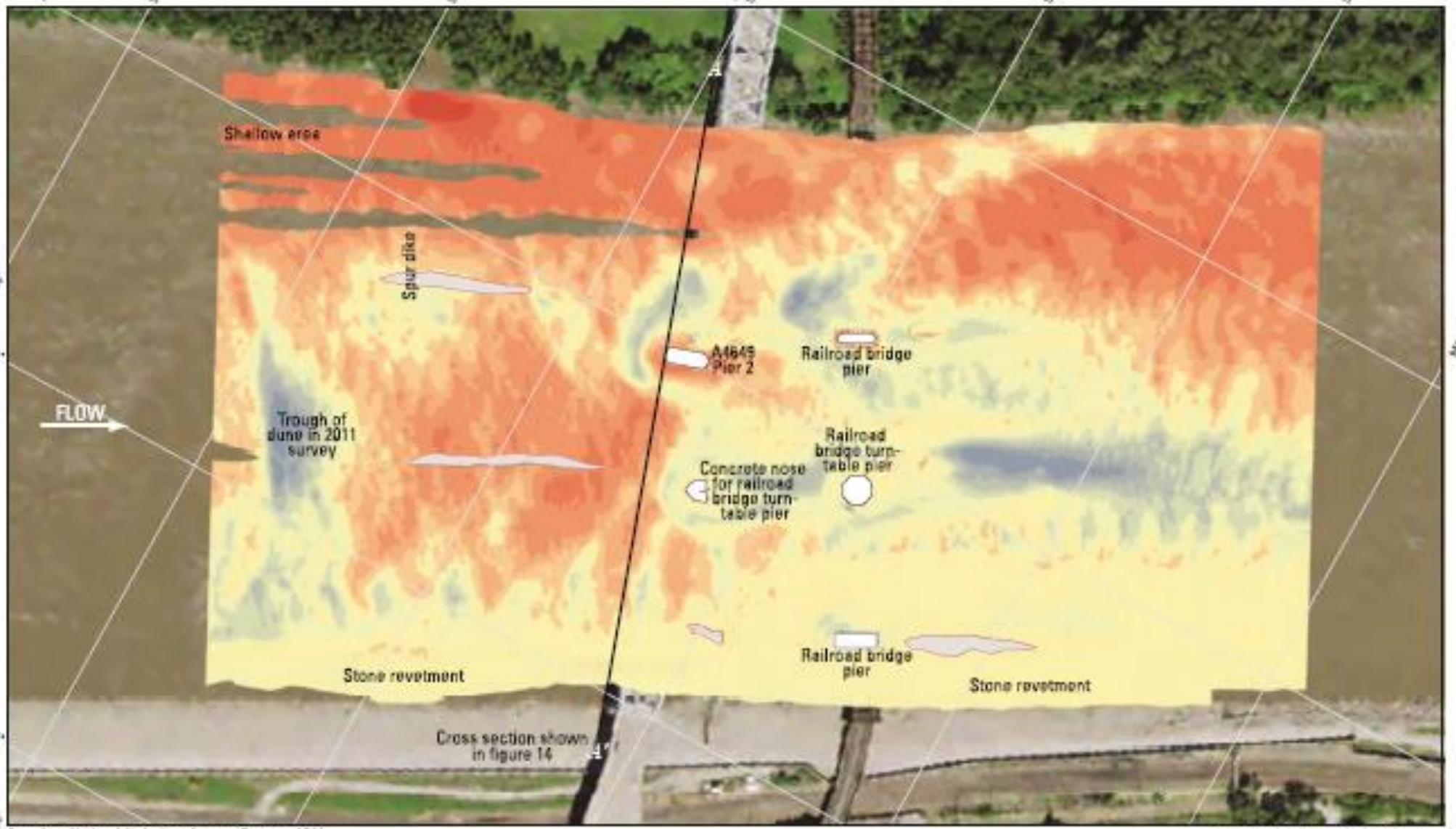


Figure 15. Difference between surfaces created from bathymetric surveys of the Missouri River channel near structure A4649 on U.S. Highway 169 in Kansas City, Missouri, on June 2, 2015, and July 17, 2011.

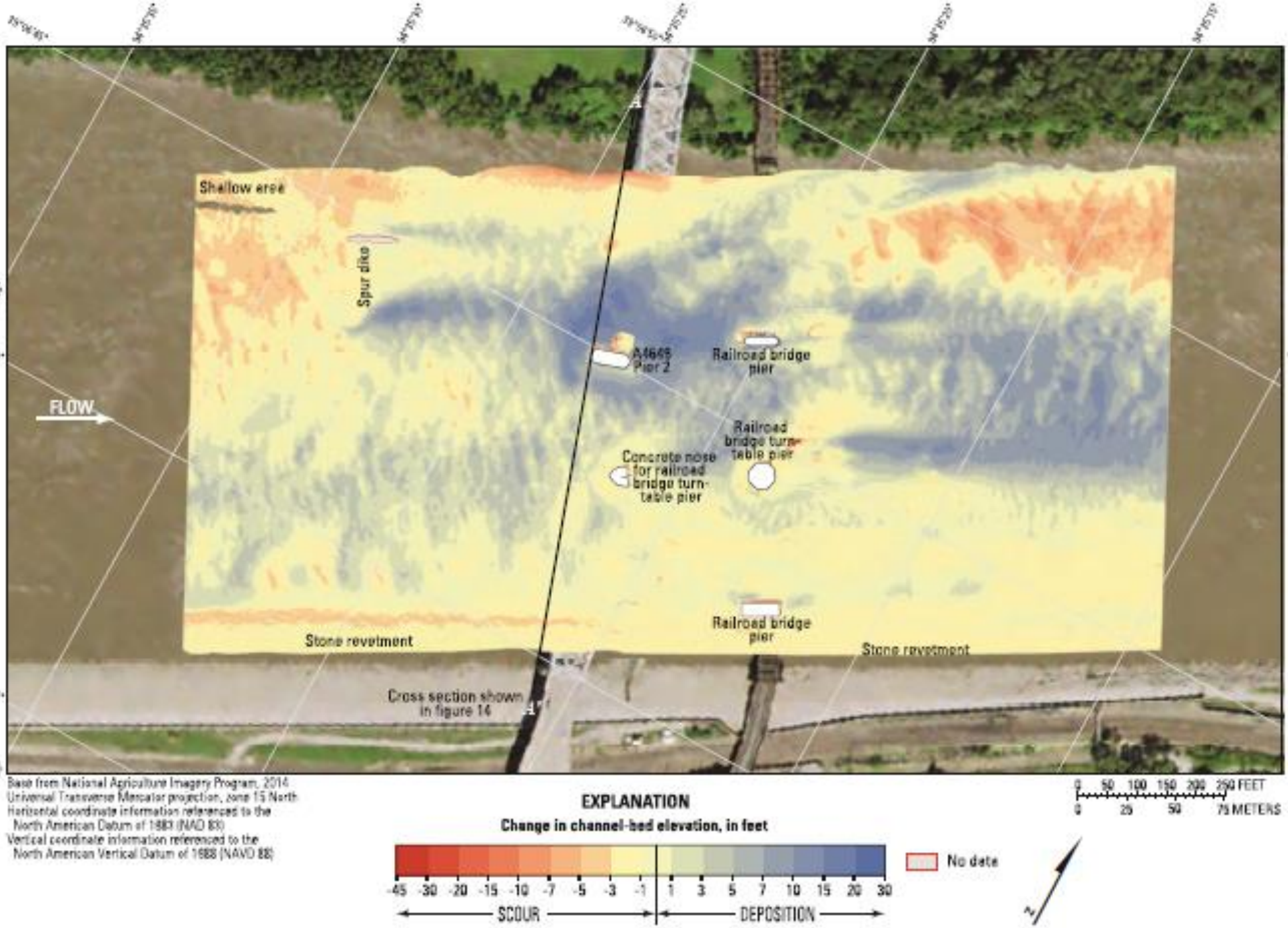


Figure 16. Difference between surfaces created from bathymetric surveys of the Missouri River channel near structure A4649 on U.S. Highway 169 in Kansas City, Missouri, on June 2, 2015, and March 16, 2010.

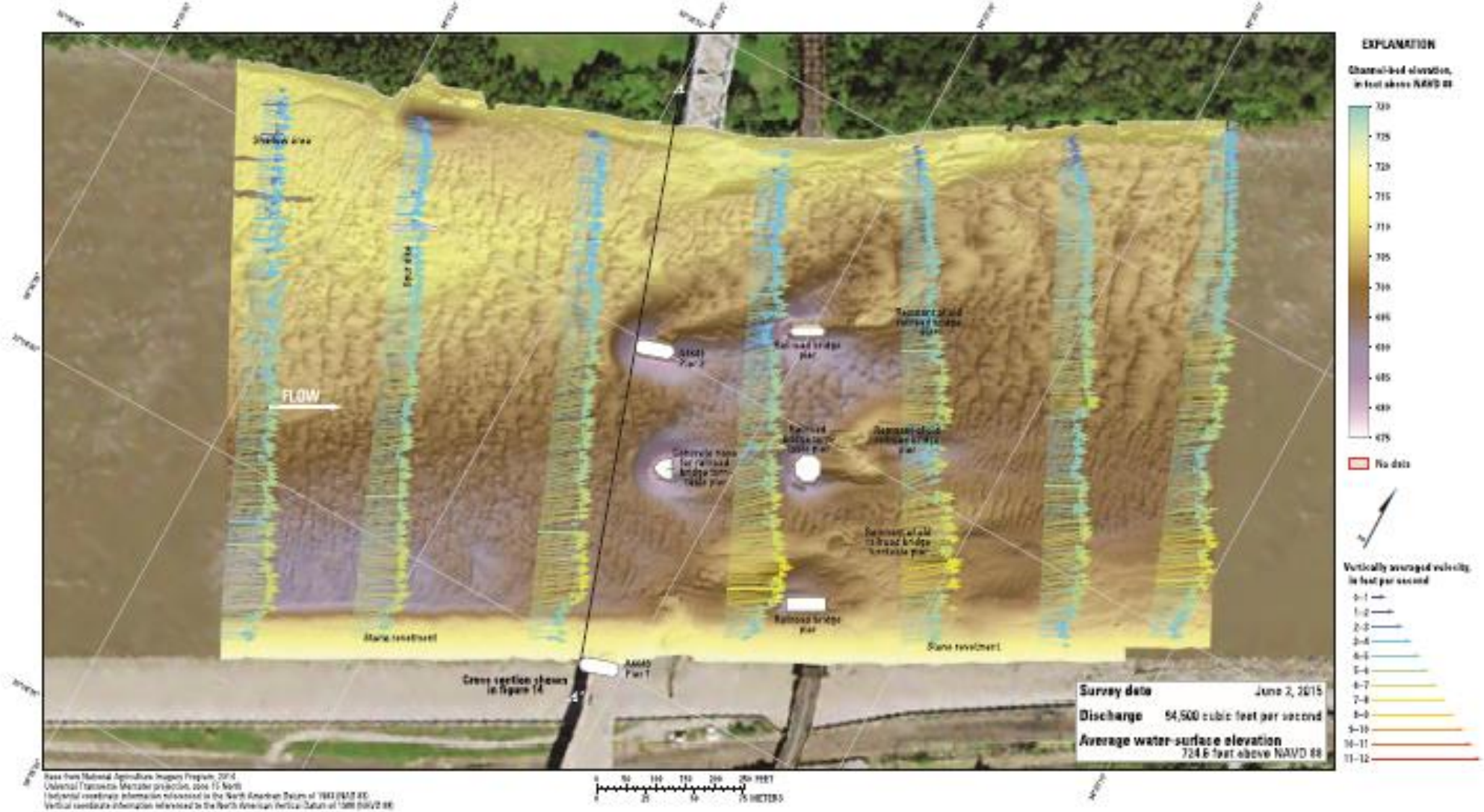


Figure 17. Bathymetry and vertically averaged velocities of the Missouri River channel near structure A4849 on U.S. Highway 169 in Kansas City, Missouri.

Appendix D

Site Photographs



Photo 1: Bridge A4649 over the Missouri River. View looking south towards pier 3 underside of bridge deck.



Photo 2: Bridge A4649 over the Missouri River. View looking north towards levee floodwall at underside of bridge deck.



Photo 3: Bridge A4649 over the Missouri River. View looking south towards pier 3 vegetation west of bridge.



Photo 4: West of Bridge A4649 over the Missouri River. View looking south towards Missouri River at Black willow (*Salix nigra*) adjacent to the river.



Photo 5: East of Bridge A4649 over the Missouri River. View looking north near abutment that was surveyed for signs of bat usage (staining and guano)



Photo 6: Under Bridge A4649 over the Missouri River. View looking under bridge near north abutment for signs of bat usage (staining and guano)



Photo 7: Under Bridge A4649 over the Missouri River. View looking under bridge at north abutment for signs of bat usage (staining and guano)



Photo 8: Forested area south of Bridge A4649 over the Missouri River looking northeast near Pennsylvania Ave and 7th Street.



Photo 9: Forested area south of Bridge A4649 over the Missouri River looking north near Pennsylvania Ave and 7th Street.



Photo 10: Forested area south of Bridge A4649 over the Missouri River looking northwest near Jefferson and 8th Street.



Photo 11: Potential clearing and grubbing area southwest of Bridge A4649 over the Missouri River looking west near Woodswether Rd.



Photo 12: Potential clearing and grubbing area southwest of Bridge A4649 over the Missouri River looking southeast south of Woodswether Rd.

Appendix E

Pallid Sturgeon Data

Removed at request of USFWS

Cannon-Mackey, Shari

Subject: FW: [EXTERNAL] Clay/Jackson US 169 (4S3085) Bridge A4649 Bridge Replacement - Informal Consultation (Consultation Code: 03E14000-2020-SLI-0211)

From: Hundley, Joshua [mailto:joshua_hundley@fws.gov]
Sent: Thursday, November 14, 2019 1:55 PM
To: Caleb J. Knerr
Cc: Christopher D. Shulse; Gerri A. Doyle; Richard Moore; Karen Herrington; raegan.ball.dot.gov; taylor.peters@dot.gov
Subject: Re: [EXTERNAL] Clay/Jackson US 169 (4S3085) Bridge A4649 Bridge Replacement - Informal Consultation (Consultation Code: 03E14000-2020-SLI-0211)

Dear Mr. Knerr,

The U.S. Fish and Wildlife Service (Service) has reviewed the information provided in your October 22, 2019 letter regarding the proposed US Route 169 Bridge Replacement (03E14000-2020-SLI-0211) in Clay/Jackson County, Missouri. The Service offers the following comments pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544).

MoDOT and FHWA requested the Service's concurrence with a "may affect, but not likely to adversely affect" (NLAA) determination for pallid sturgeon (*Scaphirhynchus albus*). The Service concurs with MoDOT and FHWA's not likely to adversely affect determination for the pallid sturgeon.

Thank you for your interest in the conservation of threatened and endangered species.

Josh Hundley
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Missouri Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, MO 65203-0057
573-234-5037 (office)

On Tue, Oct 22, 2019 at 10:03 AM Caleb J. Knerr <Caleb.Knerr@modot.mo.gov> wrote:

> Good Morning Josh,
>
> MoDOT plans to replace the US Route 169 bridge (A4649) over the Missouri River, in Clay/Jackson County, Missouri. Attached is a short BA, attachments and the IPaC official species list. As the designated non-federal representative in making Section 7 determinations for FHWA, MoDOT has determined that this project may affect but is not likely to adversely affect pallid sturgeon. We are asking for concurrence with those determinations. MoDOT will forward more detailed project plans and impact assessment when they are available at a later date. Please let me know if you have any questions with the information provided or need any additional information.
>
> Thanks,

Caleb J. Knerr

Senior Environmental Specialist

Missouri Department of Transportation

601 West Main Street

Jefferson City, MO 65102

Phone: (573) 526-6675

Cell: (573) 508-2220

Fax: (573) 522-1973

Email: Caleb.Knerr@modot.mo.gov

APPENDIX D – COMMUNITY RESOURCES

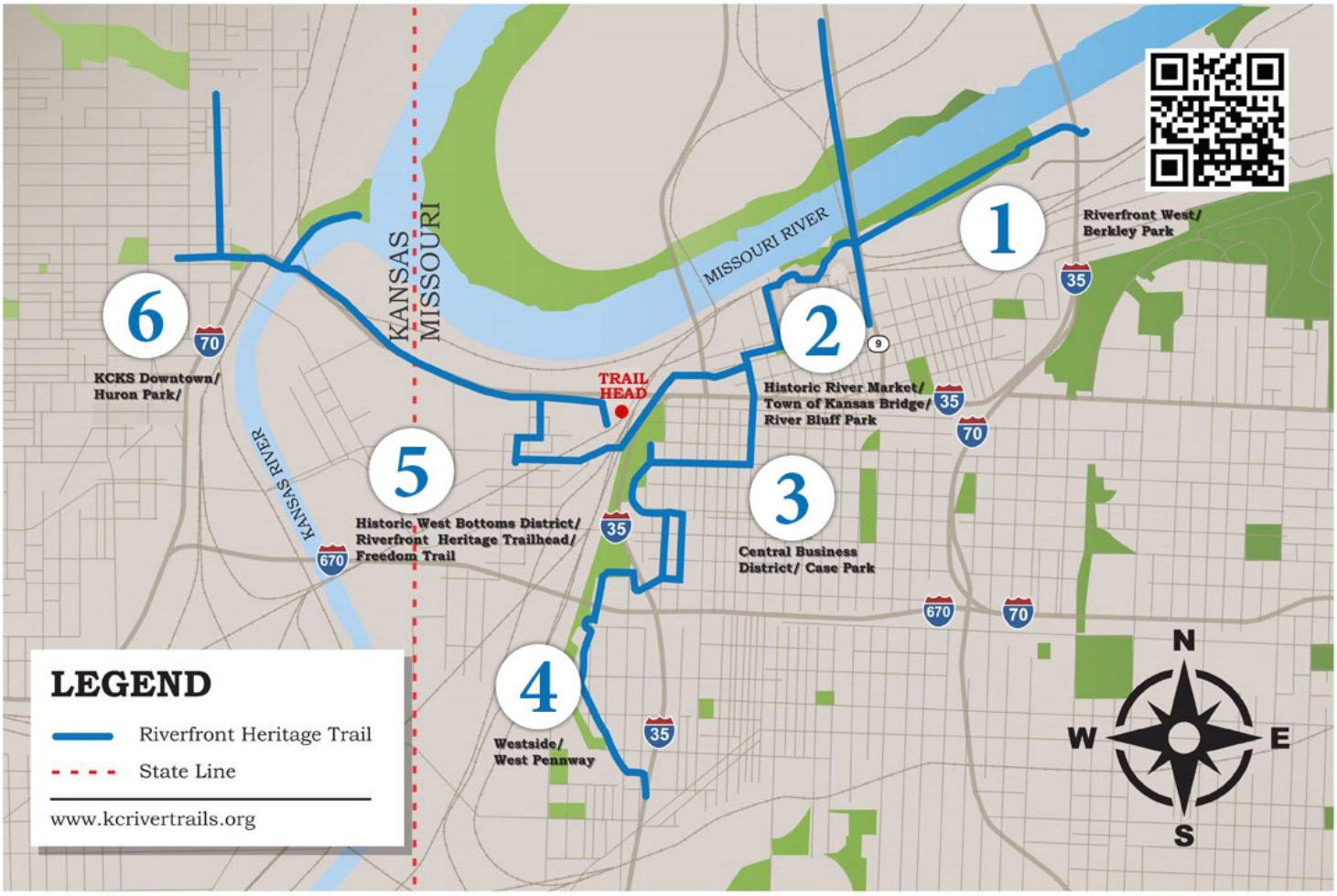
Kansas City River Trails, Inc.; Trail Segments in Study Area

Charles B. Wheeler Downtown Airport, Airport Layout Plan

Kansas City Riverfront Heritage Trail

A Bi-state Bicycle/Pedestrian Trail System Designed To:

- Rediscover the Kansas and Missouri Rivers and create links to surrounding communities
- Encourage Economic Development
- Provide a non-polluting alternative means of transportation
- Educate citizens about the history and cultural heritage of Kansas City
- Provide outdoor recreation, fitness and youth development opportunities
- Stimulate Downtown growth through Greenspace development



Click on the access points in the map above to view more information and photos on each access point.

Click here to download all the segment maps in a PDF file and printer-friendly format.

The Riverfront Heritage Trail

The Riverfront Heritage Trail is a fully accessible 15 mile bike/pedestrian pathway that begins at the riverfront and winds through the oldest and most historic parts of bi-state Kansas City. A close examination of the name of the Trail reveals the trails overall objectives, namely a trail system that provide access to the river and reawakens our appreciation of our area's unique history. It links communities, parks, and exciting destinations with unique new venues and dramatic public artwork. The completed trail system was never intended to be an area wide trail system. Rather it was designed to be the hub of such a system. By conquering numerous topological challenges (steep terrain and rivers) and manmade hurdles (levees, highways, bridges and railroads) it should ease the burden on subsequent trail efforts. The most immediate goal is to help make future trail construction easier and less costly. The trail's most ideal goal will the time when this effort will be consumed by a metropolitan trail system. Meantime, the Trail hopes to improve the quality of life in our community by reawaking an interest in our region's history, providing access to our spectacular rivers, enhancing area transportation, all the while gracing the trail with exciting public art and comfortable greenspaces.

Photo Tour Of the Trail

Click here to go on a photo tour of the trail!

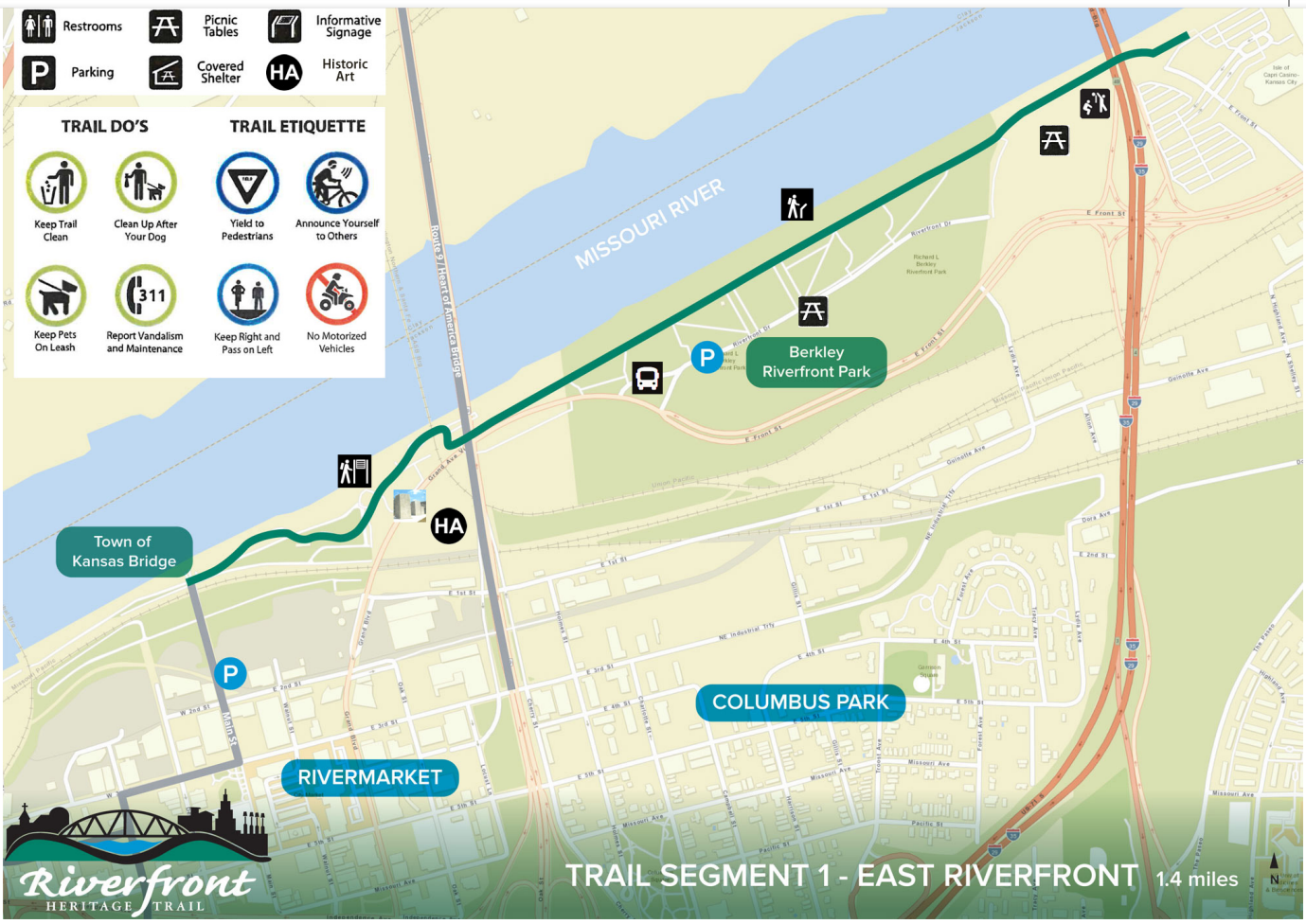
Riverfront Heritage Trail Construction

The Riverfront Heritage Trail is completed. It is a product of a coalition of public and private stakeholders including Kansas City, Missouri; The Unified Government of Wyandotte County and Kansas City; and the Port Authority of Kansas City. It soon became obvious that these three separate municipal agencies were limited by their own charters. We needed a separate entity that would facilitate discussion between these partners relative to planning and the determination of compatible goals. This gave rise to the not for profit Kansas City River Trails, Inc. whose board is composed of representatives of all those who have been working on the Trail. These partners were committed to developing a high quality Trail while simultaneously improving and beautifying the adjacent urban landscape. Where possible every effort was made to improve infrastructure, replace barren land, and clean up and remove blight. Thus, in the final analysis, the trail is more than just a recreational asset. Indeed, it is a serious commitment to positively transforming the bi-state landscape and the community's perception of livability.

Kansas City River Trails, Inc.

Kansas City River Trails, Inc, (KCRT) is a recognized Missouri Not for profit Corporation that was created to improve project efficiency, establish amenities, run programs, and maintain the Riverfront Heritage Trail. Moreover, it was created to insure continuity of Trail Design promote the Trail in the community. KCRT is not always in a position of authority but it stands ready to assist anyone in their trail construction efforts. We completely endorse all efforts to build a metropolitan trail system. Meantime, KCRT will make every effort to improve and preserve the Riverfront Heritage Trail (RHT). We have seen that the RHT is a catalyst for redevelopment, reimaged access to the river, reclaimed history that had long been overlooked and it has been a required amenity for a highly educated workforce. In addition, it has begun to be used for a safe route to school for schoolchildren. Finally, it has become an increasingly important component in the area's efforts to establish an energy efficient metropolitan transportation system.

Award Winning Trail System



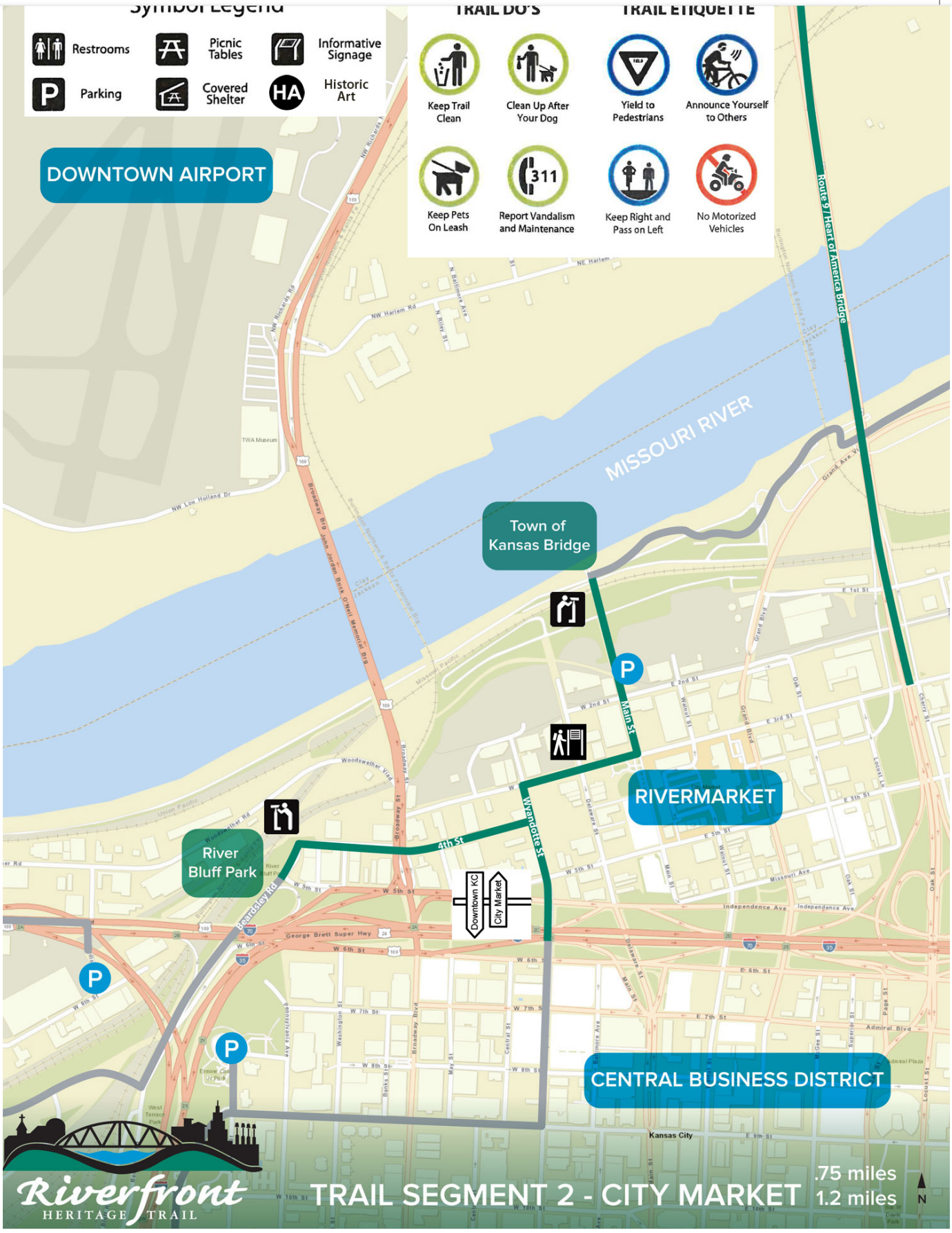
2 CITY MARKET SEGMENT

Segment Description



This trail segment runs between the Town of Kansas Bridge and River Bluff Park. There is a variety of on-street and off-street parking near the trail. The Town of Kansas Bridge allows users of the trail to get over several active railroad tracks and a levee system. The town of Kansas still waits for archeological study. Hopefully, that can be observed from this bridge. Meantime it is a good way to get to and from the trail that is adjacent to the river from the adjacent bluff. Using mostly share the road systems the trail works its way through north edge of the City Market until it reaches Wyandotte Street where it splits and heads south to Downtown and west to the West Bottoms. On the West end of the Bluff visitors on Beardsly Street the Trail runs through River Bluff Park. This exciting little park presents an overview of the great bend of the Missouri, the Wheeler airport, and a section of the first paved street of the Town of Kansas. Also in this park there is a national acclaimed art work depicting the dugout canoes used by the Lewis & Clark Expedition.

Segment Map


Symbol Legend
Restrooms
Picnic Tables
Informative Signage
Parking
Covered Shelter
Historic Art
TRAIL DO'S
TRAIL ETIQUETTE
Keep Trail Clean
Clean Up After Your Dog
Yield to Pedestrians
Announce Yourself to Others
Keep Pets On Leash
311
Report Vandalism and Maintenance
Keep Right and Pass on Left
No Motorized Vehicles
DOWNTOWN AIRPORT
MISSOURI RIVER
Town of Kansas Bridge
RIVERMARKET
River Bluff Park
CENTRAL BUSINESS DISTRICT
Route 9 / Heart of America Bridge
Main St
Wanamaker St
4th St
Broadway Blvd
Broadway Br
John Jordan Bucks O'Neil Memorial Blvd
Beardsley Rd
George Brett Super Hwy
Downtown KC City Market
Kansas City
Riverfront HERITAGE TRAIL
TRAIL SEGMENT 2 - CITY MARKET
.75 miles
1.2 miles
N

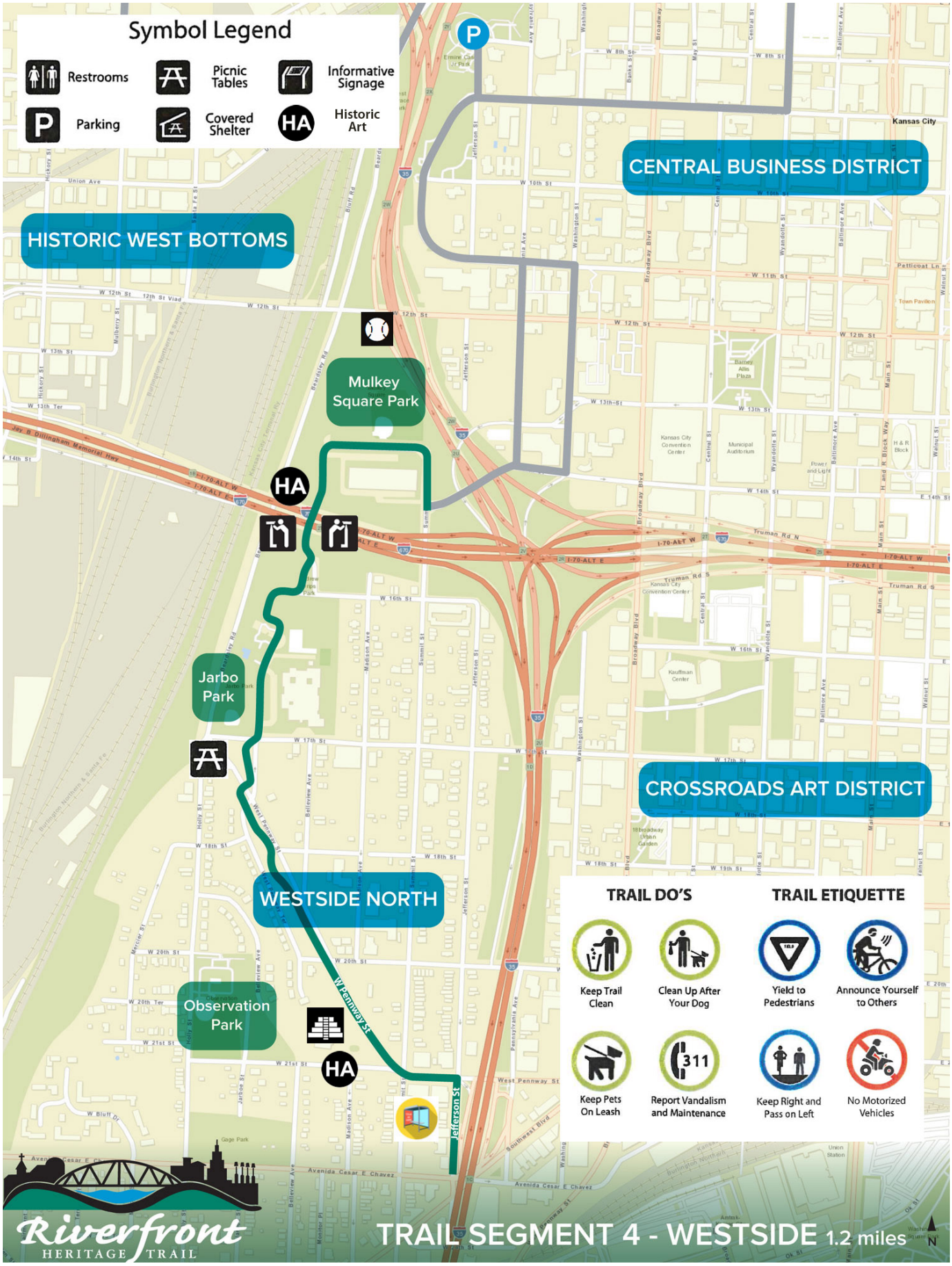
3 DOWNTOWN KANSAS CITY MISSOURI TRAIL SEGMENT

Segment Description

Obviously, most of the street plan of Downtown KCMO was in place when we created the route for the trail there. When possible we took out unnecessary parking to create bike lanes and we increased the width of sidewalks to create safe passage. In spite of these efforts most of the trail through Downtown KCMO had to rely on share the road bike routes. Where possible we placed the trail where it would link parks and important vistas. When we linked Case park we made sure is was totally accessible. Part of the trail takes you to the bluff where Lewis & Clark stopped on their return trip. Weekend parking should not be a problem unless a major event is taking place.

Segment Map


Restrooms
Picnic Tables
Informative Signage
Parking
Covered Shelter
Historic Art
RIVERMARKET
River Bluff Park
RIVERFRONT HERITAGE TRAILHEAD
Case Park / West Terrace Park
HISTORIC WEST BOTTOMS
CENTRAL BUSINESS DISTRICT
Mulkey Square Park
Jarbo Park
CROSSROADS ART DISTRICT
9th St
11th St
Jefferson St
Wyandotte St
Pennsylvania Ave
Washington St
Kansas City
TRAIL DO'S
TRAIL ETIQUETTE
Keep Trail Clean
Clean Up After Your Dog
Yield to Pedestrians
Announce Yourself to Others
Keep Pets On Leash
Report Vandalism and Maintenance
311
Keep Right and Pass on Left
No Motorized Vehicles
Riverfront HERITAGE TRAIL
TRAIL SEGMENT 3 - DOWNTOWN 2.1 miles
N


Symbol Legend
Restrooms
Picnic Tables
Informative Signage
Parking
Covered Shelter
Historic Art
CENTRAL BUSINESS DISTRICT
HISTORIC WEST BOTTOMS
Mulkey Square Park
Jarbo Park
Observation Park
WESTSIDE NORTH
CROSSROADS ART DISTRICT
W Pennway St
Jefferson St
TRAIL DO'S
Keep Trail Clean
Clean Up After Your Dog
Keep Pets On Leash
TRAIL ETIQUETTE
Yield to Pedestrians
Announce Yourself to Others
311
Report Vandalism and Maintenance
Keep Right and Pass on Left
No Motorized Vehicles
Riverfront HERITAGE TRAIL
TRAIL SEGMENT 4 - WESTSIDE 1.2 miles

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	Same	AIRPORT PROPERTY LINE
		AIRPORT AVIGATION EASEMENT
	Same	AIRPORT REFERENCE POINT (ARP)
	Same	AIRPORT ROTATING BEACON
AP	Same	AUTOMOBILE PARKING
N / A		BUILDING REMOVAL
		BUILDING CONSTRUCTION
BRL	Same	BUILDING RESTRICTION LINE (BRL)
EMAS	Same	EMAS (Engineered Materials Arresting System)
	Same	FENCING
PAPI	PAPI	NAVIGATIONAL AID INSTALLATION
		PAVEMENT CONSTRUCTION
		PAVEMENT REMOVAL / PAVEMENT ABANDONED
	Same	RUNWAY EDGE LIGHTS
	Same	RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY HOLDING POSITION MARKING
	Same	RUNWAY THRESHOLD LIGHTS
34 | 16 3/3	Same	SECTION CORNER
	Same	TOPOGRAPHIC ELEVATION CONTOURS
	Same	WIND INDICATOR (Lighted)
	Same	UNIMPROVED ROAD

RUNWAY END COORDINATES (NAD 83)

RUNWAY		EXISTING	ULTIMATE
Runway 1	Latitude	39° 06' 52.881" N	SAME
	Longitude	94° 35' 43.247" W	SAME
Runway 1 Displaced Threshold	Latitude	39° 06' 55.773" N	SAME
	Longitude	94° 35' 42.413" W	SAME
Runway 19	Latitude	39° 07' 58.715" N	SAME
	Longitude	94° 35' 24.222" W	SAME
Runway 19 Displaced Threshold	Latitude	39° 07' 55.805" N	SAME
	Longitude	94° 35' 25.063" W	SAME
Runway 3	Latitude	39° 06' 58.664" N	SAME
	Longitude	94° 35' 54.652 W	SAME
Runway 3 Displaced Threshold	Latitude	39° 07' 02.535" N	SAME
	Longitude	94° 35' 50.708" W	SAME
Runway 21	Latitude	39° 07' 37.760" N	SAME
	Longitude	94° 35' 14.819" W	SAME
Runway 21 Displaced Threshold	Latitude	39° 07' 32.348" N	SAME
	Longitude	94° 35' 20.334" W	SAME

AIRPORT DATA

Charles B. Wheeler Downtown Airport (MKC)

OWNER: City of Kansas City, Missouri — COUNTY: Clay, Missouri
ASSOCIATED CITY: Kansas City, Missouri — CIVIL TOWNSHIP: N/A
RANGE: 20 East — TOWNSHIP: 15 North — GIS Region: NAD83 Missouri West

		EXISTING	ULTIMATE
AIRPORT ELEVATION (NAVD 88)		756.6 MSL	756.6 MSL
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	39° 07' 22.573" N	39° 07' 22.573" N
	Longitude	94° 35' 34.160" W	94° 35' 34.160" W
AIRPORT ELECTRONIC AIDS		Beacon (C/G) ILS (Runways 3 and 19) GPS (Runways 3 / 19 / 21) TVOR / DME	Beacon (C/G) ILS (Runways 1 / 3 / 19) GPS (Runways 1 / 3 / 19 / 21) DME (Runways 3 and 19)
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		90.2° F (July)	90.2° F (July)
AIRPORT REFERENCE CODE		D-III / B-IV	D-III / B-IV
CRITICAL DESIGN AIRCRAFT		Gulfstream V / Bombardier BD-700	Gulfstream 550 / Bombardier BD-700
NPIAS AIRPORT SERVICE LEVEL CODE		Reliever	Reliever

NOTES:

1. Depiction of features and objects including related elevations, clearances, and obstructions; within the runway protection zones are depicted on the INNER PORTION OF THE APPROACH SURFACE DRAWINGS (Sheets 12-15).
2. Details concerning terminal area improvements are depicted on the TERMINAL AREA DRAWING (Sheet 21).
3. Recommended land uses are depicted on the AIRPORT LAND USE DRAWING (Sheet 22).
4. The Building Restriction Line (BRL) is established in accordance with F.A.R. Part 77 criteria. BRL location may vary in accordance with runway object free area, runway protection zone, NAVAID critical areas, and areas required for terminal instrument procedures.
5. The existing TVOR/DME facility is to be decommissioned and removed in the future. A part of this project, separate DME equipment will be installed in the existing Runway 3 and Runway 19 localizer antenna shelters and the existing ASOS and SAWS will be relocated from the TVOR area and co-located with the Runway 19 Glide Slope Antenna.

RUNWAY AND TAXIWAY DATA

	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	RUNWAY 1	RUNWAY 19	RUNWAY 1	RUNWAY 19	RUNWAY 3	RUNWAY 21	RUNWAY 3	RUNWAY 21
AIRCRAFT APPROACH CATEGORY - AIRPLANE DESIGN GROUP	D-III / B-IV		Same		B-II		Same	
RUNWAY PAVEMENT DIMENSIONS	6,827' x 150'		Same		5,050' x 100'		Same	
RUNWAY PAVEMENT STRENGTH (See Note A)	86(S) 171(D) 342(DT)		Same		48(S) 73(D) 136(DT)		Same	
RUNWAY PAVEMENT MATERIAL & SURFACE TREATMENT	Concrete, Grooved		Same		Asphalt, Grooved		Same	
RUNWAY TOUCHDOWN ZONE ELEVATION (MSL)	746.2	754.2	Same	Same	743.8	743.8	Same	Same
RUNWAY EFFECTIVE GRADIENT	0.19%		Same		0.02%		Same	
RUNWAY HOLDING DISTANCE FROM RUNWAY CENTERLINE	258'		Same		250'		Same	
RUNWAY MARKING	Non-Precision	Precision	Precision	Same	Precision	Non-Precision	Same	Same
RUNWAY ELECTRONIC NAVIGATIONAL / APPROACH AIDS	None	ILS, VOR, NDB, GPS	ILS, GPS	ILS, GPS	GS, LOC, VOR, GPS	GPS, VOR	ILS, GPS	GPS
RUNWAY APPROACH LIGHTING	RAIL	MALSF	MALSF	Same	None	None	MALSF	Same
RUNWAY LANDING VISUAL AIDS	VASI-4L, REIL	PAPI-4L	PAPI-4L	Same	VASI-4L, REIL	VASI-4L, REIL	PAPI-4L	PAPI-4L, REIL
RUNWAY EDGE LIGHTING	HIRL		Same		HIRL		Same	
RUNWAY THRESHOLD DISPLACEMENT FROM BEGINNING OF RUNWAY	300'	302'	Same	Same	500'	699'	Same	Same
ENGINEERED MATERIAL ARRESTING SYSTEM (EMAS)	263' x 170'	288' x 170'	Same	Same	None	None	Same	Same
STANDARD RUNWAY SAFETY AREA (RSA) BEYOND RUNWAY END	600'	600'	Same	Same	300'	300'	Same	Same
STANDARD RUNWAY OBJECT FREE AREA (ROFA) BEYOND RUNWAY END	600'	600'	Same	Same	300' (See Note B)	300' (See Note B)	Same	Same
RUNWAY SAFETY AREA (RSA) DIMENSIONS	7,227' x 500'		Same		5,370' x 150'		Same	
RUNWAY OBSTACLE FREE ZONE (ROFZ) DIMENSIONS	7,227' x 400'		Same		5,450' x 250'		Same	
RUNWAY OBJECT FREE AREA (ROFA) DIMENSIONS	7,227' x 800'		Same		5,113' x 500' (See Note B)		Same	
PRECISION OBSTACLE FREE ZONE (POFZ)	Not Required	Not Required	Same	Same	Not Required	Not Required	Same	Same
TAKEOFF RUN AVAILABLE (TORA)	6,827'	6,827'	Same	Same	5,050'	5,050'	Same	Same
TAKEOFF DISTANCE AVAILABLE (TODA)	6,827'	6,827'	Same	Same	5,050'	5,050'	Same	Same
ACCELERATE - STOP DISTANCE AVAILABLE (ASDA)	6,827'	6,827'	Same	Same	4,770' (See Note F)	5,050'	Same	Same
LANDING DISTANCE AVAILABLE (LDA)	6,527'	6,525'	Same	Same	4,270' (See Note F)	4,351'	Same	Same
F.A.R. PART 77 CATEGORY (See Note C)	V	P	P	Same	P	NP (Type C)	Same	Same
F.A.R. PART 77 APPROACH SURFACE SLOPE	20:1	50:1	50:1	Same	50:1	34:1	Same	Same
DECISION HEIGHT (DH) / HEIGHT ABOVE TOUCHDOWN (HAT)	Not Applicable	250'	250'	Same	305'	856'	250'	Same
LOWEST AVAILABLE RUNWAY APPROACH VISIBILITY, STATUE MILE (SM)	Visual	As low as 3/4 SM	As low as 3/4 SM	Same	As low as 3/4 SM	As low as 1 SM	Same	Same
AERONAUTICAL SURVEY TYPE REQUIRED FOR APPROACH	No Vertical Guidance	Vertical Guidance	Same	Same	Vertical Guidance	No Vertical Guidance	Same	Same
THRESHOLD SITING SURFACE (TSS) AND SLOPE (See Note D)	Type 3, 20:1	Type 7, 34:1	Type 6, 20:1	Same	Type 4, 20:1	Type 4, 20:1	Type 6, 20:1	Same
RUNWAY INSTRUMENT APPROACH PROCEDURES AVAILABLE	None	ILS or LOC RWY 19 RNAV (GPS) RWY 19 VOR RWY 19 NDB RWY 19	RNAV (GPS) RWY 1	ILS or LOC RWY 19 RNAV (GPS) RWY 19	ILS or LOC RWY 3 RNAV (GPS) RWY 3 VOR RWY 3	RNAV (GPS) RWY 21 VOR RWY 21	ILS or LOC RWY 3 RNAV (GPS) RWY 3	RNAV (GPS) RWY 21
TAXIWAY WIDTH (See Note E)	50' to 75'		Same		50' to 75'		Same	
TAXIWAY LIGHTING	MITL		Same		MITL		Same	
TAXIWAY SAFETY AREA WIDTH (TSA)	118'		Same		79'		Same	
TAXIWAY OBJECT FREE AREA WIDTH (TOFA)	186'		Same		131'		Same	

(A) Pavement strength expressed in 1,000 lbs. as single (S), dual (D), and dual tandem (DT) main gear wheel configurations.
(B) For Runway 3-21, a non-standard ROFA exists. At the approach end of Runway 3, the ROFA measures 38' less than standard. At the approach end of Runway 21 the ROFA measures 219' less than standard.
(C) F.A.R. Part 77 Surfaces for obstruction notification purposes. Category terms from Fig. 6-3-9 of FAA Order 7400.2J.
(D) Refer to AC 150/5300, Change 18, Appendix 2, Table A2-1 for TSS.
(E) Taxiways east of Runway 1-19 shall be 75' wide. Taxiways west of Runway 1-19 shall be 50' wide.
(F) The Runway 3 ASDA value of 4,770 is determined from the start of takeoff run (beginning of pavement) to the existing chain link fence along U.S. Highway 169 less the standard RSA length of 300'. The Runway 3 LDA value of 4,270' is determined using the ASDA less the 500' displacement of the Runway 3 threshold.

CITY OF KANSAS CITY, MISSOURI
AVIATION DEPARTMENT

APPROVED BY: Philip I. Mungy, P.E. — DATE 4/26/13
Director of Planning and Engineering

SUBMITTED BY: Lynette M. Mellett, P.E. — DATE 4/17/13
HNTB Corporation

CONDITIONAL APPROVAL

The approval indicated by my signature is given subject to the condition that the items identified in our approval letter dated May 8, 2013 may not be undertaken without prior written environmental approval by the Federal Aviation Administration. This approval action does not imply any commitment for Federal funding, or approval of future structures requiring notice under FAR Part 77.

Airport Planning Engineer, FAA Central Region — Date 5/8/13

BUILDINGS / FACILITIES

EAST SIDE OF RUNWAY 1-19

EXISTING	ULTIMATE	DESCRIPTION	ELEV.
10		HANGAR 1 (Signature Flight Support)	794 MSL
40		ELECTRICAL VAULT BUILDING	760 MSL
68		HANGAR 4B (TADIC)	771 MSL
	70	CONVENTIONAL HANGAR	778 MSL
	71	AIRCRAFT RESCUE & FIREFIGHTING (ARFF)	778 MSL
	72	AVIATION MAINTENANCE FACILITY	765 MSL
82		ABOVE-GROUND AVIATION FUEL FACILITY	757 MSL
83		UNDERGROUND AUTO FUEL FACILITY	756 MSL
95		SOUTH PUMP STATION (Kansas City Water Department)	765 MSL
96		NORTH PUMP STATION (Kansas City Water Department)	765 MSL
100		STORAGE BUILDING (Signature Flight Support)	752 MSL
101		RUNWAY 19 LOCALIZER SHELTER	757 MSL
150		HANGAR 2 (Signature Flight Support)	780 MSL
200		HANGAR 3 (Signature Flight Support)	779 MSL
250		ADMINISTRATION OFFICE BUILDING	790 MSL
300		MAINTENANCE GARAGE	790 MSL
440		HANGAR 4 (Signature Flight Support)	780 MSL
500		OFFICES (Signature Flight Support)	767 MSL
600		HANGAR 5A & 5B (Signature Flight Support)	775 MSL
850		HANGAR 50 (Signature Flight Support)	781 MSL
940		MAINTENANCE (KCAD)	761 MSL
942		KCAD SAND STORAGE FACILITY	764 MSL

BUILDINGS / FACILITIES

WEST SIDE OF RUNWAY 1-19

EXISTING	ULTIMATE	DESCRIPTION	ELEV.
	56-62	CONVENTIONAL HANGAR (30' AGL)	733 MSL
	63-65	CONVENTIONAL HANGAR (40' AGL)	783 MSL
	66	GENERAL AVIATION TERMINAL BUILDING (30' AGL)	773 MSL
71		T-HANGAR (10 Unit, Nested)	759 MSL
72		T-HANGAR (13 Unit, Nested)	759 MSL
73		T-HANGAR (21 Unit, Nested)	765 MSL
74		T-HANGAR (21 Unit, Nested)	761 MSL
75		ABOVE-GROUND AVIATION FUEL FACILITY	766 MSL
77		T-HANGAR (19 Unit, Nested)	761 MSL
78		BOX HANGAR (6 Units)	767 MSL
79		BOX HANGAR (7 Units, 6 Hangar / 1 GA Terminal)	767 MSL
91		HANGAR 10	772 MSL
	92	CONVENTIONAL HANGAR	772 MSL
	93	CONVENTIONAL HANGAR	772 MSL
	94	CONVENTIONAL HANGAR	763 MSL
97		ABOVE-GROUND AVIATION FUEL FACILITY	755 MSL
98		FUEL FACILITY (Self-Serve)	757 MSL
201		HANGAR 9 (Signature Flight Support)	795 MSL
351		OFFICE / STORAGE (Signature Flight Support)	755 MSL
401		HANGAR 8 / CARGO BUILDING (Signature Flight Support)	760 MSL
501		HANGAR 7 (Signature Flight Support)	775 MSL
	502	CONVENTIONAL HANGAR	775 MSL
601		HANGAR 6B (Signature Flight Support)	795 MSL
651		FAA AIRWAYS AND FACILITIES BUILDING	762 MSL
653		FAA AIR TRAFFIC CONTROL TOWER	841 MSL
701		HANGAR 6A (Signature Flight Support)	795 MSL
801		SHADE HANGAR (12 Units)	762 MSL

AIRPORT PACS / SACS MONUMENTS

	DESCRIPTION	POINT ID	LATITUDE	LONGITUDE	ELEV.
1	PACS - MKC F	AI4898	39° 08' 02.56354" (N)	94° 35' 19.83960" (W)	755.5
2	SACS - MKC G	AI4899	39° 07' 18.36312" (N)	94° 35' 31.35153" (W)	740.4
3	SACS - MKC H	AI4900	39° 07' 00.55269" (N)	94° 35' 46.22469" (W)	740.5

NORTH
Magnetic Variance = 1° 51' East (2015)
Annual Rate of Change = 0.7' West
400 0 400 800
Scale Feet

No.	REVISIONS	DATE	BY	APP'D

THE CONTENTS OF THIS PLAN DOES NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS DOCUMENT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE ON THE PART OF THE UNITES STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

HNTB

CITY OF KANSAS CITY, MISSOURI
AVIATION DEPARTMENT

CHARLES B. WHEELER DOWNTOWN AIRPORT

CITY OF FOUNTAINS HEART OF THE NATION — KANSAS CITY MISSOURI

AIRPORT LAYOUT DRAWING

dsn: Brian Tompkins | dtl: Jerry Smith | Aviation Project No: 62090340
chk'd: Will Reinhardt | app'd: Lynette Mellett | Sheet 2 of 23

APPENDIX E – HAZARDOUS MATERIALS

Hazardous Materials Technical Memorandum	October 4, 2019
EDR Radius Report – AVAILABLE UPON REQUEST	March 27, 2019

TO: **Shari Cannon-Mackey,** Burns & McDonnell

FROM: **David Kocour,** Hg Consult, Inc.

DATE: **October 4, 2019**

SUBJECT: **Buck O'Neil Bridge EA: Hazardous Materials Technical Memorandum**

1.0 Introduction

The Project study area for the hazardous materials analysis looks at the proposed Buck O'Neil Bridge and immediately adjacent properties (Figure 1). A review of the Beyond the Loop Planning and Environmental Linkages Study (July 2018); historical aerial photographs and topographic maps, a field reconnaissance, and a database search of potential hazardous waste sites was performed to evaluate the likelihood of soil and/or groundwater contamination within the Project study area. The purpose of the evaluation was to identify sites that may require remediation that would result in additional costs and time for completion of the selected alternative. The scope of this evaluation was limited to a database search for recorded site information, review of historical aerial photographs/topographic maps, followed by a "windshield" field reconnaissance survey of selected potential hazardous waste sites. An electronic database was used that queried federal and state agency databases. This evaluation did not include a complete site assessment per ASTM Standard E 1527-13, nor does it constitute a hazardous waste remedial investigation.

The Project study area is in a section of Kansas City that has a long history of multiple uses including commercial/industrial use. Many of these current and former businesses/industries are of environmental concern due to documented environmental contamination and/or the length of time they have been engaged in activities that may have used hazardous materials and/or produced hazardous wastes during a time period when there was little or no regulation of such materials/wastes. In addition, the hydrogeologic regime of the Project study area and surrounding area is dynamic. Changes in direction of groundwater flow, quality, and composition is common. Because of the dynamic nature of hydrogeologic regime, spills and leaks of potentially hazardous materials from off-site sources have the potential to contaminate groundwater resources underlying the Project study area.

2.0 Survey Methodology

There is no single comprehensive source of information available that identifies all known or potential sources of environmental contamination within the Project study area. Therefore, to identify and evaluate sites that may potentially contain hazardous materials, petroleum products, or other sources of contamination, a federal and state government database search was conducted by Environmental Data Resources, Inc. (EDR), dated March 27, 2019. The database search included over 100 different environmental databases including sites identified or evaluated as federal or state Superfund sites; facilities that generate, store, treat or dispose of hazardous wastes; solid waste landfills; facilities that have active, closed, or leaking aboveground storage tanks (ASTs) or underground storage tanks (USTs); sites actively undergoing cleanup; spills involving potentially hazardous materials; and a number of other activities that might be an indicator of a hazardous condition.

The Missouri Department of Natural Resources (MDNR) E-Start database was searched for the Study Area and contains information on hazardous waste site investigations and cleanups, as well as, regulated storage tank sites.

In addition to the government database search, historical aerial photographs from Google Earth and topographic maps were also obtained from EDR and reviewed for evidence of activity or features that might suggest the potential for waste disposal. Historical aerial photographs from the years 1991, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, and 2018 were reviewed. Historical U.S. Geological Survey topographic maps from the years 1894, 1935, 1940, 1948, 1957, 1964, 1970, 1975, 1991, and 1996 were also reviewed.

An electronic copy of all information obtained from EDR, Google and other sources has been provided with this document as an attachment due to the file size and amount of information.

A field reconnaissance was conducted in addition to the database search, historical aerial photograph review and historical topographic map review. The field reconnaissance was limited to a “windshield” survey for potential sites of concern that may not have been listed in the database report, plus verification of selected site locations judged to have moderate to high potential for environmental contamination. Properties were not accessed, were observed and examined externally only, and no interviews were conducted with owners or operators during the field reconnaissance.

3.0 Potential Sites

The results of the database search, historical reviews, and field reconnaissance were prioritized as to the likelihood of soil and/or groundwater contamination present on or in the Study Area.

The priority assigned was either "None-to-Low", "Low-to-Moderate", or "Moderate-to-High," in accordance with the following definitions:

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

- "**Low-to-Moderate**" – These sites include any former or current operations identified as large quantity hazardous waste generators. Also included in the category are locations where releases of hazardous materials or petroleum products have been reported, and remediation has been completed. 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 and/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 Study Area listed in the database search. Further assessment would be required if a "Moderate-to-High" priority site is affected by the selected alternative to determine the actual presence and/or levels of contamination, the contaminated medium and the need for mitigation/remediation. Actual physical assessment would not begin until the final selected alternative is defined.

Numerous sites were identified within the Study Area and used to screen the reasonable alternatives. A total of 50 sites were identified during the government database searches as being potentially impacted by the reasonable alternatives, except for the No-Build alternative, as depicted in Figures 2-4 and in Table 1 below.

Table 1 - Hazmat Database Sites Potentially Impacted By Reasonable Alternatives

Site No.	Name	Address	Status/Federal or State Program List	Priority*	Reasonable Alts. (RA) Potentially Impacted
MDNR E-Start Sites					
4	Executive Beechcraft	10 Richards Road	Former UST NFA Letter Issued Prior to 2004	2	CENTRAL, WEST, ADJACENT
6	Lightning Industries	801 Woodswether Road	Former UST NFA Letter Issued Prior to 2004	2	CENTRAL, WEST, ADJACENT
7	Sunshine Biscuit/Zea Chemical	1000-1100 W 8th Street	Long Term Stewardship	1	WEST
8	Pacific Tire & Service	501 W 6th Street	Former UST NFA Letter Issued Prior to 2004	2	CENTRAL, WEST, ADJACENT
9	Folgers Coffee Company	701 Broadway Street	Active Hazardous Substance Investigation & Cleanup Site/ Former UST NFA Letter Issued Prior to 2004	1	CENTRAL, WEST, ADJACENT
10	Hereford Building	12th & Jefferson	Former UST NFA Letter Issued Prior to 2004	2	CENTRAL, WEST, ADJACENT
EDR Sites					
E1	KCAD DOWNTOWN AIRPORT TANK FARM	1200 RICHARDS RD	RCRA-NLR, FINDS, ECHO, SPILLS	3	CENTRAL, WEST, ADJACENT
E2	CITY OF KC, MO AVIATION DEPT	834 RICHARDS RD	UST	2	CENTRAL, WEST, ADJACENT
E3	KANSAS CITY DEPT OF AVIATION	400 RICHARDS RD	FTTS, ERNS, HIST FTTS, FINDS, UST	2	CENTRAL, WEST, ADJACENT
E4	AIRPORT 66 SERVICE	128 RICHARDS RD	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E5	BNSF HANNIBAL BRIDGE	100 BROADWAY	FINDS, ECHO, RCRA-NLR, FINDS	3	CENTRAL, WEST, ADJACENT
E6	LAFARGE CONSTRUCTION	100 BROADWAY	FINDS	3	CENTRAL, WEST, ADJACENT
E7		600 BLOCK OF WOODSWETHER ROAD	SPILLS	3	CENTRAL, WEST, ADJACENT
E8		205 NORTH BROADWAY AVENUE	CDL, SPILLS	3	CENTRAL, WEST, ADJACENT
E9	MIDWEST TECO SALES INC/MORRIS REISMAN PROPERTY	500 4TH ST W	EDR GAS STATIONS, UST	2	CENTRAL, WEST, ADJACENT
E10	SHOSTAK METAL CORP.	303 BROADWAY	LEAD SMELTER 1, SEMS, FINDS	1	CENTRAL, WEST, ADJACENT
E11	CHECK MARK BUSINESS FORMS INC	404 WASHINGTON ST	RCRA-NLR, FINDS, ECHO	3	CENTRAL, WEST, ADJACENT
E12	CHEEP ANTIQUES	500 W 5TH ST	FINDS, RCRA-NLR, ECHO	2	CENTRAL, WEST, ADJACENT
E13		5TH AND WYANDOTTE ST	ERNS	3	CENTRAL, WEST, ADJACENT
E14	JAMES PAPPAS CLEANER	506 WYANDOTTE	EDR DRY CLEANERS	2	CENTRAL, WEST, ADJACENT
E15	HIGHWAY GARAGE	510 WYANDOTTE	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E16	COLONIAL PATTERNS, INC.	340 W. 5TH STREET	FINDS	3	CENTRAL, WEST, ADJACENT
E17	510 12 HIGHWAY GARAGE	512 WYANDOTTE	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E18	G G MOORE BOILER WORKS	520 5TH W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E19		5TH AND BROADWAY STREETS	SPILLS	3	CENTRAL, WEST, ADJACENT
E20		BROADWAY AVENUE AND FIFTH STREET	SPILLS	3	CENTRAL, WEST, ADJACENT
E21		I-70 WESTBOUND AT BROADWAY (NORTHWEST CORNER OF THE LOOP)	SPILLS	3	CENTRAL, WEST, ADJACENT
E22	DI REX SERVICE FILL STA	614 6TH STREET TRFY W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E23	501 11 MC CARTY R C SERVICE	511 6TH W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E24	SONIA TIRE & OIL CO/PACIFIC TIRE & SERVICE/GENERAL AUTO MART AUTO/INTERCITY 66 SERVICE	501 6TH W	EDR GAS STATIONS, RCRA-NLR, FINDS, ECHO, SPILLS, LUST, UST, RGA LUST	3	CENTRAL, WEST, ADJACENT
E25	FRASER ROBT E AUTO REPR	500 6TH W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E26	MC WILLIAMS AUTOMOTIVE SERVICE	435 6TH STREET TRFY E	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E27	NORTH SIDE BODY SHOP	431 6TH STREET TRFY E	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E28	DOWNTOWN TEXACO SERVICE	417 6TH ST TRFY W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E29	TURNER CLNS	411 6TH STREET TRFY E	EDR DRY CLEANERS	2	CENTRAL, WEST, ADJACENT

Table 1 - Hazmat Database Sites Potentially Impacted By Reasonable Alternatives

Site No.	Name	Address	Status/Federal or State Program List	Priority*	Reasonable Alts. (RA) Potentially Impacted
MDNR E-Start Sites					
E30	INTER CITY TIRE & OIL CO	322 6TH STREET TRFY W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E31	WILCOX OIL CO FILL STA	300 6TH STREET TRFY E	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E32	KERLS TEXACO SERVICE STA	212 6TH STREET TRFY W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E34	CONOCO #4	201 W 6TH STREET	UST	3	CENTRAL, WEST, ADJACENT
E35	B & B AUTO SUPPLY	215 6TH STREET TRFY E	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E36	FROGGE G W OIL CO GAS STA	201 6TH STREET TRFY W	EDR GAS STATIONS	2	CENTRAL, WEST, ADJACENT
E37	BRIGHT CONSTRUCTION INC. DBA DCM CONSTRUCTION	511 W 4TH STREET	FINDS	3	WEST, ADJACENT
E38		5TH STREET AND BEARDSLEY	CDL, SPILLS	3	WEST, ADJACENT
E39	ARNONE JOS FILL STA	600 WYANDOTTE	EDR GAS STATIONS	2	WEST, ADJACENT
E40	Zonolite	515 Madison Avenue	RCRA-NLR, SEMS	1	WEST
E41	Studer Container Site	520 Madison Avenue	RCRA-NLR, SEMS, LEAD SMELTERS, ICIS, FINDS, ECHO	1	WEST

* 1 = Moderate to High Probability of Contamination
2 = Low to Moderate Probability of Contamination
3 = None to Low Probability of Contamination

The potential impact of the reasonable alternatives on the “Moderate to High Probability” sites is discussed in Section 4.0. The other sites ranked as "Low-to-Moderate" and “None-to-Low” are not likely to have an impact upon the selection of one alternative over another. Therefore, no further consideration will be given to sites ranked as "Low-to-Moderate" and “None-to-Low” in this technical memorandum.

4.0 Potential Impacts

Hazardous waste sites located within the Project study area were inventoried and reviewed based on the results of a search of federal and state environmental databases, review of historical aerial photographs/topographic maps, and field reconnaissance. The inventory discussed in Section 3.0 includes a ranking of the sites to determine those with a “None-to-Low”, a “Low-to-Moderate”, or a “Moderate-to-High” potential for impact. This discussion provides an assessment of the “Moderate-to-High” ranked sites potentially impacted by the No Build and Reasonable Build Alternatives.

Minor variation of alignments during final design could avoid some of these sites however many of them could require further investigation to evaluate potential contamination of soils or groundwater. In addition, the possibility exists that additional sites with contamination may be encountered during actual construction, particularly given the large number and long history of commercial/industrial facilities in and near the Project study area. In the event contamination is encountered, MoDOT would develop an appropriate course of action and coordinate with the MDNR.

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 existing bridge and roadways would occur. There would be no widening of the bridge, no improvement of roadway or bridge profiles, no major rehabilitation, and no replacement of the existing bridge. The No-Build Alternative would not affect potentially hazardous waste sites.

Reasonable Build Alternatives

An assessment of the “Moderate-to-High” ranked sites for each of the Reasonable Build Alternatives is listed in Table 2.

Table 2: "Moderate-to-High" Rank Potentially Hazardous Waste Sites and Reasonable Alternatives

Site No.	Name	Address	Status/Federal or State Program List	Comments	Reasonable Alts. (RA) Potentially Impacted
7	Sunshine Biscuit/Zea Chemical	1000-1100 W 8th Street	Long Term Stewardship	This is a Long-Term Stewardship site that consists of two adjacent parcels, the former Sunshine Biscuit Bakery at 1100 West 8th and the Zea Chemical Building at 1000 West 8th. After a major fire in 1998 site assessments of the property revealed the existence of asbestos containing building debris, underground petroleum tanks with contaminated soil and groundwater. Remedial actions were taken to address the asbestos and petroleum contamination. The MDNR determined that the remedial actions taken were adequate to decrease the identified contamination to 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 managment of the stie. 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 Company	701 Broadway Street	Active Hazardous Substance Investigation & Cleanup Site/ Former UST NFA Letter Issued Prior to 2004	This property consists of two 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 as long as 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 that contains asbestos, lead paint, and groundwater contaminated with Light Non-Aqueous Phase Liquid (likely petroleum based). As a result an Environmental Covenant has been placed on this property.	CENTRAL, WEST, ADJACENT
E10	Shostak Metal Corp.	303 Broadway	Lead Smelter, SEMS, FINDS	This Superfund site was discovered in 2017 by the USEPA and is still undergoing a Preliminary Assessment by the USEPA. Additional information for this site is limited.	CENTRAL, WEST, ADJACENT
E40	Zonolite	515 Madison Avenue	RCRA-NLR, SEMS	This Superfund site was historically occupied by the Kansas City Terminal Railway who was a large quantity generator of hazardous waste. The site was discovered in 2000 by the USEPA, with a Preliminary Assessment conducted in 2001, based on USEPA'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 Avenue	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 a number of hazardous waste enforcement actions. The site was the subject of a USEPA assessment and removal action in 2012.	WEST

Regarding “Moderate-to-High” potentially hazardous waste sites, the Central and Adjacent Reasonable Alternatives would be preferred by only potentially impacting two “Moderate-to-High” sites (Folgers Coffee Company and Shostak Metal Corp.). The West Reasonable Alternative would potentially impact five sites.

In addition, these rankings hold for all sites combined (i.e., “Moderate-to-High”, “Low-to-Moderate”, and “None-to-Low” probability of contamination). In terms of total numbers of all sites combined the Central and Adjacent Reasonable Alternatives would potentially impact 42 sites and the West Reasonable Alternative would potentially impact 46 sites.

Mitigation

The preferred mitigation measures for these sites would be avoidance. However, if these sites could not be avoided, and contamination was 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.

5.0 References

City of Kansas City, Missouri, Missouri Department of Transportation, Mid-America Regional Council, *Beyond the Loop Planning and Environmental Linkages Study* (July 2018).

EDR, 2019. The EDR Area/Corridor Report; US 169 EA; Kansas City, MO 64116. EDR Inquiry Number: 5602525.5s; March 27, 2019.

Google Earth, 2019. Aerial Imagery – 1991, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, and 2018.

U.S. Geological Survey. Topographic Maps, Kansas City Quadrangle - 1894, 1935, 1940, 1948, 1957, 1964, 1970, 1975, 1991, and 1996.

Figures

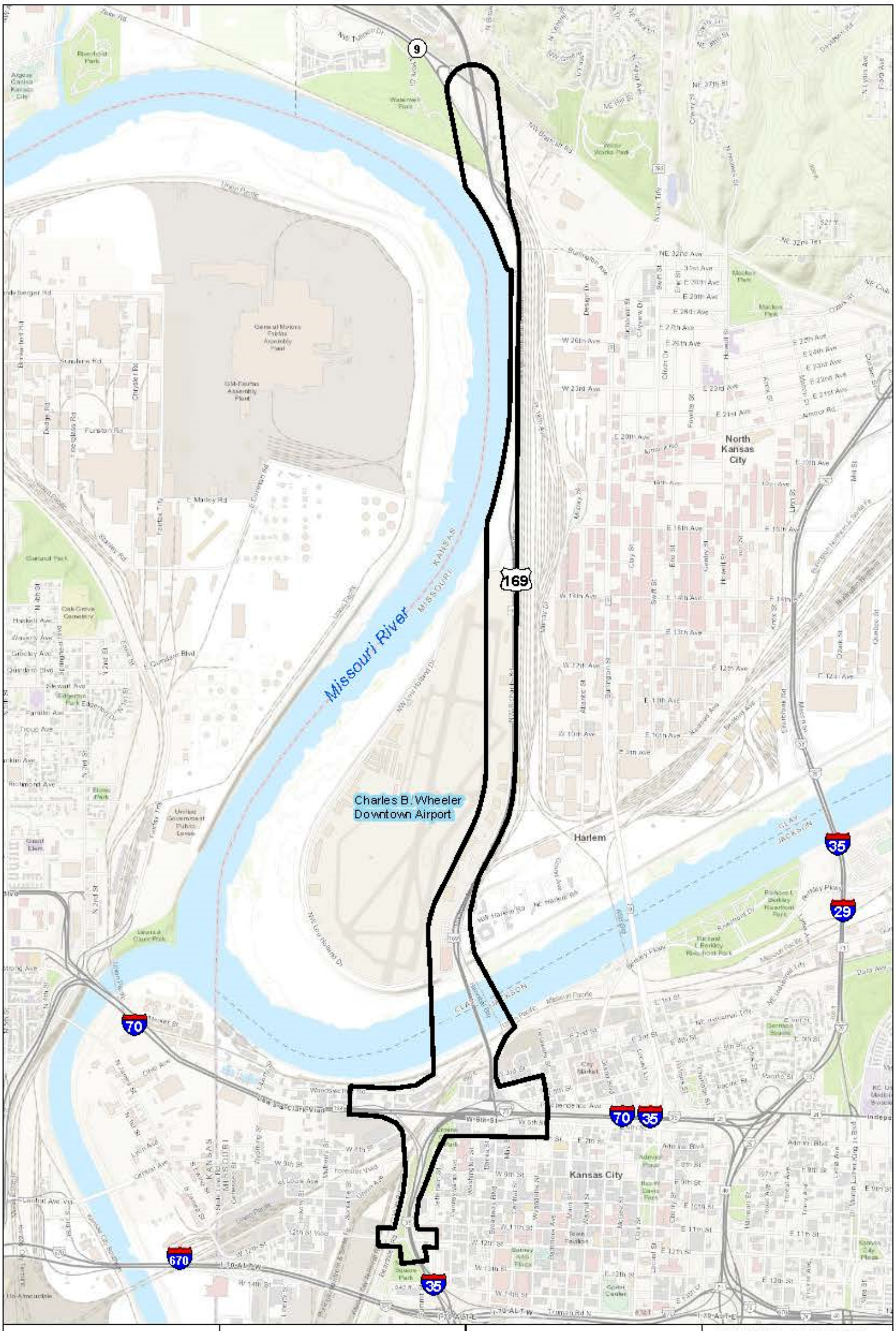


Figure 1: Study Area

Buck O'Neil Bridge
Project Hazmat Impacts
Assessment

10/2/19

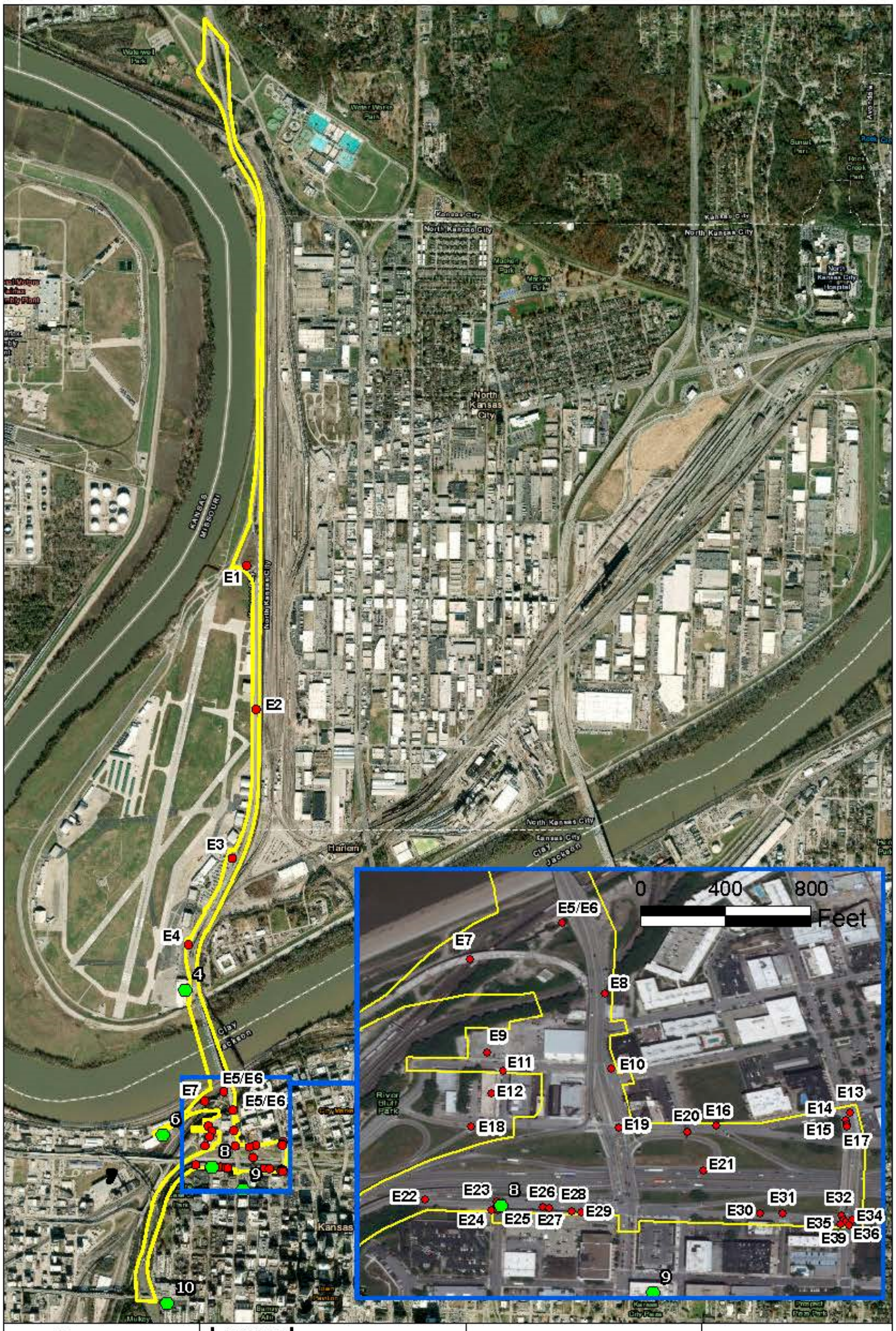
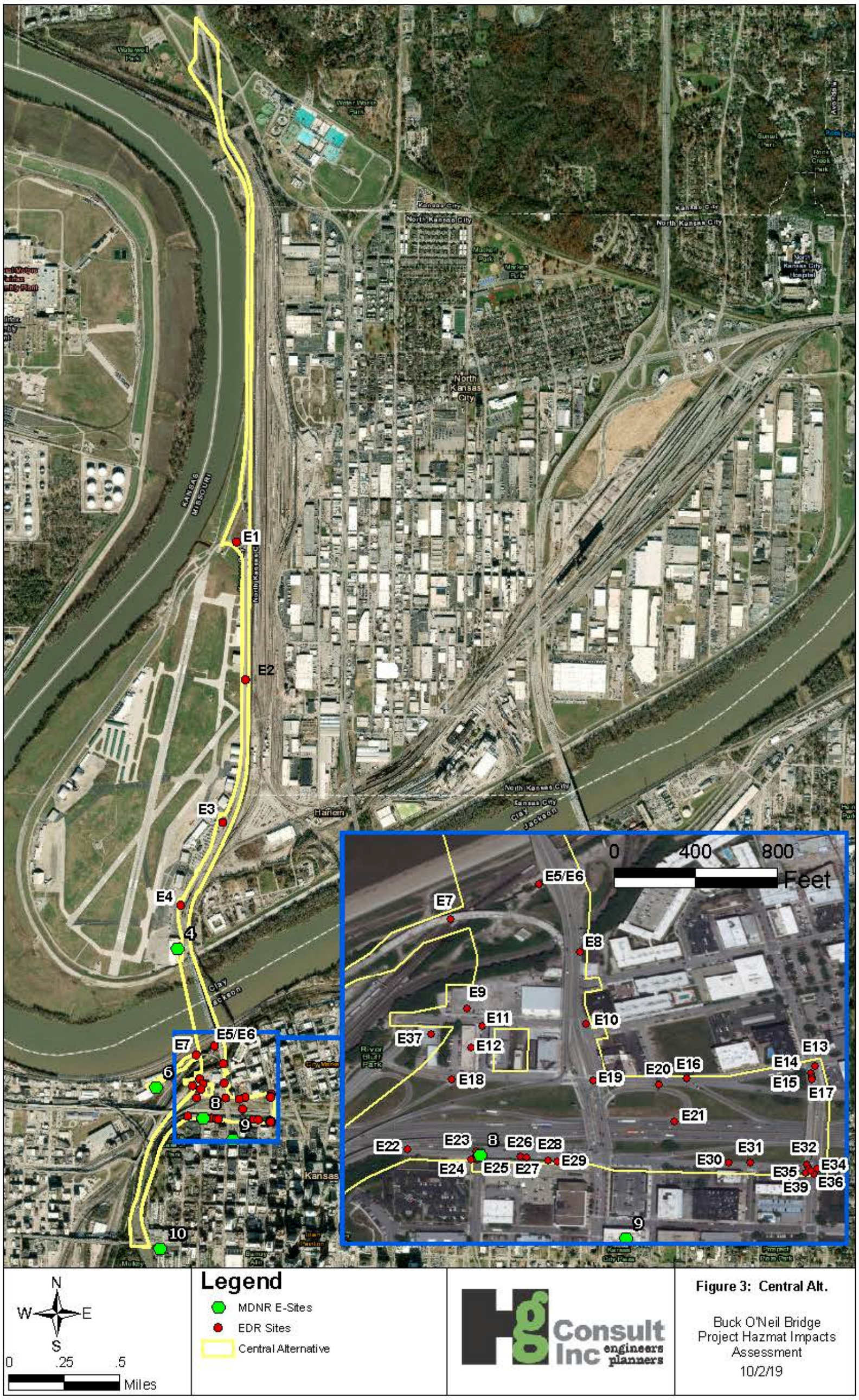


Figure 2: Adjacent Alt.

Buck O'Neil Bridge
Project Hazmat Impacts
Assessment
10/2/19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Legend
MDNR E-Sites
EDR Sites
Central Alternative
Consult Inc engineers planners
Figure 3: Central Alt.
Buck O'Neil Bridge
Project Hazmat Impacts
Assessment
10/2/19

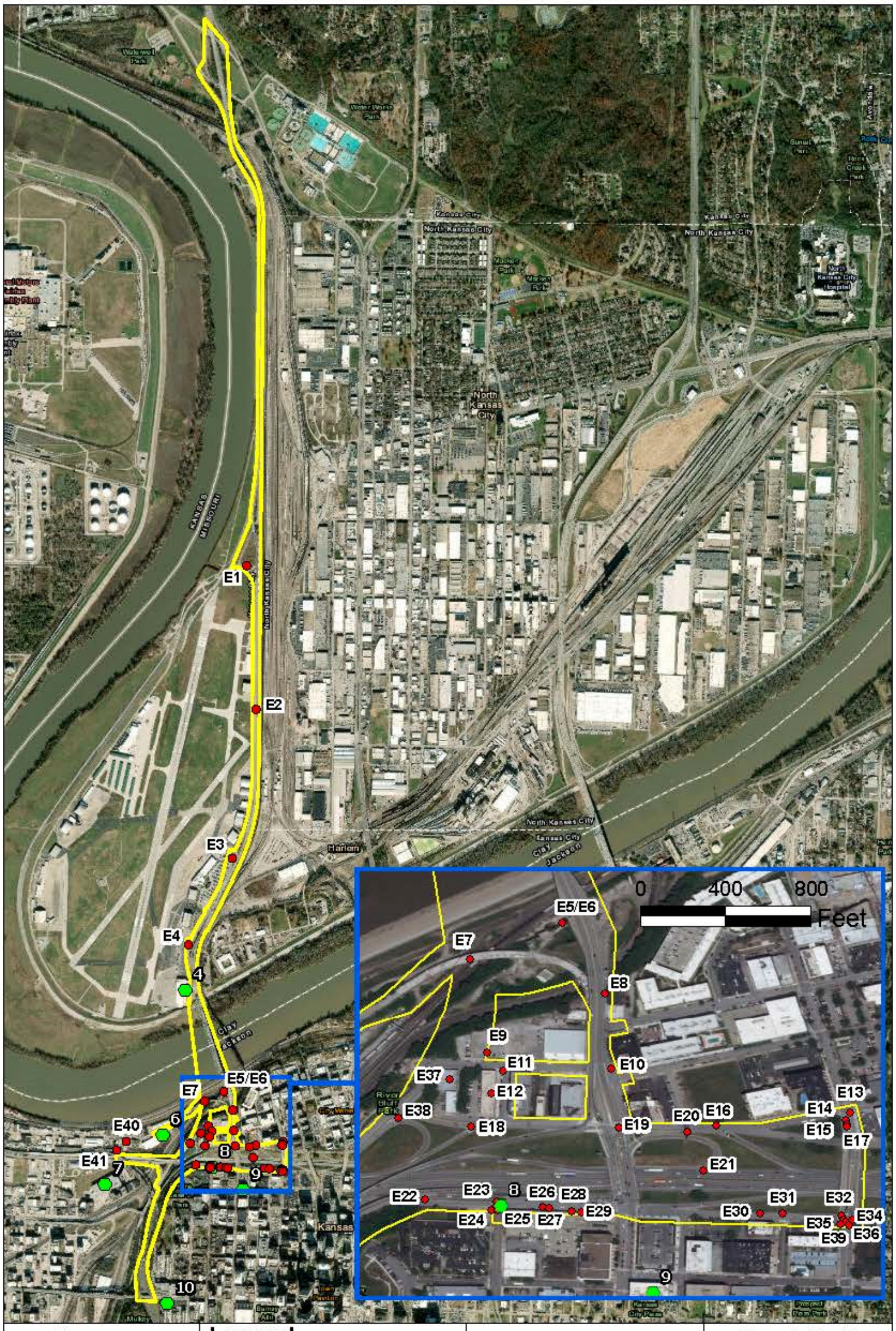

Figure 4: West Alt.

Buck O'Neil Bridge Project
Hazmat Impacts Assessment
10/2/19

Appendices can be provided in either hardcopy or electronically.

US 169 EA
US 169 EA
Kansas City, MO 64116

Inquiry Number: 5602525.5s
March 27, 2019

Available upon request

EDR Area / Corridor Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

APPENDIX F – SECTION 106

SHPO Concurrence on Effects Determinations	January 27, 2020
MoDOT Distribution of Effects Assessment to Consulting Parties for Review	December 30, 2019
Programmatic Agreement (PA) (DRAFT 5)	December 30, 2019
Information to Accompany the PA (DRAFT 2)	December 30, 2019
Section 106 Effects Assessment – AVAILABLE UPON REQUEST	December 19, 2019
MoDOT Email to Consulting Parties, PA for Review and Comment	October 16, 2019
MoDOT Email to Consulting Parties, Consultation Update	October 8, 2019
Mitigation Measures Updates, MoDOT to SHPO	October 8, 2019
SHPO Determinations of Eligibility Concurrence	October 4, 2019
MoDOT Email to Consulting Parties, Mitigation Idea Prioritization	September 11, 2019
Cultural Resources Summary - – AVAILABLE UPON REQUEST	September 6, 2019
MoDOT Email to Consulting Parties, Mitigation Brainstorming	August 28, 2019
Consulting Parties Meeting #3 (CP#3) Information Packet	August 27, 2019
MoDOT Email to SHPO, Additional Bridge Information	August 21, 2019
SHPO Comments on Cultural Resources Summary Report (Draft 1)	August 21, 2019
MoDOT Email to Consulting Parties, CP#3 Meeting Materials	August 20, 2019
MoDOT Email to Consulting Parties Regarding August Online Public Meeting	August 15, 2019
Consulting Parties Meeting #2 (CP#2) Information Packet	August 8, 2019
Consulting Parties Meeting #1 (CP#1) Information Packet	June 10, 2019
ACHP Acceptance of FHWA's Invitation to Consult	May 30, 2019
FHWA Invitation to ACHP to Consult	May 14, 2019
SHPO Assigned Project Number	December 5, 2018
Miami Tribe of Oklahoma Letter	November 14, 2018
MoDOT Response Email to Miami Tribe of Oklahoma THPO (Hunter)	November 14, 2018
Miami Tribe of Oklahoma THPO Response (Hunter);	November 14, 2018
MoDOT Invitation to Agencies to Participate in Consultation / Consulting Parties List	November 8, 2018
Ponca THPO Email Response	September 18, 2018
Tribal Coordination Email, FHWA	September 18, 2018

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

JAN 2 7 2020

Mr. Michael Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65102

Re: **SHPO Project Number 039-MLT-18** – Route 169, John J. "Buck" O'Neil Bridge, Job No. J4S3085, Clay and Jackson Counties, Missouri (FHWA)

Dear Mr. Meinkoth:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the Section 106 non-archaeological resources report entitled *Section 106 Effects Assessments for the US 169-Buck O'Neil Bridge Improvement Project, MoDOT Job No. 4S3085*. Based on this review it is evident that a thorough and adequate cultural resources survey has been conducted of the project area. We concur with your recommendation that the removal of the John J. "Buck" O'Neil Bridge (MoDOT Bridge No. A4649) and the Harlem Road Overpass (MoDOT Bridge No. A4647 and A4648), which have been determined eligible for the National Register of Historic Places (NRHP), will result in **an adverse effect** to these historic properties. We further concur that the proposed project alternatives will have **no effect or no adverse effect on the remaining NRHP-listed or eligible resources** within the project area.

Our office looks forward to continuing consultation with your office as plans for the project and Section 106 Programmatic Agreement are developed. If you have any questions, please write the State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102, attention Review and Compliance, or call Kelsey Matson at (573) 522-4641.

Recycled paper

Please be sure to include the SHPO Log Number (**039-MLT-18**) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Mike Sutherland
Acting Division Director, Missouri State Parks and
Deputy Missouri State Historic Preservation Officer

TMP:km

c. Ms. Raegan Ball, FHWA
Mr. Taylor Peters, FHWA

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

WHEREAS, the Federal Highway Administration (FHWA) Missouri Division is the federal agency responsible for ensuring the undertaking complies with Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. § 306108) codified in its implementing regulations 36 CFR Part 800, *Protection of Historic Properties*; and

WHEREAS, the duties of the Missouri State Historic Preservation Office (SHPO) pursuant Section 106 of the NHPA and 36 CFR Part 800 include responsibilities to advise, assist, review, and consult with Federal agencies as they carry out their historic preservation responsibilities and to respond to Federal agencies' requests within a specified period of time; and

WHEREAS, the Missouri Highways and Transportation Commission (MHTC) is the board that governs MoDOT, appoints the Director and authorizes the Statewide Transportation Improvement Program; and

WHEREAS, the FHWA and the Missouri Department of Transportation (MoDOT) are conducting an Environmental Assessment (EA) under the National Environmental Policy Act, as amended (NEPA) (42 U. S. C. § 4371 *et. seq*.) to determine the preferred alternate for Improvements to U. S. Highway 169 (US 169) Corridor from Missouri Route 9 to Interstate 35 (I-35), including phasing of said improvements (US-169/Buck O'Neil Bridge Environmental Study) which will be constructed as a Design-Build project; the improvements described in the EA are the subject of this Programmatic Agreement (PA) ; and

WHEREAS, the MoDOT has funding from a Better Utilizing Investments to Leverage Development (BUILD) grant, funded by the FHWA pursuant to the Fixing America's Surface Transportation (FAST) Act (PL 114-94) to improve the Missouri River crossing on US 169 and the EA includes four options for connections between US 169 to I-35, as part of the US 169 corridor improvements; and

WHEREAS, the FHWA and MoDOT have elected to phase the identification and evaluation of archaeological historic properties as provided in 36 CFR Part 800.4(b)(2) and using the Missouri Programmatic Agreement for the Phased Identification and Evaluation of Historic Properties (Phased 106 PA) executed on July 24, 2014 and amended on June 12, 2015 and August 1, 2019. FHWA will ensure that MoDOT completes the process in a timely manner, to allow practical

opportunities to avoid or minimize adverse effects to historic properties, as stipulated under this agreement; and

WHEREAS, the MoDOT, acting on behalf of the FHWA, has refined the undertaking's area of potential effects (APE), as defined at 36 CFR Part 800.16(d), from a project study area for background research for archaeological and built environment resources. The APE was refined for built environment resources to encompass the combined reasonable alternatives identified in the EA, which include the new right of way, including 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 (see Attachment 1 for description and map); and

WHEREAS, the FHWA has determined that the Old Town Historic District (resources OT-4, OT-6, OT-13 and OT-14), the Wholesale (Garment) Historic District (resources WD-1-3 and WD5-10) and the Richards-Conover Hardware Company Building (resource OT-6) are listed on the National Register of Historic Places (National Register) (criteria and areas of significance for all historic properties are described in the technical report[1]) and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the properties at 114-118 W. 5th Street (resource OT-3) and 120-122 W. 5th Street (resource OT-5) are eligible for listing on the National Register as a boundary expansion of the Old Town Historic District and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the Santa Fe Pumping Plant (resource WW-17), the Colonial Patters Company Building (resource OT-7), the Broadway "John J. 'Buck' O'Neil" Bridge (resource OT-20, bridge number A4649), the Second Hannibal Bridge (resource OT-21), the Thorn, Hunkins & Company Warehouse Building (resource WB-1), the 12th Street Trafficway Viaduct (resource WB-3, bridge number S030B11), the 8th Street Tunnel (resource QH-4), the Harlem Road Overpass (resource HDA-1, bridge numbers A4647 and A4648), the Kansas City, Missouri Water Intake Plan (resource HDA-3), the Transcontinental and Western Airlines Terminal (T&WA) (resource HDA-5) and the Municipal Airport Terminal Facility (resource HDA-6) are individually eligible for listing on the National Register and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the proposed improvements to Route 169 could have a direct adverse effect upon the John J. "Buck" O'Neil Bridge (A4649) and the Harlem Road Overpass (A4647 and A4648), properties eligible for inclusion on the National Register under criteria A and C for significance in transportation and engineering; and has consulted with the SHPO pursuant to 36 CFR Part 800, *Protection of Historic Properties*, regulations

[1] Burns & McDonnell, *Cultural Resources Summary within the US-169/Buck O'Neil Bridge Environmental Study Area, Jackson and Clay Counties, Missouri, MoDOT Job No. J4S3085*, 2019; available from the Missouri Department of Transportation, Historic Preservation Section, Jefferson City, Missouri.

implementing Section 106 of the NHPA (54 U.S.C. § 306108) (see Attachment 2 for effects by alternate table), as amended; and

WHEREAS, the FHWA has determined that the proposed improvements to US 169 could have an indirect effect, either adverse or no adverse, to the Colonial Pattern Company (resource OT-7), the Second Hannibal Bridge (resource OT-21), the Transcontinental & Western Airlines Building (resource HDA-5) and the Municipal Airport Terminal Facility (resource HDA-6), the effect of which may not be known until design has progressed; and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the proposed improvements to US 169 will have no adverse effect upon the Old Town Historic District, the Wholesale (Garment) Historic District or the Richards and Conover Hardware Company Building, properties listed on the National Register and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the proposed improvements to US 169 will have no adverse effect upon the proposed boundary expansion to the Old Town Historic District, the Santa Fe Pumping Plant, the Thorn, Hunkins & Company Warehouse, the 12th Street Trafficway Viaduct, and the Kansas City, Missouri Water Intake Plant, properties eligible for inclusion on the National Register and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the effects to the Eighth Street Tunnel cannot be determined until further into the design process, when impacts into the tunnel can be identified and evaluated; and

WHEREAS, MoDOT's noise barrier policy can be found in the *Engineering Policy Guide* in Section 127.13: Noise; and

WHEREAS, historic properties may be eligible for the construction of a noise barrier to reduce noise levels as benefited receptors, and the Section 106 effects related to the construction of a noise barrier have not been determined; and

WHEREAS, the FHWA has notified the Advisory Council on Historic Preservation (Council) of the project and its potential to have multiple adverse effects on historic properties on May 14, 2019 and invited the Council to participate in consultation and the Council accepted the invitation to participate in consultation and the development of this PA on May 30, 2019 (see Attachment 3 for consultation process to date); and

WHEREAS, the Missouri Highways and Transportation Commission (MHTC), acting by and through MoDOT, has been invited to participate in the preparation of and be a signatory to this PA; and

WHEREAS, the City of Kansas City, Missouri has been invited to participate in the preparation of and be a signatory to this PA. The City has participated in consultation but declined to be a signatory to the PA; and

WHEREAS, the FHWA recognizes that the Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Kaw Indian Nation of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, Ponca Tribe of Nebraska, Ponca Tribe of Oklahoma, Sac and Fox Tribe of the Missouri in Kansas and Nebraska, Sac and Fox Tribe of the Mississippi in Iowa, Sac and Fox Nation of Oklahoma and the Wyandotte Nation have an interest in the undertaking area, and has consulted with them on a government-to-government basis (September 18, 2018); and,

WHEREAS, the Miami Tribe of Oklahoma accepted the invitation to participate in consultation (November 14, 2018); and

WHEREAS, the Aviation History Museum, Clay County, the Downtown Neighborhood Association, the Historic Bridge Foundation, the Historic Kansas City Foundation, historicbridges.org, Jackson County, the Kansas City Landmarks Commission, Missouri Preservation, the Midwest Regional Office of the National Trust for Historic Preservation, the River Market Community Association, and the TWA Museum have been notified of undertaking and have been invited to participate in consultation (November 8, 2018); and

WHEREAS, the Kansas City Landmarks Commission and the Downtown Neighborhood Association accepted the invitation to participate in consultation; and

WHEREAS, FHWA and MoDOT have afforded and will continue to afford the public an opportunity to comment on the effects of the project undertaking on historic properties through the NEPA process and in accordance with the MoDOT *Engineering Policy Guide*, Chapter 129: Public Involvement; and

WHEREAS, a public meeting was held on February 12, 2019, and information about the Environmental Assessment with information on the potential to effect historic properties made available to the public; and

WHEREAS, an on-line public meeting was held between August 15, 2019, and September 6, 2019, about the revised Purpose and Need and the refined alternatives. The meeting included a survey in which the public could answer questions and submit general comments, including any comments about historic property concerns; and

WHEREAS, no comments about potential effects on historic properties have been received from the public as a result of the public meetings; and

WHEREAS, to the best of the FHWA's knowledge and belief, no human remains, associated or unassociated funerary objects or sacred objects, or objects of cultural patrimony as defined in the

Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. § 3001), are expected to be encountered; and

NOW, THEREFORE, the FHWA and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

FHWA, with the assistance of MoDOT, shall ensure that the following measures are carried out:

1. **EVALUATION OF EFFECTS BASED ON DESIGN-BUILD CONCEPT**
   A. MoDOT and/or its contractor shall retain a professional who meets the *SOI Standards* in Architectural History to confirm that the design is within the area identified as the project APE and included within the surveys. If the property is located outside the previously identified APE, the Phased Identification and Evaluation of Historic Properties Programmatic Agreement[2], and the processes outlined in Stipulation 1, below, shall be employed for those properties to ensure Section 106 compliance.
      1) If the property was not included within the APE, MoDOT and/or its contractor shall consult with FHWA and the SHPO about an appropriate APE.
      2) MoDOT, and/or its contractor, shall conduct built environment and archaeological surveys, consistent with SHPO and MoDOT standards[3].
      3) The SHPO and consulting parties shall be provided a copy of the survey results and shall be given thirty (30) days to review and comment on the results.
      4) If there is disagreement about the finding, FHWA and MoDOT will consult with the parties to resolve the disagreement, per Stipulation 12, Dispute Resolution.
      5) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.
      6) If there is an adverse effect finding, MoDOT and/or its contractor, shall provide FHWA with information to notify the Council of the adverse effect
      7) FHWA and MoDOT shall consult with SHPO and the other consulting parties to resolve the adverse effect, per Stipulation 1.E.
   B. MoDOT and/or its contractor shall confirm that the effects findings made for archaeological and built environment resources during the NEPA process remain valid during the design/build process.
   C. FHWA shall continue consultation with interested Indian Tribes.
   D. 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.

[2] Programmatic Agreement among FHWA, MHTC, MoSHPO and ACHP for the Phased Identification and Evaluation of Historic Properties, executed June 12, 2015 and extended August 1, 2019.
[3] State Historic Preservation Office, *Guidelines for Phase I Archaeological Surveys and Reports*, https://dnr.mo.gov/shpo/docs/MO_phase1_guide.pdf.
Missouri Department of Transportation, *Built Environment Resource Methods*, 2018.

1) SHPO and the consulting parties will have thirty (30) days to review the information and provide comments.
2) If there is disagreement about the finding, FHWA and MoDOT will consult with the parties to resolve the disagreement.
3) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.

E. FHWA and MoDOT shall consult with the SHPO and consulting parties to resolve any adverse effects.
1) Consultation shall include ways to avoid or minimize adverse effects.
2) If adverse effects cannot be avoided, consultation shall decide which of the mitigation measures, as described in Stipulations 3 and 4, below, are appropriate to mitigate the severity of the effect and the resource.
3) Consultation shall consist of an in-person or teleconference meeting, or e-mail exchange about the historic resource and the project effects upon it, and proposed mitigation measures as described in Stipulations 3 and 4 below.
4) Following the meeting, MoDOT shall send a letter to the consulting parties summarizing the results of the consultation; specifying the proposed mitigation measures for the historic property.
5) Consulting parties shall have thirty (30) days to respond with concurrence letter. If consulting parties fail to respond within thirty (30) days, concurrence can be assumed.
6) This agreement will be legally binding and fulfill the requirements to resolve adverse effects under 36 CFR 800.6.

2. **EIGHTH STREET TUNNEL**

A. Prior to design, additional survey work to determine the limits of the Eighth Street Tunnel and its location on the bluff shall be conducted. The survey shall include work to determine impacts previous I-35 construction and the effects capping the west portal had on the historic integrity of the tunnel.
1) SHPO and other consulting parties will be provided a copy of the additional research and the effects assessment for review.
2) SHPO and other consulting parties shall have thirty (30) days to review the effects assessment and provide comments.
3) If there is disagreement about the effects finding, FHWA and MoDOT shall consult with the parties to resolve the disagreement.
4) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.

B. If the project will have no effect or no adverse effect on the Eighth Street Tunnel, it's location will be marked on plans and it will be marked as "Do Not Disturb".

C. If the project will have an adverse effect, FHWA and MoDOT will consult with SHPO and the consulting parties to resolve the adverse effects per 36 CFR 800.6 and Stipulation 1.E above to identify appropriate mitigation measures, as outlined in Stipulation 3 and 4 below, for the effects of the project on the tunnel. At a minimum, the mitigation measures will include:

1) If the tunnel is uncapped, and non-historic material is removed exposing the tunnel shaft, photographs, to National Register standards, will be taken of the portal and areas that will be directly affected.
2) A plan to ensure that the stability of the tunnel is not undermined by highway construction will be developed.

3. **BRIDGE AND STRUCTURE MITIGATION MEASURES**

If the project has an adverse effect on bridges or other structures, the mitigation measures below were developed during the consultation process. The mitigation should be commensurate with the effect on the historic property and the significance of the property. The procedures outlined in Stipulation 1.E to resolve adverse effects will be utilized.

A. BRIDGE MARKETING

1) The John J. "Buck" O'Neil Bridge (A4649) Bridge is being marketed as available for reuse in accordance with the Missouri *Bridge Marketing Plan* through December 31, 2019.
2) If proposals for the reuse of the John J. "Buck" O'Neil Bridge (A4649) are received as a result of the historic bridge marketing, such proposals shall be reviewed by FHWA, SHPO, MoDOT and consulting parties in accordance with the Missouri *Bridge Marketing Plan*.
   a. Consulting parties shall be given thirty (30) days to review proposals received and to comment on the appropriateness of any proposals.
3) If an appropriate proposal is received, MoDOT shall negotiate to develop a mutually acceptable transfer agreement.

B. ARCHIVAL DOCUMENTATION

The MHTC, acting by and through MoDOT, shall develop archival documentation to the following specifications. Work shall be done by MoDOT staff or by consultants meeting the *SOI Standards* for History and/or Architectural History:

1) Prepare historical documentation to Level I standards of the *Levels of Bridge Documentation (State Level) For Section 106 Mitigation of Adverse Effect* (Documentation Standards) for the John J. "Buck" O'Neil Bridge (A4649) and the Harlem Road Overpass (A4647 and A4648).
2) Prior to letting the undertaking, MoDOT shall take archival photographs of the bridge.
   a. Take archival photographs, consistent with the National Register standards, with sufficient coverage to provide overall views of the bridge and significant details of the bridge.
   b. Prior to letting and the production of archival prints, consult with the SHPO regarding the adequacy of coverage for the bridge and the selection of images.
   c. Print photographs in size consistent with Documentation Standard Level.
   d. Print and label photographs in a manner consistent with National Register standards.
   e. Photographs shall be keyed to a site plan, map and/or bridge plans.

f. Provide original photographs and digital images (black and white .tiff images and color .jpeg images) on archival discs to the SHPO and MoDOT; both agencies will maintain original photographs and digital images.

3) Original construction plans shall be provided as part of the documentation in paper and digital format (.pdf), if available.

4) A report consisting of the historical documentation, photo log, photo key map, photo plates of the archival photographs and construction plans shall be provided to the SHPO, the Kansas City Public Library (Missouri Valley Room and Special Collections Department), and the North Kansas City Public Library in paper and digital (.pdf) formats. The report shall also be retained by MoDOT and will be made available on MoDOT's web-site.

C. INTERPRETATION

1) Interpretive Panel

a. MoDOT, or its consultant, shall develop an interpretive panel on the history and engineering of the John J. "Buck" O'Neil Bridge and Harlem Road Overpass. The interpretive panel shall be located along the Riverfront Heritage Trail or another suitable location overlooking the bridge location. If other engineering works or visual effects are also mitigated by the interpretive panel, MoDOT shall consult with the consulting parties about the themes the panel will discuss.

b. Prior to the fabrication of the interpretive panel, the consulting parties shall be provided an opportunity to review and comment on the content and proposed location of the panel for thirty (30) days.

c. Comments shall be addressed or, if there is disagreement, consultation to resolve the comments shall be conducted by MoDOT.

2) Traveling Exhibit

a. MoDOT, or its consultant, shall develop a traveling exhibit on the history and engineering of the John J. "Buck" O'Neil Bridge and the Harlem Road Overpass.

b. The traveling exhibit shall be made available to local libraries, historical societies, museums or other groups for display.

c. MoDOT shall work to find a locally based repository to take ownership of the traveling exhibit and to manage its use.

d. Prior to the fabrication of the traveling exhibit, consulting parties shall be provided an opportunity to review and comment on the content for thirty (30) days.

e. Comments shall be addressed, or if there is disagreement, consultation to resolve the comments shall be conducted by MoDOT.

3) Story Maps

a. MoDOT, or its consultant, shall develop a Story Map on major river crossings in the Kansas City area.

b. MoDOT shall work to find a locally based repository to host the content.

c. Prior to publication of the Story Maps, consulting parties shall be provided an opportunity to review and comment on the content for thirty (30) days.

d. Comments shall be addressed, or if there is disagreement, consultation to resolve the comments shall be conducted by MoDOT.

D. SCIENCE CITY

1) MoDOT shall work with Science City, to determine the feasibility of expanding existing programs or exhibits on transportation in the Kansas City area with additional information on the John J. "Buck" O'Neil Bridge. If Science City does not wish to pursue this, no further action is required by MoDOT and FHWA.
2) If Science City is interested in expanding such programs or exhibits, MoDOT shall consult with Science City, FHWA and SHPO to determine the scope and scale of information to be provided.
~~2)~~3) MoDOT and FHWA shall have final say on the scope and scale of appropriate mitigation measures.
~~3)~~4) MoDOT shall inform the other consulting parties of the results of the consultation and the nature of the programs that will be developed.
~~4)~~5) MoDOT and/or shall provide the relevant information based on the results of the consultation.

4. **ARCHITECTURAL RESOURCES**

If project effects to National Register eligible architectural resources change, FHWA and MoDOT will consult about project effects with the consulting parties, pursuant to 36 CFR 800.5. Efforts will be made to avoid adverse effects.

A. Mitigation Measures

If adverse effects cannot be avoided, FHWA and MoDOT shall work with consulting parties to identify appropriate mitigation based on the severity of the effect and the resource. Consulting parties have identified potential mitigation measures for architectural resources including:

1) Developing historical documentation for the property including property history, description and archival photographs, as appropriate for the property and project effects on it, level of detail decided through further consultation (see Attachment 4 for Mitigation Standards).
2) Installing an interpretive panel at the bluff park to interpret the changes in the riverfront area over time
3) Develop a traveling exhibit on changes in the downtown area
4) Develop an interpretive exhibit on the history of the downtown airport
5) Develop interpretation that focuses on history of transportation in area: First Hannibal Bridge, Airport, Second Hannibal Bridge, vehicular traffic on railroad bridge, Broadway Bridge (Buck O'Neil Bridge)
6) Use Story Maps to tell story of change in downtown area
7) Work with Port Authority or River Market to develop walking tours of area
8) Complete National Register nominations for adjacent properties
9) Develop a historic context for the area—include the Jefferson Highway

B. Accidental Damage During Construction

1) If, during construction, there is accidental damage to a NRHP eligible or listed ("historic") architectural resource:
   a. The contractor shall immediately stop all work in the area of the historic property and shall not resume without specific authorization from a MoDOT Historic Preservation (MoDOT HP) Specialist.

b. The contractor shall notify the MoDOT Resident Engineer or Construction Inspector, who shall contact MoDOT HP within 24 hours of the accidental damage;
c. MoDOT HP shall contact FHWA and SHPO within 48 hours learning of the accidental damage to report it, after a preliminary evaluation of the damage has been conducted;
d. If it is determined that the damage will constitute an adverse effect, MoDOT HP will immediately notify FHWA and SHPO of the finding and provide recommendations to minimize and mitigate the adverse effect.
e. FHWA will notify the Council and consulting parties within 48 hours of this determination.
f. FHWA shall take into account Council and consulting party recommendations regarding the eligibility of the property and proposed actions, and direct MoDOT to carry out the appropriate actions.
g. MoDOT will provide FHWA and SHPO with a report of the actions when they are complete.
h. FHWA will provide this report to the Council and consulting parties.

2) If possible, the contractor shall restore the damage to its previous condition, following the SOI *Standards for Rehabilitation* (36 CFR Part 68.3(b)).
   a. The contractor shall document the damaged property by photographs before work begins. Copies of the before photographs shall be provided to the SHPO and MoDOT HP.
   b. The contractor shall prepare a scope of work for review by the property owner, MoDOT HP and the SHPO.
   c. MoDOT HP and SHPO shall provide comments on the scope of work within thirty (30) days of receipt. Review shall focus on how well the scope restores the damage and is in keeping with the SOI Standards for Rehabilitation.
   d. Photographs showing the work after completion will be taken and sent to MoDOT HP and the SHPO.
3) If the damage cannot be restored to its previous condition, FHWA, MoDOT, SHPO, the contractor and the affected property owner shall consult about appropriate repairs to the property.
   a. The contractor shall document the damaged property by photographs before work begins.
   b. The contractor shall prepare a scope of work of items agreed on during consultation.
   c. The scope of work shall be made available to the property owner, FHWA, MoDOT and SHPO for review for thirty (30) days to ensure that it accurately reflects the results of the consultation.
   d. The contractor shall document the property by photographs after work is done.
   e. The photographs of the before and after work will be sent to MoDOT HP and the SHPO.
   f. FHWA and MoDOT will consult with SHPO and the other consulting parties about what additional mitigation measures are appropriate to resolve adverse

effects under Section 106, for the property, from those identified in Stipulation 4.A. Consultation about the mitigation measures for each specific property will be formalized following Stipulation 1.E.

5. **NOISE BARRIERS**
   A. If the noise study identifies that noise barriers are beneficial and that they meet the standards for feasibility and reasonableness (as defined in Section 127.13 of the *Engineering Policy Guide*), benefitted property owners and residents will be balloted to determine if the majority of benefited receptors approve of a noise barrier (per *Engineering Policy Guide*, Section 127.13.12.2.9).
   B. If noise barriers are approved by benefitted receptors adjacent to parcels containing properties eligible for listing on the National Register, MoDOT, on behalf of FHWA, shall evaluate the effects of the noise barrier on the character defining features of the historic property per 36 CFR 800.5.
      1) SHPO and other consulting parties will be provided a copy of the effects assessment for review.
      2) SHPO and other consulting parties shall have thirty (30) days to review the effects assessment and provide comments.
      3) If there is disagreement about the effects finding, FHWA and MoDOT shall consult with the parties to resolve the disagreement.
      4) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.
      5) Effects of noise barriers near historic properties may be minimized by use of aesthetic treatments.
      6) If adverse effects cannot be minimized, measures to resolve adverse effect shall be utilized per Stipulation 1.E.

6. **RIGHT OF WAY: UNECONOMIC REMNANTS AND DISPOSAL OF EXCESS**
   A. During right of way acquisition, MoDOT may find it necessary to purchase uneconomic remnants of parcels.
   B. These remnant-parcels will be surveyed by professionals meeting the *SOI Standards* for Archaeology and/or Architectural History for architectural and archaeological resources to determine if there are any National Register eligible resources.
   C. The survey shall be completed prior to the disposal of any excess right of way.
      1) Results of the survey shall be provided to SHPO and any relevant consulting parties for review.
      2) SHPO and other consulting parties shall have thirty (30) days to review survey results and provide comments.
   D. MoDOT will not dispose of any National Register eligible resources without seeking organizations willing to accept covenants to protect character defining features.
      1) Content of the covenant shall be negotiated between MoDOT, SHPO and the organization accepting the covenant.
      2) If MoDOT cannot find an organization willing to accept a covenant for a property, MoDOT will consult with FHWA, SHPO and other consulting

parties regarding appropriate mitigation measures, per Stipulation 1.E, to resolve the adverse effect, prior to the transfer.

7. **ARCHAEOLOGICAL SURVEY**

The FHWA, with MoDOT's assistance, will ensure that the following stipulations are carried out prior to taking any action that could adversely affect a National Register eligible archaeological property:

A. FHWA, with MoDOT's assistance, shall consult with the SHPO to review existing information on archaeological resources within the APE and seek appropriate information from consulting parties, other individuals, and organizations likely to have knowledge of, or concerns with, cultural resources in the area. If sites of Native American origin are encountered, this consultation shall include Indian Tribes who have indicated their interest in consulting on FHWA-funded undertakings in the county(s) where the specific project is located.
B. FHWA shall ensure that an adequate archaeological survey is conducted for the direct effects APE. Archaeological investigations will be conducted to identify and evaluate archaeological sites, assess the effects of the proposed undertaking on National Register eligible archaeological sites, and develop means to avoid, minimize or mitigate any adverse effects of the project on National Register eligible archaeological sites.
C. The FHWA, with MoDOT's assistance, shall apply the National Register Criteria for Evaluation (36 CFR Part 63), in consultation with the SHPO, appropriate Indian Tribes, and other interested parties, and guided by the Secretary's Standards and Guidelines for Evaluation, to evaluate the National Register eligibility of identified archaeological sites.
D. FHWA, with MoDOT's assistance, shall consult with the SHPO, appropriate Indian Tribes, and other interested parties, regarding evaluation of adverse effects on archaeological resources identified as eligible for the National Register, and to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate the projects adverse effects on archaeological sites eligible for the National Register.
E. If project activities are found to have adverse effects on archaeological sites eligible for the National Register, the FHWA shall consult with the SHPO, appropriate Indian Tribes and other interested parties to resolve the adverse effects, consistent with guidance provided in 36 CFR Part 800.6, through the implementation of an Archaeological Data Recovery Plan(s) developed in accordance with the Council's "Recommended Approach for Consultation on the Recovery of Significant Information from Archaeological Sites" (64 FR 27085-87 published in the *Federal Register* on May 18, 1999), the Council's Handbook on Treatment of Archaeological Properties, and the SOI *Standards for Archaeological Documentation*.
F. If human remains are encountered during archaeological investigations, the MoDOT HP staff will notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO per RSMo 194, and contact FHWA within twenty-four (24) hours of the discovery. FHWA will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification. FHWA shall take into account tribal recommendations regarding the treatment of the remains and proposed

actions, and then direct MoDOT HP staff to carry-out the appropriate actions in consultation with the SHPO. MoDOT, under FHWA oversight, shall monitor the archaeological data recovery and handling of any such human remains and associated or unassociated funerary objects, sacred objects or objects of cultural patrimony, to assure itself that these are handled, excavated or processed in accordance with the Missouri Unmarked Human Burials Sites Act (194-400-194.410 RSMo).

G. FHWA shall ensure that procedures to be used for the processing, analysis, and curation of collected materials must be in accordance with the Advisory 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.

8. **TREATMENT OF HUMAN REMAINS**

A. The FHWA recognizes that any human remains (other than from a crime scene or covered under Missouri's Cemeteries Law, §§ 214. RSMo) that may be discovered during project activities and are located on non-federal land are subject to the immediate jurisdiction of the SHPO, albeit FHWA or its delegate is responsible to have a professional archeologist analyze the remains and advise SHPO of the physical location and cultural and biological characteristics, and if SHPO determines, as per the consultation conducted under Section 106, excavation is warranted such remains will be handled pursuant to the Missouri Unmarked Human Burial Sites Act, §§ 194.400 – 194.410, RSMo, and subject to the provisions of the Native American Graves Protection and Repatriation Act as may apply.

B. FHWA, MoDOT, and SHPO recognize that Native American skeletal remains, associated or unassociated funerary objects, sacred objects, and objects of cultural patrimony that may be discovered during the archaeological survey, testing, or data recovery excavations on federal land are subject to NAGPRA. The land managing federal agency, shall, with assistance from FHWA, MoDOT and SHPO, assume responsibility for compliance with NAGPRA related to this undertaking. FHWA, in consultation with land managing federal agency will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification. FHWA and the land managing federal agency shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT to carry-out the appropriate actions.

C. If human remains are encountered during archaeological investigations:
   1) MoDOT HP staff will notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO, as per RSMo 194, and contact FHWA within 24 hours of the discovery.
   2) FHWA will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification.
   3) FHWA shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT HP to carry-out the appropriate actions in consultation with the SHPO.

4) MoDOT, under FHWA oversight, shall monitor the archaeological data recovery and handling of any such human remains and associated or unassociated funerary objects, sacred objects or objects of cultural patrimony, to assure itself that these are handled, excavated or processed in accordance with the Missouri Unmarked Human Burials Sites Act (194-400 – 194.410 RSMo).

D. If human remains are encountered during construction:
   1) The contractor shall immediately stop all work within a 50-foot radius of the remains and shall not resume without specific authorization from either the SHPO or the local law enforcement officer, whichever party has jurisdiction over and responsibility for such remains.
   2) The contractor shall notify the MoDOT Construction Inspector and/or Resident Engineer who will contact the MoDOT HP section within 24 hours of the discovery.
   3) MoDOT HP staff will immediately notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO as per RSMo 194 or to notify SHPO what has occurred and that it is covered by Missouri's Cemeteries Law, §§ 214. RSMo.
   4) MoDOT HP staff will notify FHWA that human remains have been encountered within 24 hours of being notified of the find.
   5) If, within 24 hours, the contractor is unable to contact appropriate MoDOT staff, the contractor shall initiate the involvement by local law enforcement and the SHPO. A description of the contractor's actions will be promptly made to MoDOT.
   6) FHWA will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification.
   7) FHWA shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT HP to carry-out the appropriate actions in consultation with the SHPO.
   8) MoDOT, under FHWA oversight, shall monitor the handling of any such human remains and associated funerary objected, sacred object or objects of cultural patrimony in accordance with the Missouri Unmarked Human Burial Sites Act, §§ 194.400 – 194.410, RSMo.

9. **POST-REVIEW DISCOVERIES**

A. If cultural resources are encountered during construction:
   1) The contractor shall immediately stop all work within a 50-foot buffer around the limits of the resource and shall not resume without specific authorization from a MoDOT Historic Preservation (MoDOT HP) Specialist.
   2) The contractor shall notify the MoDOT Resident Engineer or Construction Inspector, who shall contact the MoDOT HP within 24 hours of the discovery.
   3) MoDOT HP shall contact FHWA and SHPO within 48 hours of learning of the discovery and provide an evaluation of the resource and reasonable efforts to see if it can be avoided.
   4) FHWA shall make an eligibility and effects determination, based upon the preliminary evaluation, and consult with MoDOT and SHPO to minimize or mitigate any adverse effect.

5) FHWA will notify the Council and any tribes that might attach religious and/or cultural significance to the property within 48 hours of this determination.
6) FHWA shall take into account Council and Tribal recommendations regarding the eligibility of the property and proposed actions, and direct MoDOT to carry out the appropriate actions.
7) MoDOT will provide FHWA and SHPO with a report of the actions when they are completed.
8) FHWA shall provide this report to the Council and the Tribes.

10. **DURATION**

This agreement shall commence upon having been signed by all signatories and shall be null and void if its terms are not carried out within ten (10) years from the date of its execution, unless all signatories agree in writing to an extension for carrying out its terms.

11. **MONITORING AND REPORTING**

Every year, by January 31, the MoDOT, acting on behalf of FHWA, shall provide to all signatories a written report regarding the actions taken to fulfill the terms of the agreement, and shall file a copy with the Council per 36 CFR Part 800.6(b)(iv). Such reporting shall cease when the terms of the PA have been fulfilled or upon agreement of the signatories.

12. **DISPUTE RESOLUTION**

Should any signatory to this PA object at any time to any actions proposed or the manner in which the terms of the PA are implemented, the FHWA shall consult with such party to resolve the objection. If FHWA determines that such objection cannot be resolved, FHWA will:

A. Forward all documentation relevant to the dispute, including the FHWA's proposed resolution to the Council. The Council shall provide FHWA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the Council or signatories, and provide them with a copy of this written response. FHWA will then proceed with its final decision.
B. If the Council does not provide its advice regarding the dispute within the thirty (30) day time period, FHWA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FHWA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories to the PA and provide them and the Council with a copy of the written response.
C. FHWA's responsibility to carry out all other actions subject to the terms of the PA that are not the subject of the dispute remain unchanged.

13. **AMENDMENTS**

This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the Council.

14. **TERMINATION**

If any signatory to this PA determines its terms will not or cannot be carried out, that party shall immediately consult with the other signatories to attempt to develop an amendment per Stipulation 12 above. If within thirty (30) days an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.

Once the PA is terminated, and prior to work continuing on the undertaking, FHWA must either (a) execute an PA pursuant to 36 CFR Part 800.6 or (b) request, take into account, and respond to the comment of the Council under 36 Part CFR 800.7. FHWA shall notify the signatories as to the course of action it will pursue.

15. Four (4) copies of this signed PA will be provided, one to each signatory. FHWA will transmit copies to the Council for execution. The Council shall return the executed copies to MoDOT for distribution.

Execution of this PA by the Council, FHWA, the SHPO and the MHTC and the implementation of its terms evidence that FHWA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.

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PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

ADVISORY COUNCIL ON HISTORIC PRESERVATION:

By: _____ **Date:** _____

Title: _____

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

FEDERAL HIGHWAY ADMINISTRATION:

By: _____ **Date:** _____

Title: _____

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

THE MISSOURI STATE HISTORIC PRESERVATION OFFICE:

By: _____ **Date:** _____

Title: _____

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
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MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION:

By: _____ **Date:** _____

Title: _____

Attest:

_____
Commission Secretary

Approved as to form:

_____
Commission Counsel

ATTACHMENT 1: AREA OF POTENTIAL EFFECTS

The area of potential effects (APE) began with a large project study area (see Figure 1) in which background research for archaeological and built environment resources was conducted. Background research included previous surveys and development of a historic context for the study area. The APE extends along Route 169 from Missouri Route 9 on the north to 12th Street and I-35 on the south.

The APE was refined to the corridor of alignments being studied for built environment resources, including the footprint of all the alignments and including an offset of 100 feet to allow for the consideration of direct effects from construction and visual and vibration impacts.

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

The archaeological APE will be further refined once the preferred alternate is selected and will consist of the footprint of new right of way, including permanent and temporary easements.

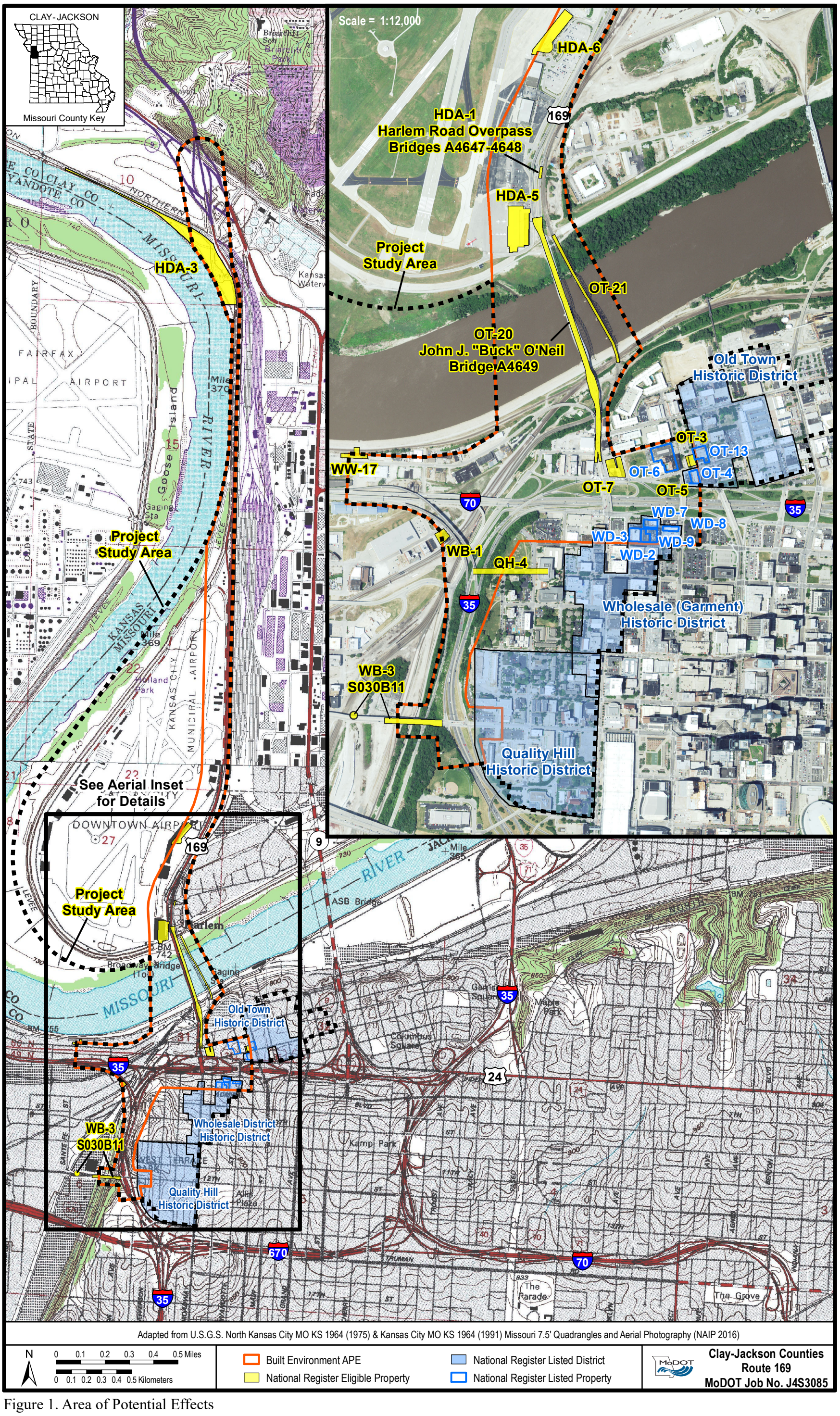


Figure 1. Area of Potential Effects

ATTACHMENT 2: PROJECT EFFECTS ON HISTORIC PROPERTIES

Effects of the project on historic properties will not be known until a project corridor is selected and a design chosen that includes rehabilitation or replacement of the Buck O'Neil Bridge.

A preliminary effects assessment for each alternative has been made for NRHP listed and eligible resources (see table below), but will need to be reassessed as the design-build process progresses.

Types of effects could include direct effects through the removal of the resource or indirect effects. Examples of possible indirect effects include (but are not limited to), visual effects of the construction of a new Missouri River Bridge, construction of new flyover ramps, changes in access or parking and construction of noise barriers.

All the build options would have an adverse effect on the Buck O'Neil Bridge (A4649) because the build option would include the removal of the bridge, which is an adverse effect under 36 CFR 800.5. The build options would also have an adverse effect on the Harlem Road Overpass (A4647 and A4648) because they would remove or reconfigure the bridges, altering their character defining features in a manner that they would no longer be eligible for listing on the NRHP, and therefore an adverse effect under 36 CFR 800.5.

Effects on the 8th Street Tunnel cannot be determined until the design stage. The west portal of the tunnel is currently blocked and is behind a retaining wall for I-35; it appears to be in the median between the north- and south-bound lanes. It is likely that grading or drilling for ramp construction will have effects on the tunnel that will need to be evaluated.

Survey Number	Property Name	No Build	West New Bridge	Central New Bridge	Adjacent New Bridge-# 1	Adjacent New Bridge-# 2	Adjacent New Bridge-# 3	North Segment
Woodswether Neighborhood								
WW-17	Santa Fe Pumping Station	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Old Town Neighborhood								
OT-4, 13, 14	Old Town Historic District (NRHP)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-3, 5	Old Town Historic District proposed expansion	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-6	Richards-Conover Hardware Co. Bldg. (NRHP)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT 7	Colonial Patterns Co.	No Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Effect
OT-20	Broadway "Buck O'Neil" Bridge (A4649)	No Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	No Effect
OT-21	Second Hannibal Bridge	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
West Bottoms Neighborhood								
WB-1	Thorn, Hunkins & Co. Warehouse	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WB-3	12th St. Trafficway Viaduct (S030B11)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Wholesale (Garment) District								
WD 1, 2, 3, 5, 6, 7, 8, 9, 10	Wholesale (Garment) District (NRHP)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Quality Hill Neighborhood								
QH-4	Eigth Street Tunnel	No Effect	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	No Effect
Harlem/Charles B. Wheeler Downtown Airport Neighborhood								
HDA-1	Harlem Road Overpass (A4647 and A4648)	No Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	No Effect
HDA-3	KC, MO Water Intake Plan	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
HDA-5	T&WA Airlines	No Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Effect
HDA-6	Municipal Airport Terminal Facility	No Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Effect

ATTACHMENT 3: CONSULTATION TO DATE

SECTION 106 CONSULTATION

On September 18, 2018 FHWA notified tribes with historical interests in the area of the study and invited them to participate in Section 106 consultation. On November 8, 2018, MoDOT, in consultation with FHWA, SHPO and the City of Kansas City, identified other potential consulting parties and invited them to participate. The table below identifies the tribes and other consulting parties invited to participate in consultation, and the responses received.

Entity	Response
Delaware Nation	None
Iowa Tribe of Kansas and Nebraska	None
Iowa Tribe of Oklahoma	None
Kaw Indian Nation of Oklahoma	None
Miami Tribe of Oklahoma	Will Consult
Osage Nation	None
Ponca Tribe of Nebraska	None
Ponce Tribe of Oklahoma	None
Sac and Fox Tribe of the Missouri in Kansas and Nebraska	None
Sac and Fox Tribe of the Mississippi in Iowa	None
Sac and Fox Nation of Oklahoma	None
Wyandotte Nation	None
Jackson County, Missouri	None
Clay County, Missouri	None
City of Kansas City	None
Kansas City Landmarks Commission	Will Consult
City of North Kansas City	None
Historic Kansas City Foundation	None
River Market Community Association	None
Downtown Neighborhood Association	Will Consult
TWA Museum	None
Airline History Museum	None
Historic Bridge Foundation	None
Historicbridges.org	None
Missouri Preservation	None
National Trust, Midwest Regional Office	None

On May 14, 2019 the FHWA invited the Council to participate in consultation, anticipating the potential for a large number of historic properties that could be affected

and the potential for controversy. The Council accepted the invitation to participate on May 30, 2019.

On June 10, 2019 the first consultation meeting was held. This meeting covered the project Purpose and Need and the Range of Alternates being considered. Prior to the meeting a draft of the Purpose & Need and Alternatives sections of the NEPA document were circulated to the consulting parties for their review.

On August 8, 2019 the second consultation meeting was held to discuss eligibility of resources within the built environment APE. The technical report, including the archival review and built environment survey were circulated to consulting parties prior to the meeting for review.

On August 27, 2019 a meeting was held to discuss the effects of the various alternatives on the historic properties and mitigation measures for historic properties for alternates that would have an adverse effect on historic properties.

Minutes from each consultation meeting were circulated to the consulting parties following the meeting.

PUBLIC INVOLVEMENT & MEETINGS

Project web-site: https://www.modot.org/buck-oneil-bridge-environmental-study

February 12, 2019, Mid-America Regional Council, 600 Broadway and On-Line
August 2019, On-Line

No comments from the public about historic properties have been received, to date.

ATTACHMENT 4: MITIGATION STANDARDS

Built Environment State-Level Mitigation Standards

The Built Environment Mitigation Standards (Standards) will be used by the Missouri Division of the Federal Highway Administration (FHWA), the Missouri Department of Transportation (MoDOT) and Local Participating Agencies (LPA) to comply with Section 106 of the National Historic Preservation Act (NHPA) for projects that have an adverse effect on historic properties (properties listed on or eligible for listing on the National Register of Historic Places (NRHP)) and which do not require national level (HABS/HAER/HALS) documentation. The appropriate level of documentation will be determined through consultation between FHWA, MoDOT/LPA, the SHPO and any other consulting parties.

Work should be done by a professional who meets the *Secretary of the Interior's Professional Qualification Standards*[1] (SOI Standards) for Architectural History and/or History or under the supervision of one who meets the SOI Standards.

The guidance is for informative purposes and the examples provided are not intended to be an all-inclusive list. The researcher should consider the individual resource and should develop themes appropriate to that resource.

The appropriate Standards for documentation of historic properties will be determined through consultation between the FHWA, MoDOT (or LPA), and the State Historic Preservation Office (SHPO) and any other consulting parties. Additional mitigation measures may be identified during the consultation process; these measures may be done in addition to, or rarely, in lieu of, those described below.

ALL RESOURCES

Section 106 requires that when assessing effects of a project on a historic property, consideration be given to all qualifying characteristics of the historic property, including those identified subsequent to the original evaluation of the property.[2] When mitigating adverse effects, all those to qualifying characteristics and areas of significance should be included in the mitigation. Even for NRHP listed properties areas of significance not previously identified may need to be mitigated.

For roads, bridges and road-related resources, some examples of NRHP criteria and areas of significance to consider are included in the information below with the documentation Standards for the particular property type. For other types of historic properties the researcher should consult the National Register Bulletins for NRHP criteria and areas of significance to consider.

[1] 36 CFR Part 61.
[2] 36 CFR Part 800.5(a)(1)

- Events (Criterion A)—consult NRHP bulletins for areas of significance and address all that would be appropriate for the resource;
- Significant persons (Criterion B)—consider significant people who may be associated with the historic property;
- Design significance (Criterion C)—consider architecture, engineering, landscape, community planning, etc., significance of the historic property;
- Information Potential (Criterion D)—could the historic property have important information that is not available through other sources?

All levels of documentation should include:

- Location map showing resource location
- Project Identifiers (County, Route, Project Number), include all items on the lists or explain why an item is not included.
- Historic and Common Name(s) of the resources
- Historic Photographs if they can be located
- Photographs--taken, printed (and labeled) and saved to archival media to the National Register/Missouri SHPO Photographic Standards. Unless otherwise stated, the photographs should be printed in an 8X10" format. Photo coverage should include views sufficient to document the resource, including overviews and settings, elevations and details. Photographs should be keyed to a site plan or to bridge plans (detail photographs).

BRIDGES

Bridge projects described in the State Highway Commission *Biennial Reports* shall be documented at Level I or Level II.

All levels of bridge documentation should include:

- Drawings—as built or final construction plans for bridge (including rehabs), if extant (if drawings are not available a detailed technical description will be required).
- Photographs showing elevations of the bridge, substructure, important connections, all span types, and other significant bridge details.[3]

Levels I and II should also include:

- Bridge description--A reader friendly bridge description narrative shall include; if bridge plans are not available, this should be a technical description of the bridge. The description should reference the mitigation photographs and plans to identify features of the bridge.

[3] Guidance on photographing bridges is available on the Preservation in Pink blog: https://preservationinpink.wordpress.com/2012/02/02/how-to-photograph-a-bridge/.

Level I: the highest level of documentation[4]—for bridges over major rivers, for example, the Mississippi or Missouri River or the main tributaries to these rivers, and bridges with Criteria A or B associations as well as Criterion C.

- Written history—should be the product of primary and contemporary sources as much as possible; it should address significant themes associated with the bridge, *for example*:
    - Engineering significance (Criterion C)—explain how and why the bridge is significant from an engineering perspective; discuss its relationship to surviving bridges of the same type in region and state. Also explain:
        - Who designed the bridge? Is it a standard bridge type or did it require modification from standard plans?
        - Who constructed the bridge? Include fabricator and contractor for truss bridges. Were they well-established companies? Did they have history of contracts with the state/county/city? Did they build a large number of bridges? How many of their bridges survive?
    - Transportation significance--explain how the bridge fit into the larger transportation system. Consider:
        - Construction of the bridge, including planning and actual construction
        - Address any issues encountered during bridge planning that had to be overcome (opposition, etc.)
        - Address any issues encountered during construction and how they were resolved (weather, etc.)
        - How was the bridge perceived by the community—eagerly anticipated, apathetically, etc.? Was it received differently in various parts of the larger community?
        - Was the bridge built as part of a new road or replacing an earlier crossing? If replacement, of what type—ford, ferry or earlier bridge?
    - Social History—did important events associated with American culture occur on the bridge or is it associated with a route significant in American culture? (Examples would be civil rights marches that crossed bridge, bridges associated with Route 66, bridges associated with early farm-to-market roads, bridges associated with seedling miles of highway, etc.)
    - Commerce—was the bridge important in the economic development of a community or did local business leaders promote the bridge? If so, explain how they were involved. If the bridge was a toll bridge, explain how the toll structure was set up, who collected the tolls, how long the tolls were collected, if possible what the toll rates were, local attempts to free the bridge, and when it became a free bridge.
    - Planning – Was the bridge built or incorporated into a Parkway? Was the bridge built as part of a larger development? Was the planning for the bridge tied up in litigation related to its construction or the construction of an associated highway?

[4] Guidance on How to Document a Bridge is available from the Missouri Department of Transportation, Historic Preservation Section.

    - There may be other broad patterns in American History that the bridge is associated with. Consultation between the SHPO, FHWA, MoDOT, the local government and other consulting parties will help to determine the appropriate areas of significance for the bridge.
    - Examples of sources to utilize include: MoDOT Bridge and Commission Records (if State Highway Department Constructed the bridge); County Commission Minutes (if County constructed the bridge); contemporary newspapers; trade journals; diaries; builder or engineering company records; County Histories; etc.
- An example of a Level I mitigation document is the Daniel Boone Bridge available for viewing at: http://library.modot.mo.gov/RDT/reports/historicbridges/Daniel_Boone_Bridge_J1000_Report.pdf

Level II: a moderate level of documentation—for bridges over small rivers/major creeks, with no significant association with historical contexts; it is anticipated that most mitigation will fall into this level. See Level I comments above

- Written history—should be the product of primary and contemporary sources as much as possible; should address significant themes associated with the bridge, *for example*:
    - Engineering significance—explain how and why the bridge is significant from an engineering perspective; discuss its relationship to surviving bridges of the same type in region and state. Also explain:
        - Who designed the bridge? Is it a standard bridge type or did it require modification from standard plans?
        - Who constructed the bridge? Include fabricator and contractor for truss bridges. Were they well-established companies? Did they have history of contracts with the state/county/city? Did they build a large number of bridges? How many of their bridges survive?
    - Transportation significance—explain how the bridge fit into the larger transportation system. Consider:
        - Construction of the bridge, including planning and actual construction
        - Address any issues encountered during bridge planning that had to be overcome (opposition, etc.)
        - Address any issues encountered during construction and how they were resolved (weather, etc.)
        - How was the bridge perceived by the community—eagerly anticipated, apathetically, etc.? Was it received differently in various parts of the larger community?
        - Was the bridge built as part of a new road or replacing an earlier crossing? If replacement, of what type—ford, ferry or earlier bridge?
- An example of a Level II document is the Branson Bridge and can be viewed at: http://library.modot.mo.gov/RDT/reports/historicbridges/Branson%20Bridge%20J0705R%20Report.pdf.

Level III: a well-documented inventory form with continuation sheets—for bridges over small streams away from populated areas, lettered routes in rural areas; these may include small bridges that were built as part of a large project and bridges which may be contributing to a district or landscape or may be individually eligible and a type with many documented examples. It may also be used when there is a context for the type developed (or being developed) which will explain the overall background for the resources.

- Completed MoDOT Missouri Bridge Inventory Form. The inventory form should include a footnoted history of the bridge, a brief description, and appropriate illustrations to demonstrate the history and significance of the bridge.
- An example of a Level III document is the St. John's Creek Bridge and can be viewed at: http://library.modot.mo.gov/RDT/reports/historicbridges/N0141_Bridge_Mitigation_Document.pdf.

Level IV: a documented inventory form for bridges over minor crossings (small streams/creeks, highways, railroads, etc.) that are not individually eligible but are contributing resources to a larger historic property. It is anticipated few bridges will qualify for this level of documentation.

- Photographs (5" X 7" format) showing elevations of the bridge, substructure, important connections, all span types, and other significant details.
- Completed MoDOT Missouri Bridge Inventory Form. The inventory form should include a concise history of the bridge, a brief description, and statement explaining the significance of the bridge.

ROADS, WALLS (THINGS IN R/W)

Level 1—highest level of documentation, to be used when….

- Plans, if available
- Photographs—typical and usual elements, overall setting
- Written description—describe important features of the resource,
- Written history explaining significance of resource (see NRHP guidance for criteria A, C or D and areas of significance) (utilizes primary and contemporary resources as much as possible)

INDIVIDUALLY LISTED OR ELIGIBLE BUILDINGS AND THEIR ASSOCIATED PROPERTIES

To be used with NRHP listed or eligible architectural resources (buildings) that are eligible under criteria A, B or C. Buildings eligible under criterion D require consultation with SHPO for appropriate mitigation measures in addition to those listed below (as appropriate).

Level 1—highest level of documentation; to be used for buildings that are of statewide significance, buildings that are unusual architectural styles (on a county, regional or

statewide basis), when project affects most of a historic property (main building and a significant percentage of secondary buildings and landscape features)

- Drawings—floor plans (original floor plans (if available) or drawn floor plans of the building as it exists today)
- Photographs—[to the extent that we have access]
    - Overview and general setting
    - Main resource exterior and interior, including significant details
    - All outbuildings, exterior of all, interior of major outbuildings (barns, etc.)
    - Landscape elements, all landscape elements—fence lines, etc. should be photographed
- Site plan (if more than one resource is on the property)
- Written detail description of the building and associated features
- Written history of the property—should be the product of primary and contemporary sources as much as possible; it should address significant themes associated with the property (see NRHP bulletins for criteria and areas of significance to be developed. All areas of significance for the property should be developed).

Level 2—moderate level of documentation, used when project effects are on properties of local significance and when the project effects the main building

- Drawings—floor plans (original floor plans (if available) or drawn floor plans of the building as it exists today)
- Photographs—[to the extent that we have access]
    - Overview and general setting
    - Main resource exterior and interior, including significant details
    - All outbuildings, exterior of all, interior of major outbuildings (barns, etc.) (that we have access to)
    - Landscape elements, all landscape elements—fence lines, etc. should be photographed
- Site plan (if more than one resource is on the property)
- Written detail description of the building and associated features
- Written history of the property—should be the product of primary and contemporary sources as much as possible; it should address significant themes associated with the property (see NRHP bulletins for criteria and areas of significance to be developed. All areas of significance for the property should be developed).

Level 3—lower level of documentation, used when project effects are on historic property but not on the main resources, but on contributing elements of an individually eligible property (e.g. contributing smokehouses, carriage houses, garage, setting, etc.)

- Photographs—[to the extent that we have access]
    - Overview and general setting
    - Affected resources (exterior, interior if significant)
    - Landscape elements, all landscape elements—fence lines, etc. if significant and affected by project

- Site plan (if more than one resource is on the property)
- Written detail description of the affected contributing and non-contributing resources

LANDSCAPES

Level 1

- Plans, if available
- Photographs
- Written description of design intent of the landscape (if designed) and general setting if vernacular
- Written history (see NRHP guidance for criteria A and C and areas of significance)

HISTORIC DISTRICTS

Listed and NRHP eligible historic districts. These could be in an urban, suburban or rural setting, and include any number of resources. Areas of significance should be identified and project impacts on these areas and character defining features should be considered.

NRHP LISTED DISTRICTS

Since documentation of the significance of these properties is already on file, the mitigation should focus on the properties that are being adversely affected by the project and any areas of significance that have been identified that are not included in the NRHP documentation.

Level 1—highest level of documentation—when impacting large numbers of resources within a historic district; when impacts are to a large number of contributing (versus non-contributing) buildings or when the project will substantially alter the ratio of contributing to non-contributing resources.

- Streetscape photographs of areas adjacent to project impacts
- Photographs of resources directly affected
- Site plan showing resources directly affected and recommended new boundary lines
- Building descriptions for directly affected buildings
- Written narrative on district history and significance (if not NRHP listed)
- Brief overview of district (if not NRHP listed)
    - Architectural styles represented
    - Overall plan and features of district
    - (Section 7 equivalent of NRHP form)
    - Recommended NRHP boundaries

The historical narrative should consider all potential areas of significance of the historic district. Even for NRHP listed historic districts, areas of significance not previously identified may need to be developed.

Level 2—medium level of documentation—to be used when project impacts are to a relatively few resources within the district and where the project does not change the ratio of contributing to non-contributing resources

- Streetscape photographs of areas adjacent to project impacts
- Photographs of resources directly affected
- Site plan showing resources directly affected and recommended new boundary lines
- Building descriptions for directly affected buildings
- Written narrative on district history and significance (if not NRHP listed)
- Brief overview of district (if not NRHP listed)
    - Architectural styles represented
    - Overall plan and features of district
    - (Section 7 equivalent of NRHP form)
    - Recommended NRHP boundaries

Things to consider:

- Events (Criterion A)—consult NRHP bulletins for areas of significance and address all that would be appropriate for the district
- Significant persons (criterion B)—consider significant people who may be associated with the historic district and the buildings being directly affected by the project
- Design significance (criterion C)—architecture, landscape, community planning, etc.
- Criterion D—could the district have important information that is not available through other sources?

The historical narrative should consider all potential areas of significance of the historic district. Even for NRHP listed historic districts, areas of significance not previously identified may need to be developed.

Level 3—lowest level of documentation—to be used when projects will affect a historic district but not affect the buildings in a historic district (e.g. affect road system, retaining walls or sidewalks of a historic district); not to be used when the historic district is a landscape or engineering historic district associated with a roadway

- Streetscape photos of areas affected by project and immediately adjacent areas
- Site plan of affected areas (before and after)

NRHP Eligible Districts (not listed)

Districts that are eligible for listing, but not listed, should be considered as above, but with the added stipulations that historic contexts, significance and written descriptions need to be completed as well. Inventories of properties that will be affected by the

project, with complete descriptions of the properties, and evaluations of what the removal of these properties does to the overall integrity of the historic district, should be included.

Agenda

Consultation Meeting #3
John J. "Buck" O'Neil Bridge Environmental Assessment
Clay/Jackson 169
MoDOT Job Number J4S3085

August 27, 2019
1-4 p.m.

Location/Teleconference Information:

Mid-America Regional Council of Governments, 600 Broadway, Suite 200, Westview Room

Teleconference: 573.526.3993 Conference ID 00714#

Introductions

Review of changes to purpose and need and any discussion about questions

Review of what constitutes an effect to a historic property

Discussion of effects of alternatives to historic properties

Discussion of mitigation

Brainstorming about potential mitigation measures for adverse effects

Discussion about prioritization of mitigation measures

Discussion about how mitigation measures will be worked into Programmatic Agreement being developed

If you encounter technical issues during the meeting, please contact Ashley Porter 573.508.2227 (call or text).

Clay/Jackson 169, J4S3085
Consultation Meeting #3
August 27, 2019

Sign-In

Name	Organization	Phone Number	E-mail
Julie Szrson	BMcD	816 276 1593	jszrson@burnsmcd.com
Cydney Millstein	AHR, LLC	816.472.4154	Cydney@ahr-KC.com
Kelsey Lutz	AHR, LLC	913.449.0715	Kelseynlutz@gmail.com
Martin Rivarole	MARC		
Brad Wolff	KCMO Planning	816-513-2901	bradley.wolff@kcmo.org
Ashley Porter	MoDOT		
Tyler Holladay	MoDOT		
Gerri Doyle	MoDOT		
Griffin Smith	MoDOT	816 607 2108	griffin.smith@modot.mo.gov
Karen Daniels	MoDOT		

Clay/Jackson 169, J4S3085
Consultation Meeting #3
August 27, 2019

Sign-In (by phone)

Name	Organization	Phone Number	E-mail
Mike Landvik	MoDOT		
Amanda Burke	SHPO		
Brandi Harris	B+Mac		

Clay-Jackson 169
MoDOT Job No. J4S3085
John J. "Buck" O'Neil Bridge
Consultation Meeting #3
August 27, 2019
Minutes

Attendees:
Amanda Burke, Missouri SHPO
Brad Wolf, City of Kansas City
Cydney Millstein, Architectural & Historical Research LLC
Brandi Harris, Burns & McDonnell
Julie Sarson, Burns & McDonnell
Kelsey lutz, Architectural & Historical Research LLC
Martin Rivarole, Mid-America Regional Council
Michael Landvik, MODOT Transportation Planning Coordinator
Griffon Smith, MODOT District Planning Manager
Gerri Doyle, MODOT Transportation Planning Coordinator
Karen Daniels, MODOT Historic Preservation
Ashley Porter, MODOT Historic Preservation
Tyler Holladay, MoDOT Historic Preservation

Karen Daniels welcomed everyone and thanked them for attending.

Introductions were made of those participating by phone and those participating at 600 Broadway, Suite 200, Kansas City, Missouri.

Karen Daniels asked Gerri Doyle to explain the revised purpose and needs. Gerri explained that MoDOT and Federal Highways are working together to revise the purpose and need. The original purpose and need was, "maintain a reliable regional transportation linkage across the Missouri River that separates local and regional traffic and minimizes local traffic conflicts," has been changed to "maintain a reliable regional transportation linkage across the Missouri River that **services** local and regional traffic and minimizes local traffic conflicts." Gerri said that this would allow alternatives to be evaluated that do not provide direct connections to I-35. The new purpose and need is being reviewed by Federal Highways.

Karen Daniels explained adverse effects and how an adverse effect is determined. Karen informed everyone that she has sent out the criteria of adverse effects that are found within the Section 106 regulations 36 CFR §800.5. Karen explained an adverse effect is found when an undertaking [the project] may alter, directly or indirectly, any of the characteristics that qualify a property for inclusion in the National Register of Historic Places (NRHP) in a way that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association. Karen further explained that considerations must be given to all the characteristics that make a property eligible for inclusion on the NRHP, including any identified characteristics

after the original evaluation (or listing) of a property. An adverse effect may include reasonably foreseeable effects caused by the undertaking that might occur later in time, either in the distant future or cumulative effects.

Karen provided some examples of adverse effects:

- Physical destruction of all or part of a property
- Alteration of a property in a manner not in keeping with the Secretary of the Interior's Standard's for the Treatment of Historic Properties
- Removal of the property from its historical location
- Change of the character of the property's use or physical features within the setting that contribute to its significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of a property's significant features
- Neglect of a property which causes its deterioration (except in certain circumstances)
- Transfer, sale or lease out of federal control without enforceable conditions or restrictions to ensure long-term preservation

Julie Sarson explained the physical locations for the north segment, center segment, and south segment. The north segment is between the US-169 and MO-9 intersection to the north flood wall for the Missouri River. The center segment is from the north flood wall to the south flood wall. The South segment is from the South flood wall to I-35 and 12th street. Julie reviewed the alternatives discussed from the previous meetings. She explained the alternatives were the no build alternative, the west alternative, the central alternative, and the adjacent alternatives with 3 connectivity options. Julie then discussed the advantages and disadvantages for each alternative and how each alternative meet, or do not meet, the purpose and need for the project.

The no build alternative uses the existing Buck O'Neil Bridge and does not require any new right of way or impacts to natural features. The no build alternative does not improve or replace the aging infrastructure. The local and regional traffic connections are not improved or serviced. The existing Buck O'Neil Bridge does not provide bicycle and pedestrian traffic.

The west alternative would provide a new river bridge that accommodates bicycle and pedestrian traffic. It improves access to the airport, downtown Kansas City, and provided direct connections to I-35. The west alternative would minimize the need for new right of way and construction closure for US-169 and Broadway. This alternative would remove the existing Buck O'Neil Bridge and temporary closures along I-70 during construction would be needed.

Julie asked if anyone had any questions. Brad Wolf asked if the existing ramps to the Buck O'Neil Bridge would be removed with the west alternative. Julie said they would be. She further explained the Broadway Blvd approach to the bridge would be removed and the downward slope would be incorporated into the street grid.

Martin Rivarole asked if the main impacts would be towards the west of the Broadway intersections. Julie agreed, saying that the majority of new construction would be west of the Broadway intersection. Julie then explained that they were aware of the Colonial Patterns Building (OT-7) that was identified eligible for listing in the NRHP. She also said that the Landmark Lofts building was also being avoided. Julie then continued to review the alternatives.

The central alternative would provide a new bridge that accommodates bicycle and pedestrian traffic. It also improves access to the airport, downtown Kansas City, and direct connections to I-35. This alternative would remove the existing Buck O'Neil Bridge and additional right of way would be need. Also temporary closures along US-169 and I-70 are required during construction.

The first adjacent alternative option would provide a new river bridge with bicycle and pedestrian traffic. Access to the airport and downtown would be improved and minimizes the need for new right of way. The existing Buck O'Neil Bridge would be removed and would not provide direct connection to I-35. Community connectivity would not be improved and closures to US-169 and Broadway would be required during construction.

The second adjacent alternative option is similar to the first but flyover ramps would be incorporated into the design for future construction. New right of way would be needed. The existing Buck O'Neil Bridge would be removed and it does not improve community connectivity. Temporary closures along US-169 and Broadway would also be required during construction. The third adjacent alternative option is the same as the second; except flyover ramps would be constructed.

Julie Sarson acknowledged that all assessments of adverse effects are preliminary and based from Burns & McDonnell's recommendations of eligibility for inclusion in the NRHP. Comments from SHPO are being incorporated into the report and concurrence for eligibly is still needed. Julie then elaborated that the goal is to push west with new construction away from the Colonial Patterns Building (OT-7), because it is recommended as eligible for the NRHP. They are also avoided the Landmark Loft residential apartments. Julie explained what the alternatives would look like with rough 3D layouts.

The west alignment 3D layout (slide 12) shows a northwest view that depicts a rough footprint of where the design will be incorporated. On the north side of the river, the bridge will be located a little east of the TMA building. The bridge will cross the river and will need to be a little higher in elevation on the south bank of the river for barge navigation. The bridge will have enough clearance for the rail tracks and the bluff to reach the downtown street grid. New roadway ramps will connect the bridge with Beardsley Rd and Fifth Street. Flyover ramps will be constructed connecting I-39. The flyover ramps will have to clear I-70 and portions of the bluff underneath West Terrace Park.

Julie asked if anyone had any questions. Karen asked how much of the existing bridge will need to be removed while the new bridge is undergoing construction. Julie said that part of the

existing structures arch span closer to the river's north bank could be left untouched. She further explained it depends on how many lanes are needed to be left opened on the existing bridge while the new bridge is being constructed. Karen said that she wanted to know about this information because she has received queries about using the bridge in place. Brad Wolf asked if there are any barge navigation issues with leaving the bridge in place. Julie said that navigation is not a major issue with the existing bridge. Martin Rivarole asked if there would be significant traffic improvements on Fifth Street to increase accessibility to the downtown area. Julie said the west alignment would improve accessibility to Fifth Street and Broadway. The I-70 overpass bridge across Beardsley Rd would have to be reconstructed to help connections.

Slide 13 shows the west alignment with a north view facing Landmark lofts. The direct impacts to the buildings are not fully shown. It is to give a general idea of the preliminary plans. Ramps from the bridge to 5th street will avoid the Landmark Lofts and connect to 5th street to the west of it.

The central alignment 3D layout (slide 14) shown with a northwest view depicts a rough footprint of the design. Elevated flyover ramps connecting to I-39 are to the left of the Landmark Lofts Building while a new ramp connects the bridge to Broadway. The new ramp avoids the Colonial Patterns Building (OT-7) and is shown on the next slide (slide 15).

The adjacent alignment 3D layout (slide 16) depict the rough design for the flyover ramps in the optional alternative designs. A new Broadway ramp will be used to connect the bridge with downtown traffic, but flyover ramps are show connecting I-39. Slide 17 shows the flyover ramps to the east of Landmark Lofts apartments but would result in the removal of the MTC building. The Broadway ramp avoids the Colonial Patterns Building.

Cydney Millstein reviewed the effects to the resources recommended eligible within the APE. The no build alternative would have no direct or indirect effects on historic properties while the other alternatives would have effects on resources recommended eligible. The Colonial Patterns Company Building (OT-7), Second Hannibal Bridge (OT-21), the Transcontinental and Western Airlines Building (HDA-5), and the Municipal Airport and Western Airlines (HAD-6) could have potential indirect effects to resources recommended eligible. The Broadway "Buck O'Neil" Bridge (OT-20) would have a direct effect while the Harlem Road Overpass (HAD-1) could have a possible direct effect. Julie Sarson explained that the Harlem Road Overpass has two independent structural systems. One supports the railroad while the other supports the highway. Julie then elaborated, she said that the overpass appears to be one bridge, but it is in fact two different structural systems that appear to be one structure. Cyd asked if both the highway and railroad have two different bridge numbers. Julie said yes, because the railroad owns the rail bridge. Julie said that half of the overpass would have a direct effect. Cyd and Karen said that if the bridge is recommended as eligible to the NRHP then it would have a direct effect. If it is not recommended eligible, then the overpass would be covered by the program comment. The 8th

Street Tunnel (QH-4) could have a possible direct effect but it depends on the features that make it eligible to the NRHP.

Cydney Millstein asked if anyone had any questions. Julie Sarson said that she had a question. Julie said the original plans for the 8th Street Tunnel was to seal it off and construct a wall over the sealed portion of tunnel when the highway was built. She then said that it was possible that they would have to remove that wall, portions of the sealed tunnel, and construct another wall to accommodate bridge construction. Julie then asked if it would be a direct effect if the wall and sealed portions of the tunnel were removed. Cyd said that it would depend on various factors, including how the removed wall was rebuilt, if any materials for the tunnel were removed, and other characteristics of that tunnel. Karen then said that it depends on the characteristics that make it eligible for listing in the NRHP.

Julie Sarson then explained the preliminary alternations comparison matrix slide. She explained that the top column across the matrix showed the alternative being considered. The left column running down the matrix showed the resource category such as wetlands, protected species, recreational resources, and cultural resources. The row for cultural resources list which resource will have a direct or an indirect effect. Karen said that the indirect effects need to be quantified into either an adverse effect or no adverse effect.

Karen said MoDOT will be preparing a Programmatic Agreement (PA). She explained that new effects could be identified during construction, and the alternative has yet to be chosen, but the PA would cover those effects and consultation throughout construction would continue. Karen said that we need to brainstorm ideas for mitigation because we can assume, at the very least, portions of the bridge will be removed. Karen said that she sent out a chart created by the Pennsylvania SHPO showing criteria for meaningful mitigation for effects on historic resources. Karen said that "meaningful" needs to relate to the significance of the property. If the property is nationally significant, then it should have more mitigation then a locally significant property. The public should receive some benefit from the mitigation. The mitigation should accommodate all needs of the parties involved in consultation. The mitigation should enhance the knowledge, or the protection, of historic properties. The cost of mitigation should commensurate with project effects and significance of the resource, so the cost to mitigate an adverse effect should be higher than an indirect effect.

Karen said that we should assume, at the very least, a portion of the bridge will be removed if no proposal for reuse for the bridge is submitted. Karen said she is accepting bridge reuse proposals until the end of the year. It is possible that someone could submit a bridge reuse proposal after the marketing period ends and it could be considered. It depends on when the proposal is submitted to MoDOT, FHWA, and SHPO. Karen then said that the consulting parties should think of mitigation measures for the bridge.

The meeting discussed bridge mitigation ideas and architectural mitigation ideas.

Bridge Mitigation Ideas:

- Documentation
    - HAER Recordation (Here is a link to the Paseo Bridge for an example of HAER Documentation: https://www.loc.gov/pictures/collection/hh/item/mo1931/)
    - State Level I Documentation (Here is a link to the Missouri River Daniel Boone Bridge for an example of State Level I Documentation: https://library.modot.mo.gov/RDT/reports/historicbridges/Daniel_Boone_Bridge_J1000_Report.pdf)
    - NRHP nominations for adjacent resources—2nd Hannibal Bridge, TWA Building
    - Work with HNTB to view their documentation on the bridge
- Interpretation
    - Permanent interpretive panels at site of bridge—possibly at Town of Kansas site--include Broadway Bridge, First Hannibal Bridge, 2nd Hannibal Bridge
    - Interpretive panel on the new bridge (bike/pedestrian access)
    - Riverfront Heritage Trail—interpretive panel
    - Bluff Park—interpretive panel in park overlooking the entire area, panel discussing history of area, development of area, development of highways and the effects these had
    - Use bump-outs on bike/ped area for interpretation
    - Exhibit at Library or Museum
    - Traveling exhibit—series of panels to be displayed in various areas—libraries, museums, AIA-KC, ASCE exhibit area, etc.
- Education
    - Local school involvement with the structure?
        - Curriculum development about the bridges
        - Field visit
        - Bring structure to classroom
    - Science City—approach them about developing something for schools
    - STEM outreach—construction then & now (differences in construction techniques between 1950s and today) (it would be possible to work this into the story map above)
    - SIA articles (in Journal or Newsletter) about the bridge
    - Story Maps about major river crossings in the Kansas City area (include link to a story map project) (Here is a link to TexDOT Beyond the Road project, scroll down to Story Maps to see some examples: https://www.txdot.gov/inside-txdot/division/environmental/beyond-the-road.html).
- Kaw River Bridge Study—replicate that for the Buck O'Neil Bridge (Here is a link to the Kaw River Bridge Study: https://www.marc.org/Regional-Planning/Creating-Sustainable-Places/assets/UG_1705-18-0329-KAW-RIVER-BRIDGE-STUDY-FOR-P.aspx)
- Use arches on the bottom of bridge

- Incorporate arches into railing of new bridge to reflect Buck O'Neil Bridge
- Follow Kansas City 1% for Arts Program
- Name of the new bridge—will be Buck O'Neil Bridge

Architectural Mitigation ideas:

- Interpretation
    - Include on interpretive panel at bluff park with changes in area
    - Educational component/traveling exhibits could include this
    - History of downtown airport in interpretive panel (possibly work with TWA Museum)
    - Focus on transportation history of area: 1st Hannibal Bridge, Airport, 2nd Hannibal Bridge, vehicles on Railroad bridge, Buck O'Neil Bridge
- Education
    - Story map could have approach to include this
    - Work with Port Authority or River Market to develop walking tour
- NRHP nominations for adjacent properties
- Context for all of area, include Jefferson Highway

Karen said she would make a list of mitigation ideas that were discussed. She would send the typed list of mitigation ideas to the consulting parties so they could prioritize the list. Amanda asked if we wanted to invite anymore parties to participate in consultation. Karen said she was concerned with inviting more parties to consultation. She explained by saying we are technically on step four (4) of the section 106 process. The section 106 process has already made it this far, if other parties joined consultation, then they would have to catch up to where we are now. We have already reviewed a lot of information and new consultation parties would have missed a large portion of the section 106 process.

Karen then discussed the next steps for the section 106 process. She informed everyone that a typed list of mitigation measures will be sent out to consulting parties to be prioritized. New mitigation ideas would also be considered from consulting parties. An agreement document will also need to be drafted and sent out to consulting parties.

Karen thanked everyone for attending the meeting and the meeting adjourned

US 169/BUCK O'NEIL BRIDGE

ENVIRONMENTAL STUDY
ALTERNATIVES COMPARISON



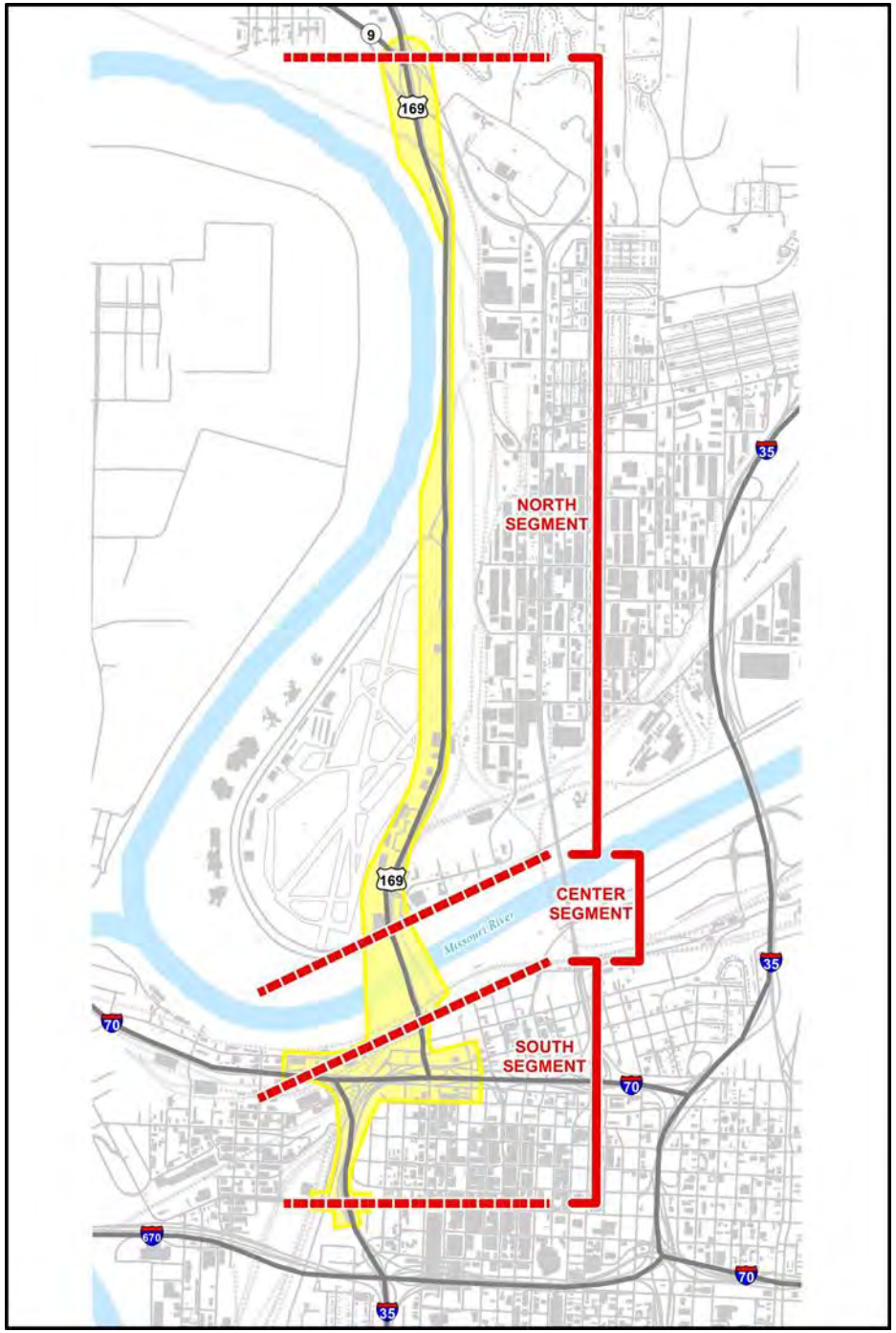
MoDOT Job No. 4S3085

Burns & McDonnell

STUDY AREA

Build Alternatives:

- North Segment – same solution
- Center Segment – river crossing alignment
- South Segment – connections to local and regional roadway systems



ALTERNATIVES

1. **No Build** Alternative
2. **West** Alternative
3. **Central** Alternative
4. **Adjacent** Alternative
    - 3 connectivity options

MAINTAIN/REPAIR EXISTING CROSSING

NO BUILD ALTERNATIVE

ALTERNATIVES

PROS:

- EXISTING BUCK O'NEIL BRIDGE REMAINS IN PLACE
- NO NEW RIGHT OF WAY NEEDED
  NO CONSTRUCTION IMPACTS TO NATURAL FEATURES

CONS:

- DOES NOT REPLACE OR IMPROVE AGING INFRASTRUCTURE
- DOES NOT IMPROVE LOCAL AND REGIONAL TRAFFIC CONNECTIONS
- DOES NOT ACCOMMODATE BICYCLES AND PEDESTRIANS - BRIDGE STRUCTURE CANNOT BE MODIFIED TO ACCOMMODATE BIKE/PED FACILITIES
- DOES NOT INCLUDE MAJOR REHABILITATION



US 169/BUCK O'NEIL BRIDGE
ENVIRONMENTAL STUDY

NEW RIVER CROSSING – BRIDGE ON WEST ALIGNMENT

WEST ALTERNATIVE

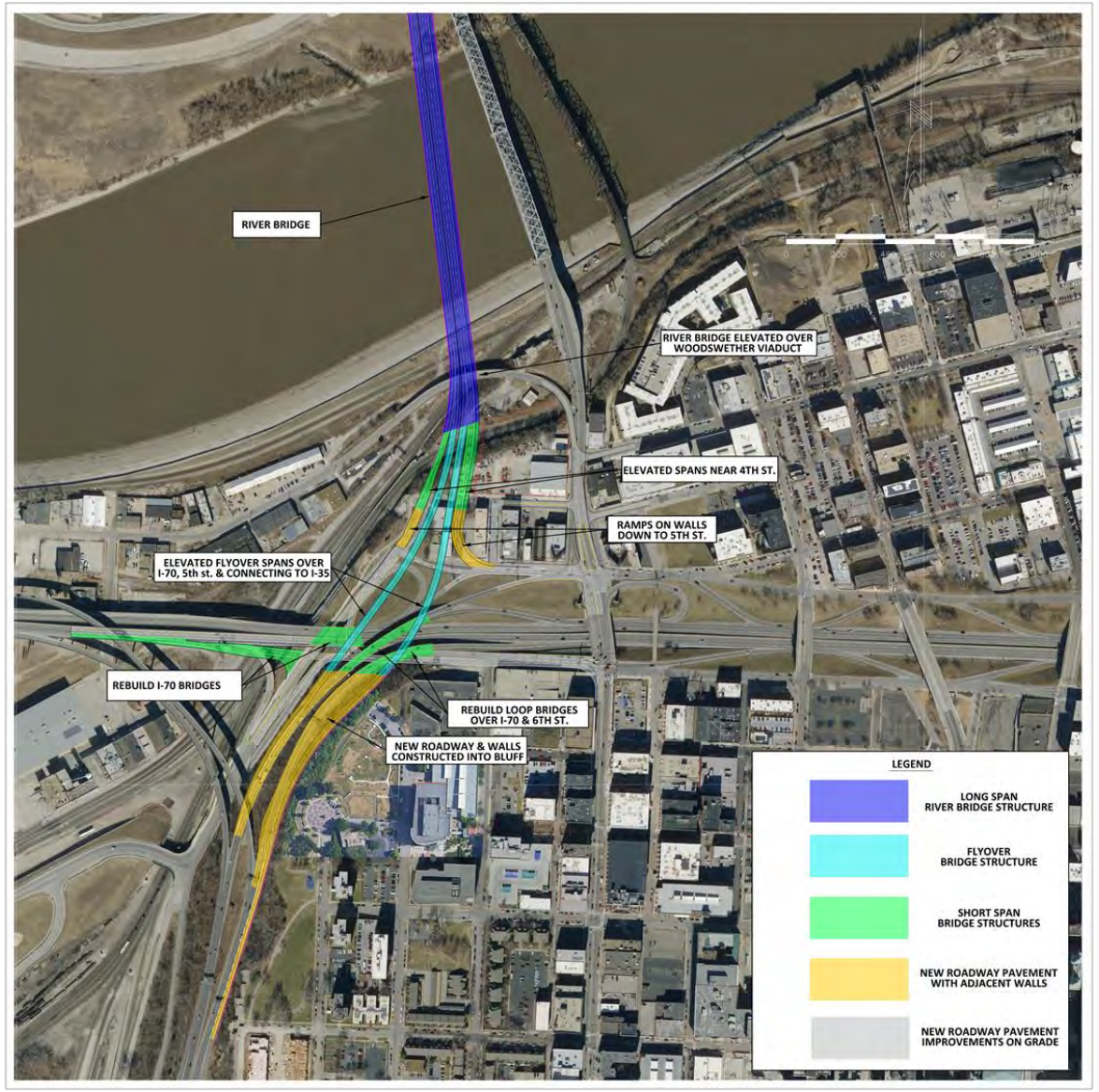
RAMPS AT 5TH/6TH STREET – DIRECT CONNECT TO I-35

PROS:

- PROVIDES NEW RIVER BRIDGE
- ACCOMMODATES BICYCLES AND PEDESTRIANS
- IMPROVES AIRPORT AND DOWNTOWN ACCESS
- PROVIDES DIRECT CONNECTIONS TO I-35
- IMPROVES COMMUNITY CONNECTIVITY
- MINIMIZES AMOUNT OF NEW RIGHT OF WAY NEEDED
  MINIMIZES CONSTRUCTION CLOSURE DURATION FOR US-169 & BROADWAY

CONS:

- REMOVES EXISTING BUCK O'NEIL BRIDGE
- TEMPORARY CLOSURES ALONG I-70 REQUIRED DURING CONSTRUCTION



ALTERNATIVES

NEW RIVER CROSSING – BRIDGE ON CENTRAL ALIGNMENT

CENTRAL ALTERNATIVE

RAMPS AT BROADWAY – DIRECT CONNECT TO I-35

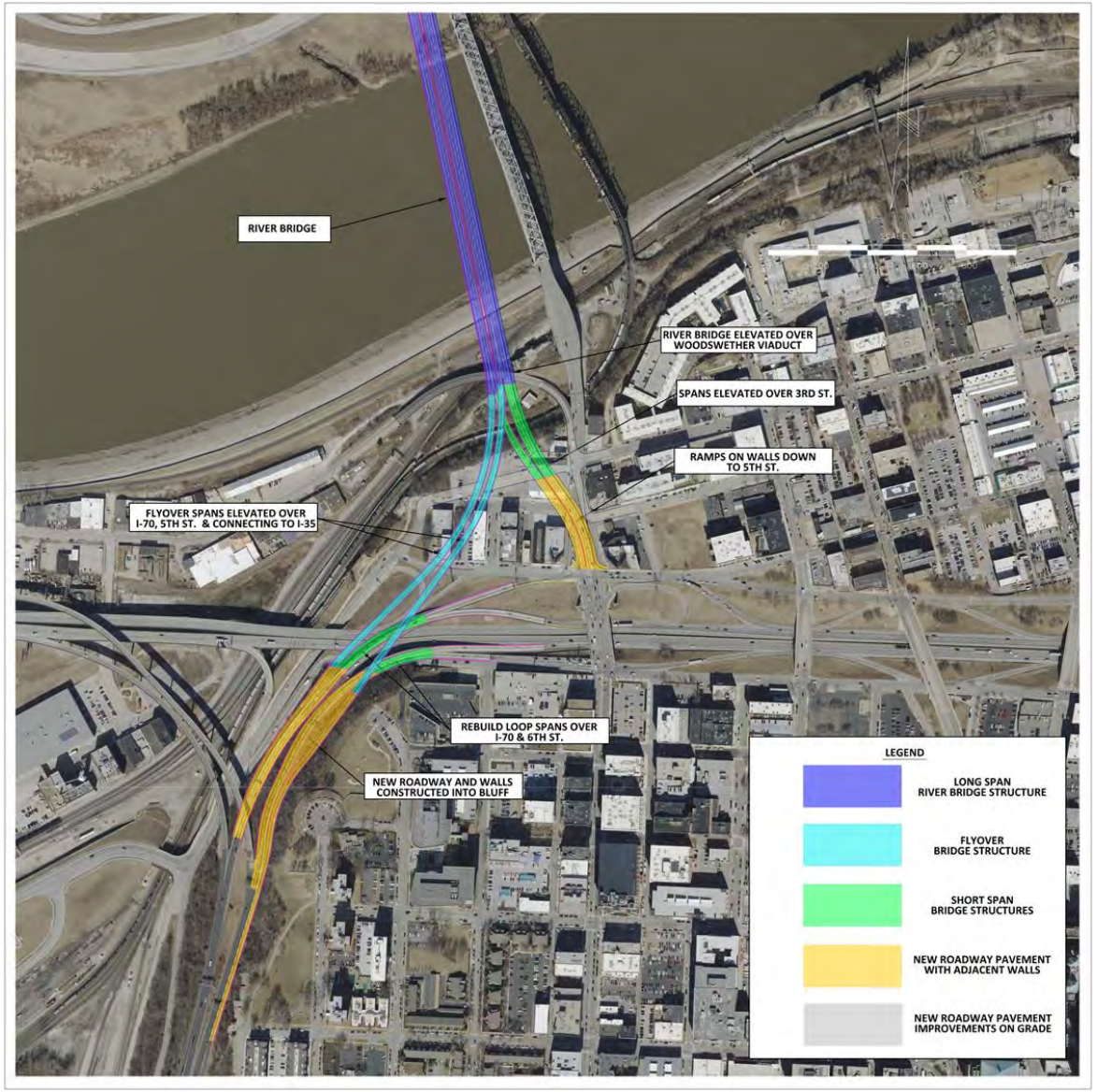
ALTERNATIVES

PROS:

- PROVIDES NEW RIVER BRIDGE
- ACCOMMODATES BICYCLES AND PEDESTRIANS
- IMPROVES AIRPORT AND DOWNTOWN ACCESS
- PROVIDES DIRECT CONNECTIONS TO I-35
- IMPROVES COMMUNITY CONNECTIVITY

CONS:

- REMOVES EXISTING BUCK O'NEIL BRIDGE
- ADDITIONAL RIGHT OF WAY NEEDED
- TEMPORARY CLOSURES ALONG US-169 AND I-70 REQUIRED DURING CONSTRUCTION



NEW RIVER CROSSING – BRIDGE ON ADJACENT ALIGNMENT

ADJACENT ALTERNATIVE

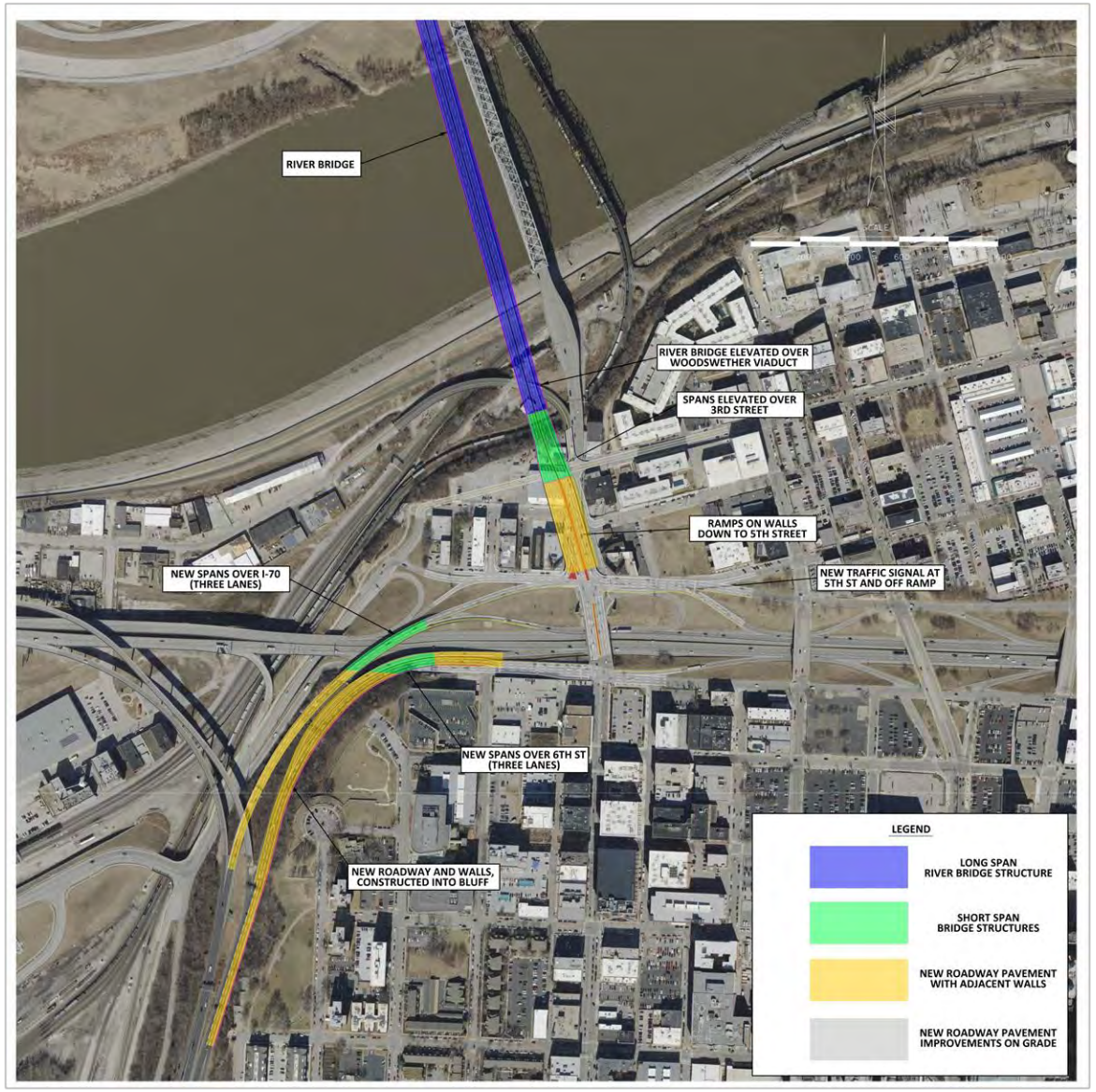
OPTION 1
CAPACITY IMPROVEMENTS AT 5TH/BROADWAY
NO DIRECT CONNECT TO I-35

PROS:

- PROVIDES NEW RIVER BRIDGE
- ACCOMMODATES BICYCLES AND PEDESTRIANS
- IMPROVES AIRPORT AND DOWNTOWN ACCESS
- MINIMIZES AMOUNT OF NEW RIGHT OF WAY NEEDED

CONS:

- REMOVES EXISTING BUCK O'NEIL BRIDGE
- NO DIRECT CONNECTION TO I-35
- DOES NOT IMPROVE COMMUNITY CONNECTIVITY
- TEMPORARY CLOSURES ALONG US-169 AND BROADWAY REQUIRED DURING CONSTRUCTION



ALTERNATIVES

US 169/BUCK O'NEIL BRIDGE
ENVIRONMENTAL STUDY

NEW RIVER CROSSING – BRIDGE ON ADJACENT ALIGNMENT

ADJACENT ALTERNATIVE

OPTION 2
CAPACITY IMPROVEMENTS AT 5TH/BROADWAY
FUTURE DIRECT CONNECT TO I-35

PROS:

- PROVIDES NEW RIVER BRIDGE
- ACCOMMODATES BICYCLES AND PEDESTRIANS
- IMPROVES AIRPORT AND DOWNTOWN ACCESS
- PROVIDES FOR FUTURE DIRECT CONNECTION TO I-35
- MINIMIZES AMOUNT OF NEW RIGHT OF WAY NEEDED

CONS:

- REMOVES EXISTING BUCK O'NEIL BRIDGE
- DOES NOT IMPROVE COMMUNITY CONNECTIVITY
- TEMPORARY CLOSURES ALONG US-169 AND BROADWAY REQUIRED DURING CONSTRUCTION



ALTERNATIVES

NEW RIVER CROSSING – BRIDGE ON ADJACENT ALIGNMENT

ADJACENT ALTERNATIVE

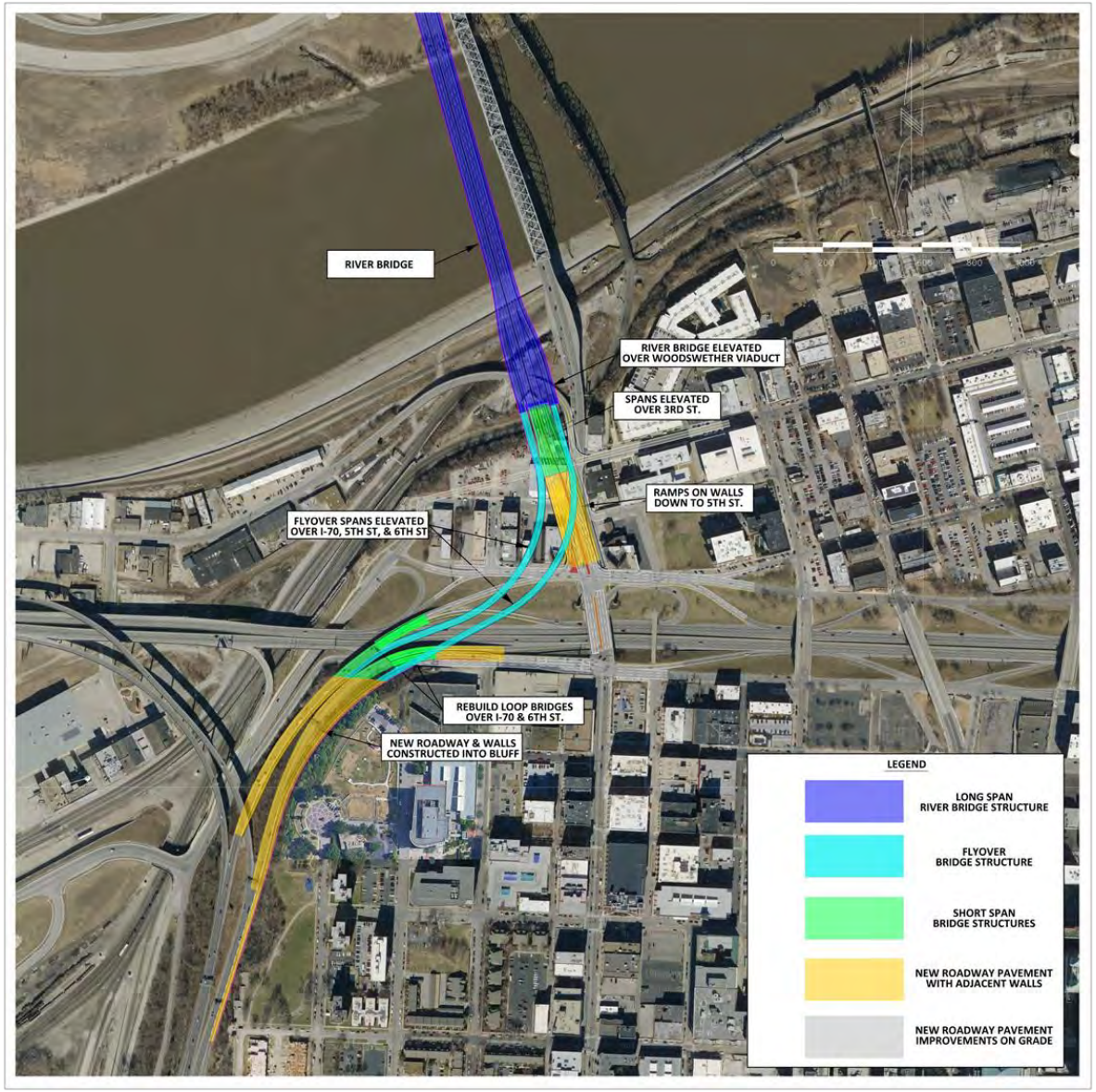
OPTION 3
RAMPS AT BORADWAY, DIRECT CONNECT TO I-35

PROS:

- PROVIDES NEW RIVER BRIDGE
- ACCOMMODATES BICYCLES AND PEDESTRIANS
- IMPROVES AIRPORT AND DOWNTOWN ACCESS
- PROVIDES DIRECT CONNECTION TO I-35
- PARTIALLY IMPROVES COMMUNITY CONNECTIVITY
- MINIMIZES AMOUNT OF NEW RIGHT OF WAY NEEDED

CONS:

- REMOVES EXISTING BUCK O'NEIL BRIDGE
- TEMPORARY CLOSURES ALONG US-169 AND BROADWAY REQUIRED DURING CONSTRUCTION



ALTERNATIVES

Landmark Lofts (residential)

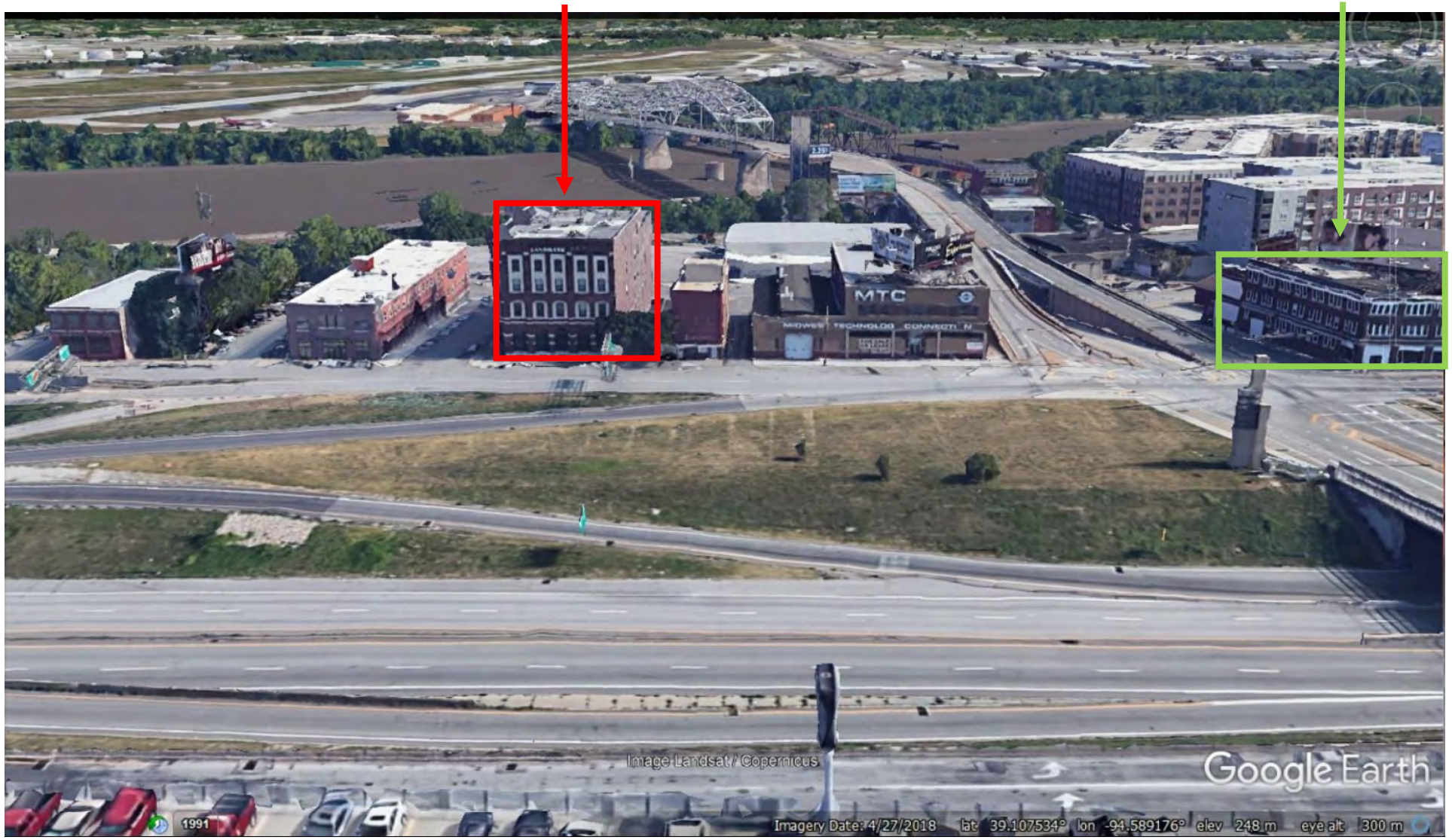
Colonial Patterns (OT-7) eligible



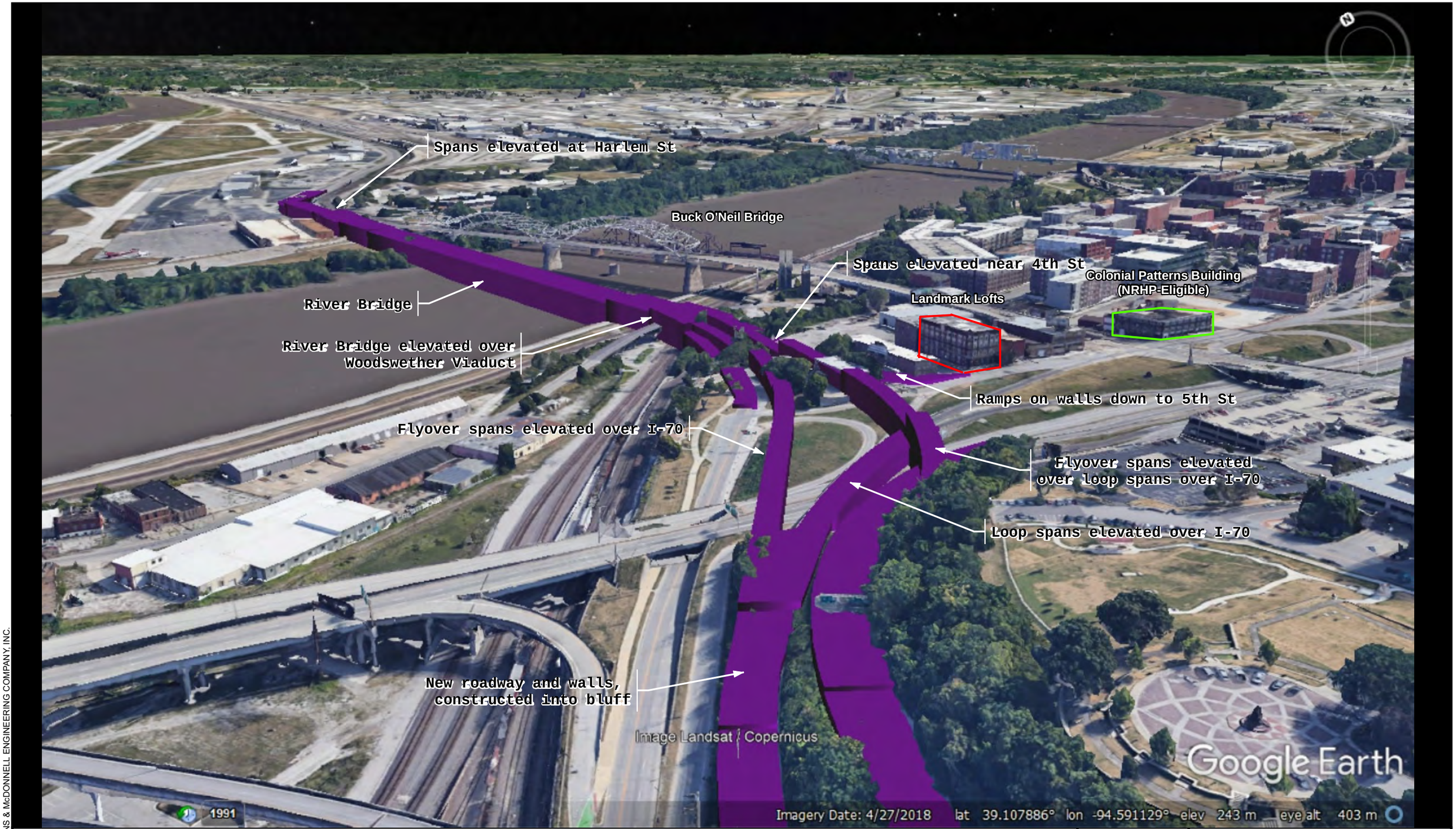
VIEWSHED 1

Landmark Lofts (residential)

Colonial Patterns (OT-7) eligible



VIEWSHED 2



West Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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West Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019



Central Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Central Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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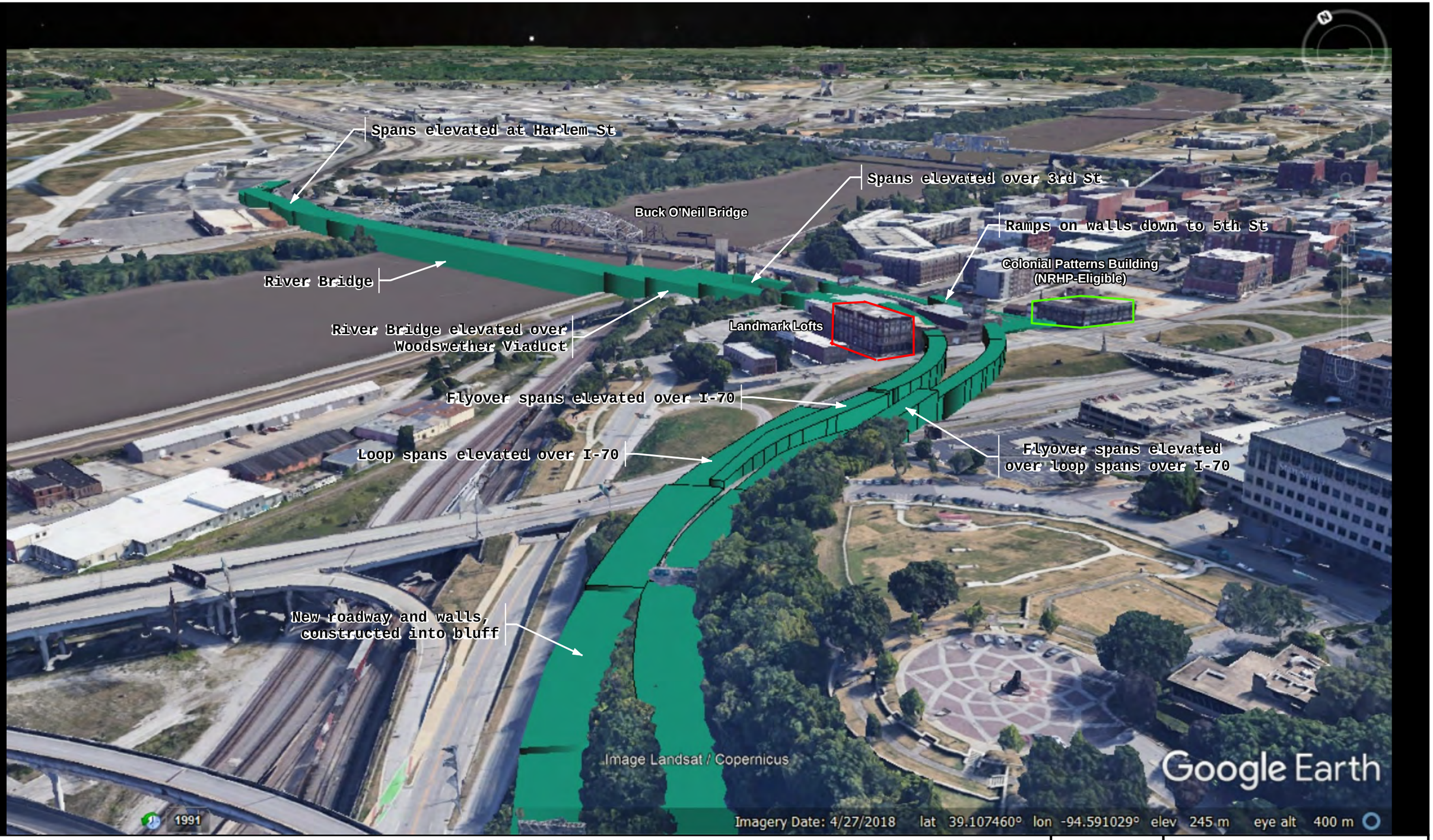

Adjacent Alignment

Adjacent - Options 2 or 3

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Adjacent Alignment

Adjacent - Option 3

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Option 1 Alignment

Adjacent - Option 1

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North Along Broadway Blvd
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/26/2019

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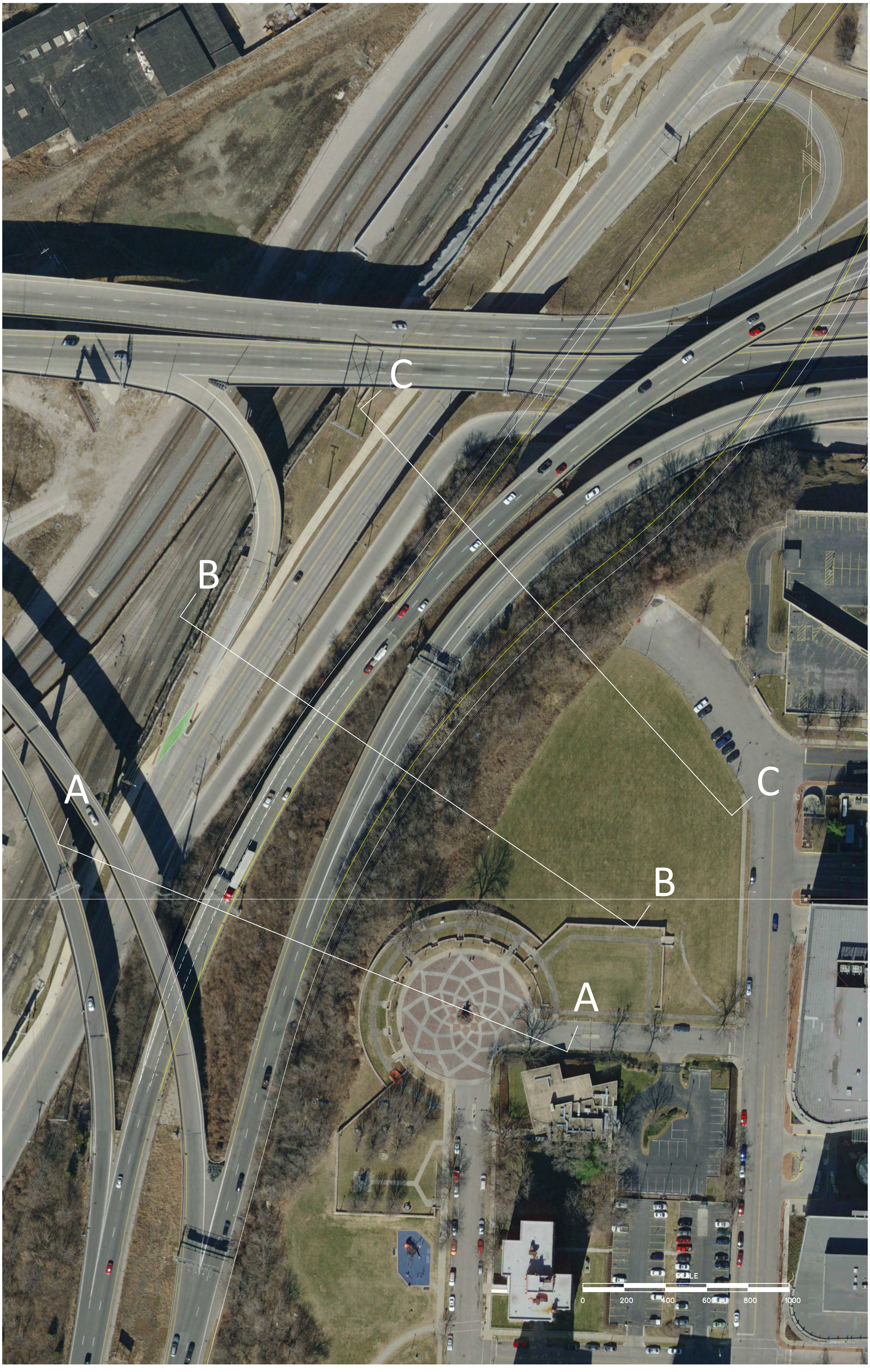
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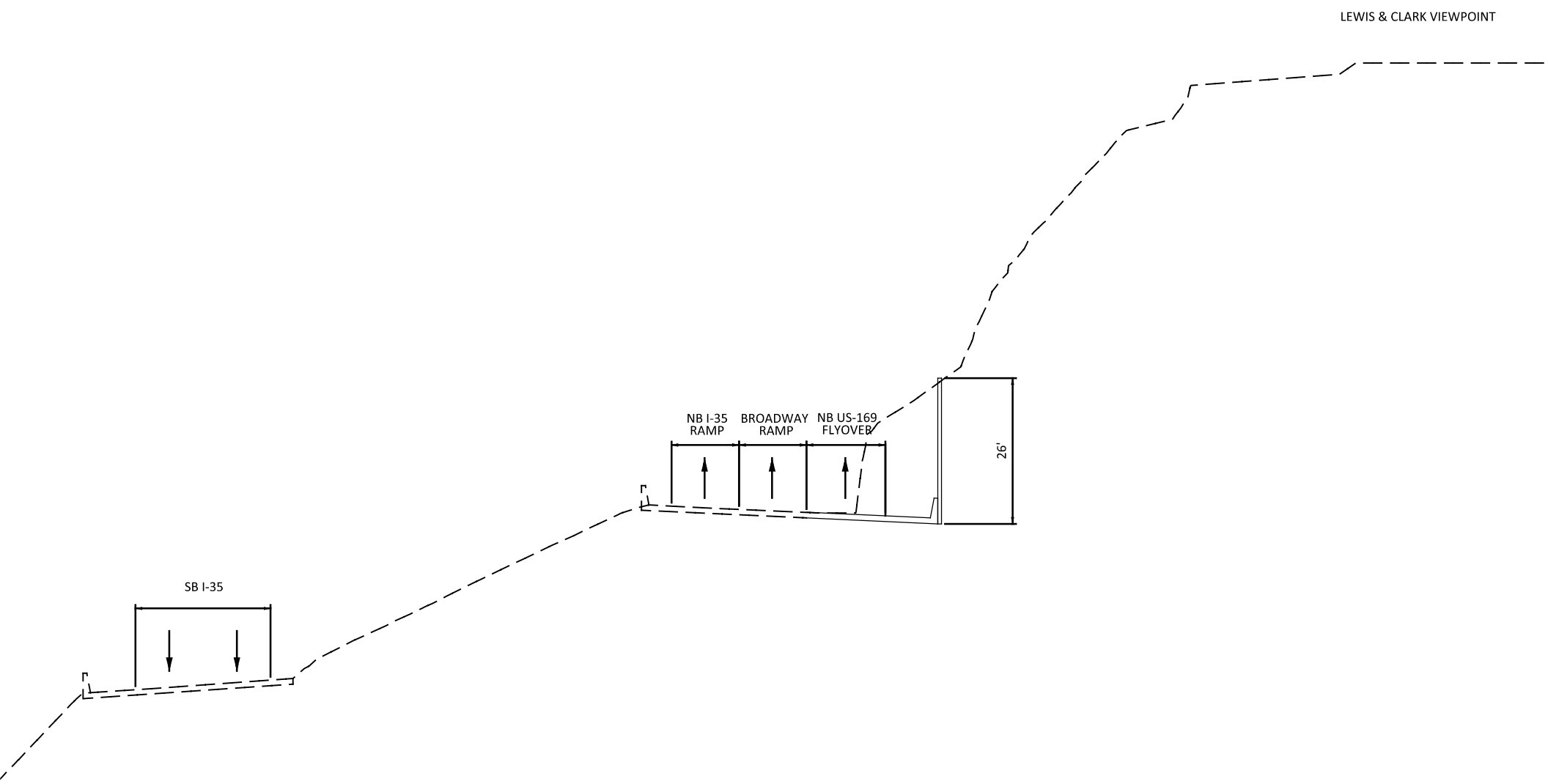
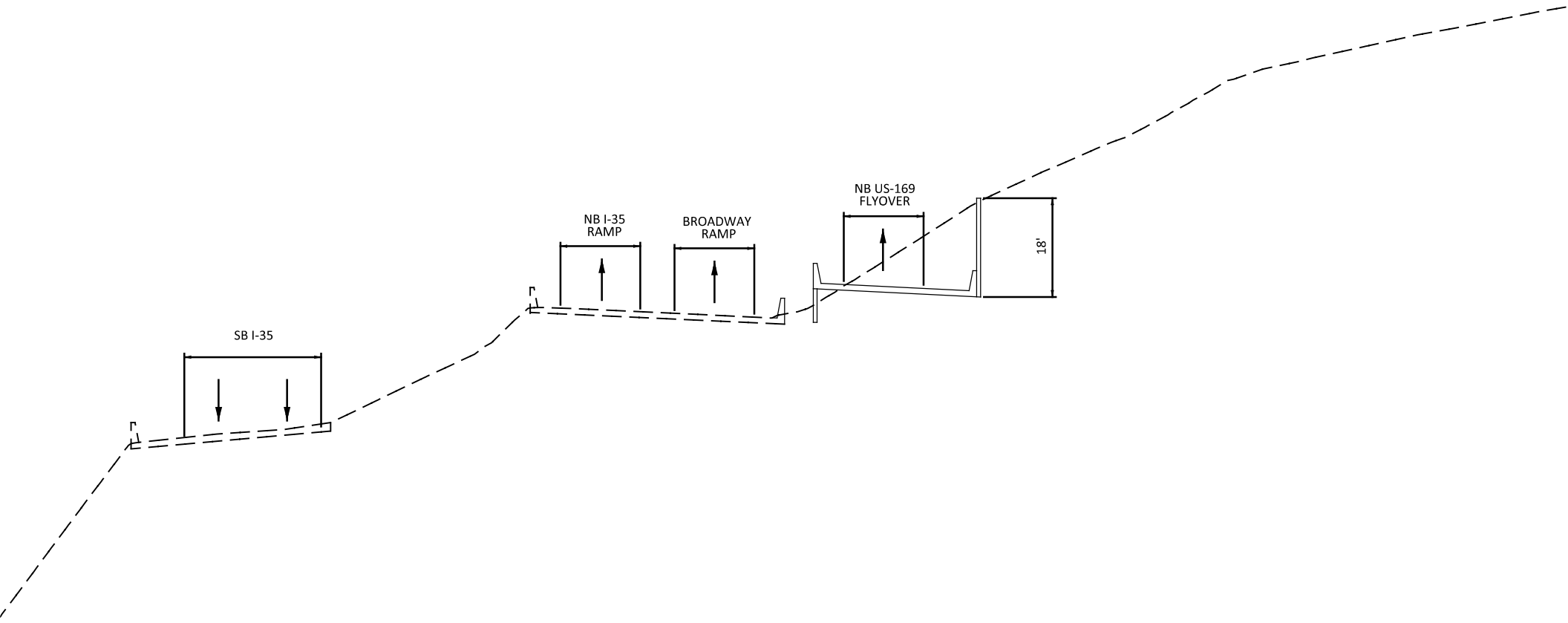
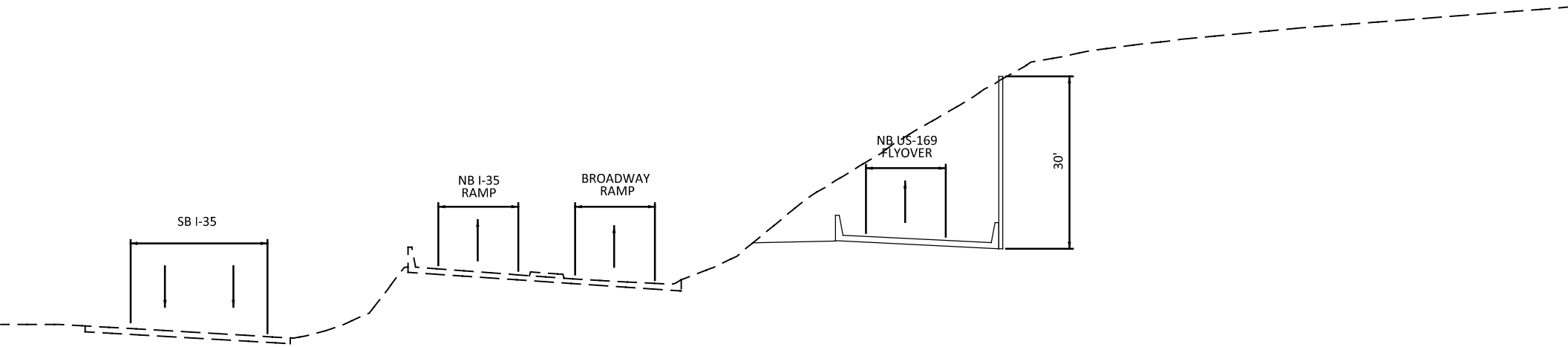

LEWIS & CLARK VIEWPOINT
NB I-35
RAMP
BROADWAY
RAMP
NB US-169
FLYOVER
26'
SB I-35

SECTION A-A



SECTION B-B



SECTION C-C

Preliminary NRHP Effects Assessment* for the US-169/Buck O'Neil Bridge Environmental Study

* This preliminary effects assessment is based on the recommended resource determinations of eligibility dated 24-June-2019; concurrence has not been provided by MoDOT, SHPO, or reviewing consulting parties.

PRELIMINARY

Resources Listed on the National Register of Historic Places (NRHP)

Survey Form Number	Resource and NRHP Status	Locational Data	No Build	West Alternative	Central Alternative	Adjacent Alternative Option 1	Adjacent Alternative Option 2	Adjacent Alternative Option 3
Old Town Neighborhood (OT)								
OT-4	Ackerman-Quigley Litho Company Building Listed: Contributes to Old Town Historic District	Address: 115 W. 5th St. Parcel ID: 54443	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-6	Richards and Conover Hardware Company Building Listed: Individually	Address: 200 W. 5th St. Parcel ID: 90861	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-13	Tootle, Hanna and Leach Dry Goods Company Building Listed: Contributes to Old Town Historic District	Address: 412 Delaware St. Parcel ID: 98357	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-14	McCord & Nave Grocery Listed: Contributes to Old Town Historic District	Address: 412 Delaware St. Parcel ID: 98357	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Wholesale/Garment District Neighborhood (WD)								
WD-1	McPike Drug Company Building Annex Listed: Contributes to Wholesale Historic District	Address: 306 W. 7th St. Parcel ID: 27471	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-2	McPike Drug Company Building Listed: Contributes to Wholesale Historic District	Address: 306 W. 7th St. Parcel ID: 27471	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-3	Kansas City Paper House Listed: Contributes to Wholesale Historic District	Address: 318 W. 7th St. Parcel ID: 2138	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-5	Montgomery Ward & Company/ Isaacs and Company Listed: Contributes to Wholesale Historic District	Address: 600 Broadway Blvd. Parcel ID: 28805	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-6	Reicher & Sons/ A.I. Robinson & Sons Listed: Contributes to Wholesale Historic District	Address: 600 Broadway Blvd. Parcel ID: 28805	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-7	Missouri Interstate Power Company Listed: Contributes to Wholesale Historic District	Address: 600 Central St. Parcel ID: 27466	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-8	Barton Brothers Shoe Company Listed: Contributes to Wholesale Historic District	Address: 609 Central St. Parcel ID: 27447	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-9	Burnham-Hanna-Munger Dry Goods Company Listed: Contributes to Wholesale Historic District	Address: 612 Central St. Parcel ID: 27469	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WD-10	Builders and Traders Exchange Company Building Listed: Contributes to Wholesale Historic District	Address: 612 Central St Parcel ID: 27469	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect

EFFECTS ASSESSMENT

EFFECTS ASSESSMENT

PRELIMINARY

Resources Recommended Eligible [pending MoDOT/SHPO/CP concurrence]								
Survey Form Number	Resource and NRHP Status	Locational Data	No Build	West Alternative	Central Alternative	Adjacent Alternative Option 1	Adjacent Alternative Option 2	Adjacent Alternative Option 3
Woodswether Neighborhood (WW)								
WW-17	Santa Fe Pumping Plant Eligible: Individually	Address: 1200 Woodswether Rd. Parcel ID:54289	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Old Town Neighborhood (OT)								
OT-3	114-118 W. 5th St. Eligible: District Potential	Address: 114-118 W. 5th St. Parcel ID: 54431	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-5	120-122 W. 5th St. Eligible: District Potential	Address: 120-122 W. 5th St. Parcel ID: 54432	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-7	Colonial Patterns Company Eligible: Individually	Address: 340 W. 5th St. Parcel ID: 54448	No Effect	Possible Indirect Effect; building's proximity to roadway potentially altered by bridge and interchange improvements	Possible Indirect Effect; building's proximity to roadway potentially altered by bridge and interchange improvements	Possible Indirect Effect; building's proximity to roadway potentially altered by bridge and interchange improvements	Possible Indirect Effect; building's proximity to roadway potentially altered by bridge and interchange improvements	Possible Indirect Effect; building's proximity to roadway potentially altered by bridge and interchange improvements
OT-20	Broadway "Buck O'Neil" Bridge Eligible: Individually	Address: MO 169 across the Missouri River Parcel ID: N/A	No Effect	Direct Effect	Direct Effect	Direct Effect	Direct Effect	Direct Effect
OT-21	Second Hannibal Bridge Eligible: Individually	Address: BNSF Railroad tracks over the Missouri River Parcel ID: N/A	No Effect	Possible Indirect Effect; viewshed impacts from replacement of Broadway Bridge	Possible Indirect Effect; viewshed impacts from replacement of Broadway Bridge	Possible Indirect Effect; viewshed impacts from replacement of Broadway Bridge	Possible Indirect Effect; viewshed impacts from replacement of Broadway Bridge	Possible Indirect Effect; viewshed impacts from replacement of Broadway Bridge
West Bottoms Neighborhood (WB)								
WB-1	Thorn, Hunkins & Company Warehouse Eligible: Individually	Address: 931 W. 8th St. Parcel ID: 28817	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WB-3	12th Street Trafficway Viaduct Eligible: Individually	Address: From east bluffs to Hickory St. Parcel ID: N/A	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Quality Hill Neighborhood (QH)								
QH-4	8th Street Tunnel Eligible: Individually	Address: From Washington St. to the west bluffs Parcel ID: 28808	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Harlem/Charles B. Wheeler Downtown Airport Neighborhood (HDA)								
HDA-1	Harlem Road Overpass Eligible: Individually	Address: N. Broadway Fwy./NW Harlem Rd. Parcel ID: N/A	No Effect	Possible Direct Effect but subject to Program Comment	Possible Direct Effect but subject to Program Comment	Possible Direct Effect but subject to Program Comment	Possible Direct Effect but subject to Program Comment	Possible Direct Effect but subject to Program Comment
HDA-3	Kansas City, Missouri Water Intake Plant Eligible: Individually	Address: 3200 N. Broadway Fwy. Parcel ID: 90864	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
HDA-5	Transcontinental and Western Airlines Eligible: Individually	Address: 10 NW Richards Rd. Parcel ID: N/A	No Effect	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking
HDA-6	Municipal Airport Terminal Facility Eligible: Individually	Address: 250-300 NW Richards Rd. Parcel ID: N/A	No Effect	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking	Possible Indirect Effect; roadway improvements would bring bridge structure closer to building; could impact access and parking

IMPACT COMPARISON

PRELIMINARY
ALTERNATIVES IMPACT COMPARISON MATRIX
US-169/BUCK O'NEIL BRIDGE ENVIRONMENTAL STUDY

PRELIMINARY

RESOURCE CATEGORY	No Build	West Alternative Ramps to 5th/6th Street, direct connect to I-35	Central Alternative	Adjacent Alternative Option 1 Capacity improvements at 5th/Broadway, no direct connect to I-35	Adjacent Alternative Option 2 Capacity improvements at 5th/Broadway, future direct connect to I-35	Adjacent Alternative Option 3 Ramps to Broadway, direct connect to I-35
Alternative Footprint (ac)	**NA**	**132.24 ac**	**121.52 ac**	**116.85 ac**	**116.85 ac**	**116.85 ac**
Natural Resources						
Floodplain, 100-year (ac)	no construction impacts	28.27 ac	23.36 ac	21.27 ac	21.27 ac	21.27 ac
Wetlands	no construction impacts	PFO/PSS = 0.49 ac PEM = 2.32 ac R2UBH = 9.5 ac	PFO/PSS = 0.5 ac PEM = 2.23 ac R2UBH = 7.92 ac	PFO/PSS = 0.48 ac PEM = 1.98 ac R2UBH = 6.42 ac	PFO/PSS = 0.48 ac PEM = 1.98 ac R2UBH = 6.42 ac	PFO/PSS = 0.48 ac PEM = 1.98 ac R2UBH = 6.42 ac
Woodlands/Forest (potential bat habitat)	no construction impacts	TBD	TBD	TBD	TBD	TBD
Protected Species	no construction impacts	E - Gray bat E - Indiana bat T - Northern long-eared bat E - pallid sturgeon migratory birds no critical habitat	E - Gray bat E - Indiana bat T - Northern long-eared bat E - pallid sturgeon migratory birds no critical habitat	E - Gray bat E - Indiana bat T - Northern long-eared bat E - pallid sturgeon migratory birds no critical habitat	E - Gray bat E - Indiana bat T - Northern long-eared bat E - pallid sturgeon migratory birds no critical habitat	E - Gray bat E - Indiana bat T - Northern long-eared bat E - pallid sturgeon migratory birds no critical habitat
Development and Infrastructure						
Airport Property	no construction impacts	release 8 ac (approx.) relocate Richards Road replace 203 parking spaces remove/replace 1,706 LF security fence	release 8 ac (approx.) relocate Richards Road replace 203 parking spaces remove/replace 1,706 LF security fence	release 8 ac (approx.) relocate Richards Road replace 203 parking spaces remove/replace 1,706 LF security fence	release 8 ac (approx.) relocate Richards Road replace 203 parking spaces remove/replace 1,706 LF security fence	release 8 ac (approx.) relocate Richards Road replace 203 parking spaces remove/replace 1,706 LF security fence
Bicycle/pedestrian facilities	no construction impacts	Existing designated trails/lanes: - 1,861' Woodswether - 1,256' Beardsley Rd - 1,717' KC Riverfront Heritage Trail - 0.02 ac trailhead	Existing designated trails/lanes: - 1,861' Woodswether - 30' Beardsley Rd - 1,448' KC Riverfront Heritage Trail	need extended crossing accommodations at 5th & Broadway	Existing designated trails/lanes: - 1,861' Woodswether - 30' Beardsley Rd - 1,520' KC Riverfront Heritage Trail	Existing designated trails/lanes: - 1,861' Woodswether - 30' Beardsley Rd - 1,520' KC Riverfront Heritage Trail
Cultural Resources	no effect	2 / 4 Buck O'Neil Bridge (direct) Harlem Road Overpass (possible direct) Colonial Patterns (possible indirect) 2nd Hannibal Bridge (possible indirect) T&WA Building (possible indirect) Municipal Airport Terminal (possible indirect) Archaeological site potential	2 / 4 Buck O'Neil Bridge (direct) Harlem Road Overpass (possible direct) Colonial Patterns (possible indirect) 2nd Hannibal Bridge (possible indirect) T&WA Building (possible indirect) Municipal Airport Terminal (possible indirect) Archaeological site potential	2 / 4 Buck O'Neil Bridge (direct) Harlem Road Overpass (possible direct) Colonial Patterns (possible indirect) 2nd Hannibal Bridge (possible indirect) T&WA Building (possible indirect) Municipal Airport Terminal (possible indirect) Archaeological site potential	2 / 4 Buck O'Neil Bridge (direct) Harlem Road Overpass (possible direct) Colonial Patterns (possible indirect) 2nd Hannibal Bridge (possible indirect) T&WA Building (possible indirect) Municipal Airport Terminal (possible indirect) Archaeological site potential	2 / 4 Buck O'Neil Bridge (direct) Harlem Road Overpass (possible direct) Colonial Patterns (possible indirect) 2nd Hannibal Bridge (possible indirect) T&WA Building (possible indirect) Municipal Airport Terminal (possible indirect) Archaeological site potential
Parkland	no effect	1.23 ac West Terrace/Ermine Case Jr Park 0.46 ac River Bluff Park	1.23 ac West Terrace/Ermine Case Jr Park 0.40 ac River Bluff Park	no use	1.23 ac West Terrace/Ermine Case Jr Park 0.5 ac River Bluff Park	1.23 ac West Terrace/Ermine Case Jr Park 0.5 ac River Bluff Park
Regulated/Hazardous Materials	ongoing maintenance of certain bridge components	Shostak Metal Corp (Lead Smelter) Studer Container Services (SEMS) City Environmental Inc. Sunshine Biscuit/Zea Chem USTs - Pacific Tire & Service, Conoco #4, Morris Reisman Property, Lightening Industries Former Airport Tank Farm	Shostak Metal Corp (Lead Smelter) USTs - Pacific Tire & Service, Conoco #4, Morris Reisman Property, Lightening Industries Former Airport Tank Farm	Shostak Metal Corp (Lead Smelter) USTs - Pacific Tire & Service, Conoco #4, Morris Reisman Property, Lightening Industries Former Airport Tank Farm	Shostak Metal Corp (Lead Smelter) USTs - Pacific Tire & Service, Conoco #4, Morris Reisman Property, Lightening Industries Former Airport Tank Farm	Shostak Metal Corp (Lead Smelter) USTs - Pacific Tire & Service, Conoco #4, Morris Reisman Property, Lightening Industries Former Airport Tank Farm
Relocations	no construction impacts	Residential = 0 Business = 3 - Lee Matthews Fluid & Co. Cogent Fluids/Lee Matthews - Offices and Escape Room	Residential = 0 Business = 7 - Boxes & More - Lee Matthews Fluid & Co. - Midwest Technology Corp (MTC) - The Barbette - Cogent Fluids/Lee Matthews - Offices and Escape Room - Unknown Light Industrial	Residential = 0 Business = 5 - Boxes & More - Lee Matthews Fluid & Co. - Midwest Technology Corp (MTC) - The Barbette - Unknown Light Industrial	Residential = 0 Business = 5 - Boxes & More - Lee Matthews Fluid & Co. - Midwest Technology Corp (MTC) - The Barbette - Unknown Light Industrial	Residential = 0 Business = 5 - Boxes & More - Lee Matthews Fluid & Co. - Midwest Technology Corp (MTC) - The Barbette - Unknown Light Industrial
Sensitive Noise Receivers	8 receiver locations that currently exceed 65dBA; number of dwelling units TBD	TBD	TBD	TBD	TBD	TBD
Estimated Construction Cost	undetermined maintenance costs	$230-$250 Million	$210-$230 Million	$180-$200 Million	$180-$200 Million + additional future costs	$210-$230 Million

Mitigation Discussion

Preliminary NRHP Effects Assessment* for the US-169/Buck O'Neil Bridge Environmental Study

*** This preliminary effects assessment is based on the recommended resource determinations of eligibility dated 24-June-2019; concurrence has not been provided by MoDOT, SHPO, or reviewing consulting parties.**

PRELIMINARY

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PRELIMINARY

Resources Recommended Eligible [pending MoDOT/SHPO/CP concurrence]

Survey Form Number	Resource and NRHP Status	Locational Data	No Build	West Alternative	Central Alternative	Adjacent Alternative Option 1	Adjacent Alternative Option 2	Adjacent Alternative Option 3
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MoDOT

105 West Capitol Avenue
P.O. Box 270
Jefferson City, Missouri 65102

Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

December 30, 2019

Dr. Toni Prawl, Director SHPO
MDNR/DSP
P. O. Box 176
Jefferson City, MO 65102

Dear Dr. Prawl:

Subject: Design
Clay and Jackson Counties, Route 169
Job No. J4S3085 (SHPO Log No. 039-MLT-18)
John J. "Buck" O'Neil Bridge Environmental Assessment
Effects Assessment

Please find attached a copy of the effects assessment on properties eligible for or listed on the National Register of Historic Places (NRHP), the State Historic Preservation Office (SHPO) concurrence with the eligibility recommendations on 4 October 2019. A preferred alternative has not been identified. The effects of the various alternatives on the historic properties are summarized on Table 4 of the attached report, beginning on page 10. All alternatives would include the removal of the John J. "Buck" O'Neil Bridge (MoDOT Bridge No. A4649) and the Harlem Road Overpass (MoDOT Bridge No. A4647 and A4648) having an adverse effect on these resources. Each alternative would have either a no adverse effect or no effect on the remaining historic properties. The justifications for these recommendations are included in the report.

Additional historical research was conducted on the Eighth Street Tunnel (survey QH-4) to determine the extent of the historic property and to properly determine the effect of the project on the character defining features of the property. This additional research is presented in this report.

The Missouri Department of Transportation (MoDOT) concurs with the findings in the report. We request the concurrence of the State Historic Preservation Office (SHPO) with this finding. We are also notifying SHPO that concurrence with determinations of "no historic properties affected" or "no historic properties adversely affected" may be used by the Federal Highway Administration in applying the *de minimis* impact criteria for Historic Sites in compliance with Section 4(f) (49 U.S.C. 303).

Efforts to resolve adverse effects will be resolved in accordance with the Section 106 programmatic agreement (PA) being developed for the project. The PA is nearing completion and will be available soon for execution by the SHPO, MoDOT (by the Missouri Highways and Transportation Commission), Federal Highway Administration and the Advisory Council on Historic Preservation.

Should you or any of your staff have any questions, please contact Karen Daniels, MoDOT Senior Historic Preservation Specialist, at Karen.Daniels@modot.mo.gov or (573) 526-7346.

Sincerely,

Michael C. Meinkoth
Historic Preservation Manager

Attachments

Copies: Mr. David Silvester – KC-ao
Mr. Shelie Daniel – CO-de
Ms. Raegan Ball – FHWA
Consulting parties—by e-mail (w/ attachment)

Karen Daniels

From: Karen Daniels
Sent: Wednesday, October 16, 2019 7:41 AM
To: Alyssa Parsons (parsons.alyssa@gmail.com); Amanda Burke; Ashley N. Porter; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org); Brandy Harris (bmharris@burnsmcd.com); Cydney Millstein; Diane Hunter; Gerri A. Doyle; Griffin T. Smith; Julie Sarson (jsarson@burnsmcd.com); Mandy Ranslow; Martin Rivarole; Matthew Burcham; Michael Landvik; Michael Meinkoth; Raegan Ball; Shari Cannon-Mackey; Taylor Peters; Tyler Holladay
Subject: MO: Clay-Jackson 169, J4S3085, Buck O'Neil Bridge EA, Section 106 Programmatic Agreement for Review
Attachments: 4S3085_ITA_DRAFT1.pdf; 4S3085_PA_DRAFT2.docx

All,

Attached for your review and comment is the draft Section 106 Programmatic Agreement (PA) and Information to Accompany (ITA) for the Buck O'Neil Bridge Environmental Assessment. The PA is a word document in track changes mode, so you can make edits and comments directly in the document and send it back to me. The ITA explains how we've gotten to here in the process.

I would appreciate comments back by November 15, 2019. The Missouri SHPO and I have scheduled a comment resolution meeting for November 20 at 10 a.m. (central time). If anyone else would like to participate in that meeting, let me know and I will make the appropriate arrangements. We hope to have a final document hammered out at the end of the meeting ready for legal review, addressing whatever comments come in.

I will send the appendices to the Information to Accompany by ftp so as not to clog up e-mail boxes.

Amanda, the SHPO log number for the project is 039-MLT-18.

Thank you all again for your assistance with the project, your help, especially in brainstorming mitigation ideas, is invaluable.

Karen

Karen L. Daniels
Senior Historic Preservation Specialist
Missouri Department of Transportation
P. O. Box 270
Jefferson City, MO 65102
573.526.7346 (office)
573.508.2209 (mobile)
573.522.1973 (fax)
Karen.Daniels@modot.mo.gov
https://www.modot.org/historic-preservation
https://www.modot.org/free-bridges

Karen Daniels

From: Burke, Amanda <Amanda.Burke@dnr.mo.gov>
Sent: Tuesday, October 8, 2019 2:39 PM
To: Karen Daniels
Subject: RE: Clay-Jackson 169, J4S3085--update on resource eligibility and bridge mitigation measures

Karen,

Thanks for the update. This is a well-round list and does a good job of capturing the varied ideas presented during consultation.

Best,

Amanda Burke, MFA
Historic Preservation Specialist
Missouri SHPO
PO Box 176
Jefferson City, MO 65102
Phone: 573.522.4641

From: Karen Daniels <Karen.Daniels@modot.mo.gov>
Sent: Tuesday, October 8, 2019 2:19 PM
To: Alyssa Parsons (parsons.alyssa@gmail.com) <parsons.alyssa@gmail.com>; Burke, Amanda <Amanda.Burke@dnr.mo.gov>; Ashley N. Porter <Ashley.Porter@modot.mo.gov>; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org) <Bradley_Wolf@kcmo.org>; Brandy Harris (bmharris@burnsmcd.com) <bmharris@burnsmcd.com>; Cydney Millstein <cydney@ahr-kc.com>; Diane Hunter <dhunter@miamination.com>; Gerri A. Doyle <Gerri.Doyle@modot.mo.gov>; Smith, Griffin <griffin.smith@modot.mo.gov>; jsarson.burnsmcd.com <jsarson@burnsmcd.com>; Mandy Ranslow <mranslow@achp.gov>; mrivarola@marc.org; Burcham, Matthew <matthew.burcham@modot.mo.gov>; Landvik, Michael <michael.landvik@modot.mo.gov>; Meinkoth, Michael <michael.meinkoth@modot.mo.gov>; raegan.ball.dot.gov <raegan.ball@dot.gov>; Shari Cannon-Mackey <scannonmackey@burnsmcd.com>; Taylor Peters <taylor.peters@dot.gov>; Tyler Holladay <Tyler.Holladay@modot.mo.gov>
Subject: Clay-Jackson 169, J4S3085--update on resource eligibility and bridge mitigation measures

All,

I just wanted to provide a quick update on a couple of items:

- The State Historic Preservation Office has concurred with the resource eligibility recommendations made for resources that are individually eligible and for the potential district expansion of the Old Town Historic District.
- Thank you all for getting back with me prioritizing bridge mitigation ideas. Thanks to your input, MoDOT plans to include the following mitigation measures for bridges that will be adversely affected by the project:
    - State Level 1 Documentation
    - An Interpretive Panel along the Riverfront Heritage Trail—exact location to be determined
    - A traveling exhibit
    - Story Maps on major river crossings in the Kansas City area
    - And, if Science City is willing, working with them to expand offerings they have on transportation in the Kansas City area to include additional information on the Broadway Bridge—obviously we need to talk with Science City about that one

Those mitigation measures provide good base-line documentation of the bridge and provide several ways to get the information to the public in ways that they will find interesting and informative—always a good goal for mitigation.

We are working on the draft of the Programmatic Agreement and you should have it for review next week.

Thank you all again for your assistance in this process, it would not be possible without you.

Karen

Karen L. Daniels
Senior Historic Preservation Specialist
Missouri Department of Transportation
P. O. Box 270
Jefferson City, MO 65102
573.526.7346 (office)
573.508.2209 (mobile)
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Karen.Daniels@modot.mo.gov
https://www.modot.org/historic-preservation
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Karen Daniels

From: Karen Daniels
Sent: Tuesday, October 8, 2019 2:19 PM
To: Alyssa Parsons (parsons.alyssa@gmail.com); Amanda Burke; Ashley N. Porter; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org); Brandy Harris (bmharris@burnsmcd.com); Cydney Millstein; Diane Hunter; Gerri A. Doyle; Griffin T. Smith; Julie Sarson (jsarson@burnsmcd.com); Mandy Ranslow; Martin Rivarole; Matthew Burcham; Michael Landvik; Michael Meinkoth; Raegan Ball; Shari Cannon-Mackey; Taylor Peters; Tyler Holladay
Subject: Clay-Jackson 169, J4S3085--update on resource eligibility and bridge mitigation measures

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Karen

Karen L. Daniels
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Missouri Department of Transportation
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https://www.modot.org/free-bridges

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

October 4, 2019

Mr. Michael Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65102

Re: **SHPO Project Number 039-MLT-18** Job No. J4S3085, Buck O'Neil Bridge over Missouri River, Kansas City, Jackson and Clay Counties, Missouri (FHWA)

Dear Mr. Meinkoth:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the cultural resources report for the US-169/Buck O'Neil Bridge Environmental Study Area which included both an archaeological summary and an architectural survey. Based on our review of the documentation, we concur with the report recommendations. More particularly, we concur that the following properties may be eligible for listing individually in the National Register of Historic Places (NRHP):

- WW-17 - Santa Fe Pumping Plant 1200 Woodswether Road
- OT-7 –Colonial Patterns Company 340 West 5th Street
- OT-20 –Broadway Bridge/ Buck O'Neil Bridge
- OT-21 –Second Hannibal Bridge
- WB-1 –Faultless Starch/Standard Seed Company 931 West 8th Street
- WB-3 -12th Street Trafficway Viaduct
- QH-4 -8th Street Tunnel
- HDA-1 – Harlem Road Overpass
- HDA-3 –Kansas City, Missouri Water Intake Plant 3200 North Broadway Fwy.
- HDA-5 –Transcontinental & Western Airlines 10 Northwest Richards Road
- HDA-6 –Municipal Airport Terminal Facility 250-300 Northwest Richards Road

We concur that the following properties may be eligible for listing in the NRHP as contributing buildings to the Old Town Historic District:

- OT-3 -114-118 West 5th Street
- OT-5 -120-122 West 5th Street

It is our understanding that the alternative selection has not been completed and therefore it is not possible to assess effects to the above listed historic properties at this time. We

Recycled paper

look forward to consulting with your office on the assessment of effects to the historic properties when it is practicable to do so.

Please be advised that, should project plans change, information documenting the revisions should be submitted to this office for further review. In the event that cultural materials are encountered during project activities, all construction should be halted, and this office notified as soon as possible in order to determine the appropriate course of action.

If you have any questions, please write the State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 attention Review and Compliance, or call Amanda Burke at 573/522-4641. Please be sure to include the SHPO Log Number (**039-MLT-18**) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl

Toni M. Prawl, Ph.D.
Director and Deputy State
Historic Preservation Officer

TMP:ab

c. Ms. Raegan Ball, FHWA
Mr. Taylor Peters, FHWA

Karen Daniels

From: Karen Daniels
Sent: Wednesday, September 11, 2019 9:24 AM
To: Alyssa Parsons (parsons.alyssa@gmail.com); Amanda Burke; Ashley N. Porter; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org); Brandy Harris (bmharris@burnsmcd.com); Cydney Millstein; Diane Hunter; Gerri A. Doyle; Griffin T. Smith; Julie Sarson (jsarson@burnsmcd.com); Mandy Ranslow; Martin Rivarole; Matthew Burcham; Michael Landvik; Michael Meinkoth; Raegan Ball; Shari Cannon-Mackey; Taylor Peters; Tyler Holladay
Subject: Clay-Jackson 169, J4S3085, Prioritization of mitigation ideas
Attachments: Mitigation_Ideas_Prioritization.docx; Mitigation_Brainstorming_catagorized.docx

All,

One additional idea was received about a potential mitigation measure for project effects on the Buck O'Neil Bridge—a video (content and platform to be determined). I would like every consulting party organization to rank their top 10 ideas that were developed through the brainstorming session and return those rankings to me by September 25, 2019. This will help us identify the appropriate mitigation measures to include in the PA we are developing.

For your convenience, I've included the table in this e-mail (if you just want to hit reply) and as an attachment (if you want to do it in the word document and return that to me). I tried to set up a survey, but it just wasn't working for me today.

Thank you all for your assistance during the consultation process and for helping FHWA and MoDOT develop appropriate mitigation measures for project effects. We also have mitigation measures for buildings, and we will address those as well, but it does not currently appear that we will be having adverse effects on architectural resources.

If you have any questions, please e-mail or call.

Karen

Rank	Bridge Mitigation Idea
	HAER Recordation
	State Level I Documentation
	NRHP nominations for adjacent resources—2nd Hannibal Bridge, TWA Building
	Work with HNTB to view their documentation on the bridge
	Video of bridge (platform and viewing options TBD)

	Permanent interpretive panels at site of bridge—possibly at Town of Kansas site--include Broadway Bridge, First Hannibal Bridge, 2nd Hannibal Bridge
	Interpretive panel on the new bridge (bike/pedestrian access)
	Riverfront Heritage Trail—interpretive panel
	Bluff Park—interpretive panel in park overlooking the entire area, panel discussing history of area, development of area, development of highways and the effects these had
	Use bump-outs on bike/ped area for interpretation
	Exhibit at Library or Museum
	Traveling exhibit—series of panels to be displayed in various areas—libraries, museums, AIA-KC, ASCE exhibit area, etc.
	Local school involvement –curriculum development
	Local school involvement –Field visit
	Local school involvement –Bring structure to classroom
	Science City—approach them about developing something for schools
	STEM outreach—construction then & now (differences in construction techniques between 1950s and today) (it would be possible to work this into the story map above)
	SIA articles (in Journal or Newsletter) about the bridge
	Story Maps about major river crossings in the Kansas City area
	Kaw River Bridge Study—replicate that for the Buck O'Neil Bridge
	Use arches on the bottom of bridge
	Incorporate arches into railing of new bridge to reflect Buck O'Neil Bridge
	Follow Kansas City 1% for Arts Program
	Name of the new bridge—will be Buck O'Neil Bridge

Amanda—SHPO Log No. 039-MLT-18

Karen L. Daniels
Senior Historic Preservation Specialist
Missouri Department of Transportation
P. O. Box 270
Jefferson City, MO 65102

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573.522.1973 (fax)
Karen.Daniels@modot.mo.gov
https://www.modot.org/historic-preservation
https://www.modot.org/free-bridges

Karen Daniels

From: Karen Daniels
Sent: Wednesday, August 28, 2019 8:04 AM
To: Alyssa Parsons (parsons.alyssa@gmail.com); Amanda Burke; Ashley N. Porter; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org); Brandy Harris (bmharris@burnsmcd.com); Cydney Millstein; Diane Hunter; Gerri A. Doyle; Griffin T. Smith; Julie Sarson (jsarson@burnsmcd.com); Mandy Ranslow; Martin Rivarole; Matthew Burcham; Michael Landvik; Michael Meinkoth; Raegan Ball; Shari Cannon-Mackey; Taylor Peters; Tyler Holladay
Subject: Clay-Jackson 169, J4S3085, Buck O'Neil Bridge, Mitigation Brainstorming
Attachments: Mitigation_Brainstorming.docx; Mitigation_Brainstorming_catagorized.docx

All,

Thank you to those who were able to participate in the consultation meeting yesterday, for your brainstorming ideas on potential mitigation measures for bridges and architectural resources. The ideas that were generated yesterday are attached.

To those who were not able to attend, I would still love to hear any ideas you might have and will add them to the list.

I am actually attaching two lists to this e-mail. One is the results of the brainstorming as the ideas were generated, the other is the list of ideas categorized by documentation, interpretation and education. I have added links where I thought they would be helpful, so that everyone would have an idea what an example of HAER documentation vs. State Level documentation is, what story maps can be (and there are a lot of examples out there, I just like Texas because they have several on one web-site), etc.

I would love to hear additional ideas. Once we have generated a list of ideas, I will send them out and ask everyone to prioritize the ideas for the ones they would most like to see done.

I do ask that you do not “reply all” with new ideas, I don’t want anyone’s e-mail getting filled up.

Please have mitigation ideas to me by September 9, 2019.

Thank you all for your assistance,

Karen

Karen L. Daniels
Senior Historic Preservation Specialist
Missouri Department of Transportation
P. O. Box 270
Jefferson City, MO 65102
573.526.7346 (office)
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Karen.Daniels@modot.mo.gov
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Bridge Mitigation Ideas

- HAER Recordation (Here is a link to the Paseo Bridge for an example of HAER Documentation: https://www.loc.gov/pictures/collection/hh/item/mo1931/)
- State Level I Documentation (Here is a link to the Missouri River Daniel Boone Bridge for an example of State Level I Documentation: https://library.modot.mo.gov/RDT/reports/historicbridges/Daniel_Boone_Bridge_J1000_Report.pdf)
- Exhibit at Library or Museum
- Traveling exhibit—series of panels to be displayed in various areas—libraries, museums, AIA-KC, ASCE exhibit area, etc.
- Local school involvement with the structure?
    - Curriculum development about the bridges
    - Field visit
    - Bring structure to classroom
- Science City—approach them about developing something for schools
- Permanent interpretive panels at site of bridge—possibly at Town of Kansas site--include Broadway Bridge, First Hannibal Bridge, 2nd Hannibal Bridge
- NRHP nominations for adjacent resources—2nd Hannibal Bridge, TWA Building
- SIA articles (in Journal or Newsletter) about the bridge
- Story Maps about major river crossings in the Kansas City area (include link to a story map project) (Here is a link to TexDOT Beyond the Road project, scroll down to Story Maps to see some examples: https://www.txdot.gov/inside-txdot/division/environmental/beyond-the-road.html).
- Kaw River Bridge Study—replicate that for the Buck O'Neil Bridge (Here is a link to the Kaw River Bridge Study: https://www.marc.org/Regional-Planning/Creating-Sustainable-Places/assets/UG_1705-18-0329-KAW-RIVER-BRIDGE-STUDY-FOR-P.aspx)
- STEM outreach—construction then & now (differences in construction techniques between 1950s and today) (it would be possible to work this into the story map above)
- Work with HNTB to view their documentation on the bridge
- Interpretive panel on the new bridge (bike/pedestrian access)
- Riverfront Heritage Trail—interpretive panel
- Bluff Park—interpretive panel in park overlooking the entire area, panel discussing history of area, development of area, development of highways and the effects these had
- Use arches on the bottom of bridge
- Incorporate arches into railing of new bridge to reflect Buck O'Neil Bridge
- Follow Kansas City 1% for Arts Program
- Use bump-outs on bike/ped area for interpretation
- Name of the new bridge—will be Buck O'Neil Bridge

Architectural Mitigation ideas:

- Include on interpretive panel at bluff park with changes in area
- NRHP nominations for adjacent properties
- Story map could have approach to include this
- Educational component/traveling exhibits could include this
- History of downtown airport in interpretive panel (possibly work with TWA Museum)
- Context for all of area, include Jefferson Highway
- Work with Port Authority or River Market to develop walking tour
- Focus on transportation history of area: 1st Hannibal Bridge, Airport, 2nd Hannibal Bridge, vehicles on Railroad bridge, Buck O'Neil Bridge

Bridge Mitigation Ideas

- Documentation
    - HAER Recordation (Here is a link to the Paseo Bridge for an example of HAER Documentation: https://www.loc.gov/pictures/collection/hh/item/mo1931/)
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- Incorporate arches into railing of new bridge to reflect Buck O'Neil Bridge
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- Name of the new bridge—will be Buck O'Neil Bridge

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    - Focus on transportation history of area: 1st Hannibal Bridge, Airport, 2nd Hannibal Bridge, vehicles on Railroad bridge, Buck O'Neil Bridge
- Education
    - Story map could have approach to include this
    - Work with Port Authority or River Market to develop walking tour
- NRHP nominations for adjacent properties
- Context for all of area, include Jefferson Highway

Karen Daniels

From: Burke, Amanda <Amanda.Burke@dnr.mo.gov>
Sent: Wednesday, August 21, 2019 4:04 PM
To: Karen Daniels
Cc: raegan.ball.dot.gov; Peters, Taylor; Michael Meinkoth; Rubingh, Amy
Subject: RE: 039-MLT-18 MoDOT Job 4S3085 Cultural Resources Summary US-169 Buck O'Neil Bridge

Karen,

Thanks for clarifying about these bridges. I see now they are covered in the Highway Bridges table. I did not look there as I was thinking the bridges are not on a highway, or at least not on one identified in the map so I did not check the table. Sorry for the oversight.

Amanda Burke, MFA
Historic Preservation Specialist
Missouri SHPO
PO Box 176
Jefferson City, MO 65102
Phone: 573.522.4641

From: Karen Daniels <Karen.Daniels@modot.mo.gov>
Sent: Wednesday, August 21, 2019 3:59 PM
To: Burke, Amanda <Amanda.Burke@dnr.mo.gov>
Cc: raegan.ball.dot.gov <raegan.ball@dot.gov>; Peters, Taylor <taylor.peters@dot.gov>; Meinkoth, Michael <michael.meinkoth@modot.mo.gov>; Rubingh, Amy <Amy.Rubingh@dnr.mo.gov>
Subject: RE: 039-MLT-18 MoDOT Job 4S3085 Cultural Resources Summary US-169 Buck O'Neil Bridge

Amanda,

I believe this format is fine, since we will need concurrence on effects, and with lingering questions about eligibility, waiting for correspondence to go back and forth is time the project really doesn't have.

One note, your bullet about bridges S029B45 and S029B44—both bridges are 1951 steel girder spans covered by the Program Comment for Post-1945 Concrete and Steel Bridges. If you think there is a reason they should be pulled out, please let me know.

I have forwarded your comments to Burns & Mac to address.

Karen

From: Burke, Amanda [mailto:Amanda.Burke@dnr.mo.gov]
Sent: Wednesday, August 21, 2019 3:47 PM
To: Karen Daniels
Cc: raegan.ball.dot.gov; Peters, Taylor; Michael Meinkoth; Rubingh, Amy
Subject: 039-MLT-18 MoDOT Job 4S3085 Cultural Resources Summary US-169 Buck O'Neil Bridge

Karen,

In our meeting on 8/8 you requested that my comments on the Cultural Resources Summary for the US-169 Buck O'Neil Bridge be provided to you via email instead of through a formal letter as this report was only evaluating eligibility of resources in the APE and does not contain a determination of effect. I am sending you this before Amy has had a chance to review the archaeological portion of the report. I have copied her here and will ask her to respond to this email with her comments. I hope this is acceptable. Please let me know if MoDOT/FHWA would like me to follow up with an official letter or if you have any questions or concerns. My comments are as follows:

- More information on the context of the Charles B. Wheeler Downtown Airport is needed in the body of the architectural survey to evaluate the eligibility of the properties. While the significance of T&WA may be widely known a little more information should be included in the report to assist in the National Register eligibility evaluation.
- The architectural survey contains some context on significant roads in the area. It would be helpful if a map similar to the bridges map (BA-4.2) was included showing the location of these roads in the APE.
- WW-12 provide more information on the history and changes the buildings have undergone to assist in determining eligibility.
- WW-17 needs more discussion of the 1963 addition to evaluate the eligibility of the resource.
- S029B45 & S029B44 in the WW area- a form for these bridges that details integrity, history, significance, and eligibility should be provided.
- OT-8 This property needs to be evaluated with the 1954 changes as potential historic alterations to determine its eligibility.
- OT-13 & OT-14 have the same address on the form. Is this correct?
- OT-19 appears to be associated with OT-21 if they are then would OT-19 be a contributing building if OT-21 was listed in the National Register? If so, please identify this on the forms. Also, provide more information on changes to OT-19.
- OT-20 (Broadway/Buck O'Neil Bridge) and HAD-1 (Harlem Rd Bridge) appear to have been constructed at the same period. If so and you cannot access one without going over the other, perhaps these are associated resources and should be discussed as such.
- WB-1 Need additional information to establish eligibility.
- HAD-5 revise to include criteria and areas of significance for the properties National Register eligibility. In addition, box 41 of the inventory form contains quotation marks but no citation to indicate where the quote is from.
- HAD-6 Need information on when the two-story curved portion was changed and the effects of those changes on the eligibility of the building need to be assessed.

Regards,

Amanda Burke, MFA
Historic Preservation Specialist
Missouri SHPO

PO Box 176
Jefferson City, MO 65102
Phone: 573.522.4641

Karen Daniels

From:	Karen Daniels
Sent:	Tuesday, August 20, 2019 6:28 AM
To:	'rona@marc.org'; 'mrivarola@marc.org'; Alyssa Parsons (parsons.alyssa@gmail.com); Amanda Burke; Ashley N. Porter; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org); Cydney Millstein; Diane Hunter; Gerri A. Doyle; Julie Sarson (jsarson@burnsmcd.com); Mandy Ranslow; Matthew Burcham; Michael Landvik; Michael Meinkoth; Raegan Ball; Shari Cannon-Mackey; Taylor Peters; Tyler Holladay
Subject:	Clay-Jackson 169, J4S3085, John J. "Buck" O'Neil Bridge EA, Consultation Meeting #3 Materials
Attachments:	2019_08_08_Meeting_Minutes_for distribution.pdf; Agenda_DRAFT.pdf; Buck_ONeil_alternatives.pdf; Criteria for Meaningful Mitigation.pdf; Criteria of Adverse Effect.pdf; DRAFT Broadway Bridge-US 169 NRHP Effects Assessment Matrix_archaeo_2019-AUG-18.pdf; DRAFT Broadway Bridge-US 169 NRHP Effects Assessment Matrix_historic_2019-AUG-18.pdf

All,

Thank you again for your participation in the consultation meeting and field visit on property eligibility on August 8, 2019. The notes from that meeting are attached. Please review the notes and let me know if you have any corrections.

Please find attached materials for review prior to the next consultation meeting on August 27, 2019 (1-4 p.m.) where we will be discussing effects of the various alternatives on the historic properties and start brainstorming mitigation measures.

Attached for your review are:

- Agenda—with meeting location and call in information
- Alternatives—these are the same alternatives that are being shown in the on-line public meeting
- Criteria of Adverse effect—summary of the regulations on adverse effect
- Draft effects tables for historic and archaeological (known) resources
- Criteria for meaningful mitigation—this was developed by Pennsylvania, and something that we wanted to try to help consulting parties understand what meaningful mitigation should be—something that gives back to the community where adversely affected resources are

I will have hard copies of all these available for those who participate in the meeting in Kansas City.

Also, I would like to remind everyone that the on-line public meeting is available on the MoDOT web-site: https://www.modot.org/buck-oneil-environmental-study-online-public-meeting; I encourage everyone to take a look. There is a discussion of the slight change to the project Purpose and Need in the first five minutes of the presentation that is worth looking at.

Thank you again for taking time to assist FHWA and MoDOT with our Section 106 responsibilities. It is only because of the participation of consulting parties that we are able to develop mitigation measures that give back to the community.

I look forward to seeing/talking with you next week.

Karen

Karen L. Daniels
Senior Historic Preservation Specialist
Missouri Department of Transportation
P. O. Box 270
Jefferson City, MO 65102
573.526.7346 (office)
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Karen.Daniels@modot.mo.gov
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https://www.modot.org/free-bridges

Karen Daniels

From: Karen Daniels
Sent: Thursday, August 15, 2019 12:34 PM
To: Alyssa Parsons (parsons.alyssa@gmail.com); Amanda Burke; Ashley N. Porter; Brad Wolf - City of Kansas City (Bradley_Wolf@kcmo.org); Cydney Millstein; Diane Hunter; Gerri A. Doyle; Julie Sarson (jsarson@burnsmcd.com); Mandy Ranslow; Matthew Burcham; Michael Landvik; Michael Meinkoth; Raegan Ball; Shari Cannon-Mackey; Taylor Peters; Tyler Holladay
Subject: FW: Buck O'Neil Virtual Meeting

All,

The public meeting for the Buck O'Neil Bridge showing alternates being carried forward is now live! There has been a slight revision to the purpose and need for the project based on traffic studies, this revision is discussed within the first five minutes of the public meeting video, and I would encourage you to watch it. We will discuss it at our meeting on August 27, if anyone has questions.

Please share the link to the public meeting with anyone and everyone you think would be interested. Help get the word out!

Thank you,

Karen

Karen L. Daniels
Senior Historic Preservation Specialist
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Four Potential Reasonable Alternatives in Online Meeting

KANSAS CITY -- In 2018, The Missouri Department of Transportation, the City of Kansas City, Missouri,

and the Federal Highway Administration began an environmental study on the Buck O'Neil Bridge. The study team hosted the first public meeting in February 2019. Today they opened a second online meeting to showcase the *four potential reasonable alternatives* for the bridge. To participate in the online meeting, watch the video explaining the alternatives then take a follow-up survey to share your thoughts on each. Review the meeting here: http://bit.ly/2Mn85zF

The environmental study builds on the planning and environmental linkages (PEL) study to further evaluate options to improve or potentially replace the U.S. 169 bridge over the Missouri River in Kansas City.

The team will evaluate potential impacts to historic structures, including the existing Buck O'Neil Bridge, and other resources in the study area such as public parks, open spaces, cultural assets, and people and businesses in and around the area.

The study, which is scheduled to conclude in 2020, will require significant public input. In addition to the first public meeting and this online meeting, there will be a third public hearing with the preferred alternative. Learn more about the study here: https://bit.ly/2G8MvLd

For more information about MoDOT news, projects or events, please visit our website at www.modot.mo.gov/kansascity. For instant updates, follow MoDOT_KC on Twitter, or share posts and comments on our Facebook at www.facebook.com/MoDOT.KansasCity. MoDOT Kansas City maintains more than 7,000 miles of state roadway in nine counties. Sign up online for workzone updates or call 888-ASK-MODOT (275-6636).

John J. “Buck” O’Neil Bridge EA

Consultation Meeting #2

August 8, 2019

1:30-4:30

Mid-America Regional Council of Governments, 600 Broadway, Suite 200, Heartland Room

Teleconference Number: 573-526-3993, Conference ID 00714#

Agenda

Quick review of National Register of Historic Places (NRHP) criteria

Review of Properties identified in Area of Potential Effects

Discussion of eligibility of properties

Short discussion of alternatives currently being considered (more discussion at meeting #3)

Discussion of how these alternatives affect APE for visual, etc. effects

Next steps in Section 106 process

Site visit for those who can and want to go (leaving approx. 3 p.m.)

Adjourn

If you encounter technical issues during the meeting, please contact Ashley Porter 573.508.2227 (call or text).

Clay/Jackson 169, J4S3085
Consultation Meeting #2
August 8, 2019

Sign-In

Name	Organization	Phone Number	E-mail
Amanda Burke	SHPO	573 522 4641	amanda.burke@dnr.mo.gov
Ashley Porter	MoDOT		ashley.porter@modot.mo.gov
Brandy Harris	Burns & McDonnell	512-558-2884	bmharris@burnsmcd.com
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Sean Cannon-Mackey	Burns & McDonnell	512-872-7132	scannonmackey@burnsmcd.com
Matt Burcham	MoDOT	573-526-6675	matthew.burcham@modot.mo.gov
Julie Sarson	Burns & McDonnell	816 276 1593	jsarson@burnsmcd.com
Brad Wolf	City of KCMO	816-513-2901	bradley.wolf@kcmo.org
Ron Achelpohl	MARC	816-474-4240	rona@marc.org
Alyssa Parsons	DNA		parsons.alyssa@gmail.com
Cydney Millstein	AHR, LLC	816.309.4154	cydney@ahr-kc.com
Martin Rivarola	MARC	816.701.8257	mrivarola@marc.org

Clay/Jackson 169, J4S3085
Consultation Meeting #2
August 8, 2019

Sign-In

Name	Organization	Phone Number	E-mail
Karen Daniels	MoDOT		
by phone:			
Diane Hunter	Miami Nation		
Mandy Ramslow	ACHP		
Taylor Peters	FHWA		

Clay-Jackson 169
MoDOT Job No. J4S3085
John J. "Buck" O'Neil Bridge
Consultation Meeting #2
August 8, 2019
Minutes

Attendees:
Amanda Burke, Missouri SHPO
Alyssa Parsons, Downtown Neighborhood Association
Brad Wolf, City of Kansas City
Diana Hunter, Miami Tribe of Oklahoma
Cyd Millstein, Architectural & Historical Research LLC
Mandy Ranslow, ACHP
Brandy Harris, Burns & McDonnell
Julie Sarson, Burns & McDonnell
Shari Cannon-Mackey, Burns & McDonnell
Martin Rivarole, Mid-America Regional Council
Ron Achelpohl, Mid-America Regional Council
Gerri Doyle, MODOT Transportation Planning Coordinator
Mathew Burcham, MODOT Environmental
Karen Daniels, MODOT Historic Preservation
Ashley Porter, MODOT Historic Preservation
Tyler Holladay, MoDOT Historic Preservation

Karen Daniels welcomed everyone and thanked them for attending.

Introductions were made of those participating by phone and those participating at 600 Broadway, Suite 200, Kansas City, Missouri.

,. Karen Daniels explained what the National Register of Historic Places (NRHP) is and that it was created from the 1966 National Historic Preservation Act, which was the same act that created Section 106. The NRHP is a list of structures, buildings, objects, sites and districts that are important to American history, prehistory, architecture, engineering, and culture. Generally, resources can be eligible for listing in the NRHP once they reach 50 years old. Other resources can be listed sooner if they have exceptional significance. Resources are listed in the NRHP by under criteria A, B, C, and D or a combination of the criteria. Criterion A is for those properties that have association with historic events. Criterion B is for properties that are associated with significant people. Criterion C is for properties that have distinctive architectural characteristics, engineering, method of construction, or if it is of great artist value or is the work of a master. Criterion D is for properties that have yielded, or likely to yield, information to prehistory or history. In order to be listed on the National Register, the properties must convey integrity. Karen asked if anyone had questions, which no one had.

Cyndney Millstein presented the results from the architectural survey.

Cyndney Millstein asked if everyone was familiar with the area of potential effects (APE) for the project, which had been discussed at the first consultation meeting. She further explained the APE. Cyndney said the APE was an irregular shaped APE that extends along U.S. Highway 169 from Missouri Highway 9 (Clay County) on the north to 12th street and I-35 on the south (Jackson County). Cyndney explained that the survey report did not assess the potential project effects to the properties. The preferred alternative has

not been selected; the current APE is the general project footprint. The properties that were surveyed had a historic age defined as resources constructed in or before 1979 with a 10-year buffer to allow for delays in the project devolvement This allowed for evaluation of resources currently eligible for the NRHP and those that could become eligible during project development. Cyd explained the survey area was divided into 7 districts which has been recognized by the city of Kansas City Historic Preservation Office. Cyd presented the resources that are listed in the NRHP and those that are eligible for the NRHP.

The Woodswether Neighborhood had twenty-four (24) properties that were identified in the APE; none are listed in the NRHP. There was one (1) building identified that recommended eligible for listing in the NRHP. The Santa Fe Pumping plant (WW-17, 1200 Woodswether Rd) is recommended as being eligible for the NRHP. It was constructed ca. 1913 and could be eligible under criteria A and C in the areas of Conservation and Engineering. The period of significance is 1913 to 1969. The plant was built to protect the area from floods, and it is still in operation. An attendee asked if they still used the plant. Cyd said yes and explained that it was used during the recent floods. She then asked Brad Wolf if he could verify. Brad said yes.

The Old Town Neighborhood, which is also known as the river market neighborhood, had forty (40) resources in the APE. There are three (3) properties identified as contributing resources to the NRHP listed Old Town Historic District. The areas of significance for the contributing properties are criteria A and C with areas of significance of commerce and architecture. The properties that are contributing to the Old Town Historic District are the Ackerman-Quigley Litho Company Building (OT-4, 115 W. 5th St.), Tootle, Hanna and Leach Dry Goods Company Building (OT-13, 412 Delaware St.), and McCord & Nave Grocery (OT-14, 416 Delaware St.). The Richards and Conover Hardware Company Building (OT-6, 200 W. 5th St.) is individually listed on the NRHP under criteria A for significance in commerce. The survey identified five (5) buildings in the Old Town Neighborhood that are recommended as eligible for the NRHP.

There are two (2) properties that are recommended as eligible for listing as a boundary expansion of the Old Town Historic District. The properties are eligible for inclusion in the district under criteria A and C with the same period of significance. The buildings also maintain the visual cohesion of the district. The first building identified is 114-118 W. 5th St. (OT-3), which is a commercial building with multiple store fronts and was built ca. 1906-1907. The second building is 120-122 W. 5th Street (OT-5), built 1907. Both buildings are recommended as eligible for the NRHP as a contributing resource of the Old Town Historic District under Criteria A and C in the areas of Commerce and Architecture.

The Colonial Patterns Company (OT-7, 340 W. 5th St), built in 1911 and recommended eligible under Criterion A and C in the areas of Commerce and Architecture. The building was the location for the Birmingham & Prosser Paper Company, which manufactured and distributed paper on a national scale. The building has Classical Revival elements and is a work of architect R. H. Sanneman. The Broadway "Buck O'Neil" Bridge (OT-20) was designed by HNTB and was constructed in 1954-1956. The bridge is eligible under Criteria A and C in the areas of Transportation and Engineering. The bridge is an early example of a superhighway design and is an early example of a tied arch bridge in Missouri. The Period of Significance is 1959-1969. The Second Hannibal Bridge (OT-21) was constructed in 1917 and is recommended eligible under Criteria A and C in the areas of Transportation and Engineering. It is an excellent example of a Baltimore through truss span with an operational swing span. The period of significance is be 1917 to 1969.

The West Bottoms Neighborhood had nine 9 resources in the APE which none are listed on the NRHP. There are two (2) resources that are recommended as eligible for listing in the NRHP. The Thorn, Hunkins & Company Warehouse (WB-1913 W. 8th St.) is recommended eligible under criteria A and C in the areas of Commerce and Architecture. The period of significance is 1886 to 1969. The Twelfth

Street Trafficway Viaduct (WB-3) is recommended eligible for the NRHP. The viaduct was designed by Waddell and Harrington and constructed in 1915. It is eligible under criteria A and C in the areas of Transportation and Engineering. The structure is a double-deck viaduct with a through arch span, and it is considered a rare construction method in Missouri. The Twelfth Street Trafficway Viaduct can be considered Missouri's foremost urban viaduct. It was also the first span to provide a direct link to the Central business district to the west bottoms with a period of significance of 1915-1969.

The Wholesale (Garment) District Neighborhood had eighteen (18) resources in the APE with nine (9) contributing resources to the NRHP listed Wholesale (Garment) District. The District is listed under criteria A and C in the area of Commerce and Architecture, and the period of significance is 1874 to 1931. The buildings within the Wholesale (Garment) District (survey numbers WD-1, WD-2, WD-3, WD-5, WD-6, WD-7, WD-8, WD-9, WD-10) contributed to a major jobbing center in Kansas City and had national distribution significance. There are no other resources that are recommended as eligible.

The Quality Hill Neighborhood had eight (8) resources in the APE; none are listed on the NRHP. One (1) is recommended as eligible for listing in the NRHP--the Eight Street Tunnel (QH-4) which was constructed in in two phases. The first tunnel was constructed in 1888 and in 1904 a second tunnel was constructed under the first. The Eighth Street Tunnel is eligible under criterion C in the area of Engineering. The original tracks for the tunnel were removed; however, the tunnel still has integrity.

The Harlem/Charles B. Wheeler Downtown Airport Neighborhood had eighteen (18) resources in the APE; none are listed on the NRHP. There are four (4) individual properties that are recommended as eligible for the NRHP. The Harlem Road Overpass (HDA-1) is recommended as eligible under Criteria A and C in the areas Transportation and Engineering. The period of significance is 1956 to 1969. It was constructed with the Broadway Bridge in 1956 and is included in the superhighway design. The Harlem Road Overpass was engineered to fit around the existing roadways 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.

The Kansas City Water Intake Plant (HDA-3, 3200 N. Broadway Freeway) is recommended eligible under criterion A in the area of industry. The plant was built in 1927 and functioned as the primary water intake plant for Kansas City. The period of significance is 1927 to 1953. The Transcontinental and Western Airlines (T&WA) (HDA-5) located at 10 NW Richards Rd is recommended as eligible under criterion A in the area of Transportation. It was constructed in 1931 and contributed to the early history of aviation, locally, regionally, and nationally. T&WA was one of the earliest aviation firms which helped develop air transport of US mail and cargo, as well as passenger transportation. The period of significance is 1934-1962. The Municipal Airport Terminal Facility (HDA-6) was constructed in 1962 and is recommended as eligible under criteria A and C in the areas of Transportation and Architecture. This building replaced the original 1930 terminal and is a representative example of Modern industrial architecture that remains high levels of integrity. The period of significance is 1962 to 1972.

Westside Neighborhood had one (1) property in the APE and it is neither listed nor eligible for the NRHP.

Karen asked the attendees if they were aware of resources that were not presented that should be considered for eligibility to the NRHP or if they had any questions over the resources discussed.

Amanda Burke asked if the airport has been looked at as a potential historic district. Cyd said that from the history of that are--including Richards Field--the majority of the area has been drastically altered. The significance of the area started with Richards Field and was the original site were air carriers landed. There are buildings on the west side of the airport that might be historic, but most of the historic structures are located on the east side. The area should have a more in-depth survey conducted, and the

other buildings not included in the project APE should be evaluated in the future. Cyd then said that the area might still be eligible as a historic district, but she also explained many buildings within the area could be considered as intrusions. Brad Wolf agreed with Cyd. Brad explained that Richards Field has been drastically altered but it should be looked at more in depth for a district nomination. Cyd asked if anyone else had questions or comments. Amanda said that she hasn't had the time to look at the survey report, but she would look at the report later. She said she would ask more question if they arise.

Shari Cannon-Mackey began to discuss the alternatives for the project. She also explained that there is going to be an online public meeting next week which would include information being disused today. Shari said some information is being revised and changed, but the majority of the information will stay the same. Shari Cannon-Mackey then explained the four alternatives being considered. The projects alternatives are a no build, a west alignment, a central alignment, and an adjacent alignment.

The no build alternative would leave the current bridge in place but it would not meet the needs of the project. Shari Cannon-Mackey explained the west alignment alternative would be placed as far west as possible without having to encroach on the airport. The west alignment alternative would provide a new bridge with connections to the existing roadway through the West Bottoms Neighborhood. New high flyover ramps would be used to connect traffic from 169 to I-35 and to 12th street. The central alignment alternative would do much of the same as the west alternative but the new bridge would be closer to the current Buck O'Neil Bridge.

Shari Cannon-Mackey explained that the adjacent alignment alternative has three options that are available. A new bridge would be constructed adjacent to the current Buck O'Neil Bridge. A short span bridge structure would take traffic to a widened intersection at Fifth Street and Broadway. To connect traffic to I-35, traffic would follow the current infrastructure. Another second option would allow future construction of flyover ramps to get traffic to I-35 more directly. The third adjacent alternate option would provide connections to I-35 and 12th Street now and provide local traffic connections.

Shari Cannon-Mackey explained that MoDOT is working with the City of Kansas City to improve access to the airport. Design options have been created and they are working on which designs would work best for improving access to the airport. The public will be presented with this information at the public meeting. Shari asked if anyone had any questions. An attendee asked if any costs have been estimated for the alternatives. Shari said it is one of the issues that we need to look at, but some cost estimate will be added into the presentation for the public meeting. Brad asked if the options to the adjacent alternative will be added in the presentation for the public meeting. Shari said that they will be added. Amanda asked if any images for the flyovers will be presented at the meeting. Shari said that one exhibit will be included on the online public meeting that illustrates driving west bound on I-70. It will show what one alternative would look like, including the flyover ramps, but the final bridge design is not final. Geri Doyle walked around the room to show participants a draft rendering of the flyovers.

Karen said that since alternatives have been presented, and the consulting parties are present, the visual effects APE should be considered. Shari said that she and Julie Sarson would help illustrate what some alternatives will look like later on the driving portion of the meeting. Brad asked if the flyover ramps will be considerably higher than the existing roadways. Julie Sarson said that they will be higher with a different grad so they have enough clearance to get over the existing roadway.

Karen Daniels asked Brad Wolf if he was aware of resources where the views down to the river are a contributing element. Brad said that he could not think of any resources. Brad went on to inform everyone that Kansas City never had any major design elements that focused on the river. He further explained that a connection to the river was a recent emphasis for design. It has slowly developed over the past few decades, but was not a main concern in the past. Alyssa Parson said that there was West Terrace Park and

River Bluff Park. Cyd said that was mostly because of their proximity to the bluffs and not necessarily because of the direct river front views. Cyd said George E. Kessler [landscape architect] was always interested in views overlooking the West Bottoms and East Bottoms, but the National Park Service has already determined West Terrace is no longer eligible because of the amount of times its been altered. Cyd did say that the parterre was specifically designed to overlook the West Bottoms— which included river—but since the original view has changed, it would be hard to list it individually to the NRHP.

Amada Burke requested that visual illustrations to be included in the SHPO submission, it would help determine visual impacts. Karen then informed all attendees that the next Section 106 meeting will be assessments of effects on August 27, 2019. Alyssa Parson wanted to clarify that the public comment portal will precede the assessments of effects meeting. Karen said that the public meeting should be available next week, and she verified that information with Shari. Shari said the online meeting is scheduled next week. She said that is ideal and would also mean that online comment period would end in the first week of September. She further explained that the information would still be accessible after that date, but they would like it if the public could fill out a survey, which would no longer be accessible.

Karen thanked all of the attendees who joined by phone and at 600 Broadway. Karen explained that we planned on doing a driving tour after the meeting and everyone at 600 Broadway were welcomed to join. The meeting at 600 Broadway adjourned.

Standing on parking garage roof of Mid-America Regional Council overlooking Buck O'Neil Bridge

Amanda Burke and Cyd Millstein discussed the slipcover at the MTC Building, a 1950s alteration and the need for it to be evaluated for changes made within the study period that may have gained significance over time.

Driving Tour

Amanda Burke, Cyd Millstein and Brad Wolf agreed that the remainder of the airport's landscape needs to be looked later. Cyd noted that Richards Field did not have a lot of documentation which makes it difficult. Julie Sarson said that the hangers were not going to be demolished.

Amanda asked if the railroad was assessed in the survey. Cyd said that the railroad was not assessed in its entirety due to restrictions. She further explained that she could not gain entrance to the rail yards. Amanda then asked if the small structure next to the rail road bridge was surveyed as a supporting structure for the Second Hannibal Bridge. Cyd said that one was assessed for eligibility. Amada went on to explain that she noticed one was listed and surveyed and if the others were from the same time period then they too should be surveyed. This includes all supporting structures for the Buck O'Neil Bridge and the Second Hannibal Bridge.

Overlooking West Terrace Dog Park

Shari Cannon-Mackey and Julie Parson explained that the flyover ramps would cut into the bluff, below the park, but they should not be visible from the park. The ramps should be lower than the bluff's edge and the trees would also obscure the ramps. An attendee asked if the trees were going to be removed. Shari said that some of them might be, but more information will be available when plans were finalized. Amanda said it would be a good idea to have a photo in this location and edit it with lines and sketches to help visualize everything. An attendee mentioned that sound will be an issue and Matthew Burcham commented that it is loud in this location and was likely at, or exceeding, the 65-decibel sound threshold. Shari said that they were already at the sound threshold. Shari also said that some locations will have a

higher increase in sound while other places will have a decrease. Karen Daniels said that vibrations will also have to be considered for blasting and pile driving purposes, and effects of those on resources considered—buildings with foundations that could be damaged, etc.

Karen also commented that the bridge will need to be a low profile bridge, which Shari said they were designing a bridge that would be compliant with the nearby airport. Amanda said that she will look at the history in the report and determine if she has any comments or questions.

Karen Daniels thanked everyone who attended the driving portion of the meeting and the meeting adjourned.

Agenda

Consultation Meeting #1
Buck O'Neil Bridge Environmental Assessment
Clay/Jackson 169
MoDOT Job Number J4S3085

June 10, 2019
1-2:30 p.m.

Location/Teleconference Information:

MoDOT KC District, 600 NE Colbern Rd., Lee's Summit, MO 64086, Conference Room 252

Teleconference: 573.526.3993 Conference ID 00714#

Welcome and Introductions

Background on the Project

Background on the Section 106 Process and Consulting Party Roles

Purpose and Need for the Project

Initial Range of Alternatives

Where we are in NEPA and Section 106 processes

Next Steps in NEPA and Section 106 Process

Questions or concerns not addressed

Adjourn

Clay/Jackson 169, J4S3085
Consultation Meeting #1
June 10, 2019

Sign-In

Name	Organization	Phone Number	E-mail
Karen Daniels	MoDOT	573.526.7346	karen.daniels@modot.mo.gov
Ashley Porter	MoDOT		Ashley.Porter@modot.mo.gov
Tyler Holladay	MoDOT	573-508-2892	tyler.holladay@modot.mo.gov
Cydney Millstein	AHRCC	816.472.4154	cydney@ahrkc.com
Griffin Smith	MoDOT	816.607.2108	griffin.smith@modot.mo.gov
Julie Swson	BMcD	816 276 1593	jswson@bmcd.com
Brad Wolf	City of KCMO	816-513-2401	bradley.wolf@kcmo.org
Mike Lundvik	MoDOT		
Shari Cannon-Macny	BMCD	512-872-7132	scannonmacny@burnsmcd.com
Gerri Doyle	MoDOT	816-607-2261	gerri.doyle@modot.mo.gov

Clay/Jackson 169, J4S3085
Consultation Meeting #1
June 10, 2019

Sign-In (By teleconference)

Name	Organization	Phone Number	E-mail
Amanda Burke	SHPO		
Diane Hunter	Miami Tribe		
Mandy Ranslow	ACHP		

Clay-Jackson 169, J4S3085 Buck O'Neil Bridge
Consultation Meeting #1
June 10, 2019
Minutes

Attendees:
Amanda Burke, Missouri SHPO
Diana Hunter, Miami Tribe of Oklahoma
Mandy Ranslow, ACHP

Brad Wolf, City of Kansas City
Cydney Millstein, Architectural & Historical Research LLC
Shari Cannon-Mackey, Burns & McDonnell
Julie Sarson, Burns & McDonnell
Gerri Doyle, MODOT Transportation Planning Coordinator
Kaylie, MODOT Transportation Planning Coordinator Intern
Michael Landvik, MODOT Transportation Planning Coordinator
Perry Allen, MODOT Assistant District Engineer
Griffon Smith, MODOT District Planning Manager
Karen Daniels, MODOT Historic Preservation
Ashley Porter, MODOT Historic Preservation
Tyler Holladay, MoDOT Historic Preservation

Karen Daniels welcomed everyone and thanked them for attending.

Introductions were made of those participating by phone and those participating at 600 NE Colbern Rd.

Karen Daniels asked Gerri Doyle to explain the scope and need for the project. Gerri explained that the environmental study was a result of the City of Kansas City receiving federal funds to improve the Woodsweather Road, which goes under the Buck O'Neil Bridge. The City decided not to use the federal funds on Woodsweather Road because they were afraid that Buck O'Neil Bridge might affect improvements made to the road. A study on the Buck O'Neil Bridge was conducted during the planning for the Woodsweather Road, and the resulting study revealed numerous structural issues that need to be addressed. Since the City of Kansas City and MoDOT have similar interest from the result of the bridge and road location, MoDOT and Kansas City have been working together to address the transportation issues. Also, the Buck O'Neil Bridge is connected to the downtown loop for Kansas City, which includes parts of the interstate infrastructure. It was decided to work with other regional figures to look at more of an umbrella approach which was done during the Planning and Environmental Linkage Study (PEL) to see what could be done to the north side of the loop: that involves Routes 9 and I-70, along with connections into Kansas, the Buck O'Neil Bridge and the airport. The studies wanted to look at possible implementation of connections and how they would affect other parts of the existing infrastructure. The Buck O'Neil Bridge is the 1st environmental study to be conducted following the PEL.

Karen Daniels asked if anyone had any question up to this point, which none did.

Karen informed everyone that we are in beginning stage of the NEPA process for the Buck O'Neil Bridge, and that the goal was to make sure section 106 consulting parties had a continuous chance to express comments at every key point in the NEPA process. Before the meeting, Karen circulated information concerning Section 106, which included the Citizen Guide to Section 106 Review and a Section 106 flow chart. Karen further explained that we are technically in the first stage of Section 106 and moving into the second stage.

Karen Daniels told the attendees that the consulting parties have been identified and contacted. Also, since it is anticipated that the project will be a design-build project with potential to affect more historic properties, a project specific programmatic agreement (PA) will be developed to ensure consideration of historic properties affected throughout the design-build process. Karen informed the attendees that Cydney Millstein will present her research from the survey area and they will discuss their historical significance at the next consultation meeting. It is highly possible that the effects on the properties will not be known; however, the next meeting will be important because the properties will be evaluated. Karen told the attendees that we should expect effects on historic properties, but since this is design-build project, we might not know all of the potential effects by the time we get to the environmental assessment and the finding of no significant impact (FONSI). The section 106 process will continue with the PA after the NEPA study.

Karen Daniels asked if anyone had any questions, which no one had. Karen then informed the consulting parties that they had their chance to explain the purpose and needs of the project and the planned alternatives.

Shari Cannon-Mackey explained the three documents that were shared before the meeting. The documents are an introduction of the project, the Purpose and Need for the proposed action, and the initial range of alternatives.

Shari Cannon-Mackey told the attendees that there were three (3) main needs for the project. The first need is to maintain infrastructure with a focus of addressing physical condition of the historic Buck O'Neil Bridge. The second need is to maintain a reliable transportation linkage system across the river that separates local traffic from regional traffic with minimal traffic conflicts. The third need is to improve operational safety of the new transportation modes. Shari then explained the alternatives which are: no build, major rehabilitation, replace "in like and kind" on existing alignment, new crossing adjacent, new crossing center, and new crossing west. The bridge had minor rehabilitations in 2018. Major rehabilitations would include replacing the deck and other major features of the bridge, but would fail to satisfy all needs. Replacing the bridge on the same alignment would meet some needs of the project but it would not meet the need for a reliable regional connection that separates local and regional traffic and would not improve operation and safety performance. The proposed alternative alignments would meet all three (3) needs that were identified. A new bridge on adjacent alignment would

be within the general vicinity of the Buck O'Neil Bridge. A new bridge on center alignment would be slightly more west of the current bridge, while a new bridge on west alignment would have a bridge even further west.

Karen asked if anyone had any questions, which no one did.

Karen Daniels said that one (1) public meeting has been held for the project, in February, and a second public meeting was anticipated during the summer Michael Landvik said that the meeting would likely be a webinar, which would be recorded and then provided to the public for comment. A webinar will hopefully provide the community a better chance to watch it at their own leisure which could result in more community feedback. Karen asked the consulting parties need to make sure that they try and inform the public about the meeting. Karen further asked the consulting parties to consider a broader Area of Potential Effects (APE) then the one identified from the NEPA study area. We need to acknowledge a broader area for vibration and visual effects on architectural resources and archaeological sites. Karen said that we need to figure out which alignments will be considered before we can do that. An attendee asked when we can expect to see another meeting in which we can identify the broader APE. Karen said that it will be later within the design-build process. Karen then said she wanted to address the airport. She said that she would like to inform the consulting parties that MoDOT acknowledges the airport is present, but that we would not select an alternative that would have direct impacts to the operations of the airport. Because of this, and because of security issues involved with inventorying an airport, it will not be included in the survey.

Karen Daniels said the next steps in the NEPA process is to prepare for the next public meeting. Also, the studies from the NEPA process need to be gathered and compiled into a document when they are completed. For the section 106 process, the preliminary survey has been completed and some revisions are being completed. Reports for the built environment should be distributed soon, but everyone will need to have time to review the reports. Karen also informed everyone that they need to figure out some technical issues so that people attending the meeting by teleconference can see visuals.

Karen then asked if anyone else had any questions, which no one did. Karen said that if anyone thinks of another consulting party then they should forward their contact information to her so they can be contacted.

Karen asked again if anyone had any questions, which no one had. The meeting adjourned.

After Meeting:

Due to technological issues, the members of the meeting at 600 NE Colbern Rd. could not hear the attendees via teleconference. Amanda Burke had asked (2) questions about the bridge plans.

Amanda asked,

1. Will the study look at an option to rehabilitate the bridge to one-way traffic and build a companion bride carrying traffic the opposite direction? If not please explain."

Response:
A couplet (combining rehabilitation of the existing bridge with a build alternative and splitting the lanes) ***is not*** being considered for this location and will not be included in the study.

The combination of rehabilitation of the existing bridge and construction of a companion/parallel bridge is not included in the study because of the following reasons:

- This concept would result in a much higher initial cost: $50M+ for the rehabilitation in addition to the cost of a new bridge.
- The new bridge may be required to have longer spans to match the existing pier locations to address river hydraulics (USACE) and river navigation (USCG) considerations, which would also increase the overall cost of the new bridge and add complexity to the overall constructability of the project.
- The project area is very built up and constrained by numerous structures on both sides of the river, severely limiting the area available to accommodate the two bridges and required tie-ins to the existing roadway network.
- The rehabilitation would extend the life of the existing bridge by about 35 years. At that time, a new replacement bridge would need to be constructed.

A couplet was tried on Route 291 over the Missouri River (the Liberty Bridge). Since that time the North bound bridge has been under almost constant maintenance and it has been rehabilitated twice in twenty years. It is currently on the replacement list. Rehabilitation is not giving us the additional bridge life we hoped for and has proved not to be an economical option.

2. "Will this project only be assessing the impacts of replacing the bridge or will we also be presented with an evaluation regarding the potential effects of rerouting the road to accommodate the new alignment?

Response:

As indicated on the study area figure, the study team is evaluating options to provide improved access to the downtown airport (segment of US-169 north of the river) and connectivity options south of the river that address locally and regionally destined traffic. These roadway improvements (including new roadways and changes to the existing roadway network) will be evaluated in this study.

Milford Wayne Donaldson, FAIA
Chairman

Leonard A. Forsman
Vice Chairman

John M. Fowler
Executive Director

Preserving America's Heritage

May 30, 2019

Ms. Brandye Hendrickson
Deputy Administrator
Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Ref: *Rehabilitation or Replacement of the John Jordan "Buck" O'Neil Memorial Bridge carrying Route 169 over the Missouri River between Clay and Jackson Counties, Missouri*
Job No. J4S3085
ACHP Connect Case No. 013984

Dear Ms. Hendrickson:

In response to an invitation from the Missouri Division of the Federal Highway Administration (FHWA), the Advisory Council on Historic Preservation (ACHP) will participate in consultation under Section 106 of the National Historic Preservation Act (54 U.S.C. 306108) for the referenced undertaking. Our decision to participate in this consultation is based on the *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, contained within the regulations implementing Section 106, "Protection of Historic Properties" (36 CFR Part 800). The criteria are met because of the potential for a substantial impact on historic properties.

Section 800.6(a)(1)(iii) of the Section 106 regulations requires that we notify you, as the head of the agency, of our decision to participate in consultation. By copy of this letter, we are also notifying Taylor Peters of the Missouri Division of FHWA, of this decision.

Our participation in this consultation will be handled by Mandy Ranslow, who can be reached at 202-517-0218 or via e-mail at mranslow@achp.gov. We look forward to working with your agency and other consulting parties to develop an approach to effectively address potential impacts to an historic property and comply with the requirements of Section 106 as this project is developed.

Sincerely,

John M. Fowler
Executive Director

U.S. Department of Transportation
Federal Highway Administration

Missouri Division
5/14/2019

3220 W. Edgewood, Suite H
Jefferson City, Missouri 65109
(573) 636-7104
Fax (573) 636-9283
Missouri.FHWA@fhwa.dot.gov

In Reply Refer To:
HDA-MO

Advisory Council on Historic Preservation
401 F Street NW, Suite 308
Washington, DC 20001-2637

RE: Invitation to participate in Section 106 consultation and proposal to develop a project Programmatic Agreement for Route 169, Job No. J4S3085, Environmental Assessment to study rehabilitation or replacement of Buck O'Neil Memorial Bridge (A4349) over the Missouri River in Clay and Jackson County, Missouri

Dear Ms. Stokely:

The Federal Highway Administration (FHWA) invites the Advisory Council to participate in Section 106 consultation. FHWA proposes to develop a project Programmatic Agreement (project PA) under 36 CFR 800.14(b)(3) for Route 169, Job No. J4S3085, Environmental Assessment to study rehabilitation or replacement of Buck O'Neil Memorial Bridge (A4349) over the Missouri River in Clay and Jackson County, Missouri, and requests to know whether the Advisory Council would like to participate in the development of the project PA. Documentation pursuant to 36 CFR Part 800 is enclosed for your use in providing a response.

If you have any questions or would like any additional information, please contact me at 573-638-2621 or Taylor.Peters@dot.gov.

Sincerely,

Taylor Peters
Environmental Protection Specialist

Enclosures

Cc: Amanda Burke, MoSHPO
Mike Meinkoth, MoDOT
Karen Daniels, MoDOT

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

December 5, 2018

Mr. Michael Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65102

Re: **SHPO Project Number: 039-MLT-18** – MoDOT Job No. J4S3085 Buck O'Neil Bridge Environmental Assessment, Jackson and Clay Counties, Missouri (FHWA)

Dear Mr. Meinkoth:

Thank you for submitting information about the above-referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which require identification and evaluation of cultural resources. We look forward to participating in consultation for this project as it moves forward.

If you have any questions please write Missouri Department of Natural Resources, State Historic Preservation Office, Attn: Review and Compliance, P.O. Box 176, Jefferson City, Missouri 65102, or call Amanda Burke (573) 522-4641. Please be sure to include the **SHPO Project Number (039-MLT-18)** on all future correspondence relating to this project. If the information is provided via telephone call, please follow up in writing for our files.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl

Toni M. Prawl, PhD
Director and Deputy
State Historic Preservation Officer

TMP:ab

c: Ms. Raegan Ball, FHWA
Mr. Taylor Peters, FHWA

Recycled paper

Miami Tribe of Oklahoma

3410 P St. NW, Miami, OK 74354 ● P.O. Box 1326, Miami, OK 74355
Ph: (918) 541-1300 ● Fax: (918) 542-7260
www.miamination.com

November 14, 2018

Taylor Peters
Environmental Protection Specialist
Missouri Division Office
Federal Highway Administration
3220 W. Edgewood, Suite H
Jefferson City, Missouri 65109

Re: U.S. 169 - Buck O'Neil Bridge Environmental Study Jackson and Clay Counties, Missouri
MoDOT Job No. 4S3085 – Comments of the Miami Tribe of Oklahoma

Dear Mr. Peters:

Aya, kikwehsitoole – I show you respect. My name is Diane Hunter, and I am the Tribal Historic Preservation Officer for the Federally Recognized Miami Tribe of Oklahoma. In this capacity I am the Miami Tribe's point of contact for all Section 106 issues.

The Buck O'Neil Bridge is very close to the nineteenth century site of the Kanza Landing, which is significant point on the Removal route of the Miami Tribe. The Miami Tribe objects to projects that will disturb or destroy archaeological sites that may be eligible for the National Register of Historic Places and requests copies of the State Historic Preservation Officer's report and any archaeological surveys that are performed on this site. Please email all documentation to dhunter@miamination.com.

It is possible that human remains and/or cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) could be discovered during this project. As the project is within the aboriginal homelands of the Miami Tribe, if such items are discovered during any phase of this project, we request immediate notification and consultation with the entity of jurisdiction for the location of discovery. In such a case, please contact me by phone at 918-541-8966 or by email at dhunter@miamination.com.

The Miami Tribe accepts the invitation to serve as a consulting party to this project. In my capacity as Tribal Historic Preservation Officer I am the point of contact for consultation.

Respectfully,

Diane Hunter

Diane Hunter
Tribal Historic Preservation Officer

cc: Mike Meinkoth

Karen Daniels

From: Michael Meinkoth
Sent: Wednesday, November 14, 2018 1:47 PM
To: Karen Daniels; Ashley N. Porter; Brianne L. Greenwood
Subject: FW: U.S. 169 - Buck O'Neil Bridge Environmental Study Jackson and Clay Counties, Missouri MoDOT Job No. 4S3085 – Comments of the Miami Tribe of Oklahoma

FYI

Mike Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
601A West Main Street
Jefferson City, MO 65101

573-526-3593
michael.meinkoth@modot.mo.gov

https://www.modot.org/historic-preservation
https://www.modot.org/free-bridges



From: Michael Meinkoth
Sent: Wednesday, November 14, 2018 1:46 PM
To: 'Diane Hunter'
Cc: Peters, Taylor
Subject: RE: U.S. 169 - Buck O'Neil Bridge Environmental Study Jackson and Clay Counties, Missouri MoDOT Job No. 4S3085 – Comments of the Miami Tribe of Oklahoma

Diane,

Thank you for your response. Any information you wish to share about the Kanza Landing would be greatly appreciated. I believe I provided you with what little information MoDOT had several years ago.

I understand the great significance of this site to your Tribe in their forced relocation. I've directed Karen Daniels, MoDOT Architectural Historian, to place you on the consulting parties list so you will be updated as this project develops. While Karen is the lead from my office on this project because of the historic nature of the Bridge, MoDOT archaeologist Brianne Greenwood is also involved.

I would appreciate any help you can provide in helping MoDOT identify and evaluate resources that may be important to your tribe. Brianne or Karen may directly contact you to ask your opinion, and you may directly contact them with questions and comments: Karen.Daniels@modot.mo.gov and Brianne.Greenwood@modot.mo.gov. My staff and I often refer to this as Little "c" consultation. The

official government to government consultation (Big "C") will be between your tribe and FHWA. It is between FHWA and you that the official findings and determinations will be made.

Mike

Mike Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
601A West Main Street
Jefferson City, MO 65101

573-526-3593
michael.meinkoth@modot.mo.gov

https://www.modot.org/historic-preservation
https://www.modot.org/free-bridges



From: Diane Hunter [mailto:dhunter@miamination.com]
Sent: Wednesday, November 14, 2018 12:26 PM
To: Peters, Taylor
Cc: Michael Meinkoth
Subject: U.S. 169 - Buck O'Neil Bridge Environmental Study Jackson and Clay Counties, Missouri MoDOT Job No. 4S3085 – Comments of the Miami Tribe of Oklahoma

Dear Mr. Peters:
Attached you will find the response of the Miami Tribe of Oklahoma to the above-mentioned project.

Diane Hunter
Tribal Historic Preservation Officer
Miami Tribe of Oklahoma
dhunter@miamination.com
918-541-8966

Karen Daniels

From: Michael Meinkoth
Sent: Wednesday, November 14, 2018 1:31 PM
To: Karen Daniels; Ashley N. Porter; Brianne L. Greenwood
Subject: FW: US 169/I-70 North Loop Planning and Environmental Linkages Study, Jackson County, MO & Wyandotte County, KS
Attachments: Kanza Landing - Kansas City and How it Grew.pdf

Categories: 3_Kansas City

A relevant note to keep in the Buck O'Neil Bridge files.

Please place Ms. Hunter on the consulting party list so she can receive project updates as the project progresses.

Mike Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
601A West Main Street
Jefferson City, MO 65101

573-526-3593
michael.meinkoth@modot.mo.gov

https://www.modot.org/historic-preservation
https://www.modot.org/free-bridges

From: Diane Hunter [mailto:dhunter@miamination.com]
Sent: Tuesday, February 28, 2017 1:11 PM
To: FHWA, Missouri (FHWA)
Subject: US 169/I-70 North Loop Planning and Environmental Linkages Study, Jackson County, MO & Wyandotte County, KS

Dear Mr. Ward:

Aya, kikwehsitoole – I show you respect. My name is Diane Hunter, and I am the Tribal Historic Preservation Officer for the Federally Recognized Miami Tribe of Oklahoma. In this capacity, I am the Miami Tribe's point of contact for all Section 106 issues.

The Miami Tribe accepts the invitation to serve as a consulting party to the above-mentioned project. I am the point of contact for consultation.

The Miami Tribe offers no objection to the proposed project at this time; however, sites within the possible project area are of historical significance to the Miami Tribe, as our Removal from Indiana to Kansas in 1846 went through the project area, starting at the Kanza Landing. Attached is information provided by the Kansas City Public Library Missouri Valley Special Collections with a map (page 17) showing the location of the Main Wharf (Kanza Landing) and other sites from the 1840s. We request a copy of any historical information regarding sites in the project area that were present in 1846, the SHPO's report, and any archaeological surveys performed as the project moves forward. Please email all documentation to dhunter@miamination.com.

If any human remains or Native American cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) or archaeological evidence is discovered during any phase of this project, the Miami Tribe requests immediate consultation with the entity of jurisdiction for the location of discovery. In such a case, please contact me at 918-541-8966 or by email at dhunter@miamination.com.

Respectfully,

Diane Hunter
Tribal Historic Preservation Officer
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK 74355

MoDOT

Missouri Department of Transportation
Patrick K. McKenna, Director

105 West Capitol Avenue
P.O. Box 270
Jefferson City, Missouri 65102

1.888.ASK MODOT (275.6636)

November 8, 2018

Jackson County, Missouri
Frank White, County Executive
415 E. 12th St. 2nd FL 200
Kansas City, MO 64106-2706

EXAMPLE LETTER

Dear Frank White:

Subject: Design
Clay and Jackson Counties, Route 169
Job No. J4S3085
Buck O'Neil Bridge Environmental Assessment
Invitation to participate in Section 106 Consultation

The Federal Highway Administration (FHWA), the Missouri Department of Transportation (MoDOT) and the City of Kansas City (KCMO) are conducting an Environmental Assessment (EA) for improvements to the Buck O'Neil Bridge (A4649) carrying Route 169 over the Missouri River between Jackson and Clay Counties. The Buck O'Neil Bridge is eligible for listing on the National Register of Historic Places (NRHP). There are also several NRHP listed properties near the project. On behalf of FHWA, MoDOT is inviting you to participate in consultation about this project under Section 106 of the National Historic Preservation Act. We would appreciate your input as we evaluate alternatives, eligibility of resources for listing on the National Register of Historic Places, effects on historic properties, and appropriate mitigation measures, if necessary. Additional information about the project, including the planning studies which have been conducted, can be found on the project web-page: https://www.modot.org/buck-oneil-bridge-environmental-study.

Information on the Section 106 process and the role of consulting parties, can be found on the MoDOT Historic Preservation web-site at https://www.modot.org/historic-preservation or in the Advisory Council on Historic Preservation Publication (ACHP), *Protecting Historic Properties: A Citizen's Guide to Section 106* available on their web-site: https://www.achp.gov/sites/default/files/documents/2017-01/CitizenGuide.pdf. In addition, the ACHP offers a short on-demand web-based class, *What is Section 106?* that may be useful (https://www.achp.gov/training/elearning).

MoDOT would like to know if your organization is interested in participating in the Section 106 process for this project by December 10, 2018. Please contact Karen Daniels at the e-mail or phone number provided. Should you or any of your staff have any questions, please contact Karen Daniels, MoDOT Senior Historic Preservation Specialist, at Karen.Daniels@modot.mo.gov or (573) 526-7346.

Sincerely,

Michael C. Meinkoth
Historic Preservation Manager

4S3085 - US-169/Buck O'Neil Bridge Crossing of the Missouri River
Section 106 Consulting Parties Invited

Organization	Contact	Address1	City/State/Zip	Telephone	E-mail
Federal Highway Administration	Raegan Ball	3220 W. Edgewood, Suite H	Jefferson City MO 65109	573.638.2620	Raegan.Ball@dot.gov
Federal Highway Administration	Taylor Peters	3220 W. Edgewood, Suite H	Jefferson City MO 65109	573.638.2621	Taylor.Peters@dot.gov
Missouri Department of Transportation	Michael Meinkoth	P. O. Box 270	Jefferson City, MO 65101	573.526.3593	Michael.Meinkoth@modot.mo.gov
Missouri Department of Transportation	Gerri Doyle, Transportation Planning Coo	600 NE Colbern Rd.	Lee's Summit, MO 64086	816.607.2261	Gerri.Doyle@modot.mo.gov
Burns & McDonnell	Shari Cannon-Mackey				scannonmackey@burnsmcd.com
Burns & McDonnell	Julie Sarson				jsarson@burnsmcd.com
Architectural & Historical Research, LLC	Cydney Millstein	1600 Genessee St. Suite 701	Kansas City, MO 64102	816.472.4154	cydney@ahr-kc.com
Missouri State Historic Preservation Office	Amanda Burke	P. O. Box 176	Jefferson City MO 65101	573.522.4641	Amanda.Burke@dnr.mo.gov
Jackson County, Missouri	Frank White, County Executive	415 E. 12th St. 2nd FL 200	Kansas City, MO 64106-27(	816.881.3333	
Clay County, Missouri	Jerry Nolte, Presiding Commissioner	1 Courthouse Sq.	Liberty, MO 64068	816-407-3600	
City of Kansas City	Sly James, Mayor	414 E. 12 St.	Kansas City, MO 64106-2795		
Kansas City Landmarks Commission	Brad Wolf	414 E. 12th St., 16th Floor, Room 16	Kansaas City, MO 64106	816.513.2901	Bradley.Wolf@kcmo.org
City of North Kansas City	Don Stielow, Mayor	2010 Howell St.	North Kansas City, MO 641	816.810.9530	dstielow@nkc.org
Historic Kansas City Foundation	Lisa Lassman Briscoe, Executive Director	234 W. 10th St.	Kansaas City, MO 64105	816.931.8448	lbriscoe@historickansascity.org
River Market Community Association	Mark Rowlands, President	20 E. 5th St., Suite 201	Kansas City, MO 64106	816.842.1271	rivermarketcommunity@gmail.com
Downtown Neighborhood Association	Alyssa Parsons, VP of Planning & Develop	P. O. Box 26053	Kansas City, MO 64196	816.200.2362	parsons.alyssa@gmail.com
TWA Museum		10 Richards Rd. #110	Kansas City, MO 64116	816.234.1001	twamuseum@gmail.com
Airline History Museum		201 NW Lou Holland Dr.	Kansas City, MO 64116	816.421.3401	
Historic Bridge Foundation	Kitty Henderson	P. O. Box 66245	Austin, TX 78766	512.407.8898	kitty@historicbridgefoundation.com
Historicbridges.org	Nathan Holth	2767 Eastway Dr.	Okemos, MI 48864		nathan@historicbridges.org
Missouri Preservation	Bill Hart	319 N. 4th Street, #850	St. Louis, MO 63102	314.691.1941	preservemo10@yahoo.com
National Trust, Midwest Regional Office		53 W. Jackson Boulevard, Suite 350	Chicago, IL 60604	312.939.5547	
Miami Tribe of Oklahoma	Diane Hunter, THPO	P. O. Box 1326	Miami, OK 74355		dhunter@miamination.com

Karen Daniels

From: Peters, Taylor <taylor.peters@dot.gov>
Sent: Tuesday, September 18, 2018 9:31 AM
To: lfoster@iowas.org; emcclellan@iowanation.org; crystal_douglas@kawnation.com; dhunter@miamination.com; ahunter@osagenation-nsn.gov; jwmunkres@osagenation-nsn.gov; swright@poncatribe-ne.org; thpo@ponca.com; tcarnes@sacandfoxcasino.com; lisa.montgomery@sacfoxenviro.org; director.historic@meskwaki-nsn.gov; Carol.Butler@sacandfoxnation-nsn.gov; sclemons@wyandottenation.org
Cc: Michael Meinkoth; Matthew Burcham; raegan.ball.dot.gov; scannonmackey@burnsmcd.com; Gerri A. Doyle; jsarson.burnsmcd.com; Wes.Minder@kcmo.org; Michael Landvik
Subject: U.S. 169-Buck O'Neil Bridge Environmental Study Jackson and Clay Counties, Missouri MoDOT Job No. 4S3085 Initiation of the NEPA Process and Invitation to Agency Scoping Meeting
Attachments: Bridge Map.pdf

To Whom it May Concern:

The Federal Highway Administration (FHWA), in cooperation with the Missouri Department of Transportation (MoDOT) and the City of Kansas City, Missouri (KCMO), are initiating the environmental study to evaluate alternatives that would improve the transportation infrastructure at the U.S. 169 crossing of the Missouri River (location map attached). This study will assess possible options to improve mobility, connectivity, and accessibility across the Missouri River. The FHWA is the Federal agency responsible for conducting government-to-government consultations with federally-recognized tribes under Executive Order 13084, the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and other Federal laws and statutes.

Project Background: The Buck O'Neil Bridge, one of five highway crossings of the Missouri River within KCMO, is an important link in the overall highway network of the region. The bridge, constructed in 1956, is considered eligible for listing on the National Register of Historic Places. MoDOT is currently rehabilitating the bridge to extend its useful life. This short-term rehabilitation project should be completed in December 2018.

In January 2018, the Mid America Regional Council (MARC), KCMO, and MoDOT completed a Planning and Environmental Linkages (PEL) Study to evaluate options for improving travel and connectivity in the region. The PEL process engaged residents, stakeholders, neighborhood groups, government and transportation officials in defining improvements that would address near- and long-term transportation needs. The PEL identified the need to address the structural and operational issues of the Buck O'Neil Bridge and river crossing. MoDOT and KCMO identified this need as a priority, and requested an environmental classification for a portion of the U.S. 169 corridor from FHWA.

The current environmental study will use the information collected and input received during the PEL process to further assess the potential impacts and benefits of a variety of options for an improved river crossing.

Agency Scoping Meeting: The FHWA, MoDOT, and KCMO invite your tribe's designated representative to participate in an agency scoping meeting to be held on **Monday, October 1, 2018 at 11 a.m.** A face-to-face meeting will be conducted at MARC, 600 Broadway, Suite 200, Kansas City, Missouri 64105. A Skype/Webex link

will also be provided for those participants unable to attend in person. The meeting is anticipated to last approximately 90 minutes.

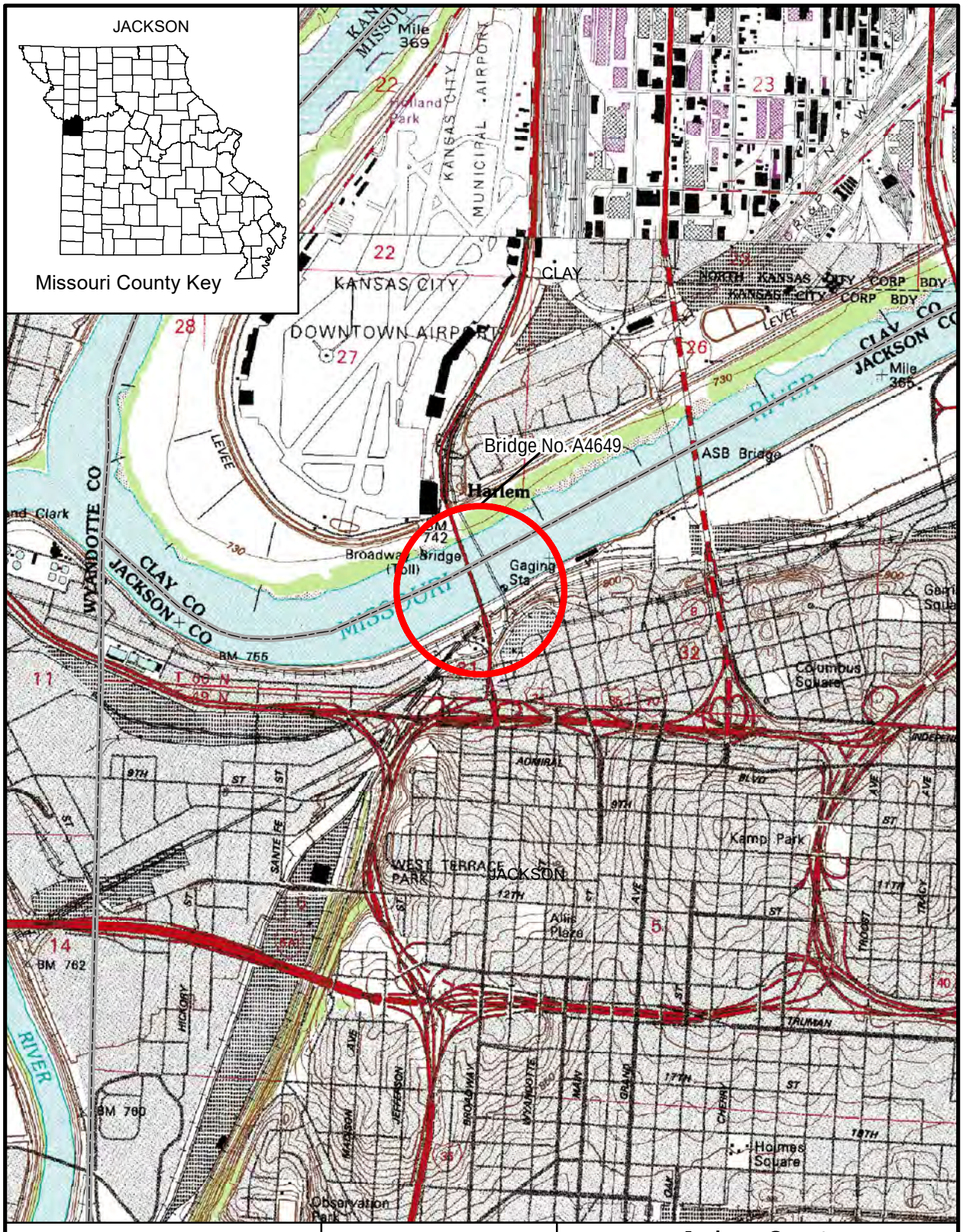
The study team will present an overview of the study process including the information being pulled forward from the PEL, and the anticipated milestones and schedule to complete the study. Meeting materials and a summary of the input received will be sent to participants following the meeting.

Response Requested: We request that your agency confirm your intent to participate in the meeting via email to Gerri Doyle, MoDOT Transportation Planning Coordinator, Gerri.Doyle@modot.mo.gov no later than **Wednesday, September 26, 2018**. If needed, a link to the Skype/Webex presentation will be sent prior to the meeting.

We also invite you to respond in writing regarding any information you would like to provide to the project team or describing any concerns you may have with the project. If you have any questions regarding this invitation, please contact myself or Raegan Ball, Program Development Team Leader, at raegan.ball@dot.gov or (573) 638-2620, and copy Mike Meinkoth with the MoDOT Historic Preservation Section who is copied on this email.

Sincerely,

Taylor R. Peters
Environmental Protection Specialist
Missouri Division Office
Federal Highway Administration
3220 W. Edgewood, Suite H
Jefferson City, Missouri 65109
573-638-2621



N

0 0.5 Miles

0 0.5 Kilometers

Adapted from U.S.G.S.
Kansas City1964 (1991)
Missouri 7.5' Quadrangle

Jackson County
Highway 169
MoDOT Job No. J4S3085
Bridge No. A4649

APPENDIX G – PROGRAMMATIC SECTION 4(f) EVALUATION

DRAFT Nationwide/Programmatic Section 4(f) Evaluation for Projects that Necessitate the Use of Historic Bridges	February 7, 2020
DRAFT Determination of Section 4(f) *De Minimis* Use of Public Parks, Recreation Areas, Wildlife and/or Waterfowl Refuges	February 7, 2020

On Behalf of the Federal Highway Administration–Missouri Division Office

Nationwide/Programmatic Section 4(f) Evaluation for Projects that Necessitate the Use of Historic Bridges

September 2017 Version

County: Jackson and Clay	**Route:** US-169	**Job/Project Number:** 4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

NEPA CLASSIFICATION:** ☐ **EIS** ☒ **EA** ☐ **CE**

***NEPA will not be approved prior to completing Section 4(f) evaluations. Section 4(f) evaluations should be submitted to FHWA for approval concurrent with the NEPA document.*

This Programmatic Section 4(f) Evaluation Form will be completed by the MoDOT District and Historic Preservation Staff. **District staff should complete sections A, B and E (questions 1, 2 and 3) and provide the name of the preparer.** Historic Preservation staff will complete sections C, D and F and the names of their preparer. Once compiled, the form will be reviewed by the Historic Preservation Manager before being submitted to the FHWA for approval.

A. PROJECT DESCRIPTION:

(Provide a description of the proposed action. The description should be detailed enough to allow the reviewer to ascertain whether or not the project activities will be affecting the features that make the property eligible for Section 4(f) protection).

Improve the US-169 crossing of the Missouri River through downtown Kansas City, Missouri. The proposed project would improve the transportation infrastructure within a narrow corridor extending from the intersection of US-169 and Missouri Route 9 in Clay County to I-35 and 12th Street in Jackson County. The project includes construction of a new bridge on a new alignment to the west of the existing US-169/Buck O'Neil Bridge crossing, construct direct connect ramps to I-35 and downtown Kansas City, and improve access into the neighboring Charles B. Wheeler Downtown Airport. The project would remove the existing Buck O'Neil Bridge and its companion north approach structure, the Harlem Road Overpass.

B. PROJECT PURPOSE AND NEEDS:

(Include the project's purpose and need(s), which are the same as those included in the project's NEPA documentation. Needs are problem statements, not solutions. Include information on the deficiencies the project is addressing. Information on the bridge ratings and sufficiency rating is helpful.)

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 (weight restricted to 45 tons, remains in poor condition even after rehabilitation in 2018)
- Maintain a reliable regional transportation linkage across the Missouri River that services local and regional traffic and minimizes local traffic conflicts
- Improve the operation and safety performance of the Missouri River crossing for all transportation modes

County:	Route:	Job/Project Number:
Jackson and Clay	US-169	4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

C. IDENTIFICATION OF SECTION 4(f) PROPERTY:

(List the property (bridge name and number) and provide a description of the property. Attach a map, photo(s), etc. as appropriate.)

Broadway/Buck O'Neil Bridge (Bridges A4649 and A4646)
Constructed in 1955 at a total length of 2,674 feet, the bridge 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. The 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 Buck O'Neil Bridge is eligible for listing in the NRHP under Criterion A for Transportation and Criterion C for Engineering. The Buck O'Neil Bridge carries US-169 over the Missouri River in downtown Kansas City, Missouri.



County:	Route:	Job/Project Number:
Jackson and Clay	US-169	4S3085

Project Name:	Resource Name:
US-169/Buck O'Neil Bridge Crossing of the Missouri River	Broadway/Buck O'Neil Bridge and Harlem Road Overpass

Harlem Road Overpass (Bridges A4647 and A4648)
The Harlem Road Overpass was built in 1956 concurrently with the Broadway/Buck O'Neil 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. 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. The Harlem Road Overpass is eligible for listing in the NRHP under Criterion A for Transportation and Criterion C for Engineering. The Harlem Road Overpass supports the north approach to the Buck O'Neil Bridge, supporting US-169 above and providing access to Harlem Road and Richards Road at the primary access to the Charles B. Wheeler Downtown Airport.



County: Jackson and Clay	**Route:** US-169	**Job/Project Number:** 4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

D. APPLICABILITY DETERMINATION:

1. The bridge will be replaced or rehabilitated. ☒ YES

2. The project requires the use of a historic bridge structure which is eligible for listing or listed on the *National Register of Historic Places* (including contributing elements to a historic district). ☒ YES

3. The bridge has not been determined to be a National Historic Landmark (NHL) (If the bridge is a NHL, this programmatic Section 4(f) evaluation does not apply). ☒ YES

4. A Memorandum of Agreement (MOA)/Programmatic Agreement (PA) has been executed pursuant to 36 CFR 800.6 or is being submitted concurrently with this form. ☒ YES

5. The project does not involve any uses that would require an individual Section 4(f) Evaluation. (It is acceptable if there are other Section 4(f) uses that are *de minimis* or covered by one of the other nationwide programmatic Section 4(f) evaluations or meet temporary occupancy criteria). ☒ YES

6. If there are other Section 4(f) properties used, list them here, briefly describe the use, and identify how the use will be addressed.

   West Terrace Park and Ermine Case Jr. Park (resource QH-4) [not NRHP-eligible]; top of bluff east of I-35 overlooking project area – right-of-way along I-35 will be acquired from the park property. but will not result in a use of the designated park areas. *De minimis* impact recommendation under Section 4(f) (see MoDOT Parks De Minimis Form)

7. Are there Section 4(f) properties in the project area that will NOT be used by the undertaking? ☒ YES ☐ NO

   List the properties and attach a map showing their location(s) in relation to the proposed project.

   - Colonial Patters Company (resource OT-7); south end of Buck O'Neil Bridge, 5th and Broadway Boulevard
   - Second Hannibal Bridge (resource OT-21); east of Buck O'Neil Bridge over the Missouri River
   - Eighth Street Tunnel (resource QH-4); east of I-35 on alignment of 8th Street, within bluff area
   - Transcontinental and Western Airlines (T&WA) Building (resource HDA-5); Charles B. Wheeler Downtown Airport, immediately west of the north approach to Buck O'Neil Bridge

County: Jackson and Clay	Route: US-169	Job/Project Number: 4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

- Municipal Airport Terminal Facility (resource HDA-6); Charles B. Wheeler Downtown Airport terminal area west of US-169

See Attachments 2 and 3

E. ALTERNATIVES CONSIDERED/FINDINGS:

1. Verify that the **Do Nothing Alternative** has been examined, and document why it has been determined to ignore the basic transportation need and not be feasible and prudent. It should clearly demonstrate the consequences of failing to rehabilitate or replace the bridge. It should also provide additional discussions concerning the social, economic and environmental impacts and the constructability, safety and design issues facing the historic bridge if the project is not developed. **(*Indicate all that apply. A minimum of one must be selected for this programmatic Section 4(f) evaluation to be applicable*):**

☒ **Maintenance** – The Do Nothing Alternative does not correct the situation that causes the bridge to be considered structurally deficient or deteriorated. These deficiencies can lead to sudden collapse and potential injury or loss of life. Normal maintenance is not considered adequate to address the situation.

Explain (Provide the facts that support this conclusion):

See following discussion and Attachment 5

☒ **Safety** – The Do Nothing Alternative does not correct the situation that causes the bridge to be considered deficient. Because of these deficiencies, the bridge poses serious and unacceptable safety hazards to the traveling public or places intolerable restriction on transport and travel.

Explain (Provide the facts that support this conclusion):

See following discussion

☐ **Other:** Click here to enter text.

Explain (Provide the facts that support this conclusion):

Click here to enter text.

County: Jackson and Clay	**Route:** US-169	**Job/Project Number:** 4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

2. Investigations must be conducted to **construct a bridge on a new location/alignment or parallel to the old bridge** (including consideration of using the bridge as a couplet with a new bridge) to determine if the alternative would be feasible and prudent. Document below why building on new location/alignment without using the old bridge is not feasible and prudent. (***Indicate all that apply. A minimum of one must be selected for this programmatic Section 4(f) evaluation to be applicable***):

☐ **Terrain** – A new bridge at another site will result in extraordinary bridge and approach engineering and construction difficulty, or cost, or extraordinary disruption to established traffic patterns.

☐ **Adverse Social, Economic, or Environmental Effects** – A new bridge away from the present site would result in social or environmental impact of extraordinary magnitude.

☒ **Engineering and Economy** – Cost and engineering difficulties reach extraordinary magnitude. Factors supporting this conclusion include significantly increased roadway and structure costs, serious foundation problems, or extreme difficulty in reaching the new site with construction equipment. Additional design and safety factors considered include minimum design standards or requirements of various permits such as involved with navigation, pollution, and the environment.

☒ **Preservation of Old Bridge** – It is not feasible and prudent to preserve the existing bridge at the existing location or a new location. This could occur when the bridge is beyond rehabilitation for transportation or an (non-motorized) alternative use, or when no responsible party can be located to maintain and preserve the bridge through the Bridge Marketing Plan, or when a permitting authority requires removal[1] or demolition of the old bridge. (Note: Moving a historic bridge to a new location with rehabilitation may constitute a no use.)

Explain (For each checkbox above, provide thorough and specific evidence/explanation that supports checking the box):

The US-169 corridor and crossing of the Missouri River are constrained by development. The section of US-169 north of the river is bounded by the Charles B. Wheeler Downtown Airport and the Missouri River on the west and the BNSF Murray Yard on the east. The Second Hannibal Bridge (NRHP-eligible), connecting to the BNSF Murray Yard, limits consideration of alignment options east of the existing Buck O'Neil Bridge. The north approach to the Buck O'Neil Bridge is severely constrained by the Second Hannibal Bridge on the east and the T&WA Building (NRHP-eligible) on the west. This pinch point does not provide adequate room to accommodate retainage of the existing Buck O'Neil Bridge and construction of a new connection and river crossing on US-169.

[1] Note that if a permitting authority requires removal of a historic bridge, it still may be usable at another location rehabilitated.

County:	Route:	Job/Project Number:
Jackson and Clay	US-169	4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

Major rehabilitation of the existing bridge, retainage of the bridge as a couplet or as a pedestrian facility and constructing a new bridge in-like-and-kind on or adjacent to the existing crossing were evaluated and eliminated for the following reasons.

Major Rehabilitation of the Existing Bridge - 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.

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.

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 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.

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.

MoDOT advertised the Buck O'Neil Bridge for reuse (August 2018-December 2019) and no responsible party responded.

County:	Route:	Job/Project Number:
Jackson and Clay	US-169	4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

3. Investigations must be conducted to determine if **rehabilitation of the existing** bridge, without affecting the historic integrity of the bridge, would be feasible and prudent. Include a description of what the rehabilitation would entail. **Refer to a Bridge Memo or information from the Bridge Division** (please attach). Refer to functional and structural deficiencies described in the No Build, and discuss how the deficiencies impact, influence or relate to the historic bridge being rehabilitated for continued vehicular use. Explain the constructability, safety and design project issues created or resolved by rehabilitation (including right-of-way constraints, traffic demands and types, roadway geometric constraints, location advantages or disadvantages and bridge load capacity). Explain social, economic and environmental issues created or resolved by rehabilitating the historic bridge. Document below why the rehabilitation alternative is not feasible and prudent. (***Indicate all that apply. A minimum of one must be selected for this programmatic Section 4(f) evaluation to be applicable***)**:**

☒ **Structurally Deficient** – The bridge is so structurally deficient that it cannot be rehabilitated to meet minimum acceptable load requirements without affecting the historic integrity of the bridge.

☐ **Geometrically Deficient** – The bridge is seriously deficient geometrically and cannot be widened (horizontally and/or vertically) to meet the minimum required capacity of the highway system on which it is located without affecting the historic integrity of the bridge.

☐ **Approach(es) Geometrically Deficient** – The approach(es) is seriously deficient due to horizontal or vertical curves that do not meet the minimum design criteria.

Explain (For each checkbox above, provide thorough and specific evidence/explanation that supports checking the box. Note that flexibility in the application of AASHTO standards should be exercised during the analysis of this alternative. It is important that project needs be specific for a location and this discussion should focus on whether the rehabilitation alternative is feasible and prudent for the project location and needs.):

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. Major rehabilitation would not address the additional transportation needs within the study area and input received from the public during a Planning and Environmental Linkages (PEL) Study conducted by MARC, MoDOT, and KCMO 2017-2019 and the current environmental study for the US-169/Buck O'Neil Bridge Crossing of the Missouri River conducted by MoDOT 2018-2020 (maintaining a reliable transportation linkage and minimizing local traffic conflicts, improving operational and safety performance of the crossing for all modes).To facilitate

County: Jackson and Clay	Route: US-169	Job/Project Number: 4S3085
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rehabilitation, the crossing would be closed to traffic for two years or more. With an initial cost of $50 million, only extending the useful life of the crossing by 30 to 40 years, and not addressing the identified transportation, rehabilitation is not considered feasible or prudent.

F. MEASURES TO MINIMIZE HARM:

1. Verify that the project includes all possible planning to minimize harm. **(Indicate all that apply. A minimum of one must be selected for this programmatic Section 4(f) evaluation to be applicable):**

☐ For bridges that are to be **rehabilitated**, the historic integrity of the bridge will be preserved, to the greatest extent possible, consistent with unavoidable transportation needs, safety, and load requirements.

☒ For bridges that are to be **rehabilitated** to the point that the historic integrity is affected or that are to be **replaced**, adequate records will be made of the bridge through State Level or Historic American Engineering Record (HAER) standards, as determined through the Section 106 consultation process.

☒ For bridges that are to be **replaced**, the existing bridge will be made available for alternative use provided a responsible party agrees to maintain and preserve the bridge.

☒ Other: Programmatic Agreement

Explain (For each checkbox above, provide thorough and specific evidence/explanation that supports checking the box):

MoDOT advertised the bridge for reuse August 2018-December 2020.

A Programmatic Agreement (PA) was developed for project. ACHP, FHWA, Missouri SHPO, and the Missouri Highways and Transportation Commission are signatories to the PA. The PA specifies MoDOT or its contractor will retain a professional who meets the *Secretary of the Interior (SOI) Standards* 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. The PA stipulates 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) with development of materials about the bridges

County:	Route:	Job/Project Number:
Jackson and Clay	US-169	4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

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.

2. Verify that the measures to minimize harm from the Section 106 MOA/PA have been incorporated into the project or are included as environmental commitments. ☒

   The executed MOA/PA can be found in the following Attachment:
   Attachment 7

G. DETERMINATION OF APPLICABILITY:

The applicability of this Programmatic Section 4(f) has been based on the contents of this form and other supporting documentation.

County:	Route:	Job/Project Number:
Jackson and Clay	US-169	4S3085
Project Name: US-169/Buck O'Neil Bridge Crossing of the Missouri River	**Resource Name:** Broadway/Buck O'Neil Bridge and Harlem Road Overpass	

H. SUMMARY AND APPROVAL:

The subject project meets all of the applicability criteria set forth in this Programmatic Section 4(f) Evaluation issued on August 22, 1983. All alternatives set forth in the subject programmatic have been fully evaluated and the findings made are clearly applicable to this project. There are no feasible and prudent alternatives to the use of the historic bridge.

The project includes all possible planning to minimize harm. FHWA will assure that the measures to minimize harm are incorporated into the project through its oversight of the federal-aid highway program. MoDOT or the Local Participating Agency will include the measures to minimize harm as environmental commitments in the applicable NEPA document and Environmental Commitments for the project. MoDOT or the Local Participating Agency will also provide a copy of this evaluation to other parties upon request.

All supporting documentation is attached or referenced.

The project, and its use of the historic bridge, fall within and satisfy all of the criteria as set forth in the Department of Transportation, Federal Highway Administration – Nationwide/Programmatic Section 4(f) Evaluation and Approval for FHWA Projects that Necessitate the Use of Historic Bridges, dated August 22, 1983.

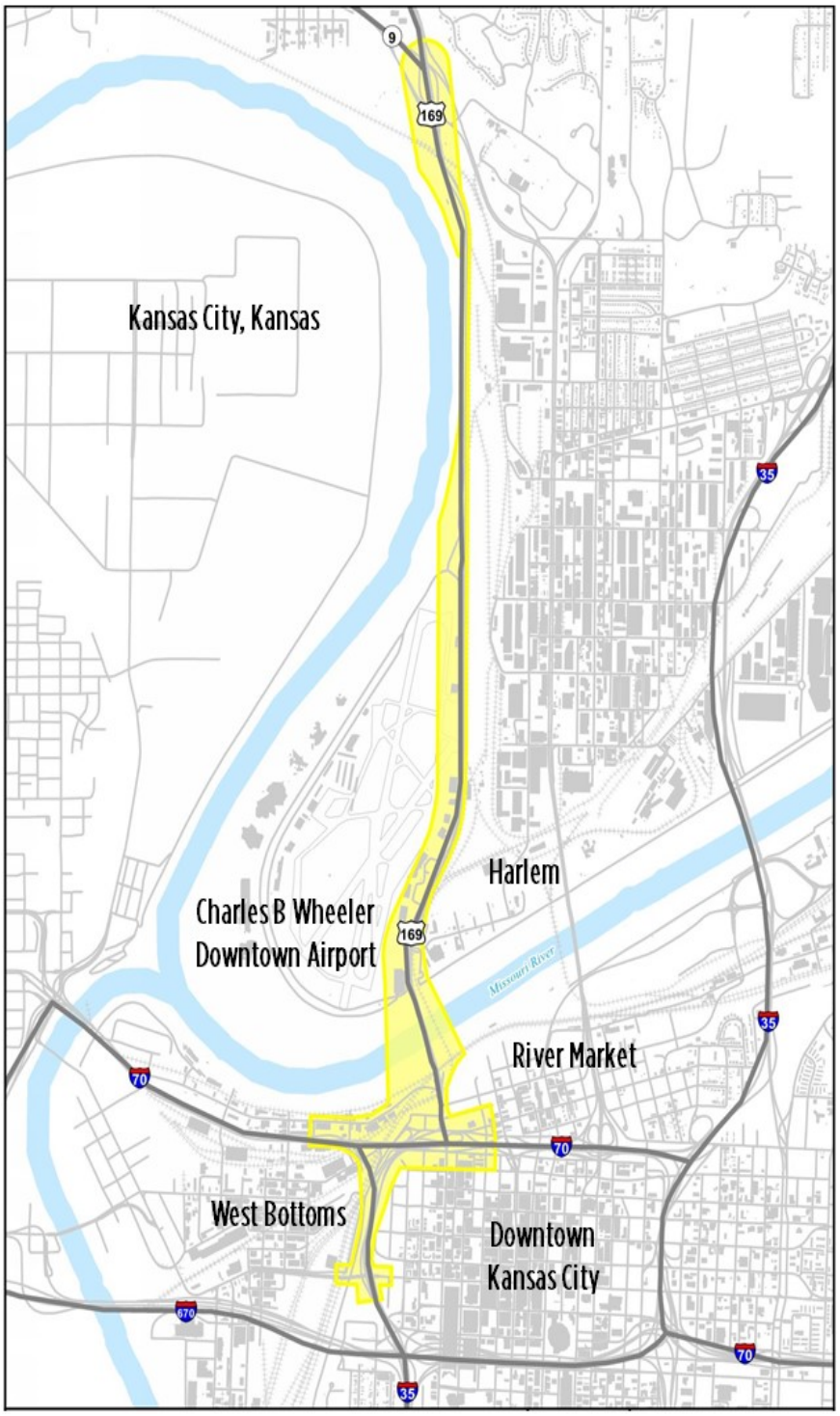
Name(s) of Preparer(s): Shari Cannon-Mackey, CEP, ENV SP Date: 2/7/2020

Historic Preservation Manager: _____ Date: _____

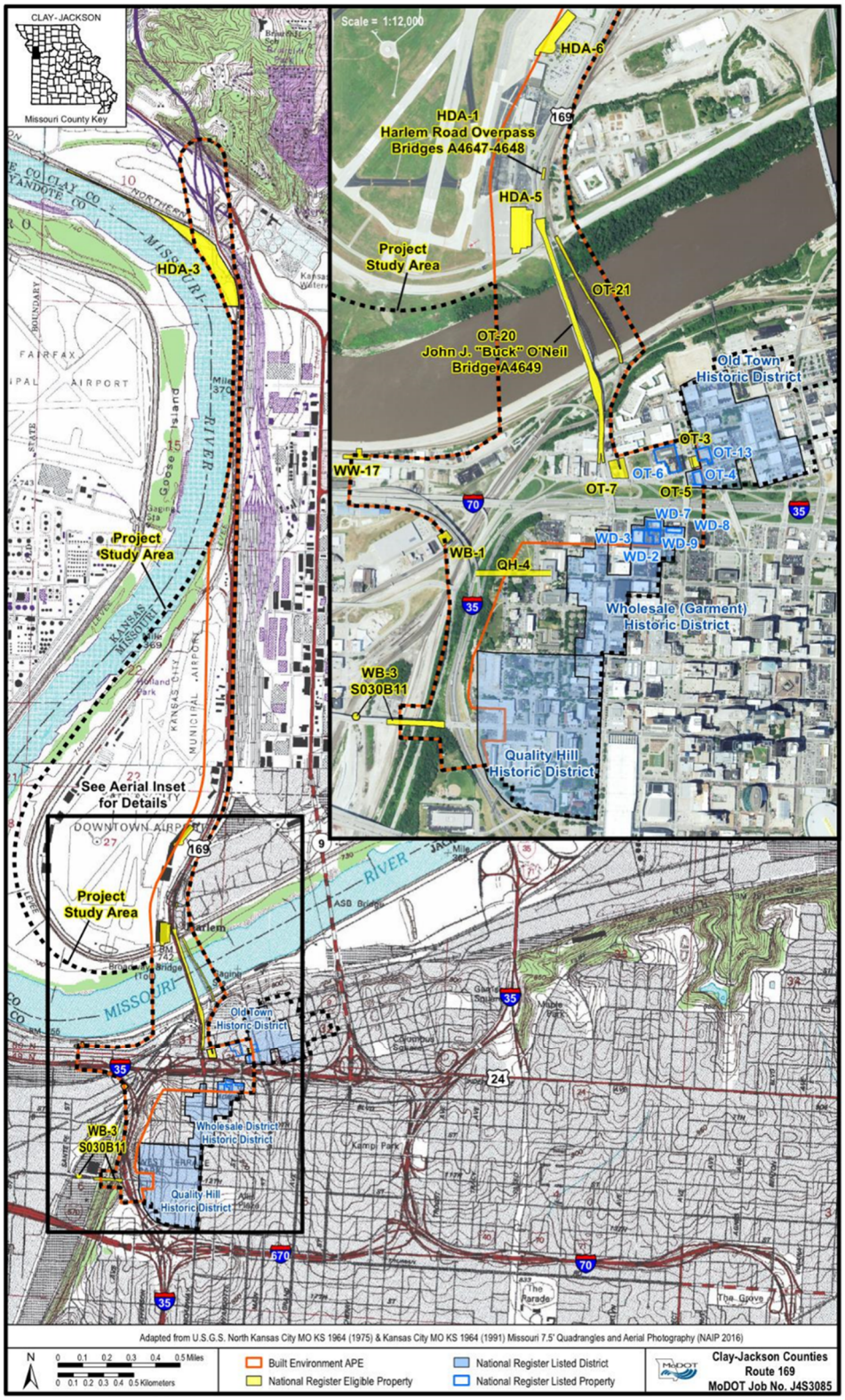
FHWA : _____ Date: _____

Typical attachments for this form include, but are not limited to:

- Attachment 1 - Project location map
- Attachment 2 - Map of affected Section 4(f) property and other Section 4(f) properties in the project vicinity
- Attachment 3 – MDNR Bridge Inventory Forms w/Photographs
- Attachment 4 – Alternatives Corridor for 3 Build Alternatives Considered
- Attachment 5 – Buck O'Neil Bridge Existing Conditions Memo
- Attachment 6 - SHPO Correspondence Regarding Effects
- Attachment 7 – DRAFT PA and Information to Accompany



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


CLAY-JACKSON
Missouri County Key
Scale = 1:12,000
HDA-6
HDA-1
Harlem Road Overpass
Bridges A4647-4648
169
HDA-5
Project
Study Area
OT-21
OT-20
John J. "Buck" O'Neil
Bridge A4649
Old Town
Historic District
OT-3
OT-13
OT-6
OT-4
OT-7
OT-5
WW-17
70
WD-7
WD-8
WD-3
WD-9
WD-2
35
WB-1
QH-4
Wholesale (Garment)
Historic District
WB-3
S030B11
Quality Hill
Historic District
HDA-3
Project
Study Area
See Aerial Inset
for Details
DOWNTOWN AIRPORT
Project
Study Area
Old Town
Historic District
Wholesale District
Historic District
WB-3
S030B11
Quality Hill
Historic District
24
670
Adapted from U.S.G.S. North Kansas City MO KS 1964 (1975) & Kansas City MO KS 1964 (1991) Missouri 7.5' Quadrangles and Aerial Photography (NAIP 2016)
0 0.1 0.2 0.3 0.4 0.5 Miles
0 0.1 0.2 0.3 0.4 0.5 Kilometers
Built Environment APE
National Register Eligible Property
National Register Listed District
National Register Listed Property
Clay-Jackson Counties
Route 169
MoDOT Job No. J4S3085

Missouri Department of Transportation
Historic Preservation Section
601 W. Main, P.O. Box 270
Jefferson City, MO 65102
(573) 526-3597

Missouri Bridge Inventory Form

Survey Form No. OT-20

Instructions

Please fill out this form as accurately as possible and return to the Missouri Department of Transportation Historic Preservation Section.

Section 1: Bridge Identification

Bridge Number: MoDOT A-4649	*Please provide the official number given to the bridge by the road organization maintaining the bridge, including but not limited to MoDOT, the County, or the City. If a railroad bridge, use the railroad designated number. If no such number, leave blank*
Common Name: Buck O'Neil Bridge	Other Name(s): Broadway Bridge (Historic)

Section 2: Bridge Location

County(ies): Jackson and Clay		City or Town (vicinity): Kansas City	
Legal Location:	Township: 50 N	Range: 33 W	Section: 31
Route (current): US 169		Route(s) (historic): Broadway Blvd.	
Feature Crossed: Missouri River			
Latitude: 39.11338		Longitude: -94.58990	
Coordinates:	UTM Zone: 15	Northing: 4330561	Easting: 362543

Section 3: Bridge History – *Please explain the details from this section further in the Section 6 narrative.*

Is the Bridge listed in the National Register of Historic Places (NRHP)?	☐Yes	☒No
Is the Bridge part of a listed historic district?	☐Yes	☒No
Has the Bridge been determined eligible for the NRHP?	☒Yes	☐No
Is preservation underway?	☐Yes	☒No
Is the bridge endangered?	☒Yes	☐No
By what? Future demolition		
Has the Bridge been relocated? ☐Yes ☒No	When? N/A	
Where from? N/A		
Construction Date: 1955	Rehabilitation Date(s): 1990; 2018	
Builder: American Bridge Company	Fabricator: American Bridge Company/Stupp Brothers Bridge and Iron Company	

Section 4: Bridge Design			
Overall length of bridge:	2547.2’	Overall type of bridge:	Steel Through Tied Arch
Number of sidewalks carried on structure:	N/A	Which side(s)?	N/A & N/A
Number of Lanes:	4		
Skew:	5°		
Legal Load Condition:	45 Tons		
SUBSTRUCTURE			
Number of Abutments:	4	Abutment Material:	Concrete
Abutment Configuration:	Cantilevered		
Number of Piers/Bents:	15	Pier Material:	Steel/Concrete
Pier Configuration:	Column		
SUPERSTRUCTURE			
Bridge Type:	Arch		
# of Spans:	16		
Main Span(s)			
Main Span Material:	Metal	and/or	N/A
# of Main Spans:	3	Width of Main Spans:	47’ 10”
Length of each Main Span:	451’, 453’, 540’	Total length of all Main Spans:	1447’
Height over deck *(*for through truss & through arches):*	14’ 6”		
Deck material:	Concrete	Deck construction method:	Cast-in-place
Wearing Surface:	Asphalt		
Approach Span(s)			
Approach Span Material:	Metal	and/or	N/A
# of Approach Spans:	12	Width of Approach Spans:	48’
Length of each Approach Span:	66’-121’	Total length of all Approach Spans:	1320’

Section 5: Other Surveys	
What other surveys has this bridge been a part of?	*This could include the Missouri Historic Bridge Inventory, local resource surveys, Bridgehunter.com, and more.*
2017 MoDOT Survey	

Section 6: Narratives

Brief Description of the Bridge (include any rehabilitation or alterations).

This bridge 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 6 concrete column piers. The south end of the bridge features two abutments, each 29' wide with a 6' walkway in between. Bents one through have concrete columns with steel cross girders. The steel cross girder hangs over the east column of bent one by approximately 5'6". Bent four steel cross girder overhangs the west column by 17'4". Bent five is steel tent 76' wide with concrete footings and a cofferdam on each side to accommodate the Broadway viaduct. Piers one, two, and three are river piers, measuring 121' 9 1/2" tall, 115' 8 ¾" tall and 103' 3 ½" tall, respectively. The width of all the piers is 12' and the top length where the pier meets the deck is 74', the bottom length (base) on all the piers is 66'. Pier four and bents ten and eleven are on the north side of the bridge near the Airport Plaza Arena."

"The bridge has sixteen spans with a total length of 2764'." Span types and lengths from north to south include continuous plate girders (66'-67' long); three tied arch spans varying from 451' to 540' in length, nine continuous plate girders varying from 90' to 125' in length, and one through girder, 113' long.
Over 19,000 cubic yards of structure concrete, 90,000 square yards of highway concrete, and 7,670 tons of structural steel were used in the construction of this bridge.[1]

History of the Bridge

Constructed in 1955 over the Missouri River in Kansas City from Jackson County to Clay County, Missouri, the Broadway Bridge was designed by Howard, Needles, Tammen & Bergendoff, Kansas City and fabricated by American Bridge Company with Stupp Brother Bridge and Iron Company. The cost of the bridge was approximately 13 million dollars with funds obtained from the sale of revenue bonds authorized by the city council. This bridge replaced the traffic deck of the Hannibal Bridge, located directly to the east. The original toll for the bridge was removed in 1991 when ownership of the bridge was transferred to MoDOT.

Significance of the Bridge with Justification

The Broadway Bridge was determined eligible for listing in the NRHP on March 7, 2015, during consultation between MoDOT and SHPO. The Broadway Bridge is eligible for listing under Criterion C for Engineering and Criterion A for Transportation. The Broadway Bridge is representative of an early example of a superhighway design, which became popular in the mid twentieth century. As reported in Historicbridges.org, the Broadway Bridge includes a "super elevation for curves, grades to adjust for vertical elevation, curved designs for ramps, support systems for elevated ramps and a complex substructure that was custom designed to fit around existing roads and railway- all common elements in superhighway design."[2] This bridge is significant as a fine, representative example of an early constructed tied arch bridge in Missouri (and can be compared to other bridges of its age and type including bridge No. K0941 in Platte County and bridge No. L0550 in Callaway County, both over the Missouri River) and from the same period of construction. Furthermore, the Broadway Bridge is an early example of a superhighway design that combined riveted construction in a contemporary design.

[1] Ashley Porter and Brianne Greenwood, "MoDOT Job No. J4S3085, Jackson County, Route 169, Bridge Rehabilitation Over the Missouri River," Section 106 Non-Archeological Resources Survey Memo. August 1, 2017. The information provided in the 2017 survey is taken directly from historicbridges.org, documented June 7, 2016.
[2] Ibid.

This notable bridge is associated with the Harlem Road Overpass (survey form HDA-1), as it shares history, access, and significance. Additionally, the Broadway Bridge and Harlem Road Overpass were designed concurrently by the same engineering firm (HNTB, Kansas City).

The eligible property includes the entire parcel historically associated with the Broadway Bridge.

Sources of Information

City of Kansas City, Missouri, "Broadway Bridge Dedication." September 5, 1956.

Historicbridges.org

Missouri Office of the Secretary of State. "Kansas City 1940 Tax Assessment Photographs." Missouri Digital Heritage. http://cdm16795.contentdm.oclc.org/cdm/landingpage/collection/kcpltax

Missouri Valley Special Collections, Kansas City Public Library, Kansas City, Missouri

Porter, Ashley and Greenwood, Brianne. "MoDOT Job No. J4S3085, Jackson County, Route 169 Bridge Rehabilitation Over the Missouri River." Section 106 Cultural Resource Survey. August 1, 2017.

Sanborn Map Company. *Kansas City, Jackson County, Missouri*. Volume 1, Sheet 5. NY: Sanborn-Perris Maps Co. Limited., 1885-1896.

Note:

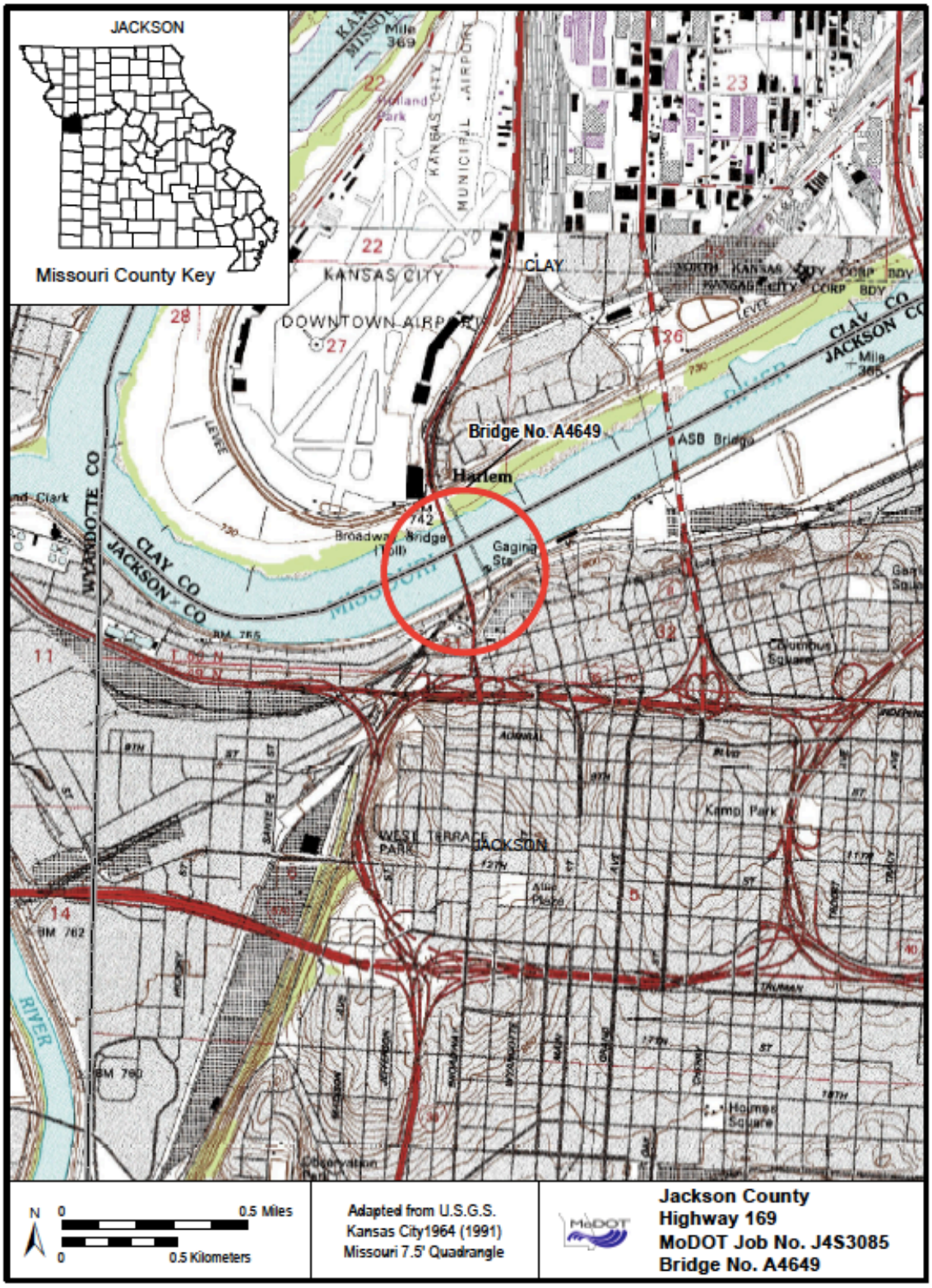
A copy of a 1:24,000 topographic map identifying the location of the bridge should be attached. Photographs of the bridge showing the deck, sides and substructure as well as the setting of the bridge should be included either attached or added after Section 7 of this document.

Section 7: Contact Information

Legal Owner:	Missouri Department of Transportation				
Street Address 1:	105 W Capitol Ave.	Street Address 2:	P.O. Box 270		
City: Jefferson City		State: MO		Zip Code: 65102	
Prepared By:	Cydney Millstein and Kelsey Lutz	Date:	10/22/2018		
Title of Preparer:		Organization:	Architectural and Historical Research, LLC		
Street Address 1:	1537 Belleview Ave.	Street Address 2:			
City: Kansas City		State: MO		Zip Code: 64108	
Email:	cydney@ahr-kc.com	Phone:	(816) 472-4154		

Map and Photographs

MAP



PHOTOGRAPHS

Source:	Date:	Description:
Missouri Valley Special Collections, Kansas City Public Library	1955	Broadway Bridge under construction.



Source:	Date:	Description:
Missouri Valley Special Collections, Kansas City Public Library	1956	Toll booths on the Broadway Bridge.



Source:	Date:	Description:
Missouri Valley Special Collections, Kansas City Public Library	11/7/1956	Overview, east side of Broadway looking northwest.



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	General view facing northeast.



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	General view of main spans and substructure; view facing northwest..



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	Detail of substructure; view facing north.



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	Detail of north tied arch span, view facing northeast.



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	Detail of tied arch span, view facing south..



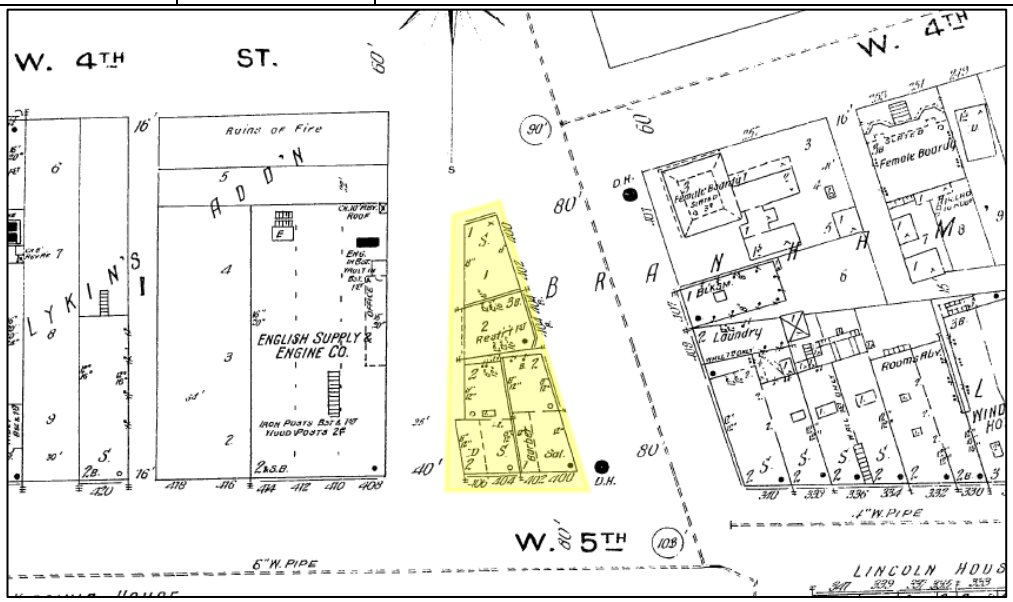
Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	Detail of tied arch span, view facing northwest.



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	South end of bridge; view facing south. This particular triangularly-shaped site was once occupied by buildings (see below).



Source:	Date:	Description:
Sanborn Fire Insurance Map	1885 (with 1896 overlay)	This map illustrates the location of several stores and a restaurant that were demolished for the construction of the Broadway Bridge near the south end.



Source:	Date:	Description:
Missouri Digital Heritage	1940	1940s tax assessment photographs showing some of the buildings demolished for the fork of the Broadway Bridge at the south end.

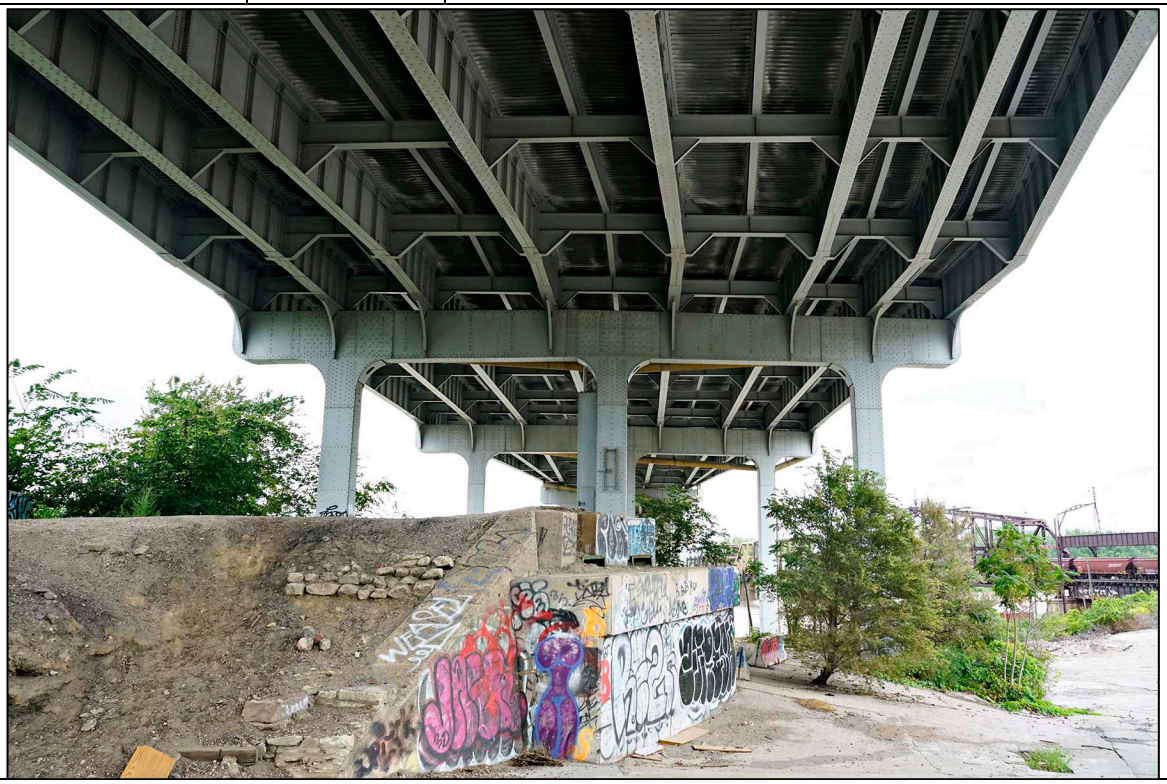




Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	Detail of substructure straddle bent, view facing south.



Photographer:	Date:	Description:
Richard Welnowski	9/10/2018	South end view facing north.



Missouri Department of Transportation
Historic Preservation Section
601 W. Main, P.O. Box 270
Jefferson City, MO 65102
(573) 526-3597

Missouri Bridge Inventory Form

Survey Form No. HDA-1

Instructions

Please fill out this form as accurately as possible and return to the Missouri Department of Transportation Historic Preservation Section.

Section 1: Bridge Identification

Bridge Number:	MoDOT A4647 and A4648, and adjacent BNSF bridges	*Please provide the official number given to the bridge by the road organization maintaining the bridge, including but not limited to MoDOT, the County, or the City. If a railroad bridge, use the railroad designated number. If no such number, leave blank*
Common Name:	Harlem Road Overpass	Other Name(s): Click here to enter text.

Section 2: Bridge Location

County(ies):	Clay	City or Town (vicinity):	Kansas City
Legal Location:	Township: 50 N	Range: 33 W	Section: 27
Route (current):	Harlem Rd.	Route(s) (historic):	Harlem Rd.
Feature Crossed:	Roadway		
Latitude: 39.116712		Longitude: -94.590561	
Coordinates:	UTM Zone: 15	Northing: 4330932.7	Easting: 362493.4

Section 3: Bridge History – *Please explain the details from this section further in the Section 6 narrative.*

Is the Bridge listed in the National Register of Historic Places (NRHP)?	☐Yes	☒No
Is the Bridge part of a listed historic district?	☐Yes	☒No
Has the Bridge been determined eligible for the NRHP?	☐Yes	☒No
Is preservation underway?	☐Yes	☒No
Is the bridge endangered?	☒Yes	☐No
By what? Possible demolition		
Has the Bridge been relocated? ☐Yes ☒No	When? N/A	
Where from? N/A		
Construction Date: 1956	Rehabilitation Date(s):	Click here to enter text.
Builder: See form for Broadway/Buck O'Neil Bridge (same)	Fabricator:	See form for Broadway/Buck O'Neil Bridge (same)

Section 4: Bridge Design

Overall length of bridge:	Varies	Overall type of bridge:	Voided Slab (at 169 Lanes) and Steel Rolled Beams (at BNSF Tracks)
Number of sidewalks carried on structure:	0	Which side(s)?	N/A
Number of Lanes:	2 Lanes (169) and 2 Tracks (BNSF)		
Skew:	Curved abutment walls		
Legal Load Condition:	Unknown		

SUBSTRUCTURE

Number of Abutments:	2	Abutment Material:	Concrete
Abutment Configuration:	Curved Walls *Ex. Cantilever, Stub, Open*		
Number of Piers/Bents:	N/A	Pier Material:	N/A
Pier Configuration:	N/A		

SUPERSTRUCTURE

Bridge Type:	Voided Slab (at 169 Lanes) and Steel Rolled Beams (at BNSF Tracks)
# of Spans:	4

Main Span(s)

Main Span Material:	Concrete (169) and Steel (BNSF)		
# of Main Spans:	4	Width of Main Spans:	24’
Length of each Main Span:	Varies	Total length of all Main Spans:	Approx. 99’
Height over deck *(*for through truss & through arches):*	N/A		
Deck material:	Concrete	Deck construction method:	Cast-in-place
Wearing Surface:	Asphalt		

Approach Span(s)

Approach Span Material:	N/A		
# of Approach Spans:	N/A	Width of Approach Spans:	N/A
Length of each Approach Span:	N/A	Total length of all Approach Spans:	N/A

Section 5: Other Surveys

What other surveys has this bridge been a part of?

None known.

Section 6: Narratives

Brief Description of the Bridge (include any rehabilitation or alterations).

This system of two-lane slab bridge spans supporting two the northbound lanes of 169 and the parallel system of multi-beam steel stringer spans supporting two tracks of the BNSF railroad was constructed in 1956. Four single span structures are supported on curved concrete abutment walls. Railing adjacent to 169 lanes is open metal.

History of the Bridge (including citations)

Designed by HNTB and constructed in 1956 as part of the Broadway Bridge project.

Significance of the Bridge with Justification

Built concurrently with the Broadway Bridge, the Harlem Road Overpass appears eligible for listing in the National Register of Historic Places under Criteria A and C in the areas of Transportation and Engineering. The Harlem Road Overpass shares the same context and history as the Broadway Bridge (survey form OT-20). In tandem with the Broadway Bridge, it demonstrates the canons of the superhighway design (multiple lanes designed for high speed traffic), which became popular throughout the US 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 three steel through tied arch bridge (the Broadway Bridge), access to Harlem, and shares a system of abutment walls that support two tracks of the BNSF Railroad. Due to the fact that the Harlem Road Overpass and the Broadway Bridge are physically connected (one cannot be accessed without traversing the other), they should be considered associated resources. Additionally, drawings for the Harlem Road Overpass are included in the original drawings for the Broadway Bridge (noted as the "Missouri River Bridge at Broadway," see photographs below)

The eligible property includes the entire parcel historically associated with the Harlem Road Overpass.

Sources of Information

HNTB, "General Plan and Elevation, Missouri River Bridge at Broadway," February 16, 1955, with revisions.

Julie Sarson, Project Manager, Burns and McDonnell, Kansas City, Missouri

MoDOT Bridge Inspection Reports for Bridge A4647 and A4648, 2016.

Robert Askren Photograph Collection, Missouri Valley Special Collections, Kansas City Public Library, Kansas City, Missouri

Section 7: Contact Information

Legal Owner: MoDOT			
Street Address 1: 908 E Truman Rd		Street Address 2:	
City: Kansas City	State: MO		Zip Code: 64106
Prepared By: Julie Sarson (Burns & McDonnell), Cydney Millstein and Kelsey Lutz		Date: 10/23/2018	
Title of Preparer:		Organization: Architectural and Historical Research, LLC	
Street Address 1: 1537 Belleview Ave.		Street Address 2:	
City: Kansas City		State: MO	Zip Code: 64108
Email: cydney@ahr-kc.com		Phone: (816) 472-4154	

Map and Photographs

MAP



PHOTOGRAPHS

Photographer:	Date:	Description:
Richard Welnowski	9/4/2018	Southernmost underpass; view facing east.



Photographer:	Date:	Description:
Richard Welnowski	9/4/2018	Northernmost underpass; view facing east.



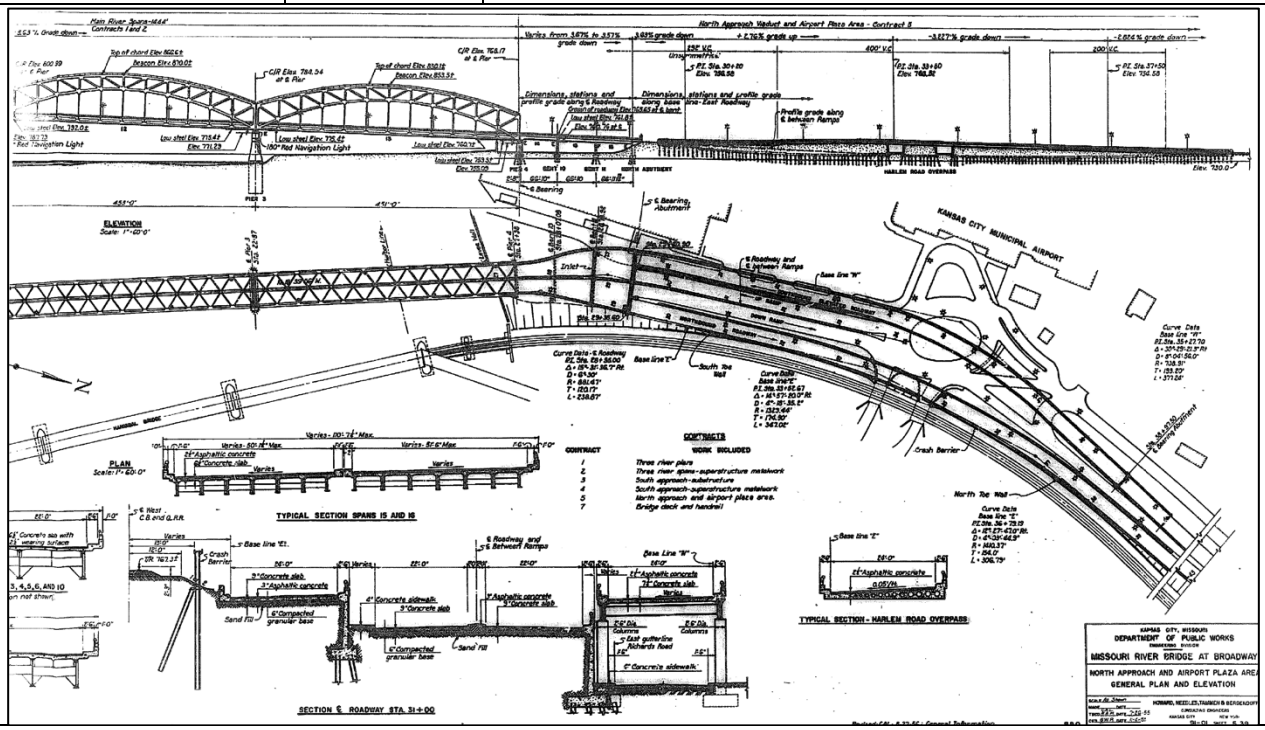
Photographer:	Date:	Description:
Richard Welnowksi	9/4/2018	Bridge plaque; view facing east.



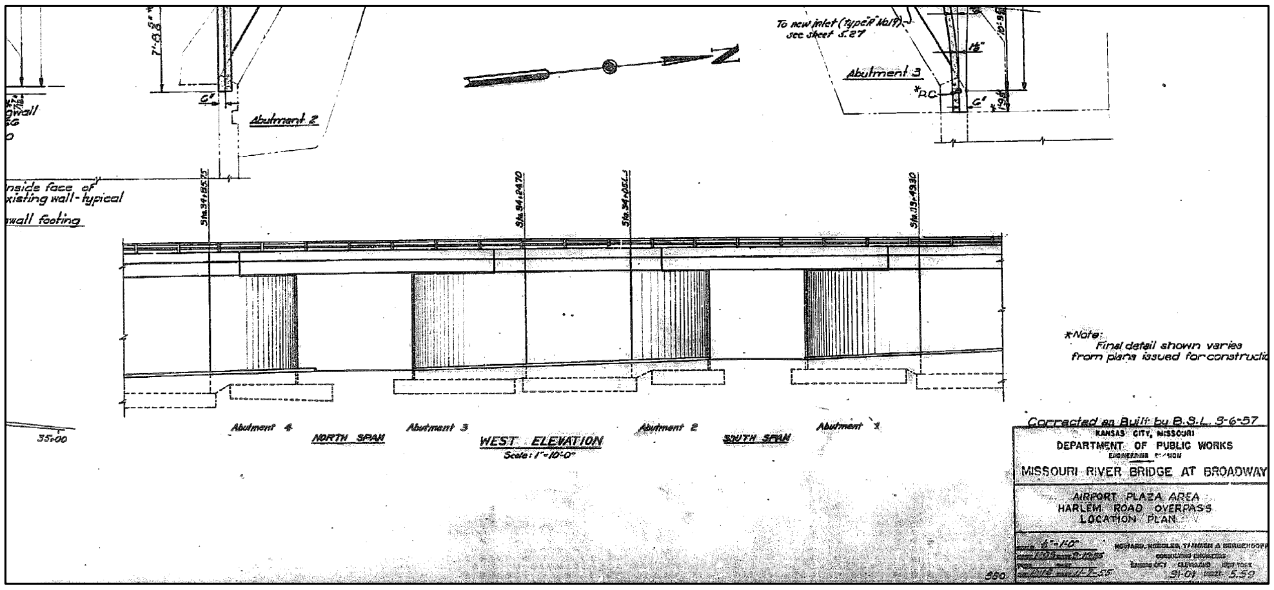
Photographer:	Date:	Description:
Richard Welnowksi	9/4/2018	General view of plaza area; view facing southeast.



Source:	Date:	Description:
HNTB	1955	"North Approach and Airport Plaza Area, General Plan and Elevation"

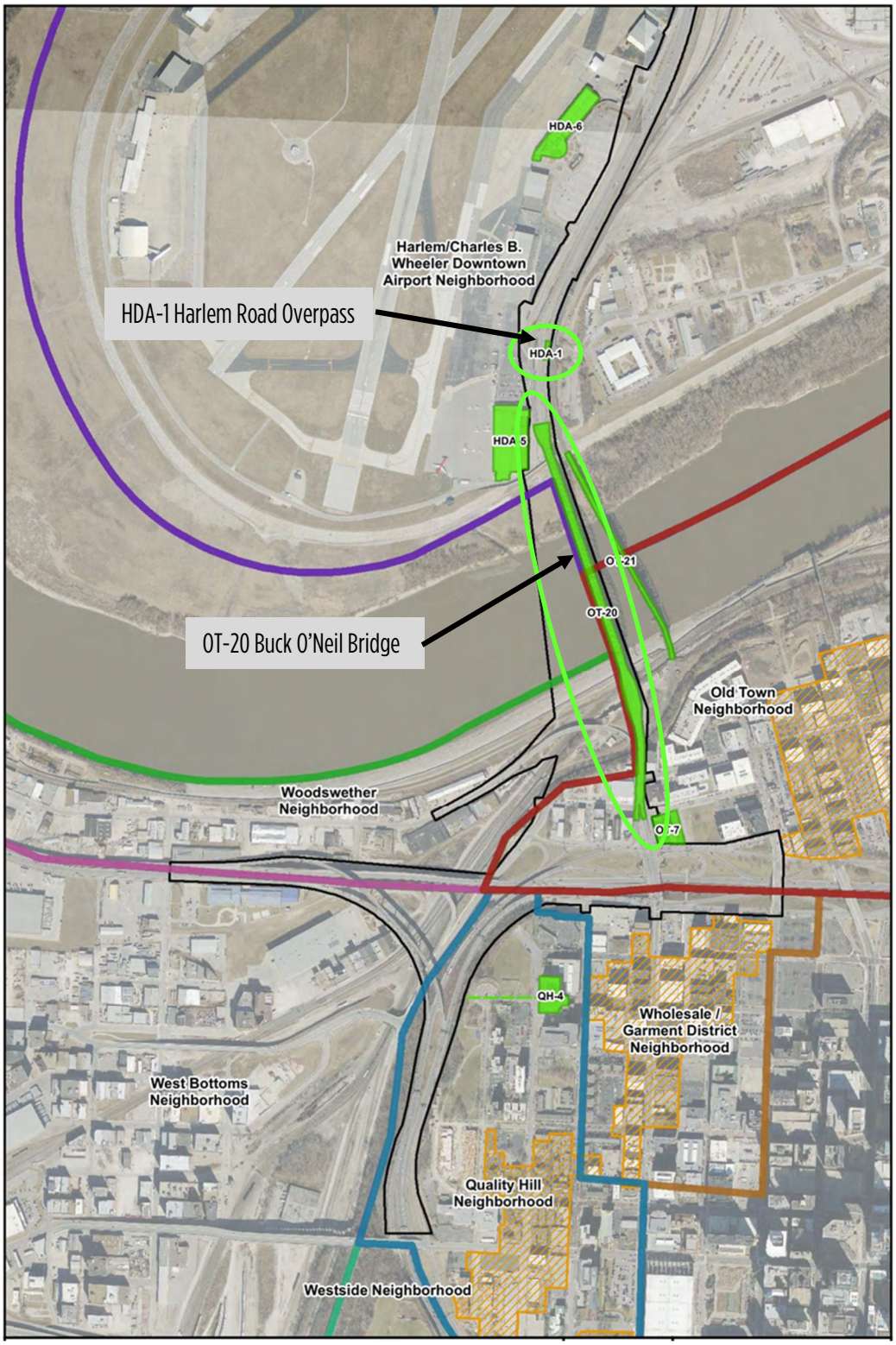


Source:	Date:	Description:
HNTB	1955	"Airport Plaza Area, Harlem Road Overpass Location Plan"



Source:	Date:	Description:
Missouri Valley Special Collections, Kansas City Public Library	c. 1920s	This c. 1920s photograph of Richard's Field shows an underpass for vehicular traffic underneath the railroad tracks in the same location as the current Harlem Road Overpass.




HDA-6
Harlem/Charles B. Wheeler Downtown Airport Neighborhood
HDA-1 Harlem Road Overpass
HDA-1
HDA 5
O -21
OT-20
OT-20 Buck O'Neil Bridge
Old Town Neighborhood
Woodswether Neighborhood
O -7
QH-4
Wholesale / Garment District Neighborhood
West Bottoms Neighborhood
Quality Hill Neighborhood
Westside Neighborhood

MoDOT completed an extensive inspection of the Buck O'Neil Bridge in 2015. The inspection identified numerous structural deficiencies in need of rehabilitation or replacement. Condition assessment of the trussed-arch spans, approach spans and supporting elements are summarized below.

1.0 Trussed-Arch Spans (Bridge A4649)

Significant deterioration of structural steel has occurred at truss elements, gusset plates, connectors, bearings and steel stringers that support the roadway. Corrosion and deterioration are most prominent near roadway expansion joints where supporting elements are exposed to roadway drainage, but also occur throughout. Many of these elements need to be repaired or replaced. In addition, fatigue retrofits, painting and repairs to hanger assemblies are needed to prolong the life of the existing structure. Likewise, condition of the roadway deck and expansion joints warrant replacement of these items.



Figure 1: Bridge A4649

Structural Steel - The most severe sections of bridge deterioration occur at stringer ends of the Main Spans, keeper plates and floorbeam webs. Ends of steel stringers that support the roadway deck are exhibiting serious deterioration and section loss due to long term exposure to chloride contaminated runoff from the deck through open joints and curbs. Cracking also occurs in the stringer webs. The stringers are supported on steel plate bearings which are also deteriorating with extensive pack rust between the steel plate bearings and bottom flange of the stringers.



Figure 2: Pack rust at stringer bearing plates



Figure 3: Typical deterioration at steel elements

Section loss occurs in top and bottom flanges of the floorbeams. Pitting in the floorbeam webs occurs throughout. Pack rust occurs between stiffening angles and floorbeam webs, with holes occurring in the floorbeam stiffening angles. Tie girders at the arch spans have pack rust between top plates and connecting

angles which causes cupping and bowing of the top plates. Localized areas of pitting also occur on the tie girders. Portal frames, box members and gusset plates all have pack rust between plies of steel and deterioration.

Suspender Cable Keepers - At each of the cable supports on the mains spans from panel points T2 to T2' the lower sockets of the cables are retained by keeper angles. These angles were attached with tap bolts to the socket bearing plate. Pack rust has formed between the keeper angles and the bearing plates at most locations. The pack rust is prying the keeper angles away from the bearing plate, and in some instances the bolts have failed, and the keeper angles are no longer in place.



Figure 4: Broken retainer angle at suspender cable socket

Expansion Joints - The finger plate expansion joints at each end of the main spans have no drainage collection system. This allows roadway drainage to flow onto underlying structural steel and pier tops. Although vertical misalignment has occurred at the joints, the finger plates are in satisfactory condition, but the supporting steel structure below is deteriorating. Pack rust, deterioration and broken clip angles occur at the joint support brackets. Compression seal joints at contraction joint locations have failed in all main spans. Filler material in the compression seals is missing and armoring is missing or damaged, again allowing roadway drainage access to structural steel elements below.



Figure 5: Deterioration at expansion joint support

Bridge Deck - The existing bridge deck has a low slump overlay on top which has numerous cracks in both the transverse and longitudinal directions, and deterioration near drain locations. Stay-in-place forms are underneath the deck and exhibit bulging in some places. The overlay above and deck forms underneath hinder crack detection in the actual deck. Based on reported visual observations, it is estimated that half-sole repairs are required on 20 percent of the deck area, and full depth repairs are required on 15 percent of the deck area. It is also recommended that the overlay be removed and replaced. Deck saturation also occurs in the north approach spans.



Figure 6: Deck cracking in overlay (left), corrosion and spalling at railing parapets (right)

Railing - The railing has numerous locations where vehicular impact has caused damage including bent and broken rail tubes and broken rail posts. Curbs and parapets supporting rail posts are corroded and spalled. Pack rust is also prevalent on steel curb support brackets.

Main Span Piers and Scour - A significant scour hole up to 24 feet deep is present at Pier 2. Pier 2 is located near the middle of the river at the north end of the 540 foot-long navigation span. The scour occurs on all sides of the pier. The pier is embedded approximately 1 foot into shale. This scour hole should be filled with stone or riprap to prevent further scouring in this vicinity.

Faces of the piers are in generally poor conditions. Areas of delamination and spalls occur on the faces and corners. Elevated chloride content occurs in the concrete.

Approach Span Piers - Pack rust occurs between flanges and connecting angles and end plates and connecting angles at the approach piers. Localized concrete spalling also occurs.

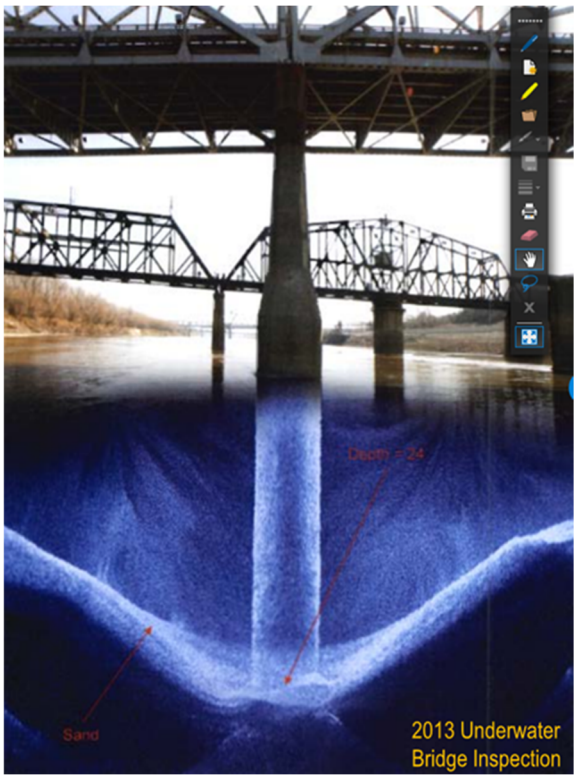


Figure 7: Image of scour hole at Pier 2

Repairs Performed to Bridge A4649 in 2018 - Minor concrete repairs to several piers were performed. Expansion joints and ends of steel stringers at the ends of the arch spans were replaced. Partial repairs were made to the median and barrier rails. Cable keepers were replaced. The scour hole will be filled in spring 2020.

Deficiencies Remaining on Bridge A4649 - The deck condition was not improved and the deck will continue to deteriorate over time. The pack rust throughout the structure was not repaired and the steel condition will continue to deteriorate over time.



Figure 8: Corrosion at approach piers

2.0 North Approach Spans (Bridge A4646)

Deck deterioration and pack rust similar to Bridge A4649 is present. Systemic cracking of the girder webs occurs at the ends of stiffeners. Cracking can primarily be classified as distortion induced fatigue cracking. Some of the cracking has propagated into the webs. Monitoring has shown the cracks continue to grow over time.

Repairs to Bridge A4646 in 2018 - Repairs were made to steel girder hinges at 21 locations.

Deficiencies Remaining on Bridge A4649 - The deck condition was not improved and the deck will continue to deteriorate over time. The pack rust throughout the structure was not repaired and the steel condition will continue to deteriorate over time.



Figure 9: Bridge A4646 Southbound north approach spans have fatigue cracking issues



Figure 10: Fatigue cracking in southbound north approach spans

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

October 4, 2019

Mr. Michael Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65102

Re: **SHPO Project Number 039-MLT-18** Job No. J4S3085, Buck O'Neil Bridge over Missouri River, Kansas City, Jackson and Clay Counties, Missouri (FHWA)

Dear Mr. Meinkoth:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the cultural resources report for the US-169/Buck O'Neil Bridge Environmental Study Area which included both an archaeological summary and an architectural survey. Based on our review of the documentation, we concur with the report recommendations. More particularly, we concur that the following properties may be eligible for listing individually in the National Register of Historic Places (NRHP):

- WW-17 - Santa Fe Pumping Plant 1200 Woodswether Road
- OT-7 –Colonial Patterns Company 340 West 5th Street
- OT-20 –Broadway Bridge/ Buck O'Neil Bridge
- OT-21 –Second Hannibal Bridge
- WB-1 –Faultless Starch/Standard Seed Company 931 West 8th Street
- WB-3 -12th Street Trafficway Viaduct
- QH-4 -8th Street Tunnel
- HDA-1 – Harlem Road Overpass
- HDA-3 –Kansas City, Missouri Water Intake Plant 3200 North Broadway Fwy.
- HDA-5 –Transcontinental & Western Airlines 10 Northwest Richards Road
- HDA-6 –Municipal Airport Terminal Facility 250-300 Northwest Richards Road

We concur that the following properties may be eligible for listing in the NRHP as contributing buildings to the Old Town Historic District:

- OT-3 -114-118 West 5th Street
- OT-5 -120-122 West 5th Street

It is our understanding that the alternative selection has not been completed and therefore it is not possible to assess effects to the above listed historic properties at this time. We

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look forward to consulting with your office on the assessment of effects to the historic properties when it is practicable to do so.

Please be advised that, should project plans change, information documenting the revisions should be submitted to this office for further review. In the event that cultural materials are encountered during project activities, all construction should be halted, and this office notified as soon as possible in order to determine the appropriate course of action.

If you have any questions, please write the State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 attention Review and Compliance, or call Amanda Burke at 573/522-4641. Please be sure to include the SHPO Log Number (**039-MLT-18**) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl

Toni M. Prawl, Ph.D.
Director and Deputy State
Historic Preservation Officer

TMP:ab

c. Ms. Raegan Ball, FHWA
Mr. Taylor Peters, FHWA

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

JAN 2 7 2020

Mr. Michael Meinkoth
Historic Preservation Manager
Missouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65102

Re: **SHPO Project Number 039-MLT-18** – Route 169, John J. "Buck" O'Neil Bridge, Job No. J4S3085, Clay and Jackson Counties, Missouri (FHWA)

Dear Mr. Meinkoth:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the Section 106 non-archaeological resources report entitled *Section 106 Effects Assessments for the US 169-Buck O'Neil Bridge Improvement Project, MoDOT Job No. 4S3085*. Based on this review it is evident that a thorough and adequate cultural resources survey has been conducted of the project area. We concur with your recommendation that the removal of the John J. "Buck" O'Neil Bridge (MoDOT Bridge No. A4649) and the Harlem Road Overpass (MoDOT Bridge No. A4647 and A4648), which have been determined eligible for the National Register of Historic Places (NRHP), will result in **an adverse effect** to these historic properties. We further concur that the proposed project alternatives will have **no effect or no adverse effect on the remaining NRHP-listed or eligible resources** within the project area.

Our office looks forward to continuing consultation with your office as plans for the project and Section 106 Programmatic Agreement are developed. If you have any questions, please write the State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102, attention Review and Compliance, or call Kelsey Matson at (573) 522-4641.

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Please be sure to include the SHPO Log Number (**039-MLT-18**) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Mike Sutherland
Acting Division Director, Missouri State Parks and
Deputy Missouri State Historic Preservation Officer

TMP:km

c. Ms. Raegan Ball, FHWA
Mr. Taylor Peters, FHWA

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

WHEREAS, the Federal Highway Administration (FHWA) Missouri Division is the federal agency responsible for ensuring the undertaking complies with Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. § 306108) codified in its implementing regulations 36 CFR Part 800, *Protection of Historic Properties*; and

WHEREAS, the duties of the Missouri State Historic Preservation Office (SHPO) pursuant Section 106 of the NHPA and 36 CFR Part 800 include responsibilities to advise, assist, review, and consult with Federal agencies as they carry out their historic preservation responsibilities and to respond to Federal agencies' requests within a specified period of time; and

WHEREAS, the Missouri Highways and Transportation Commission (MHTC) is the board that governs MoDOT, appoints the Director and authorizes the Statewide Transportation Improvement Program; and

WHEREAS, the FHWA and the Missouri Department of Transportation (MoDOT) are conducting an Environmental Assessment (EA) under the National Environmental Policy Act, as amended (NEPA) (42 U. S. C. § 4371 *et. seq*.) to determine the preferred alternate for Improvements to U. S. Highway 169 (US 169) Corridor from Missouri Route 9 to Interstate 35 (I-35), including phasing of said improvements (US-169/Buck O'Neil Bridge Environmental Study) which will be constructed as a Design-Build project; the improvements described in the EA are the subject of this Programmatic Agreement (PA) ; and

WHEREAS, the MoDOT has funding from a Better Utilizing Investments to Leverage Development (BUILD) grant, funded by the FHWA pursuant to the Fixing America's Surface Transportation (FAST) Act (PL 114-94) to improve the Missouri River crossing on US 169 and the EA includes four options for connections between US 169 to I-35, as part of the US 169 corridor improvements; and

WHEREAS, the FHWA and MoDOT have elected to phase the identification and evaluation of archaeological historic properties as provided in 36 CFR Part 800.4(b)(2) and using the Missouri Programmatic Agreement for the Phased Identification and Evaluation of Historic Properties (Phased 106 PA) executed on July 24, 2014 and amended on June 12, 2015 and August 1, 2019. FHWA will ensure that MoDOT completes the process in a timely manner, to allow practical

opportunities to avoid or minimize adverse effects to historic properties, as stipulated under this agreement; and

WHEREAS, the MoDOT, acting on behalf of the FHWA, has refined the undertaking's area of potential effects (APE), as defined at 36 CFR Part 800.16(d), from a project study area for background research for archaeological and built environment resources. The APE was refined for built environment resources to encompass the combined reasonable alternatives identified in the EA, which include the new right of way, including 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 (see Attachment 1 for description and map); and

WHEREAS, the FHWA has determined that the Old Town Historic District (resources OT-4, OT-6, OT-13 and OT-14), the Wholesale (Garment) Historic District (resources WD-1-3 and WD5-10) and the Richards-Conover Hardware Company Building (resource OT-6) are listed on the National Register of Historic Places (National Register) (criteria and areas of significance for all historic properties are described in the technical report[1]) and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the properties at 114-118 W. 5th Street (resource OT-3) and 120-122 W. 5th Street (resource OT-5) are eligible for listing on the National Register as a boundary expansion of the Old Town Historic District and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the Santa Fe Pumping Plant (resource WW-17), the Colonial Patters Company Building (resource OT-7), the Broadway "John J. 'Buck' O'Neil" Bridge (resource OT-20, bridge number A4649), the Second Hannibal Bridge (resource OT-21), the Thorn, Hunkins & Company Warehouse Building (resource WB-1), the 12th Street Trafficway Viaduct (resource WB-3, bridge number S030B11), the 8th Street Tunnel (resource QH-4), the Harlem Road Overpass (resource HDA-1, bridge numbers A4647 and A4648), the Kansas City, Missouri Water Intake Plan (resource HDA-3), the Transcontinental and Western Airlines Terminal (T&WA) (resource HDA-5) and the Municipal Airport Terminal Facility (resource HDA-6) are individually eligible for listing on the National Register and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the proposed improvements to Route 169 could have a direct adverse effect upon the John J. "Buck" O'Neil Bridge (A4649) and the Harlem Road Overpass (A4647 and A4648), properties eligible for inclusion on the National Register under criteria A and C for significance in transportation and engineering; and has consulted with the SHPO pursuant to 36 CFR Part 800, *Protection of Historic Properties*, regulations

[1] Burns & McDonnell, *Cultural Resources Summary within the US-169/Buck O'Neil Bridge Environmental Study Area, Jackson and Clay Counties, Missouri, MoDOT Job No. J4S3085*, 2019; available from the Missouri Department of Transportation, Historic Preservation Section, Jefferson City, Missouri.

implementing Section 106 of the NHPA (54 U.S.C. § 306108) (see Attachment 2 for effects by alternate table), as amended; and

WHEREAS, the FHWA has determined that the proposed improvements to US 169 could have an indirect effect, either adverse or no adverse, to the Colonial Pattern Company (resource OT-7), the Second Hannibal Bridge (resource OT-21), the Transcontinental & Western Airlines Building (resource HDA-5) and the Municipal Airport Terminal Facility (resource HDA-6), the effect of which may not be known until design has progressed; and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the proposed improvements to US 169 will have no adverse effect upon the Old Town Historic District, the Wholesale (Garment) Historic District or the Richards and Conover Hardware Company Building, properties listed on the National Register and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the proposed improvements to US 169 will have no adverse effect upon the proposed boundary expansion to the Old Town Historic District, the Santa Fe Pumping Plant, the Thorn, Hunkins & Company Warehouse, the 12th Street Trafficway Viaduct, and the Kansas City, Missouri Water Intake Plant, properties eligible for inclusion on the National Register and has consulted with the SHPO pursuant to 36 CFR Part 800; and

WHEREAS, the FHWA has determined that the effects to the Eighth Street Tunnel cannot be determined until further into the design process, when impacts into the tunnel can be identified and evaluated; and

WHEREAS, MoDOT's noise barrier policy can be found in the *Engineering Policy Guide* in Section 127.13: Noise; and

WHEREAS, historic properties may be eligible for the construction of a noise barrier to reduce noise levels as benefited receptors, and the Section 106 effects related to the construction of a noise barrier have not been determined; and

WHEREAS, the FHWA has notified the Advisory Council on Historic Preservation (Council) of the project and its potential to have multiple adverse effects on historic properties on May 14, 2019 and invited the Council to participate in consultation and the Council accepted the invitation to participate in consultation and the development of this PA on May 30, 2019 (see Attachment 3 for consultation process to date); and

WHEREAS, the Missouri Highways and Transportation Commission (MHTC), acting by and through MoDOT, has been invited to participate in the preparation of and be a signatory to this PA; and

WHEREAS, the City of Kansas City, Missouri has been invited to participate in the preparation of and be a signatory to this PA. The City has participated in consultation but declined to be a signatory to the PA; and

WHEREAS, the FHWA recognizes that the Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Kaw Indian Nation of Oklahoma, Miami Tribe of Oklahoma, Osage Nation, Ponca Tribe of Nebraska, Ponca Tribe of Oklahoma, Sac and Fox Tribe of the Missouri in Kansas and Nebraska, Sac and Fox Tribe of the Mississippi in Iowa, Sac and Fox Nation of Oklahoma and the Wyandotte Nation have an interest in the undertaking area, and has consulted with them on a government-to-government basis (September 18, 2018); and,

WHEREAS, the Miami Tribe of Oklahoma accepted the invitation to participate in consultation (November 14, 2018); and

WHEREAS, the Aviation History Museum, Clay County, the Downtown Neighborhood Association, the Historic Bridge Foundation, the Historic Kansas City Foundation, historicbridges.org, Jackson County, the Kansas City Landmarks Commission, Missouri Preservation, the Midwest Regional Office of the National Trust for Historic Preservation, the River Market Community Association, and the TWA Museum have been notified of undertaking and have been invited to participate in consultation (November 8, 2018); and

WHEREAS, the Kansas City Landmarks Commission and the Downtown Neighborhood Association accepted the invitation to participate in consultation; and

WHEREAS, FHWA and MoDOT have afforded and will continue to afford the public an opportunity to comment on the effects of the project undertaking on historic properties through the NEPA process and in accordance with the MoDOT *Engineering Policy Guide*, Chapter 129: Public Involvement; and

WHEREAS, a public meeting was held on February 12, 2019, and information about the Environmental Assessment with information on the potential to effect historic properties made available to the public; and

WHEREAS, an on-line public meeting was held between August 15, 2019, and September 6, 2019, about the revised Purpose and Need and the refined alternatives. The meeting included a survey in which the public could answer questions and submit general comments, including any comments about historic property concerns; and

WHEREAS, no comments about potential effects on historic properties have been received from the public as a result of the public meetings; and

WHEREAS, to the best of the FHWA's knowledge and belief, no human remains, associated or unassociated funerary objects or sacred objects, or objects of cultural patrimony as defined in the

Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. § 3001), are expected to be encountered; and

NOW, THEREFORE, the FHWA and the SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

FHWA, with the assistance of MoDOT, shall ensure that the following measures are carried out:

1. **EVALUATION OF EFFECTS BASED ON DESIGN-BUILD CONCEPT**
   A. MoDOT and/or its contractor shall retain a professional who meets the *SOI Standards* in Architectural History to confirm that the design is within the area identified as the project APE and included within the surveys. If the property is located outside the previously identified APE, the Phased Identification and Evaluation of Historic Properties Programmatic Agreement[2], and the processes outlined in Stipulation 1, below, shall be employed for those properties to ensure Section 106 compliance.
      1) If the property was not included within the APE, MoDOT and/or its contractor shall consult with FHWA and the SHPO about an appropriate APE.
      2) MoDOT, and/or its contractor, shall conduct built environment and archaeological surveys, consistent with SHPO and MoDOT standards[3].
      3) The SHPO and consulting parties shall be provided a copy of the survey results and shall be given thirty (30) days to review and comment on the results.
      4) If there is disagreement about the finding, FHWA and MoDOT will consult with the parties to resolve the disagreement, per Stipulation 12, Dispute Resolution.
      5) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.
      6) If there is an adverse effect finding, MoDOT and/or its contractor, shall provide FHWA with information to notify the Council of the adverse effect
      7) FHWA and MoDOT shall consult with SHPO and the other consulting parties to resolve the adverse effect, per Stipulation 1.E.
   B. MoDOT and/or its contractor shall confirm that the effects findings made for archaeological and built environment resources during the NEPA process remain valid during the design/build process.
   C. FHWA shall continue consultation with interested Indian Tribes.
   D. 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.

[2] Programmatic Agreement among FHWA, MHTC, MoSHPO and ACHP for the Phased Identification and Evaluation of Historic Properties, executed June 12, 2015 and extended August 1, 2019.
[3] State Historic Preservation Office, *Guidelines for Phase I Archaeological Surveys and Reports*, https://dnr.mo.gov/shpo/docs/MO_phase1_guide.pdf.
Missouri Department of Transportation, *Built Environment Resource Methods*, 2018.

1) SHPO and the consulting parties will have thirty (30) days to review the information and provide comments.
2) If there is disagreement about the finding, FHWA and MoDOT will consult with the parties to resolve the disagreement.
3) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.

E. FHWA and MoDOT shall consult with the SHPO and consulting parties to resolve any adverse effects.
1) Consultation shall include ways to avoid or minimize adverse effects.
2) If adverse effects cannot be avoided, consultation shall decide which of the mitigation measures, as described in Stipulations 3 and 4, below, are appropriate to mitigate the severity of the effect and the resource.
3) Consultation shall consist of an in-person or teleconference meeting, or e-mail exchange about the historic resource and the project effects upon it, and proposed mitigation measures as described in Stipulations 3 and 4 below.
4) Following the meeting, MoDOT shall send a letter to the consulting parties summarizing the results of the consultation; specifying the proposed mitigation measures for the historic property.
5) Consulting parties shall have thirty (30) days to respond with concurrence letter. If consulting parties fail to respond within thirty (30) days, concurrence can be assumed.
6) This agreement will be legally binding and fulfill the requirements to resolve adverse effects under 36 CFR 800.6.

2. **EIGHTH STREET TUNNEL**

A. Prior to design, additional survey work to determine the limits of the Eighth Street Tunnel and its location on the bluff shall be conducted. The survey shall include work to determine impacts previous I-35 construction and the effects capping the west portal had on the historic integrity of the tunnel.
1) SHPO and other consulting parties will be provided a copy of the additional research and the effects assessment for review.
2) SHPO and other consulting parties shall have thirty (30) days to review the effects assessment and provide comments.
3) If there is disagreement about the effects finding, FHWA and MoDOT shall consult with the parties to resolve the disagreement.
4) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.

B. If the project will have no effect or no adverse effect on the Eighth Street Tunnel, it's location will be marked on plans and it will be marked as "Do Not Disturb".

C. If the project will have an adverse effect, FHWA and MoDOT will consult with SHPO and the consulting parties to resolve the adverse effects per 36 CFR 800.6 and Stipulation 1.E above to identify appropriate mitigation measures, as outlined in Stipulation 3 and 4 below, for the effects of the project on the tunnel. At a minimum, the mitigation measures will include:

1) If the tunnel is uncapped, and non-historic material is removed exposing the tunnel shaft, photographs, to National Register standards, will be taken of the portal and areas that will be directly affected.
2) A plan to ensure that the stability of the tunnel is not undermined by highway construction will be developed.

3. **BRIDGE AND STRUCTURE MITIGATION MEASURES**

If the project has an adverse effect on bridges or other structures, the mitigation measures below were developed during the consultation process. The mitigation should be commensurate with the effect on the historic property and the significance of the property. The procedures outlined in Stipulation 1.E to resolve adverse effects will be utilized.

A. BRIDGE MARKETING

1) The John J. "Buck" O'Neil Bridge (A4649) Bridge is being marketed as available for reuse in accordance with the Missouri *Bridge Marketing Plan* through December 31, 2019.
2) If proposals for the reuse of the John J. "Buck" O'Neil Bridge (A4649) are received as a result of the historic bridge marketing, such proposals shall be reviewed by FHWA, SHPO, MoDOT and consulting parties in accordance with the Missouri *Bridge Marketing Plan*.
   a. Consulting parties shall be given thirty (30) days to review proposals received and to comment on the appropriateness of any proposals.
3) If an appropriate proposal is received, MoDOT shall negotiate to develop a mutually acceptable transfer agreement.

B. ARCHIVAL DOCUMENTATION

The MHTC, acting by and through MoDOT, shall develop archival documentation to the following specifications. Work shall be done by MoDOT staff or by consultants meeting the *SOI Standards* for History and/or Architectural History:

1) Prepare historical documentation to Level I standards of the *Levels of Bridge Documentation (State Level) For Section 106 Mitigation of Adverse Effect* (Documentation Standards) for the John J. "Buck" O'Neil Bridge (A4649) and the Harlem Road Overpass (A4647 and A4648).
2) Prior to letting the undertaking, MoDOT shall take archival photographs of the bridge.
   a. Take archival photographs, consistent with the National Register standards, with sufficient coverage to provide overall views of the bridge and significant details of the bridge.
   b. Prior to letting and the production of archival prints, consult with the SHPO regarding the adequacy of coverage for the bridge and the selection of images.
   c. Print photographs in size consistent with Documentation Standard Level.
   d. Print and label photographs in a manner consistent with National Register standards.
   e. Photographs shall be keyed to a site plan, map and/or bridge plans.

f. Provide original photographs and digital images (black and white .tiff images and color .jpeg images) on archival discs to the SHPO and MoDOT; both agencies will maintain original photographs and digital images.

3) Original construction plans shall be provided as part of the documentation in paper and digital format (.pdf), if available.

4) A report consisting of the historical documentation, photo log, photo key map, photo plates of the archival photographs and construction plans shall be provided to the SHPO, the Kansas City Public Library (Missouri Valley Room and Special Collections Department), and the North Kansas City Public Library in paper and digital (.pdf) formats. The report shall also be retained by MoDOT and will be made available on MoDOT's web-site.

C. INTERPRETATION

1) Interpretive Panel

a. MoDOT, or its consultant, shall develop an interpretive panel on the history and engineering of the John J. "Buck" O'Neil Bridge and Harlem Road Overpass. The interpretive panel shall be located along the Riverfront Heritage Trail or another suitable location overlooking the bridge location. If other engineering works or visual effects are also mitigated by the interpretive panel, MoDOT shall consult with the consulting parties about the themes the panel will discuss.

b. Prior to the fabrication of the interpretive panel, the consulting parties shall be provided an opportunity to review and comment on the content and proposed location of the panel for thirty (30) days.

c. Comments shall be addressed or, if there is disagreement, consultation to resolve the comments shall be conducted by MoDOT.

2) Traveling Exhibit

a. MoDOT, or its consultant, shall develop a traveling exhibit on the history and engineering of the John J. "Buck" O'Neil Bridge and the Harlem Road Overpass.

b. The traveling exhibit shall be made available to local libraries, historical societies, museums or other groups for display.

c. MoDOT shall work to find a locally based repository to take ownership of the traveling exhibit and to manage its use.

d. Prior to the fabrication of the traveling exhibit, consulting parties shall be provided an opportunity to review and comment on the content for thirty (30) days.

e. Comments shall be addressed, or if there is disagreement, consultation to resolve the comments shall be conducted by MoDOT.

3) Story Maps

a. MoDOT, or its consultant, shall develop a Story Map on major river crossings in the Kansas City area.

b. MoDOT shall work to find a locally based repository to host the content.

c. Prior to publication of the Story Maps, consulting parties shall be provided an opportunity to review and comment on the content for thirty (30) days.

d. Comments shall be addressed, or if there is disagreement, consultation to resolve the comments shall be conducted by MoDOT.

D. SCIENCE CITY

1) MoDOT shall work with Science City, to determine the feasibility of expanding existing programs or exhibits on transportation in the Kansas City area with additional information on the John J. "Buck" O'Neil Bridge. If Science City does not wish to pursue this, no further action is required by MoDOT and FHWA.
2) If Science City is interested in expanding such programs or exhibits, MoDOT shall consult with Science City, FHWA and SHPO to determine the scope and scale of information to be provided.
~~2)~~3) MoDOT and FHWA shall have final say on the scope and scale of appropriate mitigation measures.
~~3)~~4) MoDOT shall inform the other consulting parties of the results of the consultation and the nature of the programs that will be developed.
~~4)~~5) MoDOT and/or shall provide the relevant information based on the results of the consultation.

4. **ARCHITECTURAL RESOURCES**

If project effects to National Register eligible architectural resources change, FHWA and MoDOT will consult about project effects with the consulting parties, pursuant to 36 CFR 800.5. Efforts will be made to avoid adverse effects.

A. Mitigation Measures

If adverse effects cannot be avoided, FHWA and MoDOT shall work with consulting parties to identify appropriate mitigation based on the severity of the effect and the resource. Consulting parties have identified potential mitigation measures for architectural resources including:

1) Developing historical documentation for the property including property history, description and archival photographs, as appropriate for the property and project effects on it, level of detail decided through further consultation (see Attachment 4 for Mitigation Standards).
2) Installing an interpretive panel at the bluff park to interpret the changes in the riverfront area over time
3) Develop a traveling exhibit on changes in the downtown area
4) Develop an interpretive exhibit on the history of the downtown airport
5) Develop interpretation that focuses on history of transportation in area: First Hannibal Bridge, Airport, Second Hannibal Bridge, vehicular traffic on railroad bridge, Broadway Bridge (Buck O'Neil Bridge)
6) Use Story Maps to tell story of change in downtown area
7) Work with Port Authority or River Market to develop walking tours of area
8) Complete National Register nominations for adjacent properties
9) Develop a historic context for the area—include the Jefferson Highway

B. Accidental Damage During Construction

1) If, during construction, there is accidental damage to a NRHP eligible or listed ("historic") architectural resource:
   a. The contractor shall immediately stop all work in the area of the historic property and shall not resume without specific authorization from a MoDOT Historic Preservation (MoDOT HP) Specialist.

b. The contractor shall notify the MoDOT Resident Engineer or Construction Inspector, who shall contact MoDOT HP within 24 hours of the accidental damage;
c. MoDOT HP shall contact FHWA and SHPO within 48 hours learning of the accidental damage to report it, after a preliminary evaluation of the damage has been conducted;
d. If it is determined that the damage will constitute an adverse effect, MoDOT HP will immediately notify FHWA and SHPO of the finding and provide recommendations to minimize and mitigate the adverse effect.
e. FHWA will notify the Council and consulting parties within 48 hours of this determination.
f. FHWA shall take into account Council and consulting party recommendations regarding the eligibility of the property and proposed actions, and direct MoDOT to carry out the appropriate actions.
g. MoDOT will provide FHWA and SHPO with a report of the actions when they are complete.
h. FHWA will provide this report to the Council and consulting parties.

2) If possible, the contractor shall restore the damage to its previous condition, following the SOI *Standards for Rehabilitation* (36 CFR Part 68.3(b)).
   a. The contractor shall document the damaged property by photographs before work begins. Copies of the before photographs shall be provided to the SHPO and MoDOT HP.
   b. The contractor shall prepare a scope of work for review by the property owner, MoDOT HP and the SHPO.
   c. MoDOT HP and SHPO shall provide comments on the scope of work within thirty (30) days of receipt. Review shall focus on how well the scope restores the damage and is in keeping with the SOI Standards for Rehabilitation.
   d. Photographs showing the work after completion will be taken and sent to MoDOT HP and the SHPO.
3) If the damage cannot be restored to its previous condition, FHWA, MoDOT, SHPO, the contractor and the affected property owner shall consult about appropriate repairs to the property.
   a. The contractor shall document the damaged property by photographs before work begins.
   b. The contractor shall prepare a scope of work of items agreed on during consultation.
   c. The scope of work shall be made available to the property owner, FHWA, MoDOT and SHPO for review for thirty (30) days to ensure that it accurately reflects the results of the consultation.
   d. The contractor shall document the property by photographs after work is done.
   e. The photographs of the before and after work will be sent to MoDOT HP and the SHPO.
   f. FHWA and MoDOT will consult with SHPO and the other consulting parties about what additional mitigation measures are appropriate to resolve adverse

effects under Section 106, for the property, from those identified in Stipulation 4.A. Consultation about the mitigation measures for each specific property will be formalized following Stipulation 1.E.

5. **NOISE BARRIERS**
   A. If the noise study identifies that noise barriers are beneficial and that they meet the standards for feasibility and reasonableness (as defined in Section 127.13 of the *Engineering Policy Guide*), benefitted property owners and residents will be balloted to determine if the majority of benefited receptors approve of a noise barrier (per *Engineering Policy Guide*, Section 127.13.12.2.9).
   B. If noise barriers are approved by benefitted receptors adjacent to parcels containing properties eligible for listing on the National Register, MoDOT, on behalf of FHWA, shall evaluate the effects of the noise barrier on the character defining features of the historic property per 36 CFR 800.5.
      1) SHPO and other consulting parties will be provided a copy of the effects assessment for review.
      2) SHPO and other consulting parties shall have thirty (30) days to review the effects assessment and provide comments.
      3) If there is disagreement about the effects finding, FHWA and MoDOT shall consult with the parties to resolve the disagreement.
      4) If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.
      5) Effects of noise barriers near historic properties may be minimized by use of aesthetic treatments.
      6) If adverse effects cannot be minimized, measures to resolve adverse effect shall be utilized per Stipulation 1.E.

6. **RIGHT OF WAY: UNECONOMIC REMNANTS AND DISPOSAL OF EXCESS**
   A. During right of way acquisition, MoDOT may find it necessary to purchase uneconomic remnants of parcels.
   B. These remnant-parcels will be surveyed by professionals meeting the *SOI Standards* for Archaeology and/or Architectural History for architectural and archaeological resources to determine if there are any National Register eligible resources.
   C. The survey shall be completed prior to the disposal of any excess right of way.
      1) Results of the survey shall be provided to SHPO and any relevant consulting parties for review.
      2) SHPO and other consulting parties shall have thirty (30) days to review survey results and provide comments.
   D. MoDOT will not dispose of any National Register eligible resources without seeking organizations willing to accept covenants to protect character defining features.
      1) Content of the covenant shall be negotiated between MoDOT, SHPO and the organization accepting the covenant.
      2) If MoDOT cannot find an organization willing to accept a covenant for a property, MoDOT will consult with FHWA, SHPO and other consulting

parties regarding appropriate mitigation measures, per Stipulation 1.E, to resolve the adverse effect, prior to the transfer.

7. **ARCHAEOLOGICAL SURVEY**

The FHWA, with MoDOT's assistance, will ensure that the following stipulations are carried out prior to taking any action that could adversely affect a National Register eligible archaeological property:

A. FHWA, with MoDOT's assistance, shall consult with the SHPO to review existing information on archaeological resources within the APE and seek appropriate information from consulting parties, other individuals, and organizations likely to have knowledge of, or concerns with, cultural resources in the area. If sites of Native American origin are encountered, this consultation shall include Indian Tribes who have indicated their interest in consulting on FHWA-funded undertakings in the county(s) where the specific project is located.
B. FHWA shall ensure that an adequate archaeological survey is conducted for the direct effects APE. Archaeological investigations will be conducted to identify and evaluate archaeological sites, assess the effects of the proposed undertaking on National Register eligible archaeological sites, and develop means to avoid, minimize or mitigate any adverse effects of the project on National Register eligible archaeological sites.
C. The FHWA, with MoDOT's assistance, shall apply the National Register Criteria for Evaluation (36 CFR Part 63), in consultation with the SHPO, appropriate Indian Tribes, and other interested parties, and guided by the Secretary's Standards and Guidelines for Evaluation, to evaluate the National Register eligibility of identified archaeological sites.
D. FHWA, with MoDOT's assistance, shall consult with the SHPO, appropriate Indian Tribes, and other interested parties, regarding evaluation of adverse effects on archaeological resources identified as eligible for the National Register, and to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate the projects adverse effects on archaeological sites eligible for the National Register.
E. If project activities are found to have adverse effects on archaeological sites eligible for the National Register, the FHWA shall consult with the SHPO, appropriate Indian Tribes and other interested parties to resolve the adverse effects, consistent with guidance provided in 36 CFR Part 800.6, through the implementation of an Archaeological Data Recovery Plan(s) developed in accordance with the Council's "Recommended Approach for Consultation on the Recovery of Significant Information from Archaeological Sites" (64 FR 27085-87 published in the *Federal Register* on May 18, 1999), the Council's Handbook on Treatment of Archaeological Properties, and the SOI *Standards for Archaeological Documentation*.
F. If human remains are encountered during archaeological investigations, the MoDOT HP staff will notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO per RSMo 194, and contact FHWA within twenty-four (24) hours of the discovery. FHWA will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification. FHWA shall take into account tribal recommendations regarding the treatment of the remains and proposed

actions, and then direct MoDOT HP staff to carry-out the appropriate actions in consultation with the SHPO. MoDOT, under FHWA oversight, shall monitor the archaeological data recovery and handling of any such human remains and associated or unassociated funerary objects, sacred objects or objects of cultural patrimony, to assure itself that these are handled, excavated or processed in accordance with the Missouri Unmarked Human Burials Sites Act (194-400-194.410 RSMo).

G. FHWA shall ensure that procedures to be used for the processing, analysis, and curation of collected materials must be in accordance with the Advisory 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.

8. **TREATMENT OF HUMAN REMAINS**

A. The FHWA recognizes that any human remains (other than from a crime scene or covered under Missouri's Cemeteries Law, §§ 214. RSMo) that may be discovered during project activities and are located on non-federal land are subject to the immediate jurisdiction of the SHPO, albeit FHWA or its delegate is responsible to have a professional archeologist analyze the remains and advise SHPO of the physical location and cultural and biological characteristics, and if SHPO determines, as per the consultation conducted under Section 106, excavation is warranted such remains will be handled pursuant to the Missouri Unmarked Human Burial Sites Act, §§ 194.400 – 194.410, RSMo, and subject to the provisions of the Native American Graves Protection and Repatriation Act as may apply.

B. FHWA, MoDOT, and SHPO recognize that Native American skeletal remains, associated or unassociated funerary objects, sacred objects, and objects of cultural patrimony that may be discovered during the archaeological survey, testing, or data recovery excavations on federal land are subject to NAGPRA. The land managing federal agency, shall, with assistance from FHWA, MoDOT and SHPO, assume responsibility for compliance with NAGPRA related to this undertaking. FHWA, in consultation with land managing federal agency will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification. FHWA and the land managing federal agency shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT to carry-out the appropriate actions.

C. If human remains are encountered during archaeological investigations:
   1) MoDOT HP staff will notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO, as per RSMo 194, and contact FHWA within 24 hours of the discovery.
   2) FHWA will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification.
   3) FHWA shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT HP to carry-out the appropriate actions in consultation with the SHPO.

4) MoDOT, under FHWA oversight, shall monitor the archaeological data recovery and handling of any such human remains and associated or unassociated funerary objects, sacred objects or objects of cultural patrimony, to assure itself that these are handled, excavated or processed in accordance with the Missouri Unmarked Human Burials Sites Act (194-400 – 194.410 RSMo).

D. If human remains are encountered during construction:
   1) The contractor shall immediately stop all work within a 50-foot radius of the remains and shall not resume without specific authorization from either the SHPO or the local law enforcement officer, whichever party has jurisdiction over and responsibility for such remains.
   2) The contractor shall notify the MoDOT Construction Inspector and/or Resident Engineer who will contact the MoDOT HP section within 24 hours of the discovery.
   3) MoDOT HP staff will immediately notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO as per RSMo 194 or to notify SHPO what has occurred and that it is covered by Missouri's Cemeteries Law, §§ 214. RSMo.
   4) MoDOT HP staff will notify FHWA that human remains have been encountered within 24 hours of being notified of the find.
   5) If, within 24 hours, the contractor is unable to contact appropriate MoDOT staff, the contractor shall initiate the involvement by local law enforcement and the SHPO. A description of the contractor's actions will be promptly made to MoDOT.
   6) FHWA will notify any Indian tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification.
   7) FHWA shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT HP to carry-out the appropriate actions in consultation with the SHPO.
   8) MoDOT, under FHWA oversight, shall monitor the handling of any such human remains and associated funerary objected, sacred object or objects of cultural patrimony in accordance with the Missouri Unmarked Human Burial Sites Act, §§ 194.400 – 194.410, RSMo.

9. **POST-REVIEW DISCOVERIES**

A. If cultural resources are encountered during construction:
   1) The contractor shall immediately stop all work within a 50-foot buffer around the limits of the resource and shall not resume without specific authorization from a MoDOT Historic Preservation (MoDOT HP) Specialist.
   2) The contractor shall notify the MoDOT Resident Engineer or Construction Inspector, who shall contact the MoDOT HP within 24 hours of the discovery.
   3) MoDOT HP shall contact FHWA and SHPO within 48 hours of learning of the discovery and provide an evaluation of the resource and reasonable efforts to see if it can be avoided.
   4) FHWA shall make an eligibility and effects determination, based upon the preliminary evaluation, and consult with MoDOT and SHPO to minimize or mitigate any adverse effect.

5) FHWA will notify the Council and any tribes that might attach religious and/or cultural significance to the property within 48 hours of this determination.
6) FHWA shall take into account Council and Tribal recommendations regarding the eligibility of the property and proposed actions, and direct MoDOT to carry out the appropriate actions.
7) MoDOT will provide FHWA and SHPO with a report of the actions when they are completed.
8) FHWA shall provide this report to the Council and the Tribes.

10. **DURATION**

This agreement shall commence upon having been signed by all signatories and shall be null and void if its terms are not carried out within ten (10) years from the date of its execution, unless all signatories agree in writing to an extension for carrying out its terms.

11. **MONITORING AND REPORTING**

Every year, by January 31, the MoDOT, acting on behalf of FHWA, shall provide to all signatories a written report regarding the actions taken to fulfill the terms of the agreement, and shall file a copy with the Council per 36 CFR Part 800.6(b)(iv). Such reporting shall cease when the terms of the PA have been fulfilled or upon agreement of the signatories.

12. **DISPUTE RESOLUTION**

Should any signatory to this PA object at any time to any actions proposed or the manner in which the terms of the PA are implemented, the FHWA shall consult with such party to resolve the objection. If FHWA determines that such objection cannot be resolved, FHWA will:

A. Forward all documentation relevant to the dispute, including the FHWA's proposed resolution to the Council. The Council shall provide FHWA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the Council or signatories, and provide them with a copy of this written response. FHWA will then proceed with its final decision.
B. If the Council does not provide its advice regarding the dispute within the thirty (30) day time period, FHWA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FHWA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories to the PA and provide them and the Council with a copy of the written response.
C. FHWA's responsibility to carry out all other actions subject to the terms of the PA that are not the subject of the dispute remain unchanged.

13. **AMENDMENTS**

This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the Council.

14. **TERMINATION**

If any signatory to this PA determines its terms will not or cannot be carried out, that party shall immediately consult with the other signatories to attempt to develop an amendment per Stipulation 12 above. If within thirty (30) days an amendment cannot be reached, any signatory may terminate the PA upon written notification to the other signatories.

Once the PA is terminated, and prior to work continuing on the undertaking, FHWA must either (a) execute an PA pursuant to 36 CFR Part 800.6 or (b) request, take into account, and respond to the comment of the Council under 36 Part CFR 800.7. FHWA shall notify the signatories as to the course of action it will pursue.

15. Four (4) copies of this signed PA will be provided, one to each signatory. FHWA will transmit copies to the Council for execution. The Council shall return the executed copies to MoDOT for distribution.

Execution of this PA by the Council, FHWA, the SHPO and the MHTC and the implementation of its terms evidence that FHWA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment.

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PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

ADVISORY COUNCIL ON HISTORIC PRESERVATION:

By: _____ **Date:** _____

Title: _____

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

FEDERAL HIGHWAY ADMINISTRATION:

By: _____ **Date:** _____

Title: _____

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICE,
AND THE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
REGARDING THE TREATMENT OF HISTORIC PROPERTIES
THAT MIGHT BE AFFECTED BY IMPROVEMENTS TO THE
US 169 CORRIDOR FROM MISSOURI ROUTE 9 TO INTERSTATE 35,
MoDOT JOB NUMBER J4S3085,
CLAY AND JACKSON COUNTIES, MISSOURI

THE MISSOURI STATE HISTORIC PRESERVATION OFFICE:

By: _____ **Date:** _____

Title: _____

PROGRAMMATIC AGREEMENT
AMONG
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION:

By: _____ **Date:** _____

Title: _____

Attest:

_____
Commission Secretary

Approved as to form:

_____
Commission Counsel

ATTACHMENT 1: AREA OF POTENTIAL EFFECTS

The area of potential effects (APE) began with a large project study area (see Figure 1) in which background research for archaeological and built environment resources was conducted. Background research included previous surveys and development of a historic context for the study area. The APE extends along Route 169 from Missouri Route 9 on the north to 12th Street and I-35 on the south.

The APE was refined to the corridor of alignments being studied for built environment resources, including the footprint of all the alignments and including an offset of 100 feet to allow for the consideration of direct effects from construction and visual and vibration impacts.

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

The archaeological APE will be further refined once the preferred alternate is selected and will consist of the footprint of new right of way, including permanent and temporary easements.

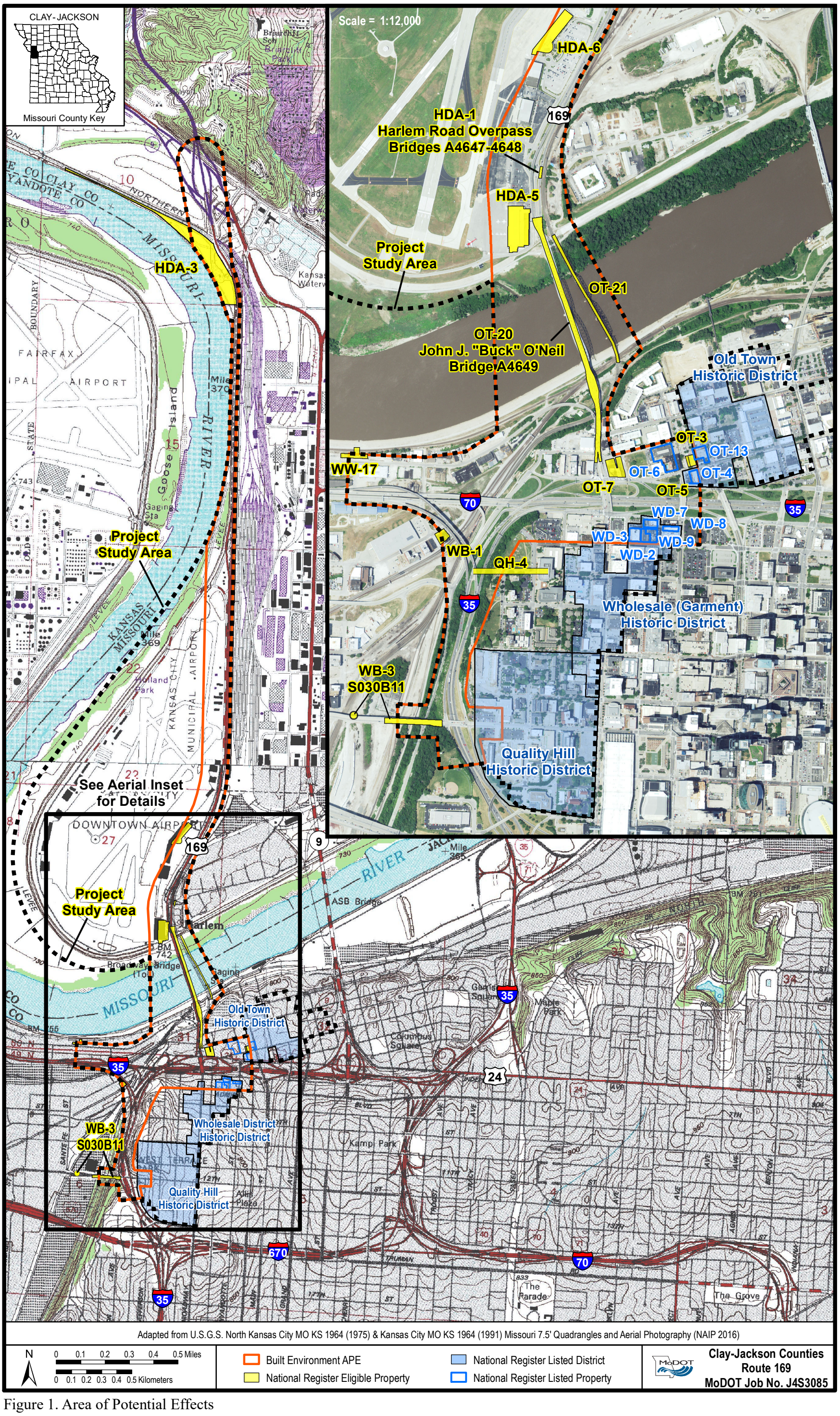


Figure 1. Area of Potential Effects

ATTACHMENT 2: PROJECT EFFECTS ON HISTORIC PROPERTIES

Effects of the project on historic properties will not be known until a project corridor is selected and a design chosen that includes rehabilitation or replacement of the Buck O'Neil Bridge.

A preliminary effects assessment for each alternative has been made for NRHP listed and eligible resources (see table below), but will need to be reassessed as the design-build process progresses.

Types of effects could include direct effects through the removal of the resource or indirect effects. Examples of possible indirect effects include (but are not limited to), visual effects of the construction of a new Missouri River Bridge, construction of new flyover ramps, changes in access or parking and construction of noise barriers.

All the build options would have an adverse effect on the Buck O'Neil Bridge (A4649) because the build option would include the removal of the bridge, which is an adverse effect under 36 CFR 800.5. The build options would also have an adverse effect on the Harlem Road Overpass (A4647 and A4648) because they would remove or reconfigure the bridges, altering their character defining features in a manner that they would no longer be eligible for listing on the NRHP, and therefore an adverse effect under 36 CFR 800.5.

Effects on the 8th Street Tunnel cannot be determined until the design stage. The west portal of the tunnel is currently blocked and is behind a retaining wall for I-35; it appears to be in the median between the north- and south-bound lanes. It is likely that grading or drilling for ramp construction will have effects on the tunnel that will need to be evaluated.

Survey Number	Property Name	No Build	West New Bridge	Central New Bridge	Adjacent New Bridge-# 1	Adjacent New Bridge-# 2	Adjacent New Bridge-# 3	North Segment
Woodswether Neighborhood								
WW-17	Santa Fe Pumping Station	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Old Town Neighborhood								
OT-4, 13, 14	Old Town Historic District (NRHP)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-3, 5	Old Town Historic District proposed expansion	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT-6	Richards-Conover Hardware Co. Bldg. (NRHP)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
OT 7	Colonial Patterns Co.	No Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Effect
OT-20	Broadway "Buck O'Neil" Bridge (A4649)	No Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	No Effect
OT-21	Second Hannibal Bridge	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
West Bottoms Neighborhood								
WB-1	Thorn, Hunkins & Co. Warehouse	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
WB-3	12th St. Trafficway Viaduct (S030B11)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Wholesale (Garment) District								
WD 1, 2, 3, 5, 6, 7, 8, 9, 10	Wholesale (Garment) District (NRHP)	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Quality Hill Neighborhood								
QH-4	Eigth Street Tunnel	No Effect	Undetermined	Undetermined	Undetermined	Undetermined	Undetermined	No Effect
Harlem/Charles B. Wheeler Downtown Airport Neighborhood								
HDA-1	Harlem Road Overpass (A4647 and A4648)	No Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	Adverse Effect	No Effect
HDA-3	KC, MO Water Intake Plan	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
HDA-5	T&WA Airlines	No Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Effect
HDA-6	Municipal Airport Terminal Facility	No Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Adverse Effect	No Effect

ATTACHMENT 3: CONSULTATION TO DATE

SECTION 106 CONSULTATION

On September 18, 2018 FHWA notified tribes with historical interests in the area of the study and invited them to participate in Section 106 consultation. On November 8, 2018, MoDOT, in consultation with FHWA, SHPO and the City of Kansas City, identified other potential consulting parties and invited them to participate. The table below identifies the tribes and other consulting parties invited to participate in consultation, and the responses received.

Entity	Response
Delaware Nation	None
Iowa Tribe of Kansas and Nebraska	None
Iowa Tribe of Oklahoma	None
Kaw Indian Nation of Oklahoma	None
Miami Tribe of Oklahoma	Will Consult
Osage Nation	None
Ponca Tribe of Nebraska	None
Ponce Tribe of Oklahoma	None
Sac and Fox Tribe of the Missouri in Kansas and Nebraska	None
Sac and Fox Tribe of the Mississippi in Iowa	None
Sac and Fox Nation of Oklahoma	None
Wyandotte Nation	None
Jackson County, Missouri	None
Clay County, Missouri	None
City of Kansas City	None
Kansas City Landmarks Commission	Will Consult
City of North Kansas City	None
Historic Kansas City Foundation	None
River Market Community Association	None
Downtown Neighborhood Association	Will Consult
TWA Museum	None
Airline History Museum	None
Historic Bridge Foundation	None
Historicbridges.org	None
Missouri Preservation	None
National Trust, Midwest Regional Office	None

On May 14, 2019 the FHWA invited the Council to participate in consultation, anticipating the potential for a large number of historic properties that could be affected

and the potential for controversy. The Council accepted the invitation to participate on May 30, 2019.

On June 10, 2019 the first consultation meeting was held. This meeting covered the project Purpose and Need and the Range of Alternates being considered. Prior to the meeting a draft of the Purpose & Need and Alternatives sections of the NEPA document were circulated to the consulting parties for their review.

On August 8, 2019 the second consultation meeting was held to discuss eligibility of resources within the built environment APE. The technical report, including the archival review and built environment survey were circulated to consulting parties prior to the meeting for review.

On August 27, 2019 a meeting was held to discuss the effects of the various alternatives on the historic properties and mitigation measures for historic properties for alternates that would have an adverse effect on historic properties.

Minutes from each consultation meeting were circulated to the consulting parties following the meeting.

PUBLIC INVOLVEMENT & MEETINGS

Project web-site: https://www.modot.org/buck-oneil-bridge-environmental-study

February 12, 2019, Mid-America Regional Council, 600 Broadway and On-Line
August 2019, On-Line

No comments from the public about historic properties have been received, to date.

ATTACHMENT 4: MITIGATION STANDARDS

Built Environment State-Level Mitigation Standards

The Built Environment Mitigation Standards (Standards) will be used by the Missouri Division of the Federal Highway Administration (FHWA), the Missouri Department of Transportation (MoDOT) and Local Participating Agencies (LPA) to comply with Section 106 of the National Historic Preservation Act (NHPA) for projects that have an adverse effect on historic properties (properties listed on or eligible for listing on the National Register of Historic Places (NRHP)) and which do not require national level (HABS/HAER/HALS) documentation. The appropriate level of documentation will be determined through consultation between FHWA, MoDOT/LPA, the SHPO and any other consulting parties.

Work should be done by a professional who meets the *Secretary of the Interior's Professional Qualification Standards*[1] (SOI Standards) for Architectural History and/or History or under the supervision of one who meets the SOI Standards.

The guidance is for informative purposes and the examples provided are not intended to be an all-inclusive list. The researcher should consider the individual resource and should develop themes appropriate to that resource.

The appropriate Standards for documentation of historic properties will be determined through consultation between the FHWA, MoDOT (or LPA), and the State Historic Preservation Office (SHPO) and any other consulting parties. Additional mitigation measures may be identified during the consultation process; these measures may be done in addition to, or rarely, in lieu of, those described below.

ALL RESOURCES

Section 106 requires that when assessing effects of a project on a historic property, consideration be given to all qualifying characteristics of the historic property, including those identified subsequent to the original evaluation of the property.[2] When mitigating adverse effects, all those to qualifying characteristics and areas of significance should be included in the mitigation. Even for NRHP listed properties areas of significance not previously identified may need to be mitigated.

For roads, bridges and road-related resources, some examples of NRHP criteria and areas of significance to consider are included in the information below with the documentation Standards for the particular property type. For other types of historic properties the researcher should consult the National Register Bulletins for NRHP criteria and areas of significance to consider.

[1] 36 CFR Part 61.
[2] 36 CFR Part 800.5(a)(1)

- Events (Criterion A)—consult NRHP bulletins for areas of significance and address all that would be appropriate for the resource;
- Significant persons (Criterion B)—consider significant people who may be associated with the historic property;
- Design significance (Criterion C)—consider architecture, engineering, landscape, community planning, etc., significance of the historic property;
- Information Potential (Criterion D)—could the historic property have important information that is not available through other sources?

All levels of documentation should include:

- Location map showing resource location
- Project Identifiers (County, Route, Project Number), include all items on the lists or explain why an item is not included.
- Historic and Common Name(s) of the resources
- Historic Photographs if they can be located
- Photographs--taken, printed (and labeled) and saved to archival media to the National Register/Missouri SHPO Photographic Standards. Unless otherwise stated, the photographs should be printed in an 8X10" format. Photo coverage should include views sufficient to document the resource, including overviews and settings, elevations and details. Photographs should be keyed to a site plan or to bridge plans (detail photographs).

BRIDGES

Bridge projects described in the State Highway Commission *Biennial Reports* shall be documented at Level I or Level II.

All levels of bridge documentation should include:

- Drawings—as built or final construction plans for bridge (including rehabs), if extant (if drawings are not available a detailed technical description will be required).
- Photographs showing elevations of the bridge, substructure, important connections, all span types, and other significant bridge details.[3]

Levels I and II should also include:

- Bridge description--A reader friendly bridge description narrative shall include; if bridge plans are not available, this should be a technical description of the bridge. The description should reference the mitigation photographs and plans to identify features of the bridge.

[3] Guidance on photographing bridges is available on the Preservation in Pink blog: https://preservationinpink.wordpress.com/2012/02/02/how-to-photograph-a-bridge/.

Level I: the highest level of documentation[4]—for bridges over major rivers, for example, the Mississippi or Missouri River or the main tributaries to these rivers, and bridges with Criteria A or B associations as well as Criterion C.

- Written history—should be the product of primary and contemporary sources as much as possible; it should address significant themes associated with the bridge, *for example*:
    - Engineering significance (Criterion C)—explain how and why the bridge is significant from an engineering perspective; discuss its relationship to surviving bridges of the same type in region and state. Also explain:
        - Who designed the bridge? Is it a standard bridge type or did it require modification from standard plans?
        - Who constructed the bridge? Include fabricator and contractor for truss bridges. Were they well-established companies? Did they have history of contracts with the state/county/city? Did they build a large number of bridges? How many of their bridges survive?
    - Transportation significance--explain how the bridge fit into the larger transportation system. Consider:
        - Construction of the bridge, including planning and actual construction
        - Address any issues encountered during bridge planning that had to be overcome (opposition, etc.)
        - Address any issues encountered during construction and how they were resolved (weather, etc.)
        - How was the bridge perceived by the community—eagerly anticipated, apathetically, etc.? Was it received differently in various parts of the larger community?
        - Was the bridge built as part of a new road or replacing an earlier crossing? If replacement, of what type—ford, ferry or earlier bridge?
    - Social History—did important events associated with American culture occur on the bridge or is it associated with a route significant in American culture? (Examples would be civil rights marches that crossed bridge, bridges associated with Route 66, bridges associated with early farm-to-market roads, bridges associated with seedling miles of highway, etc.)
    - Commerce—was the bridge important in the economic development of a community or did local business leaders promote the bridge? If so, explain how they were involved. If the bridge was a toll bridge, explain how the toll structure was set up, who collected the tolls, how long the tolls were collected, if possible what the toll rates were, local attempts to free the bridge, and when it became a free bridge.
    - Planning – Was the bridge built or incorporated into a Parkway? Was the bridge built as part of a larger development? Was the planning for the bridge tied up in litigation related to its construction or the construction of an associated highway?

[4] Guidance on How to Document a Bridge is available from the Missouri Department of Transportation, Historic Preservation Section.

    - There may be other broad patterns in American History that the bridge is associated with. Consultation between the SHPO, FHWA, MoDOT, the local government and other consulting parties will help to determine the appropriate areas of significance for the bridge.
    - Examples of sources to utilize include: MoDOT Bridge and Commission Records (if State Highway Department Constructed the bridge); County Commission Minutes (if County constructed the bridge); contemporary newspapers; trade journals; diaries; builder or engineering company records; County Histories; etc.
- An example of a Level I mitigation document is the Daniel Boone Bridge available for viewing at: http://library.modot.mo.gov/RDT/reports/historicbridges/Daniel_Boone_Bridge_J1000_Report.pdf

Level II: a moderate level of documentation—for bridges over small rivers/major creeks, with no significant association with historical contexts; it is anticipated that most mitigation will fall into this level. See Level I comments above

- Written history—should be the product of primary and contemporary sources as much as possible; should address significant themes associated with the bridge, *for example*:
    - Engineering significance—explain how and why the bridge is significant from an engineering perspective; discuss its relationship to surviving bridges of the same type in region and state. Also explain:
        - Who designed the bridge? Is it a standard bridge type or did it require modification from standard plans?
        - Who constructed the bridge? Include fabricator and contractor for truss bridges. Were they well-established companies? Did they have history of contracts with the state/county/city? Did they build a large number of bridges? How many of their bridges survive?
    - Transportation significance—explain how the bridge fit into the larger transportation system. Consider:
        - Construction of the bridge, including planning and actual construction
        - Address any issues encountered during bridge planning that had to be overcome (opposition, etc.)
        - Address any issues encountered during construction and how they were resolved (weather, etc.)
        - How was the bridge perceived by the community—eagerly anticipated, apathetically, etc.? Was it received differently in various parts of the larger community?
        - Was the bridge built as part of a new road or replacing an earlier crossing? If replacement, of what type—ford, ferry or earlier bridge?
- An example of a Level II document is the Branson Bridge and can be viewed at: http://library.modot.mo.gov/RDT/reports/historicbridges/Branson%20Bridge%20J0705R%20Report.pdf.

Level III: a well-documented inventory form with continuation sheets—for bridges over small streams away from populated areas, lettered routes in rural areas; these may include small bridges that were built as part of a large project and bridges which may be contributing to a district or landscape or may be individually eligible and a type with many documented examples. It may also be used when there is a context for the type developed (or being developed) which will explain the overall background for the resources.

- Completed MoDOT Missouri Bridge Inventory Form. The inventory form should include a footnoted history of the bridge, a brief description, and appropriate illustrations to demonstrate the history and significance of the bridge.
- An example of a Level III document is the St. John's Creek Bridge and can be viewed at: http://library.modot.mo.gov/RDT/reports/historicbridges/N0141_Bridge_Mitigation_Document.pdf.

Level IV: a documented inventory form for bridges over minor crossings (small streams/creeks, highways, railroads, etc.) that are not individually eligible but are contributing resources to a larger historic property. It is anticipated few bridges will qualify for this level of documentation.

- Photographs (5" X 7" format) showing elevations of the bridge, substructure, important connections, all span types, and other significant details.
- Completed MoDOT Missouri Bridge Inventory Form. The inventory form should include a concise history of the bridge, a brief description, and statement explaining the significance of the bridge.

ROADS, WALLS (THINGS IN R/W)

Level 1—highest level of documentation, to be used when….

- Plans, if available
- Photographs—typical and usual elements, overall setting
- Written description—describe important features of the resource,
- Written history explaining significance of resource (see NRHP guidance for criteria A, C or D and areas of significance) (utilizes primary and contemporary resources as much as possible)

INDIVIDUALLY LISTED OR ELIGIBLE BUILDINGS AND THEIR ASSOCIATED PROPERTIES

To be used with NRHP listed or eligible architectural resources (buildings) that are eligible under criteria A, B or C. Buildings eligible under criterion D require consultation with SHPO for appropriate mitigation measures in addition to those listed below (as appropriate).

Level 1—highest level of documentation; to be used for buildings that are of statewide significance, buildings that are unusual architectural styles (on a county, regional or

statewide basis), when project affects most of a historic property (main building and a significant percentage of secondary buildings and landscape features)

- Drawings—floor plans (original floor plans (if available) or drawn floor plans of the building as it exists today)
- Photographs—[to the extent that we have access]
    - Overview and general setting
    - Main resource exterior and interior, including significant details
    - All outbuildings, exterior of all, interior of major outbuildings (barns, etc.)
    - Landscape elements, all landscape elements—fence lines, etc. should be photographed
- Site plan (if more than one resource is on the property)
- Written detail description of the building and associated features
- Written history of the property—should be the product of primary and contemporary sources as much as possible; it should address significant themes associated with the property (see NRHP bulletins for criteria and areas of significance to be developed. All areas of significance for the property should be developed).

Level 2—moderate level of documentation, used when project effects are on properties of local significance and when the project effects the main building

- Drawings—floor plans (original floor plans (if available) or drawn floor plans of the building as it exists today)
- Photographs—[to the extent that we have access]
    - Overview and general setting
    - Main resource exterior and interior, including significant details
    - All outbuildings, exterior of all, interior of major outbuildings (barns, etc.) (that we have access to)
    - Landscape elements, all landscape elements—fence lines, etc. should be photographed
- Site plan (if more than one resource is on the property)
- Written detail description of the building and associated features
- Written history of the property—should be the product of primary and contemporary sources as much as possible; it should address significant themes associated with the property (see NRHP bulletins for criteria and areas of significance to be developed. All areas of significance for the property should be developed).

Level 3—lower level of documentation, used when project effects are on historic property but not on the main resources, but on contributing elements of an individually eligible property (e.g. contributing smokehouses, carriage houses, garage, setting, etc.)

- Photographs—[to the extent that we have access]
    - Overview and general setting
    - Affected resources (exterior, interior if significant)
    - Landscape elements, all landscape elements—fence lines, etc. if significant and affected by project

- Site plan (if more than one resource is on the property)
- Written detail description of the affected contributing and non-contributing resources

LANDSCAPES

Level 1

- Plans, if available
- Photographs
- Written description of design intent of the landscape (if designed) and general setting if vernacular
- Written history (see NRHP guidance for criteria A and C and areas of significance)

HISTORIC DISTRICTS

Listed and NRHP eligible historic districts. These could be in an urban, suburban or rural setting, and include any number of resources. Areas of significance should be identified and project impacts on these areas and character defining features should be considered.

NRHP LISTED DISTRICTS

Since documentation of the significance of these properties is already on file, the mitigation should focus on the properties that are being adversely affected by the project and any areas of significance that have been identified that are not included in the NRHP documentation.

Level 1—highest level of documentation—when impacting large numbers of resources within a historic district; when impacts are to a large number of contributing (versus non-contributing) buildings or when the project will substantially alter the ratio of contributing to non-contributing resources.

- Streetscape photographs of areas adjacent to project impacts
- Photographs of resources directly affected
- Site plan showing resources directly affected and recommended new boundary lines
- Building descriptions for directly affected buildings
- Written narrative on district history and significance (if not NRHP listed)
- Brief overview of district (if not NRHP listed)
    - Architectural styles represented
    - Overall plan and features of district
    - (Section 7 equivalent of NRHP form)
    - Recommended NRHP boundaries

The historical narrative should consider all potential areas of significance of the historic district. Even for NRHP listed historic districts, areas of significance not previously identified may need to be developed.

Level 2—medium level of documentation—to be used when project impacts are to a relatively few resources within the district and where the project does not change the ratio of contributing to non-contributing resources

- Streetscape photographs of areas adjacent to project impacts
- Photographs of resources directly affected
- Site plan showing resources directly affected and recommended new boundary lines
- Building descriptions for directly affected buildings
- Written narrative on district history and significance (if not NRHP listed)
- Brief overview of district (if not NRHP listed)
    - Architectural styles represented
    - Overall plan and features of district
    - (Section 7 equivalent of NRHP form)
    - Recommended NRHP boundaries

Things to consider:

- Events (Criterion A)—consult NRHP bulletins for areas of significance and address all that would be appropriate for the district
- Significant persons (criterion B)—consider significant people who may be associated with the historic district and the buildings being directly affected by the project
- Design significance (criterion C)—architecture, landscape, community planning, etc.
- Criterion D—could the district have important information that is not available through other sources?

The historical narrative should consider all potential areas of significance of the historic district. Even for NRHP listed historic districts, areas of significance not previously identified may need to be developed.

Level 3—lowest level of documentation—to be used when projects will affect a historic district but not affect the buildings in a historic district (e.g. affect road system, retaining walls or sidewalks of a historic district); not to be used when the historic district is a landscape or engineering historic district associated with a roadway

- Streetscape photos of areas affected by project and immediately adjacent areas
- Site plan of affected areas (before and after)

NRHP Eligible Districts (not listed)

Districts that are eligible for listing, but not listed, should be considered as above, but with the added stipulations that historic contexts, significance and written descriptions need to be completed as well. Inventories of properties that will be affected by the

project, with complete descriptions of the properties, and evaluations of what the removal of these properties does to the overall integrity of the historic district, should be included.

On Behalf of the Federal Highway Administration–Missouri Division

Determination of Section 4(f) *De Minimis* Use Public Parks, Recreation Areas, Wildlife and/or Waterfowl Refuges

June 2017 Version

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

NEPA CLASSIFICATION:** ☐ **EIS** ☒ **EA** ☐ **CE** ☐ **PCE**

***NEPA will not be approved prior to completing Section 4(f) evaluations. Section 4(f) evaluations should be submitted to FHWA for approval concurrent with the NEPA document.*

A. PROJECT DESCRIPTION:

(Provide a description of the proposed action. The description should be detailed enough to allow the reviewer to ascertain whether or not the project activities will be affecting the features that make the property eligible for Section 4(f) protection).

Improve the US-169 crossing of the Missouri River through downtown Kansas City, Missouri. The proposed project would improve the transportation infrastructure within a narrow corridor extending from the intersection of US-169 and Missouri Route 9 in Clay County to I-35 and 12th Street in Jackson County. The project includes construction of a new bridge on a new alignment to the west of the existing US-169/Buck O'Neil Bridge crossing, construct direct connect ramps to I-35 and downtown Kansas City, and improve access into the neighboring Charles B. Wheeler Downtown Airport. The project would remove the existing Buck O'Neil Bridge and its companion north approach structure, the Harlem Road Overpass. Right-of-way along I-35 at the base of the bluff where both park properties are located is required for the project.

Identify detour route(s) to be used during road/bridge closure and the length of closure (include map showing detour routes):

Specific detour routes and the length of time temporary road closures and detour routes would be in effect will be determined as the project advances through the Design-Build process. As described in the EA, 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.

B. IDENTIFICATION OF THE SECTION 4(f) PROPERTY:

*(*List the property and provide a description of the property(ies), including the boundary of the property. Include a description of the specific features that make the property eligible for protection under Section 4(f) (23CFR§774.11 and 23CFR§774.17). The management plan may be necessary to determine the boundaries and features. Attach location map(s), photo(s), etc. as appropriate.)

West Terrace Park and Ermine Case J. Park – owned/managed by the Kansas City Parks and Recreation Department (KCPRD), encompass 32.2 acres at the intersection of Jefferson Street and

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

West 8th Street in Kansas City, Missouri.
Taken from the Cultural Resource Summary Report for the US-169/Buck O'Neil Bridge Environmental Study Area (September 6, 2019) - *Landscape architect George Kessler's original design (and subsequent construction) for West Terrace Park, which stretched from 6th Street to Jarboe and West Pennway, has been drastically altered over the years. Sliced by Interstate connections, it is now a series of separated parks including Jarboe Park, Mulkey Square, and Case Park.*

The northern portion of the park retains the "West Terrace" moniker and features a designated members-only dog park, the circular plaza, and a bronze statue titled "Corps of Discovery" (dedicated in 2000). It is a slender piece of parkland bounded by Interstate 1-35 on the west and Kirk Drive on the east. The southern boundary is approximately midway between Eleventh and Tenth Streets and the park continues north to its terminus along the bluff at approximately Seventh Street. Adjacent to the current West Terrace Park is Ermine Case, Jr. Park…Most of this land was donated by George Bowen Case in 1944 in honor of his father, a local lawyer after whom the park was named. Case Park, within North Terrace Park, is on the northwest corner of the intersection of W. Tenth Street and Jefferson Street, its western boundary is West Terrace Park and its northern boundary is slightly south of W. Ninth Street.

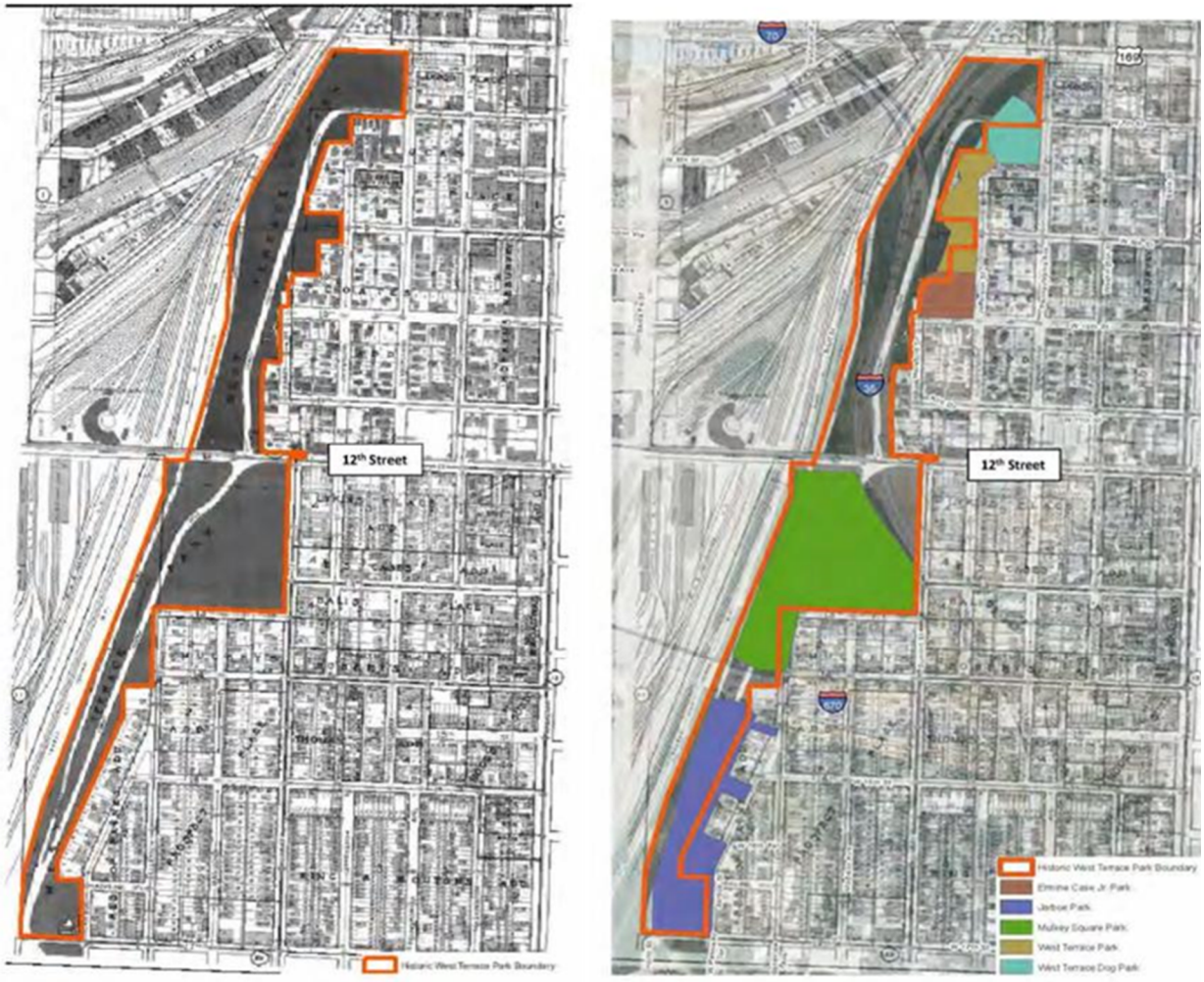
In its historic form, West Terrace Park, and in particular Kersey Coates Drive, was considered one of the best representations of Kessler's work in Kansas City. Due to the modifications to the park caused mainly by I-35 and I-670 cutting the original park into thirds, its loss of integrity has compromised Kessler's work. Case Park has been similarly impacted by the extensive alteration of its wider setting.

West Terrace Park is documented on National Register of Historic Places Nomination, Kansas City, Jackson County, Missouri, 2014, F-14-16, 20. Because of the compromised integrity, West Terrace Park was not included in the subsequent listing of the Kansas City Parks and Boulevards Historic District (2016).

Parks properties mentioned above – Jarboe Park and Mulkey Square Park are located outside of the study area and Alternatives Corridor defined for the build alternatives considered and will not be affected by the proposed project.

The following inset was copied from the above referenced report showing the original expanse of West Terrace Park (ca. 1925) on the left and the mapped areas as the remain today (2019). The proposed project would require right-of-way from along I-35 from north of 12th Street to I-70.

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		



1935 West Terrace Park Boundary (orange) compared with modern boundary of West Terrace, Ermine Case Jr., Jarboe, and Mulkey Square Parks. SOURCE: Tittle-Ayers-Woodward Company, Atlas of Kansas City, Missouri and Environs, 1925.

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		



Features within West Terrace/Ermine Case Jr. (2019)

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

OFFICIAL WITH JURISDICTION OVER SECTION 4(f):

1. Identify agency with jurisdiction (23CFR774.17):
   City of Kansas City, Missouri, Kansas City Parks and Recreation Department

2. Name and title of contact person at agency:
   Teresa Rynard, Director

C. APPLICABILITY DETERMINATION:

1. Provide the total acreage of the property: 32.2 acres (both parks combined; KCPRD does not recognize a discernable boundary between the parks)

   Describe the use of land from the property to be used, including acreages of temporary and permanent easements as well as permanent acquisition:

   Approximately 1.3 acres of land along existing I-35 at the base of the bluff where the park sit is required to construct the proposed the project. This land is vacant and has a nearly vertical profile immediately adjacent to the existing interstate. No park/recreational uses occur within this portion of the property.

2. The project **does not** adversely affect the activities, features, and attributes of the resource that qualify it for protection under Section 4(f). **(If this statement cannot be verified as true, *de minimis*/no adverse use does not apply.)** ☒ YES

   Describe the effect to the qualities, activities, features, or attributes of the resource that qualify it for protection under Section 4(f). Include a description of measures taken to minimize harm included when making the determination regarding effects to the resource:

   The property is an existing public park providing open space and supporting recreational activities for the greater Kansas City community since its establishment in around 1925. The park includes a dog park, the Corps of Discovery plaza/overlook, trails, open lawns, and playgrounds. Panoramic views of the Missouri River corridor as well as downtown Kansas City and the Charles B/ Wheeler Downtown Airport can be seen from the park. The right-of-way to be acquired is at the foot of the bluff adjacent to I-35 and would not affect the qualities, activities, features, or attributes that qualify it for protection under Section 4(f).

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

The footprint needed to accommodate the construction of direct connect ramps from US-169 to I-35 has been minimized based on the level of design conducted to date. As the project advances through a Design-Build implementation process, consideration will be given to options that further minimize the use of the property without compromising the design.

3. Per 23CFR§774.5(b)(2), the **public was afforded** an opportunity to **review and comment** on the **effects of the project** on the **protected activities, features, and attributes** of the resource. ☒ YES

   Identify the opportunity(ies) for public comment and describe the input received (provide attachments as appropriate to document the public involvement activity):

   The Section 4(f) process (along with Section 106) and the resources within the study area that would be provided protection under Section 4(f) were described during the public open house meeting conducted on February 7, 2019.

   MoDOT/KCMO met with the KCPRD Review Board on multiple occasions.

   Additional information will be shared with the public during the public hearing.

4. The official with jurisdiction over the property was informed of FHWA's intent to make a *de minimis*/no adverse use finding (per 23CFR§774.5(b)(2)(ii)). ☒ YES

   Identify the method used to notify the official with jurisdiction and attach appropriate correspondence.

   MoDOT/KCMO submitted a package of information to KCPRD on December 17, 2019.

   Correspondence documenting notification of the official with jurisdiction is included in the following Attachment: Attachment 5

5. The official with jurisdiction over the property concurred that the project will not adversely affect the activities, features or attributes that make the property eligible for Section 4(f) protection. (NOTE: Public input must be received and considered prior to the official with jurisdiction making a final determination.) ☒ YES

   Date of concurrence: TBD

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

Written concurrence from the official with jurisdiction is included in the following Attachment or indicated on signature page:
To be included in Attachment 5

6. Have Federal LWCF 6(f) funds been used in the acquisition of, or for any improvements to, the Section 4(f) property? ☐ YES ☒ NO

If Yes, identify the boundary of the 6(f) property (attach map showing Section 6(f) boundary) and describe boundary.

N/A

If Yes, the appropriate Federal agency has been coordinated with and is in agreement with the land conversion or transfer. ☐ YES

Attach the necessary coordination and include the applicable mitigation measures in the mitigation section:

N/A

7. The project does not involve any impacts that would require an individual Section 4(f) evaluation. (It is acceptable if there are other Section 4(f) impacts that are covered by one of the nationwide programmatic Section 4(f) evaluations or meet temporary occupancy criteria.) ☒ YES

If there are other Section 4(f) properties impacted, list them here, briefly describe the impacts, and identify which form(s) will be completed to address them:

- Broadway/Buck O'Neil Bridge (Bridges A4649 and A4646) (resource OT-20) – use, FHWA Programmatic Section 4(f) for Projects that Necessitate Use of a Historic Bridge
- Harlem Road Overpass (Bridges A4647 and A4648) (resource HDA-1) - use, FHWA Programmatic Section 4(f) for Projects that Necessitate Use of a Historic Bridge
- Colonial Patters Company (resource OT-7); south end of Buck O'Neil Bridge, 5th and Broadway Boulevard – no use (No Adverse Effects under Section 106)
- Second Hannibal Bridge (resource OT-21); east of Buck O'Neil Bridge over the Missouri River – no use (No Adverse Effects under Section 106)
- Eighth Street Tunnel (resource QH-4); east of I-35 on alignment of 8th Street, within bluff area – de minimis due to proximity with the bluff, FORM? (No Adverse Effects under Section

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

106)

- Transcontinental and Western Airlines (T&WA) Building (resource HDA-5); Charles B. Wheeler Downtown Airport, immediately west of the north approach to Buck O'Neil Bridge - de minimis due to right-of-way needed from airport, FORM? (No Adverse Effects under Section 106)
- Municipal Airport Terminal Facility (resource HDA-6); Charles B. Wheeler Downtown Airport terminal area west of US-169 de minimis due to right-of-way needed from airport, FORM? (No Adverse Effects under Section 106)

See Attachment 2

List Section 4(f) mitigation measures associated with this use that will be implemented as part of this project:
During the Design-Build process the amount of right-of-way required will be minimized to the extent practical. 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.

Typical attachments for this form include, but are not limited to:

- Attachment 1 - Project location map
- Attachment 2 – Section 4(f) Properties in Project Vicinity
- Attachment 3 – MDNR Historic Resources Form w/Photographs
- Attachment 4 – Alternatives Corridor adjacent to West Terrace and Ermine Case Jr. parks (also see attachments provided in Attachment 5 below)
- Attachment 5 - Correspondence with the Official with Jurisdiction
- Attachment 6 - Public Involvement Information

County: Jackson and Clay	**Route:** US-169	**Job #:** 4S3085
Section 4(f) Resource(s): West Terrace Park and Ermine Case Jr. Park		
Project Sponsor: MoDOT; US-169/Buck O'Neil Bridge Crossing of the Missouri River		

D. SUMMARY AND DETERMINATION:

The project involves a *de minimis/*no adverse use on the Section 4(f) property as evidenced through the minimization of harm to a public park, recreation land, or wildlife and waterfowl refuge as a result of mitigation to or avoidance of impacts to the qualifying characteristics and/or the functions of the resource. Because the undertaking does not adversely affect the function or qualities of the Section 4(f) property on a permanent or temporary basis, includes agreed-to commitments/mitigation/minimization measures as described above and has received agreement from the official with jurisdiction, the proposed action constitutes a *de minimis* impact, and therefore no further analysis is required. If the project scope changes, or the conditions of the Section 4(f) property change such that new impacts may occur, a reevaluation of this Section 4(f) determination is required.

Concurrence by official with jurisdiction over the Section 4(f) property:

Official with Jurisdiction: _____ Date: _____

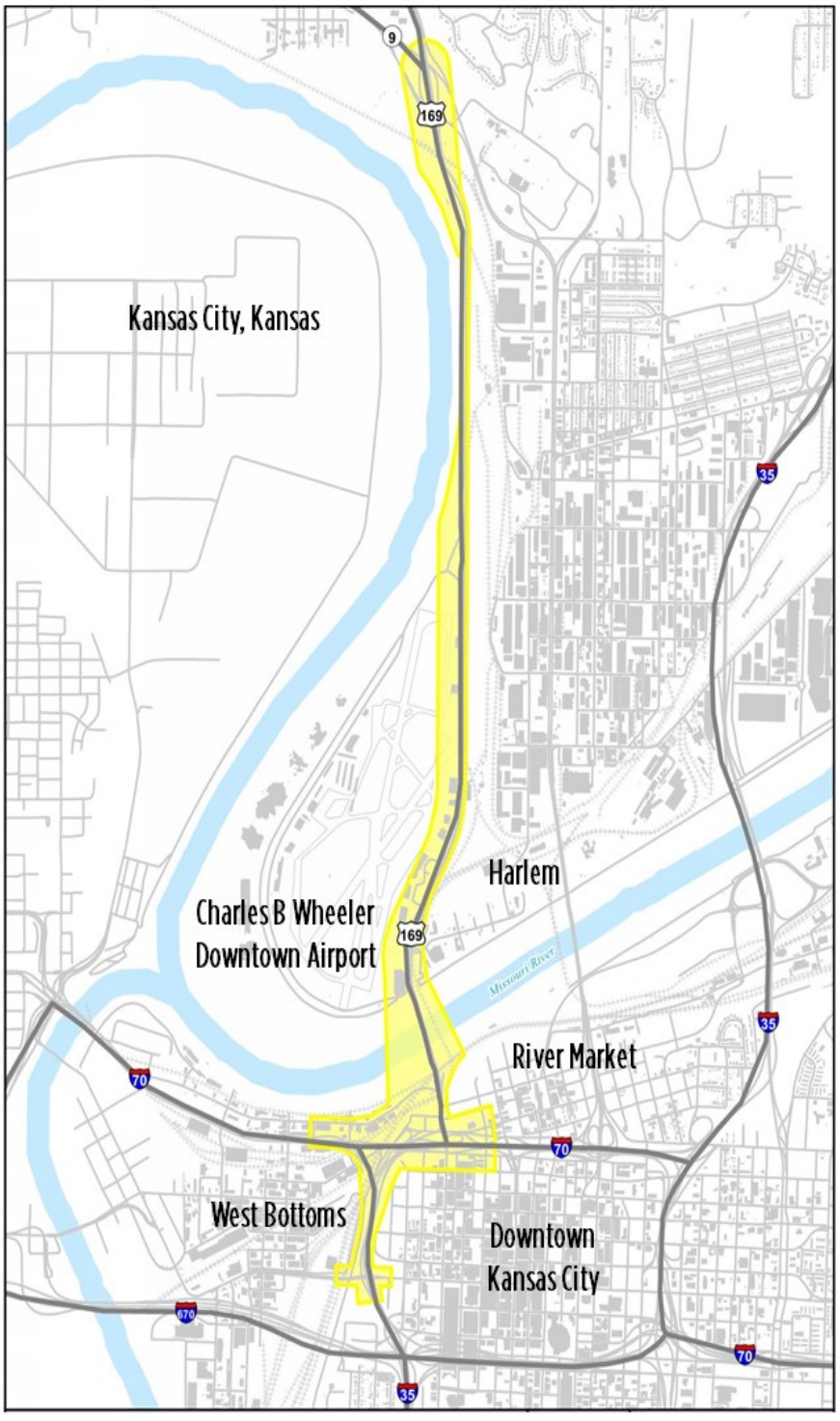
Name of Preparer: Shari Cannon-Mackey, CEP, ENV, SP Date: 2/7/2020

MoDOT Historic Preservation Manager: Date:

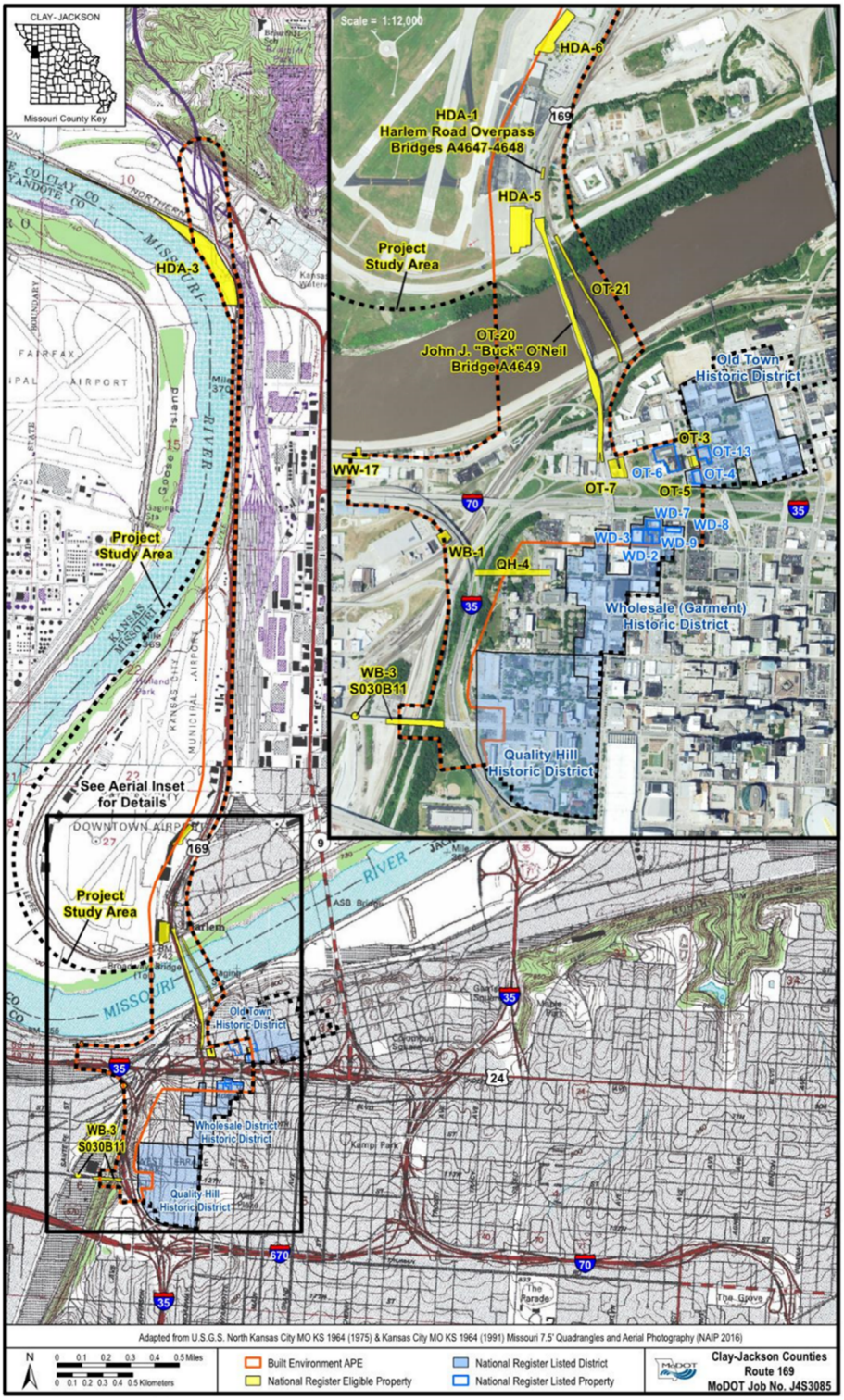
_____ _____

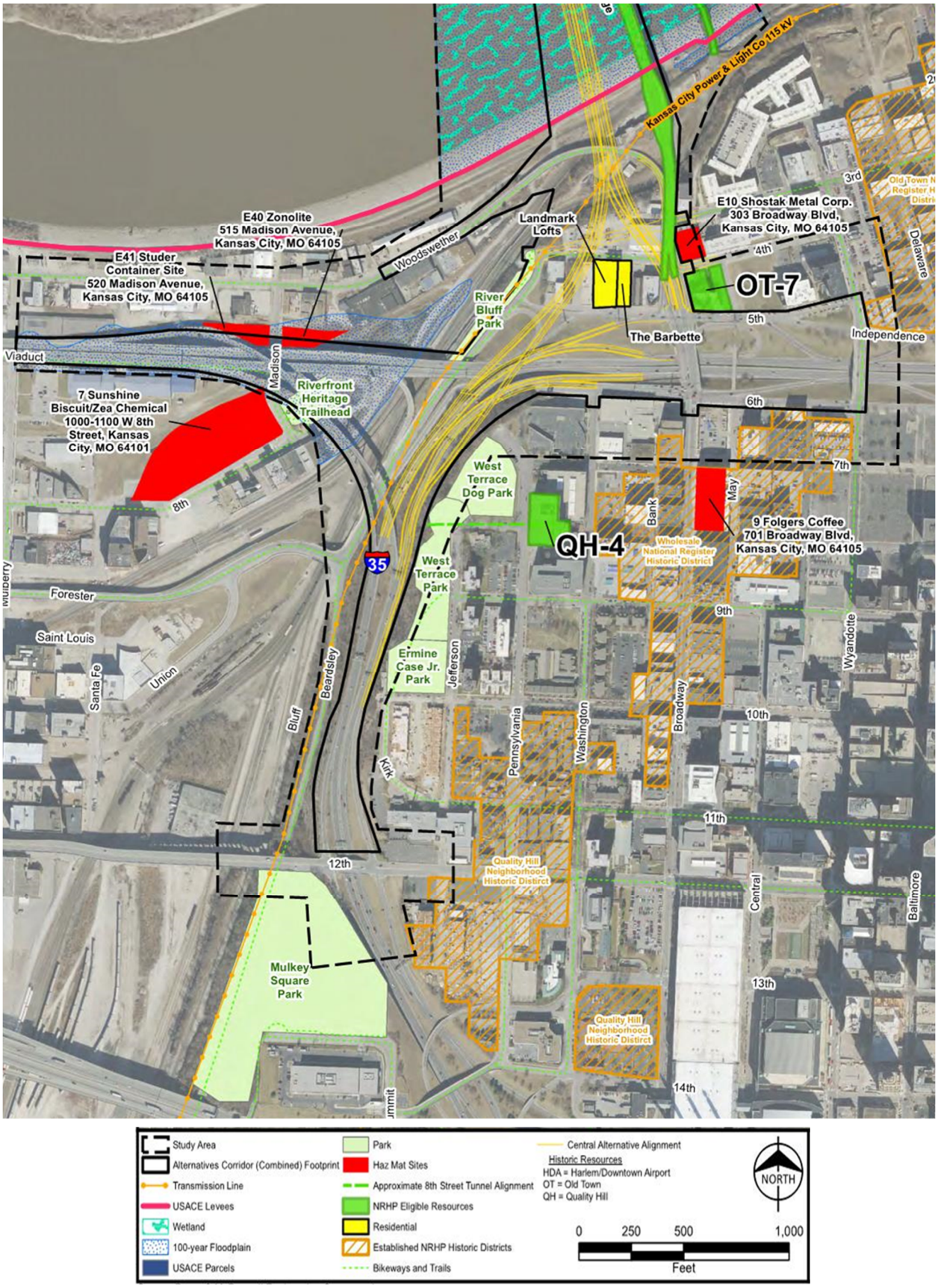
Federal Highway Administration: Date:

_____ _____



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


CLAY - JACKSON
Missouri County Key
Scale = 1:12,000
HDA-6
HDA-1
Harlem Road Overpass
Bridges A4647-4648
HDA-5
HDA-3
Project
Study Area
OT-21
OT-20
John J. "Buck" O'Neil
Bridge A4649
Old Town
Historic District
OT-3
OT-13
OT-6
OT-4
OT-7
OT-5
WW-17
WD-7
WD-8
WD-3
WD-9
WD-2
WB-1
QH-4
Wholesale (Garment)
Historic District
WB-3
S030B11
Quality Hill
Historic District
See Aerial Inset
for Details
Project
Study Area
Old Town
Historic District
Wholesale District
Historic District
WB-3
S030B11
Quality Hill
Historic District
Adapted from U.S.G.S. North Kansas City MO KS 1964 (1975) & Kansas City MO KS 1964 (1991) Missouri 7.5' Quadrangles and Aerial Photography (NAIP 2016)
Built Environment APE
National Register Eligible Property
National Register Listed District
National Register Listed Property
Clay-Jackson Counties
Route 169
MoDOT Job No. J4S3085


Kansas City Power & Light Co 115 kV
E40 Zonolite
515 Madison Avenue,
Kansas City, MO 64105
E41 Studer
Container Site
520 Madison Avenue,
Kansas City, MO 64105
Woodswether
Landmark
Lofts
E10 Shostak Metal Corp.
303 Broadway Blvd,
Kansas City, MO 64105
OT-7
River
Bluff
Park
The Barbette
Viaduct
Madison
Riverfront
Heritage
Trailhead
7 Sunshine
Biscuit/Zea Chemical
1000-1100 W 8th
Street, Kansas
City, MO 64101
West
Terrace
Dog Park
QH-4
West
Terrace
Park
9 Folgers Coffee
701 Broadway Blvd,
Kansas City, MO 64105
Wholesale
National Register
Historic District
Ermine
Case Jr.
Park
Mulkey
Square
Park
Quality Hill
Neighborhood
Historic District
Forester
Saint Louis
Union
Santa Fe
Bluff
Beardsley
Jefferson
Kirk
Pennsylvania
Washington
Broadway
Bank
May
Wyandotte
Central
Baltimore
Delaware
Independence
3rd
4th
5th
6th
7th
8th
9th
10th
11th
12th
13th
14th
35
Study Area
Alternatives Corridor (Combined) Footprint
Transmission Line
USACE Levees
Wetland
100-year Floodplain
USACE Parcels
Park
Haz Mat Sites
Approximate 8th Street Tunnel Alignment
NRHP Eligible Resources
Residential
Established NRHP Historic Districts
Bikeways and Trails
Central Alternative Alignment
Historic Resources
HDA = Harlem/Downtown Airport
OT = Old Town
QH = Quality Hill
NORTH
0
250
500
1,000
Feet

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATE HISTORIC PRESERVATION OFFICE, P.O. Box 176, Jefferson City, MO 65102

ARCHITECTURAL/HISTORIC INVENTORY FORM

1. Survey No. QH-1		2. Survey name: U.S. 169 Buck O'Neil Bridge Environmental Study Architectural Survey	
3. County: Jackson		4. Address (Street No.)	Street (name) W. 8th St./Jefferson St.
5.City: Kansas City	Vicinity: ☐	6. UTM: 15/362264.3 E/4329479 N	7. Township/Range/Section: T: 49 N R: 33 W S:6
8.Historic name (if known): West Terrace Park		9. Present/other name (if known): N/A	
10. Ownership: ☐ Private ☒ Public		11a. Historic use (if known): Recreational	11b. Current use: Recreational

HISTORICAL INFORMATION

12. Construction date: 1906-1951	15. Architect: George Edward Kessler, WPA, Hare & Hare	18. Previously surveyed? ☒ Cite survey name in box 22 cont. (page 3)
13. Significant date/period: N/A	16. Builder/contractor: WPA (1941)	19. On National Register? ☐ individual ☐ district Cite nomination name in box 22 cont. (page 3)
14. Area(s) of significance: N/A	17. Original or significant owner: City of Kansas City, Missouri	20. National Register eligible? ☐ individually eligible ☐ district potential (☐ C ☐ NC) ☒ not eligible ☐ not determined
21. History and significance on continuation page. ☒		22. Sources of information on continuation page. ☒

ARCHITECTURAL INFORMATION

23. Category of property: ☐ building(s) ☒ site ☒ structure ☒ object	30: Roof material: N/A	37.Windows: ☐ historic ☐ replacement Pane arrangement: N/A
24. Vernacular or property type: N/A	31. Chimney placement: N/A	38. Acreage (rural): 30.56 Visible from public road? ☒
25. Architectural Style: N/A	32. Structural system: N/A	39. Changes (describe in box 41 cont.): ☒ Addition(s) Date(s): Various, See Below ☒ Altered Date(s): Various, See Below ☐ Moved Date(s): ☐Other Date(s): Endangered by:
26. Plan shape: N/A	33. Exterior wall cladding: N/A	
27. No. of stories: N/A	34. Foundation material: N/A	
28. No. of bays (1st floor): N/A	35. Basement type: N/A	40. No. of outbuildings (describe in box 40 cont.): 0
29. Roof type: N/A	36. Front porch type/placement: N/A N/A	41. Further description of building features and associated resources on continuation page. ☒

OTHER

42. Current owner/address: City of Kansas City 414 E 12th Kansas City, MO 64106	43.Form prepared by (name and org.): Cydney Millstein and Kelsey Lutz Architectural & Historical Research, LLC. 1537 Belleview Avenue Kansas City, MO 64108	44. Survey date: 8/29/2018 45. Date of revisions:

ARCHITECTURAL/HISTORIC INVENTORY FORM

LOCATION MAP (include north arrow)



SITE MAP/PLAN (include north arrow)



PHOTOGRAPHS

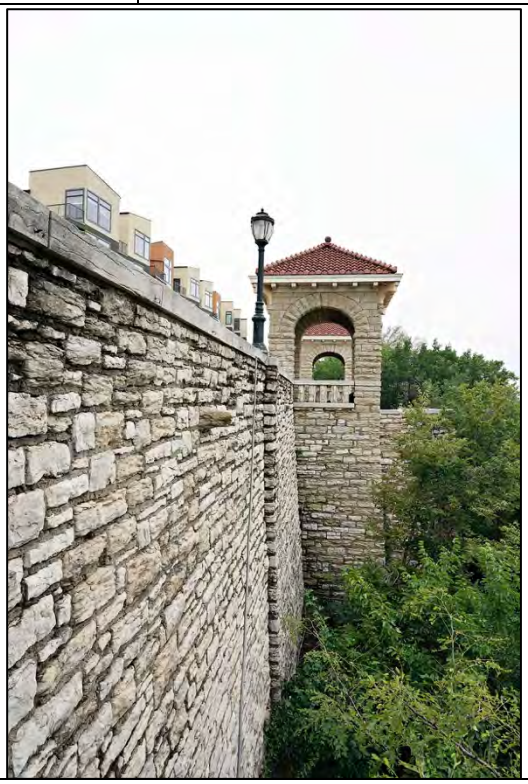
Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	General view facing north, northeast.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	View of Parterre at 10th St.; view facing north.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	View of Parterre at 10th St.; view facing south.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	Detail of 10th St. outlook; view facing west, northwest.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	WPA wall and stairs; view facing northwest.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	Picnic area; view facing south.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	The Pendergast Memorial; view facing east.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	10th St. and Jefferson St. seating area; view facing south.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	The Corps of Discovery located at Clark's Point; view facing east.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	The Corps of Discovery located at Clark's Point; view facing northwest.



Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	Offleash dog park; view facing northwest.



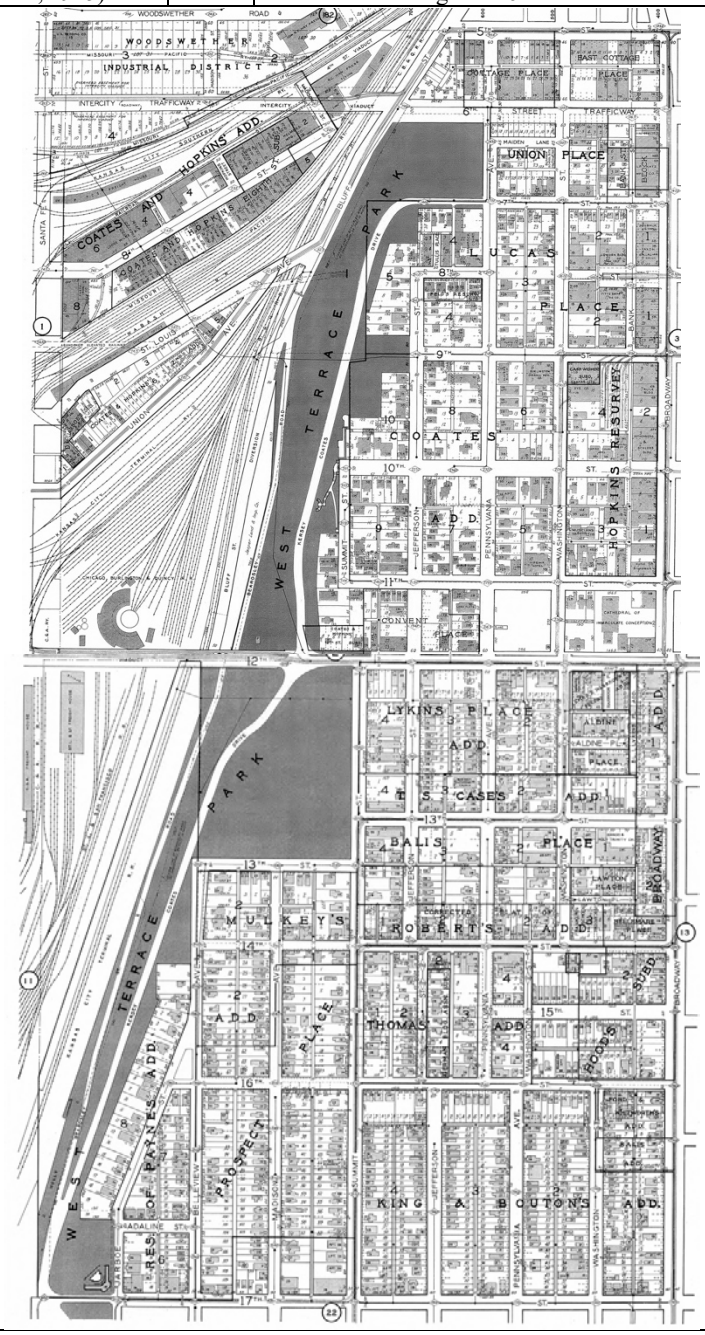
Photographer:	Date:	Description:
Richard Welnowski	8/29/2018	Lewis and Clark Memorial at the northeastern end of the park; view facing west.



ARCHITECTURAL/HISTORIC INVENTORY FORM

Source:	Date:	Description:
Tuttle-Ayers-Woodward Company, *Atlas of Kansas City, Missouri and Environs, 1925* (Kansas City, MO: Tuttle-Ayers-Woodward Co., 1925)	1925	Two historic atlas plates superimposed to illustrate West Terrace Park. These atlas plates are not to scale. West Terrace, as it was originally designed, is shown stretching from 6th Street on the north to 17th Street on the south.





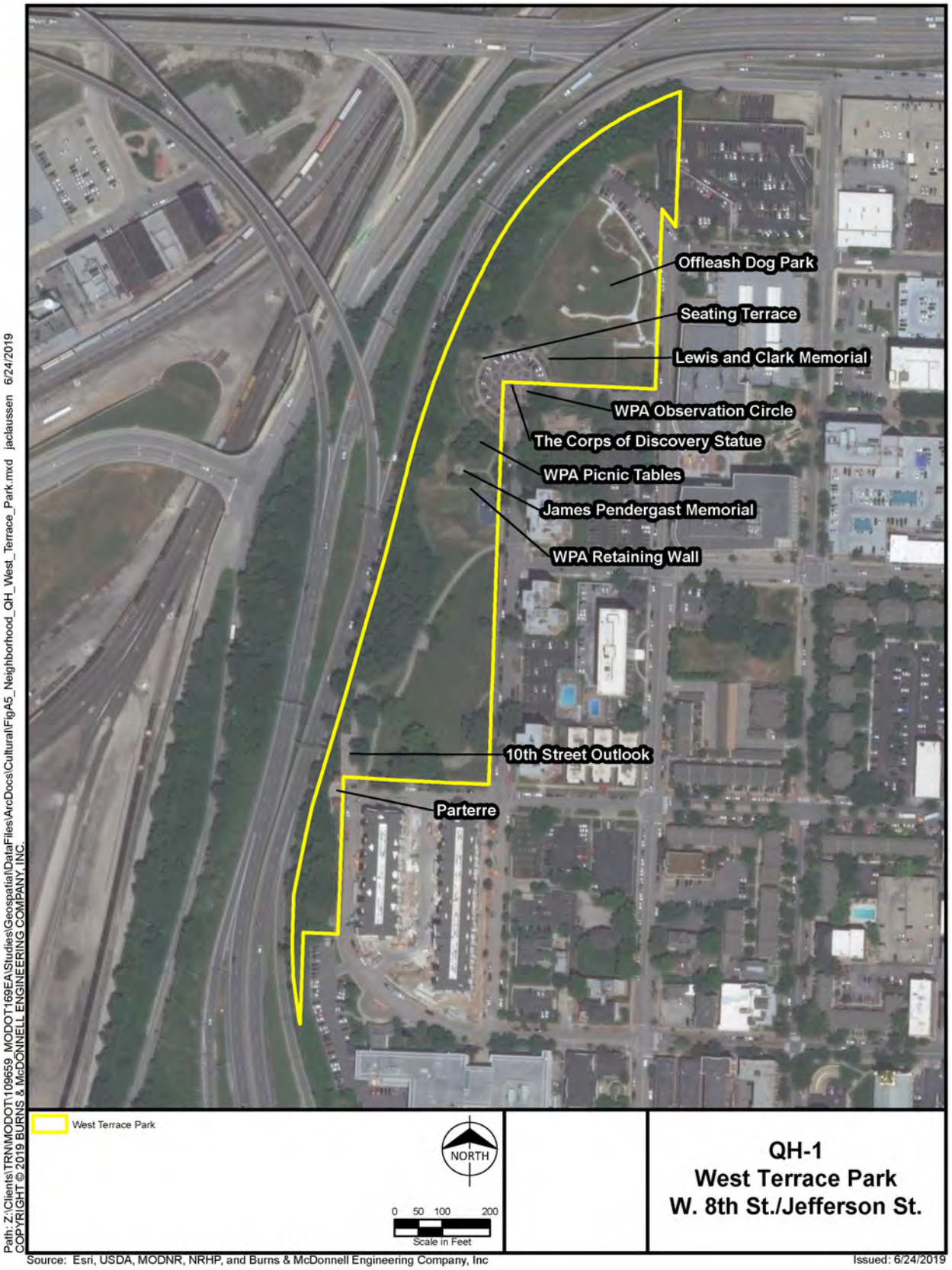
ARCHITECTURAL/HISTORIC INVENTORY FORM

Source:	Date:	Description:
City of Kansas City, Missouri KIVA Parcel Viewer (GIS Database)	2019	Current map illustrating how West Terrace Park has been severed into separate parks by the interstate system.



ARCHITECTURAL/HISTORIC INVENTORY FORM

Source:	Date:	Description:
Esri, USDA, MODNR, NRHP, and Burns & McDonnell Engineering Company, Inc	2019	Labeled components of West Terrace Park



ARCHITECTURAL/HISTORIC INVENTORY FORM

ADDITIONAL INFORMATION:

21. (cont.) History and significance. Expand box as necessary, or add continuation pages.

As outlined in George Kessler's 1893 report on the parks and boulevards, three major parks— North Terrace (today's Kessler Park), West Terrace, and Penn Valley Park— were established.

In its historic form, West Terrace Park, and in particular Kersey Coates Drive, was considered one of the best representations of George Kessler's work in Kansas City. Due to the modifications to the park caused mainly by I-35 and I-670 cutting the original park into thirds, its loss of integrity has compromised Kessler's work; therefore West Terrace Park is not significant, and therefore not eligible.

However, there are historic resources within the park such as the Terrace (or Parterre), an excellent representation of Kessler's work designed in the American Romantic style, which has retained its historic integrity. There are other good examples of stonework within Case Park, including the circular terraces at Eighth and Jefferson Streets (constructed by the WPA); the observation circle at Clark's Point (1940); and the Seating Terrace (Hare & Hare, 1951). The James Pendergast Memorial (Fredrick C. Hibbard, 1913), was moved from its original location in Mulkey Square. A modern addition to Case Park is the Lewis and Clark Memorial statue and circle.

22. (cont.) Sources of information. Expand box as necessary, or add continuation pages.

KIVA Parcel Viewer [GIS Database]. City of Kansas City, Missouri. http://maps.kcmo.org/apps/parcelviewer/

Millstein, Cydney E. "Kansas City System of Parks and Boulevards MPDF." (Draft Copy) 2014.

40. (cont.) Description of environment and outbuildings. Expand box as necessary, or add continuation pages.

Located along the west bluffs from 6th Street to 10th Street. I-35 is located directly to the north. The Quality Hill Center Historic District (February 2017) is located to the east and south.

41. (cont.) Description of primary resource. Expand box as necessary, or add continuation pages.

The area, which was originally West Terrace Park, is now a series of separated parks: Jarboe Park, Mulkey Square, and Case Park totaling 30.56 acres. Jarboe Park comprises what was originally the southernmost section of West Terrace Park. It is bounded by Seventeenth on the south, Beardsley Road/West Pennway on the west, and Jarboe Street on the east. There is a ball diamond at the south end. To the north facilities include a small pool, spray-ground, shelter and picnic facilities, constructed in 2011. There are significant mature trees buffering the pool and spray-ground area from the street.

The northern section of the original West Terrace Park today is a slender piece of parkland bounded by Interstate 1-35 on the west and Kirk Drive on the east. The southern boundary is approximately midway between Eleventh and Tenth Streets and the park continues north to its terminus along the bluff at approximately Seventh Street. Along Kirk Drive, atop the bluffs is the native limestone Terrace. The Terrace is comprised of a series of connecting stairways and landings, which work their way down the bluffs with views to the west bottoms. Two limestone pavilions with round arched openings and pyramidal red tiled roofs mark a formal entry to the park at the end of Tenth Street.

Case Park, within North Terrace Park, is on the northwest corner of the intersection of W. Tenth Street and Jefferson Street, its western boundary is West Terrace Park and its northern boundary is slightly south of W. Ninth Street. A curving walkway with period lighting leads northwesterly from the Terrace to intersect with the sidewalk along Jefferson. At the intersection of Tenth and Jefferson Streets there is a curved limestone retaining wall with benches forming gathering area. Steps lead up to the sidewalks along Jefferson and W. 10th Streets. There is open lawn as well as numerous mature shade trees. Immediately to the north of this area is a playground with limestone (not original) seat wall. High limestone retaining walls to the north of the playground enclose a grassed terrace area, which includes numerous shade trees, stone picnic tables and the James Pendergast Memorial.

The circular observation area at the intersection of Eighth and Jefferson Streets is known as Clark's Point. Clark's Point consists of two levels. The upper level is a circular roadway with parking around the edge. A sculpture, “The Corps of Discovery,” is in the center of the roadway, and consists of a monumental bronze sculpture of the entire Lewis and Clark expedition party on an ornate granite base. The outer edge of the circular road is the pedestrian walkway. There is another limestone wall on the outermost edge of the pedestrian walkway serving as protective railing.

On the eastern edge of Clark's Point (north of Eighth Street) is a level grassed terrace with limestone walls along the edges and period lighting. A large granite boulder with a bronze plaque honoring the Lewis and Clark Expedition is located on the west end of the terrace. Below the wall is open grass to the parks edge at the bluff.

A list of resources within West Terrace Park includes, but is not limited to, the following:

Parterre with walls (Kessler, 1906)
Retaining wall (WPA)
Picnic Tables (WPA)
Observation Circle (WPA)
Lewis and Clark Memorial
Seating Terrace (Hare & Hare, 1951)
James Pendergast Memorial (moved from Mulkey Square; Fredrick C. Hibbard, 1913)

West Terrace Dog Park, an off-leash dog park (members only) is located at the northeast end of West Terrace Park. This c. 2017 amenity modified the northeast section of West Terrace Park.


City, MO 64105
Woodswether
River Bluff Park
The Bark
Madison
Riverfront Heritage Trailhead
West Terrace Dog Park
Bank
QH-4
35
West Terrace Park
Ermine Case Jr. Park
Jefferson
Beardsley
Bluff
Kirk
Pennsylvania
Washington
12th
Quality Hill Neighborhood Historic District
Mulkey Square Park
Summit
I-670
Study Area
Park
Alternatives Corridor (Combined) Footprint

December 17, 2019

Teresa Rynard, Director
Kansas City Parks and Recreation Department
4600 East 63rd Street
Kansas City, Missouri 64130

Re: US-169/Buck O'Neil Bridge Crossing of the Missouri River, Jackson and Clay Counties, Missouri; MoDOT Job No. 4S3085
Potential Effects on West Terrace and Ermine Case Jr. Parks

Dear Ms. Rynard:

The Federal Highway Administration (FHWA), in cooperation with the Missouri Department of Transportation (MoDOT) and the City of Kansas City, Missouri (KCMO), is evaluating improvement of the US-169 crossing over the Missouri River in Kansas City, Jackson and Clay Counties, Missouri (Attachment A). Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) is preparing the environmental document for this project in compliance with the National Environmental Policy Act (NEPA) of 1969, Section 106 of the National Historic Preservation Act (NHPA), and Section 4(f) of the DOT Act of 1966.

This letter is to request your concurrence that the proposed project would result in a 'de minimis' effect under Section 4(f) to the public park properties known as West Terrace Park and Ermine Case Jr. Park. As described below, right-of-way from the property owned by the Kansas City Parks and Recreation Department would be needed to support construction of the proposed improvements. The right-of-way to be acquired would be adjacent to I-35 near the base of the bluff that supports both park properties and would not include land from the active portion of either park. As the official with jurisdiction over these properties, we request a written response providing your concurrence on the 'de minimis' finding, or the reason why you do not concur and your input on design or construction issues that should be considered and included in the developing environmental document.

Project Description - The proposed project would construct a US-169 crossing of the Missouri River on a new alignment improving connectivity to both local and regional roadway networks. The build alternatives under consideration would provide direct connect ramps from the relocated river crossing tying into I-35 north of 12th Street. To maintain connectivity to I-35 in the vicinity of the river bluff – location of West Terrace Park and Ermine Case Jr. Park – part of

the bluff face would be removed to allow for construction of the new direct connect ramps to and from I-35 (see Attachments B and C).

Based on the preliminary level of engineering conducted to date, we anticipate that approximately 1.3 acres along the bluff face, adjacent to existing I-35, would be acquired by MoDOT and excavated to support construction of the proposed improvements (see the cross-sections provided in Attachment C). The project would avoid direct effects to the two park areas on top of the bluff used for recreation. MoDOT has incorporated avoidance and minimization, where practical, in developing the alternatives under consideration, and will make every attempt to minimize tree clearing near the top of the bluff to maintain the character of the two park properties. Increased dust and noise levels and visual effects may occur during construction, but these would be temporary and occur over a relatively short duration. The project would not adversely affect the activities, features, or attributes that qualify both parks for protection under Section 4(f).

MoDOT intends to implement this project through a design-build process which would begin in 2020. This type of project delivery allows a single contractor to perform both the design and construction of a project at the same time to improve project delivery. During design-build, MoDOT and the design-build team would continue to coordinate with the Kansas City Parks and Recreation Department as the alignment and location of roadways and ramps evolves.

If you have any questions or need further information, please contact Gerri Doyle, MoDOT, at (816) 607-2261 or gerri.doyle@modot.mo.gov, or me at (512) 872-7132 or scannonmackey@burnsmcd.com

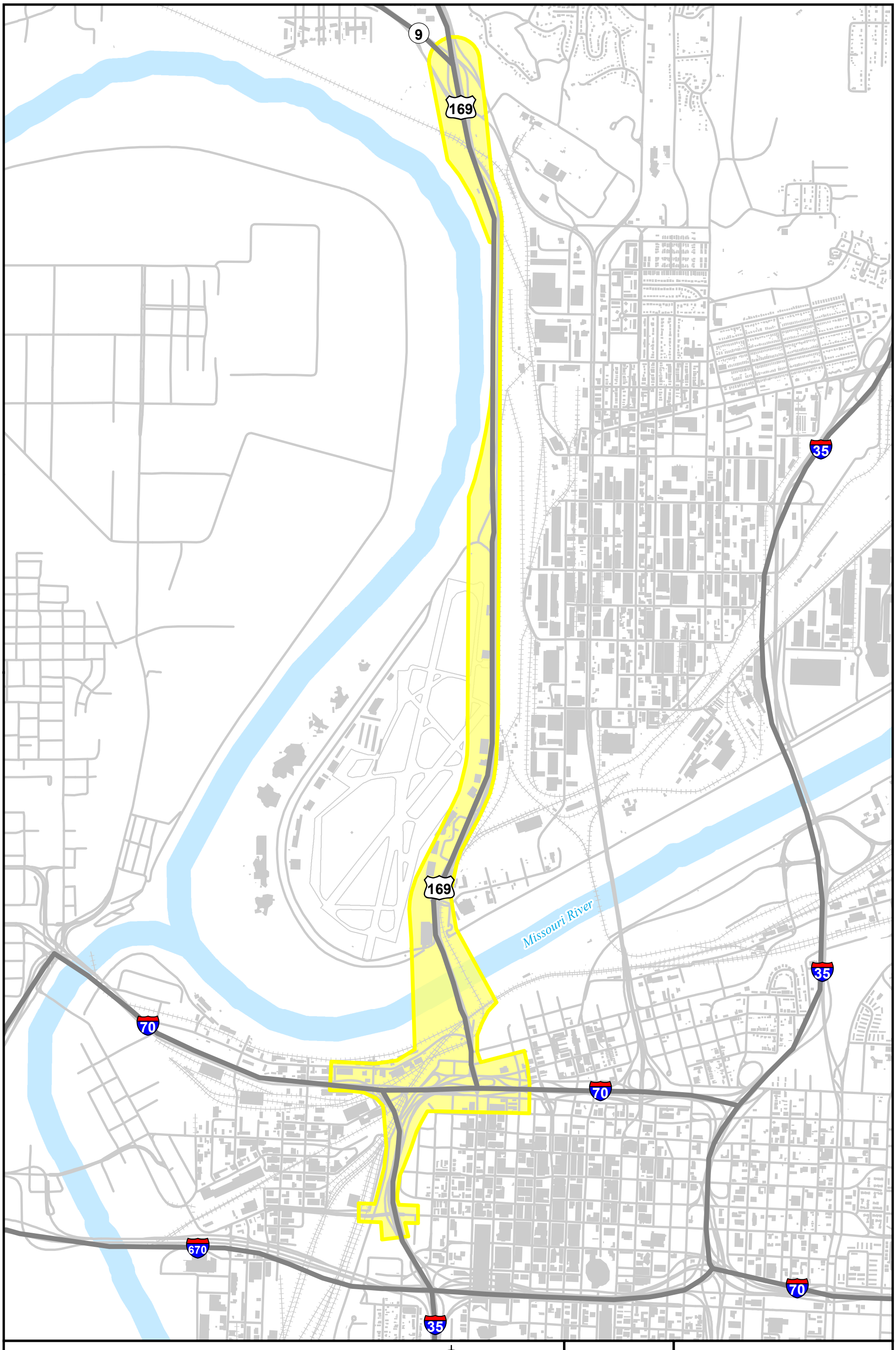
Sincerely,

Attachments:
Appendix A - Map Figures
Appendix B - AHR Report

Cc: Wes Minder, KCMO
Matthew Burcham, MoDOT
Raegan Ball, FHWA

DRAFT

ATTACHMENT A – PROJECT AREA



NORTH

1,600 800 0 1,600

Scale in Feet

BURNS McDONNELL

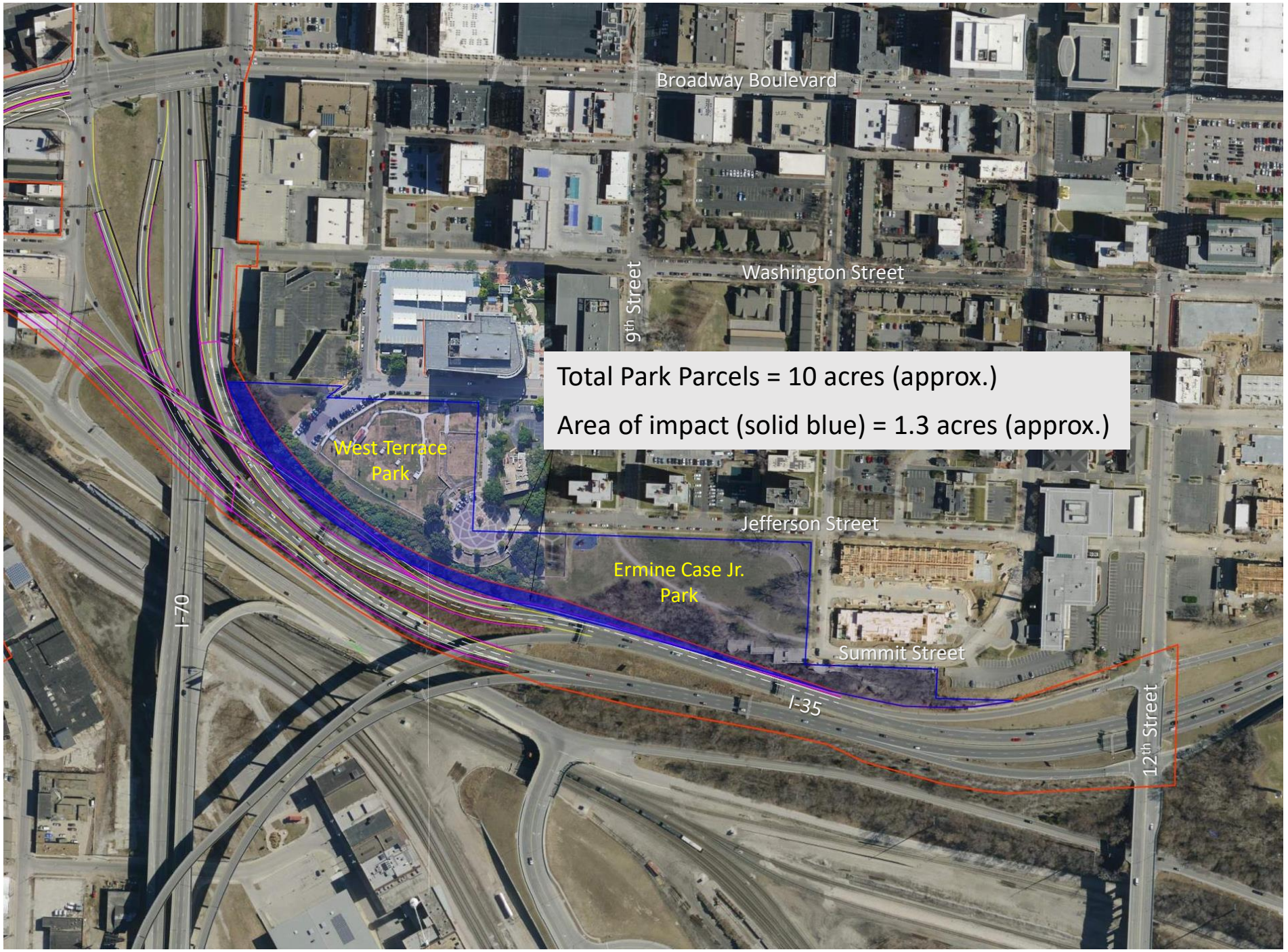
U.S. 169 Corridor
Including the
Buck O'Neil Bridge over
the Missouri River

Source: Burns & McDonnell Engineering Company, Inc.

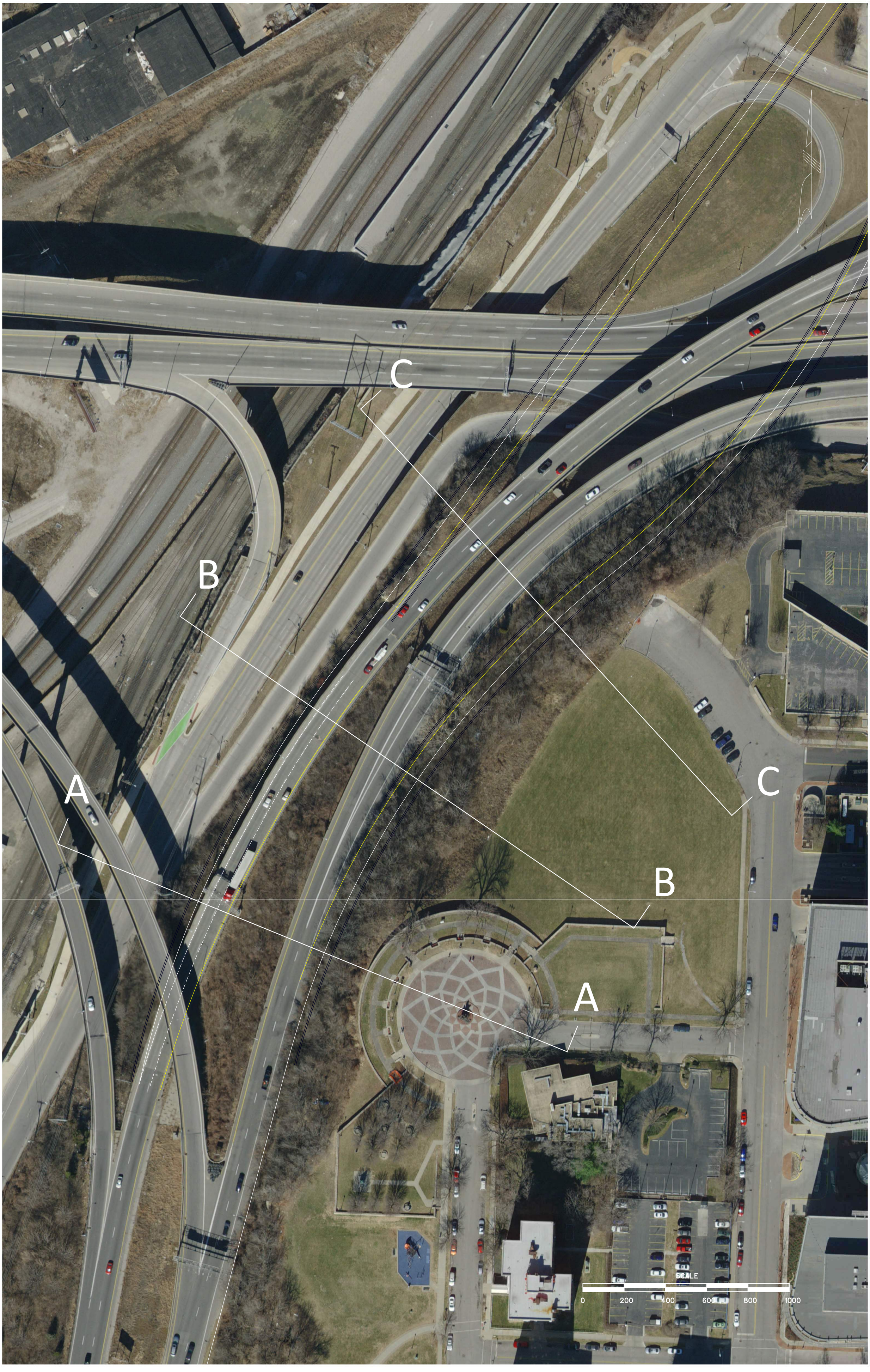
Issued: 5/30/2019

Path: Z:\Clients\TRN\MODOT\109659_MODOT169EA\Studies\GeospatialDataFiles\ArcDocs\StudyArea_Traffic.mxd jaclaussen 5/30/2019
COPYRIGHT © 2019 BURNS & McDONNELL ENGINEERING COMPANY, INC.

ATTACHMENT B – ANTICIPATED BLUFF AREA IMPACTS


Broadway Boulevard
Washington Street
9th Street
Total Park Parcels = 10 acres (approx.)
Area of impact (solid blue) = 1.3 acres (approx.)
West Terrace Park
Jefferson Street
Ermine Case Jr. Park
Summit Street
I-70
I-35
12th Street

ATTACHMENT C – PRELIMINARY BLUFF AREA CROSS-SECTIONS


C
B
A
C
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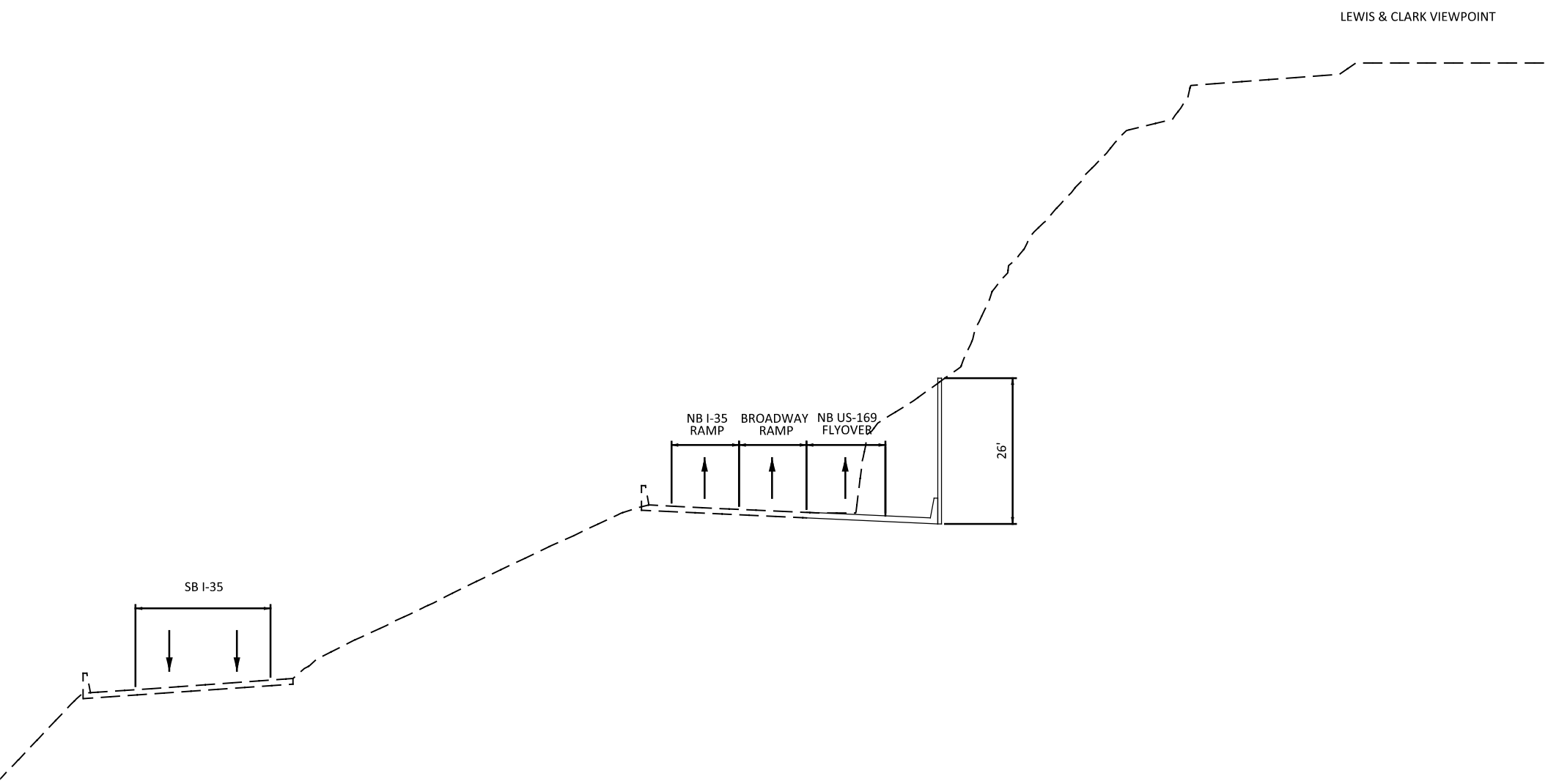
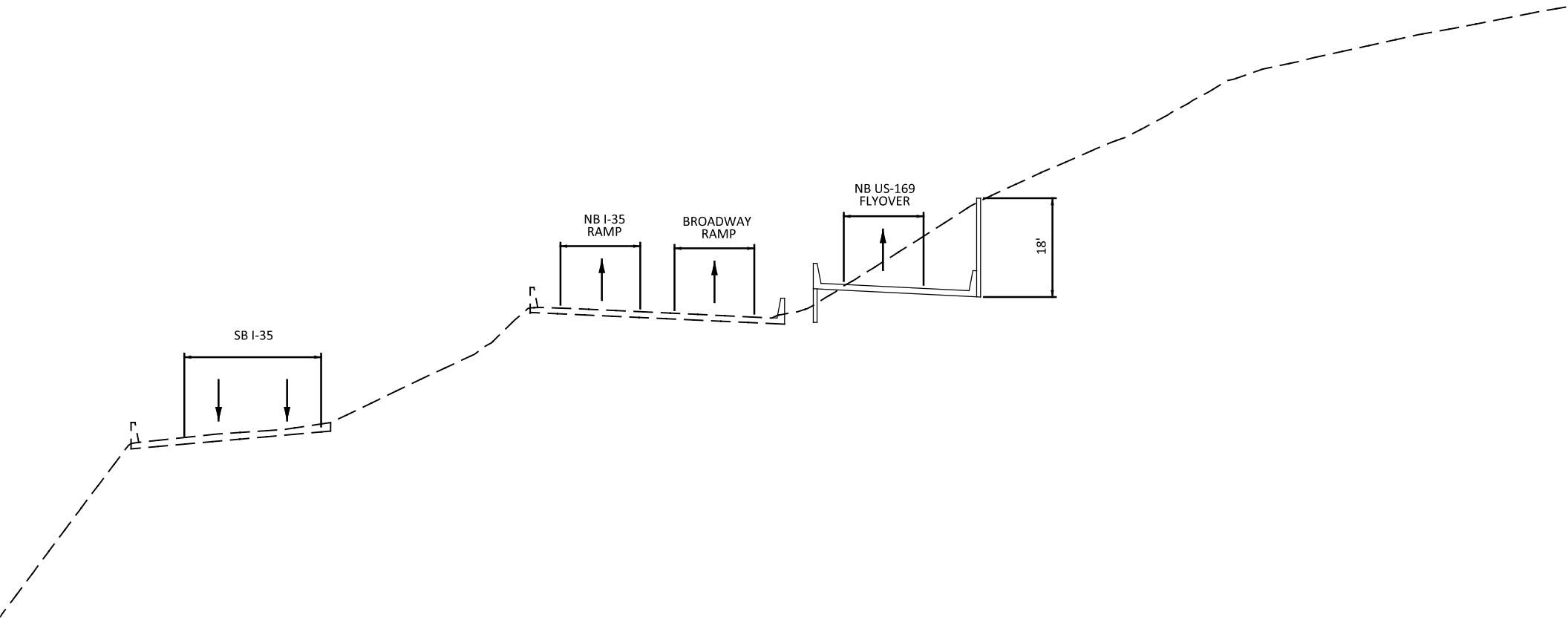
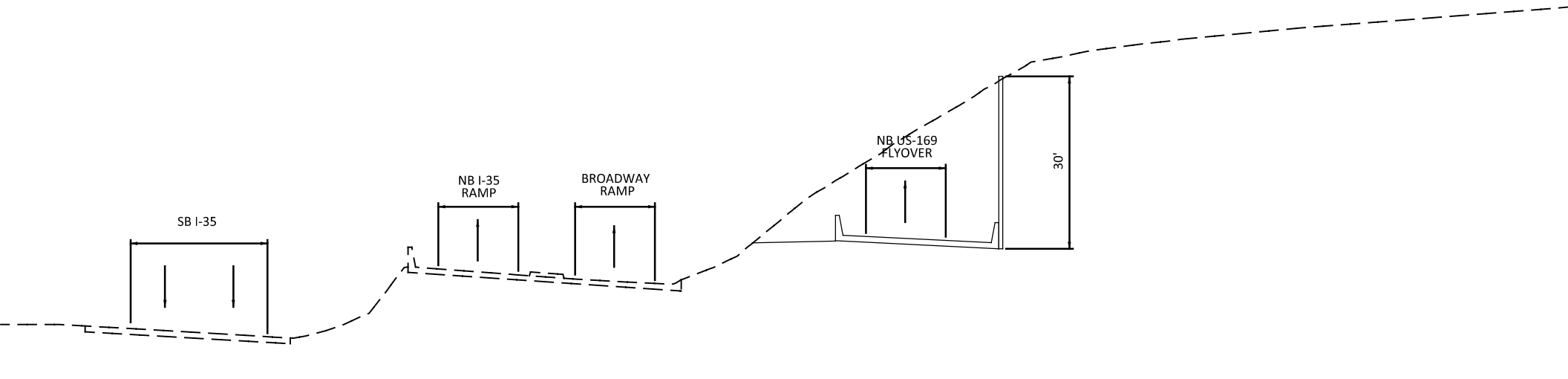
A
SCALE
0
200
400
600
800
1000


LEWIS & CLARK VIEWPOINT
NB I-35
RAMP
BROADWAY
RAMP
NB US-169
FLYOVER
26'
SB I-35

SECTION A-A



SECTION B-B



SECTION C-C

SECTION 106 & 4(f) RESOURCES

NATIONAL REGISTER OF HISTORIC PLACES (NRHP) ELIGIBLE PROPERTIES IN THE STUDY AREA:



THORN HUNKINS COMPANY & WAREHOUSE



TWA BUILDING



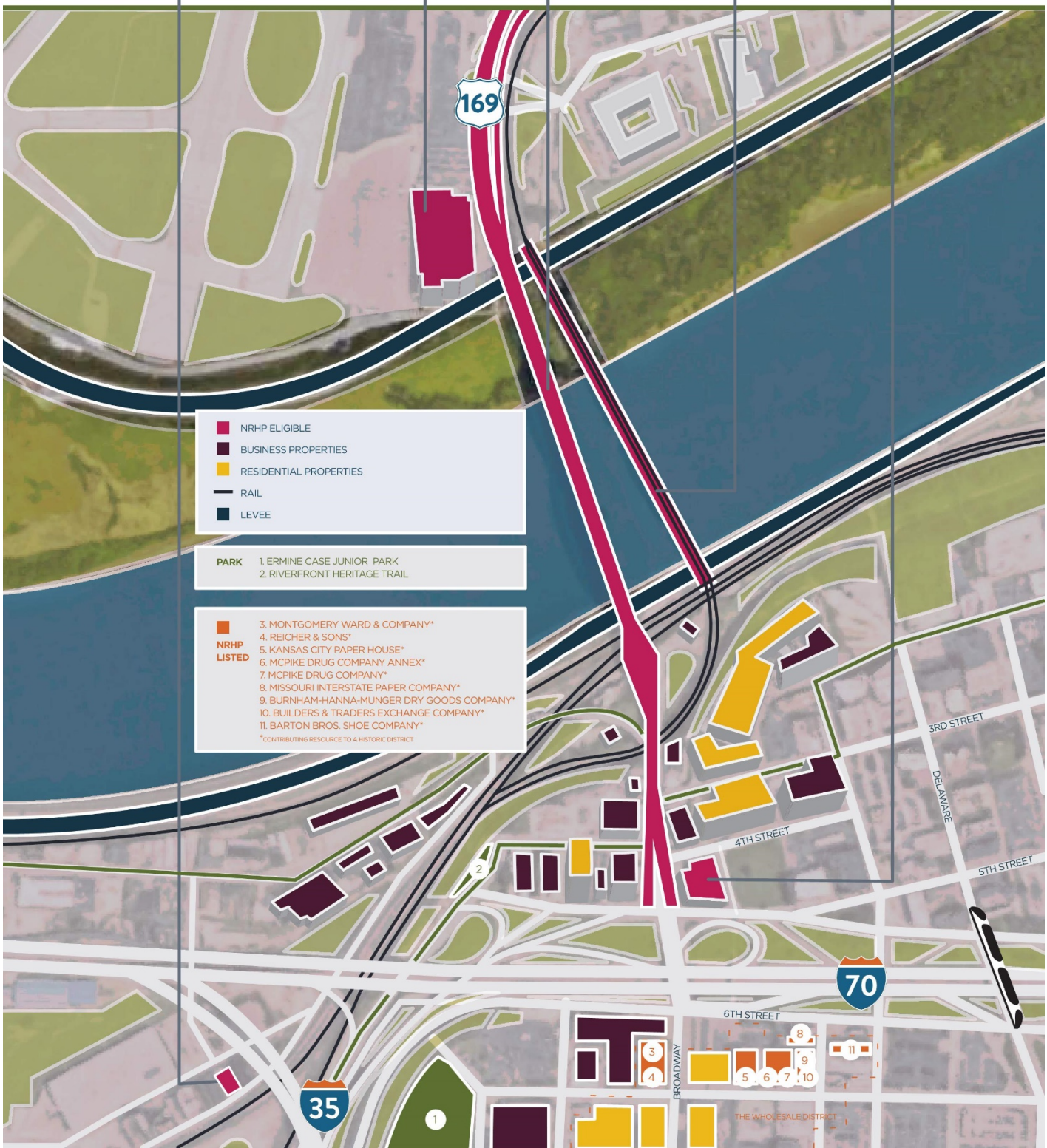
BUCK O'NEIL BRIDGE



2ND HANNIBAL BRIDGE



COLONIAL PATTERNS BUILDING



LEARN MORE ABOUT FEDERAL SECTION 106 & 4(f)

WHAT IS THE SECTION 106 PROCESS?

One of the key environmental factors that must be considered in an environmental study is historic properties. Historic properties are buildings, structures, objects, sites, or districts with historical or archeological significance and qualify for inclusion on the National Register of Historic Places (NRHP). This includes a wide range of resources, from buildings to bridges, dwellings, trains, rock carvings, battlefields, and cultural landscapes. To be considered "historic," a property must possess three essential attributes:

- **Age** – In general, a property must be at least 50 years old to be considered historic.
- **Integrity** - A property must retain the physical characteristics that existed during its period of significance. The National Park Service recognizes a property's integrity through seven aspects: location, design, setting, materials, workmanship, feeling, and association, all of which combine to convey a property's significance.
- **Significance** - A property must have significance at the local, state, or national level to be considered historic. In general, a property must be significant in prehistory or history, whether for its association with important events or persons, for its architecture or design, or for its potential to yield archeological information.

The study team uses a systematic process to identify these resources, evaluate potential effects to them, and determine what action will be taken to avoid or mitigate those effects. For historic properties, this is commonly referred to as the Section 106 Process. Section 106 is named after the portion of the National Historic Preservation Act that requires agencies to take into account the effects of their actions on historic properties.

There are a number of resources that are eligible for listing in the National Register of Historic Places (NRHP)in the study area. Examples include: the Broadway/Buck O'Neil Bridge, the Transcontinental & Western Airlines building, the Colonial Patterns building, and the 2nd Hannibal Bridge. Potential effects to historic resources will also be given consideration under the Section 4(f) process described to the right.

The study team will be conducting further investigations and consulting with interested groups throughout the study process to consider potential project effects on these and other historic resources.

This environmental study will address possible effects on resources considered under Section 4(f) which may include:



2nd Hannibal Bridge



Riverfront Heritage Trail



Colonial Patterns



Ermine Case Junior Park

WHAT IS THE SECTION 4(f) PROCESS?

Section 4(f) of the Department of Transportation Act stipulates that the FHWA and other DOT agencies cannot approve the use of land from:

- Publicly owned parks or recreational areas
- Wildlife and waterfowl refuges
- Public and private historical sites

unless the following conditions apply:

There is no feasible and prudent avoidance alternative to the use of that land; and the action includes all possible planning to minimize harm to the property resulting from such use;

OR

The Administration determines that the use of the property will have a de minimis impact.

WHAT ELSE WILL THE STUDY LOOK AT?

Potential impacts to a variety of environmental resources will be evaluated during the study process. We welcome your input on those that are most important to you:

- Land use
- Geology & soils
- Socioeconomics
- Low income/ Minority popularlions
- Relocations
- Pedestiral & bicycle access
- Transportation facilities & systems
- Air quality
- Noice and vibration
- Light emmissions
- Hazardous materials & wastes
- Construction impacts
- Historical, architectual & archaeological resources
- Wetlands and waters of the US
- Floodplains/ floodways
- Permits
- Wildlife, plants & fish
- Threatened or endangered species
- Public lands & recreation areas
- Visual resources
- Indirect/ cumulative effects

YOUR ROLE IN HISTORIC PROPERTY REVIEW

The Section 106 process encourages consultation. Members of the public may wish to play a more formal role in the Section 106 process if they have a special interest in a historic property. Consulting parties can include:

- Federal agencies
- State Historic Preservation Office
- Representatives of local governments with jurisdiction over the area of historic properties
- Applicants for Federal funds
- Additional consulting parties include those with a demonstrated interest in the undertaking due to their legal or economic interest in the project or property OR the project effects on historic properties.

Consultation is the process of seeking, discussing, and considering the views of others, and where feasible, seeking agreement with them on how historic properties should be identified, considered, and managed. Consultation is built on the exchange of ideas.

Consultation occurs at key stages of each project including:

- Identification of properties eligible for listing on the National Register of Historic Places.
- Assessment of effects on those properties, and
- Resolution of adverse effects.

The public can be involved in the Section 106 review process by expressing concerns about historic properties through the MoDOT website (www.modot.org). They can also be involved in identifying and evaluating resources that are historically important.

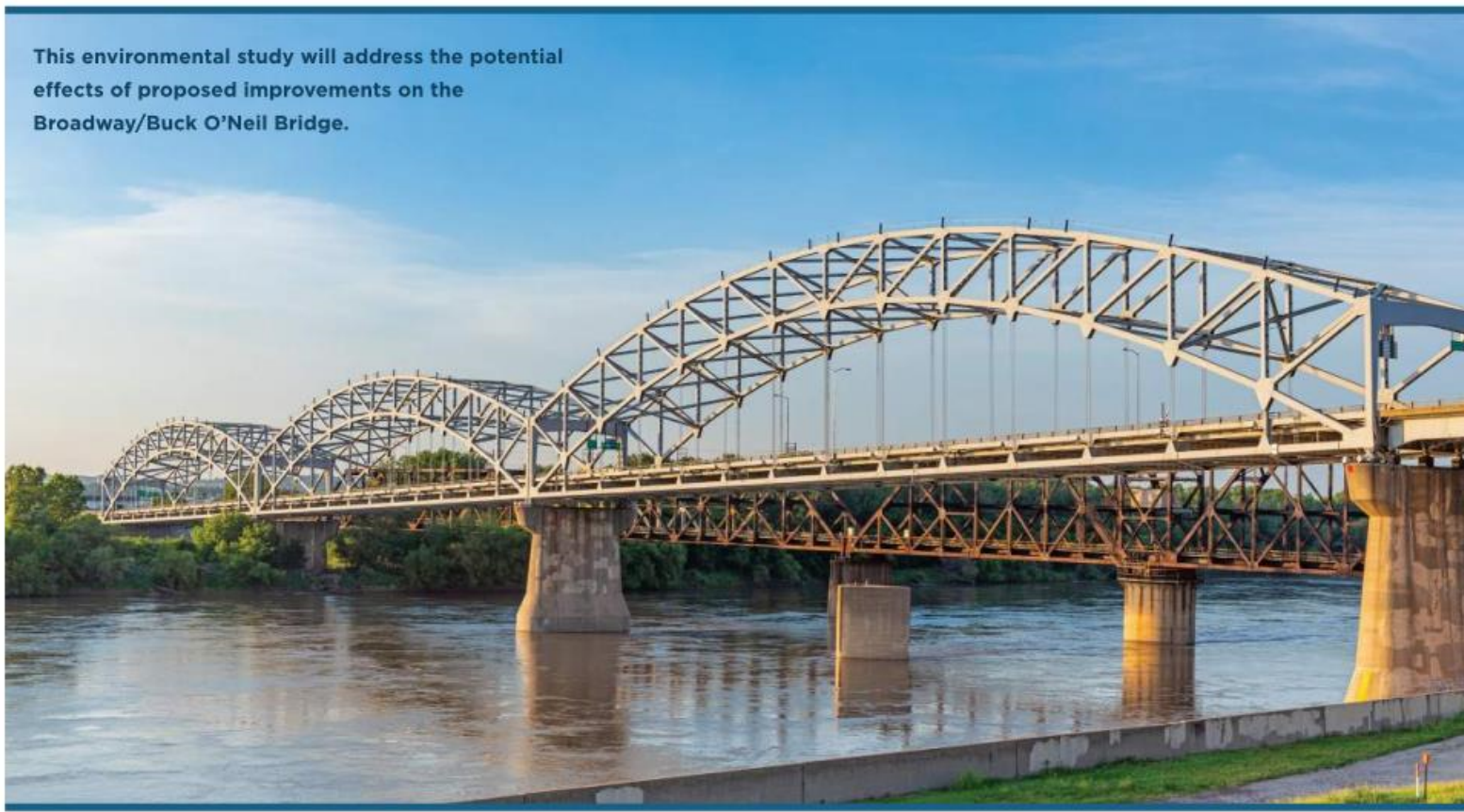
The public can also let us know what they think is important at public meetings by telling representatives of MoDOT or by submitting comments. Public meeting comments can be submitted at the meeting and on-line.

The public can also work with consulting parties to make sure that their views are being represented. It is important for the public to let us know what is important to you and why it is important. More information is available at:

www.modot.org/historic-preservation

To request consulting party status, send a letter explaining your interest in the project or historic property to:

Historic Preservation Section
Missouri Department of Transportation
P.O. Box 270, Jefferson City, MO 65102



This environmental study will address the potential effects of proposed improvements on the Broadway/Buck O'Neil Bridge.

APPENDIX H – TRAFFIC NOISE

Traffic Noise Assessment; January 21, 2020



Draft Traffic Noise Assessment

US 169 Corridor (Buck O'Neil Bridge)
over the Missouri River

BURNS McDONNELL



Prepared For:

Burns and McDonnell

January 21, 2020

GARVER

GarverUSA.com

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1.0 Executive Summary

This Traffic Noise Assessment Report examines the potential noise impacts attributed to proposed roadway improvements associated with three build alternatives and the no-build alternative for addressing congestion issues and solutions in the US 169/Interstate (I-70) North Loop study area as identified in the recently completed Planning and Environmental Linkage (PEL) study. Potential alternatives were screened with a tiered process outlined in the PEL and included fatal flaw, further refinement, and final reasonable strategies/detailed evaluations for addressing traffic congestion issues. Further evaluation is being conducted on the Central Build Alternative, which is being carried forward in an Environmental Assessment (EA) that is currently being developed. Additional information pertaining to these alternative alignments can be found the EA.

The study area is located along US 169 at the interchange of US 169, I-30, and I-70 in Kansas City, Missouri. The proposed improvements begin approximately 1.0 mile north of the Missouri River and extend south approximately 3,500 feet through the Interchange along I-30. Refer to the Project Location Map in **Appendix A**. The noise analysis was performed using the Federal Highway Administration's (FHWA) computer model Traffic Noise Model (TNM) version 2.5 and complies with the Missouri Department of Transportation (MoDOT) Engineering Policy Guide 127.13 (MoDOT Noise Policy) dated June 21, 2019. MoDOT's Noise Policy was developed in accordance with requirements of the FHWA Noise Standard at 23 Code of Federal Regulations Part 772.

The land uses within the project extents primarily contain commercial properties, residential (mainly high-density apartment complexes with and without balconies), recreational areas, and industrial properties. The noise sensitive land uses for this project are considered to be residential dwellings with balconies and/or common places of gathering, recreational areas (parks and trails), historic districts, National Register of Historic Places (NRHP) sites, and commercial properties with a common place of gathering. Based on field inspections, aerial maps, and conceptual design plans, twenty-two (22) model receiver sites, representing 278 receivers were analyzed. Refer to **Appendix B**.

A total of five TNM model runs were evaluated as part of this traffic noise study. The existing conditions were modeled utilizing 2016 traffic data and represent the baseline data for comparison to all other models evaluated for this project. A technical memorandum containing results of the 2016 existing conditions was prepared in July 2019 and updated in October 2019. Under current conditions, one hundred twenty-eight (128) receivers are impacted by approaching or exceeding the Noise Abatement Criteria (NAC) for Categories B or C (Residential and Parks) threshold of 67 dB(A) Leq(h). Results of the 2016 existing conditions are provided in **Appendix C**. The 2040 no-build scenario was also modeled in TNM for comparative purposes; see **Appendix D** for results of the no-build traffic noise model. Three build alternatives (West, Central, and Adjacent) were evaluated for traffic noise impacts and are summarized below. Based on the future traffic volumes for the preferred alternative (Central

Build Alternative), one hundred sixty-one (161) receivers will approach or exceed the 67 dB(A) Leq(h) for NAC Categories B and C.

Table 1: Summary of Impacts

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 Central-Build (Preferred)	0	0	0	10	24	22	0	0	0	0	0
2040 West Build	0	0	0	0	2	14	0	0	0	0	0
2040 Adjacent Build	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 Central-Build (Preferred)	0	0	1	1	0	26	30	2	0	1	44
2040 West Build	0	0	1	1	0	26	30	2	0	1	37
2040 Adjacent Build	0	0	1	1	0	23	30	1	0	1	46

As shown in **Table 1** above, based on the proposed project and future traffic volumes for the Central, West, and Adjacent Alternatives, one hundred sixty-one (161), one hundred fourteen (114), and one hundred fifty eight (158) receivers, respectively, will approach or exceed the 67 dB(A) Leq(h) threshold for NAC Categories B or C. No receivers will experience a 15-decibel increase over the current conditions, which is considered to be a substantial increase for noise impact determination. The future noise levels for impacted and near receivers are expected to increase up to 4.2-decibels above existing levels for the Central Alternative. Traffic noise model results and detailed exhibits for each of the proposed alternatives are provided as follows: **Appendix E** for the West Alternative, **Appendix F** for the Central Alternative, and **Appendix G** for the Adjacent Alternative. Supporting data such as traffic volumes, roadway typical section data, and photographs are located in **Appendices H**, **I**, and **J**, respectively.

Noise abatement in the form of freestanding noise walls that were determined feasible locations for impacted receivers were modeled for the Central Alternative. Two barrier analyses (BA-1 and BA-2) were conducted for the first-floor impacted residences at two receiver sites (R-6 – Conover Place Condos and R-22 – Planned Industrial Expansion Authority of KC). Abatement factors considered in determining feasibility and reasonableness of abatement were consistent with MoDOT Noise Policy and are described in more detail in this report. Two noise walls were evaluated and did meet feasibility criteria. Four (4) other noise wall locations were considered;

however, due to site distance/safety concerns and park preservation concerns, only barriers BA-1 and BA-2 were considered feasible for further evaluation. Noise barrier analysis results are provided in **Appendix K**. Construction of a noise wall in meeting MoDOT Noise Policy requirements in providing acceptable reduction in noise levels would not be feasible due to the limited available right-of-way to construct a noise wall of the dimensions required to achieve the required reduction in noise levels. Therefore, noise mitigation is not proposed for this project.

2.0 Project Description

This Traffic Noise Assessment Report examines the potential noise impacts associated with the proposed roadway improvements on US 169 in Kansas City, Jackson and Clay Counties, Missouri. The proposed improvements are located within and outside MoDOT right-of-way. There are 3 primary roadways involved in this noise study, which are identified in **Appendix H**.

Existing and future roadway typical section data are included in **Appendix I**. The existing mainline highways include US 169, I-70 and I-35, all of which are 4 or 6-lane freeways. US 169 is a 4-lane paved median highway. I-70 is a 4-lane divided highway with paved and parapet wall medians. I-30 is a 4 and 6-lane existing facility with short median barriers. US 169 has an existing bridge over the Missouri River known as the Buck O'Neil Bridge. There are overpasses associated with on/off ramps for merging traffic at the I-70/I-35 interchange where US 169 converges. Additional information regarding alternative alignments and strategies are documented in the recently completed PEL and EA.

The proposed improvements consist of constructing a new bridge over the Missouri River and improving traffic conditions in the bridge vicinity along US 169, I-70, and I-35. **Figure 1** depicts the project location and build alternatives. Three alternatives (West, Central, and Adjacent) are currently proposed for the project. All three alternatives will construct a new long span river bridge over the Missouri River and will remove the existing Buck O'Neil Bridge.

The proposed West Alternative (**Appendix E**) provides a new river bridge to the west of the existing Buck O'Neil Bridge and improves community connectivity by removing the existing bridge infrastructure that separates portions of the River Market. The West Alternative provides a direct connection from US 169 to I-35 via elevated flyover spans over I-70 and 5th Street along with a new roadway along I-35, south of I-70. Impacts to right-of-way are minimized by this alternative as all the bridge infrastructure and ramps down to 5th Street are located on the western side of the River Market. Additionally, the West Alternative will rebuild 1-70 bridges and rebuild the loop span over 1-70 and 6th Street. This alternative provides safe pedestrian and bicycle trips, but the location of the bridge increases walking distance, potentially making pedestrian trips less attractive.

The proposed Central Alternative (**Appendix F**) will construct a new river bridge between the existing Buck O'Neil Bridge and the proposed West Alternative. The Central Alternative provides a direct connection from US 169 to I-35 (also via elevated flyover spans over I-70 and 5th Street

along with a new roadway along I-35, south of I-70), so traffic bound for downtown is separated from traffic heading to I-35 and destinations to the south. The Central Alternative partially improves community connectivity by removing some of the existing infrastructure that separates portions of the River Market, but has more right-of-way impacts than identified in the West Alternative. Travelers headed into downtown will connect with Broadway at 5th Street as they do today as spans elevated over 3rd Street lead from US 169 to ramps down to the intersection of 5th Street and Broadway Boulevard. Additionally, the Central Alternative will rebuild the loop spans over 1-70 and 6th Street.

Figure 1: 2040 Build Alternatives Evaluated



The proposed Adjacent Alternative (**Appendix G**) will provide a new river bridge adjacent to and west of the existing Buck O'Neil Bridge. The adjacent alternative also provides direct connection from US 169 to I-35 via flyovers. The adjacent alternative has elevated spans over 3rd Street that lead to ramps down to 5th Street at the intersection of 5th Street and Broadway Boulevard. Additionally, the Adjacent Alternative will construct new spans over I-70.

2.1 Noise Assessment Area

The noise assessment area (NAA) was developed to encompass sensitive noise receiver groups within the original project area. The NAA limits are generally shown in **Appendix B**. This NAA consists of the interchange of US 169, I-70, and I-35 and extends south along I-35 to W. 14th Street. The NAA extends from west to east to encompass an area from approximately 800 feet west of the I-70 overpass of Mulberry Street east to the Grand Avenue overpass of I-70/I-35. Sensitive noise receivers in this NAA are identified in **Section 4** and include apartments (with and without balconies), parks, and trails. There are significant and steep elevations changes (i.e., 140 feet difference) between the roadway system and sensitive receivers within the NAA.

The analysis of this project relies on aerial maps, conceptual design plans, field surveys, traffic data, and information from Burns and McDonnell. The noise analysis complies with MoDOT's Noise Policy, which was developed in accordance with requirements of the Federal Highway Administration (FHWA) Noise Standard at 23 Code of Federal Regulations Part 772.

3.0 Criteria for Determining Impacts

3.1 Traffic Noise Terminology

Noise, defined as unwanted or excessive sound, is an undesirable by-product of our modern way of life. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on known impacts of noise on people such as speech interference, sleep interference, physiological responses, hearing loss, and annoyance. Highway traffic noise is a major contributor to overall transportation noise and is considered to be a line source of energy from which the energy levels dissipate vertically and laterally from the roadway. Traffic noise is not constant. It varies as each vehicle passes a point. The time-varying characteristics of environmental noise are analyzed statistically to determine the duration and intensity of noise exposure. In an urban environment, noise is made up of two distinct parts. One is ambient or background noise. Wind noise and distant traffic noise make up the acoustical environment surrounding the project. These sounds are not readily recognized but combine to produce a nonirritating ambient sound level. This background sound level varies throughout the day, being lowest at night and highest during the day. The other component of urban noise is intermittent and louder than the background noise. Transportation noise and local industrial noise are

examples of this type of noise. It is for these reasons that environmental noise is analyzed statistically.

Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels (dB) and is a logarithmic unit, as opposed to the more common linear unit of measurement such as temperature. Sound is composed of many frequencies measured in Hertz (Hz). The healthy young adult ear generally responds to sound in the range of 20 to 20,000 Hz. For highway traffic noise, since humans are not equally sensitive to all frequencies, noise is adjusted or weighted using an A-weighted scale. The A weighting scale is widely used in environmental analysis because it closely resembles the nonlinearity of human hearing. The unit of A-weighted noise is dB(A). Because highway traffic sounds fluctuate over time, an equivalent sound level is used to represent a single number to describe varying traffic sound levels. The term Leq(h) refers to the steady-state sound level, which in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same period. All traffic noise levels in this analysis will be expressed in dB(A) Leq(h).

Traffic noise analysis consists of a comparison of physically measured or modeled noise levels for the existing condition with projected noise levels for the future condition. The analysis was performed using the FHWA's Traffic Noise Model version 2.5 (TNM 2.5) to model existing and future noise levels based on traffic data, roadway geometry, and receiver site locations. A receiver is a location, usually representing one or more dwelling units, where frequent exterior human activity occurs. The chosen receiver is modeled for noise levels and evaluated for noise impacts. Conceptual plans developed in 2019 were utilized for TNM modeling. Refer to **Section 5** for a discussion of the traffic data.

3.2 Noise Abatement Criteria (NAC)

The FHWA has seven noise activity categories based on land use and sound levels, each of which has its own Noise Abatement Criteria (NAC). The NAC categories are listed in **Table 2**. If a project would result in higher Leq(h) values than the NAC values for a given location, then noise abatement or mitigation measures must be evaluated. For the noise sensitive receivers where no frequent exterior human activity area is identifiable, then interior noise levels can be determined using adjustment factors and compared to the NAC in determining impacts in accordance with the MoDOT Noise Policy. An impact occurs when, at a given receiver, future noise levels approach by one dB(A), meet, or exceed the FHWA NAC for its activity category. An impact also occurs when the future noise levels exceed existing noise levels by 15 dB(A) at a given receiver. Once an impact is identified, then noise abatement is considered for the impacted area. Only those areas for which mitigation is determined to be feasible and reasonable as defined by MoDOT Noise Policy will be recommended.

TABLE 2

Federal Highway Administration Noise Abatement Criteria (NAC)

Hourly A-Weighted Sound Level, decibels dB(A)

Activity Category	Activity Criteria[1] Leq(h)[2]	Activity Description
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67 (Exterior)	Residential
C[3]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E[3]	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	- -	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	- -	Undeveloped lands that are not permitted

[1] The Leq(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.

[2] The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

[3] Includes undeveloped lands permitted for this activity category.

4.0 Identification of Noise-Sensitive Land Uses and Noise Study Areas

Based on aerial maps, field investigations, and review of the PEL study, land uses within the project extents consist primarily of maintained right-of-way, historic districts, National Register of Historic Places (NRHP) sites and eligible sites, commercial properties, residential dwellings (primarily high-density apartment complexes with and without balconies), and public recreation

parks and trails. Below is a list of sensitive receptors evaluated for noise impacts during this noise study.

- B & W Investment Properties (R-1)
- Market Station Apartments (R-2 and R-3)
- River Market West Apartments (R-4 and R-5)
- Conover Place Condominiums (R-6)
- Richard and Conover Lofts (R-7)
- DeLoft Apartments (R-8)
- Skyline Real Estate Apartments (R-9)
- O'Reilly Investments Apartments (R-10)
- Ermine Case Jr. Park and Trails (R-11, R-12, R-13, and R-14)
- "Caboose" Park Trailhead (R-15)
- Quality Hill Apartments (R-16)
- JVM Apex Apartments (R-17)
- Summit on Quality Hill (R-18)
- Riverfront Trail Head (R-19)
- Mulkey Square Park (R-20)
- O'Reilly Investments / Roaster Block Apartments (R-21)
- Planned Industrial Expansion Authority Apartments (R-22)

These land uses correspond with NAC Categories B, C, and E, and the model receiver locations are shown in **Appendix B**. Evaluation of NAC Categories A, D, or G were not required, modeled, or applied. The only noise sensitive land uses for this project are considered to be the residential dwellings that have areas of common outdoor use (i.e., balconies or other central outdoor gathering locations), commercial properties that have areas of common outdoor use, and recreational parks/trails. The residential dwellings were evaluated as NAC Category B, the commercial properties were evaluated as NAC Category E, and public recreational parks were evaluated as NAC Activity Category C. Based on coordination with MoDOT environmental staff, residential and historic properties that did not have balconies or provide an outdoor common place of gathering were not evaluated as sensitive noise receptors.

5.0 Determination of Existing Sound Levels

The unit of measure for roadway traffic is the average annual daily traffic (AADT), which is defined as the estimate of traffic volumes in vehicles per day on a roadway, averaged from the seven annual average days of the week, for a calendar year. TNM utilizes the design hourly volume (DHV) to determine the existing traffic noise levels and calculates the predicted noise levels that occur when the highest volume for an hour is combined with the highest speeds and considered as the "worst hour for noise." DHV data is based on the percentage of hourly vehicular traffic present on the facility at the design capacity consisting of cars, medium trucks, heavy trucks, buses, and motorcycles.

For existing noise levels, traffic noise calculations based on 2016 Year AADT traffic volumes were performed using the FHWA TNM 2.5 model. This traffic data was provided by Burns and McDonnell between March and November 2019. Based on review of both AM and PM peak hour volumes, the AM peak hour has slightly higher volumes; however due to the higher

percentage of traffic volumes during AM heading southbound and during the PM heading northbound, MoDOT has determined the worst noise hour to include both the higher PM and AM counts along US 169 and I-30. The AM peak hour traffic was utilized for I-70, side and connecting streets. MoDOT supplied truck percentages were utilized for side and connecting streets. Additionally, the Burns and McDonnell traffic study utilized 2016 as the existing year. Truck percentages used were consistent with those provided in the Burns and McDonnell corridor-wide traffic study. There are a significant number of roadways modeled in TNM for this project as identified in **Appendix H**, which depicts the DHV values utilized in the modeling. The modeling assumed all vehicles were traveling at posted speed limits associated with each roadway for existing and design speeds future conditions, with speeds gradually increasing and decreasing on the on and off ramps respectively. The traffic data utilized in this noise study did not include bus and motorcycle vehicle classifications.

Model Validation

For purposes in validating the noise model, field measurements were performed using a Larson-Davis Model LxT1 precision sound level meter. Sound level meter readings were conducted December 5, 2018 and collected for 15 minutes at 2 locations. **Appendix B** depicts the model validation sites. A traffic count by vehicle type was collected simultaneously with the sound level readings. The TNM model was calibrated using the existing roadway/traffic, and receiver locations. Traffic volumes counted during the short-term measurement period were scaled up to one hour and entered into the TNM model. A summary of the measured and modeled noise levels used for the model calibration is in **Table 3,** Noise Measurement data sheets and photographs of the model validation sites are provided in **Appendix J**. Measured versus predicted levels within ±3 dB(A) range are considered to have a reasonable agreement and it indicates that the TNM 2.5 model developed for the study area would provide an acceptably accurate estimate of noise levels under varying future traffic conditions according to MoDOT's Noise Policy. The field data, sound meter calibration certificate, and the modeling results can be provided upon request.

TABLE 3
Model Validation Results
Broadway / Buck O'Neil Bridge, Jackson County

Receiver	Field Record Noise Level dB(A) Leq(h)	TNM Predicted Noise Level dB(A) Leq(h)	Difference (field-model)
MV-1A	70.5	72.5	+2.0
MV-1B	70.3	72.6	+2.3
MV-2A	67.0	65.5	-1.5

Twenty-two (22) receiver locations representing two hundred seventy-eight (278) receivers were selected for modeling purposes to identify noise levels for the existing and future conditions. **Appendix B** depicts the location of the modeled receivers. NAC Activity Categories B, C, and E were utilized during this modeling effort to identify potential impacts to these receivers. Using the 2016 design traffic data and the existing roadway, the 2016 existing noise levels were modeled and the sound levels summarized in **Appendix C**. The TNM data and results of the existing condition are on file with the MoDOT SW District and are available upon request.

6.0 Determination of Future Sound Levels

Traffic Data

The traffic analysis and any traffic-based environmental analysis are based on MARC's 2040 Land Use and 2040 Regional Travel Demand Model. All traffic data and roadway design were provided by Burns and McDonnell. 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 2025. Posted and design speeds on the primary travel highways (US 169, I-35, and I-70) ranged from 45 mph to 55 mph. Traffic noise results of the build noise levels were determined for the twenty-two (22) receiver locations representing two hundred seventy-eight (278) receivers and summarized in **Appendix D**.

Many of the impacted receivers are represented by elevated apartments (above the ground floor) with outdoor balconies having direct line of sight to the major adjacent highways. Where outdoor balconies did not exist for evaluated apartment buildings, a common place of gathering area was selected for modeling purposes. The TNM 2.5 results of the existing, no-build, west, central, and adjacent alternatives are on file with the MoDOT SW District and are available upon request.

6.1 No-Build Alternative

Traffic noise calculations based on future design year 2040 AADT traffic volumes were performed using the FHWA TNM 2.5 model. **Appendix H** depicts the DHV values utilized in the modeling. The modeling assumed all vehicles were traveling at design or posted speed limits for future conditions. Roadways modeled in the 2040 no-build alternative are the same roadways modeled in the 2016 existing conditions model. A total of one hundred eighty-nine (189) impacts were determined to occur for the 2040 no-build conditions. This is a result of increased traffic on the same roadway system. **Appendix D** contains the technical memorandum prepared after results of the analysis were known.

6.2 West Build Alternative

The west alignment alternative includes a five-lane section on new alignment located west of existing US 169 and provides for direct connection to I-35 south and the existing intersection of US 169 and W. Independence Avenue.

Using 2040 future design roadway and traffic data, the future noise levels were determined to occur at one hundred fourteen (114) modeled receivers and are summarized in **Appendix E**. The reduction in impacts compared to the no-build alternative is a result of the far western shift of the roadway away from sensitive noise receivers and the replacement of solid concrete parapet or safety walls in locations where open safety walls currently exist.

6.3 Central Build Alternative

The central alignment alternative includes a five-lane section on new alignment west located of existing US 169, but east of the West Build Alternative and provides for direct connection to I-35 south and the existing intersection of US 169, W. Independence Avenue, and Broadway Boulevard.

Traffic noise calculations based on future design year 2040 traffic volumes were performed using the FHWA TNM 2.5 model and assumed all vehicles were traveling at 45 mph for future conditions on the mainline of US 169, I-35 and I-70 except where posted at 55 mph traveling westbound on I-70.

Using 2040 future design roadway and traffic data, the future noise impacts were determined to occur at one hundred sixty-one (161) modeled receivers and summarized in **Appendix F**. This build alternative has more impacts associated with it compared to the west build alternative since the new alignment of US 169 remains in close proximity to sensitive receivers.

6.4 Adjacent Build Alternative

The adjacent alignment alternative includes a five-lane section on new alignment west of existing US 169 and provides for direct connection to I-35 south and the existing intersection of US 169 and W. Independence Avenue.

Traffic noise calculations were based on future design year 2040 traffic volumes. **Appendix H** depicts the DHV values utilized in the modeling. The modeling also assumed all vehicles were traveling at 45 mph for future conditions on the mainline of US 169, I-35, and I-70 except where posted at 55 mph traveling westbound on I-70.

Using 2040 future design roadway and traffic data, the future noise impacts were determined to occur at one hundred fifty-eight (158) modeled receivers and are summarized in **Appendix G**. The adjacent build alternative only has three less impacts than the central build alternative, but has more impacts associated with it compared to the west build alternative since the new alignment of US 169 remains in close proximity to sensitive receivers.

7.0 Impact Determination Analysis, Central Build Alternative

Results of the future central build conditions indicated that one hundred sixty-one (161) residences will approach, meet, or exceed the 67 dB(a) Leq(h) for NAC Category B. Four (4) park/trail receivers will meet or exceed the 67 dB(a) Leq(h) for NAC Category C. No other traffic noise impacts are anticipated. Refer to **Appendix F** for detailed results of the noise study.

8.0 Noise Abatement Evaluation, Central Build Alternative

Noise mitigation measures have been considered for each impacted receiver location associated with the central build alternative. The consideration to construct a noise barrier in the form of a free-standing sound wall is regarded as the most appropriate form of noise abatement measure for the US 169 interchange improvements project due to available right-of-way and other constraining factors. Noise mitigation must meet two requirements to be recommended for design and construction: one is "feasibility" and the other is "reasonableness."

8.1 Noise Barrier Feasibility

"Feasibility" is the ability to provide abatement in a given location considering the acoustic and engineering limitations of the site. Acoustic feasibility refers to noise abatement measure(s) ability to achieve the minimum noise reduction at impacted receptors. MoDOT requires at least a 5 dBA insertion loss for a minimum of 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.

8.2 Noise Barrier Reasonableness

"Reasonableness" refers to the many factors to be considered to determine if mitigation is fair and affordable. Each of the three required reasonableness factors listed below, as specified in the MoDOT Noise Policy, 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.

3. Noise abatement measures must provide a minimum reduction of 7 dBA for 100 percent of benefitted, first-row receptors.

8.3 Views of Benefited Property Owners and Residents

Noise abatement was not found to be warranted for this project; therefore, views of property owners and residents were not obtained.

8.4 Summary

Noise abatement in the form of freestanding noise walls were considered for impacted receivers modeled in the central alternative. Two (2) barrier analyses were conducted for two receiver sites' first row, first floor receivers per MoDOT Noise Policy. Abatement factors considered in determining feasibility and reasonableness of abatement was consistent with MoDOT's Noise Policy and is described in more detail in this report. Noise abatement for receiver sites R-6 (Conover Place Condominiums) and R-22 (a new development currently under construction, Planned Industrial Expansion Authority of KC) was evaluated through the two barrier analyses. Neither of the two noise walls evaluated met feasibility criteria. Results of determining feasibility of the two walls is provided in **Appendix K**.

The following impacted receivers listed in **Table 4** were not evaluated through a barrier analysis as a result of feasibility review factors such as second row, 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
Impacted Receivers – Abatement Determined Not Feasible

Receiver	Receiver Name	Feasibility Determination
R-4	River Market West (north building)	• Considered 2nd row receivers
R-5	River Market West (south building)	• Considered 2nd row receivers
R-14	Ermine Case Jr. Park (Overlook)	• Constructability atop existing rock bluffs • Additional impacts to the park would occur
R-15	"Caboose" Park Trailhead	• Available right-of-way • Inability to mitigate for impacts for the entire trail system and due to access constraints

TABLE 4 Impacted Receivers – Abatement Determined Not Feasible		
R-17	JVM Apex Apartments	• Constructability atop existing rock bluffs • Additional impacts to the park would occur • No ground floor impacts
R-19	Riverfront Trail Head	• Available right-of-way • Inability to mitigate for impacts for the entire trail system and due to access constraints
R-21	O'Reilly Investments/Roaster Block Apartments	• Considered 2nd row receivers • No ground floor impacts

The two sound walls evaluated at various heights and their locations are described below and shown in **Appendix K**. Consistent with MoDOT practice, the acoustic feasibility determinations requiring at least a 5dBA insertion loss (IL) were performed in TNM. This estimate does not take into account wall adjustments for any utilities, drainage modifications, or aesthetics. The following is a summary of the barrier analysis.

Barrier Analysis Results for Conover Place Apartments (R-6) & Planned Industrial Expansion Authority of KC Apartments (R-22)

BA-1

A noise wall (*BA-1*), placed within existing MoDOT right-of-way along the south edge of W. 5th Street and the I-35 off-ramp to W. 5th Street, with a length of 482 feet and a maximum height of 20 feet did not meet MoDOT feasibility criteria of achieving a 5dB(A) IL for a minimum of two first row, first-floor, impacted receivers. Although further away from the primary noise source (I-35), this wall position was chosen to be evaluated due to the ground elevation being higher than the depressed roadway section of I-35.

BA-2

A noise wall (*BA-2*), placed within existing MoDOT right-of-way along the north edge of of I-35, with a length of 495 feet and a maximum height of 20 feet also did not meet MoDOT feasibility criteria of achieving a 5dB(A) IL for a minimum of two first row, first floor, impacted receivers. This wall position was chosen as a result of being close to the primary noise source (I-35).

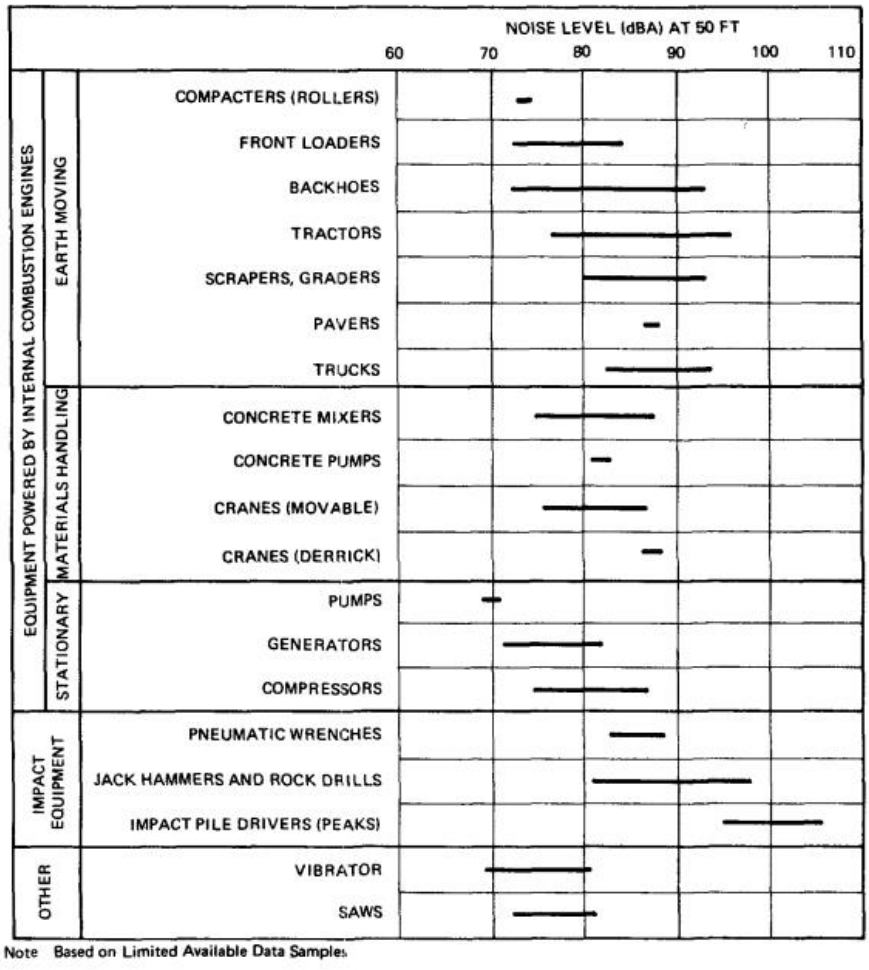
Construction of a noise wall in meeting MoDOT Noise Policy requirements in providing acceptable reduction in noise levels would not be feasible due to available right-of-way

constraints required for construction of a noise wall of the necessary dimensions. Therefore, noise mitigation is not proposed for this project.

9.0 Construction Noise

In general, construction noise related to highway projects is not a major issue. Sources of noise include heavy machinery like backhoes and scrapers, cranes, pile drivers, and trucks transporting materials. Refer to **Figure 2**. Typically, construction noise can be minimized by implementing time of day restrictions for construction operations adjacent to noise sensitive areas. MoDOT is concerned about any special noise-sensitive land uses or activities that may be affected by construction noise from the proposed project, and any special measures which are feasible and reasonable will be added to the project plans and specifications. No special noise sensitive land uses or activities that may be affected by construction noise are in proximity to the project.

Figure 2: Construction Equipment Noise Ranges



10.0 Information for Local Officials

Traffic noises that approach, meet, or exceed the sound levels specified in the MoDOT Noise Policy resulting from the proposed US 169 project have been identified. To aid in noise compatible land use planning, using TNM 2.5, the approximate distance from the center of the proposed five-lane roadway was used to determine the noise impact contours of 66 dB(A). **Table 5** summarizes the location and distances of the noise impact zones. The distances vary due primarily to variation in the topography of the receivers relative to the roadway and the different traffic volumes and vehicle speeds associated with the new highway facility. This technical report will be updated when the 66 dB(A) contours are identified and will include a description of the contour in relation to the proposed right-of-way on both sides of the proposed central build alternative analysis. Development within the 66dB(A) and 71dB(A) contour zones on either side of the proposed highway facility should be compatible with elevated traffic noise levels. Residential and other related land use is discouraged within the designated impact zone(s) due to anticipated future noise levels.

TABLE 5: Noise Contour Impact Zone
US 169 Corridor

Roadway Section	66 dB(A)*	71 dB(A)*
Five-Lane Facility, 45 mph along US 169	229' East / 314' West	101' East / 190' West
Five-Lane Facility, 45 mph along I-35	158' East / 115' West	87' East / 84' West
Five-Lane Facility, 45 mph along I-70	321' North / 348' South	121' North / 120' South

* Distance from proposed centerline of US 169, I-35 or I-70, whichever is closest to the receiver. Distances vary along highway by location. Above distances occur at approximate average distances from the contour to the proposed highway centerline. For purposes of estimating contour zones, distances from US 169 were measured beginning at the proposed ramps just south of I-70 and extended north to northern limits of the project.

11.0 Indirect and Cumulative Effects

Indirect effects that could occur within the near future that are reasonably foreseeable include those land use changes resulting from growth of the community and resulting actions. This US 169 corridor improvements project will provide additional capacity and better traffic flow for traffic traveling north and south through the I-35/I-70 interchange in Kansas City. Cumulative effects resulting from this project in light of other roadway improvement projects, such as current roadway improvements along I-35, are intended to result in improved traffic flow, which could alleviate congestion and allow more consistent traffic speeds throughout the corridor.

12.0 References

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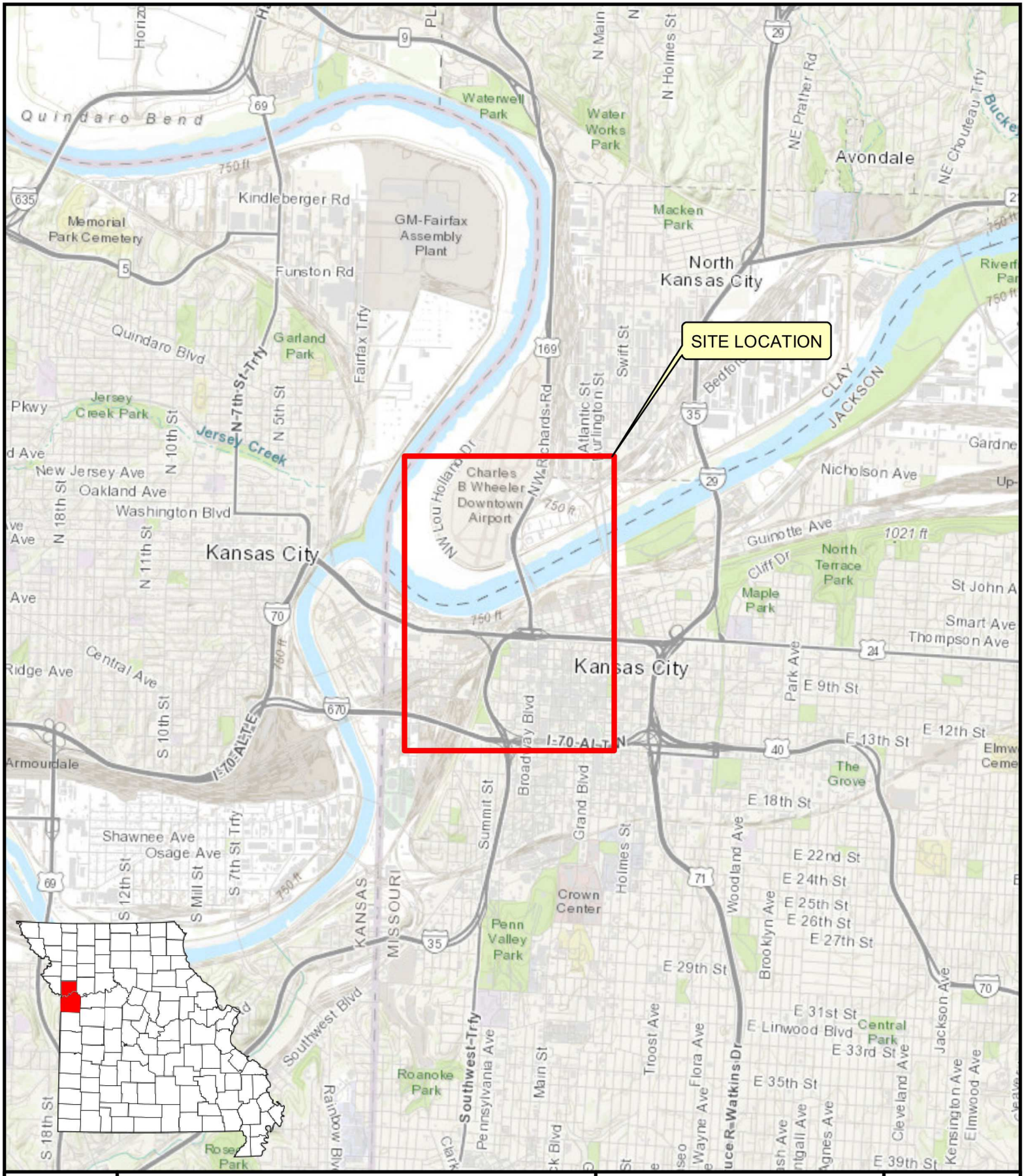
https://www.ecfr.gov/cgi-bin/text-idx?SID=811ba0fef3d35407d30526d9cdbcadbd&mc=true&node=pt23.1.772&rgn=div5

APPENDICES

APPENDIX A

Project Location Map



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JOB NO.: 17177187

DATE: JUL 2019

PROJECT LOCATION

MODOT

KANSAS CITY, CLAY AND JACKSON CO., MO

BROADWAY / BUCK O'NEIL BRIDGE

BURNS McDONNELL

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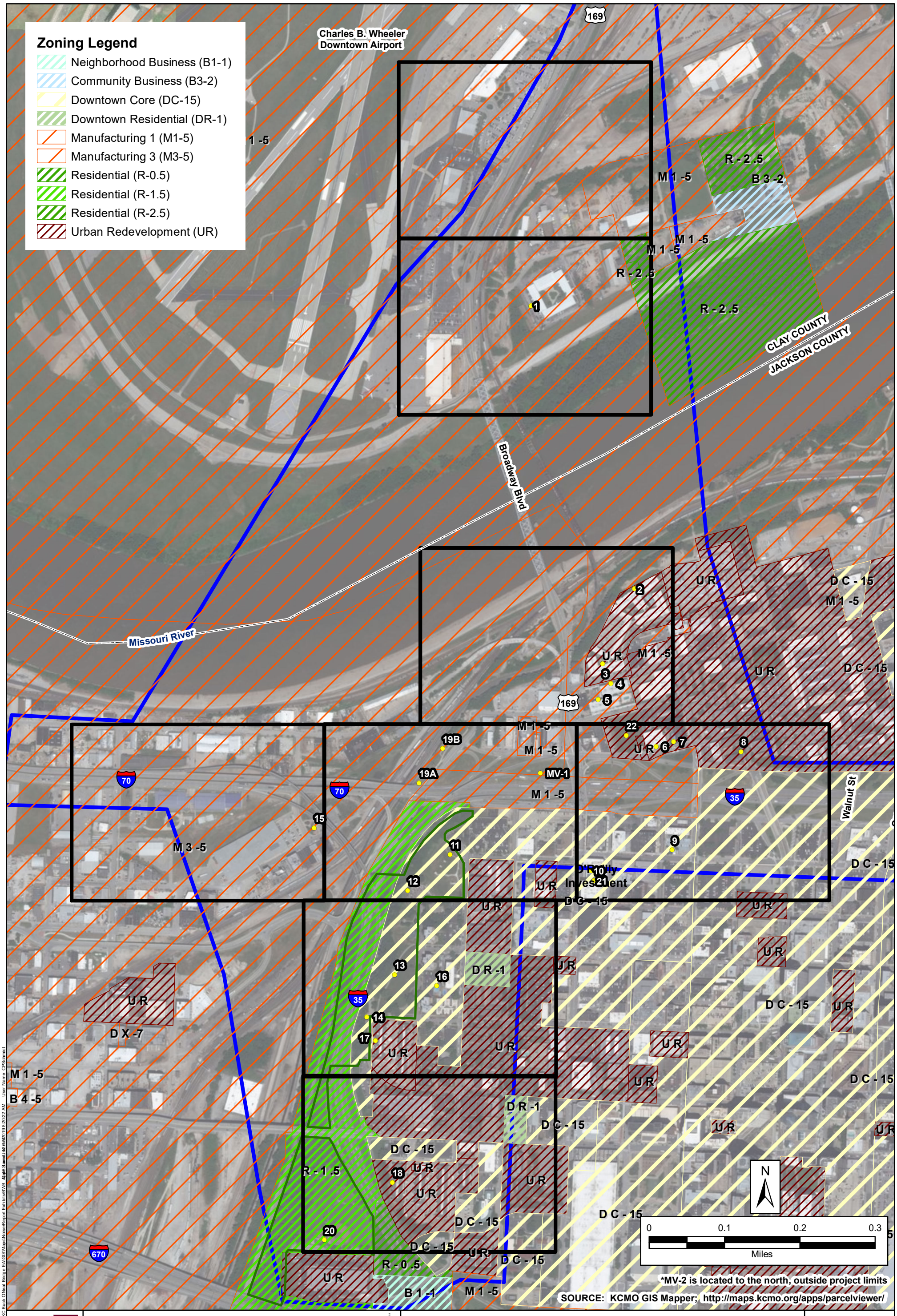
APPENDIX A

APPENDIX B

Noise Study Overview Land Use Exhibit



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NOISE ANALYSIS LAND USE

MODOT

KANSAS CITY, CLAY AND JACKSON CO., MO

BROADWAY / BUCK O'NEIL BRIDGE

BURNS McDONNELL

Legend

- Receivers
- Noise Assessment Area
- Park Property
- Detailed Noise Study Exhibit Sheets for Appendices D & F

APPENDIX

B

APPENDIX C

2016 Existing Conditions Technical Memo

2049 E. Joyce Blvd.
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FAX 479.527.9101

www.GarverUSA.com

EXISTING NOISE CONDITIONS

Date: August 2, 2019

To: MoDOT
Burns & McDonnell

Attn: Matt Burcham, MoDOT
Julie Sarson, Burns & McDonnell, Project Manager

From: Ryan Mountain, Garver

RE: Broadway/Buck O'Neil Bridge – Route 169
MoDOT No. 4S3085
Noise Study – Existing Condition Results

Copies To: Shari Cannon-Mackey, Burns & McDonnell, scannonmackey@burnsmcd.com
Chip Touzinsky, Garver, CETouzinsky@GarverUSA.com

Garver has completed the existing traffic noise model run. This technical memo serves to document the results of existing model conditions only. Many impacts exist under current conditions. Turning movement traffic data in the form of peak hour volumes determined in 2016-2017 were utilized in the preparation of the existing model. Receivers modeled include: apartments with balconies and common areas, public recreation parks, and trails. New/on-going construction of what is likely an apartment building with balconies was recently observed on 5th Street and will need added to the model. Modeling also included terrain lines and existing barriers to capture the steep elevation changes within the project limits. Figures 1 - 3 depict the impacted receivers (red) and non-impacted receivers (yellow) under existing conditions. The receiver naming convention followed MoDOT Noise Policy guidance. Due to shielding provided by adjacent buildings between the receiver and adjacent highways, some receivers are not impacted in the existing condition. Table 1 below summarizes the impacts associated with the 20 designated receiver sites, which represent 194 receivers.

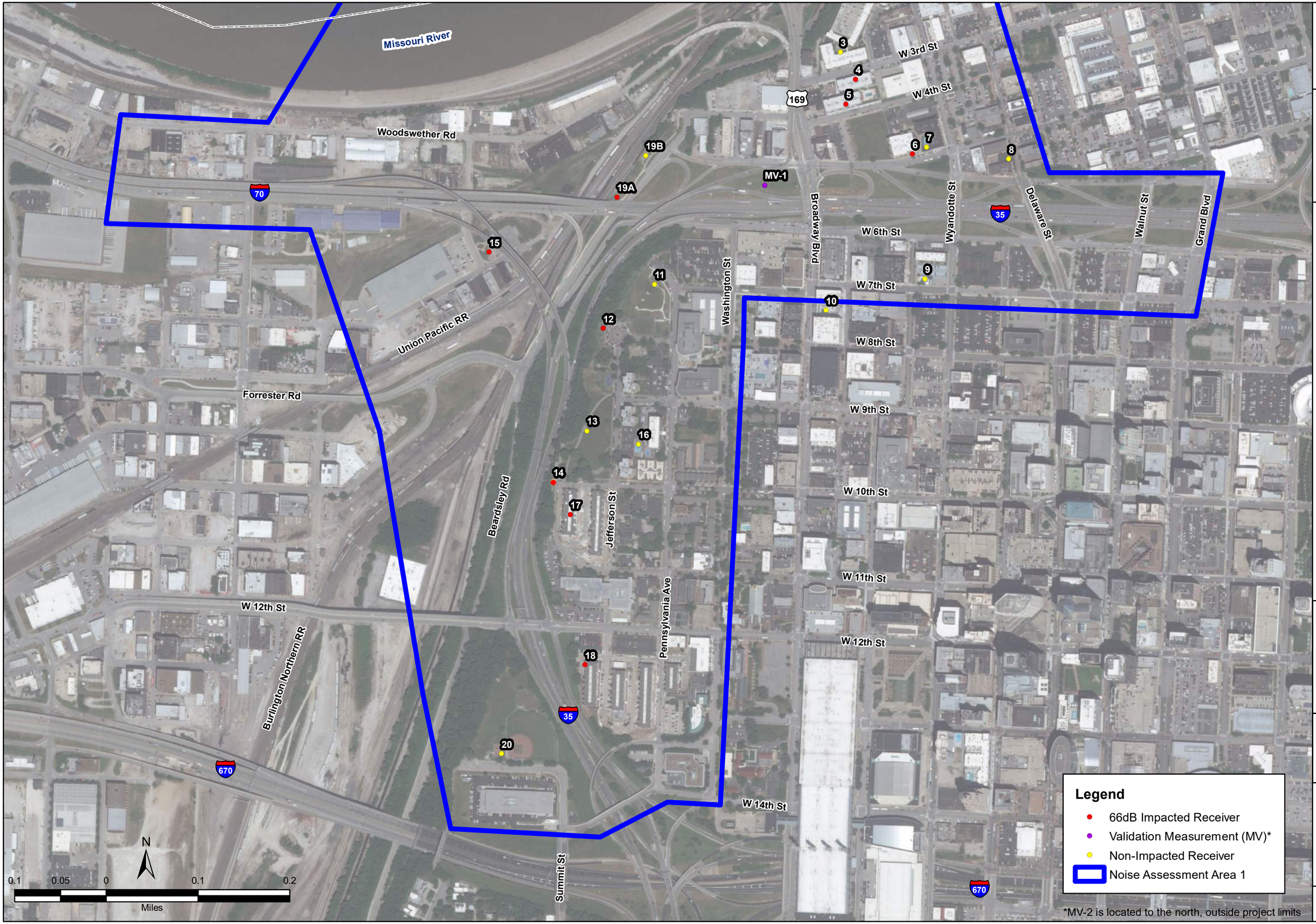
Table 1 - Receivers

Receiver Site	Existing dBA Level*	Dwelling Units
1	66	4
2	No existing impacts	--
3	No existing impacts	--
4	73.7	15
5	69.4	18
6	69.6	15
7	No existing impacts	--
8	No existing impacts	--
9	No existing impacts	--
10	No existing impacts	--
11	No existing impacts	--

Receiver Site	Existing dBA Level*	Dwelling Units
12	No existing impacts	--
13	No existing impacts	--
14	No existing impacts	--
15	67.1	TBD
16	No existing impacts	--
17	70.2	19
18	72.6	20
19	66.1	TBD
20	No existing impacts	--
21**	Proposed Receiver New construction	--

*Highest dBA result for set of receivers. **New apartments on 5th St. could have balconies that will need modeled. Potential impacts may be similar to the Receiver 6 site.

Attachments: 4 **Figures 1-3, Table 2**



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NOISE ANALYSIS DETAIL SHEET

FIGURE NUMBER: 1

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NOISE ANALYSIS DETAIL SHEET

FIGURE NUMBER: 2

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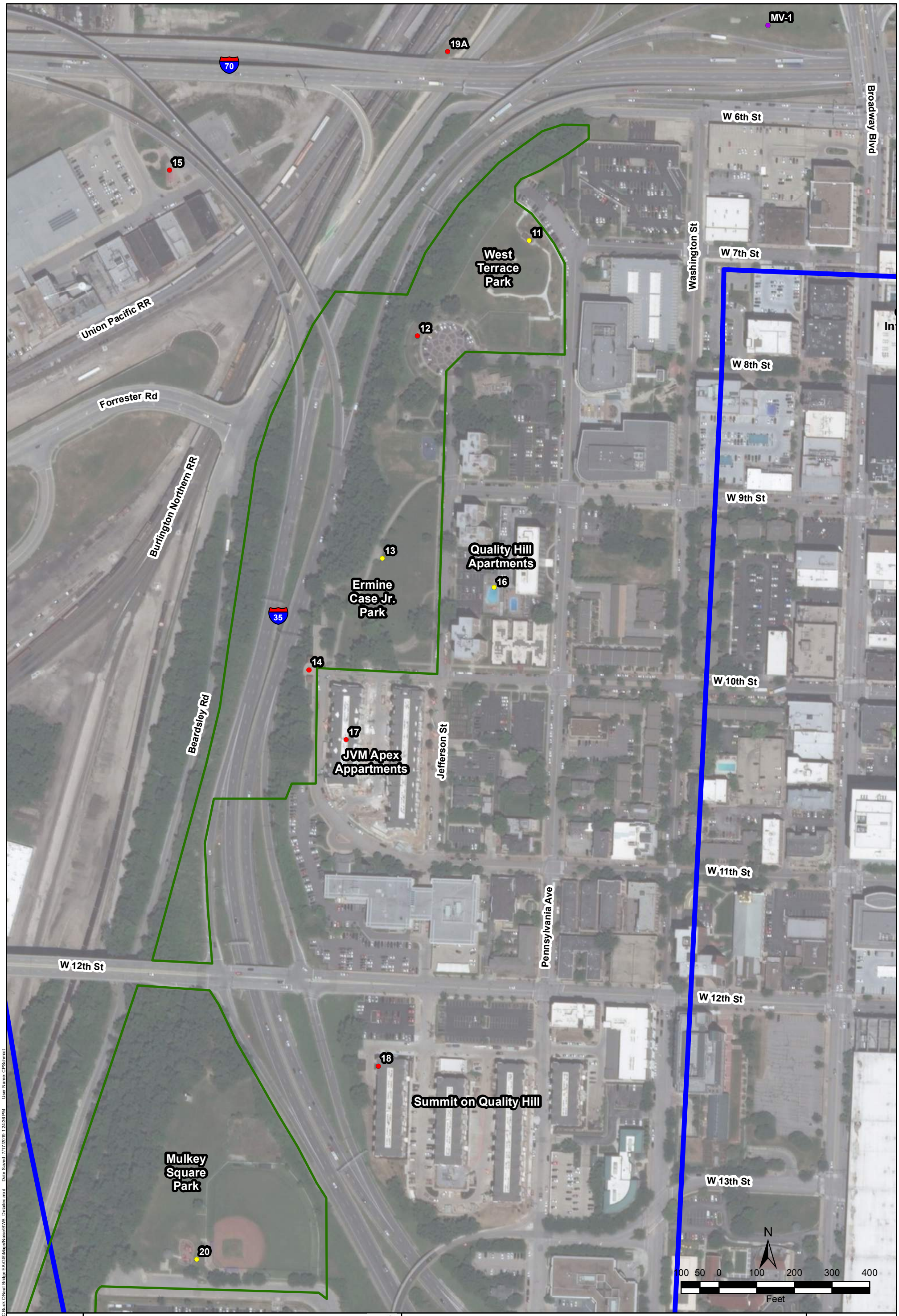

LOGO

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JOB NO.: 17177187

DATE: JUL 2019

NOISE ANALYSIS DETAIL SHEET

MODOT

KANSAS CITY, CLAY AND JACKSON CO., MO

BROADWAY / BUCK O'NEIL BRIDGE

BURNS McDONNELL

Legend

- 66dB Impacted Receiver
- Validation Measurement (MV)*
- Non-Impacted Receiver
- Noise Assessment Area 1
- Park

*MV-2 is located to the north, outside project limits

FIGURE NUMBER

3

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Garver **26-Jul-19**
Ryan Mountain **TNM 2.5**
Calculated with TNM 2.5
TABLE 2 - EXISTING SOUND LEVEL RESULTS
PROJECT/CONTRACT: **Broadway Bridge-17177187**
RUN: **BWB_Existing**

Receiver Name	Receiver Number	Dwelling Units	Calculated dBA
B&W Investment Properties - with Balconies	1-1A-169B	4	62.8
	1-1C-169B	6	60.3
	1-1F-169B	6	63.1
	1-1E-169B	6	58.5
	1-1D-169B	6	64.2
	1-1B-169B (2nd story only)	4	66
	1-1G-169B	3	56
	1-1H-169B	3	60.5
	1-1I-169B	4	55.7
	1-1J-169B	4	59.5
	1-1K-169B	6	55.4
	1-1L-169B	6	58.7
	1-1M-169B	5	55
	1-1N-169B	5	58
Market Station Apartments - with Balconies	1-2A-169B	1	64.7
	1-2B-169B	1	65.2
	1-2C-169B	1	65.2
	1-2D-169B	1	65.2
	1-2E-169B	1	64.1
	1-2F-169B	1	64.7
	1-2G-169B	1	64.8
	1-2H-169B	1	64.9
Market Station Apartments - Common Area	1-3-169B	1	63.8
Ermine Case Jr. Park	1-14-I-35B	1	73.7
River Market West Apartments - North Bldg.	1-4B-169B	1	67.7
	1-4C-169B	1	67.9
	1-4D-169B	1	68
	1-4E-169B	1	68.1
	1-4F-169B	1	66.7
	1-4G-169B	1	66.3
	1-4H-169B	1	66.6
	1-4I-169B	1	66.8
	1-4J-169B	1	67.2
	1-4K-169B	1	65.3
	1-4L-169B	1	64.4
	1-4M-169B	1	64.9
	1-4N-169B	1	65.2
	1-4O-169B	1	65.5
	1-4P-169B	1	62.5
	1-4Q-169B	1	67.1
	1-4R-169B	1	67.9
	1-4S-169B	1	67.9
	1-4T-169B	1	68.2
	1-4U-169B	1	68.2
River Market West Apartments - South Bldg.	1-5A-169B	1	66.4
	1-5B-169B	1	69.4
	1-5C-169B	1	69.4
	1-5D-169B	1	69.3
	1-5E-169B	1	69.2
	1-5F-169B	1	66.2
	1-5G-169B	1	68.7
	1-5H-169B	1	68.9
	1-5I-169B	1	68.9
	1-5J-169B	1	68.8
	1-5K-169B	1	65.9
	1-5L-169B	1	68
	1-5M-169B	1	68.3
	1-5N-169B	1	68.3
	1-5O-169B	1	68.3
	1-5P-169B	1	65.6
	1-5Q-169B	1	67.6
	1-5R-169B	1	68
	1-5S-169B	1	68.1
	1-5T-169B	1	68.2
Conover Place Condos	1-6A-I-70B	1	65.3
	1-6B-I-70B	1	66.9
	1-6C-I-70B	1	67.5
	1-6D-I-70B	1	66.6
	1-6E-I-70B	1	67.8
	1-6F-I-70B	1	68.2
	1-6G-I-70B	1	68.5
	1-6H-I-70B	1	69.4
	1-6I-I-70B	1	69.6
	1-6J-I-70B	1	66.9
	1-6K-I-70B	1	65.9
	1-6L-I-70B	1	65.3
	1-6M-I-70B	1	64.9
	1-6N-I-70B	1	64.9
	1-6O-I-70B	1	64.7
	1-6P-I-70B	1	64.4
	1-6Q-I-70B	1	67
	1-6R-I-70B	1	68
	1-6S-I-70B	1	68.4
	1-6T-I-70B	1	67
	1-6U-I-70B	1	68.1
	1-6V-I-70B	1	68.5

Receiver Name	Receiver Number	Dwelling Units	Calculated dBA
Richards & Conover Lofts	1-7-I-70B	1	62.9
DeLofts	1-8-I-70B	1	64.9
Skyline Real Estate	2-9-I-70B	1	56.7
O'Reilly Investments	1-10A-BRB	1	61.7
	1-10B-BRB	1	58.9
JVM Apex Apartments	1-17B-I-35B	1	67.5
	1-17C-I-35B	1	69.3
	1-17D-I-35B	1	70.2
	1-17E-I-35B	1	64.4
	1-17F-I-35B	1	66.2
	1-17G-I-35B	1	68.2
	1-17H-I-35B	1	69.5
	1-17I-I-35B	1	64.9
	1-17J-I-35B	1	65.9
	1-17K-I-35B	1	67.3
	1-17L-I-35B	1	68.8
	1-17M-I-35B	1	65.3
	1-17N-I-35B	1	66.1
	1-17O-I-35B	1	67.1
	1-17P-I-35B	1	68.7
	1-17Q-I-35B	1	66.6
	1-17R-I-35B	1	68.4
	1-17S-I-35B	1	61.7
	1-17T-I-35B	1	64.1
	1-17U-I-35B	1	66
	1-17V-I-35B	1	68.1
Summit on Quality Hill	1-18A-I-35B	1	66.8
	1-18B-I-35B	1	69.2
	1-18C-I-35B	1	69.3
	1-18D-I-35B	1	69.3
	1-18E-I-35B	1	69.4
	1-18F-I-35B	1	70.1
	1-18G-I-35B	1	70.1
	1-18H-I-35B	1	70
	1-18I-I-35B	1	70.7
	1-18J-I-35B	1	71.2
	1-18K-I-35B	1	70.9
	1-18L-I-35B	1	70.9
	1-18M-I-35B	1	71.8
	1-18N-I-35B	1	72.1
	1-18O-I-35B	1	71.8
	1-18P-I-35B	1	71.6
	1-18Q-I-35B	1	72.6
	1-18R-I-35B	1	72.4
	1-18S-I-35B	1	72.3
	1-18T-I-35B	1	67.3
West Terrace Park	1-11-I-35B	1	62.9
Ermine Case Jr. Park	1-12-I-35B	1	63.4
Ermine Case Jr. Park	1-13-I-35B	1	62.2
Mulkey Square Park	1-20-I-35B	1	54.5
Trialhead	1-15-I-35B	1	67.1
Quality Hill Apts.	1-16-JEB	1	54.1
Trail	1-19A-BEB	1	66.1
Trail	1-19B-BEB	1	62.3

	Impacted Receivers
1	First Row
5Q	Receiver No.
169B	Adjacent Highway

APPENDIX D

No-Build Technical Memo, Detailed Noise Study Exhibits, and TNM Plan Views

Technical Memo*

***All technical memos were updated with R-22 (Owner: Planned Industrial Expansion Authority of KC) after submittal to MoDOT.**

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NO-BUILD NOISE CONDITIONS

Date: October 23, 2019

To: MoDOT
Burns & McDonnell

Attn: Matt Burcham, MoDOT
Julie Sarson, Burns & McDonnell, Project Manager

From: Ryan Mountain, Garver RCM

RE: Broadway/Buck O'Neil Bridge – Route 169
MoDOT No. 4S3085
Noise Study – 2040 No-Build Condition Results

Copies To: Shari Cannon-Mackey, Burns & McDonnell, scannonmackey@burnsmcd.com
Chip Touzinsky, Garver, CETouzinsky@GarverUSA.com

Garver has completed the no-build traffic noise model run. This technical memo serves to document the results of no-build model conditions only. The no-build conditions TNM model consisted of utilizing the validated 2016 existing conditions TNM model[1] as a baseline for determining future (2040[2]) traffic noise impacts if the project would not be built, which utilizes the same existing roadways. Many impacts are anticipated under the projected 2040 no-build conditions, most of which are in multi-story apartment buildings. Turning movement traffic data in the form of peak hour volumes for 2040 were utilized in the preparation of the no-build model. Receivers modeled are identical to those modeled in the existing TNM model. New/on-going construction of what is likely an apartment building with balconies was recently observed on 5th Street and will need to be added to the model. TNM modeling also included existing terrain lines and existing barriers to capture the steep elevation changes within the project limits. Figures 1 - 2 depict the impacted receivers (red) and non-impacted receivers (yellow) under no-build conditions. Due to shielding provided by adjacent buildings between the receiver and adjacent highways, some receivers are not impacted in the no-build condition. Table 1 below summarizes the impacts associated with the 21 designated receiver sites, which represent 241 receivers.

Table 2 shows the detailed results of the 2040 no-build conditions compared to the 2016 existing conditions. Under the 2040 no-build conditions, 121 receivers are anticipated to approach[3], meet, or exceed the 67 dB(A) Leq(h) for Noise Abatement Criteria (NAC) Categories B and C. Under the 2016 existing conditions, 108 receivers are anticipated to approach, meet, or exceed the same thresholds. Under the 2040 no-build condition, no receivers will experience a substantial increase (15 dBA or more). Thirteen (13) additional receivers will be impacted during the 2040 no-build conditions compared to the 2016 existing conditions.

[1] The 2016 existing conditions TNM model (from the July 2019 technical memo) has been updated to model all travel lanes as well as more receivers that were identified within the noise study area. The October 2016 existing conditions model will serve as the baseline for determining impacts moving forward.

[2] 2040/2045 disclaimer - The traffic analysis and any traffic-based environmental analysis 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 2025.

[2] Approaching the NAC B and C criteria includes receivers experiencing a noise level of 66 dB(A).

Table 1 - Receivers

Receiver Site	No-Build dBA Level*	Dwelling Units
1	No impacts	--
2	66.5	3
3	No impacts	--
4	70.1	17
5	71.4	30
6	70.1	16
7	No impacts	--
8	No impacts	--
9	No impacts	--
10	No impacts	--
11	No impacts	--
12	No impacts	--

Receiver Site	No-Build dBA Level*	Dwelling Units
13	No impacts	--
14**	73.8	1
15**	67.9	1
16	No impacts	TBD
17	70.0	21
18	72.5	30
19**	66.9	1
20	No impacts	--
21	66.3	1
22**	Proposed Receiver Location for New construction on 5th St.	--

*Highest dBA result for set of receivers.
**Number of receivers will be determined based on park or trail usage.
***Receiver 22 is reserved for new apartment buildings being constructed along 5th St.

Attachments: 3 Figures 1 & 2, Table 2



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NOISE ANALYSIS-NO-BUILD

FIGURE NUMBER: 1

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NOISE ANALYSIS-NO-BUILD

FIGURE NUMBER: 2

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Garver 23-Oct-19
Ryan Mountain TNM 2.5
Calculated with TNM 2.5
TABLE 2 - NO-BUILD SOUND LEVEL RESULTS
PROJECT/CONTRACT: Broadway Bridge-17177187
RUN: BWB_2040 No-Build

2016 Existing Conditions Non-Impacted Receivers = 13	
2040 No-Build Conditions Impacted Receivers = 121	
1	First Row
5Q	Receiver No.
169B	Adjacent Highway

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 No-Build dBA	Calculated dBA Difference
B&W Investment Properties - with Balconies	1-1A-169B	1	4	62.5	62.5	0
	1-1B-169B	2	4	64.1	64.4	0.3
	1-1C-169B	1	6	60.5	60.6	0.1
	1-1D-169B	2	6	62.4	62.8	0.4
	1-1E-169B	1	6	58.5	58.8	0.3
	1-1F-169B	2	6	61.6	62.1	0.5
	1-1G-169B	1	3	55.3	56.1	0.8
	1-1H-169B	2	3	59.6	60.3	0.7
	1-1I-169B	1	4	55	55.9	0.9
	1-1J-169B	2	4	58.6	59.4	0.8
	1-1K-169B	1	6	55	55.8	0.8
	1-1L-169B	2	6	57.9	58.7	0.8
	1-1M-169B	1	5	54.7	55.4	0.7
	1-1N-169B	2	5	57.2	58	0.8
Market Station Apartments with Balconies	1-2A-169B	1	1	62.9	64.5	1.6
	1-2B-169B	2	1	64.2	65.9	1.7
	1-2C-169B	3	1	64.6	66.4	1.8
	1-2D-169B	4	1	64.8	66.5	1.7
	1-2E-169B	1	1	62.3	63.9	1.6
	1-2F-169B	2	1	63.6	65.2	1.6
	1-2G-169B	3	1	64.2	65.9	1.7
	1-2H-169B	4	1	64.4	66.1	1.7
Market Station Apartments Common Area	1-3-169B	1	1	63.4	65.2	1.8
River Market West Apartments - North Bldg.	1-4B-169B	2	1	67.4	69.3	1.9
	1-4C-169B	3	1	67.9	69.7	1.8
	1-4D-169B	4	1	68	69.8	1.8
	1-4E-169B	5	1	68.2	70	1.8
	1-4F-169B	1	1	65.8	67.7	1.9
	1-4G-169B	2	1	66	67.9	1.9
	1-4H-169B	3	1	66.6	68.4	1.8
	1-4I-169B	4	1	66.9	68.6	1.7
	1-4J-169B	5	1	67.2	69	1.8
	1-4K-169B	1	1	64	65.9	1.9
	1-4L-169B	2	1	63.4	65.2	1.8
	1-4M-169B	3	1	64.7	66.4	1.7
	1-4N-169B	4	1	65.1	66.8	1.7
	1-4O-169B	5	1	65.5	67.1	1.6
	1-4P-169B	1	1	61.5	63.4	1.9
	1-4Q-169B	1	1	66.5	68.3	1.8
	1-4R-169B	2	1	67.7	69.6	1.9
	1-4S-169B	3	1	67.9	69.8	1.9
	1-4T-169B	4	1	68.2	70.1	1.9
	1-4U-169B	5	1	68.3	70.1	1.8
River Market West Apartments - South Bldg.	1-5A-169B	1	1	67.1	69	1.9
	1-5B-169B	2	1	69.4	71.4	2
	1-5C-169B	3	1	69.4	71.3	1.9
	1-5D-169B	4	1	69.4	71.3	1.9
	1-5E-169B	5	1	69.4	71.2	1.8
	1-5F-169B	1	1	66.5	68.3	1.8
	1-5G-169B	2	1	68.6	70.5	1.9
	1-5H-169B	3	1	68.9	70.8	1.9
	1-5I-169B	4	1	68.9	70.7	1.8
	1-5J-169B	5	1	68.9	70.7	1.8
	1-5K-169B	1	1	65.3	67.2	1.9
	1-5L-169B	2	1	67.7	69.6	1.9
	1-5M-169B	3	1	68.3	70.1	1.8
	1-5N-169B	4	1	68.4	70.2	1.8
	1-5O-169B	5	1	68.4	70.2	1.8
	1-5P-169B	1	1	64.8	66.8	2
	1-5Q-169B	2	1	67.3	69.3	2
	1-5R-169B	3	1	68	69.8	1.8
	1-5S-169B	4	1	68.1	69.9	1.8
	1-5T-169B	5	1	68.2	70	1.8
	1-5U-169B	1	1	66.5	67.9	1.4
	1-5V-169B	2	1	69	70.5	1.5
	1-5W-169B	3	1	69.3	70.7	1.4
	1-5X-169B	4	1	69.4	70.8	1.4
	1-5Y-169B	5	1	69.5	70.8	1.3
	1-5Z-169B	1	1	65.3	67.3	2
	1-5AA-169B	2	1	67.6	69.5	1.9
	1-5BB-169B	3	1	68.2	70	1.8
	1-5CC-169B	4	1	68.5	70.1	1.6
	1-5DD-169B	5	1	68.6	70.2	1.6
Conover Place Condos	1-6A-I-70B	1	1	64.9	65.8	0.9
	1-6B-I-70B	2	1	66.4	67.3	0.9
	1-6C-I-70B	3	1	67.3	68.3	1
	1-6D-I-70B	1	1	66	66.9	0.9
	1-6E-I-70B	2	1	67.4	68.3	0.9
	1-6F-I-70B	3	1	68	69	1
	1-6G-I-70B	1	1	68	68.7	0.7
	1-6H-I-70B	2	1	69.1	69.9	0.8
	1-6I-I-70B	3	1	69.3	70.1	0.8
	1-6J-I-70B	1	1	66.9	67.4	0.5
	1-6K-I-70B	1	1	65.9	66.4	0.5
	1-6L-I-70B	1	1	65.3	65.8	0.5
	1-6M-I-70B	1	1	64.9	65.4	0.5
	1-6N-I-70B	1	1	64.8	65.4	0.6
	1-6O-I-70B	1	1	64.6	65.1	0.5
	1-6P-I-70B	1	1	64.4	64.9	0.5
	1-6Q-I-70B	2	1	66.2	66.9	0.7
	1-6R-I-70B	3	1	67.7	68.5	0.8
	1-6S-I-70B	4	1	68.1	68.8	0.7
	1-6T-I-70B	2	1	66.4	67.1	0.7
	1-6U-I-70B	3	1	67.9	68.6	0.7
	1-6V-I-70B	4	1	68.3	69	0.7
Richards & Conover Lofts	1-7-I-70B	1	1	62.7	63.3	0.6
DeLofts	1-8-I-70B	1	1	64.8	65.3	0.5
Skyline Real Estate	2-9-I-70B	1	1	56.6	57.3	0.7
O'Reilly Investments	1-10A-BRB	1	1	62.7	64.3	1.6
	1-10B-BRB	1	1	62.7	64.3	1.6
	1-10C-BRB	3	1	62.9	64.4	1.5
	1-10D-BRB	4	1	63.1	64.6	1.5
	1-10E-BRB	5	1	63.4	64.9	1.5
	1-10F-BRB	1	1	60.5	62	1.5
West Terrace Park	1-11-I-35B	1	1	63.4	64	0.6
Ermine Case Jr. Park	1-12-I-35B	1	1	64.1	64.1	0
	1-13-I-35B	1	1	62	61.9	-0.1
	1-14-I-35B	1	1	73.6	73.8	0.2
Trialhead	1-15-I-35B	1	1	68.2	67.9	-0.3
Quality Hill Apartments	1-16-JEB	1	1	54.2	54.3	0.1

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 No-Build dBA	Calculated dBA Difference
JVM Apex Apartments	1-17A-I-35B	1	1	64.4	64.6	0.2
	1-17B-I-35B	2	1	67.4	67.6	0.2
	1-17C-I-35B	3	1	69.1	69.4	0.3
	1-17D-I-35B	4	1	69.8	70	0.2
	1-17E-I-35B	1	1	63.9	64.1	0.2
	1-17F-I-35B	2	1	66	66.2	0.2
	1-17G-I-35B	3	1	67.9	68.2	0.3
	1-17H-I-35B	4	1	69	69.3	0.3
	1-17I-I-35B	1	1	64.3	64.6	0.3
	1-17J-I-35B	2	1	65.5	65.8	0.3
	1-17K-I-35B	3	1	67.1	67.3	0.2
	1-17L-I-35B	4	1	68.4	68.7	0.3
	1-17M-I-35B	1	1	64.6	64.9	0.3
	1-17N-I-35B	2	1	65.5	65.8	0.3
	1-17O-I-35B	1	1	64.8	65	0.2
	1-17P-I-35B	2	1	65.7	66	0.3
	1-17Q-I-35B	3	1	66.1	66.4	0.3
	1-17R-I-35B	4	1	67.9	68.2	0.3
	1-17S-I-35B	1	1	61	61.2	0.2
	1-17T-I-35B	2	1	63.6	63.9	0.3
	1-17U-I-35B	3	1	65.5	65.8	0.3
	1-17V-I-35B	4	1	67.5	67.8	0.3
	1-17W-I-35B	1	1	63.2	63.4	0.2
	1-17X-I-35B	2	1	64.6	64.9	0.3
	1-17Y-I-35B	1	1	64.2	64.4	0.2
	1-17Z-I-35B	2	1	65.1	65.3	0.2
	1-17AA-I-35B	3	1	66.3	66.6	0.3
	1-17BB-I-35B	4	1	68	68.3	0.3
	1-17CC-I-35B	3	1	67.1	67.4	0.3
	1-17DD-I-35B	4	1	68.5	68.8	0.3
	1-17EE-I-35B	1	1	64	64.3	0.3
	1-17FF-I-35B	2	1	65.6	65.9	0.3
	1-17GG-I-35B	3	1	67.4	67.7	0.3
	1-17HH-I-35B	4	1	68.6	68.9	0.3
	1-17II-I-35B	1	1	63.9	64.1	0.2
	1-17JJ-I-35B	2	1	66.9	67.1	0.2
	1-17KK-I-35B	3	1	68.7	69	0.3
	1-17LL-I-35B	4	1	69.6	69.8	0.2
Summit on Quality Hill	1-18A-I-35B	1	1	66.1	66.4	0.3
	1-18B-I-35B	2	1	68.5	68.8	0.3
	1-18C-I-35B	3	1	68.9	69.2	0.3
	1-18D-I-35B	4	1	68.9	69.2	0.3
	1-18E-I-35B	1	1	68.4	68.7	0.3
	1-18F-I-35B	2	1	69.4	69.7	0.3
	1-18G-I-35B	3	1	69.7	70.1	0.4
	1-18H-I-35B	4	1	69.7	70	0.3
	1-18I-I-35B	1	1	69.7	70	0.3
	1-18J-I-35B	2	1	70.6	71	0.4
	1-18K-I-35B	3	1	70.7	71	0.3
	1-18L-I-35B	4	1	70.6	70.9	0.3
	1-18M-I-35B	1	1	71	71.3	0.3
	1-18N-I-35B	2	1	71.7	72	0.3
	1-18O-I-35B	1	1	70.4	70.7	0.3
	1-18P-I-35B	2	1	71.1	71.5	0.4
	1-18Q-I-35B	1	1	71.8	72.1	0.3
	1-18R-I-35B	2	1	72.3	72.5	0.2
	1-18S-I-35B	3	1	72.1	72.5	0.4
	1-18T-I-35B	1	1	72.1	72.5	0.4
	1-18U-I-35B	3	1	71.1	71.4	0.3
	1-18V-I-35B	4	1	71	71.4	0.4
	1-18W-I-35B	1	1	68.9	69.3	0.4
	1-18X-I-35B	2	1	69.9	70.2	0.3
	1-18Y-I-35B	3	1	70.1	70.4	0.3
	1-18Z-I-35B	4	1	70	70.4	0.4
	1-18AA-I-35B	1	1	67	67.3	0.3
	1-18BB-I-35B	2	1	68.8	69.1	0.3
	1-18CC-I-35B	3	1	69.2	69.5	0.3
	1-18DD-I-35B	4	1	69.1	69.5	0.4
Trail	1-19A-BEB	1	1	66.5	66.9	0.4
	1-19B-BEB	1	1	62.2	63.2	1
Mulkey Park	1-20-I-35B	1	1	54.2	54.4	0.2
Roaster Block Apartments	1-21A-BRB	1	1	63.8	65.4	1.6
	1-21B-BRB	2	1	63.8	65.5	1.7
	1-21C-BRB	3	1	63.9	65.4	1.5
	1-21D-BRB	4	1	64.1	65.6	1.5
	1-21E-BRB	5	1	64.2	65.7	1.5
	1-21F-BRB	6	1	64.9	66.3	1.4
Owner: Planned Industrial Expansion Authority of KC*	1-22A-5thB		2	69.7	70.8	1.1
	1-22B-5thB		2	70.6	72	1.4
	1-22C-5thB		2	71	72.5	1.5
	1-22D-5thB		2	71.1	72.4	1.3
	1-22E-5thB		2	69.4	70.5	1.1
	1-22F-5thB		2	70.3	71.6	1.3
	1-22G-5thB		2	70.7	72.1	1.4
	1-22H-5thB		2	70.8	72.1	1.3
	1-22I-5thB		2	68.9	69.8	0.9
	1-22J-5thB		2	69.8	70.9	1.1
	1-22K-5thB		2	70.4	71.5	1.1
	1-22L-5thB		2	70.5	71.6	1.1
	1-22M-5thB		2	68.4	69.1	0.7
	1-22N-5thB		2	69.4	70.4	1
	1-22O-5thB		2	70.1	71.1	1
	1-22P-5thB		2	70.2	71.2	1
	1-22Q-5thB		1	63.4	67.8	4.4
	1-22R-5thB		1	65.4	69.8	4.4
	1-22S-5thB		1	66.4	70.9	4.5
	1-22T-5thB		1	68.1	71.1	3
	1-22U-5thB		2	62.3	67.4	5.1
	1-22V-5thB		2	64	69.1	5.1
	1-22W-5thB		2	65.3	70.2	4.9
	1-22X-5thB		2	67.2	70.5	3.3
	1-22Y-5thB		2	61.4	66.5	5.1
	1-22Z-5thB		2	63.3	68.1	4.8
	1-22AA-5thB		2	64.8	69.3	4.5
	1-22BB-5thB		2	66.3	69.7	3.4
	1-22CC-5thB		1	60.8	65.9	5.1
	1-22DD-5thB		1	62.9	67	4.1
	1-22EE-5thB		1	64.4	68.3	3.9
	1-22FF-5thB		1	65.6	68.9	3.3
	1-22GG-5thB		2	62.1	66.1	4
	1-22HH-5thB		2	63.9	67.5	3.6
	1-22II-5thB		2	64.5	68.4	3.9
	1-22JJ-5thB		2	65.9	68.9	3
	1-22KK-5thB		2	60	64.9	4.9
	1-22LL-5thB		2	62	65.7	3.7
	1-22MM-5thB		2	63.2	67.1	3.9
	1-22JJ-5thB		2	64.6	67.7	3.1
	1-22Z-5thB		2	63.3	68.1	4.8
	1-22AA-5thB		2	64.8	69.3	4.5
	1-22BB-5thB		2	66.3	69.7	3.4
	1-22CC-5thB		1	60.8	65.9	5.1
	1-22DD-5thB		1	62.9	67	4.1
	1-22EE-5thB		1	64.4	68.3	3.9
	1-22FF-5thB		1	65.6	68.9	3.3
	1-22GG-5thB		2	62.1	66.1	4
	1-22HH-5thB		2	63.9	67.5	3.6
	1-22II-5thB		2	64.5	68.4	3.9
	1-22JJ-5thB		2	65.9	68.9	3
	1-22KK-5thB		2	60	64.9	4.9
	1-22LL-5thB		2	62	65.7	3.7
	1-22MM-5thB		2	63.2	67.1	3.9
	1-22OO-5thB		2	64.6	67.7	3.1

Detailed Noise Study Exhibits

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver
- Park Property

Ermine Case Jr. Park

W. 12th St.

Pennsylvania Ave

Mulkey Square Park

35

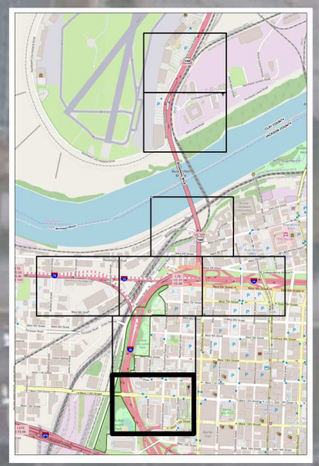
18

Summit on Quality Hill Apartments

20







N

0 50 100 200 300

Feet

*MV-2 is located to the north, outside project limits

GARVER

2049 East Joyce Blvd.
Suite 400
Fayetteville, AR 72703
(479) 527-9100

BURNS McDONNELL

MODOT
KANSAS CITY, CLAY AND JACKSON CO., MO
BROADWAY / BUCK O'NEIL BRIDGE

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST

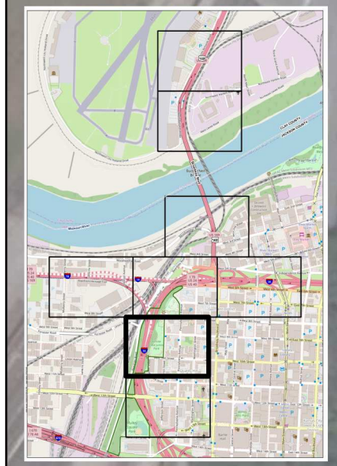
JOB NO.: 17177187
DATE: OCT 2019
DESIGNED BY: RCM
DRAWN BY: CPS

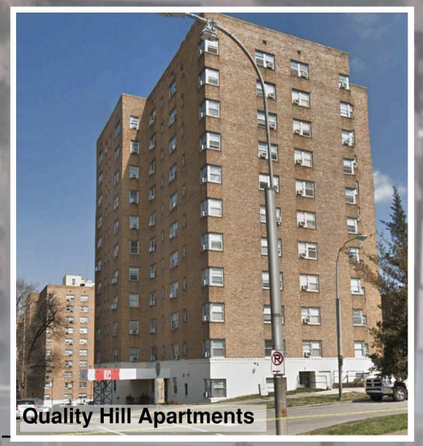
NOISE ANALYSIS-NO BUILD

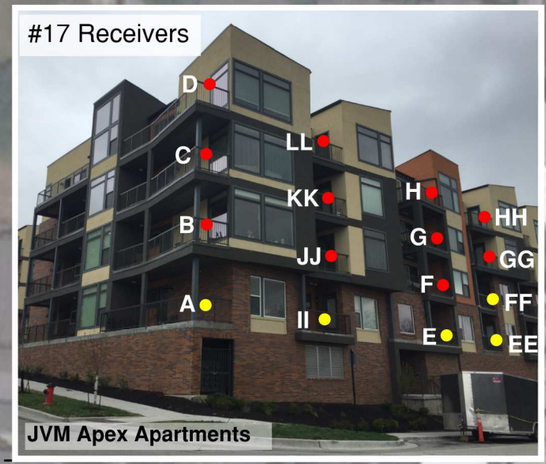
FIGURE NUMBER: D-1

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver
- Park Property









Quality Hill Apartments

13

Ermine Case Jr. Park

16

Quality Hill Common Area

Quality Hill Apartments

14

W 10th St.

35

Beardsley Rd

17

JVM Apex Apartments

Jefferson St

N

0 50 100 200 300

Feet

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NOISE ANALYSIS-NO BUILD

FIGURE NUMBER: D-2



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NOISE ANALYSIS-NO BUILD

FIGURE NUMBER: D-3



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DATE: OCT 2019
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS- NO BUILD

FIGURE NUMBER: D-4

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver

22

Conover Place Lofts

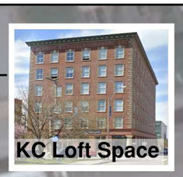
6

7

KC Loft Space

KC Loft Space Common Area

W. 5th St.

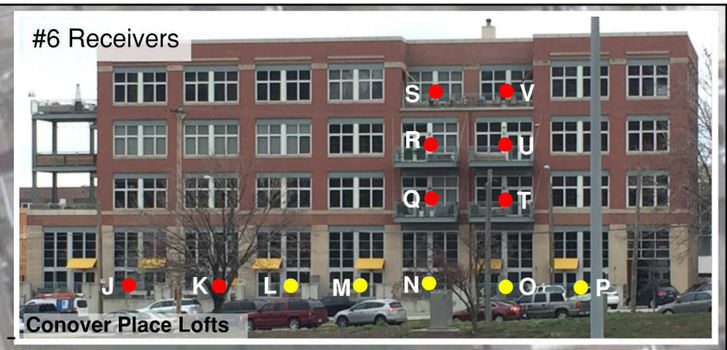


DeLofts Common Area

8

DeLoft Apartments

W. Independence Ave.



Broadway Blvd

Wyandotte St

35

Delaware St

W 6th St



Apartment Complex Common Area

9

W 7th St

Roaster's Block Apartment Complex

10

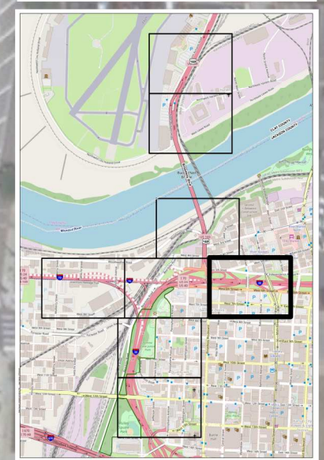
Roaster's Block Common Area

21

Roaster's Block Apartment Complex







N

0 50 100 200 300

Feet

*MV-2 is located to the north, outside project limits

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0 1"

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NOISE ANALYSIS-NO BUILD

FIGURE NUMBER: D-5a

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver

22

KC Loft Space

Conover Place Lofts

7

6

KC Loft Space Common Area

W. 5th St.

DeLofts Common Area

8

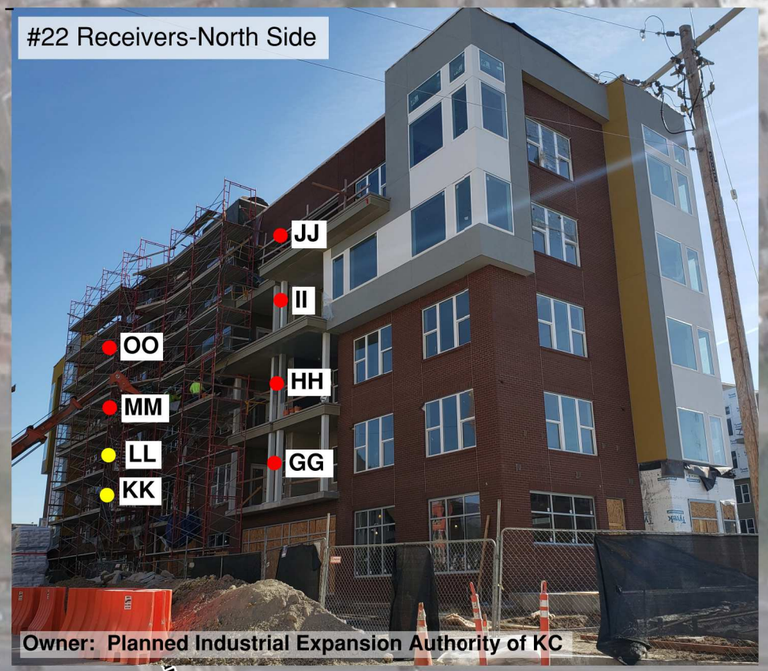
DeLoft Apartments

W. Independence Ave.

Broadway Blvd

35

#22 Receivers-North Side



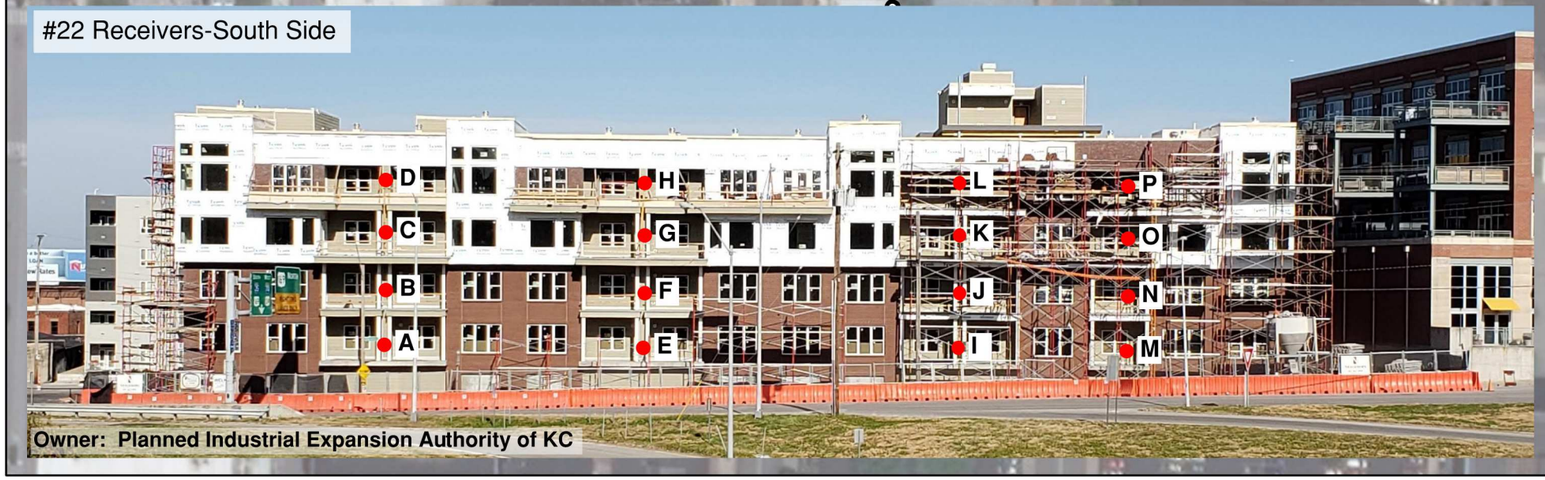
Owner: Planned Industrial Expansion Authority of KC

#22 Receivers-West Side

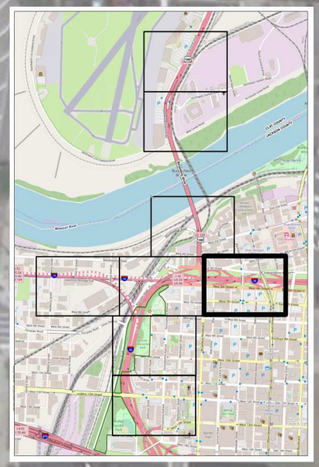


Owner: Planned Industrial Expansion Authority of KC

#22 Receivers-South Side



Owner: Planned Industrial Expansion Authority of KC



N

0 50 100 200 300

Feet

*MV-2 is located to the north, outside project limits

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0 1"

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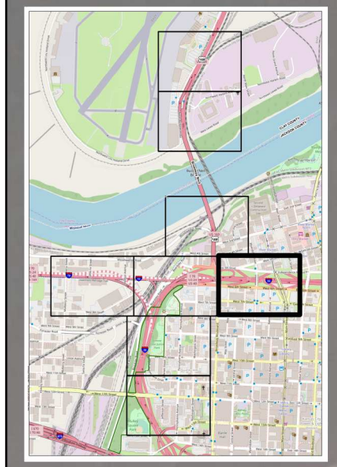
NOISE ANALYSIS-NO BUILD

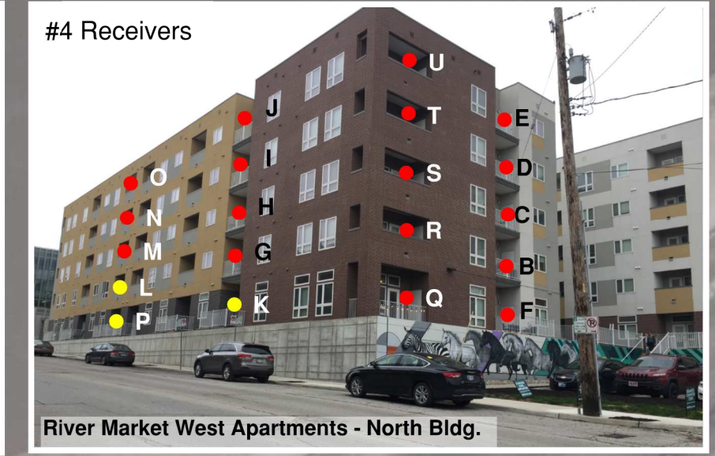
FIGURE NUMBER: D-5b

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver

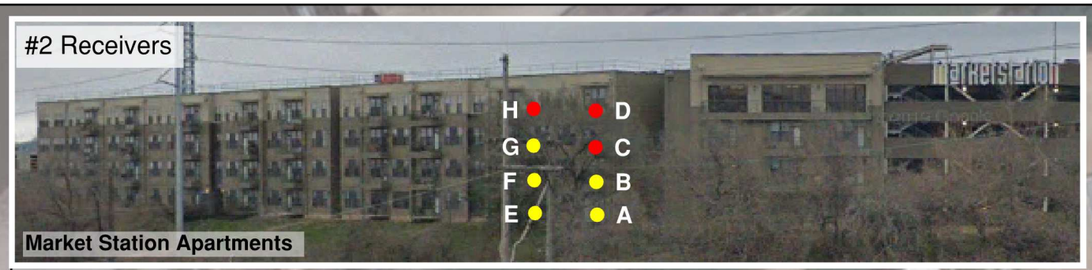


#4 Receivers



River Market West Apartments - North Bldg.

#2 Receivers



Market Station Apartments

#5 Receivers



River Market West Apartments - South Bldg.

#5 Receivers



River Market West Apartments - North Bldg.



Market Station Apartments

Broadway Blvd/US-169

169

Market Station Apartments

W 3rd St

RM West Apartment Complexes

N

0 50 100 200 300

Feet

*MV-2 is located to the north, outside project limits

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Suite 400
Fayetteville, AR 72703
(479) 527-9100

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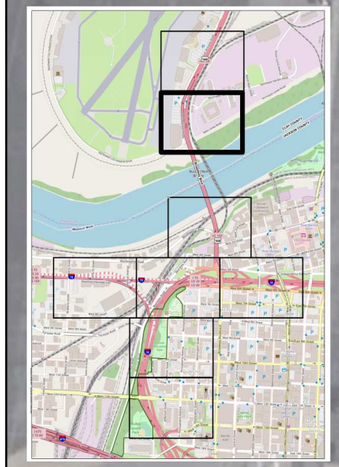
NOISE ANALYSIS- NO BUILD

FIGURE NUMBER: D-6

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver



Richards Rd.

NE Harlem Rd

B&W Investment Properties

1

NE Levee Rd

Broadway Blvd./US 169

Charles B.Wheeler Downtown Airport

N

0 50 100 200 300

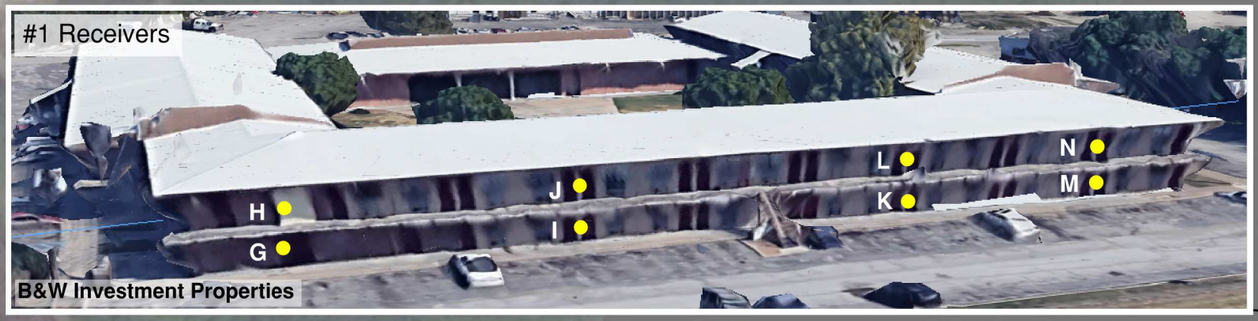
Feet

*MV-2 is located to the north, outside project limits

#1 Receivers



#1 Receivers



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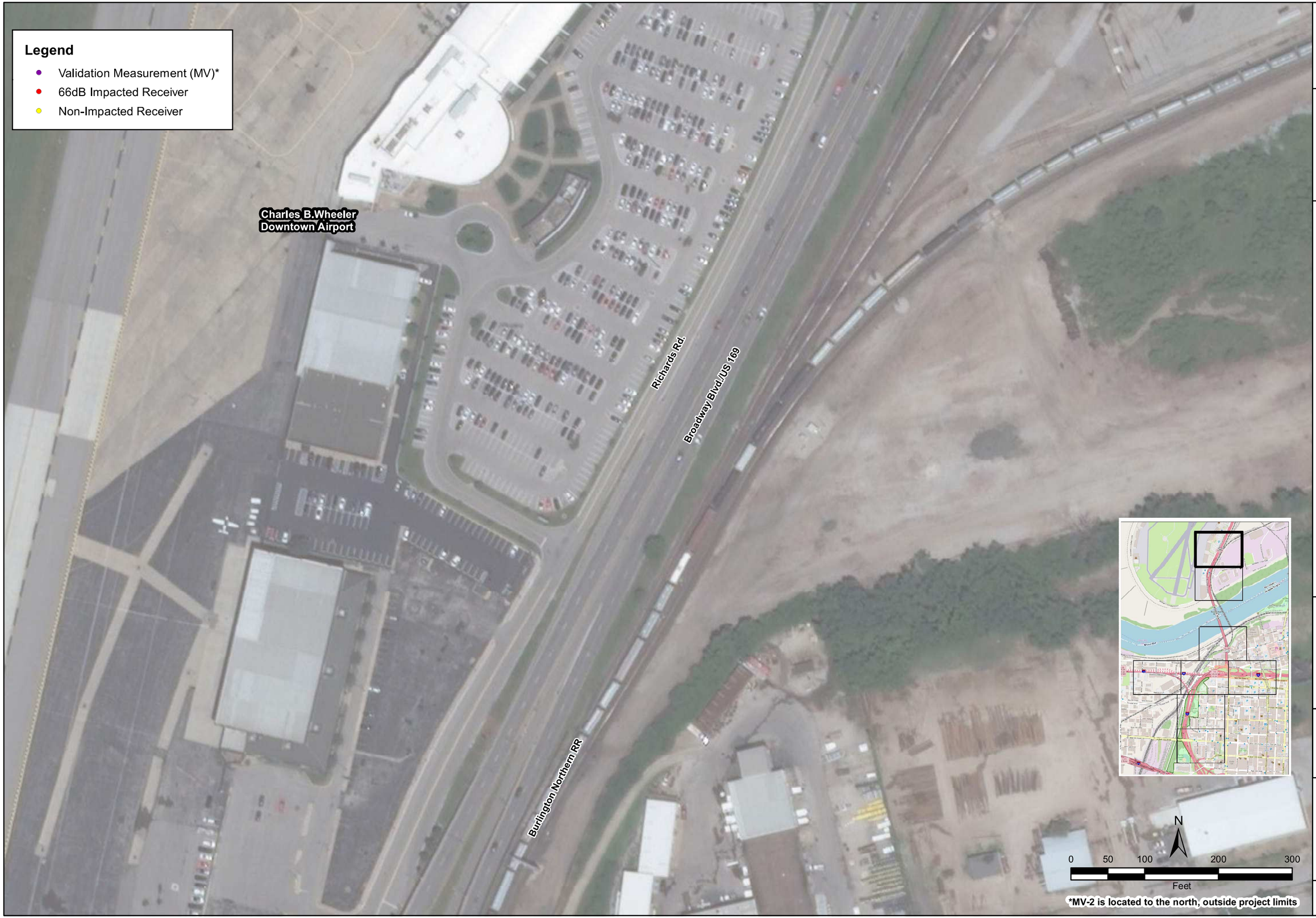
DATE: OCT 2019
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-NO BUILD

FIGURE NUMBER: D-7



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MODOT
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BROADWAY / BUCK O'NEIL BRIDGE

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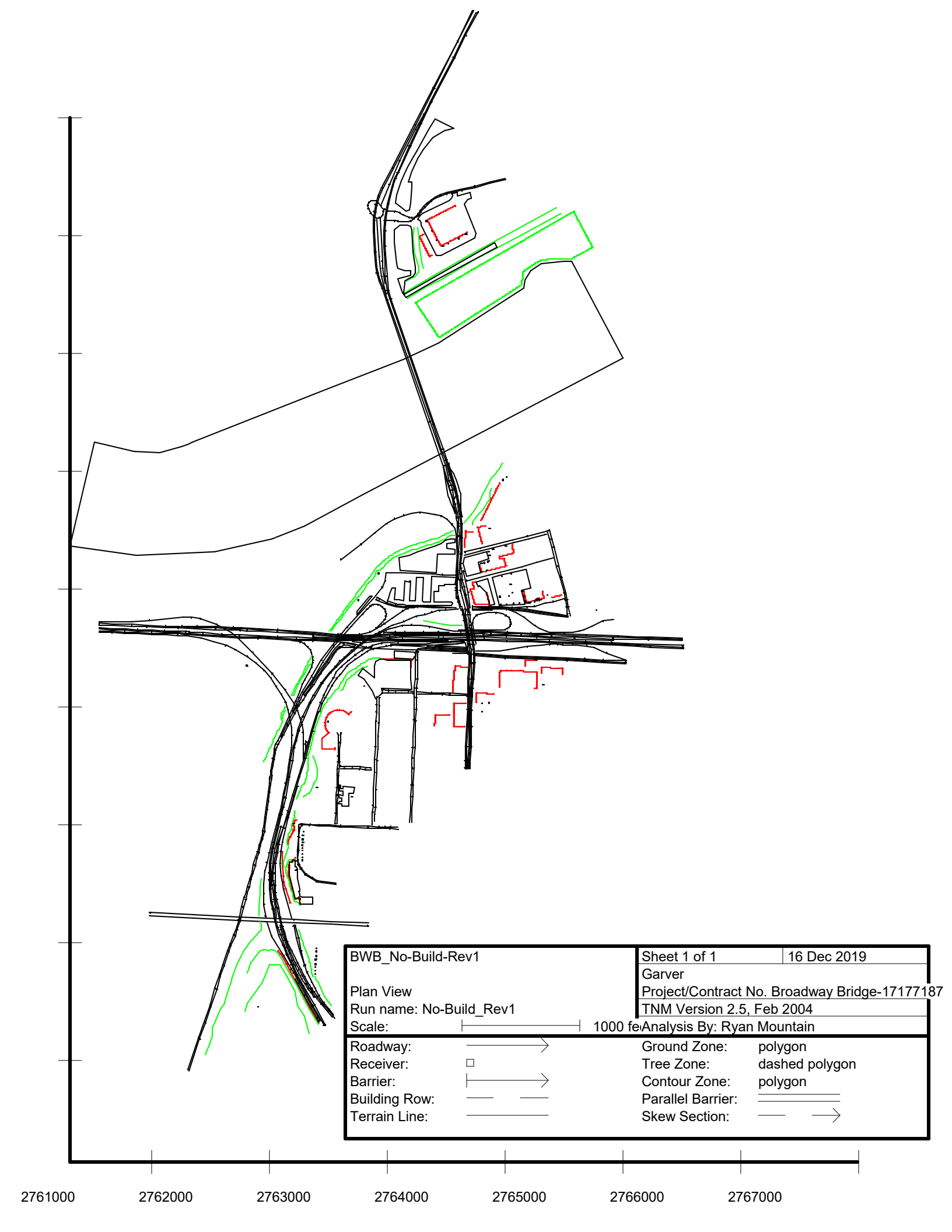
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST

JOB NO.: 17177187
DATE: OCT 2019
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS- NO BUILD

FIGURE NUMBER: D-8

TNM Plan Views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Plan View
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Scale:
1000 fe
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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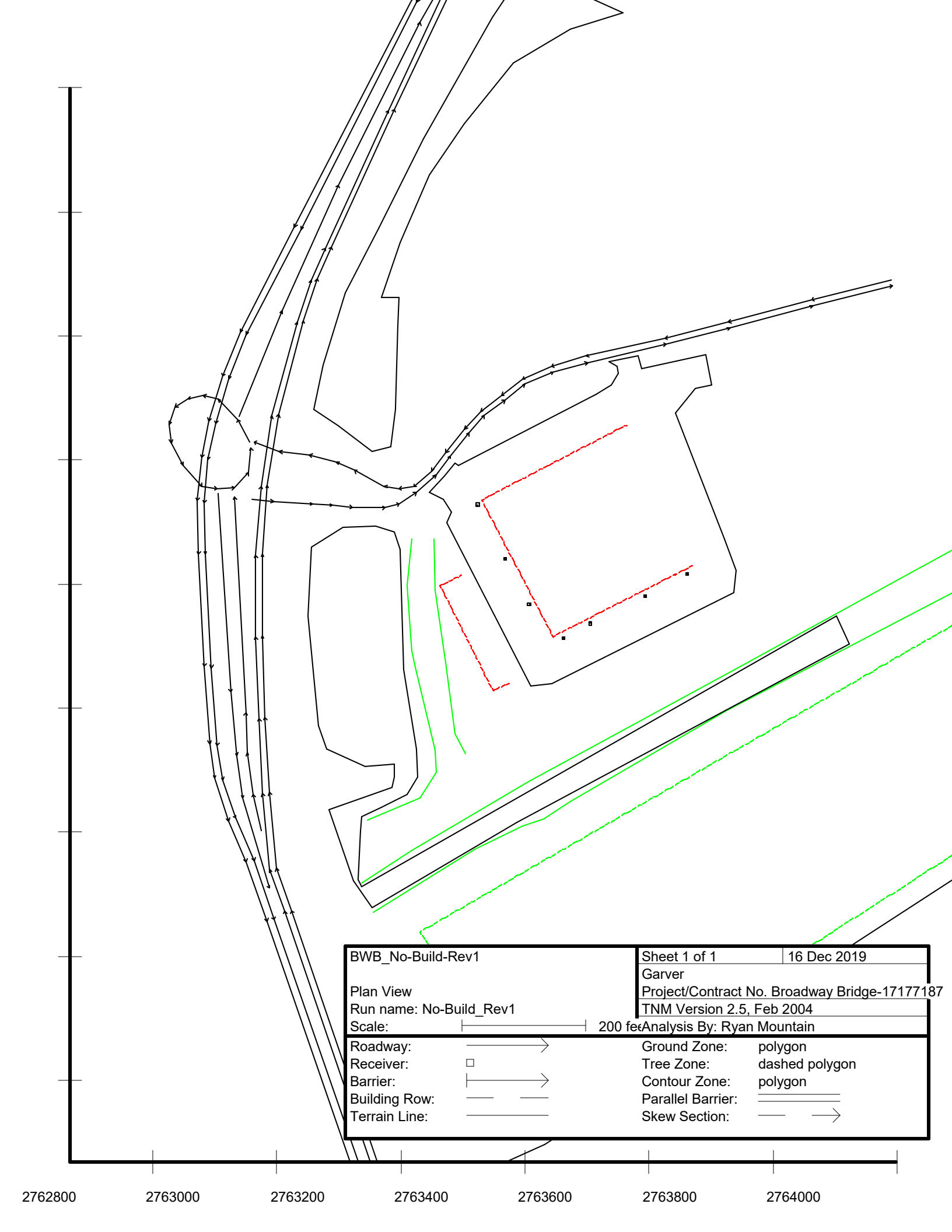
2762000
2763000
2764000
2765000
2766000
2767000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Plan View
Run name: No-Build_Rev1
Scale:
200 fe
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
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Parallel Barrier:
Skew Section:
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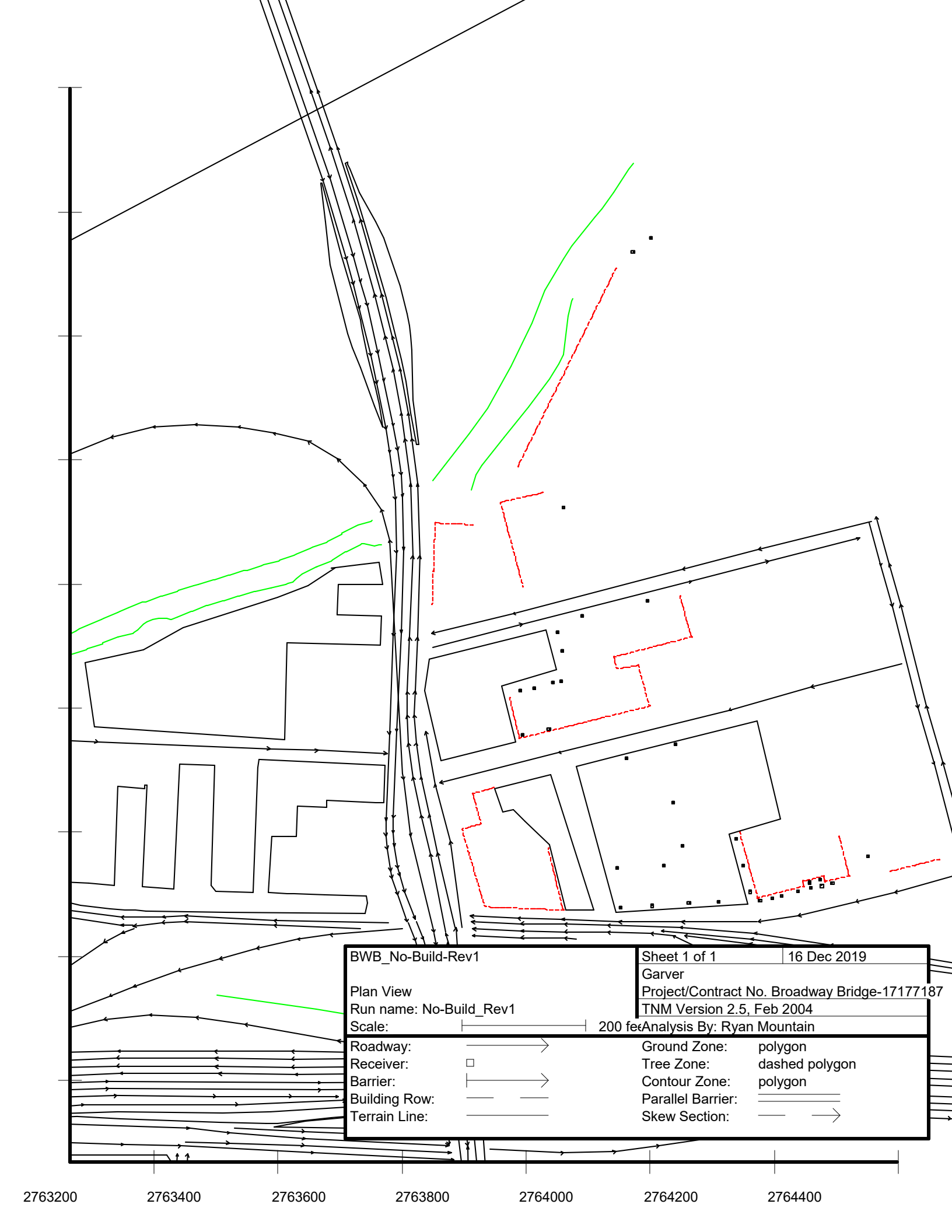
BWB_No-Build-Rev1
Plan View
Run name: No-Build_Rev1
Scale:
200 fe
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
2763200
2763400
2763600
2763800
2764000
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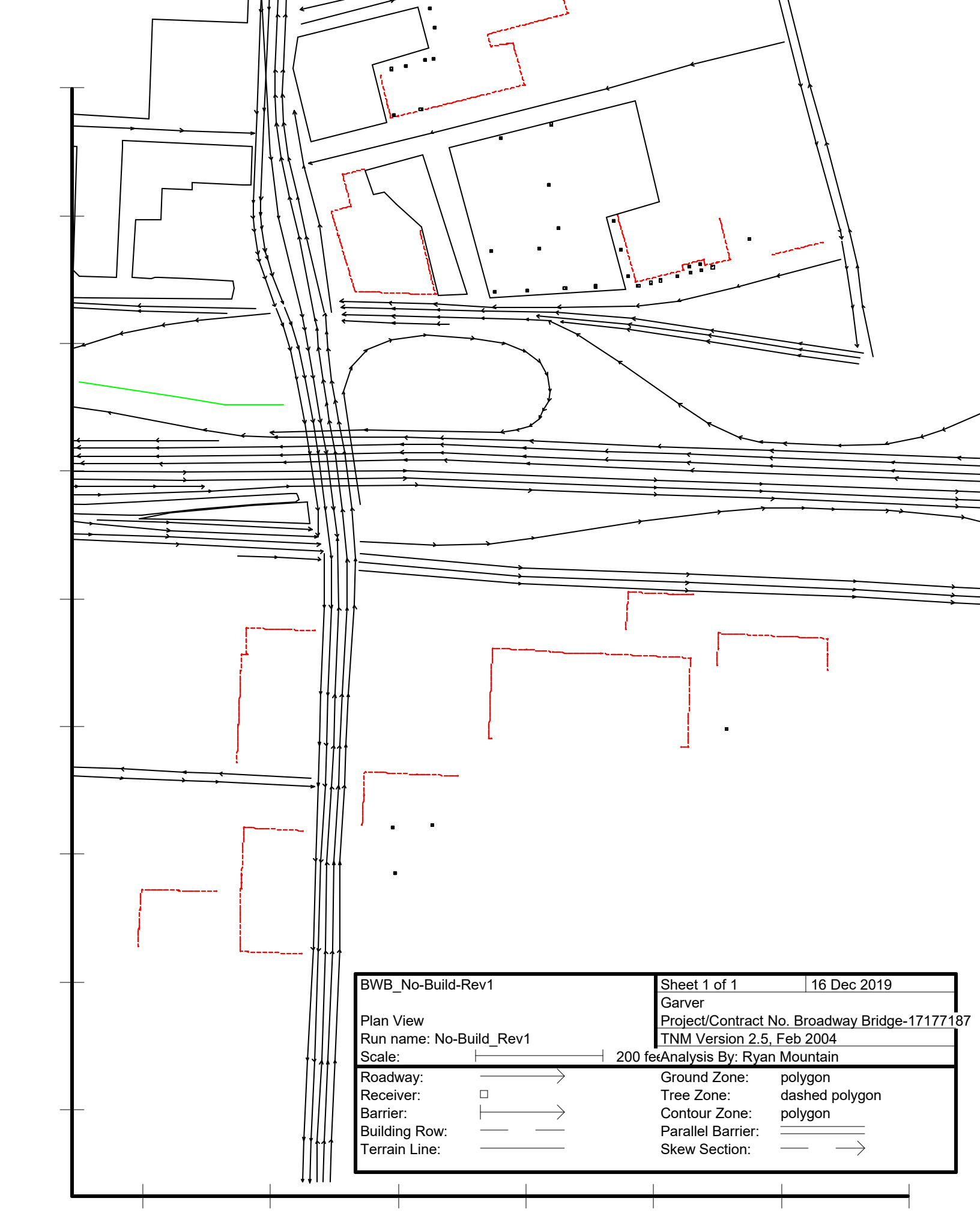

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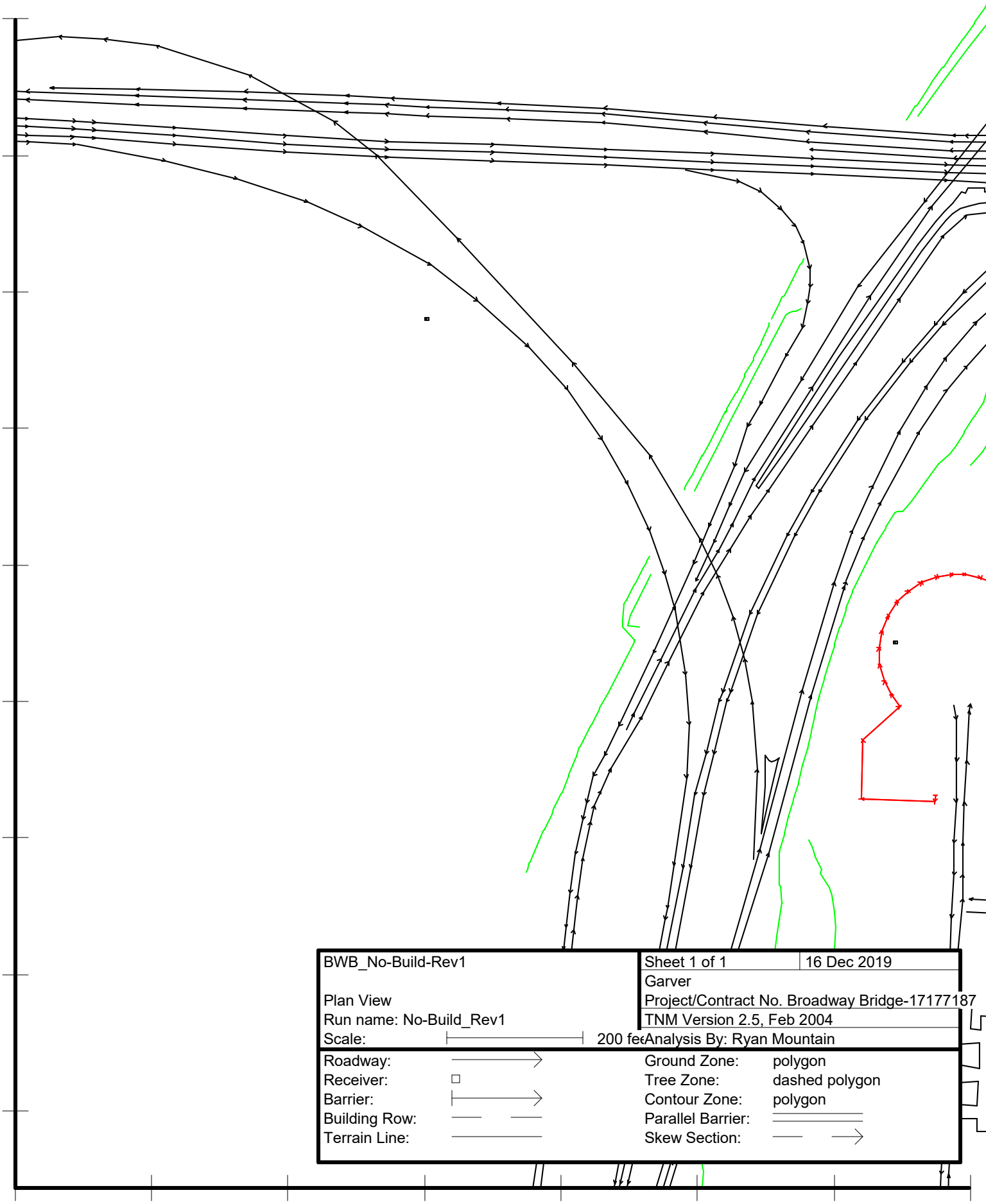
		Garver	
Plan View		Project/Contract No. Broadway Bridge-17177187	
Run name: No-Build_Rev1		TNM Version 2.5, Feb 2004	
Scale:	200 fe	Analysis By: Ryan Mountain	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	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Plan View
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Scale: 200 fe
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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2761800
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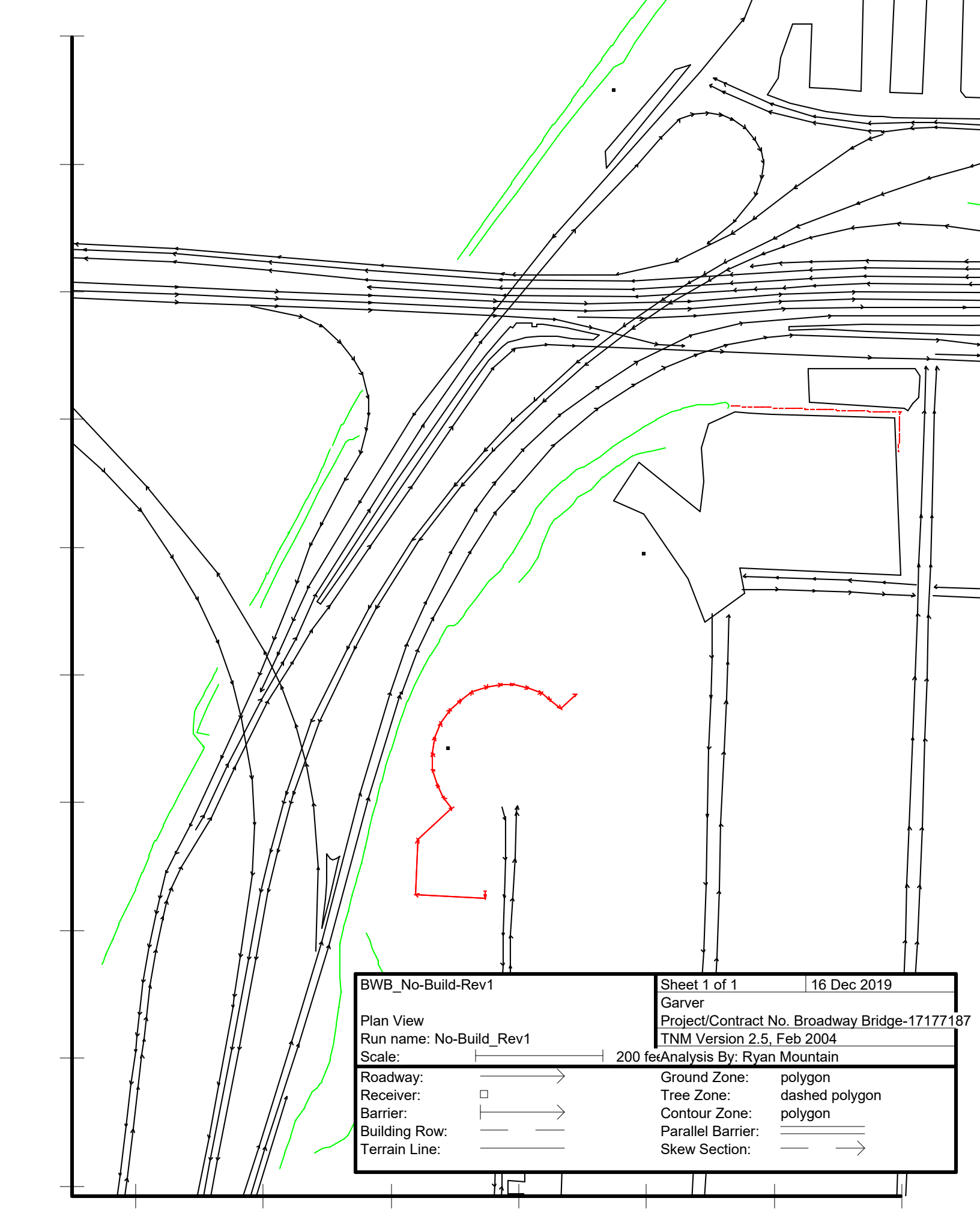
2762200
2762400
2762600



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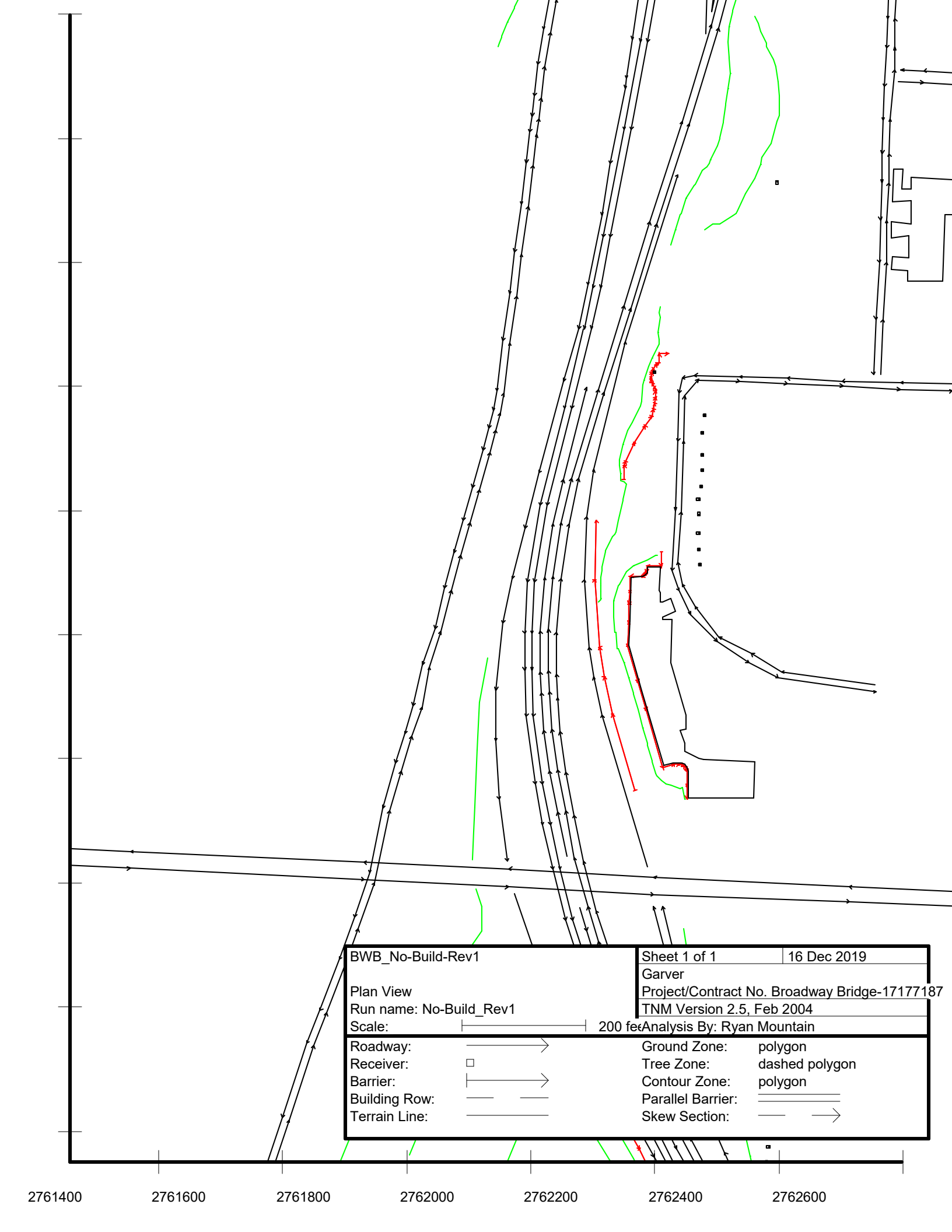
		Garver	
Plan View		Project/Contract No. Broadway Bridge-17177187	
Run name: No-Build_Rev1		TNM Version 2.5, Feb 2004	
Scale:	200 fe	Analysis By: Ryan Mountain	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	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Plan View
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Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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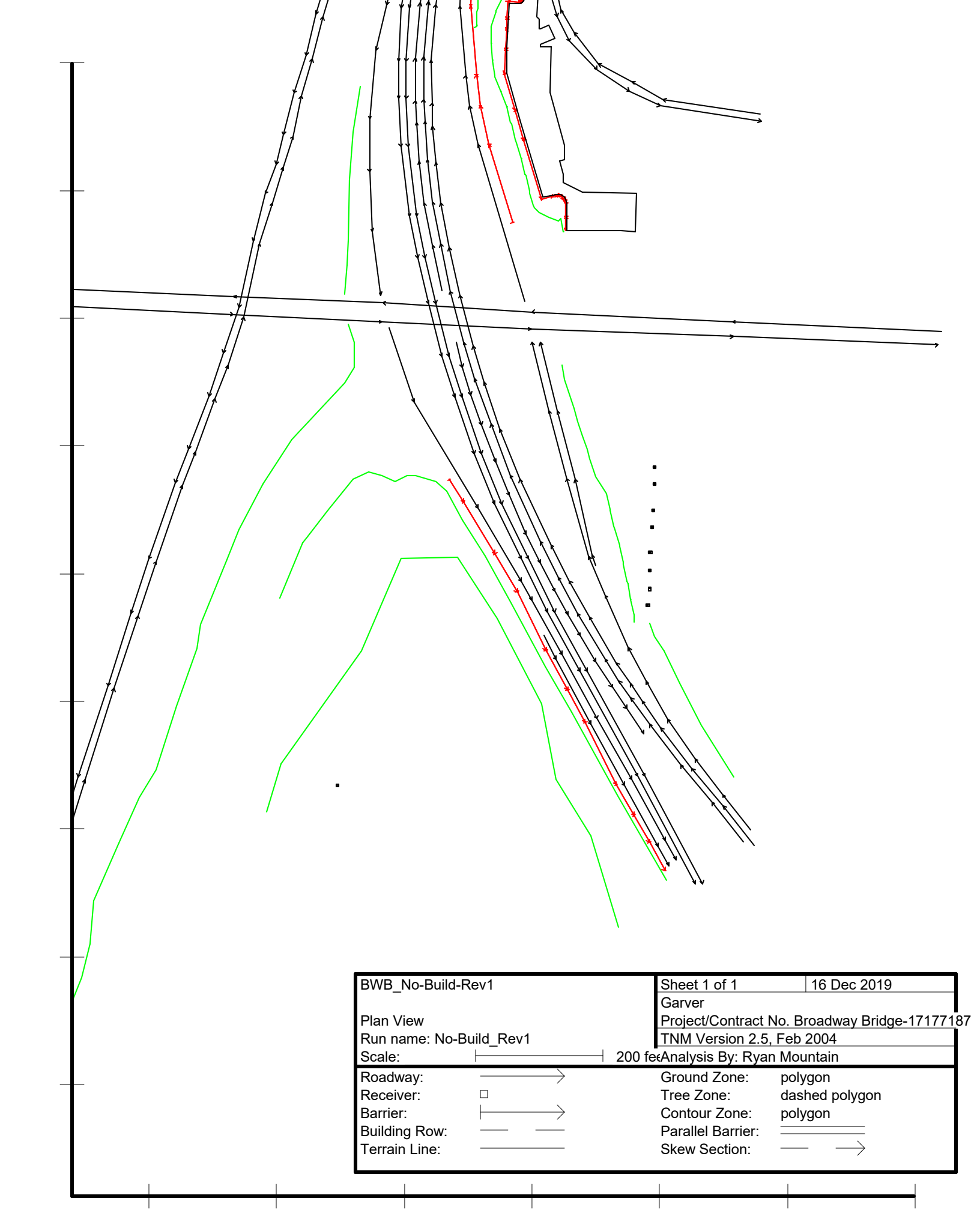

BWB_No-Build-Rev1		Sheet 1 of 1	16 Dec 2019
		Garver	
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Run name: No-Build_Rev1		TNM Version 2.5, Feb 2004	
Scale:	200 fe	Analysis By: Ryan Mountain	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

APPENDIX E

West Alternative Technical Memo and TNM Plan Views

Technical Memo*

***All technical memos were updated with R-22 (Owner: Planned Industrial Expansion Authority of KC) after submittal to MoDOT.**

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WEST BUILD NOISE CONDITIONS

Date: November 25, 2019

To: MoDOT
Burns & McDonnell

Attn: Matt Burcham, MoDOT
Julie Sarson, Burns & McDonnell, Project Manager

From: Ryan Mountain, Garver

RE: Broadway/Buck O'Neil Bridge – Route 169
MoDOT No. 4S3085
Noise Study – 2040 West Build Condition Results

Copies To: Shari Cannon-Mackey, Burns & McDonnell, scannonmackey@burnsmcd.com
Chip Touzinsky, Garver, CETouzinsky@GarverUSA.com

Garver has completed the west build traffic noise model run. This technical memo serves to document the results of west build model conditions only. The west build conditions TNM model consisted of utilizing the validated 2016 existing conditions TNM model as a baseline for determining future (2040[1]) traffic noise impacts should the west build alternative be constructed. Many impacts are anticipated under the projected 2040 west build conditions, most of which are in multi-story apartment buildings. Turning movement traffic data in the form of peak hour volumes for 2040 were utilized in the preparation of the west build model. Receivers modeled are identical to those modeled in the existing TNM model. New/on-going construction of an apartment building with balconies was recently observed on 5th Street and added to this west build model. TNM modeling also included terrain lines, existing and proposed concrete parapet/safety walls, and retaining walls that serve as barriers. Solid concrete parapet walls replacing open safety walls adjacent to the proposed roadways would provide some shielding of those roadways as evidenced by reduced sound levels for some receivers. Additionally, due to the westward shift of Route 169 and shielding provided by adjacent buildings between the receiver and adjacent highways, some receivers that were impacted in the 2016 existing conditions model are not impacted in the 2040 west build conditions. Figures 1 - 2 depict the impacted receivers (red) and non-impacted receivers (yellow) under west build conditions. Table 1 below summarizes the impacts associated with the 22 designated receiver sites, which represent 278 receivers.

Table 2 shows the detailed results of the 2040 west build conditions compared to the 2016 existing conditions. Under the 2040 west build conditions, 114 receivers are anticipated to approach[2], meet, or exceed the 67 dB(A) Leq(h) for Noise Abatement Criteria (NAC) Categories B and C. Under the 2040 west build conditions, no receivers will experience a substantial increase (15 dBA or more). The impacted receivers will be analyzed for noise abatement options, per the MoDOT guidelines, if this configuration is selected for construction, as the project progresses, and alignments are finalized. Abatement evaluation is pending selection of a preferred alternative.

[1] 2040/2045 disclaimer - The traffic analysis and any traffic-based environmental analysis 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 2025.

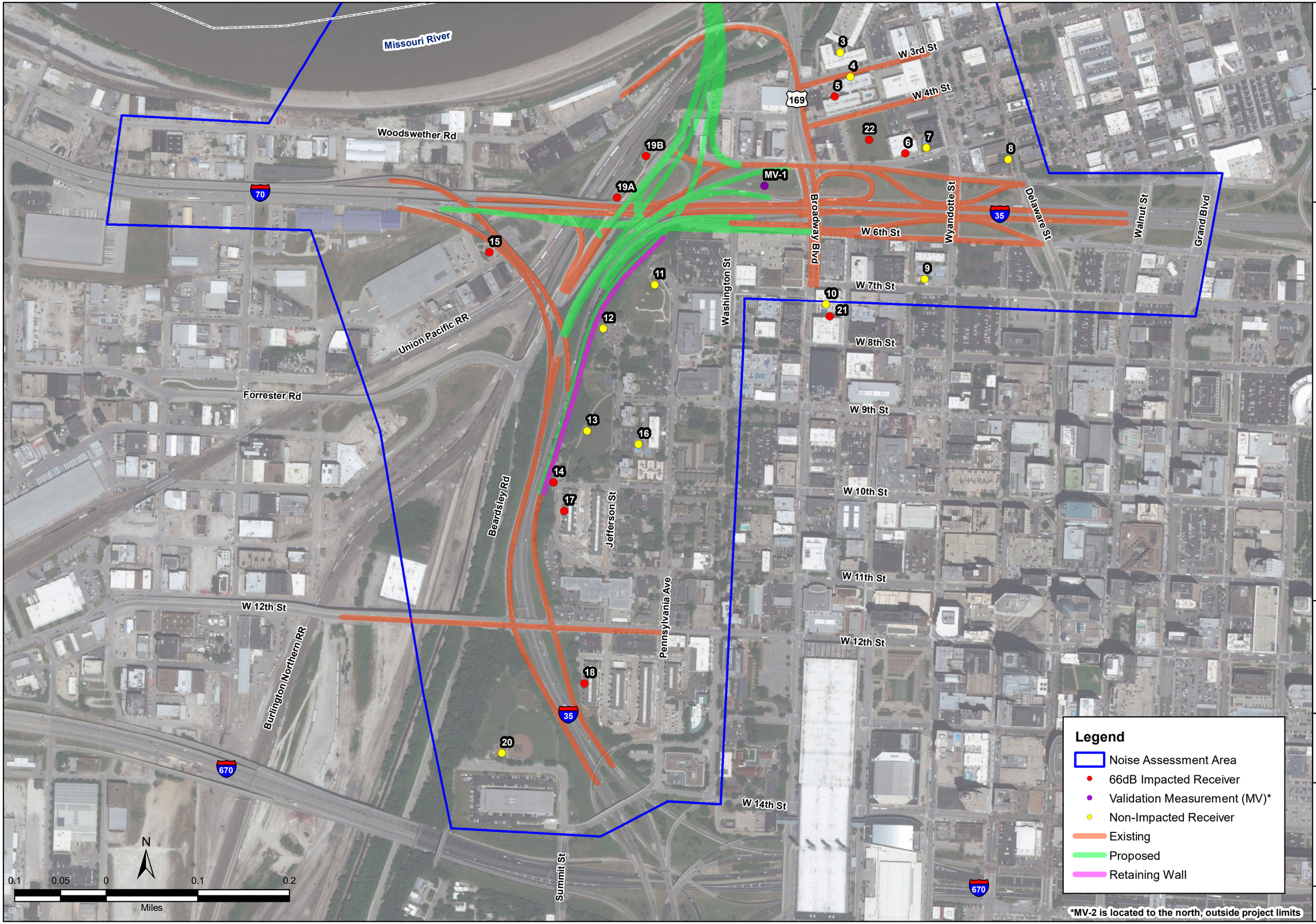
[2] Approaching the NAC B and C criteria includes receivers experiencing a noise level of 66 dB(A).

Table 1 - Receivers

Receiver Site	West Build dBA Level*	Dwelling Units Impacted
1	No impacts	--
2	No impacts	--
3	No impacts	--
4	No impacts	--
5	66.2	2
6	69.7	14
7	No impacts	--
8	No impacts	--
9	No impacts	--
10	No impacts	--
11	No impacts	--
12	No impacts	--
13	No impacts	--
14†	75.0	1
15†	67.9	1
16	No impacts	--
17	70.9	26
18	73.5	30
19†	70.5	2
20	No impacts	--
21	66.1	1
22	71.3	37

* Highest dBA result for set of receivers.
† Number of receivers will be determined based on park or trail usage.

3 Attachments: **Figure 1**
Figure 2
Table 2



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BROADWAY / BUCK O'NEIL BRIDGE

BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST

JOB NO.: 17177187
DATE: NOV 2019
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-WEST BUILD 2040

FIGURE NUMBER: 1

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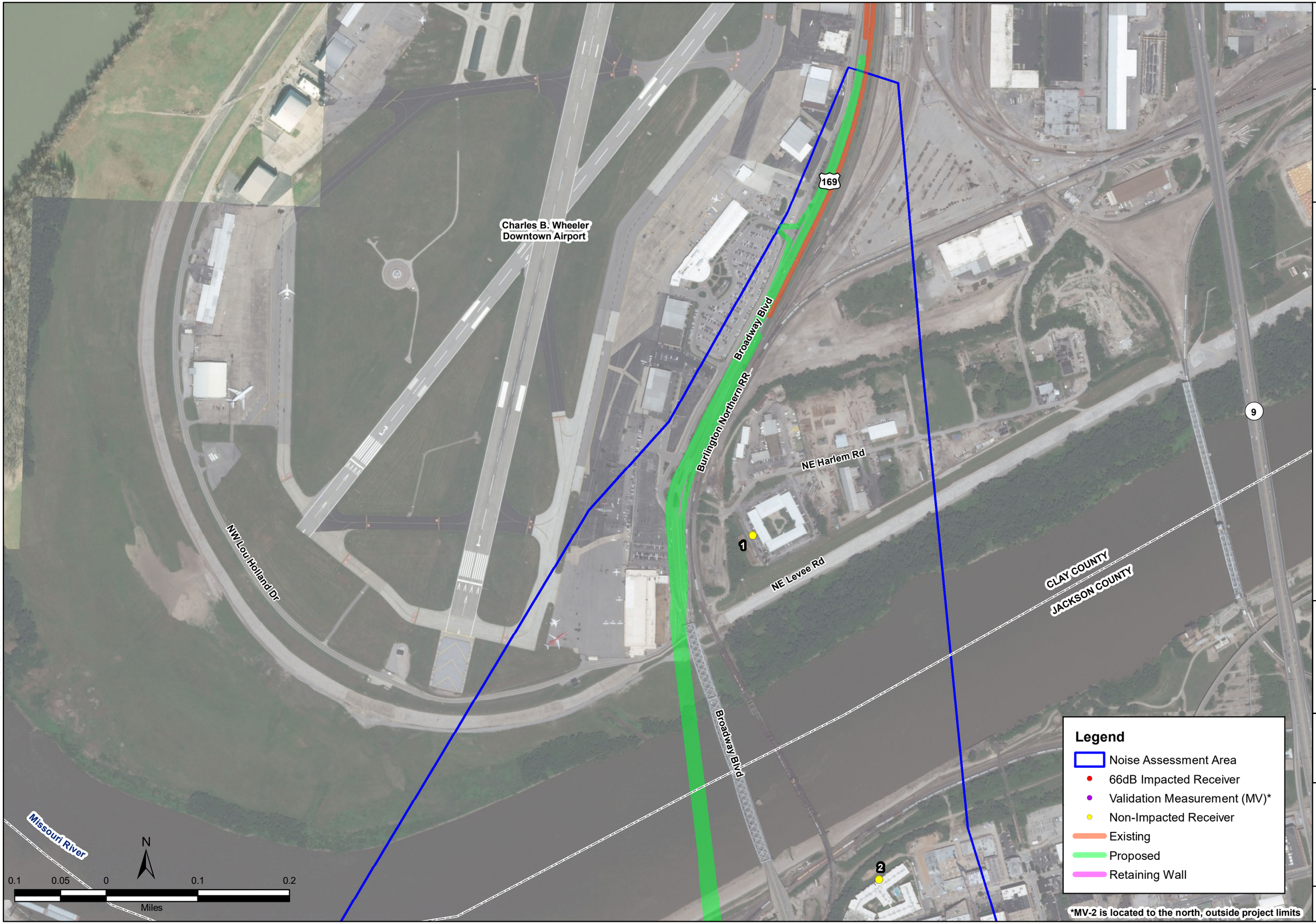

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JOB NO.: 17177187
DATE: NOV 2019
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-WEST BUILD 2040

FIGURE NUMBER: 2

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Garver 21-Nov-19
Ryan Mountain TNM 2.5
Calculated with TNM 2.5
TABLE 2 - WEST BUILD SOUND LEVEL RESULTS
PROJECT/CONTRACT: Broadway Bridge-17177187
RUN: BWB_West Build Alt.

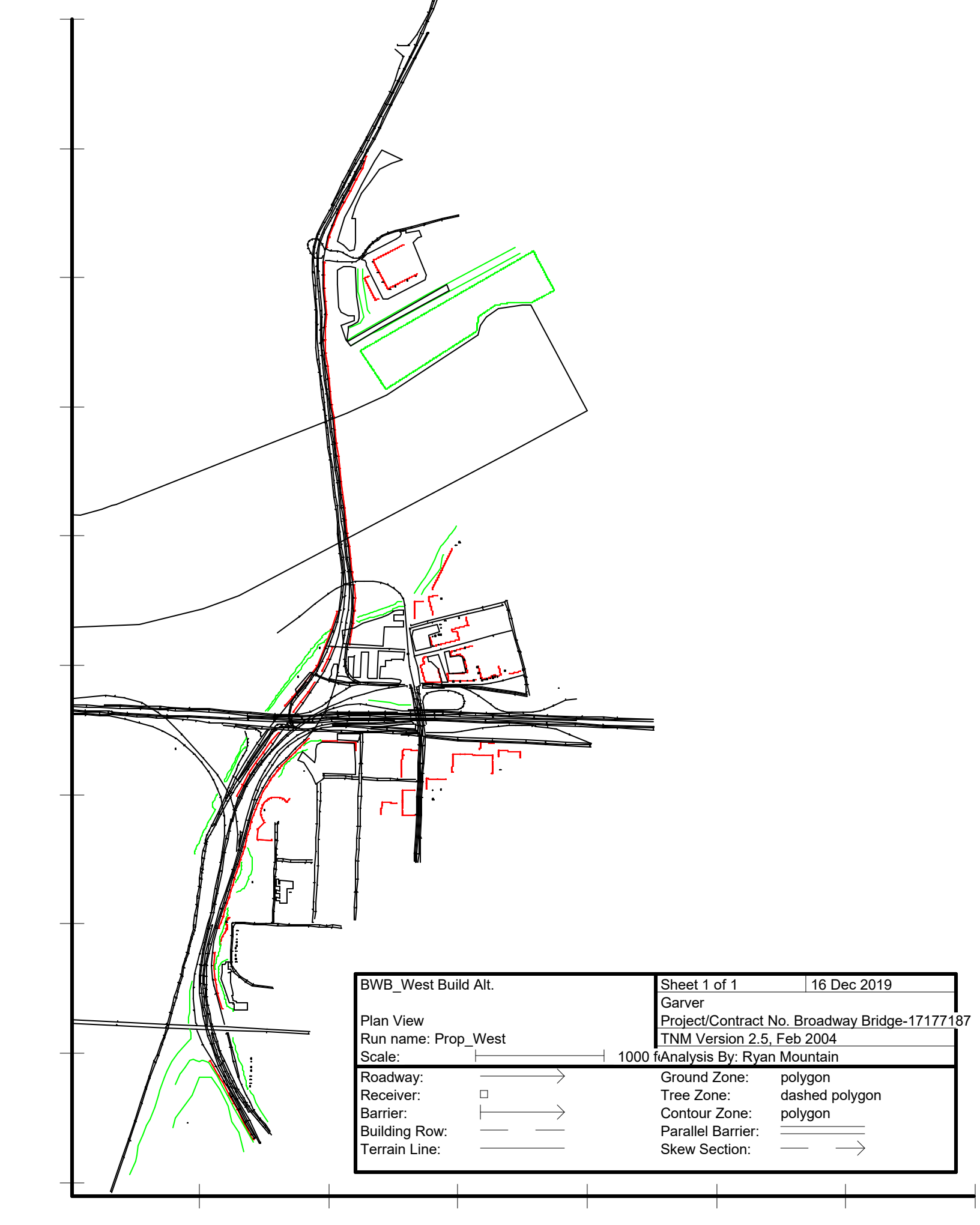
2040 West Build Conditions Impacted Receivers = 114	
2016 Impacted Receivers Not Impacted in 2040 West Build = 41	
1	First Row
5Q	Receiver No.
169B	Adjacent Highway

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 West Build dBA	Calculated dBA Difference
B&W Investment Properties - with Balconies	1-1A-169B	1	4	62.5	62.6	0.1
	1-1B-169B	2	4	64.1	65.8	1.7
	1-1C-169B	1	6	60.5	60.8	0.3
	1-1D-169B	2	6	62.4	64.2	1.8
	1-1E-169B	1	6	58.5	59.5	1
	1-1F-169B	2	6	63.4	62.4	-1
	1-1G-169B	1	3	55.3	55.2	-0.1
	1-1H-169B	2	3	59.6	61.3	1.7
	1-1I-169B	1	4	55	54.8	-0.2
	1-1J-169B	2	4	58.6	60.2	1.6
	1-1K-169B	1	6	55	54.7	-0.3
	1-1L-169B	2	6	57.9	59.5	1.6
	1-1M-169B	1	5	54.7	54.4	-0.3
	1-1N-169B	2	5	57.2	58.8	1.6
Market Station Apartments with Balconies	1-2A-169B	1	1	62.9	61.3	-1.6
	1-2B-169B	2	1	64.2	62.3	-1.9
	1-2C-169B	3	1	64.6	62.7	-1.9
	1-2D-169B	4	1	64.8	63	-1.8
	1-2E-169B	1	1	62.3	61	-1.3
	1-2F-169B	2	1	63.6	62	-1.6
	1-2G-169B	3	1	64.2	62.4	-1.8
	1-2H-169B	4	1	64.4	62.8	-1.6
Market Station Apartments Common Area	1-3-169B	1	1	63.4	58.2	-5.2
River Market West Apartments - North Bldg.	1-4B-169B	2	1	67.4	63	-4.4
	1-4C-169B	3	1	67.9	64.3	-3.6
	1-4D-169B	4	1	68	65	-3
	1-4E-169B	5	1	68.2	65.5	-2.7
	1-4F-169B	1	1	65.8	61.2	-4.6
	1-4G-169B	2	1	66	62.1	-3.9
	1-4H-169B	3	1	66.6	63.4	-3.2
	1-4I-169B	4	1	66.9	64.2	-2.7
	1-4J-169B	5	1	67.2	65	-2.2
	1-4K-169B	1	1	64	60.4	-3.6
	1-4L-169B	2	1	63.4	60.6	-2.8
	1-4M-169B	3	1	64.7	61.9	-2.8
	1-4N-169B	4	1	65.1	62.8	-2.3
	1-4O-169B	5	1	65.5	63.7	-1.8
	1-4P-169B	1	1	61.5	58.9	-2.6
	1-4Q-169B	1	1	66.5	62	-4.5
	1-4R-169B	2	1	67.7	63.5	-4.2
	1-4S-169B	3	1	67.9	64.5	-3.4
	1-4T-169B	4	1	68.2	65.1	-3.1
	1-4U-169B	5	1	68.3	65.6	-2.7
River Market West Apartments - South Bldg.	1-5A-169B	1	1	67.1	61.1	-6
	1-5B-169B	2	1	69.4	63.6	-5.8
	1-5C-169B	3	1	69.4	65	-4.4
	1-5D-169B	4	1	69.4	65.7	-3.7
	1-5E-169B	5	1	69.4	66.2	-3.2
	1-5F-169B	1	1	66.5	60.5	-6
	1-5G-169B	2	1	68.6	63.1	-5.5
	1-5H-169B	3	1	68.9	64.6	-4.3
	1-5I-169B	4	1	68.9	65.3	-3.6
	1-5J-169B	5	1	68.9	65.9	-3
	1-5K-169B	1	1	65.3	60.2	-5.1
	1-5L-169B	2	1	67.7	62.7	-5
	1-5M-169B	3	1	68.3	64.2	-4.1
	1-5N-169B	4	1	68.4	65	-3.4
	1-5O-169B	5	1	68.4	65.5	-2.9
	1-5P-169B	1	1	64.8	60	-4.8
	1-5Q-169B	2	1	67.3	62.5	-4.8
	1-5R-169B	3	1	68	64	-4
	1-5S-169B	4	1	68.1	64.9	-3.2
	1-5T-169B	5	1	68.2	65.4	-2.8
	1-5U-169B	1	1	66.5	61.1	-5.4
	1-5V-169B	2	1	69	63.4	-5.6
	1-5W-169B	3	1	69.3	65	-4.3
	1-5X-169B	4	1	69.4	65.7	-3.7
	1-5Y-169B	5	1	69.5	66.2	-3.3
	1-5Z-169B	1	1	65.3	60.6	-4.7
	1-5AA-169B	2	1	67.6	62.9	-4.7
	1-5BB-169B	3	1	68.2	64.6	-3.6
	1-5CC-169B	4	1	68.5	65.4	-3.1
	1-5DD-169B	5	1	68.6	65.9	-2.7
Conover Place Condos	1-6A-I-70B	1	1	64.9	62.7	-2.2
	1-6B-I-70B	2	1	66.4	64.4	-2
	1-6C-I-70B	3	1	67.3	66.2	-1.1
	1-6D-I-70B	1	1	66	64.6	-1.4
	1-6E-I-70B	2	1	67.4	66.3	-1.1
	1-6F-I-70B	3	1	68	67.9	-0.1
	1-6G-I-70B	1	1	68	67.8	-0.2
	1-6H-I-70B	2	1	69.1	69.1	0
	1-6I-I-70B	3	1	69.3	69.7	0.4
	1-6J-I-70B	1	1	66.9	66.5	-0.4
	1-6K-I-70B	1	1	65.9	66.1	0.2
	1-6L-I-70B	1	1	65.3	65.6	0.3
	1-6M-I-70B	1	1	64.9	65.4	0.5
	1-6N-I-70B	1	1	64.8	65.3	0.5
	1-6O-I-70B	1	1	64.6	65.1	0.5
	1-6P-I-70B	1	1	64.4	64.9	0.5
	1-6Q-I-70B	2	1	66.2	66.8	0.6
	1-6R-I-70B	3	1	67.7	68.3	0.6
	1-6S-I-70B	4	1	68.1	68.7	0.6
	1-6T-I-70B	2	1	66.4	67	0.6
	1-6U-I-70B	3	1	67.9	68.5	0.6
	1-6V-I-70B	4	1	68.3	68.9	0.6
Richards & Conover Lofts	1-7-I-70B	1	1	62.7	63	0.3
DeLofts	1-8-I-70B	1	1	64.8	65.1	0.3
Skyline Real Estate	2-9-I-70B	1	1	56.6	56.9	0.3
O'Reilly Investments	1-10A-BRB	1	1	62.7	64	1.3
	1-10B-BRB	1	1	62.7	64	1.3
	1-10C-BRB	3	1	62.9	64.2	1.3
	1-10D-BRB	4	1	63.1	64.4	1.3
	1-10E-BRB	5	1	63.4	64.7	1.3
	1-10F-BRB	1	1	60.5	61.7	1.2
West Terrace Park	1-11-I-35B	1	1	63.4	65.2	1.8
Ermine Case Jr. Park	1-12-I-35B	1	1	64.1	64.7	0.6
	1-13-I-35B	1	1	62	62.7	0.7
	1-14-I-35B	1	1	73.6	75	1.4
Trialhead	1-15-I-35B	1	1	68.2	67.9	-0.3
Quality Hill Apartments	1-16-JEB	1	1	54.2	55.9	1.7

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 West Build dBA	Calculated dBA Difference
JVM Apex Apartments	1-17A-I-35B	1	1	64.4	65.5	1.1
	1-17B-I-35B	2	1	67.4	68.5	1.1
	1-17C-I-35B	3	1	69.1	70.3	1.2
	1-17D-I-35B	4	1	69.8	70.9	1.1
	1-17E-I-35B	1	1	63.9	65	1.1
	1-17F-I-35B	2	1	66	67.1	1.1
	1-17G-I-35B	3	1	67.9	69	1.1
	1-17H-I-35B	4	1	69	70.2	1.2
	1-17I-I-35B	1	1	64.3	65.4	1.1
	1-17J-I-35B	2	1	65.5	66.7	1.2
	1-17K-I-35B	3	1	67.1	68.2	1.1
	1-17L-I-35B	4	1	68.4	69.6	1.2
	1-17M-I-35B	1	1	64.6	65.8	1.2
	1-17N-I-35B	2	1	65.5	66.7	1.2
	1-17O-I-35B	1	1	64.8	65.9	1.1
	1-17P-I-35B	2	1	65.7	66.9	1.2
	1-17Q-I-35B	3	1	66.1	67.3	1.2
	1-17R-I-35B	4	1	67.9	69	1.1
	1-17S-I-35B	1	1	61	63	2
	1-17T-I-35B	2	1	63.6	64.9	1.3
	1-17U-I-35B	3	1	65.5	66.7	1.2
	1-17V-I-35B	4	1	67.5	68.7	1.2
	1-17W-I-35B	1	1	63.2	64.6	1.4
	1-17X-I-35B	2	1	64.6	65.8	1.2
	1-17Y-I-35B	1	1	64.2	65.3	1.1
	1-17Z-I-35B	2	1	65.1	66.3	1.2
	1-17AA-I-35B	3	1	66.3	67.6	1.3
	1-17BB-I-35B	4	1	68	69.1	1.1
	1-17CC-I-35B	3	1	67.1	68.3	1.2
	1-17DD-I-35B	4	1	68.5	69.6	1.1
	1-17EE-I-35B	1	1	64	65.2	1.2
	1-17FF-I-35B	2	1	65.6	66.8	1.2
	1-17GG-I-35B	3	1	67.4	68.6	1.2
	1-17HH-I-35B	4	1	68.6	69.8	1.2
	1-17II-I-35B	1	1	63.9	65	1.1
	1-17JJ-I-35B	2	1	66.9	68	1.1
	1-17KK-I-35B	3	1	68.7	69.9	1.2
	1-17LL-I-35B	4	1	69.6	70.7	1.1
Summit on Quality Hill	1-18A-I-35B	1	1	66.1	67.3	1.2
	1-18B-I-35B	2	1	68.5	69.6	1.1
	1-18C-I-35B	3	1	68.9	70.1	1.2
	1-18D-I-35B	4	1	68.9	70.1	1.2
	1-18E-I-35B	1	1	68.4	69.5	1.1
	1-18F-I-35B	2	1	69.4	70.5	1.1
	1-18G-I-35B	3	1	69.7	70.9	1.2
	1-18H-I-35B	4	1	69.7	70.8	1.1
	1-18I-I-35B	1	1	69.7	70.8	1.1
	1-18J-I-35B	2	1	70.6	71.8	1.2
	1-18K-I-35B	3	1	70.7	71.8	1.1
	1-18L-I-35B	4	1	70.6	71.8	1.2
	1-18M-I-35B	1	1	71	72.1	1.1
	1-18N-I-35B	2	1	71.7	72.9	1.2
	1-18O-I-35B	1	1	70.4	71.5	1.1
	1-18P-I-35B	2	1	71.1	72.3	1.2
	1-18Q-I-35B	1	1	71.8	72.9	1.1
	1-18R-I-35B	2	1	72.3	73.5	1.2
	1-18S-I-35B	3	1	72.1	73.3	1.2
	1-18T-I-35B	1	1	72.1	73.3	1.2
	1-18U-I-35B	3	1	71.1	72.3	1.2
	1-18V-I-35B	4	1	71	72.2	1.2
	1-18W-I-35B	1	1	68.9	70.1	1.2
	1-18X-I-35B	2	1	69.9	71	1.1
	1-18Y-I-35B	3	1	70.1	71.2	1.1
	1-18Z-I-35B	4	1	70	71.2	1.2
	1-18AA-I-35B	1	1	67	68.1	1.1
	1-18BB-I-35B	2	1	68.8	70	1.2
	1-18CC-I-35B	3	1	69.2	70.3	1.1
	1-18DD-I-35B	4	1	69.1	70.3	1.2
Trail	1-19A-BEB	1	1	66.5	70.3	3.8
	1-19B-BEB	1	1	62.2	70.5	8.3
Mulkey Park	1-20-I-35B	1	1	54.2	55.2	1
Roaster Block Apartments	1-21A-BRB	1	1	63.8	65.1	1.3
	1-21B-BRB	2	1	63.8	65.2	1.4
	1-21C-BRB	3	1	63.9	65.2	1.3
	1-21D-BRB	4	1	64.1	65.5	1.4
	1-21E-BRB	5	1	64.2	65.7	1.5
	1-21F-BRB	6	1	64.9	66.1	1.2
Owner: Planned Industrial Expansion Authority of KC*	1-22A-5thB	1	2	69.7	69.6	-0.1
	1-22B-5thB	2	2	70.6	70.8	0.2
	1-22C-5thB	3	2	71	71.2	0.2
	1-22D-5thB	4	2	71.1	71.3	0.2
	1-22E-5thB	1	2	69.4	69.3	-0.1
	1-22F-5thB	2	2	70.3	70.5	0.2
	1-22G-5thB	3	2	70.7	71	0.3
	1-22H-5thB	4	2	70.8	71.1	0.3
	1-22I-5thB	1	2	68.9	68.5	-0.4
	1-22J-5thB	2	2	69.8	70	0.2
	1-22K-5thB	3	2	70.4	70.6	0.2
	1-22L-5thB	4	2	70.5	70.7	0.2
	1-22M-5thB	1	2	68.4	67.9	-0.5
	1-22N-5thB	2	2	69.4	69.5	0.1
	1-22O-5thB	3	2	70.1	70.3	0.2
	1-22P-5thB	4	2	70.2	70.4	0.2
	1-22Q-5thB	1	1	63.4	62.4	-1
	1-22R-5thB	2	1	65.4	64.1	-1.3
	1-22S-5thB	3	1	66.4	65.5	-0.9
	1-22T-5thB	4	1	68.1	67.7	-0.4
	1-22U-5thB	1	2	62.3	61.8	-0.5
	1-22V-5thB	2	2	64	63.5	-0.5
	1-22W-5thB	3	2	65.3	64.9	-0.4
	1-22X-5thB	4	2	67.2	67.2	0
	1-22Y-5thB	1	2	61.4	60.9	-0.5
	1-22Z-5thB	2	2	63.3	62.9	-0.4
	1-22AA-5thB	3	2	64.8	64.5	-0.3
	1-22BB-5thB	4	2	66.3	66.2	-0.1
	1-22CC-5thB	1	1	60.8	60.3	-0.5
	1-22DD-5thB	2	1	62.9	62.5	-0.4
	1-22EE-5thB	3	1	64.4	64	-0.4
	1-22FF-5thB	4	1	65.6	65.4	-0.2
	1-22GG-5thB	1	2	62.1	59.5	-2.6
	1-22HH-5thB	2	2	63.9	61.4	-2.5
	1-22II-5thB	3	2	64.5	62.5	-2
	1-22JJ-5thB	4	2	65.9	64.6	-1.3
	1-22KK-5thB	1	2	60	58.4	-1.6
	1-22LL-5thB	2	2	62	60.5	-1.5
	1-22MM-5thB	3	2	63.2	61.8	-1.4
	1-22OO-5thB	4	2	64.6	63.9	-0.7

* Apartment complex name is not available at this time.

TNM Plan Views



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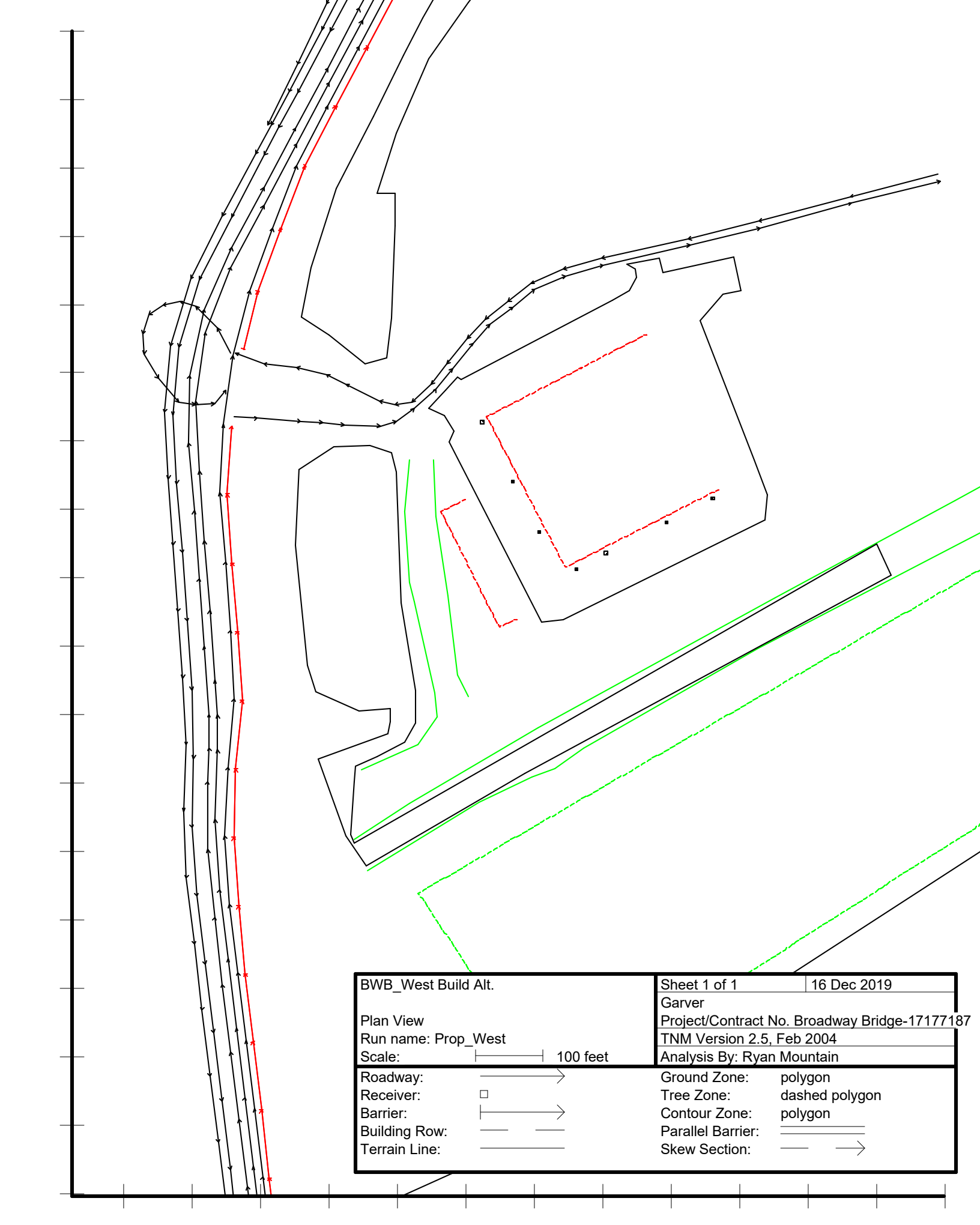
		Garver	
Plan View		Project/Contract No. Broadway Bridge-17177187	
Run name: Prop_West		TNM Version 2.5, Feb 2004	
Scale:	1000 ft	Analysis By: Ryan Mountain	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	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Plan View
Run name: Prop_West
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
762800
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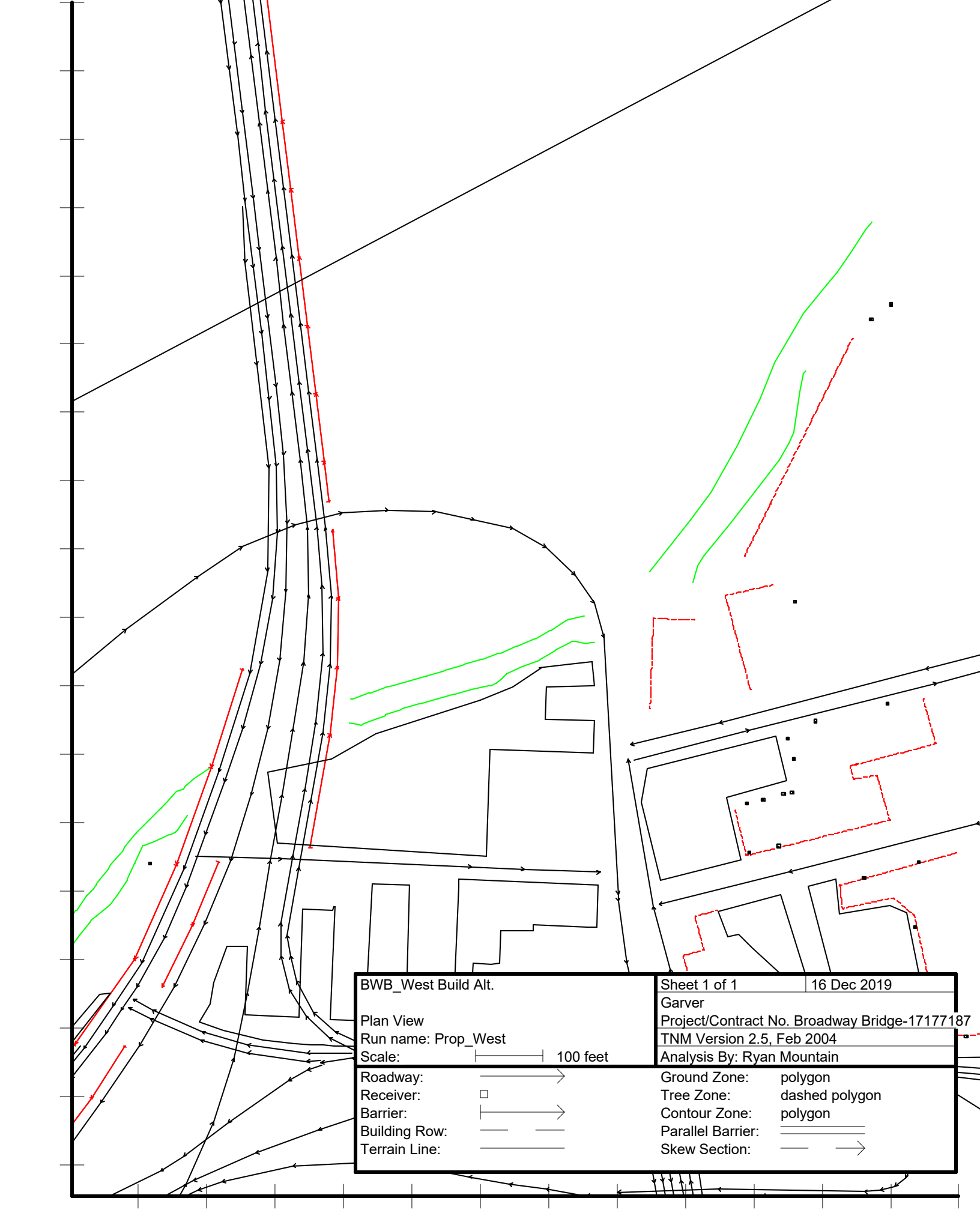
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Plan View
Run name: Prop_West
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Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
2762900
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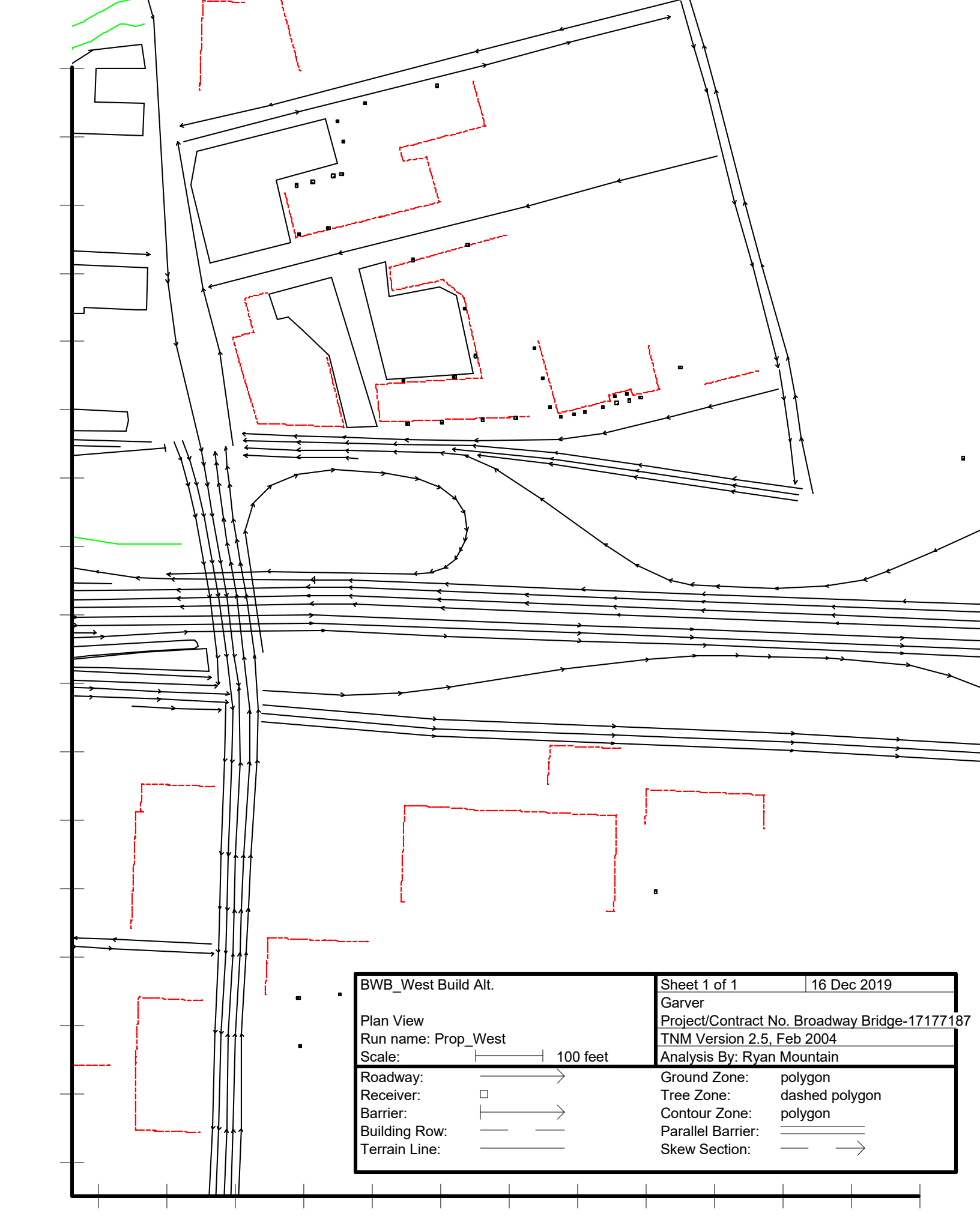
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Plan View
Run name: Prop_West
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
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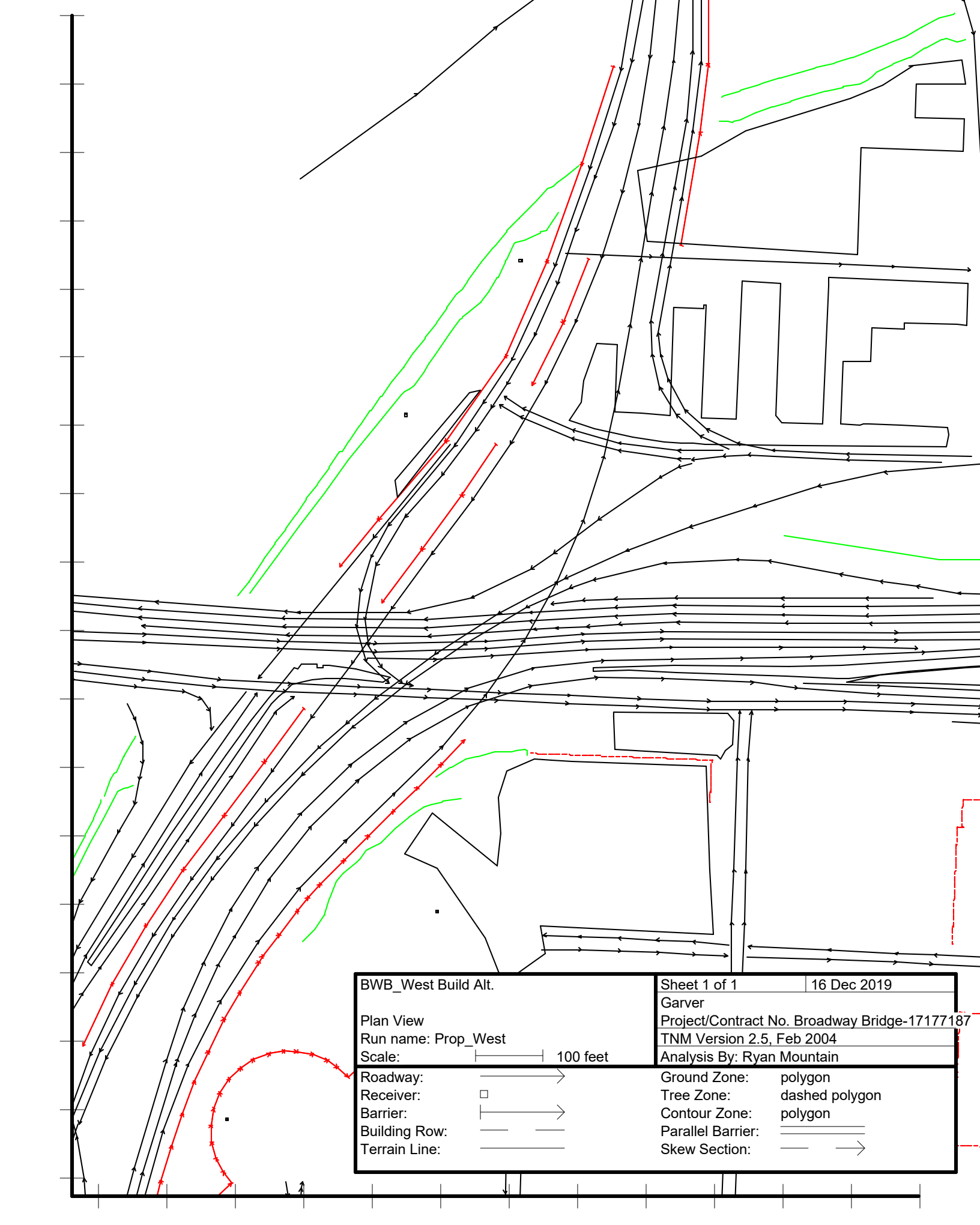
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Plan View
Run name: Prop_West
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
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Parallel Barrier:
Skew Section:
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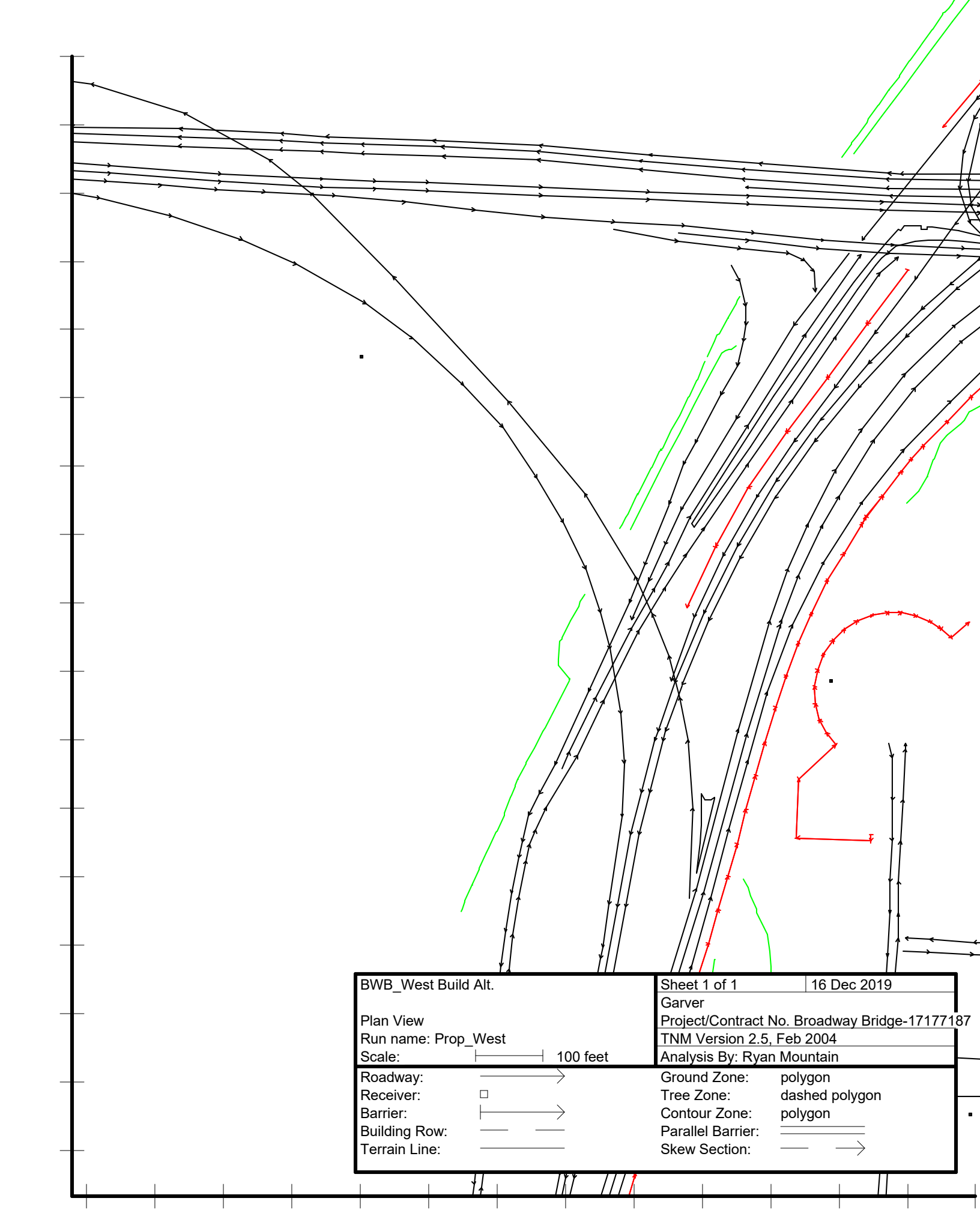
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Plan View
Run name: Prop_West
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
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Parallel Barrier:
Skew Section:
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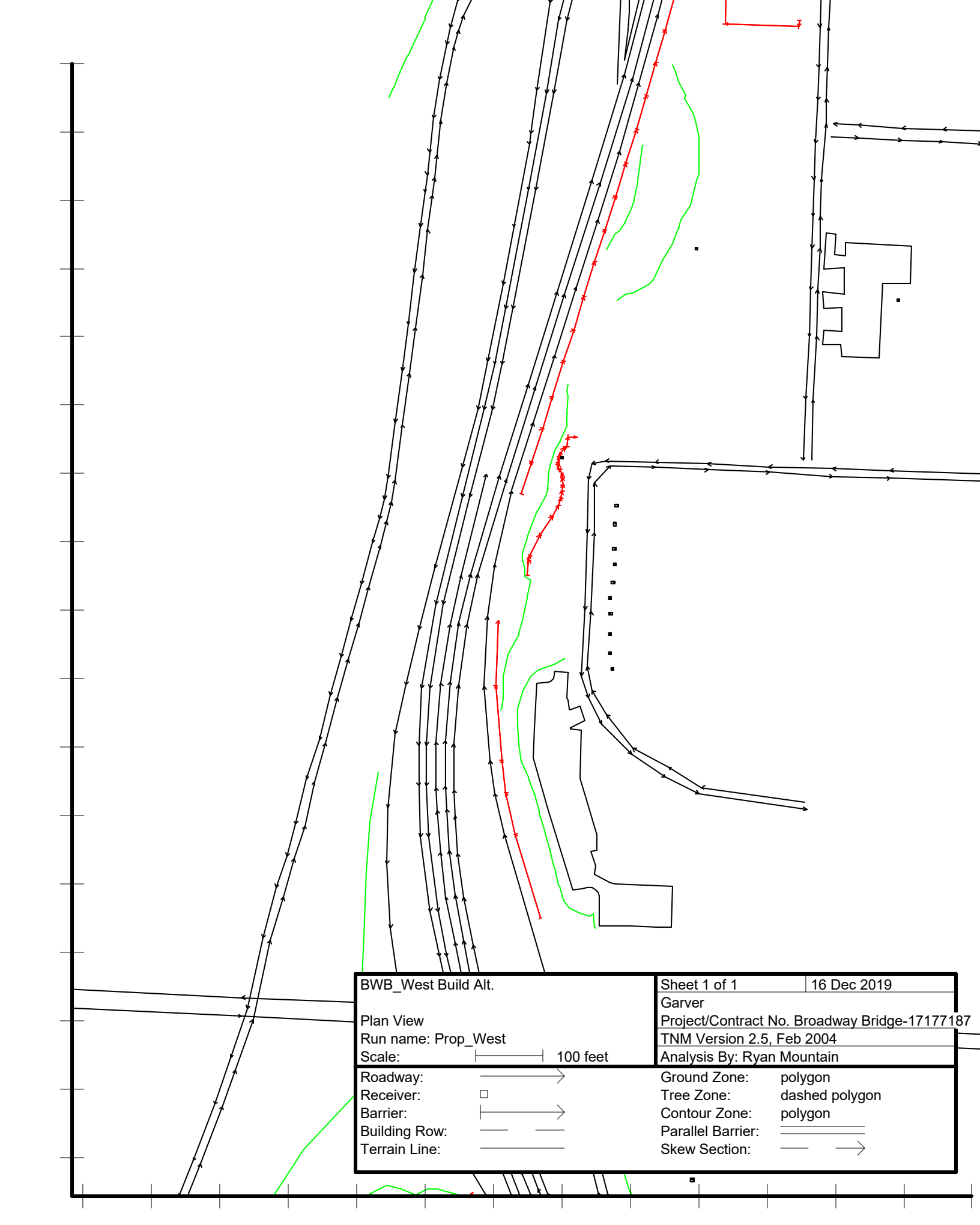
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Plan View
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Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
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Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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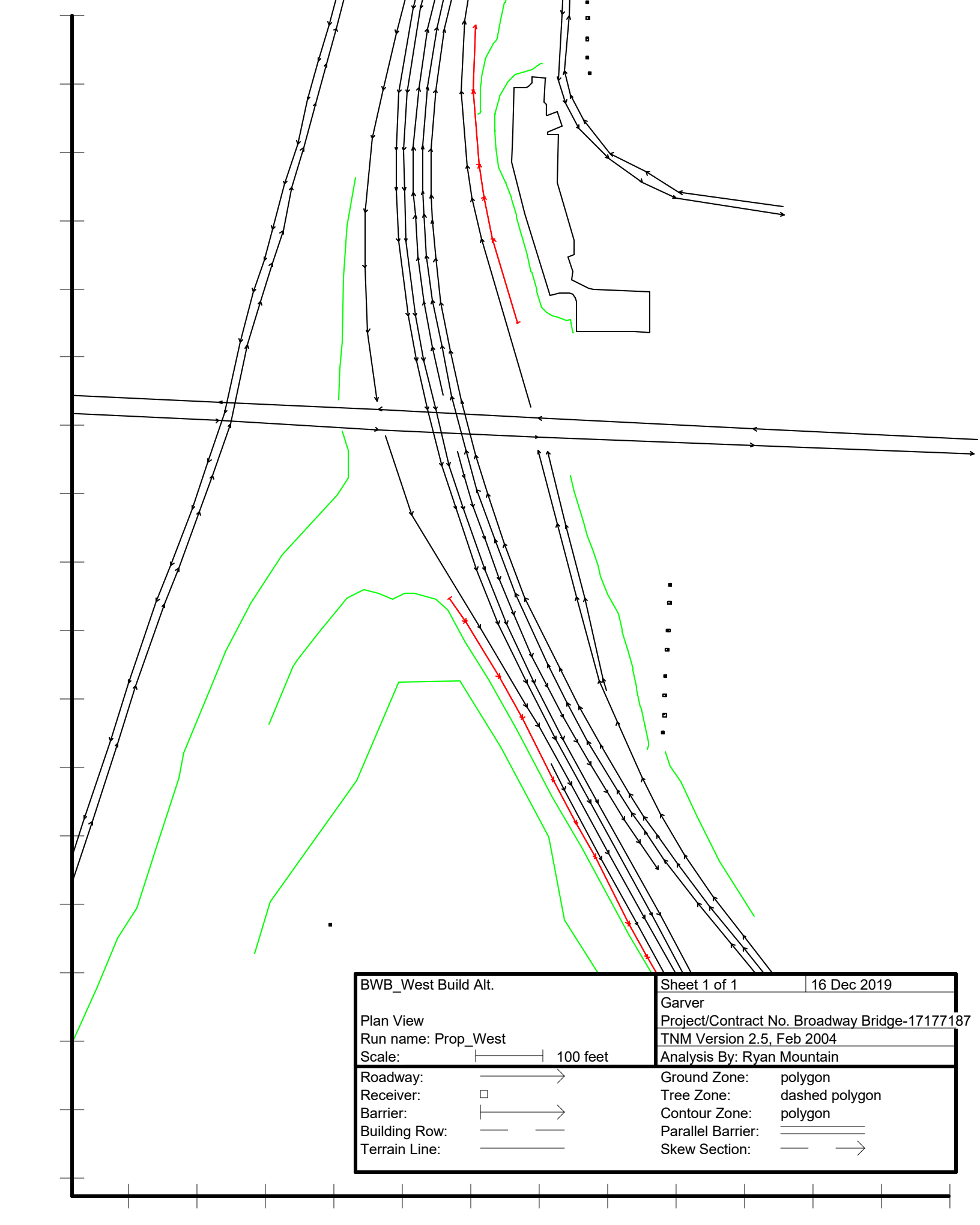
BWB_West Build Alt.
Plan View
Run name: Prop_West
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
2761600
2761700
2761800
2761900
2762000
2762100
2762200
2762300
2762400
2762500
2762600
2762700
2762800

APPENDIX F

Central Alternative Technical Memo, Detailed Noise Study Exhibits, and TNM Plan Views

Technical Memo*

***All technical memos were updated with R-22 (Owner: Planned Industrial Expansion Authority of KC) after submittal to MoDOT.**

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CENTRAL BUILD NOISE CONDITIONS

Date: November 6, 2019

To: MoDOT
Burns & McDonnell

Attn: Matt Burcham, MoDOT
Julie Sarson, Burns & McDonnell, Project Manager

From: Ryan Mountain, Garver

RE: Broadway/Buck O'Neil Bridge – Route 169
MoDOT No. 4S3085
Noise Study – 2040 Central Build Condition Results

Copies To: Shari Cannon-Mackey, Burns & McDonnell, scannonmackey@burnsmcd.com
Chip Touzinsky, Garver, CETouzinsky@GarverUSA.com

Garver has completed the central build traffic noise model run. This technical memo serves to document the results of central build model conditions only. The central build conditions TNM model consisted of utilizing the validated 2016 existing conditions TNM model as a baseline for determining future (2040[1]) traffic noise impacts should the central build alternative be constructed. Many impacts are anticipated under the projected 2040 central build conditions, most of which are in multi-story apartment buildings. Turning movement traffic data in the form of peak hour volumes for 2040 were utilized in the preparation of the central build model. Receivers modeled are identical to those modeled in the existing TNM model. New/on-going construction of what is likely an apartment building with balconies was recently observed on 5th Street and will need to be added to the model. TNM modeling also included terrain lines, existing and proposed concrete parapet/safety walls, and retaining walls that serve as barriers. Solid concrete parapet walls replacing open safety walls adjacent to the proposed roadways would provide some shielding of those roadways as evidenced by reduced sound levels for some receivers (e.g., receiver series 1). Additionally, due to the westward shift of Route 169 and shielding provided by adjacent buildings between the receiver and adjacent highways, some receivers that were impacted in the 2016 existing conditions model are not impacted in the 2040 central build conditions. Figures 1 - 2 depict the impacted receivers (red) and non-impacted receivers (yellow) under central build conditions. Table 1 below summarizes the impacts associated with the 21 designated receiver sites, which represent 241 receivers.

Table 2 shows the detailed results of the 2040 central build conditions compared to the 2016 existing conditions. Under the 2040 central build conditions, 117 receivers are anticipated to approach[2], meet, or exceed the 67 dB(A) Leq(h) for Noise Abatement Criteria (NAC) Categories B and C. Under the 2040 central build conditions, no receivers will experience a substantial increase (15 dBA or more).

[1] 2040/2045 disclaimer - The traffic analysis and any traffic-based environmental analysis 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 2025.
[2] Approaching the NAC B and C criteria includes receivers experiencing a noise level of 66 dB(A).

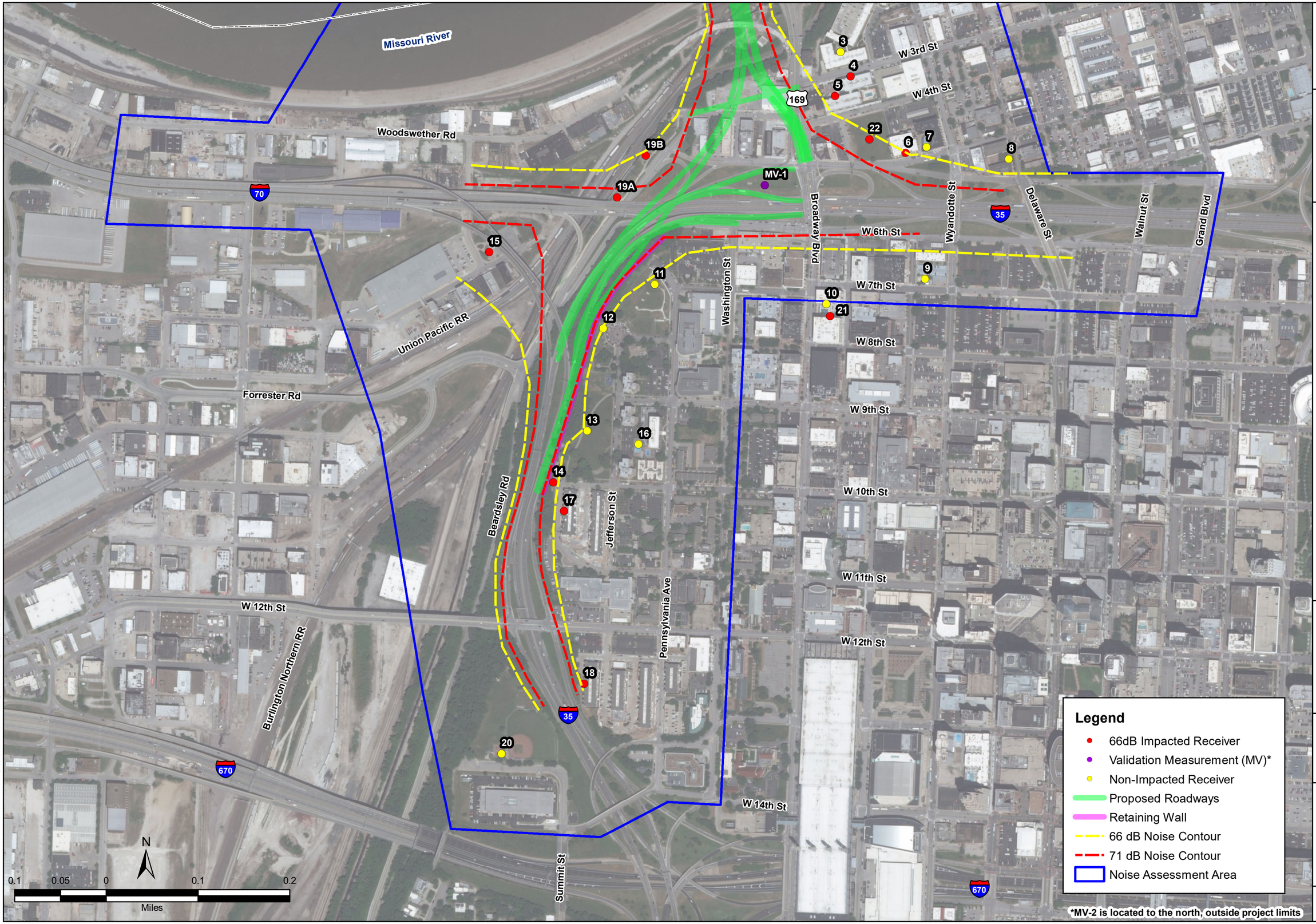
Table 1 - Receivers

Receiver Site	Central-Build dBA Level*	Dwelling Units Impacted
1	No impacts	--
2	No impacts	--
3	No impacts	--
4	67.9	10
5	71.1	24
6	70.1	22
7	No impacts	--
8	No impacts	--
9	No impacts	--
10	No impacts	--
11	No impacts	--
12	No impacts	--

Receiver Site	Central-Build dBA Level*	Dwelling Units Impacted
13	No impacts	--
14**	73.6	1
15**	68.0	1
16	No impacts	--
17	69.8	26
18	73.5	30
19**	68.1	2
20	No impacts	--
21	66.2	1
22**	Proposed Receiver Location for New construction on 5th St.	--

*Highest dBA result for set of receivers.
**Number of receivers will be determined based on park or trail usage.
***Receiver 22 is reserved for new apartment buildings being constructed along 5th St.

Attachments: 3 Figures 1 & 2, Table 2



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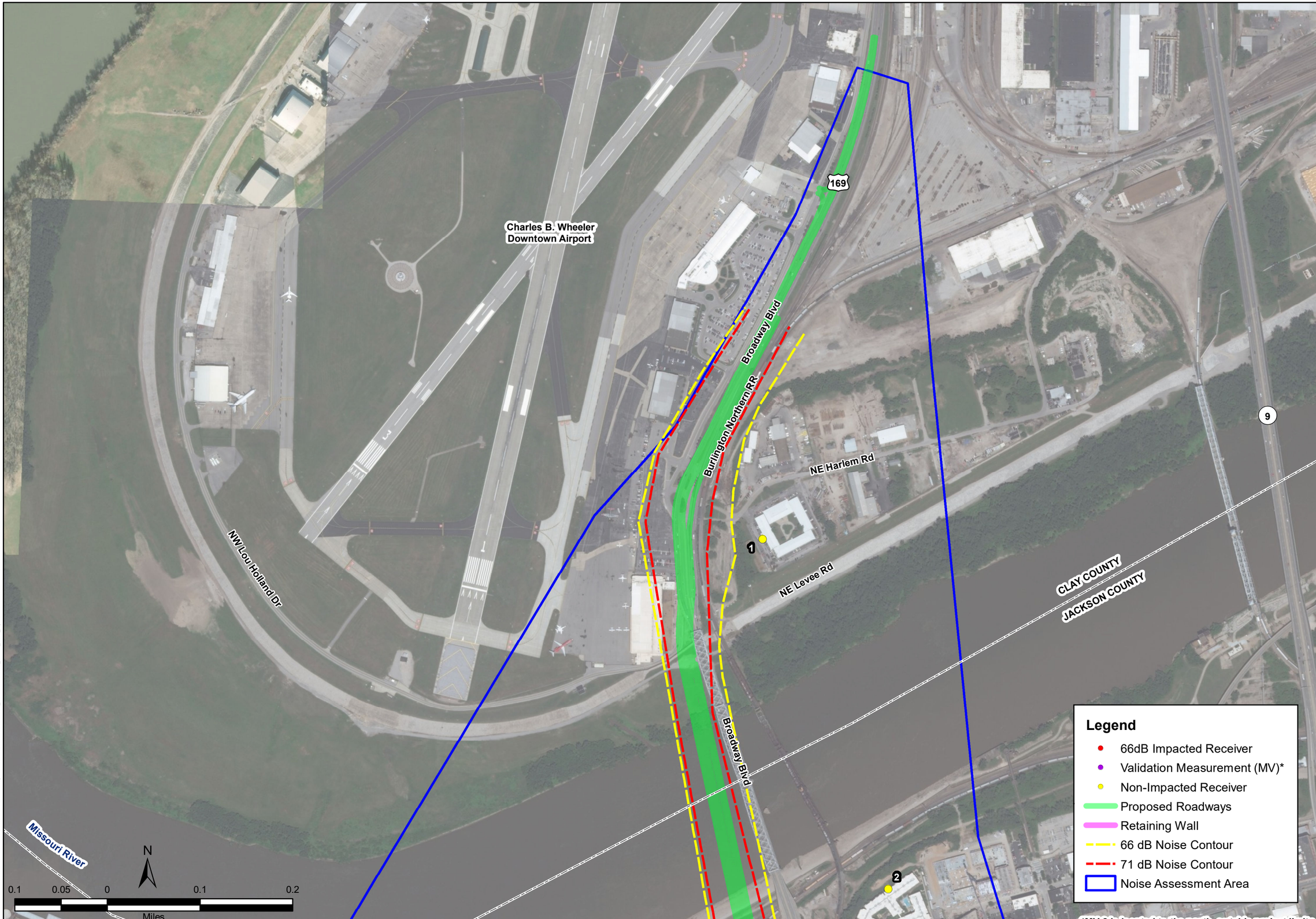
BROADWAY / BUCK O'NEIL BRIDGE

BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST

JOB NO.: 17177187
DATE: JAN 2020
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-CENTRAL BUILD 2040

FIGURE NUMBER: 1



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DATE: JAN 2020
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-CENTRAL BUILD 2040

FIGURE NUMBER: 2

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Garver 5-Nov-19
Ryan Mountain TNM 2.5
Calculated with TNM 2.5
TABLE 2 - CENTRAL BUILD SOUND LEVEL RESULTS
PROJECT/CONTRACT: Broadway Bridge-17177187
RUN: BWB_2040 Central Build

2040 Central Build Conditions Impacted Receivers = 117	
1	First Row
5Q	Receiver No.
169B	Adjacent Highway

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 Central-Build dBA	Calculated dBA Difference
B&W Investment Properties - with Balconies	1-1A-169B	1	4	62.5	62	-0.5
	1-1B-169B	2	4	64.1	64.9	0.8
	1-1C-169B	1	6	60.5	59.5	-1
	1-1D-169B	2	6	62.4	63.4	1
	1-1E-169B	1	6	58.5	57.5	-1
	1-1F-169B	2	6	61.6	62.4	0.8
	1-1G-169B	1	3	55.3	53.8	-1.5
	1-1H-169B	2	3	59.6	60	0.4
	1-1I-169B	1	4	55	53.1	-1.9
	1-1J-169B	2	4	58.6	59	0.4
	1-1K-169B	1	6	55	52.6	-2.4
	1-1L-169B	2	6	57.9	58.2	0.3
	1-1M-169B	1	5	54.7	52.3	-2.4
	1-1N-169B	2	5	57.4	57.3	-0.1
Market Station Apartments with Balconies	1-2A-169B	1	1	62.9	61.8	-1.1
	1-2B-169B	2	1	64.2	62.9	-1.3
	1-2C-169B	3	1	64.6	63.3	-1.3
	1-2D-169B	4	1	64.8	63.6	-1.2
	1-2E-169B	1	1	62.3	61.4	-0.9
	1-2F-169B	2	1	63.6	62.6	-1
	1-2G-169B	3	1	64.2	63	-1.2
	1-2H-169B	4	1	64.4	63.4	-1
Market Station Apartments Common Area	1-3-169B	1	1	63.4	60.5	-2.9
River Market West Apartments - North Bldg.	1-4B-169B	2	1	67.4	66	-1.4
	1-4C-169B	3	1	67.9	66.9	-1
	1-4D-169B	4	1	68	67.4	-0.6
	1-4E-169B	5	1	68.2	67.8	-0.4
	1-4F-169B	1	1	65.8	64.3	-1.5
	1-4G-169B	2	1	66	64.8	-1.2
	1-4H-169B	3	1	66.6	65.8	-0.8
	1-4I-169B	4	1	66.9	66.5	-0.4
	1-4J-169B	5	1	67.2	67	-0.2
	1-4K-169B	1	1	64	63.1	-0.9
	1-4L-169B	2	1	63.4	62.8	-0.6
	1-4M-169B	3	1	64.7	64	-0.7
	1-4N-169B	4	1	65.1	64.7	-0.4
	1-4O-169B	5	1	65.5	65.5	0
	1-4P-169B	1	1	61.5	61.2	-0.3
	1-4Q-169B	1	1	66.5	65.1	-1.4
	1-4R-169B	2	1	67.7	66.3	-1.4
	1-4S-169B	3	1	67.9	67	-0.9
	1-4T-169B	4	1	68.2	67.5	-0.7
	1-4U-169B	5	1	68.3	67.9	-0.4
River Market West Apartments - South Bldg.	1-5A-169B	1	1	67.1	64.3	-2.8
	1-5B-169B	2	1	69.4	67.2	-2.2
	1-5C-169B	3	1	69.4	68.2	-1.2
	1-5D-169B	4	1	69.4	68.9	-0.5
	1-5E-169B	5	1	69.4	69.1	-0.3
	1-5F-169B	1	1	66.5	64.3	-2.2
	1-5G-169B	2	1	68.6	66.6	-2
	1-5H-169B	3	1	68.9	67.7	-1.2
	1-5I-169B	4	1	68.9	68.3	-0.6
	1-5J-169B	5	1	68.9	68.7	-0.2
	1-5K-169B	1	1	65.3	63.6	-1.7
	1-5L-169B	2	1	67.7	66	-1.7
	1-5M-169B	3	1	68.3	67.1	-1.2
	1-5N-169B	4	1	68.4	67.8	-0.6
	1-5O-169B	5	1	68.4	68.1	-0.3
	1-5P-169B	1	1	64.8	63.3	-1.5
	1-5Q-169B	2	1	67.3	65.8	-1.5
	1-5R-169B	3	1	68	66.9	-1.1
	1-5S-169B	4	1	68.1	67.6	-0.5
	1-5T-169B	5	1	68.2	68	-0.2
	1-5U-169B	1	1	66.5	66.1	-0.4
	1-5V-169B	2	1	69	68.4	-0.6
	1-5W-169B	3	1	69.3	69.5	0.2
	1-5X-169B	4	1	69.4	69.9	0.5
	1-5Y-169B	5	1	69.5	70.1	0.6
	1-5Z-169B	1	1	65.3	65.2	-0.1
	1-5AA-169B	2	1	67.6	67.3	-0.3
	1-5BB-169B	3	1	68.2	68.3	0.1
	1-5CC-169B	4	1	68.5	68.9	0.4
	1-5DD-169B	5	1	68.6	69.1	0.5
Conover Place Condos	1-6A-I-70B	1	1	64.9	66	1.1
	1-6B-I-70B	2	1	66.4	67.4	1
	1-6C-I-70B	3	1	67.3	68.1	0.8
	1-6D-I-70B	1	1	66	67.1	1.1
	1-6E-I-70B	2	1	67.4	68.3	0.9
	1-6F-I-70B	3	1	68	68.8	0.8
	1-6G-I-70B	1	1	68	68.9	0.9
	1-6H-I-70B	2	1	69.1	69.9	0.8
	1-6I-I-70B	3	1	69.3	70.1	0.8
	1-6J-I-70B	1	1	66.9	68.2	1.3
	1-6K-I-70B	1	1	65.9	67.2	1.3
	1-6L-I-70B	1	1	65.3	66.6	1.3
	1-6M-I-70B	1	1	64.9	66.2	1.3
	1-6N-I-70B	1	1	64.8	66.2	1.4
	1-6O-I-70B	1	1	64.6	66.1	1.5
	1-6P-I-70B	1	1	64.4	66	1.6
	1-6Q-I-70B	2	1	66.2	67.3	1.1
	1-6R-I-70B	3	1	67.7	68.5	0.8
	1-6S-I-70B	4	1	68.1	68.8	0.7
	1-6T-I-70B	2	1	66.4	67.4	1
	1-6U-I-70B	3	1	67.9	68.7	0.8
	1-6V-I-70B	4	1	68.3	69	0.7
Richards & Conover Lofts	1-7-I-70B	1	1	62.7	63.9	1.2
DeLofts	1-8-I-70B	1	1	64.8	65.2	0.4
Skyline Real Estate	2-9-I-70B	1	1	56.6	57.5	0.9
O'Reilly Investments	1-10A-BRB	1	1	62.7	64.2	1.5
	1-10B-BRB	1	1	62.7	64.2	1.5
	1-10C-BRB	3	1	62.9	64.3	1.4
	1-10D-BRB	4	1	63.1	64.5	1.4
	1-10E-BRB	5	1	63.4	64.8	1.4
	1-10F-BRB	1	1	60.5	62	1.5
West Terrace Park	1-11-I-35B	1	1	63.4	65	1.6
Ermine Case Jr. Park	1-12-I-35B	1	1	64.1	64.4	0.3
	1-13-I-35B	1	1	62	61.9	-0.1
	1-14-I-35B	1	1	73.6	73.6	0
Trialhead	1-15-I-35B	1	1	68.2	68	-0.2
Quality Hill Apartments	1-16-JEB	1	1	54.2	55.3	1.1

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 Central-Build dBA	Calculated dBA Difference
JVM Apex Apartments	1-17A-I-35B	1	1	64.4	64.7	0.3
	1-17B-I-35B	2	1	67.4	67.5	0.1
	1-17C-I-35B	3	1	69.1	69.2	0.1
	1-17D-I-35B	4	1	69.8	69.8	0
	1-17E-I-35B	1	1	63.9	64.8	0.9
	1-17F-I-35B	2	1	66	66.5	0.5
	1-17G-I-35B	3	1	67.9	68.2	0.3
	1-17H-I-35B	4	1	69	69.4	0.4
	1-17I-I-35B	1	1	64.3	65.3	1
	1-17J-I-35B	2	1	65.5	66.4	0.9
	1-17K-I-35B	3	1	67.1	67.6	0.5
	1-17L-I-35B	4	1	68.4	68.9	0.5
	1-17M-I-35B	1	1	64.6	65.7	1.1
	1-17N-I-35B	2	1	65.5	66.6	1.1
	1-17O-I-35B	1	1	64.8	65.8	1
	1-17P-I-35B	2	1	65.7	66.7	1
	1-17Q-I-35B	3	1	66.1	67.1	1
	1-17R-I-35B	4	1	67.9	68.8	0.9
	1-17S-I-35B	1	1	61	62	1
	1-17T-I-35B	2	1	63.6	64.7	1.1
	1-17U-I-35B	3	1	65.5	66.5	1
	1-17V-I-35B	4	1	67.5	68.4	0.9
	1-17W-I-35B	1	1	63.2	64.2	1
	1-17X-I-35B	2	1	64.6	65.7	1.1
	1-17Y-I-35B	1	1	64.2	65.2	1
	1-17Z-I-35B	2	1	65.1	66.2	1.1
	1-17AA-I-35B	3	1	66.3	67.3	1
	1-17BB-I-35B	4	1	68	68.8	0.8
	1-17CC-I-35B	3	1	67.1	67.8	0.7
	1-17DD-I-35B	4	1	68.5	69.1	0.6
	1-17EE-I-35B	1	1	64	65.1	1.1
	1-17FF-I-35B	2	1	65.6	66.4	0.8
	1-17GG-I-35B	3	1	67.4	67.9	0.5
	1-17HH-I-35B	4	1	68.6	69.1	0.5
	1-17II-I-35B	1	1	63.9	64.6	0.7
	1-17JJ-I-35B	2	1	66.9	67.2	0.3
	1-17KK-I-35B	3	1	68.7	68.9	0.2
	1-17LL-I-35B	4	1	69.6	69.7	0.1
Summit on Quality Hill	1-18A-I-35B	1	1	66.1	67.3	1.2
	1-18B-I-35B	2	1	68.5	69.6	1.1
	1-18C-I-35B	3	1	68.9	70.1	1.2
	1-18D-I-35B	4	1	68.9	70.1	1.2
	1-18E-I-35B	1	1	68.4	69.5	1.1
	1-18F-I-35B	2	1	69.4	70.6	1.2
	1-18G-I-35B	3	1	69.7	70.9	1.2
	1-18H-I-35B	4	1	69.7	70.9	1.2
	1-18I-I-35B	1	1	69.7	70.8	1.1
	1-18J-I-35B	2	1	70.6	71.8	1.2
	1-18K-I-35B	3	1	70.7	71.8	1.1
	1-18L-I-35B	4	1	70.6	71.8	1.2
	1-18M-I-35B	1	1	71	72.1	1.1
	1-18N-I-35B	2	1	71.7	72.9	1.2
	1-18O-I-35B	1	1	70.4	71.5	1.1
	1-18P-I-35B	2	1	71.1	72.3	1.2
	1-18Q-I-35B	1	1	71.8	72.9	1.1
	1-18R-I-35B	2	1	72.3	73.5	1.2
	1-18S-I-35B	3	1	72.1	73.3	1.2
	1-18T-I-35B	1	1	72.1	73.3	1.2
	1-18U-I-35B	3	1	71.1	72.3	1.2
	1-18V-I-35B	4	1	71	72.2	1.2
	1-18W-I-35B	1	1	68.9	70.1	1.2
	1-18X-I-35B	2	1	69.9	71	1.1
	1-18Y-I-35B	3	1	70.1	71.3	1.2
	1-18Z-I-35B	4	1	70	71.2	1.2
	1-18AA-I-35B	1	1	67	68.1	1.1
	1-18BB-I-35B	2	1	68.8	70	1.2
	1-18CC-I-35B	3	1	69.2	70.3	1.1
	1-18DD-I-35B	4	1	69.1	70.3	1.2
Trail	1-19A-BEB	1	1	66.5	68.1	1.6
	1-19B-BEB	1	1	62.2	66.2	4
Mulkey Park	1-20-I-35B	1	1	54.2	54.9	0.7
Roaster Block Apartments	1-21A-BRB	1	1	63.8	65.3	1.5
	1-21B-BRB	2	1	63.8	65.3	1.5
	1-21C-BRB	3	1	63.9	65.3	1.4
	1-21D-BRB	4	1	64.1	65.5	1.4
	1-21E-BRB	5	1	64.2	65.7	1.5
	1-21F-BRB	6	1	64.9	66.2	1.3
Owner: Planned Industrial Expansion Authority of KC*	1-22A-5thB	1	2	69.7	70.6	0.9
	1-22B-5thB	2	2	70.6	71.5	0.9
	1-22C-5thB	3	2	71	71.8	0.8
	1-22D-5thB	4	2	71.1	72	0.9
	1-22E-5thB	1	2	69.4	70.3	0.9
	1-22F-5thB	2	2	70.3	71.2	0.9
	1-22G-5thB	3	2	70.7	71.5	0.8
	1-22H-5thB	4	2	70.8	71.7	0.9
	1-22I-5thB	1	2	68.9	69.9	1
	1-22J-5thB	2	2	69.8	70.8	1
	1-22K-5thB	3	2	70.4	71.2	0.8
	1-22L-5thB	4	2	70.5	71.4	0.9
	1-22M-5thB	1	2	68.4	69.4	1
	1-22N-5thB	2	2	69.4	70.4	1
	1-22O-5thB	3	2	70.1	70.9	0.8
	1-22P-5thB	4	2	70.2	71.1	0.9
	1-22Q-5thB	1	1	63.4	64.6	1.2
	1-22R-5thB	2	1	65.4	66.4	1
	1-22S-5thB	3	1	66.4	67.2	0.8
	1-22T-5thB	4	1	68.1	68.9	0.8
	1-22U-5thB	1	2	62.3	63.7	1.4
	1-22V-5thB	2	2	64	65.4	1.4
	1-22W-5thB	3	2	65.3	66.3	1
	1-22X-5thB	4	2	67.2	67.9	0.7
	1-22Y-5thB	1	2	61.4	62.9	1.5
	1-22Z-5thB	2	2	63.3	64.8	1.5
	1-22AA-5thB	3	2	64.8	65.8	1
	1-22BB-5thB	4	2	66.3	67.1	0.8
	1-22CC-5thB	1	1	60.8	62.5	1.7
	1-22DD-5thB	2	1	62.9	64.4	1.5
	1-22EE-5thB	3	1	64.4	65.5	1.1
	1-22FF-5thB	4	1	65.6	66.7	1.1
	1-22GG-5thB	1	2	62.1	62.6	0.5
	1-22HH-5thB	2	2	63.9	64.2	0.3
	1-22II-5thB	3	2	64.5	64.8	0.3
	1-22JJ-5thB	4	2	65.9	66.4	0.5
	1-22KK-5thB	1	2	60	61	1
	1-22LL-5thB	2	2	62	62.7	0.7
	1-22MM-5thB	3	2	63.2	63.6	0.4
	1-22OO-5thB	4	2	64.6	65.2	0.6

Detailed Noise Study Exhibits

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver
- Park Property

Ermine Case Jr. Park

W. 12th St.

Pennsylvania Ave

Mulkey Square Park

35

18

Summit on Quality Hill Apartments

20

#18 Receivers

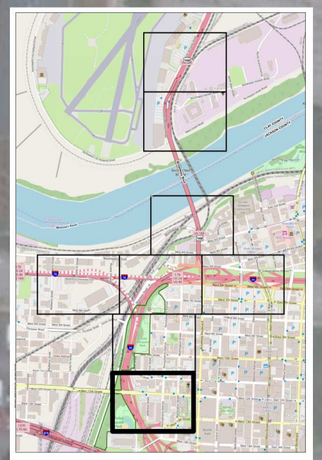


Summit on Quality Hill Apartments

#18 Receivers



Summit on Quality Hill Apartments



N

0 50 100 200 300

Feet

*MV-2 is located to the north, outside project limits

GARVER

2049 East Joyce Blvd.
Suite 400
Fayetteville, AR 72703
(479) 527-9100

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MODOT
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0 1"

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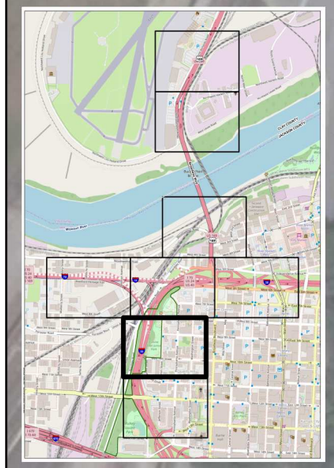
DATE: NOV 2019
DESIGNED BY: RCM
DRAWN BY: CPS

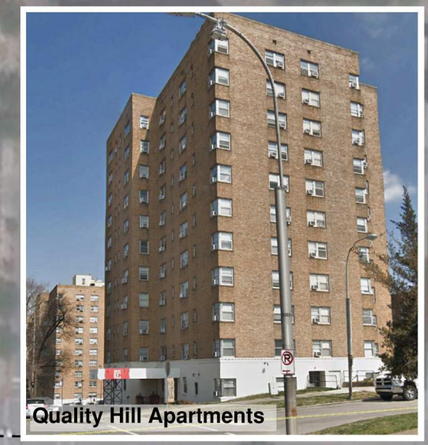
NOISE ANALYSIS-CENTRAL BUILD

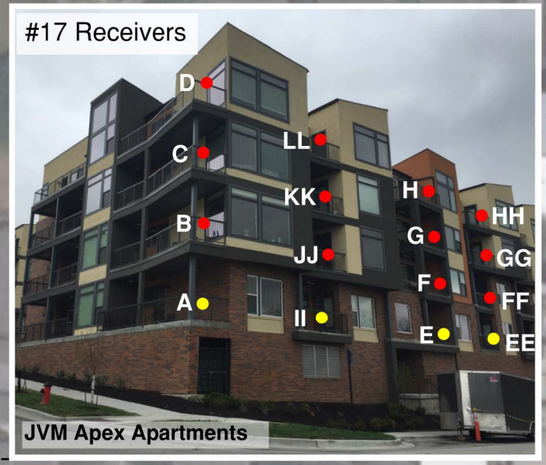
FIGURE NUMBER: F-1

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver
- Park Property









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NOISE ANALYSIS-CENTRAL BUILD

FIGURE NUMBER: F-2



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NOISE ANALYSIS-CENTRAL BUILD

FIGURE NUMBER: F-3



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0 1"
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NOISE ANALYSIS-CENTRAL BUILD

FIGURE NUMBER: F-4

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver

22

Conover Place Lofts

6

7

KC Loft Space

KC Loft Space Common Area

W. 5th St.

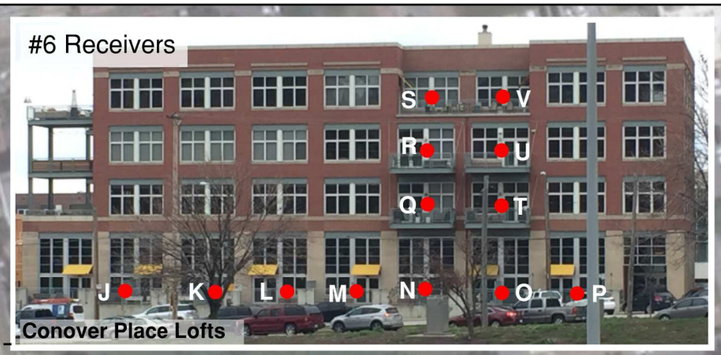


DeLofts Common Area

8

DeLoft Apartments

W. Independence Ave.



Broadway Blvd

Wyandotte St

35

Delaware St

W 6th St



Apartment Complex Common Area

9

W 7th St

Roaster's Block Apartment Complex

10

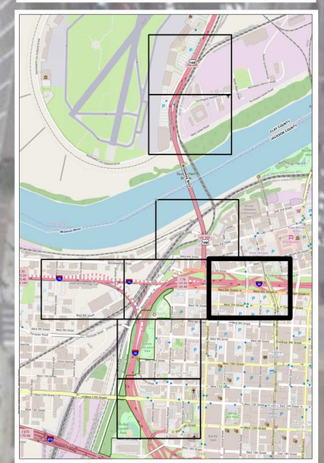
Roaster's Block Common Area

21

Roaster's Block Apartment Complex







N

0 50 100 200 300

Feet

*MV-2 is located to the north, outside project limits

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NOISE ANALYSIS-CENTRAL BUILD

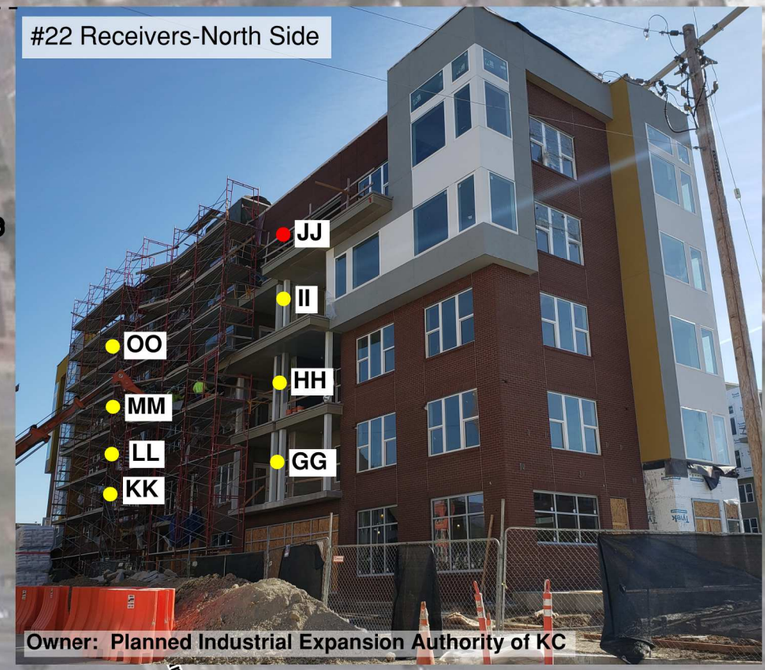
FIGURE NUMBER: F-5a

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver

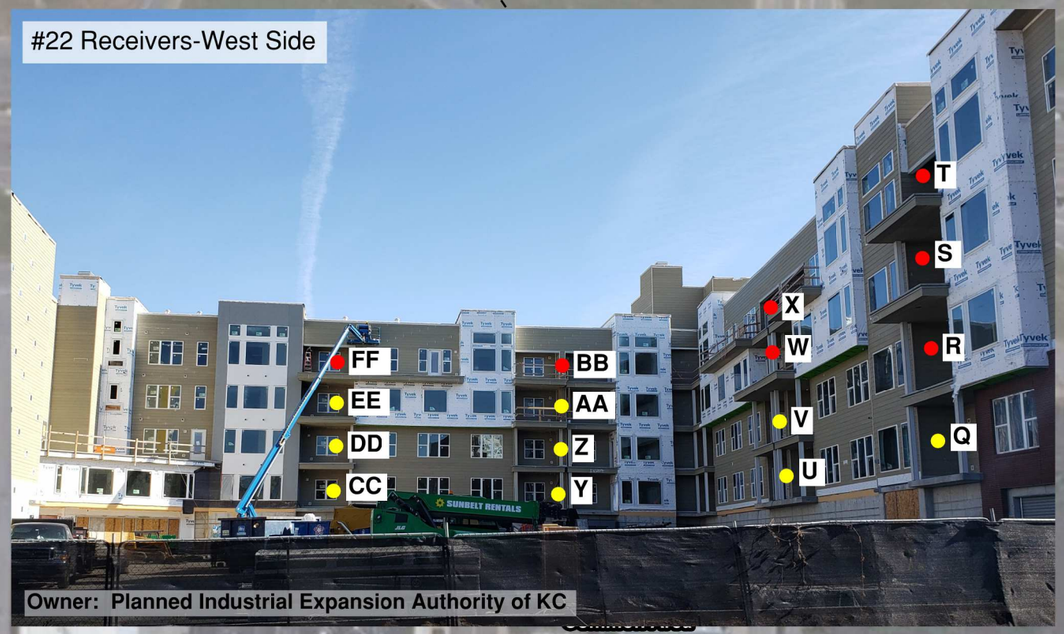
KC Loft Space
Conover Place Lofts
KC Loft Space Common Area
W. 5th St.
DeLofts Common Area
DeLoft Apartments
W. Independence Ave.
Broadway Blvd
35

#22 Receivers-North Side



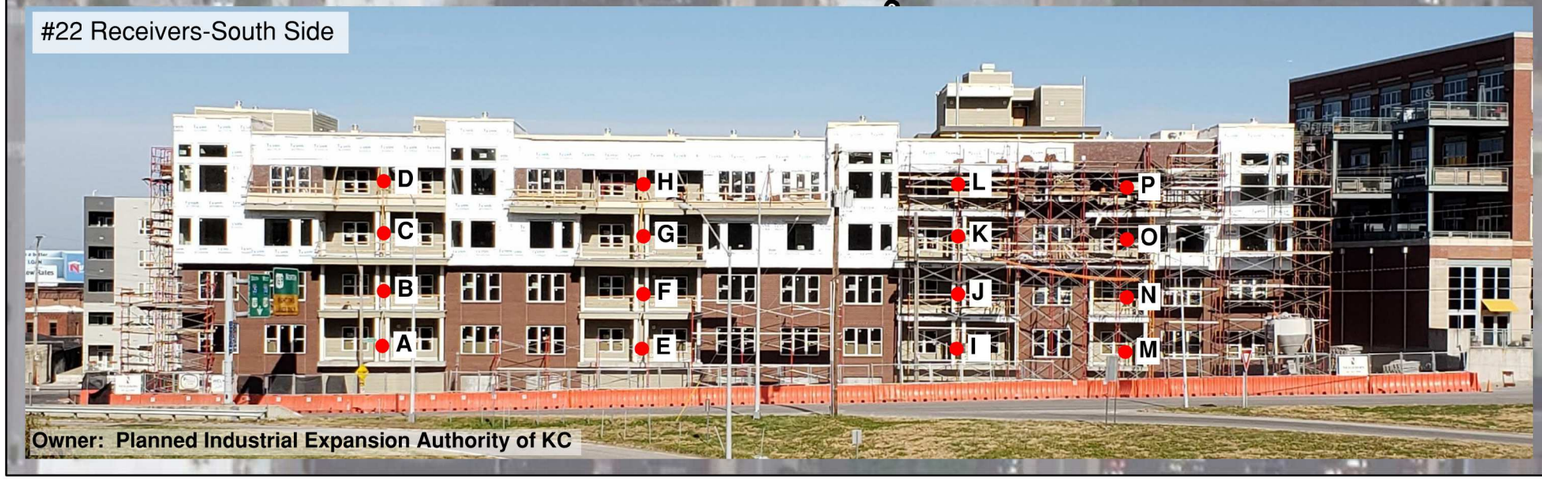
Owner: Planned Industrial Expansion Authority of KC

#22 Receivers-West Side

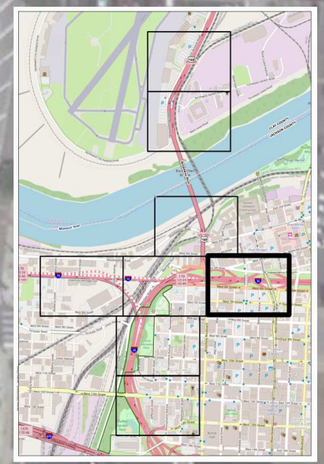


Owner: Planned Industrial Expansion Authority of KC

#22 Receivers-South Side



Owner: Planned Industrial Expansion Authority of KC



N

0 50 100 200 300
Feet

*MV-2 is located to the north, outside project limits

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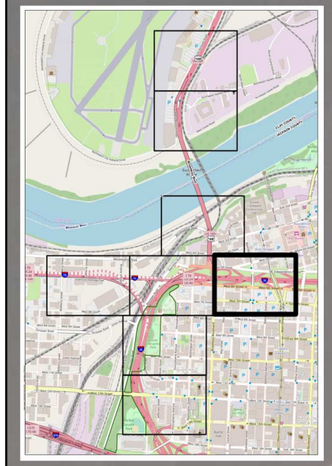
NOISE ANALYSIS-CENTRAL BUILD

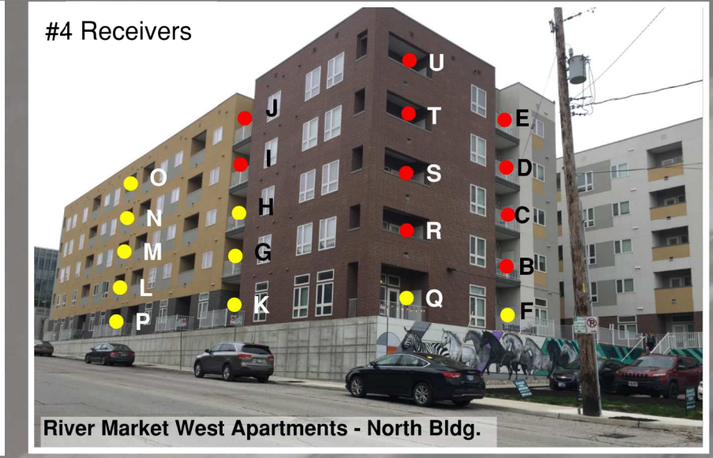
FIGURE NUMBER: F-5b

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver

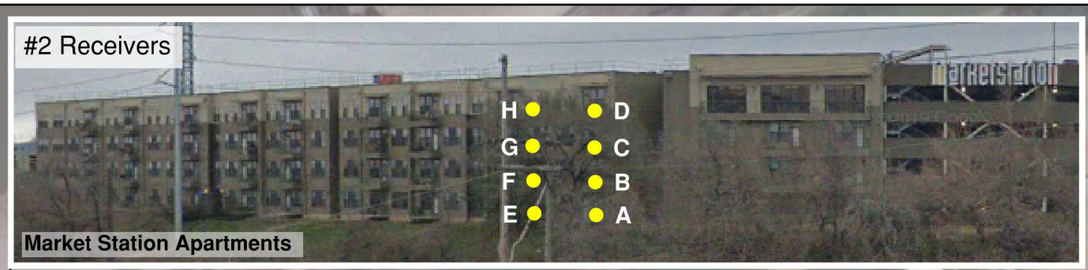


#4 Receivers



River Market West Apartments - North Bldg.

#2 Receivers



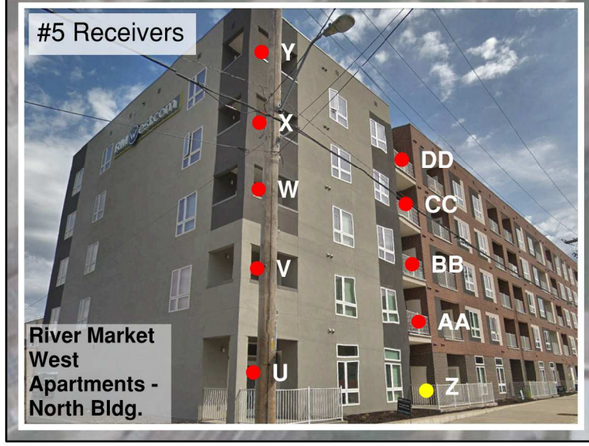
Market Station Apartments

#5 Receivers



River Market West Apartments - South Bldg.

#5 Receivers



River Market West Apartments - North Bldg.



Market Station Apartments

Broadway Blvd/US-169

169

W 3rd St

Market Station Apartments

RM West Apartment Complexes

0 50 100 200 300

Feet

N

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GARVER

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Suite 400
Fayetteville, AR 72703
(479) 527-9100

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BROADWAY / BUCK O'NEIL BRIDGE

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0 1"

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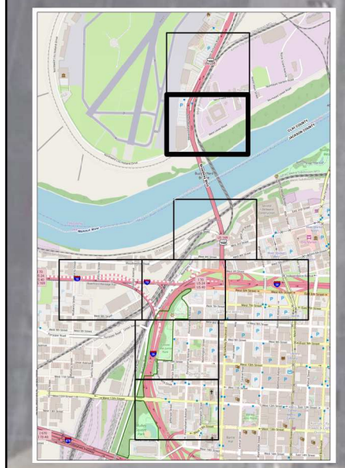
DATE: NOV 2019
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-CENTRAL BUILD

FIGURE NUMBER: F-6

Legend

- Validation Measurement (MV)*
- 66dB Impacted Receiver
- Non-Impacted Receiver



Richards Rd.

NE Harlem Rd

B&W Investment Properties

1

NE Levee Rd

Broadway Blvd./US 169

Charles B.Wheeler Downtown Airport

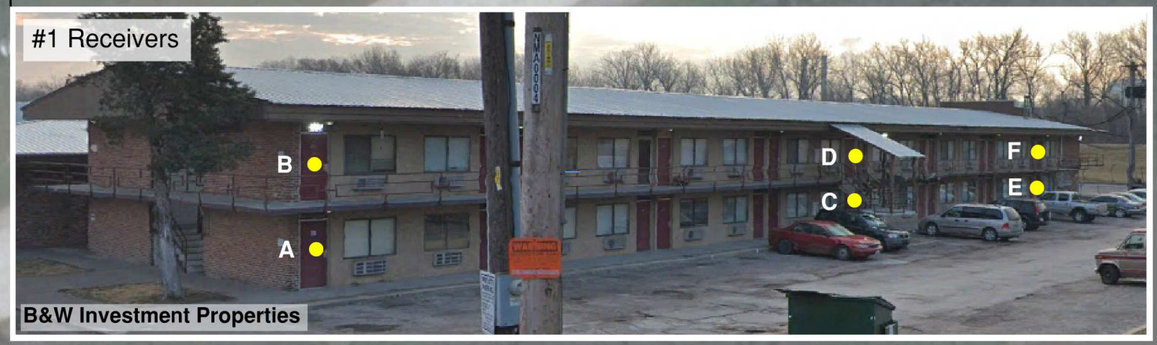
N

0 50 100 200 300

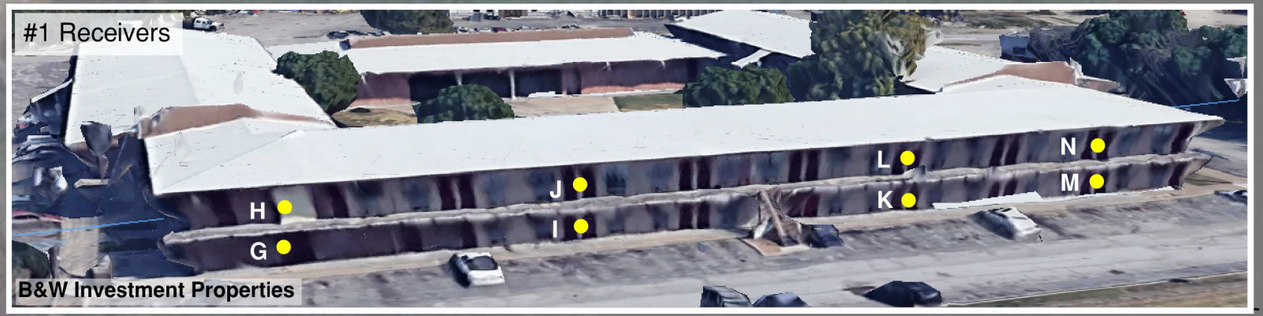
Feet

*MV-2 is located to the north, outside project limits

#1 Receivers



#1 Receivers



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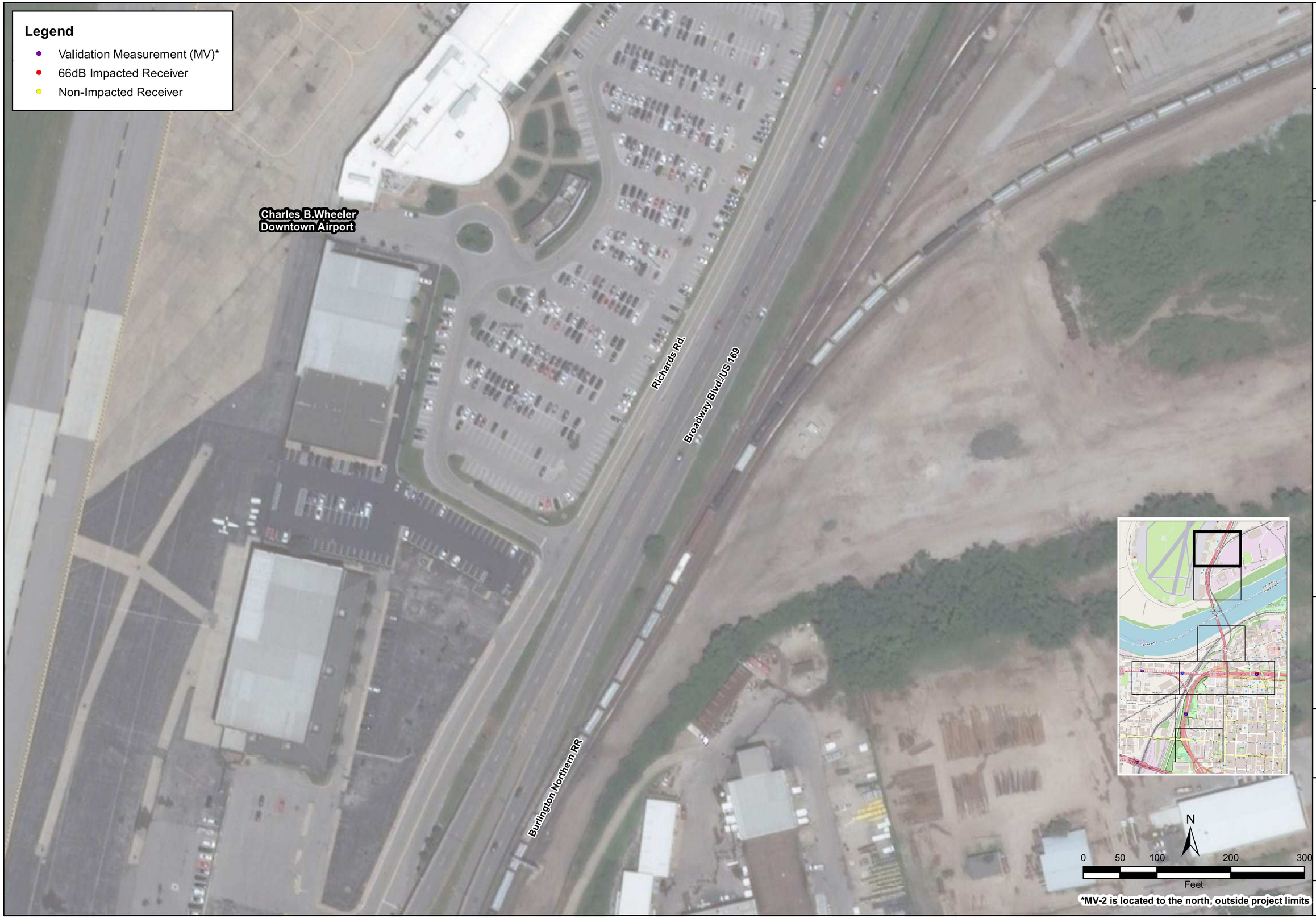
DESIGNED BY: RCM
DRAWN BY: CPS

NOISE ANALYSIS-CENTRAL BUILD

FIGURE NUMBER: F-7



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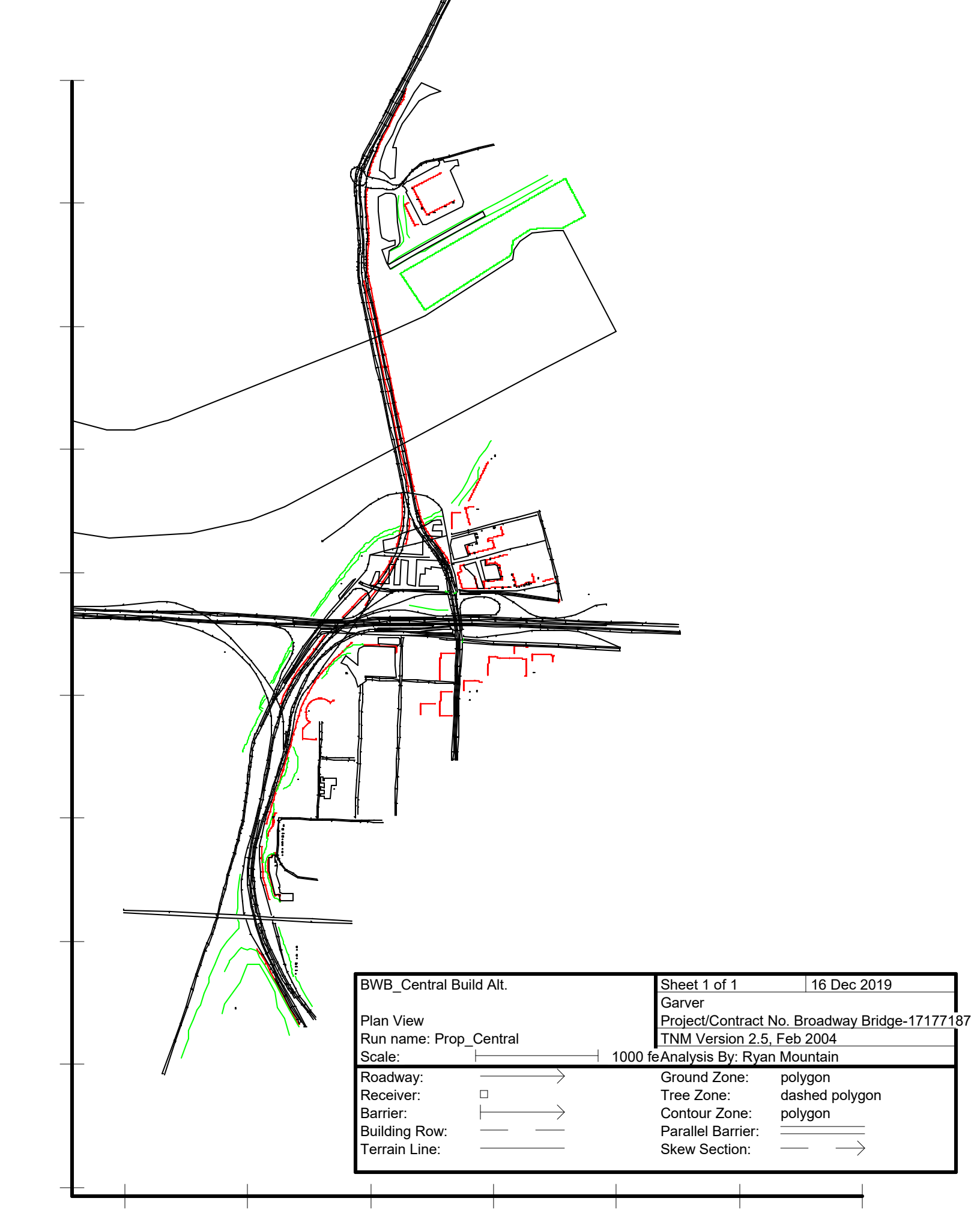
NOISE ANALYSIS-CENTRAL BUILD

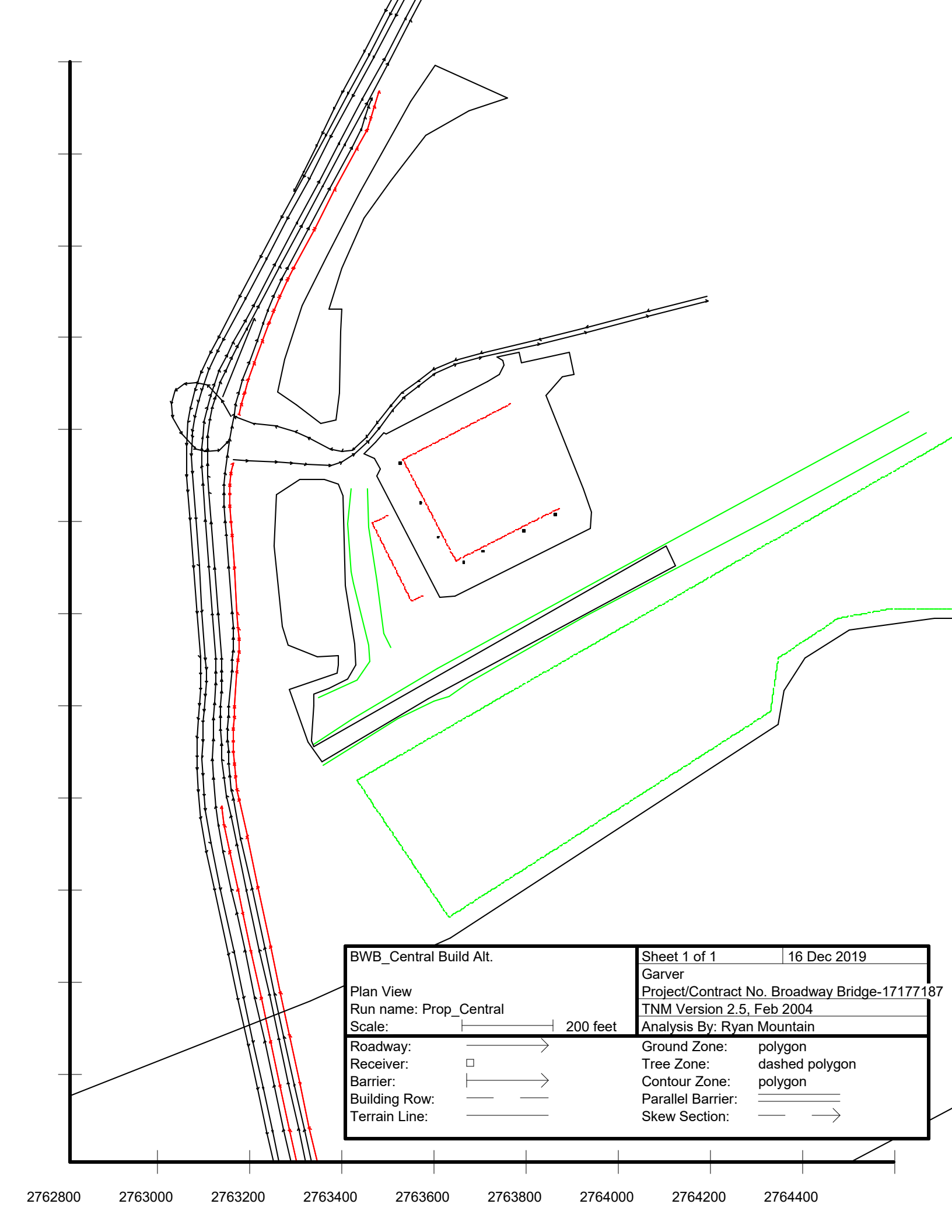
FIGURE NUMBER: F-8

TNM Plan Views



BWB_Central Build Alt.		Sheet 1 of 1	16 Dec 2019
		Garver	
Plan View		Project/Contract No. Broadway Bridge-17177187	
Run name: Prop_Central		TNM Version 2.5, Feb 2004	
Scale:	1000 fe	Analysis By: Ryan Mountain	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	


BWB_Central Build Alt.
Plan View
Run name: Prop_Central
Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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2763200
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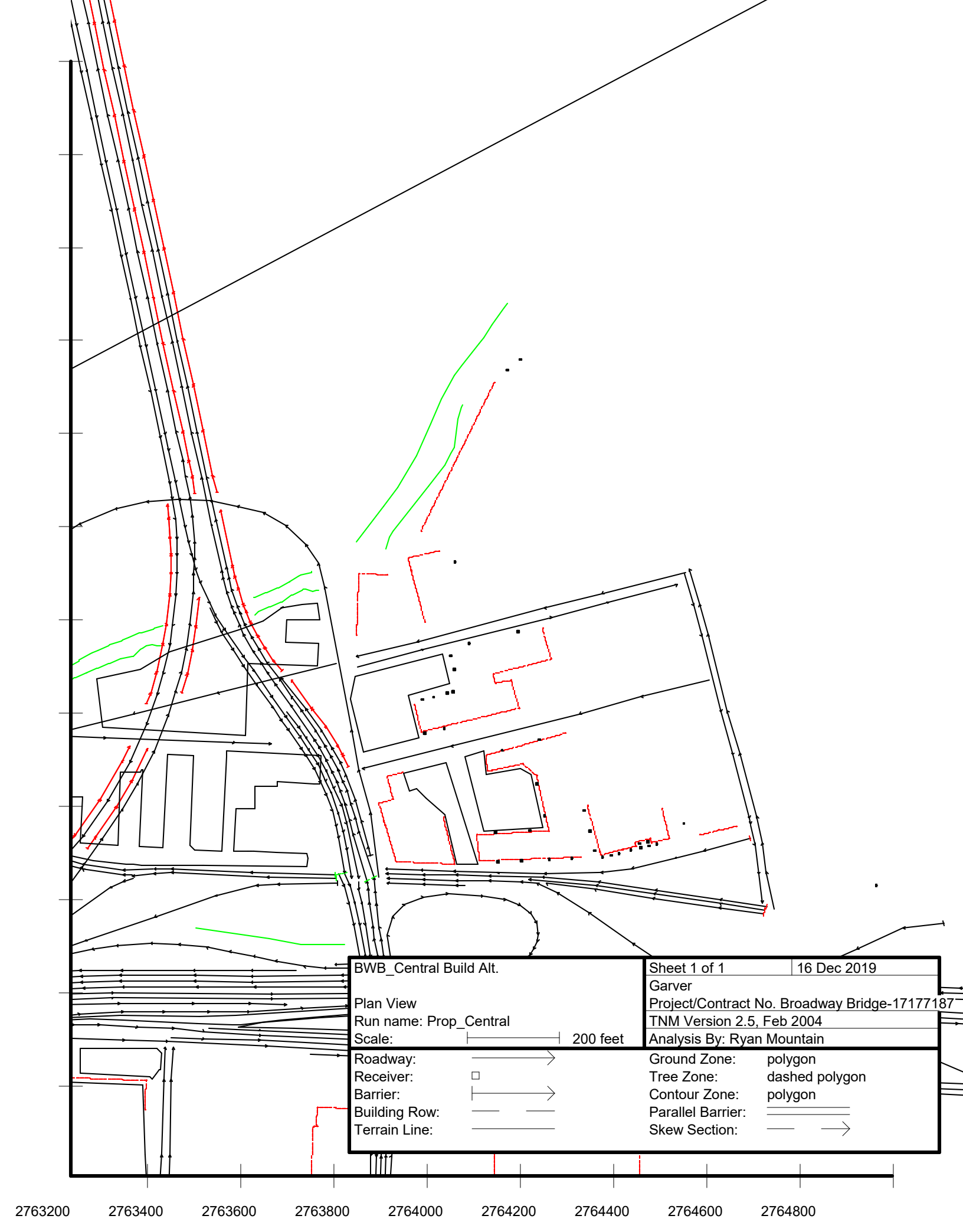
2763800
2764000
2764200
2764400


BWB_Central Build Alt.
Plan View
Run name: Prop_Central
Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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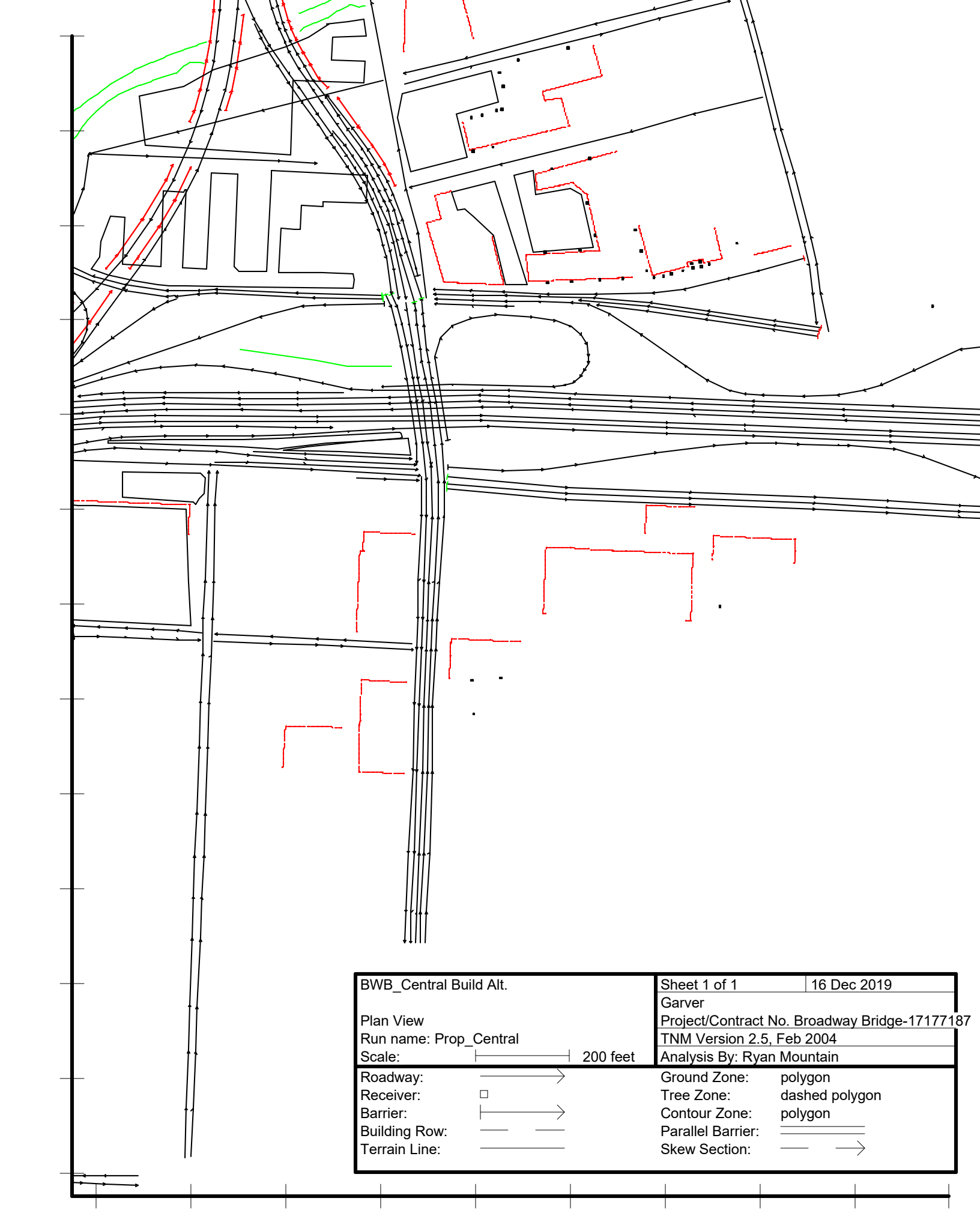
2764800


BWB_Central Build Alt.
Plan View
Run name: Prop_Central
Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
000
2763200
2763400
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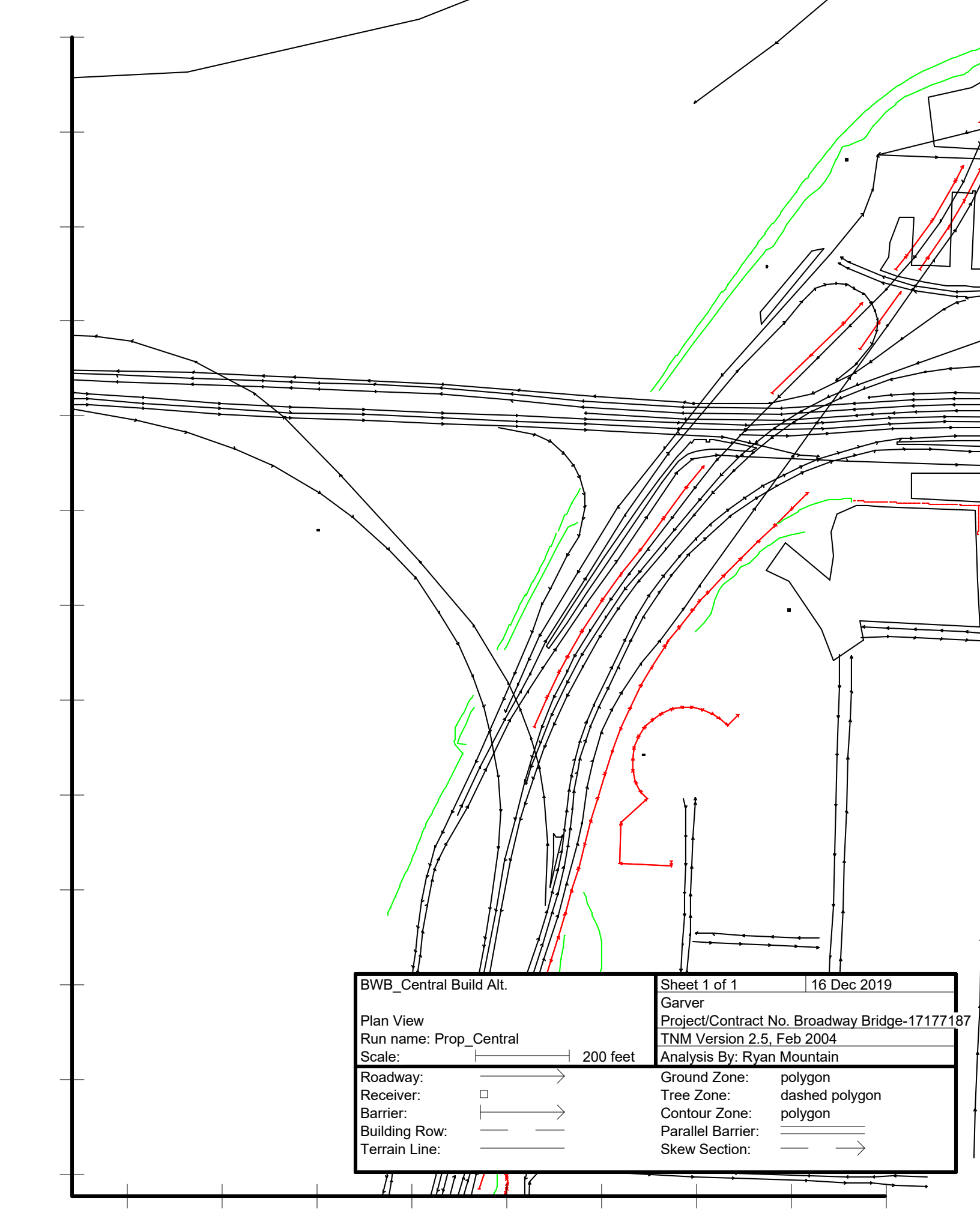
2764400
2764600
2764800


BWB_Central Build Alt.
Plan View
Run name: Prop_Central
Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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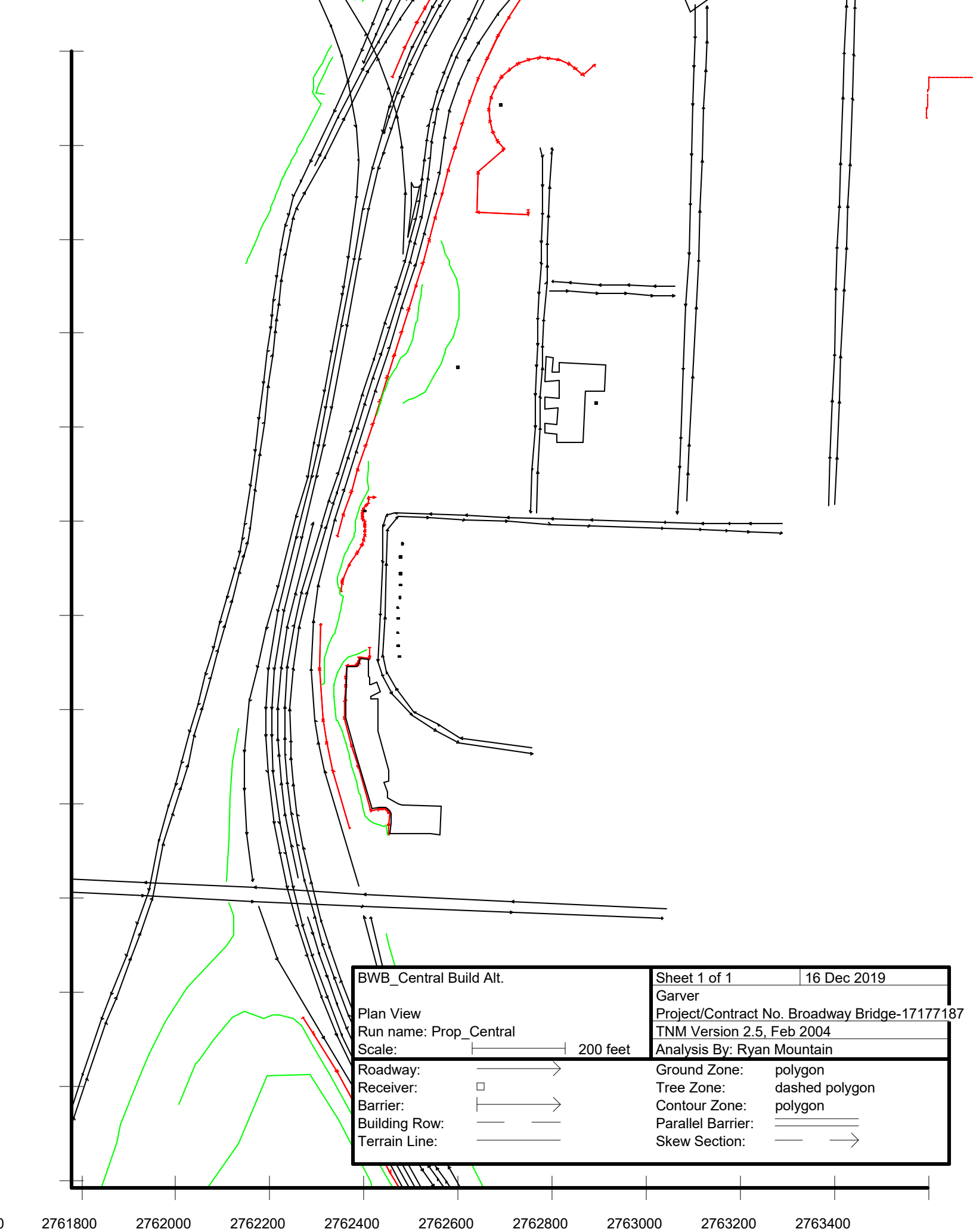
2762200
2762400
2762600
2762800
2763000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Plan View
Run name: Prop_Central
Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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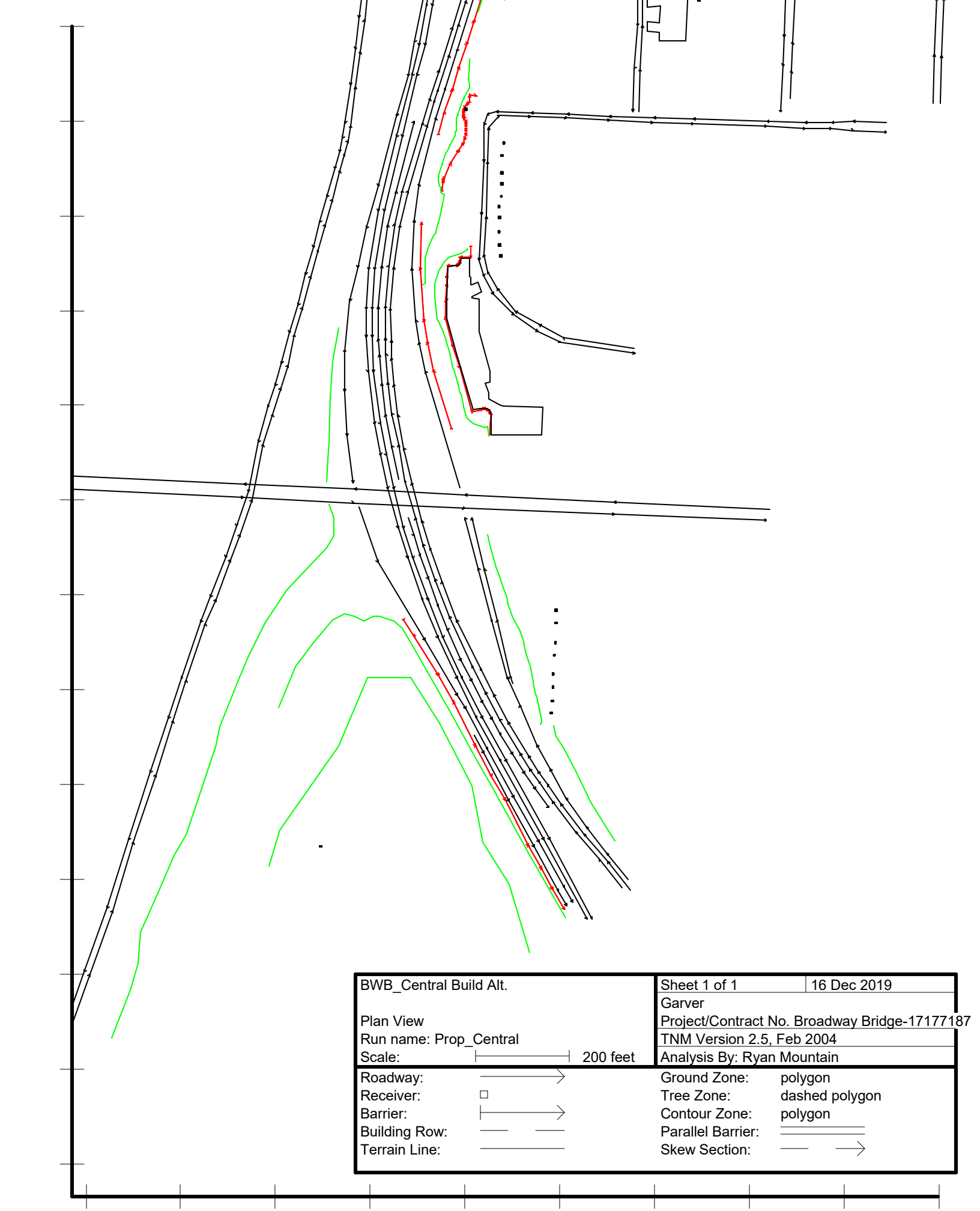
BWB_Central Build Alt.
Plan View
Run name: Prop_Central
Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
0
2761600
2761800
2762000
2762200
2762400
2762600
2762800
2763000
2763200

APPENDIX G

Adjacent Alternative Technical Memo and TNM Plan Views

Technical Memo*

***All technical memos were updated with R-22 (Owner: Planned Industrial Expansion Authority of KC) after submittal to MoDOT.**

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ADJACENT BUILD NOISE CONDITIONS

Date: December 6, 2019

To: MoDOT
Burns & McDonnell

Attn: Matt Burcham, MoDOT
Julie Sarson, Burns & McDonnell, Project Manager

From: Ryan Mountain, Garver

RE: Broadway/Buck O'Neil Bridge – Route 169
MoDOT No. 4S3085
Noise Study – 2040 Adjacent Build Condition Results

Copies To: Shari Cannon-Mackey, Burns & McDonnell, scannonmackey@burnsmcd.com
Chip Touzinsky, Garver, CETouzinsky@GarverUSA.com

Garver has completed the adjacent build traffic noise model run. This technical memo serves to document the results of adjacent build model conditions only. The adjacent build conditions TNM model consisted of utilizing the validated 2016 existing conditions TNM model as a baseline for determining future (2040[1]) traffic noise impacts should the adjacent build alternative be constructed. As with the other build alternatives, many impacts are anticipated under the projected 2040 adjacent build conditions, most of which are in multi-story apartment buildings. It should be noted that the majority of first row, first floor receivers were not impacted. Turning movement traffic data in the form of peak hour volumes for 2040 were utilized in the preparation of the adjacent build model. Receivers modeled are identical to those modeled in the existing TNM model. TNM modeling also included terrain lines, existing and proposed concrete parapet/safety walls, and retaining walls that serve as barriers. Solid concrete parapet walls replacing open safety walls adjacent to the proposed roadways would provide some shielding of those roadways as evidenced by reduced sound levels for some receivers (e.g., receiver series 1). Figures 1 - 2 depict the impacted receivers (red) and non-impacted receivers (yellow) under adjacent build conditions. Table 1 below summarizes the impacts associated with the 22 designated receiver sites, which represent 241 receivers.

Table 2 shows the detailed results of the 2040 adjacent build conditions compared to the 2016 existing conditions. Under the 2040 adjacent build conditions, 114 receivers are anticipated to approach[2], meet, or exceed the 67 dB(A) Leq(h) for Noise Abatement Criteria (NAC) Categories B and C. Under the 2040 adjacent build conditions, no receivers will experience a substantial increase (15 dBA or more).

[1] 2040/2045 disclaimer - The traffic analysis and any traffic-based environmental analysis 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 2025.
[2] Approaching the NAC B and C criteria includes receivers experiencing a noise level of 66 dB(A).

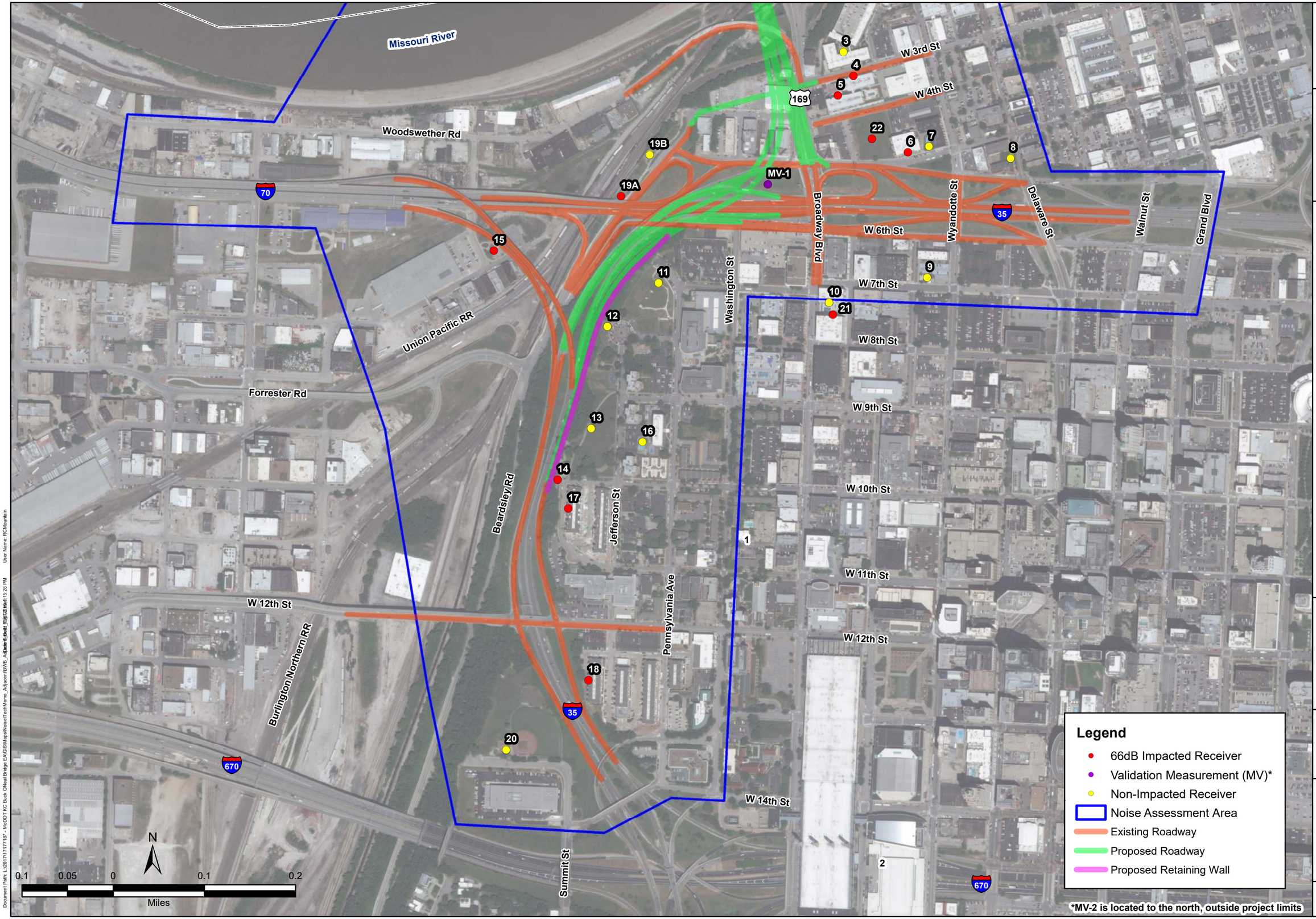
Table 1 - Receivers

Receiver Site	Adjacent Build dBA Level*	Dwelling Units Impacted
1	No impacts	--
2	No impacts	--
3	No impacts	--
4	68.5	13
5	69.9	27
6	70.5	15
7	No impacts	--
8	No impacts	--
9	No impacts	--
10	No impacts	--
11	No impacts	--

Receiver Site	Adjacent Build dBA Level*	Dwelling Units Impacted
12	No impacts	--
13	No impacts	--
14†	74.7	1
15†	68.4	1
16	No impacts	--
17	70.4	23
18	72.7	30
19†	67.1	1
20	No impacts	--
21	66.1	1
22	72.9	46

* Highest dBA result for set of receivers.
† Number of receivers will be determined based on park or trail usage.

3 Attachments: **Figure 1**
Figure 2
Table 2



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NOISE ANALYSIS-ADJACENT BUILD 2040

FIGURE NUMBER: 1

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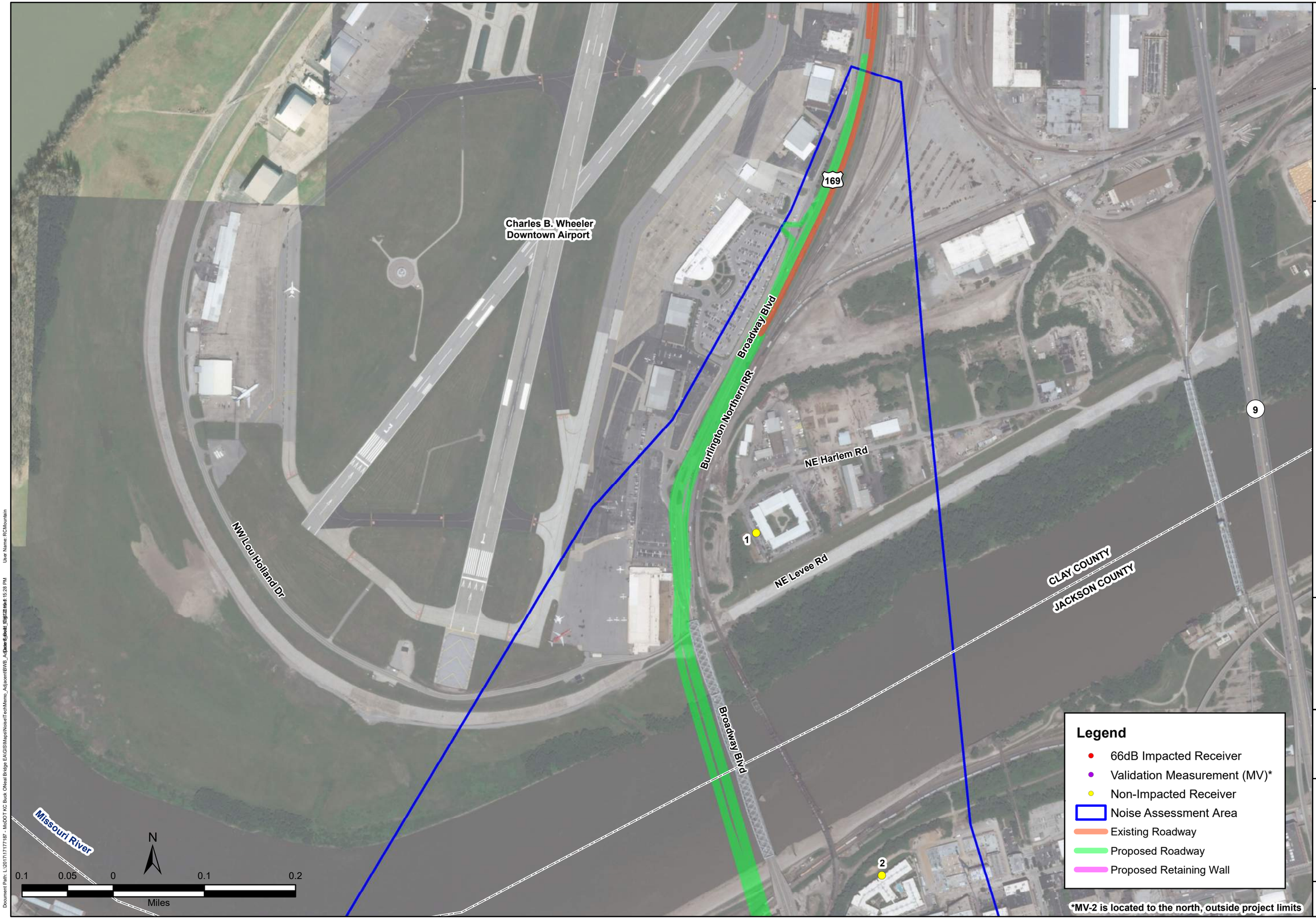

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NOISE ANALYSIS-ADJACENT BUILD 2040

FIGURE NUMBER: 2

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Garver 4-Dec-19
Ryan Mountain TNM 2.5
Calculated with TNM 2.5
TABLE 2 - ADJACENT BUILD SOUND LEVEL RESULTS
PROJECT/CONTRACT: Broadway Bridge-17177187
RUN: BWB_Adjacent Build Alt.

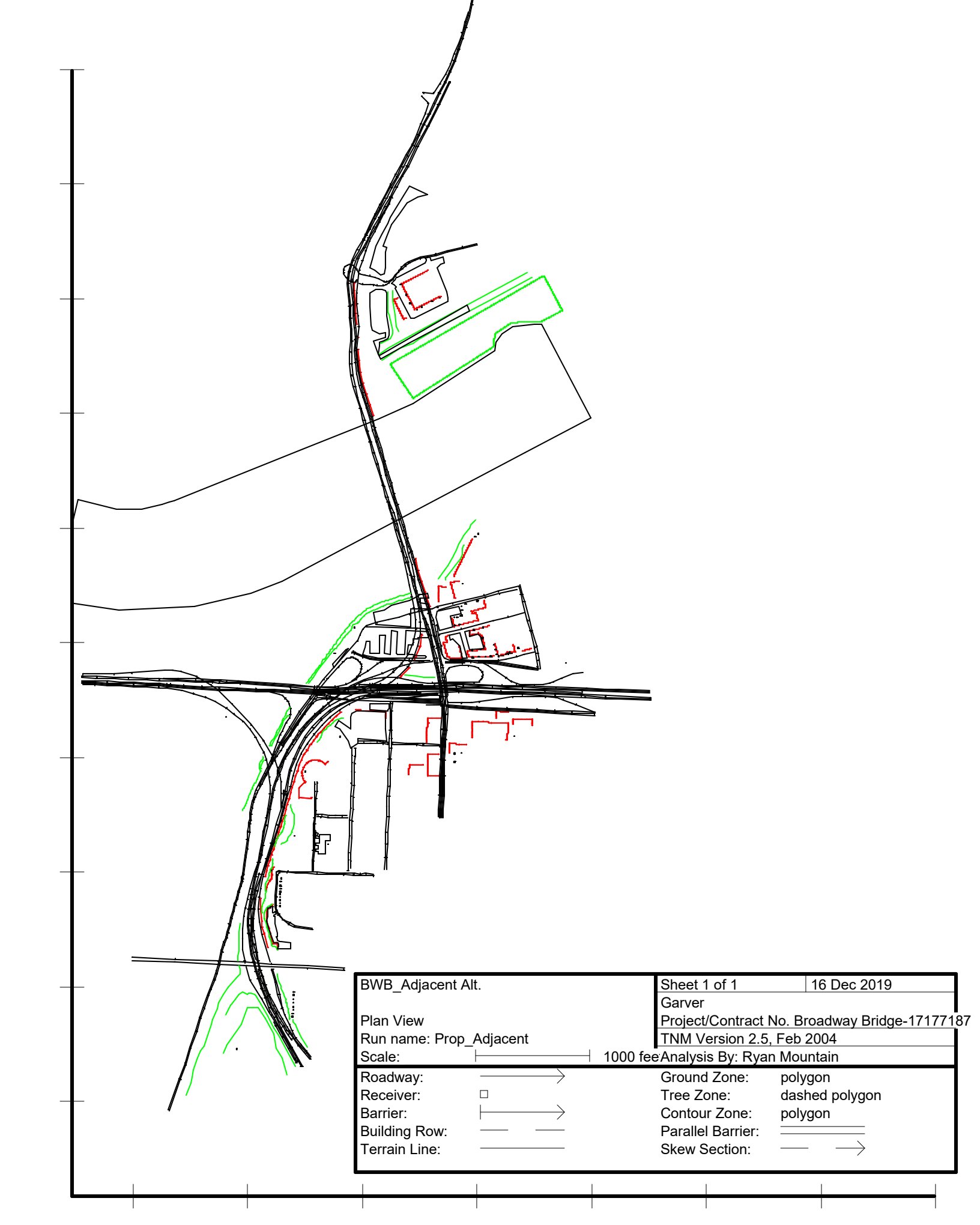
2040 Adjacent Build Conditions Impacted Receivers = 158	
1	First Row
5Q	Receiver No.
169B	Adjacent Highway

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 Adjacent Build dBA	Calculated dBA Difference
B&W Investment Properties with Balconies	1-1A-169B	1	4	62.5	62.2	-0.3
	1-1B-169B	2	4	64.1	65.2	1.1
	1-1C-169B	1	6	60.5	60	-0.5
	1-1D-169B	2	6	62.4	63.8	1.4
	1-1E-169B	1	6	58.5	58.8	0.3
	1-1F-169B	2	6	63.4	63.2	-0.2
	1-1G-169B	1	3	55.3	54.5	-0.8
	1-1H-169B	2	3	59.6	61.3	1.7
	1-1I-169B	1	4	55	54	-1
	1-1J-169B	2	4	58.6	60.3	1.7
	1-1K-169B	1	6	55	53.9	-1.1
	1-1L-169B	2	6	57.9	59.6	1.7
	1-1M-169B	1	5	54.7	53.5	-1.2
	1-1N-169B	2	5	57.2	58.9	1.7
Market Station Apartments with Balconies	1-2A-169B	1	1	62.9	62.9	0
	1-2B-169B	2	1	64.2	63.9	-0.3
	1-2C-169B	3	1	64.6	64.3	-0.3
	1-2D-169B	4	1	64.8	64.6	-0.2
	1-2E-169B	1	1	62.3	62.5	0.2
	1-2F-169B	2	1	63.6	63.5	-0.1
	1-2G-169B	3	1	64.2	64	-0.2
	1-2H-169B	4	1	64.4	64.3	-0.1
Market Station Apartments Common Area	1-3-169B	1	1	63.4	61.8	-1.6
River Market West Apartments - North Bldg. (2nd Row)	1-4B-169B	2	1	67.4	67.5	0.1
	1-4C-169B	3	1	67.9	68	0.1
	1-4D-169B	4	1	68	68.2	0.2
	1-4E-169B	5	1	68.2	68.4	0.2
	1-4F-169B	1	1	65.8	65.7	-0.1
	1-4G-169B	2	1	66	66.1	0.1
	1-4H-169B	3	1	66.6	66.7	0.1
	1-4I-169B	4	1	66.9	67.1	0.2
	1-4J-169B	5	1	67.2	67.6	0.4
	1-4K-169B	1	1	64	64.1	0.1
	1-4L-169B	2	1	63.4	63.9	0.5
	1-4M-169B	3	1	64.7	64.7	0
	1-4N-169B	4	1	65.1	65.2	0.1
	1-4O-169B	5	1	65.5	65.9	0.4
	1-4P-169B	1	1	61.5	61.8	0.3
	1-4Q-169B	1	1	66.5	66.5	0
	1-4R-169B	2	1	67.7	67.8	0.1
	1-4S-169B	3	1	67.9	68.1	0.2
	1-4T-169B	4	1	68.2	68.4	0.2
	1-4U-169B	5	1	68.3	68.5	0.2
River Market West Apartments - South Bldg. (2nd Row)	1-5A-169B	1	1	67.1	66.9	-0.2
	1-5B-169B	2	1	69.4	69.1	-0.3
	1-5C-169B	3	1	69.4	69.7	0.3
	1-5D-169B	4	1	69.4	69.8	0.4
	1-5E-169B	5	1	69.4	69.9	0.5
	1-5F-169B	1	1	66.5	66.2	-0.3
	1-5G-169B	2	1	68.6	68.4	-0.2
	1-5H-169B	3	1	68.9	69.1	0.2
	1-5I-169B	4	1	68.9	69.2	0.3
	1-5J-169B	5	1	68.9	69.3	0.4
	1-5K-169B	1	1	65.3	65.3	0
	1-5L-169B	2	1	67.7	67.6	-0.1
	1-5M-169B	3	1	68.3	68.3	0
	1-5N-169B	4	1	68.4	68.6	0.2
	1-5O-169B	5	1	68.4	68.7	0.3
	1-5P-169B	1	1	64.8	65	0.2
	1-5Q-169B	2	1	67.3	67.3	0
	1-5R-169B	3	1	68	68.1	0.1
	1-5S-169B	4	1	68.1	68.3	0.2
	1-5T-169B	5	1	68.2	68.5	0.3
	1-5U-169B	1	1	66.5	67	0.5
	1-5V-169B	2	1	69	69.1	0.1
	1-5W-169B	3	1	69.3	69.6	0.3
	1-5X-169B	4	1	69.4	69.7	0.3
	1-5Y-169B	5	1	69.5	69.8	0.3
	1-5Z-169B	1	1	65.3	65.6	0.3
	1-5AA-169B	2	1	67.6	68	0.4
	1-5BB-169B	3	1	68.2	68.7	0.5
	1-5CC-169B	4	1	68.5	68.9	0.4
	1-5DD-169B	5	1	68.6	69	0.4
Conover Place Condos	1-6A-I-70B	1	1	64.9	63.9	-1
	1-6B-I-70B	2	1	66.4	65.3	-1.1
	1-6C-I-70B	3	1	67.3	67	-0.3
	1-6D-I-70B	1	1	66	65.8	-0.2
	1-6E-I-70B	2	1	67.4	67.1	-0.3
	1-6F-I-70B	3	1	68	68.5	0.5
	1-6G-I-70B	1	1	68	69.1	1.1
	1-6H-I-70B	2	1	69.1	70	0.9
	1-6I-I-70B	3	1	69.3	70.5	1.2
	1-6J-I-70B	1	1	66.9	68.5	1.6
	1-6K-I-70B	1	1	65.9	67.3	1.4
	1-6L-I-70B	1	1	65.3	66.5	1.2
	1-6M-I-70B	1	1	64.9	65.9	1
	1-6N-I-70B	1	1	64.8	65.7	0.9
	1-6O-I-70B	1	1	64.6	65.5	0.9
	1-6P-I-70B	1	1	64.4	65.2	0.8
	1-6Q-I-70B	2	1	66.2	67.1	0.9
	1-6R-I-70B	3	1	67.7	68.5	0.8
	1-6S-I-70B	4	1	68.1	68.8	0.7
	1-6T-I-70B	2	1	66.4	67.2	0.8
	1-6U-I-70B	3	1	67.9	68.7	0.8
	1-6V-I-70B	4	1	68.3	69.1	0.8
Richards & Conover Lofts	1-7-I-70B	1	1	62.7	62.7	0
DeLofts	1-8-I-70B	1	1	64.8	64.8	0
Skyline Real Estate	2-9-I-70B	1	1	56.6	56.6	0
O'Reilly Investments	1-10A-BRB	1	1	62.7	64.1	1.4
	1-10B-BRB	1	1	62.7	61.9	-0.8
	1-10C-BRB	3	1	62.9	64.1	1.2
	1-10D-BRB	4	1	63.1	64.2	1.1
	1-10E-BRB	5	1	63.4	64.4	1
	1-10F-BRB	1	1	60.5	64.7	4.2
West Terrace Park	1-11-I-35B	1	1	63.4	64.7	1.3
Ermine Case Jr. Park	1-12-I-35B	1	1	64.1	64.6	0.5
	1-13-I-35B	1	1	62	62.7	0.7
	1-14-I-35B	1	1	73.6	74.7	1.1
Trialhead	1-15-I-35B	1	1	68.2	68.4	0.2
Quality Hill Apartments	1-16-JEB	1	1	54.2	55.1	0.9

Receiver Name	Receiver Number	Floor	Dwelling Units	2016 Existing dBA	2040 Adjacent Build dBA	Calculated dBA Difference
JVM Apex Apartments	1-17A-I-35B	1	1	64.4	65.1	0.7
	1-17B-I-35B	2	1	67.4	68.1	0.7
	1-17C-I-35B	3	1	69.1	69.9	0.8
	1-17D-I-35B	4	1	69.8	70.4	0.6
	1-17E-I-35B	1	1	63.9	64.3	0.4
	1-17F-I-35B	2	1	66	66.5	0.5
	1-17G-I-35B	3	1	67.9	68.5	0.6
	1-17H-I-35B	4	1	69	69.7	0.7
	1-17I-I-35B	1	1	64.3	64.7	0.4
	1-17J-I-35B	2	1	65.5	66	0.5
	1-17K-I-35B	3	1	67.1	67.6	0.5
	1-17L-I-35B	4	1	68.4	69	0.6
	1-17M-I-35B	1	1	64.6	64.9	0.3
	1-17N-I-35B	2	1	65.5	65.9	0.4
	1-17O-I-35B	1	1	64.8	65.1	0.3
	1-17P-I-35B	2	1	65.7	66.1	0.4
	1-17Q-I-35B	3	1	66.1	66.5	0.4
	1-17R-I-35B	4	1	67.9	68.3	0.4
	1-17S-I-35B	1	1	61	61.3	0.3
	1-17T-I-35B	2	1	63.6	64	0.4
	1-17U-I-35B	3	1	65.5	65.9	0.4
	1-17V-I-35B	4	1	67.5	67.9	0.4
	1-17W-I-35B	1	1	63.2	63.5	0.3
	1-17X-I-35B	2	1	64.6	64.9	0.3
	1-17Y-I-35B	1	1	64.2	64.5	0.3
	1-17Z-I-35B	2	1	65.1	65.4	0.3
	1-17AA-I-35B	3	1	66.3	66.8	0.5
	1-17BB-I-35B	4	1	68	68.5	0.5
	1-17CC-I-35B	3	1	67.1	67.6	0.5
	1-17DD-I-35B	4	1	68.5	69	0.5
	1-17EE-I-35B	1	1	64	64.5	0.5
	1-17FF-I-35B	2	1	65.6	66.2	0.6
	1-17GG-I-35B	3	1	67.4	68	0.6
	1-17HH-I-35B	4	1	68.6	69.2	0.6
	1-17II-I-35B	1	1	63.9	64.5	0.6
	1-17JJ-I-35B	2	1	66.9	67.5	0.6
	1-17KK-I-35B	3	1	68.7	69.4	0.7
	1-17LL-I-35B	4	1	69.6	70.2	0.6
Summit on Quality Hill	1-18A-I-35B	1	1	66.1	66.4	0.3
	1-18B-I-35B	2	1	68.5	68.8	0.3
	1-18C-I-35B	3	1	68.9	69.2	0.3
	1-18D-I-35B	4	1	68.9	69.2	0.3
	1-18E-I-35B	1	1	68.4	68.7	0.3
	1-18F-I-35B	2	1	69.4	69.7	0.3
	1-18G-I-35B	3	1	69.7	70.1	0.4
	1-18H-I-35B	4	1	69.7	70	0.3
	1-18I-I-35B	1	1	69.7	70	0.3
	1-18J-I-35B	2	1	70.6	71	0.4
	1-18K-I-35B	3	1	70.7	71	0.3
	1-18L-I-35B	4	1	70.6	70.9	0.3
	1-18M-I-35B	1	1	71	71.3	0.3
	1-18N-I-35B	2	1	71.7	72	0.3
	1-18O-I-35B	1	1	70.4	70.7	0.3
	1-18P-I-35B	2	1	71.1	71.5	0.4
	1-18Q-I-35B	1	1	71.8	72.1	0.3
	1-18R-I-35B	2	1	72.3	72.7	0.4
	1-18S-I-35B	3	1	72.1	72.5	0.4
	1-18T-I-35B	1	1	72.1	72.5	0.4
	1-18U-I-35B	3	1	71.1	71.4	0.3
	1-18V-I-35B	4	1	71	71.4	0.4
	1-18W-I-35B	1	1	68.9	69.3	0.4
	1-18X-I-35B	2	1	69.9	70.2	0.3
	1-18Y-I-35B	3	1	70.1	70.4	0.3
	1-18Z-I-35B	4	1	70	70.4	0.4
	1-18AA-I-35B	1	1	67	67.3	0.3
	1-18BB-I-35B	2	1	68.8	69.1	0.3
	1-18CC-I-35B	3	1	69.2	69.5	0.3
	1-18DD-I-35B	4	1	69.1	69.5	0.4
Trail	1-19A-BEB	1	1	66.5	67.1	0.6
	1-19B-BEB	1	1	62.2	64.2	2
Mulkey Park	1-20-I-35B	1	1	54.2	54.9	0.7
Roaster Block Apartments	1-21A-BRB	1	1	63.8	65.2	1.4
	1-21B-BRB	2	1	63.8	65.3	1.5
	1-21C-BRB	3	1	63.9	65.2	1.3
	1-21D-BRB	4	1	64.1	65.4	1.3
	1-21E-BRB	5	1	64.2	65.5	1.3
	1-21F-BRB	6	1	64.9	66.1	1.2
Owner: Planned Industrial Expansion Authority of KC*	1-22A-5thB	1	2	69.7	71.8	2.1
	1-22B-5thB	2	2	70.6	72.4	1.8
	1-22C-5thB	3	2	71	72.6	1.6
	1-22D-5thB	4	2	71.1	72.9	1.8
	1-22E-5thB	1	2	69.4	71.5	2.1
	1-22F-5thB	2	2	70.3	72.1	1.8
	1-22G-5thB	3	2	70.7	72.3	1.6
	1-22H-5thB	4	2	70.8	72.5	1.7
	1-22I-5thB	1	2	68.9	71	2.1
	1-22J-5thB	2	2	69.8	71.6	1.8
	1-22K-5thB	3	2	70.4	71.9	1.5
	1-22L-5thB	4	2	70.5	72.1	1.6
	1-22M-5thB	1	2	68.4	70.4	2
	1-22N-5thB	2	2	69.4	71.1	1.7
	1-22O-5thB	3	2	70.1	71.6	1.5
	1-22P-5thB	4	2	70.2	71.8	1.6
	1-22Q-5thB	1	1	63.4	65.5	2.1
	1-22R-5thB	2	1	65.4	67	1.6
	1-22S-5thB	3	1	66.4	67.7	1.3
	1-22T-5thB	4	1	68.1	69.2	1.1
	1-22U-5thB	1	2	62.3	64.6	2.3
	1-22V-5thB	2	2	64	65.9	1.9
	1-22W-5thB	3	2	65.3	66.7	1.4
	1-22X-5thB	4	2	67.2	68.3	1.1
	1-22Y-5thB	1	2	61.4	63.6	2.2
	1-22Z-5thB	2	2	63.3	65.2	1.9
	1-22AA-5thB	3	2	64.8	66.1	1.3
	1-22BB-5thB	4	2	66.3	67.4	1.1
	1-22CC-5thB	1	1	60.8	62.9	2.1
	1-22DD-5thB	2	1	62.9	64.7	1.8
	1-22EE-5thB	3	1	64.4	65.6	1.2
	1-22FF-5thB	4	1	65.6	66.7	1.1
	1-22GG-5thB	1	2	62.1	63.9	1.8
	1-22HH-5thB	2	2	63.9	65	1.1
	1-22II-5thB	3	2	64.5	65.5	1
	1-22JJ-5thB	4	2	65.9	66.8	0.9
	1-22KK-5thB	1	2	60	62.1	2.1
	1-22LL-5thB	2	2	62	63.5	1.5
	1-22MM-5thB	3	2	63.2	64.2	1
	1-22OO-5thB	4	2	64.6	65.5	0.9

* Apartment complex name is not available at this time.

TNM Plan Views



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		Garver	
Plan View		Project/Contract No. Broadway Bridge-17177187	
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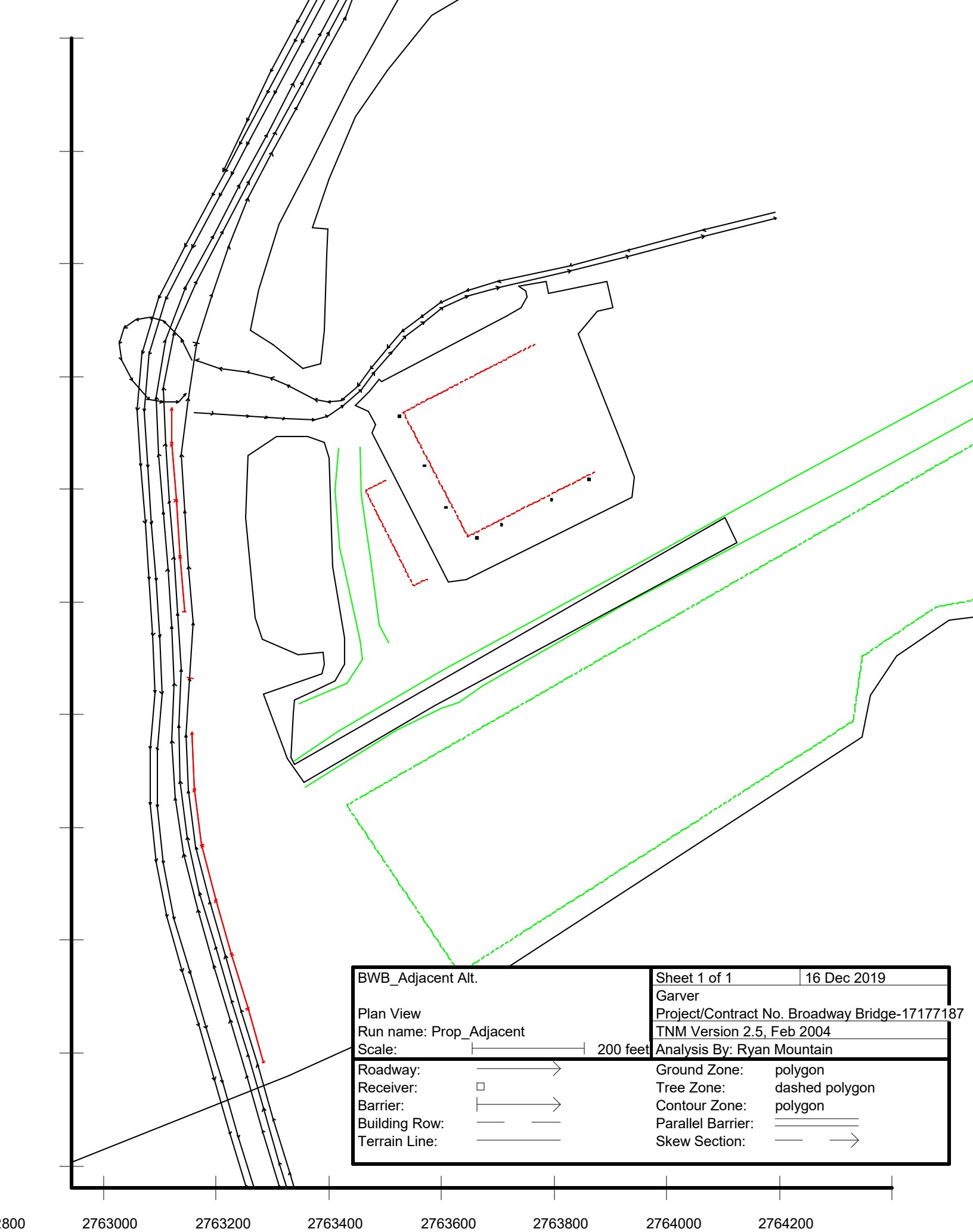
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	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Plan View
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Scale: 200 feet
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Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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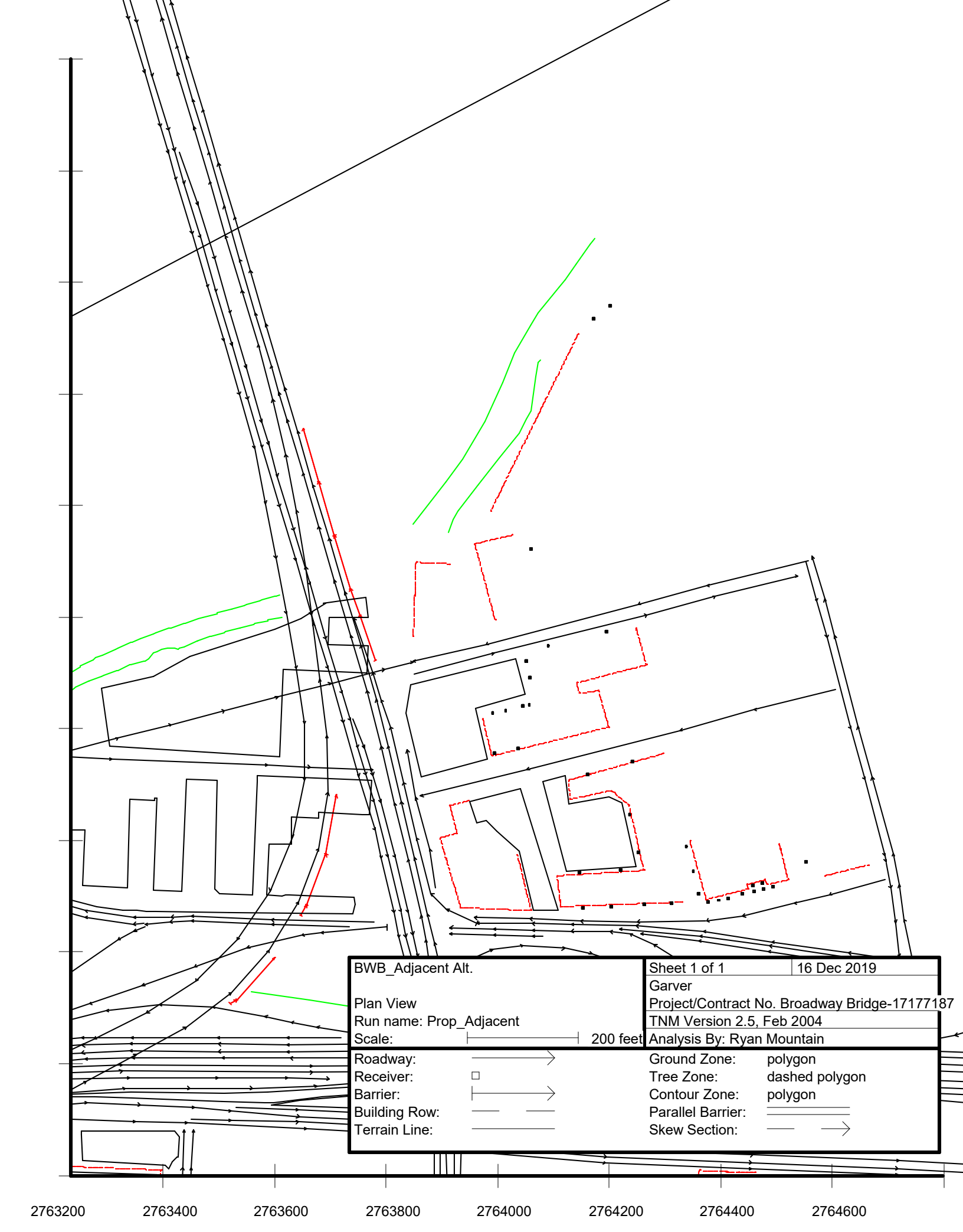
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16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
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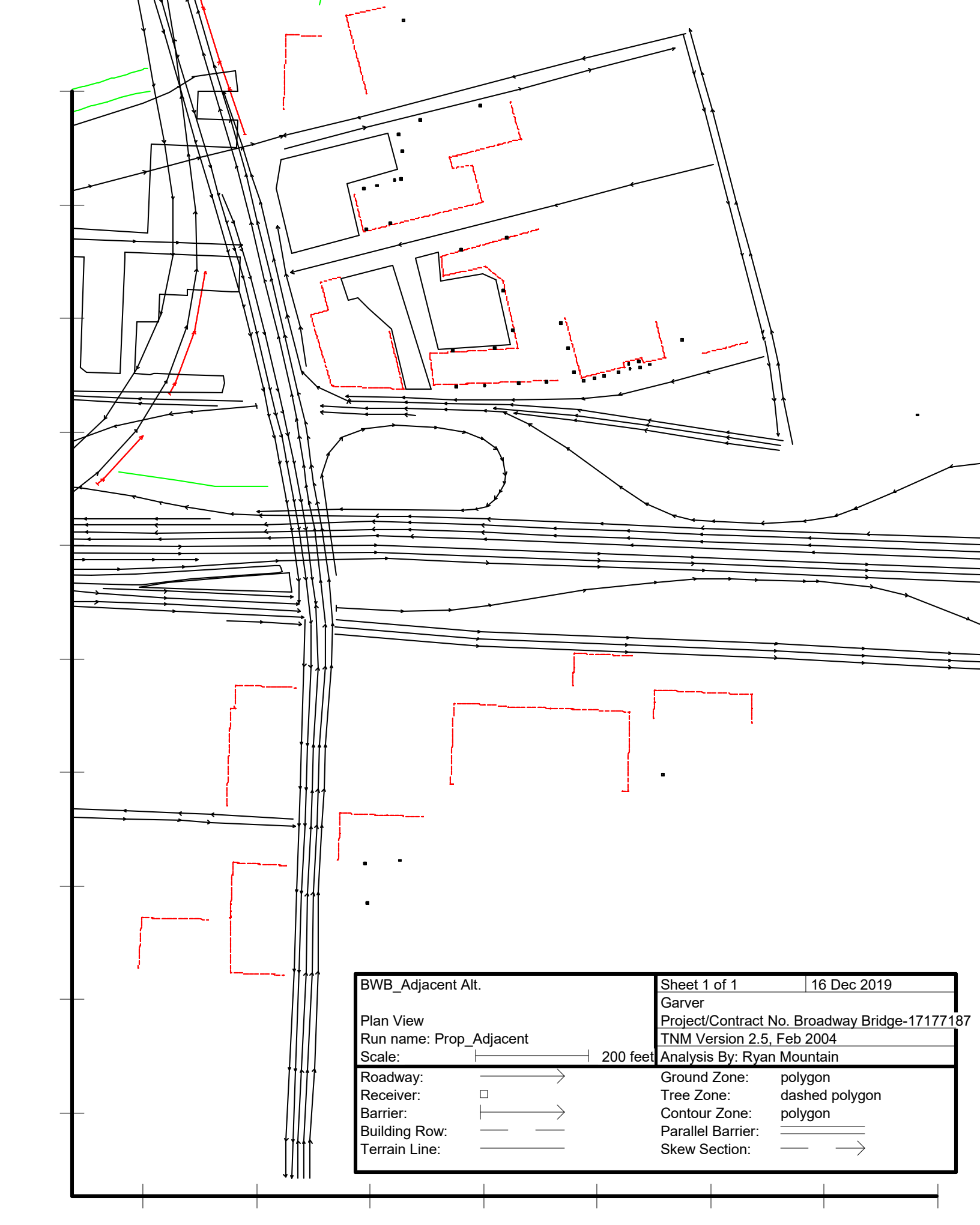
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Plan View
Run name: Prop_Adjacent
Scale: 200 feet
Sheet 1 of 1
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Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
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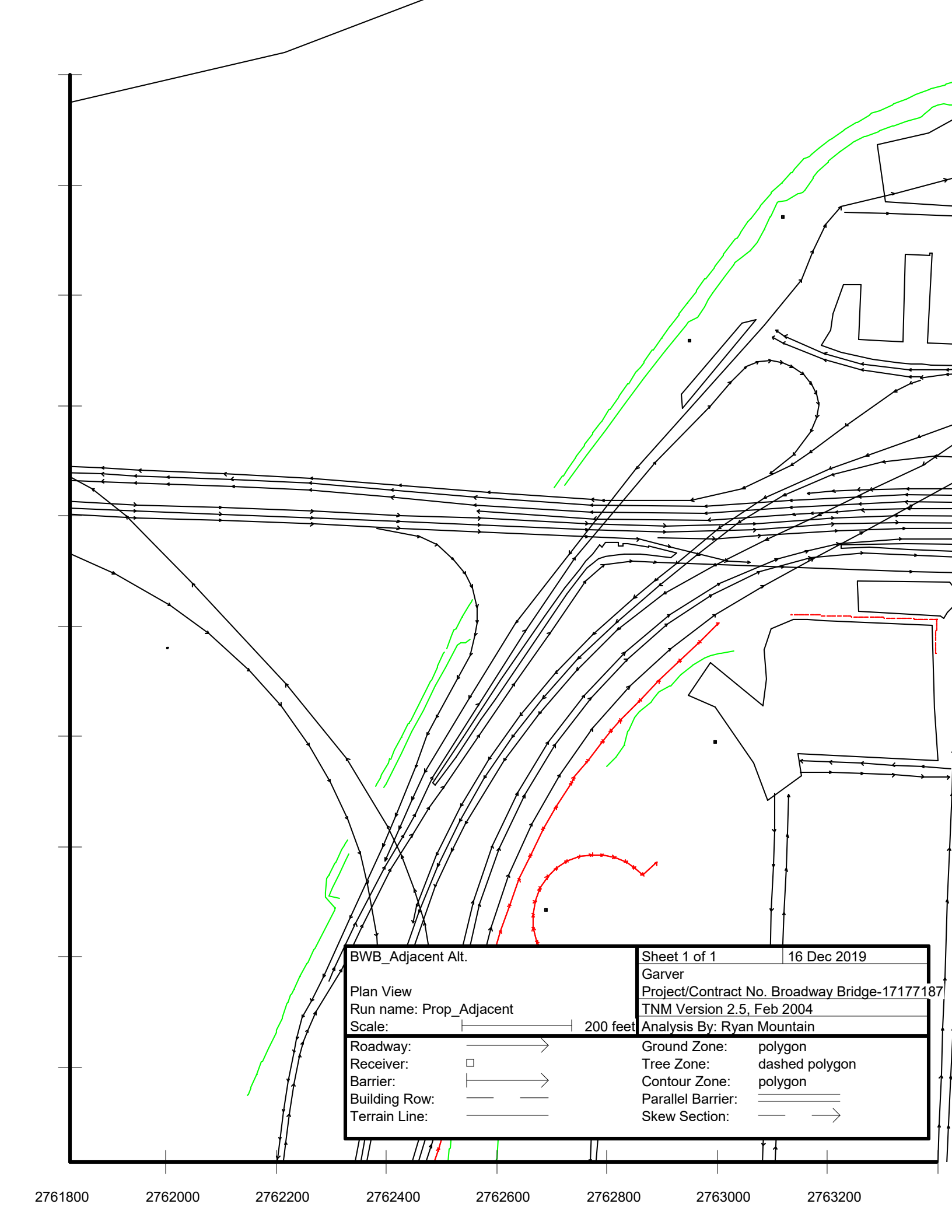
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Scale: 200 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
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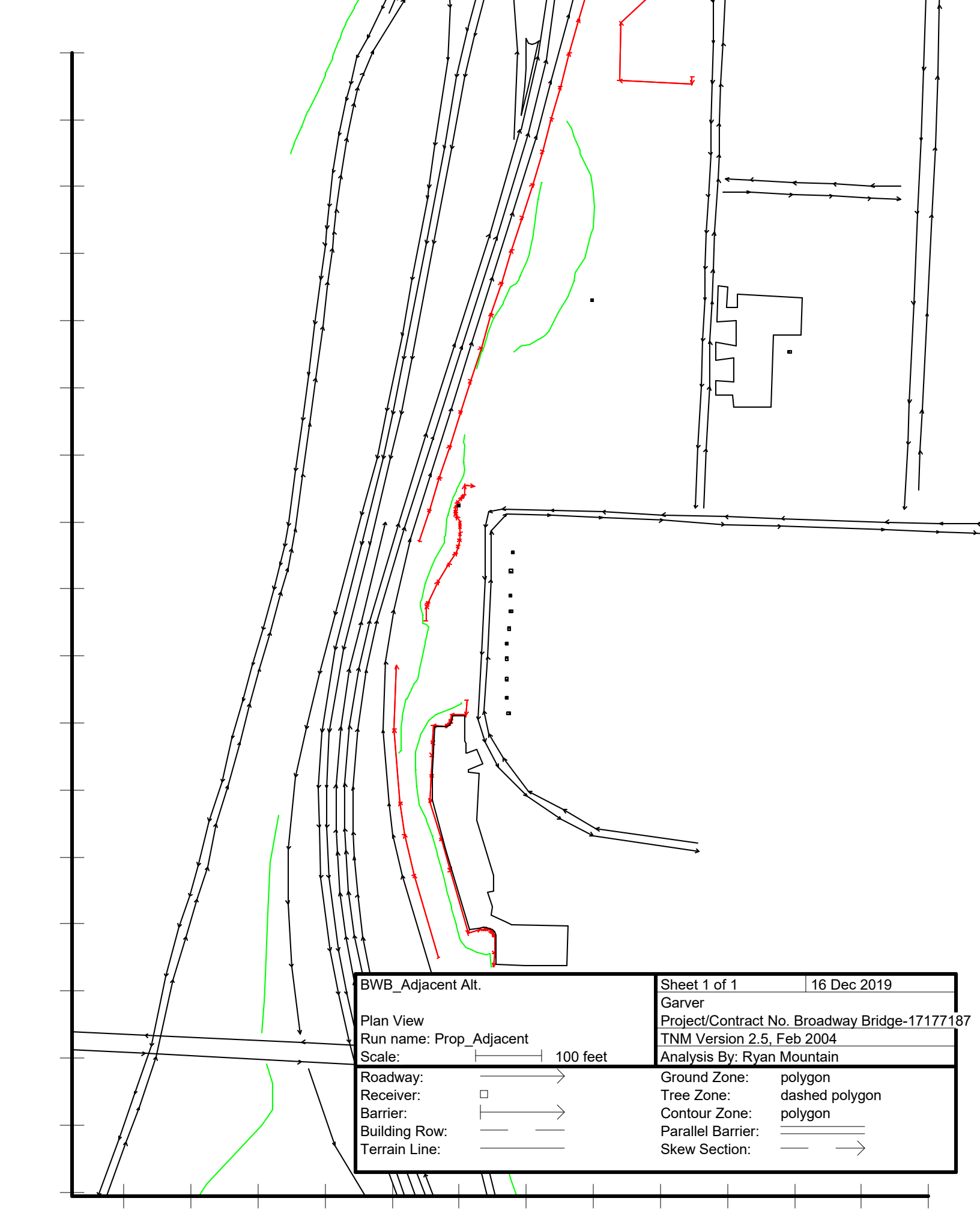
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Plan View
Run name: Prop_Adjacent
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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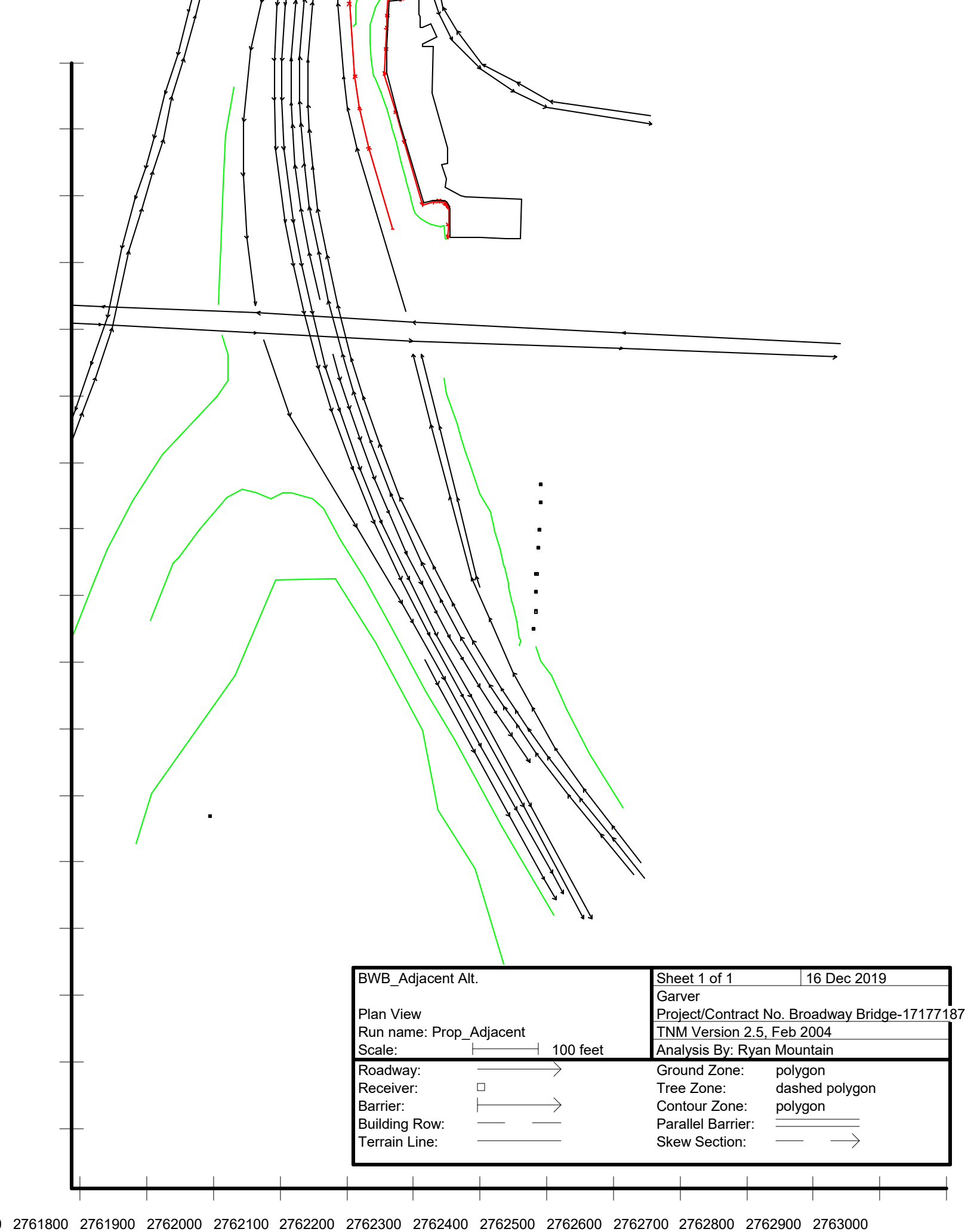
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Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
2761800
2761900
2762000
2762100
2762200
2762300
2762400
2762500
2762600
2762700
2762800
2762900
2763000

APPENDIX H

Noise Model Traffic Volumes for each Roadway Segment

Truck Percentages Existing Conditions
Peak Hour Volumes
Medium/Heavy AM (Medium/Heavy PM)

7%/1%
(17%/2%)

12%/1%
(6%/1%)

5%/4%
(6%/5%)

6%/4%
(5%/3%)

8%/4%
(7%/3%)

8%/5%
(8%/6%)

3%/2%
(4%/1%)

2%/1%
(3%/2%)

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

Truck Percentages Existing Conditions
Peak Hour Volumes
Medium/Heavy AM (Medium/Heavy PM)

7%/1%
(17%/2%)

12%/1%
(6%/1%)

5th St Ramps East
of Broadway:
4%/2%
(3%/2%)

5%/6%
(4%/3%)

5th St Ramps
West of Broadway:
5%/2%
(1%/3%)

5%/4%
(6%/5%)

5%/6%
(4%/3%)

6%/4%
(5%/3%)

8%/4%
(7%/3%)

8%/5%
(8%/6%)

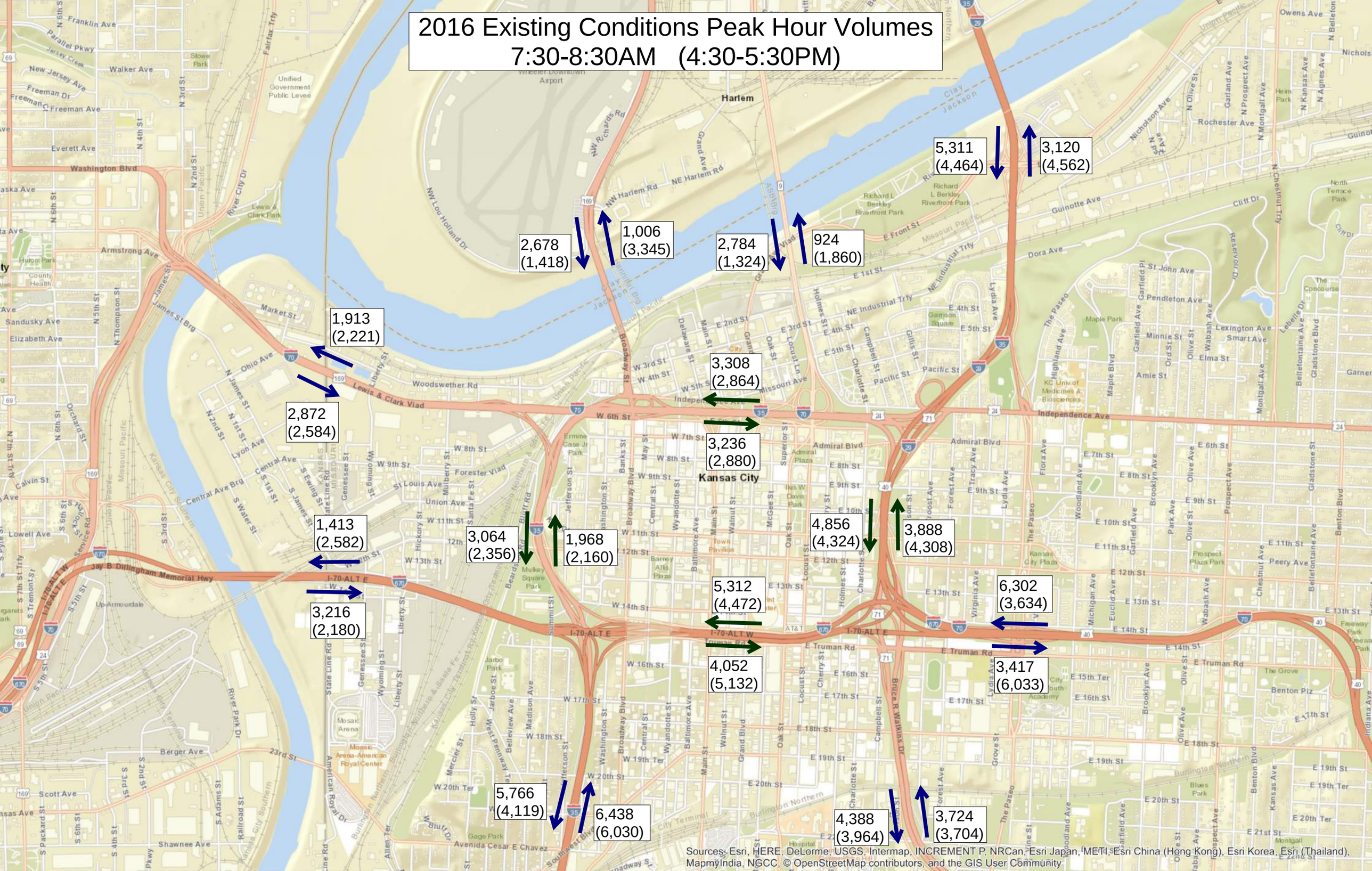
6th St Ramps East
of Broadway:
3%/2%
(1%/4%)

3%/2%
(4%/1%)

2%/1%
(3%/2%)

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

2016 Existing Conditions Peak Hour Volumes
7:30-8:30AM (4:30-5:30PM)



2016 EXISTING TRAFFIC TNM ENTRY					AM			PM		
Roadway Segment	AM - Peak Hourly Volume	PM - Peak Hourly Volume	# lanes	speed	Auto	MT	HT	Auto	MT	HT
1	1580	1952	2	45 & 55	469	26	32	922	49	59
2	1128	704	1	45	981	90	56	676	14	14
3	176	276	1		169	4	4	265	6	6
4	1268	856	1		1167	63	38	822	17	17
5	2372	2176	2 & 3	55	1056	59	71	2089	44	44
6	2832	2088	2	45	1246	113	57	2004	42	42
7	1728	2052	2	45	1659	35	35	1765	164	123
8	600	1348	1	45	576	12	12	1294	27	27
9	916	1688	4		879	18	18	405	8	8
10	1584	1248	1		1521	32	32	1198	25	25
11	412	488	1		396	8	8	468	10	10
12	314	116	1		301	6	6	111	2	2
13	3236	2880	3	45	971	65	43	2650	144	86
13b	2872	2584	4	55	639	36	43	2377	129	78
14	3308	2864	2		1505	83	66	2749	57	57
14c	2954		2	45	1344	74	59			
14d	1414		2	45	643	35	28			
15	54	243	1		52	1	1	233	5	5
16	344	1020	3	30	110	2	2	979	20	20
17	80	184	1		77	2	2	177	4	4
18	408	260	1		384	16	8	250	5	5
19	1006	3345	2		875	121	10	1555	100	17
20	2678	1418	2	45	1232	94	13	1149	241	28
21	238	139	1	35	209	19	10	133	3	3
21b	500	496	1	40	440	40	20	476	10	10
21c	3332	2584	3	45	977	89	44	1214	103	52
22	76	172	1	35	73	2	2	148	14	10
22b	2044	2332	1		1962	41	41	1003	93	70
22c	316	280	1	40	281	16	19	269	6	6
23	1968	2160	2	45	1712	157	98	929	86	65
24	3064	2356	2	45	1348	123	61	1908	401	47
26a	435	896		30	418	9	9	860	18	18
26b	279	401	2	30	137	3	3	192	4	4
26c	197	52		30	189	4	4	25	1	1
27a	44		1	25	42	1	1			
27b	2044	2332	2	30	1084	70	12	1084	70	23
28	182	421			87	2	2			
29	653				209	4	4			
31a	914	0	3	30	280	21	3			
32	1011		2	30	485	10	10			
33		1148						551	11	11
57	1006	3025	2	45				1407	91	15
58	2743	1418	2	45	1275	192	27			
59	3500		3	45	1050	70	47			
60	4	24	1	35	1	0	0	22	1	0
61	320	72	1	30	96	6	4	67	4	1
62	218	168	1	30	201	15	2	156	10	2

Enterred into Existing Rev 1 model

2040 NO-BUILD TRAFFIC TNM ENTRY					AM			PM		
Roadway Segment	AM - Peak Hourly Volume	PM - Peak Hourly Volume	# TNM lanes	speed	Auto	MT	HT	Auto	MT	HT
1	1690	2988	2 & 3	55	513	28	23	1412	75	90
2	1309	740	1	45	1165	105	65	710	15	15
3	208	354	1	35	200	4	4	340	7	7
4	1455	1085	1	35	1339	102	15	1042	22	22
5	2328	3027	2	45	1059	58	47	2906	61	61
6	3341	2441	2	45	1470	134	67	2343	49	49
7	1967	2103	2	45	1888	39	39	904	84	63
8	658	1363	1	45	632	13	13	1308	27	27
9	1027	1824	4	35	986	21	21	438	9	9
10	1886	1356	1	35	1697	94	75	1302	27	27
11	448	704	1	35	430	9	9	676	14	14
12	378	156	1	35	363	8	8	150	3	3
13	3397	3942	3	45	1019	68	45	3627	197	118
13b	2782	3588	4	55	626	42	28	3301	179	108
14	3882	4306	2	45	1766	97	78	4134	86	86
14c	3348	3921	2	45	1523	84	67			
14d	1482		2	55	674	37	30			
15	188	271	1	35	180	4	4	260	5	5
16	378	1322	3	30	121	3	3	1269	26	26
17	83	178	1	30	80	2	2	171	4	4
18	534	385	1	35	513	11	11	370	8	8
19	1310	3762	2	45	1140	157	13	1749	113	19
20	3096	1960	2	45	2848	217	31	1588	333	39
21	320	192	1	35	282	26	13	184	4	4
21b	454	561	1	40	400	36	18	539	11	11
21c	3795	3002	3	45	1113	101	51	1411	120	60
22	172	74	1	35	165	3	3	64	6	4
22b	2388	2310	1	45	2292	48	48	993	92	69
22c	421	207	1	40	366	34	21	199	4	4
23	2216	2236	2	45	1928	177	111	961	89	67
24	3475	2810	2	45	1529	139	70	2276	478	56
26a	516	1433	2	30	495	10	10	688	14	14
26b	245	416	2	30	120	2	2	399	8	8
26c	234	36	1	30	225	5	5	35	1	1
27a	20	69	1	25	19	0	0			
27b		2349	2	30				1092	70	12
28	1697	1457	2	30	815	17	17			
29	426	556	3	30	136	3	3			
31a	1669		2	30	768	58	8			
31b	397	345	1	30	365	28	4			
32	1576	708	2	30	756	16	16			
33	373	1566	2	30				752	16	16
45	202	95	1	30	188	12	2			
46	56	209	1	30	192	15	2			
47	4	24	1	30	23	0	0	23	0	0
57	1108	3667	2	45				1705	110	18
57b	1112	3692	2	45				1717	111	18
58	3096	1960	2	45	1424	108	15			
59	3327	3394	3	45	998	67	44			
60	50	20	2	30	24	1	1			

Entered into No-Bld Rev1 model

2040 WEST BUILD TRAFFIC TNM ENTRY					AM			PM		
Roadway Segment	AM - Peak Hourly Volume	PM - Peak Hourly Volume	# lanes	speed	Auto	MT	HT	Auto	MT	HT
1	1751	2626	2 & 3	45 & 55	519	29	35	1241	66	79
2	1383	722	1	45	1203	111	69	693	14	14
3	254	325	1	35	244	5	5	312	7	7
4	135	191	1	35	126	7	3	183	4	4
4b	1631	1271	1	35	1484	82	65	1220	25	25
5	2467	2254	2 & 3	55	1098	62	74	2164	45	45
5b	393	416	2	45	175	10	12	399	8	8
6	2465	1703	1	45	2169	197	99	1635	34	34
7	2547	2388	3	45	2445	51	51	685	64	48
8	276	650	1	45	265	6	6	624	13	13
9	2189	2016	4	35	525	11	11	484	10	10
10	1766	1462	2	45	777	71	35	1404	29	29
10b	4231	3165	2	45	1862	169	85	3038	63	63
11	464	488	1	35	445	9	9	468	10	10
12	461	209	1	35	443	9	9	201	4	4
13	3533	3024	3	45	1060	71	47	2782	151	91
13b	2948	3149	4	55	656	37	44	2897	157	94
14	3465	3644	2	45	1577	87	69	3498	73	73
14c	3107	3568	2	45	1414	78	62			
14d	1476	2297	2	55	672	37	30			
15	212	245	1	35	204	4	4	235	5	5
16	422	1070	3	30	135	3	3	342	7	7
18	570	321	1	35	536	23	11	308	6	6
19	1658	3826	3	45	1442	199	17	1186	77	13
19a	702	2751	2	45	611	84	7	1279	83	14
19b	1311	3668	2	45	1141	157	13	1706	110	18
19c	1333	3691	2	45	1160	160	13	1716	111	18
20	3928	2525	2	45	1807	137	20	2045	429	51
20a	2465	1703	2	45	1134	86	12	1379	290	34
20b	3928	2525	3	45	1205	92	13	2045	429	51
20c	3994	2837	2	45	1837	140	20	2298	482	57
20d	1397	794	2	45	643	49	7	643	135	16
21	424	250	1	35	373	34	17	240	5	5
21b	481	895	1	40	423	38	19	859	18	18
21c	4712	4060	3	45	1382	126	63	1908	162	81
22	107	192	1	35	103	2	2	165	15	12
22b	3012	2893	3	45	2892	60	60	829	77	58
22c	465	505	1	40	414	23	28	485	10	10
23	2905	2701	2	45	2527	232	145	1161	108	81
24	4210	3676	2	45	1852	168	84	2978	625	74
25	92	211	2	35	88	2	2	171	36	4
25b	39	20	2	35	37	1	1	16	3	0
26a	0	0	1	30	0	0	0	0	0	0
26b	475	1348	2	30	233	5	5	647	13	13
26c	590	195	1	30	566	12	12	187	4	4
27b	658	1890	2	30	822	113	9	879	57	9
29	405	477	3	30	130	3	3	229	10	10
31a	652	221	2	30	313	7	7			
32	1602	2084	2	30	769	16	16			
33	369	1391	2	30	177	4	4	668	14	14
45	347	158	1	45				147	9	2
47	22	23	1	45				21	1	0
48	1311	3691								
49	3928	2525								
59	3530	2745	2	45	1059	71	47			
62	966	1150	1	45				989	92	69
63										
64	66	28	1	35	63	1	1			

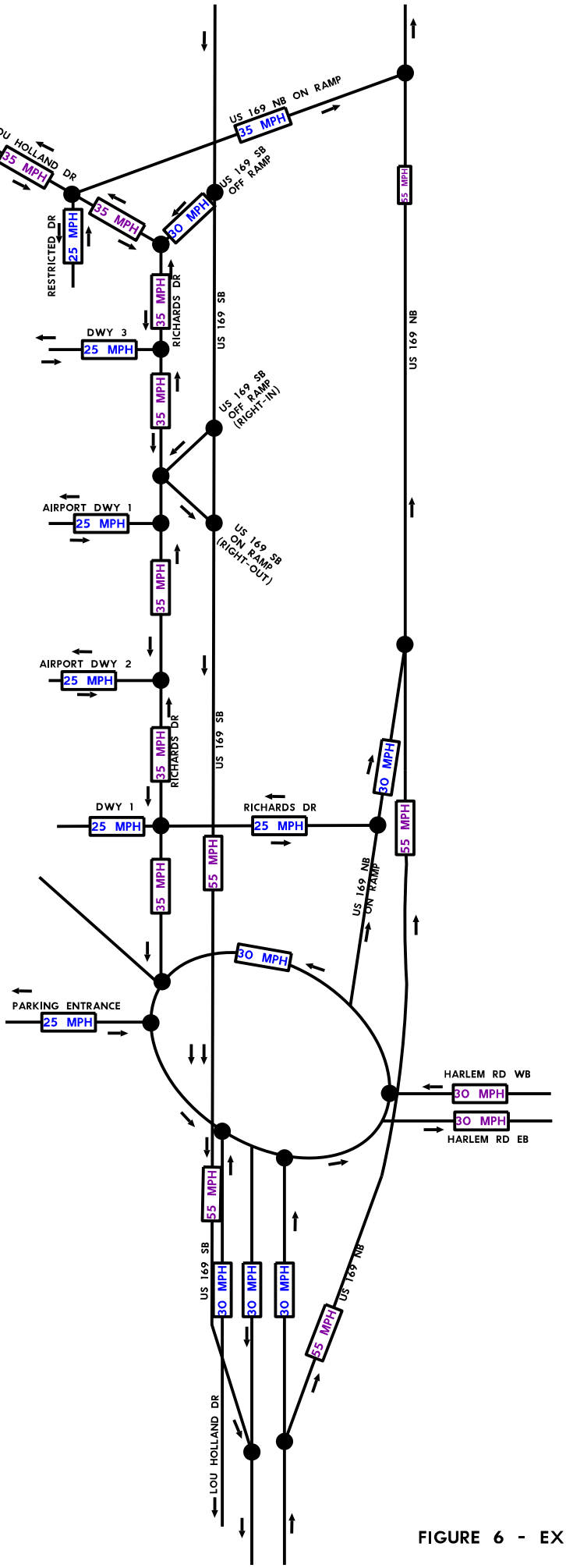
Entered into West Build model

2040 CENTRAL BUILD TRAFFIC TNM ENTRY					AM			PM		
Roadway Segment	AM - Peak Hourly Volume	PM - Peak Hourly Volume	# lanes	speed	Auto	MT	HT	Auto	MT	HT
1	1706	2604	2	45 & 55	776	43	34	1230	65	78
2	1383	722	1	45	1203	111	69	693	14	14
3	230	307	1	35	221	5	5	295	6	6
4	135	191	1	35	124	9	1	183	4	4
5	2467	2254	3	55	740	49	33	2164	45	45
5b	2147	2023	2	45	966	64	43		40	40
6	1766	1462	2	45	1554	71	35	1404	29	29
7	1659	1372	2	45	1593	33	33	590	55	41
8	276	650	1	45	265	6	6	624	13	13
9	638	1007	4	35	612	13	13	242	5	5
10	1631	1271	1	45	1484	82	65	1220	25	25
11	476	492	1	35	452	14	10	472	10	10
12	461	209	1	35	438	14	9	201	4	4
13	3545	3028	3	45	1064	71	47	2786	151	91
13b	2948	3149	4	55	663	44	29			
14	3465	3644	2	45	1577	87	69	3498	73	73
14c	3107	3568	2	45	1414	78	62			
14d	1476	2297	2	45/55	672	37	30			
15	212	245	1	35	204	4	4	235	5	5
16	433	1125	3	30	139	3	3	1080	23	23
17	83	178	1	30	80	2	2	171	4	4
18	570	321	1	35	536	23	11	308	6	6
19	1658	3826	3	45	1442	199	17	1779	115	19
20	3928	2525	2	45	1807	137	20	2045	429	51
21	424	250	1	35	373	34	17	240	5	5
21b	481	895	1	40	423	38	19	859	18	18
21c	2247	2357	3	45	659	60	30	1108	94	47
22	107	192	1	35	103	2	2	165	15	12
22b	2046	1743	3	45	1964	41	41	500	46	35
22c	387	371	1	40	337	31	19	356	7	7
23	2905	2701	2	45	2527	232	145	1161	108	81
24	4210	3676	2	45	1852	168	84	2978	625	74
26a	230	1098	1	30	221	5	5	1054	22	22
26b	256	305	2	30	125	3	3	146	3	3
26c	590	195	1	30	566	12	12	187	4	4
27b	462	1578	2	30	686	95	8	734	47	8
28	288	357	2	30	138	3	3	171	4	4
29	442	548	3	30	140	4	3	526	11	11
31a	1521	639	3	30	700	53	8			
31b	443	269	1	30	204	16	2			
32	1591	688	2	30	764	16	16			
33	369	1391	2	30				668	14	14
57	1311	3668	3	45				1137	73	12
59	2147	2023	3	45	644	43	29			
60	66	28	2	30	32	1	1			
61	2387	1569	1	45	2101	191	95			
62	966	1150	1	45				989	92	69
63	1541	956	1, 2 & 3	45	473	36	5			
64	320	231	1	35	307	6	6			

Entered into Central Build model

2040 ADJACENT BUILD TRAFFIC TNM ENTRY					AM			PM		
Roadway Segment	AM - Peak Hourly Volume	PM - Peak Hourly Volume	# TNM lanes	speed	Auto	MT	HT	Auto	MT	HT
1	1706	2988	2 & 3	45 & 55	506	28	34	1412	75	90
2	1383	740	1	45	1203	111	69	710	15	15
3	208	307	1	35	200	4	4	295	6	6
4	135	191	1	35	126	7	3	183	4	4
4b	1631	1271	1	35	1484	82	65	1220	25	25
4c	1766	1085	2	45	777	71	35	1042	22	22
5	2467	3027	3	45	732	41	49	2906	61	61
5b	2147	2654	2	45	955	54	64	2548	53	53
6	2387	2441	2	45	1098	84	12	2343	49	49
7	1659	1372	2	45	1593	33	33	590	55	41
8	276	650	1	35	265	6	6	624	13	13
9	638	1007	4	35	612	13	13	242	5	5
10b	4153	1462	2	45	1827	166	83	1404	29	29
11	476	492	1	35	452	14	10	472	10	10
12	461	156	1	35	443	9	9	150	3	3
13	3545	3028	3	45	1064	71	47	2786	151	91
13b	2948	3588	4	55	656	37	44	3301	179	108
14	3465	4306	2	45	1577	87	69	4134	86	86
14b	3677		2	55	1673	92	74			
14c	3107	3568	2	45	1414	78	62			
14d	1476	2297	2	55	672	37	30			
15	212	245	1	35	204	4	4	235	5	5
16	433	1125	3	30	139	3	3	1080	23	23
17	73	178	1	30	70	1	1	171	4	4
18	570	321	1	35	536	23	11	308	6	6
19a	1310	3826	2	45	1140	157	13	1779	115	19
19b	1310	3826	3	45	1140	157	13	1186	77	13
19c	1311	3668	2	45	1141	157	13	1706	110	18
19d	1333	3691	2	45	1160	160	13	1716	111	18
20	3928	2525	2	45	1807	137	20	2045	429	51
20b	3928	2525	3	45	1205	92	13	2045	429	51
20c	3928	2525	3	45	1205	92	13	2045	429	51
20d	66	312	1	45	61	5	1	253	53	6
20e	3862	2213	2	45	1777	135	19			
20f	25	13	1	30	23	2	0			
21b	481	895	1	40	423	38	19	859	18	18
21c	4634	3002	3	45	1359	124	62	1411	120	60
22b	3012	2893	3	45				829	77	58
22c	387	371	1	40	344	19	23	356	7	7
26a	1076	1598	1	30	1033	22	22	1534	32	32
26b	256	305	2	30	246	5	5	146	3	3
26c	590	195	1	30	566	12	12	187	4	4
27a		2676	3	40				830	54	9
27b		1578	2	30				734	47	8
28	296	335	2	30	142	3	3			
29	442	548	3	30	141	3	3			
31a	1964		2	30	943	20	20			
31b	443	269	1	30	425	9	9			
31c	1541	956	2	40	709	54	8			
31e	1541	956	3	40	473	36	5			
32	1591	688	2	30	764	16	16			
33	369	1391	2	30				668	14	14
45	347	158	1	45	302	42	3			
47	22	23	1	45	22	0	0	21	1	0
59	3530	2745	3	45	1059	71	47			
60	66	28	2	30	32	1	1			
62	966	1150	1	45	840	77	48	1104	23	23

Entered into Adjacent Build model



LEGEND

- ● STUDY INTERSECTIONS
- XX MPH EXISTING SPEED LIMIT
- XX MPH SPEED LIMIT ASSUMED

FIGURE 6 - EXISTING SPEED LIMITS

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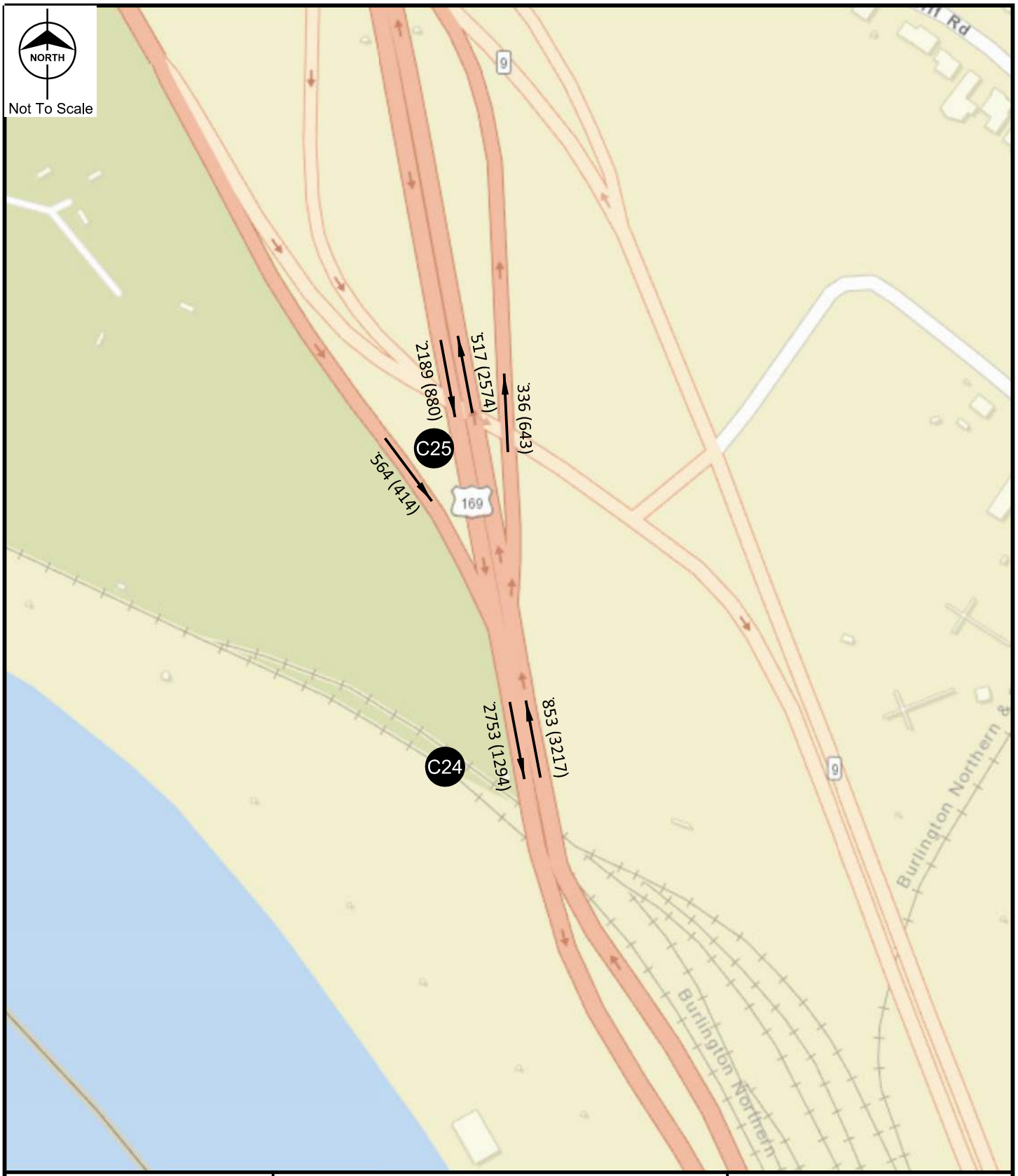
Exhibit Layout Orientation

Exhibit 1.0

LEGEND

Exhibit Number



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2016 Existing Conditions

Exhibit 2.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date July 2019

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2016 Existing Conditions

Exhibit 2.2

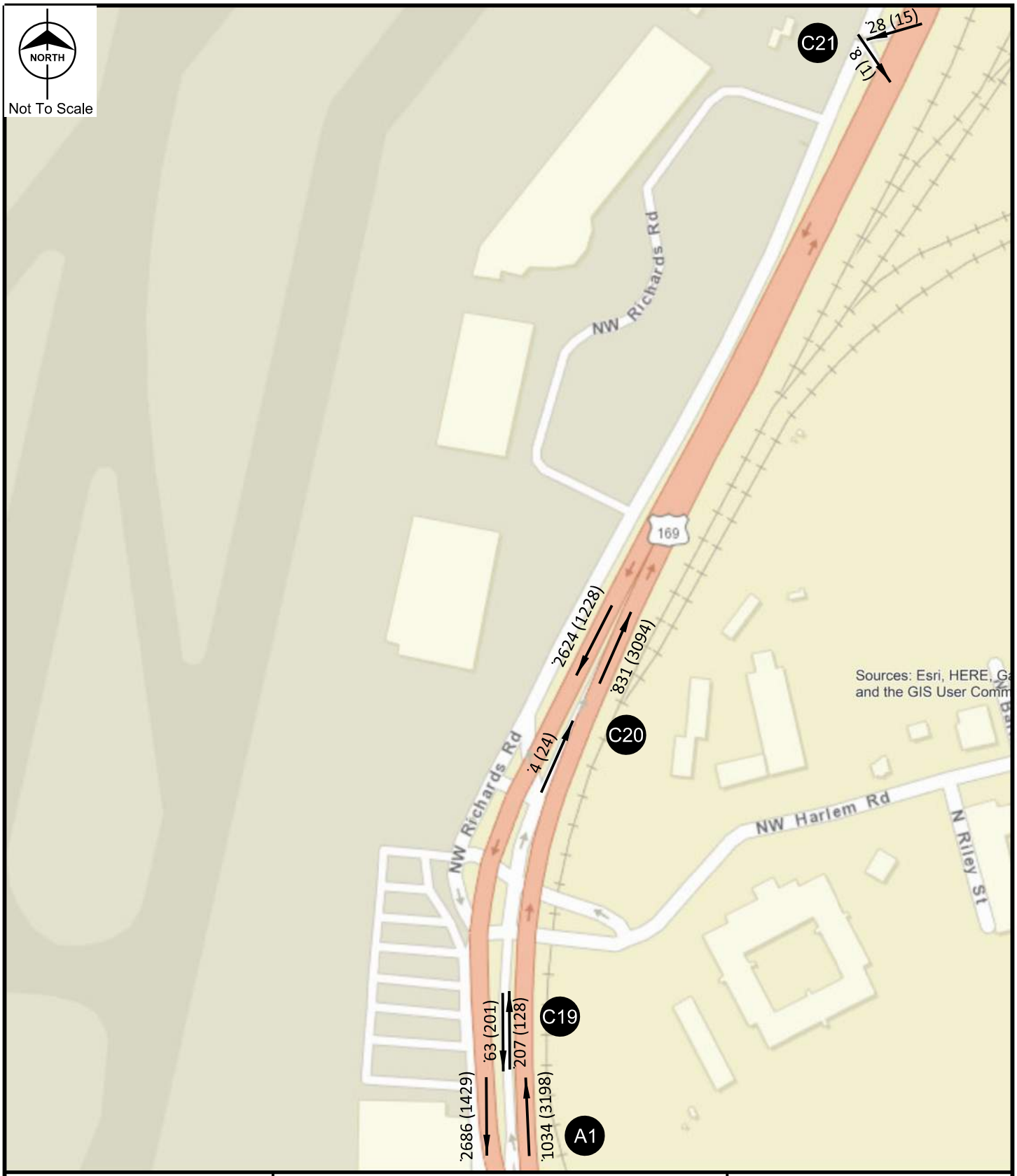
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2016 Existing Conditions

Exhibit 2.3

date	July 2019
designed	T. Cope

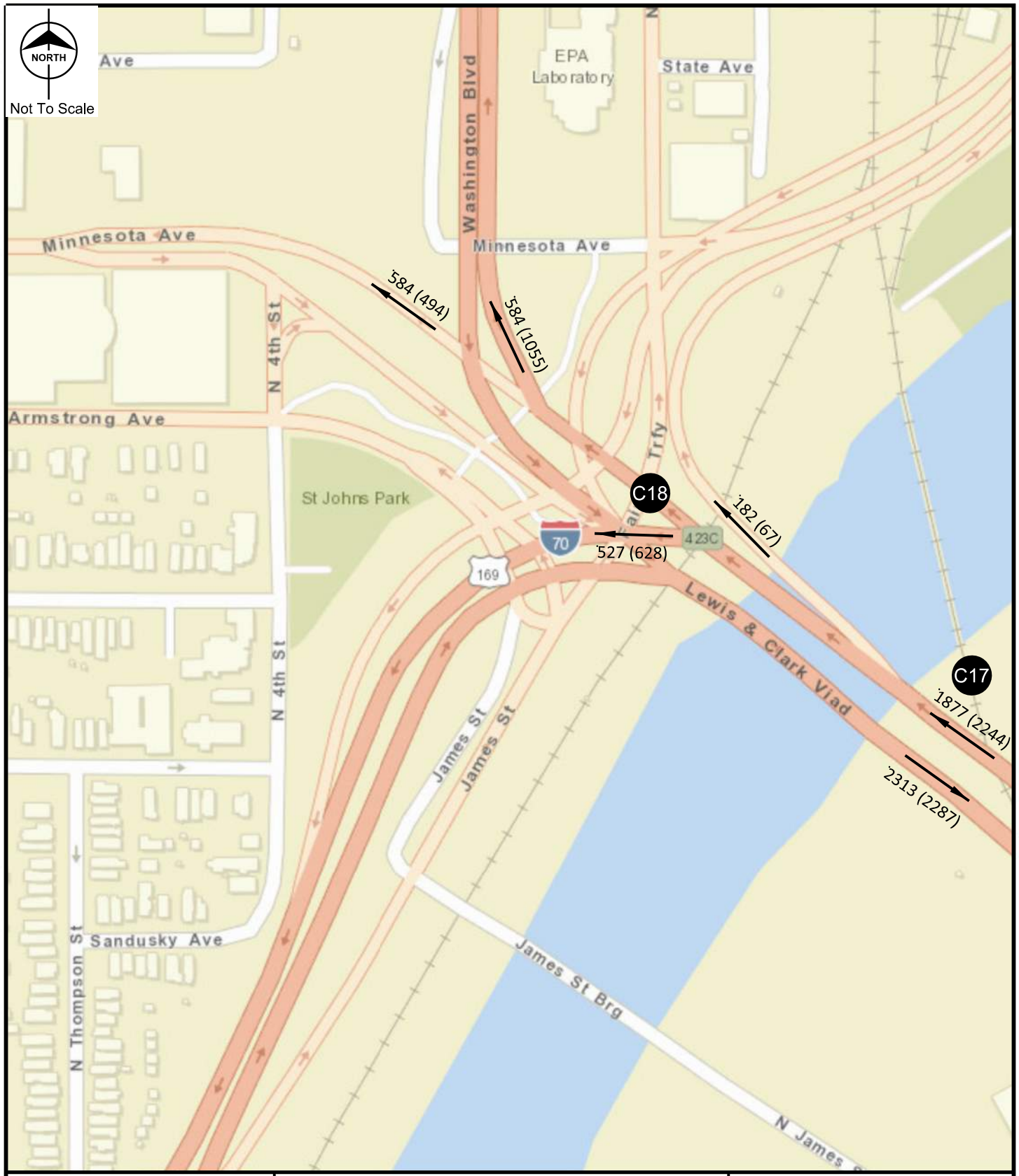
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
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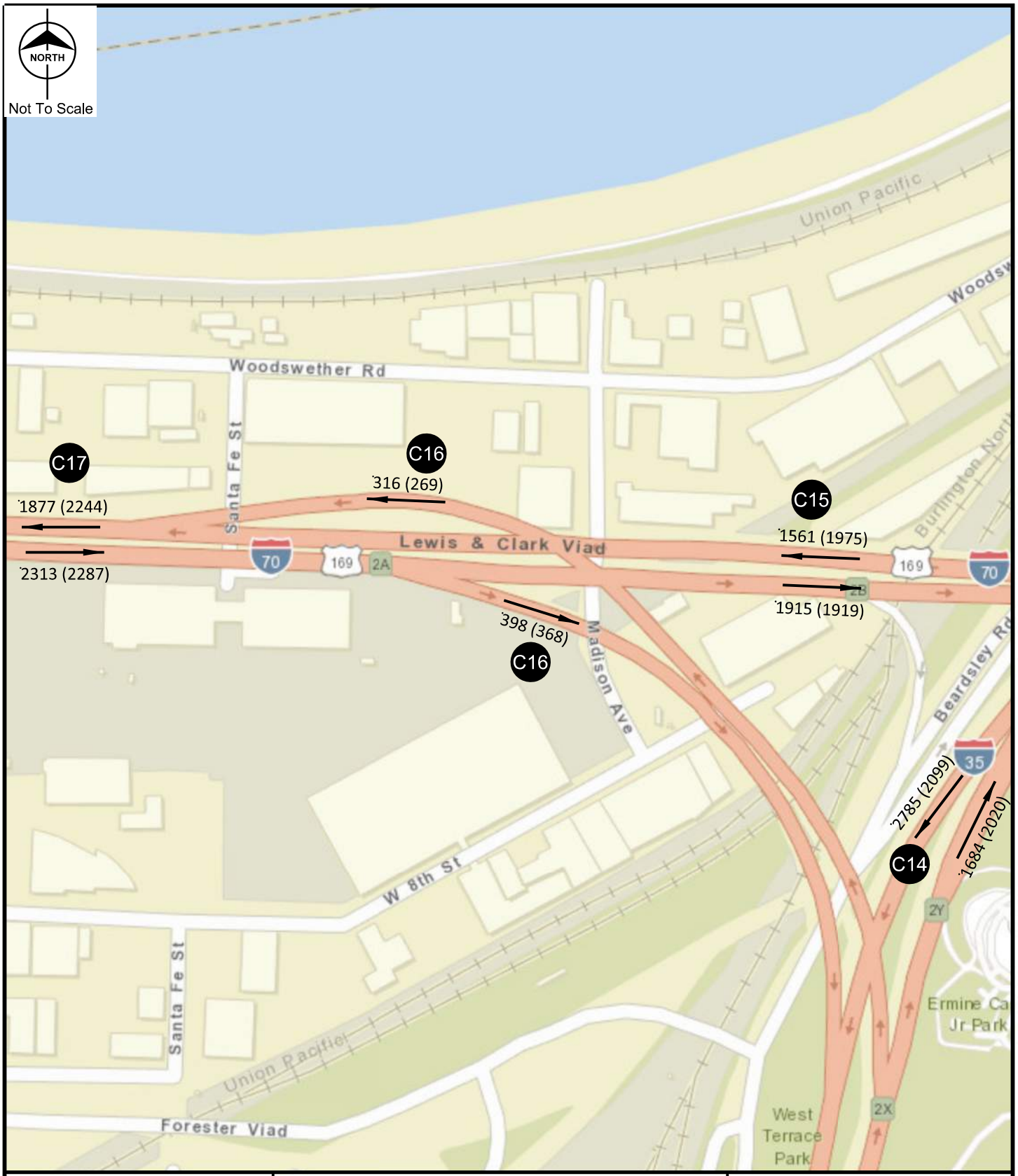
2016 Existing Conditions

Exhibit 2.4

LEGEND	MOVEMENT
Study Intersection	L: Left
Signalized	T: Through
Stop Controlled	R: Right
Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
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2016 Existing Conditions

Exhibit 2.5

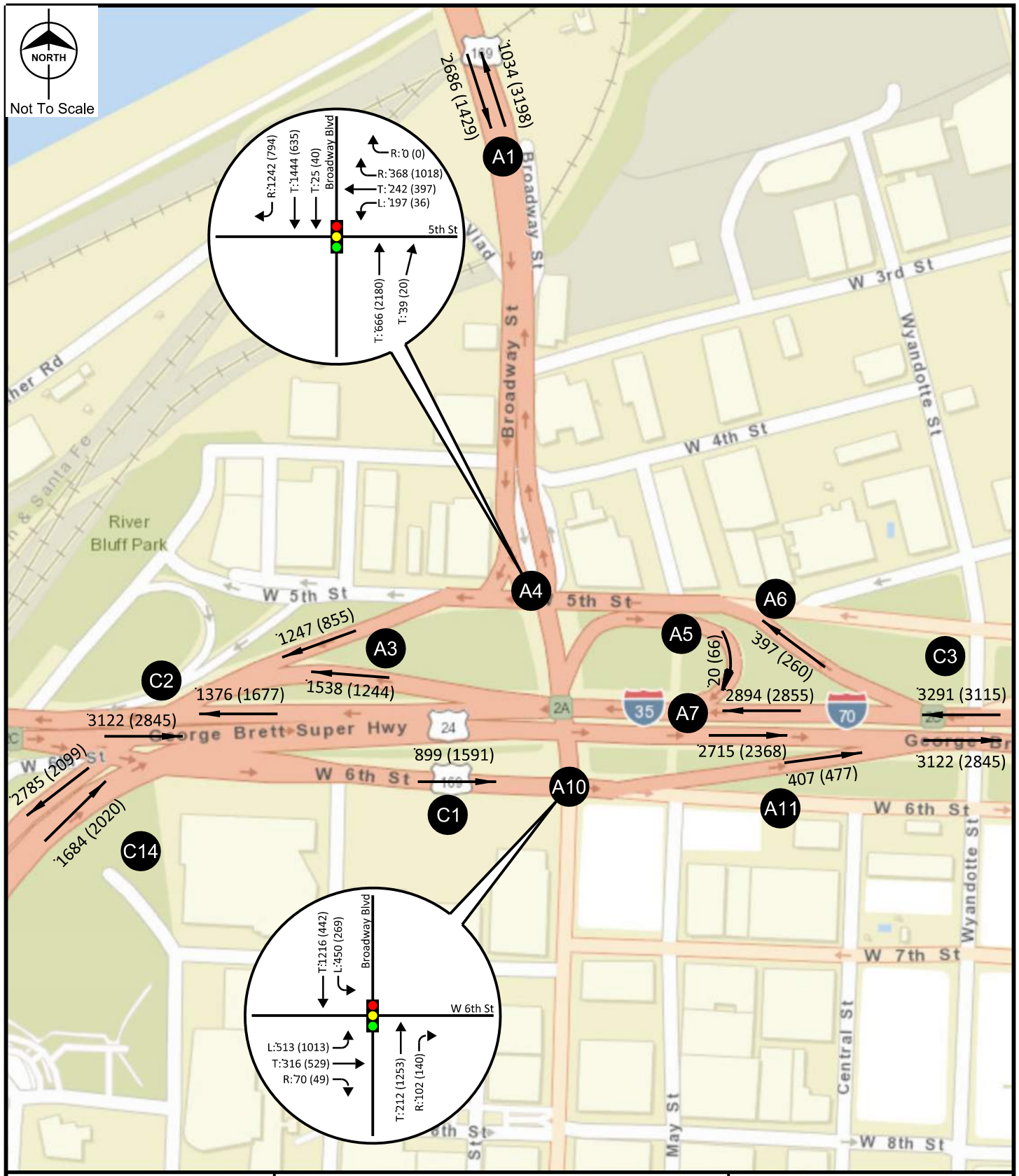
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date July 2019

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Missouri Department of Transportation

2016 Existing Conditions

Exhibit 2.6

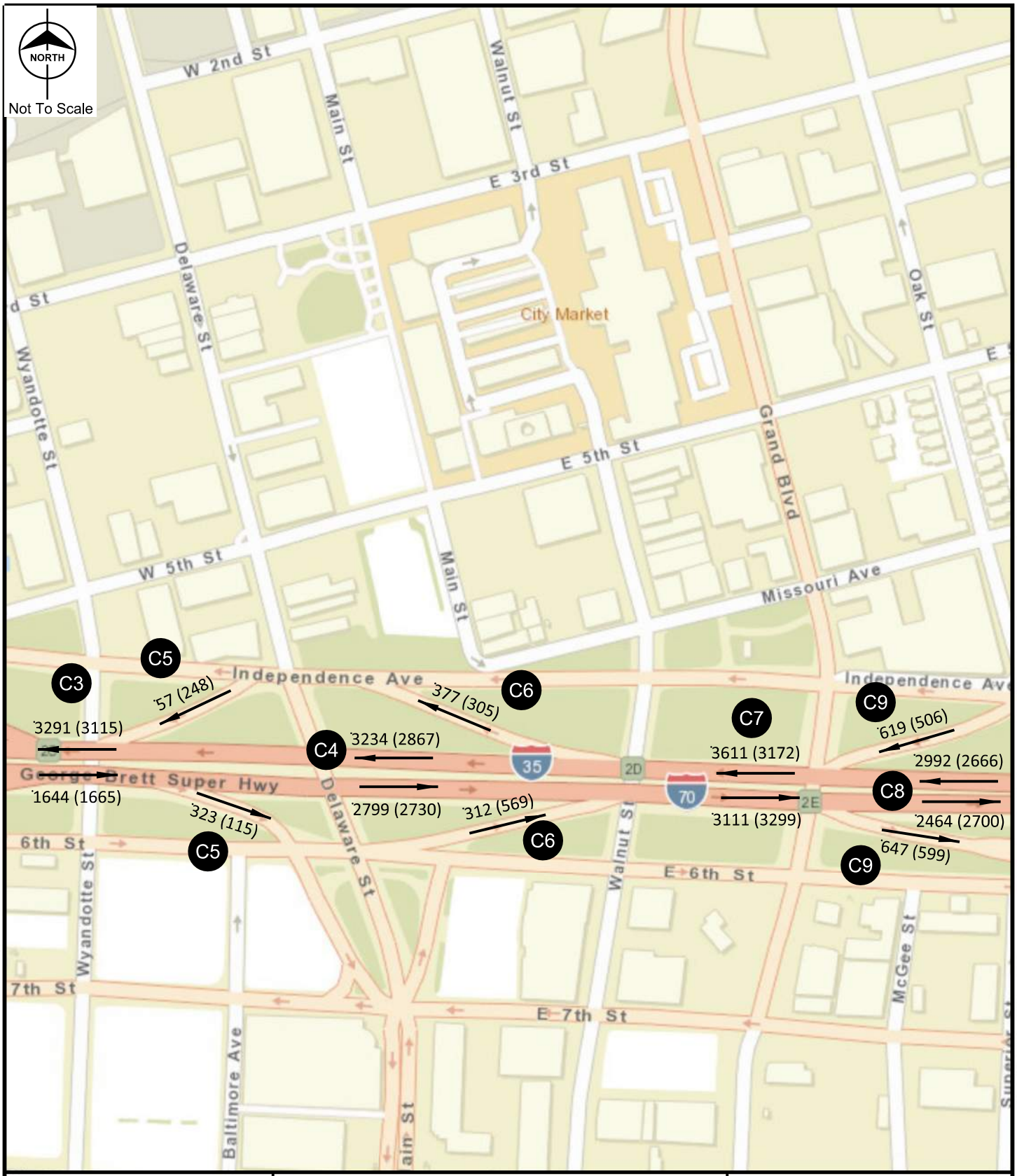
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2016 Existing Conditions

Exhibit 2.7

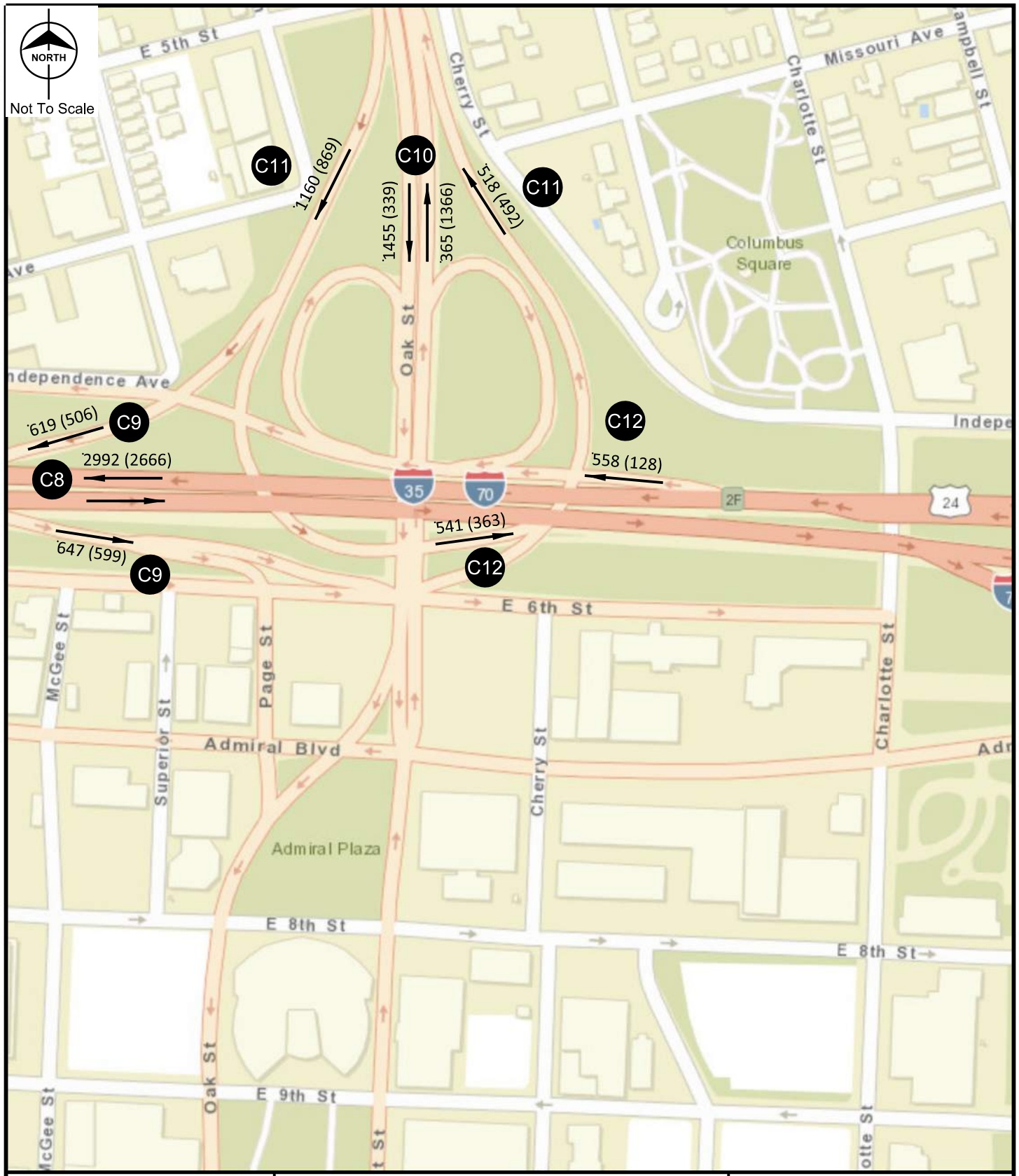
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date July 2019

designed T. Cope

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2016 Existing Conditions

Exhibit 2.8

LEGEND	MOVEMENT
Study Intersection	L: Left
Signalized	T: Through
Stop Controlled	R: Right
Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

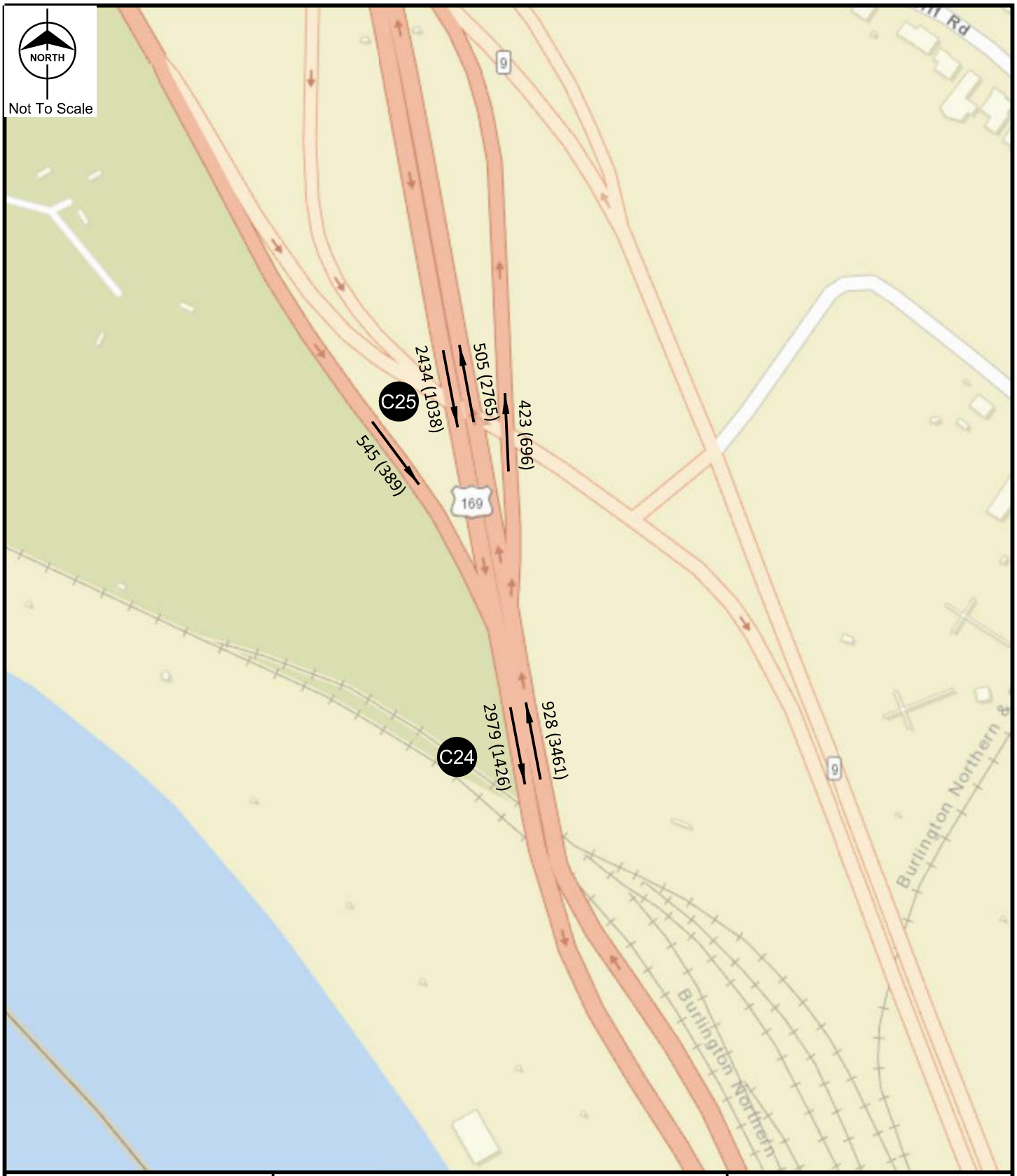
Missouri Department of Transportation

2016 Existing Conditions

Exhibit 2.9

LEGEND	MOVEMENT
Study Intersection	L: Left
Signalized	T: Through
Stop Controlled	R: Right
Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

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2025 No-Build

Exhibit 3.1

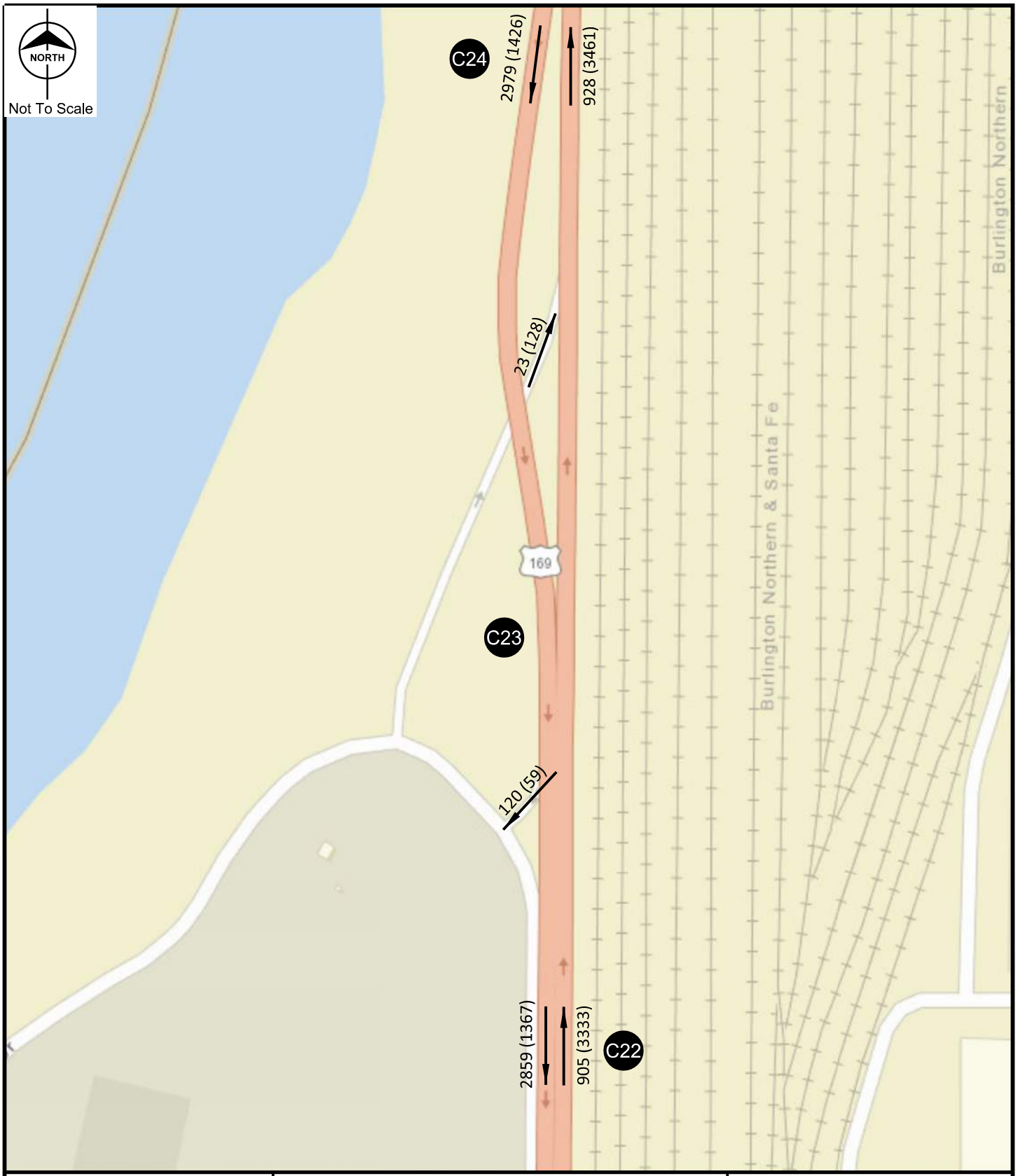
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date July 2019

designed T. Cope

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2025 No-Build

Exhibit 3.2

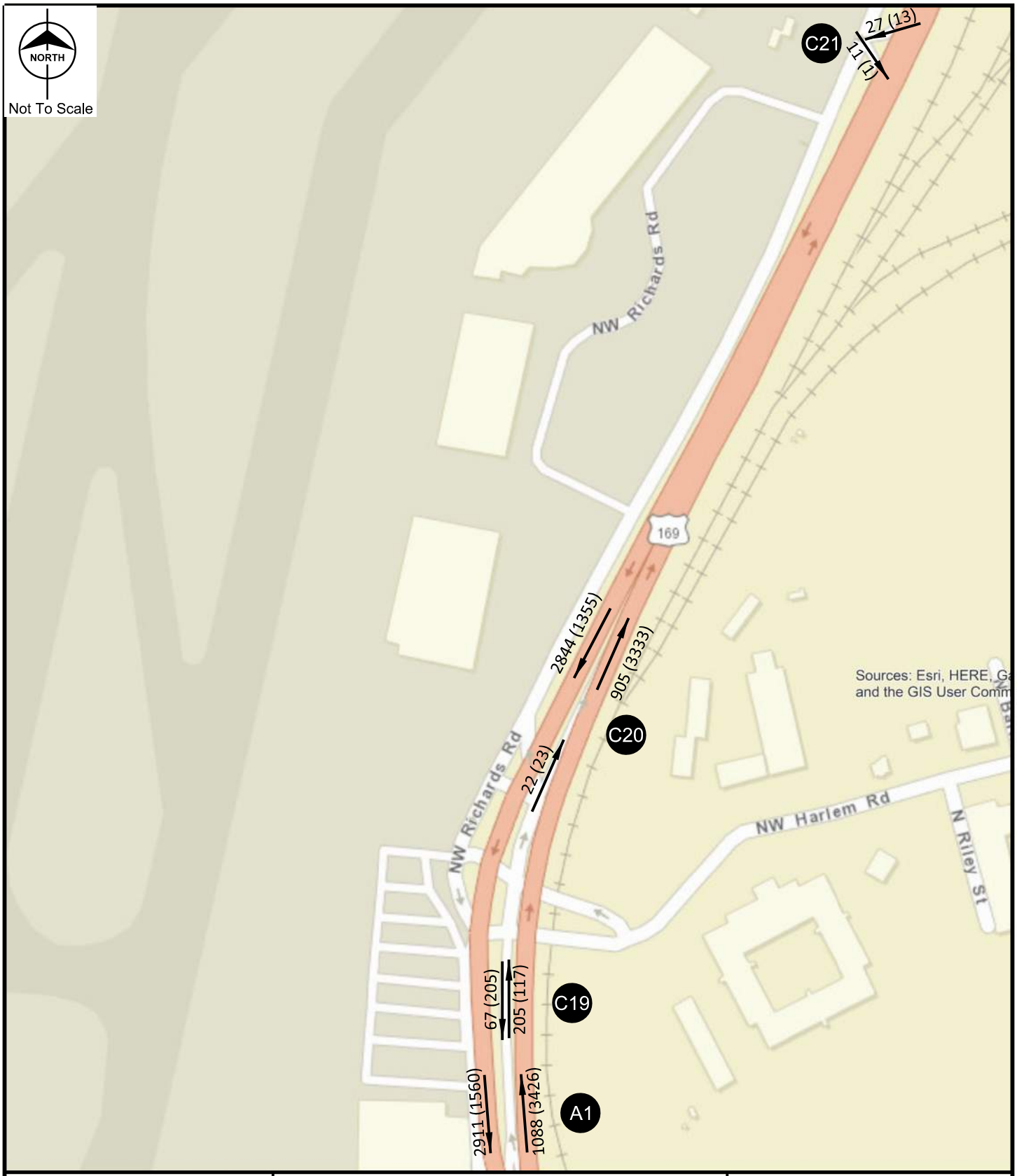
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2025 No-Build

Exhibit 3.3

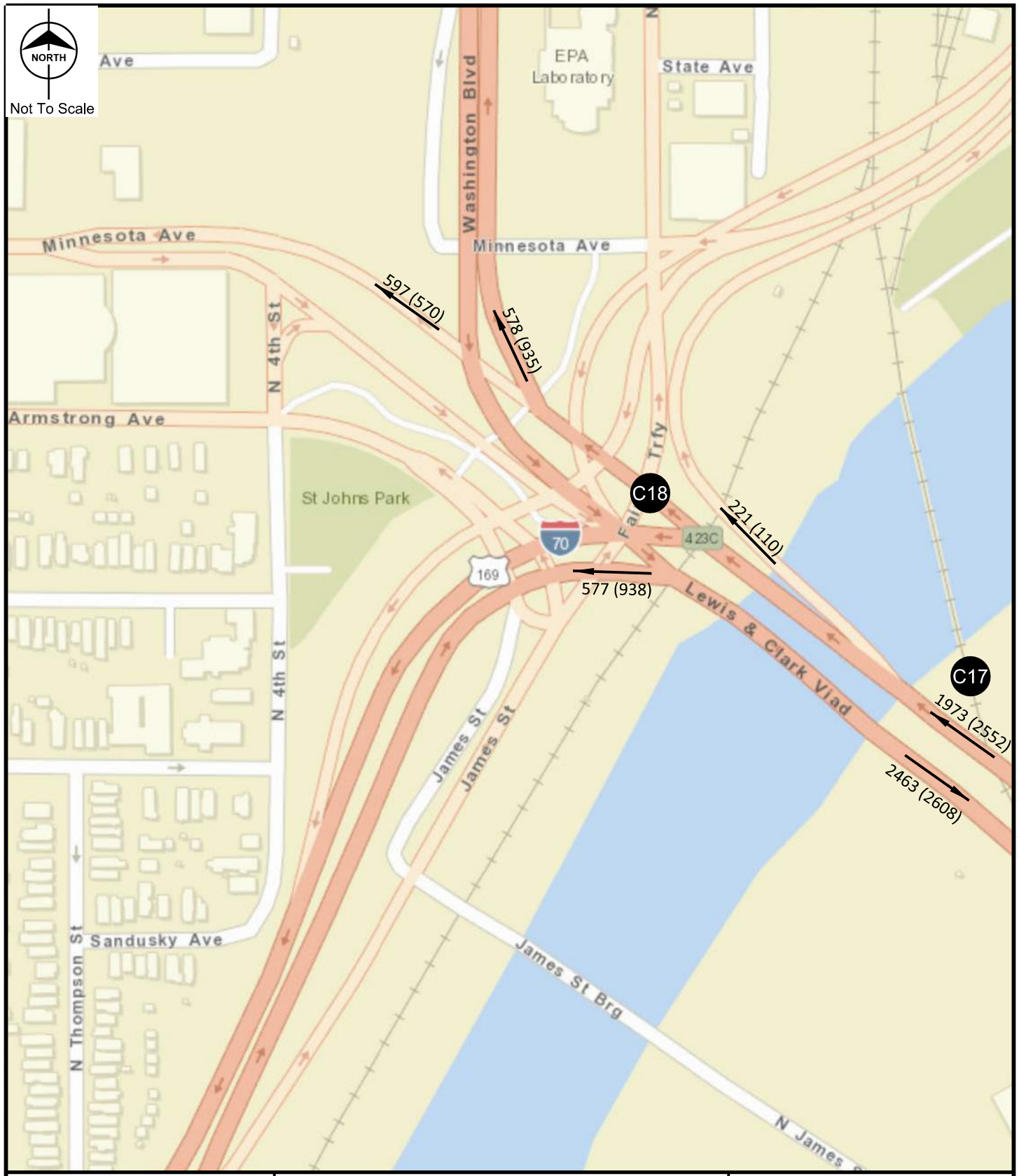
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

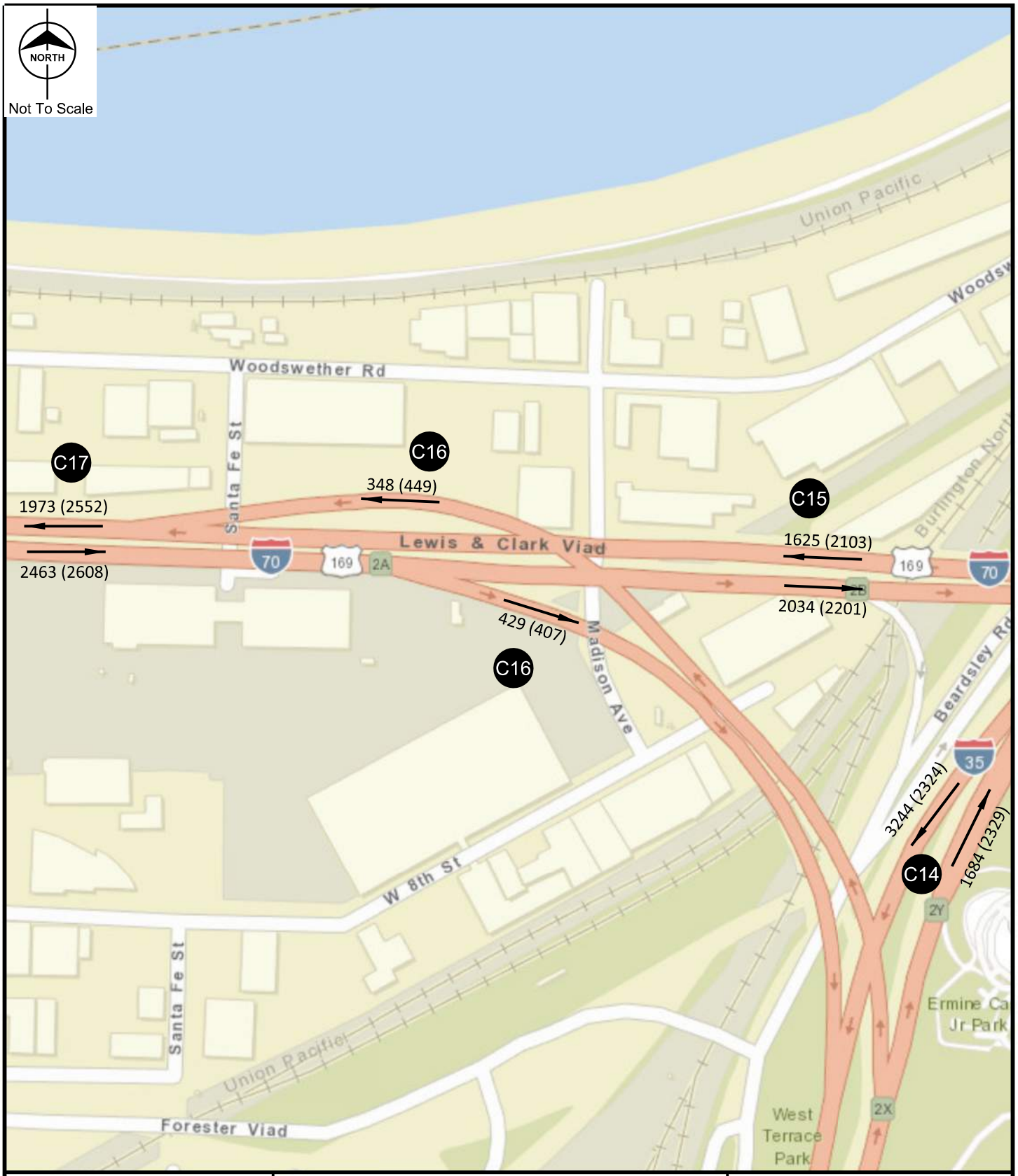
Missouri Department of Transportation

2025 No-Build

Exhibit 3.4

LEGEND	MOVEMENT
Study Intersection	L: Left
Signalized	T: Through
Stop Controlled	R: Right
Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2025 No-Build

Exhibit 3.5

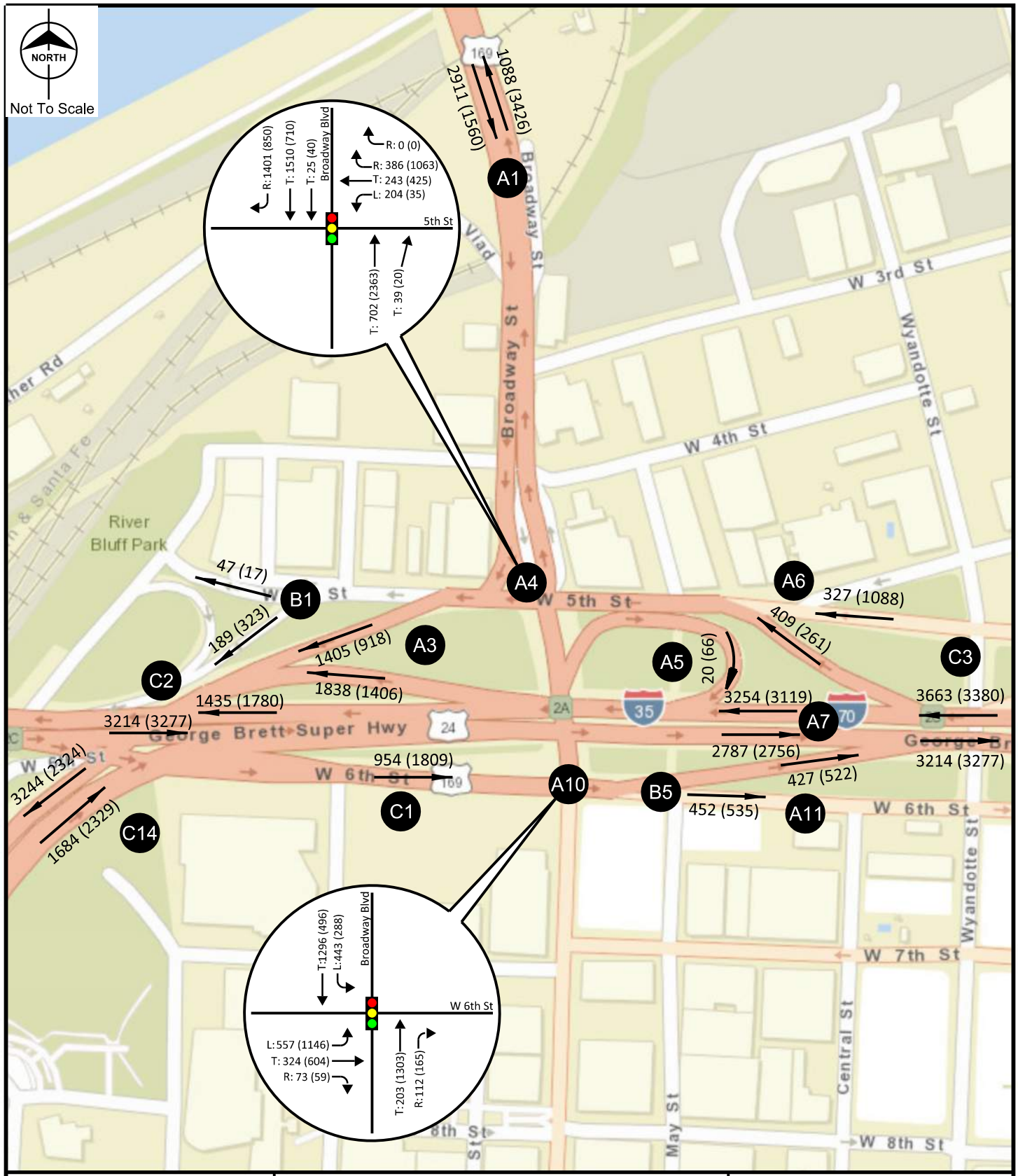
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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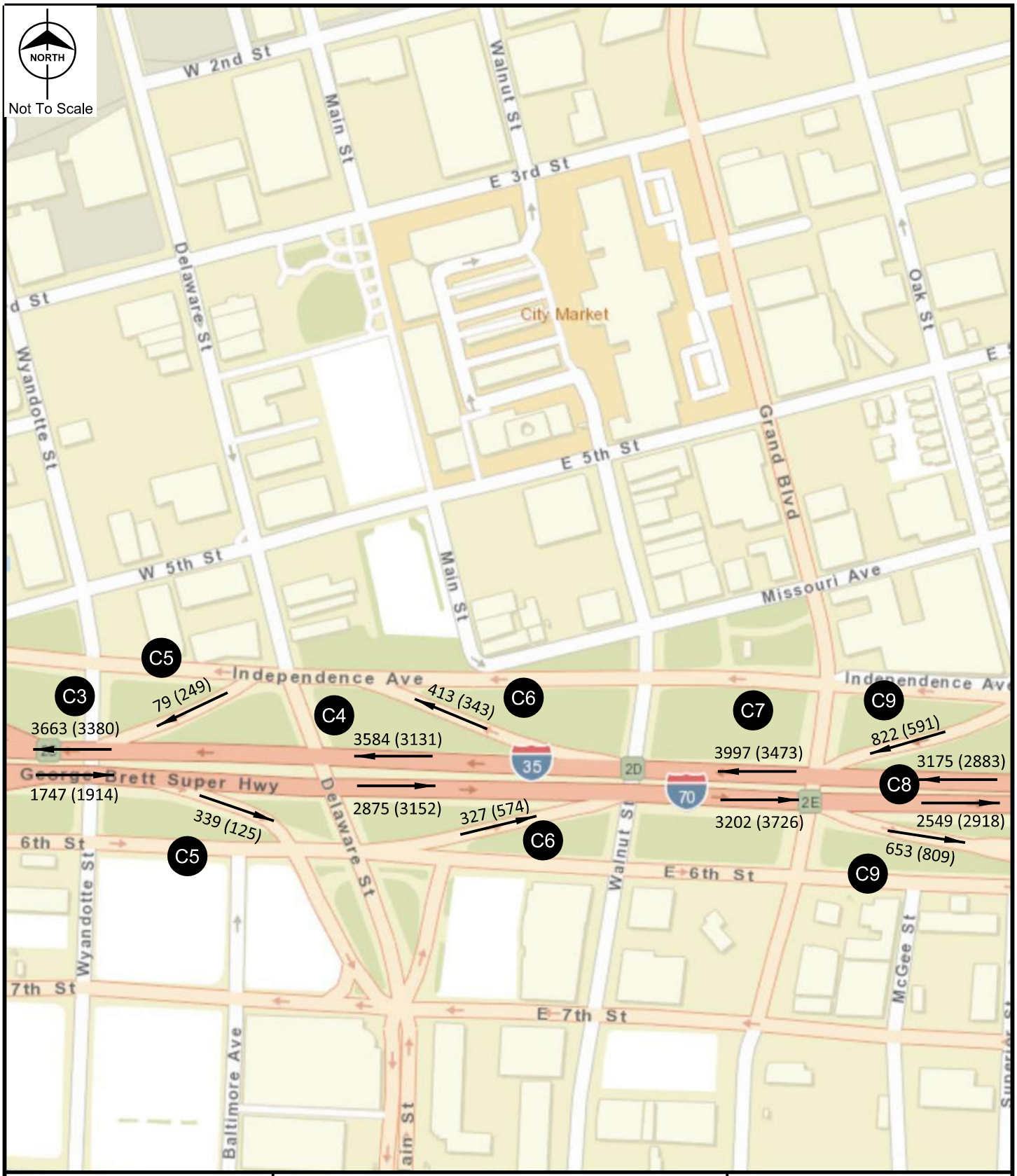
2025 No-Build

Exhibit 3.6

LEGEND		MOVEMENT
X	Study Intersection	L: Left
	Signalized	T: Through
STOP	Stop Controlled	R: Right
	Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 No-Build

Exhibit 3.7

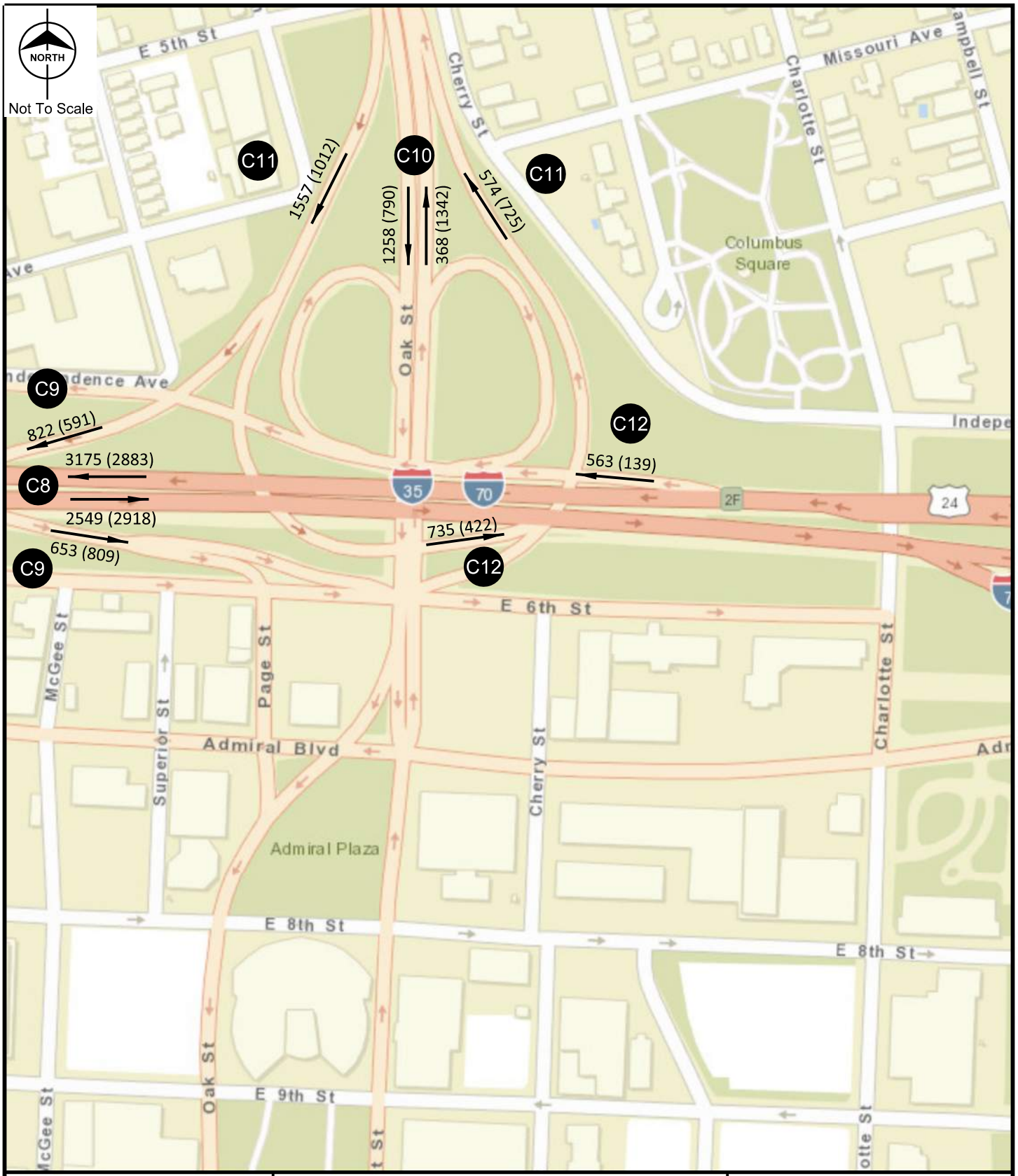
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 No-Build

Exhibit 3.8

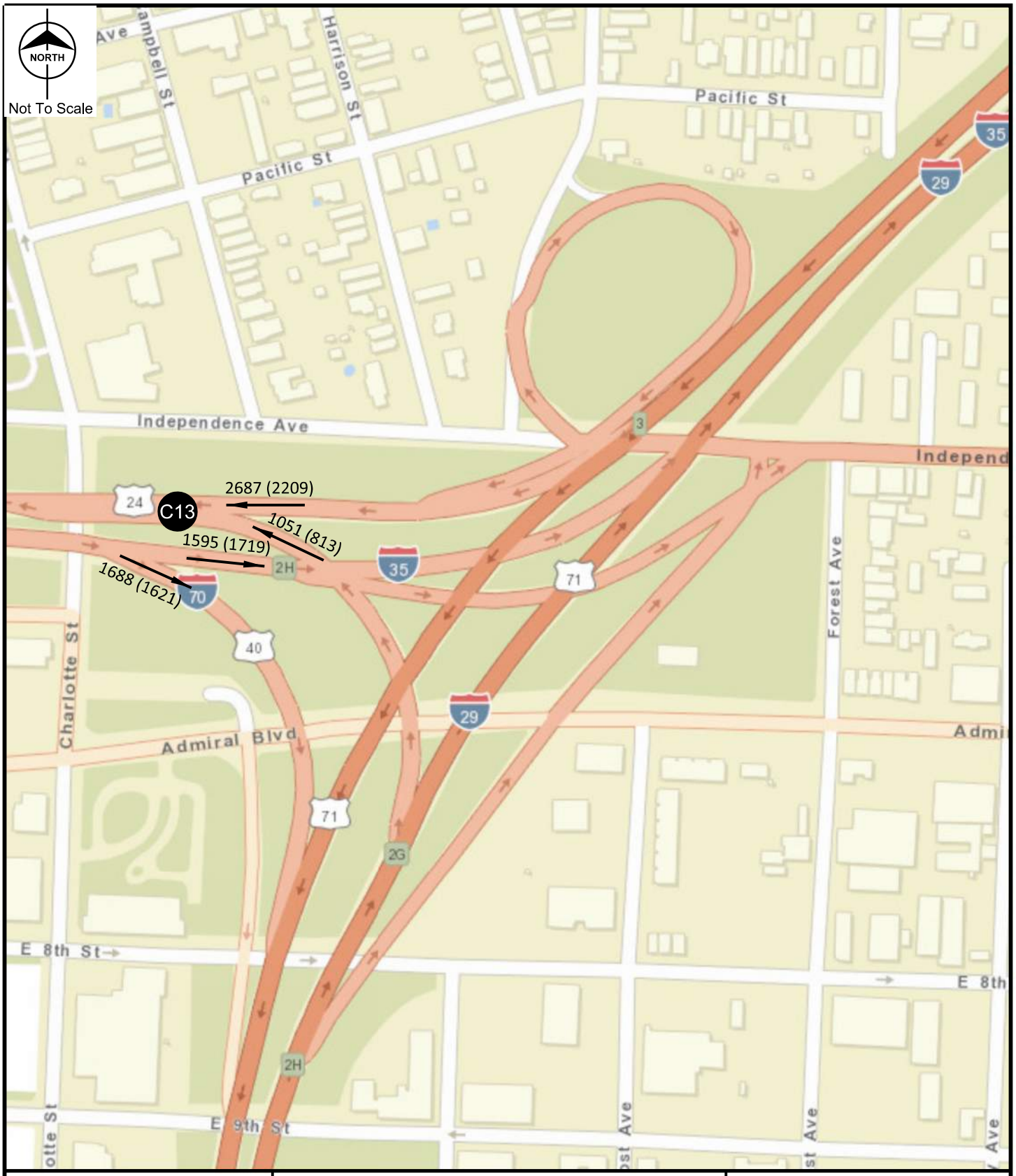
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 No-Build

Exhibit 3.9

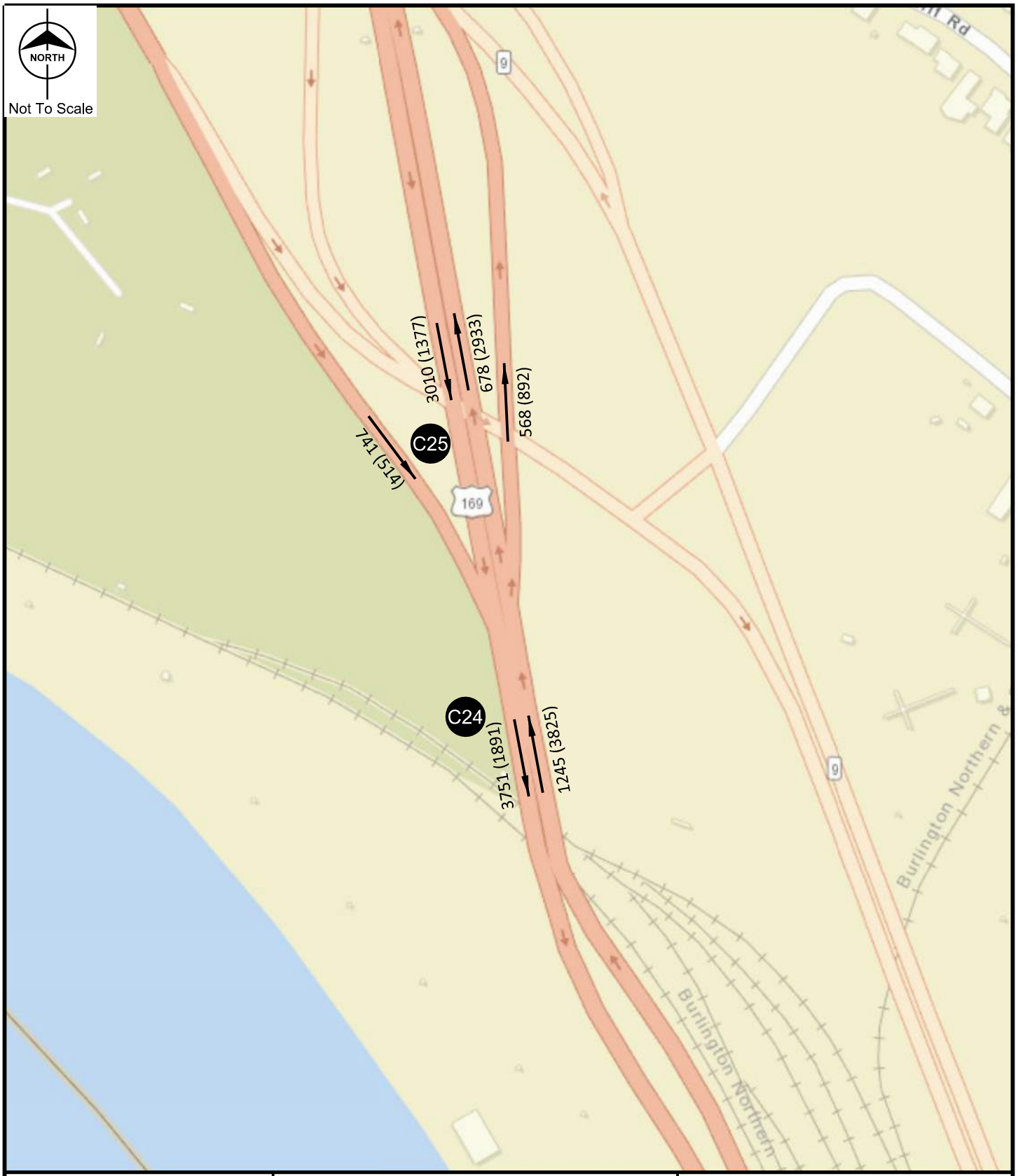
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Central Alternative

Exhibit 4.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Central Alternative

Exhibit 4.2

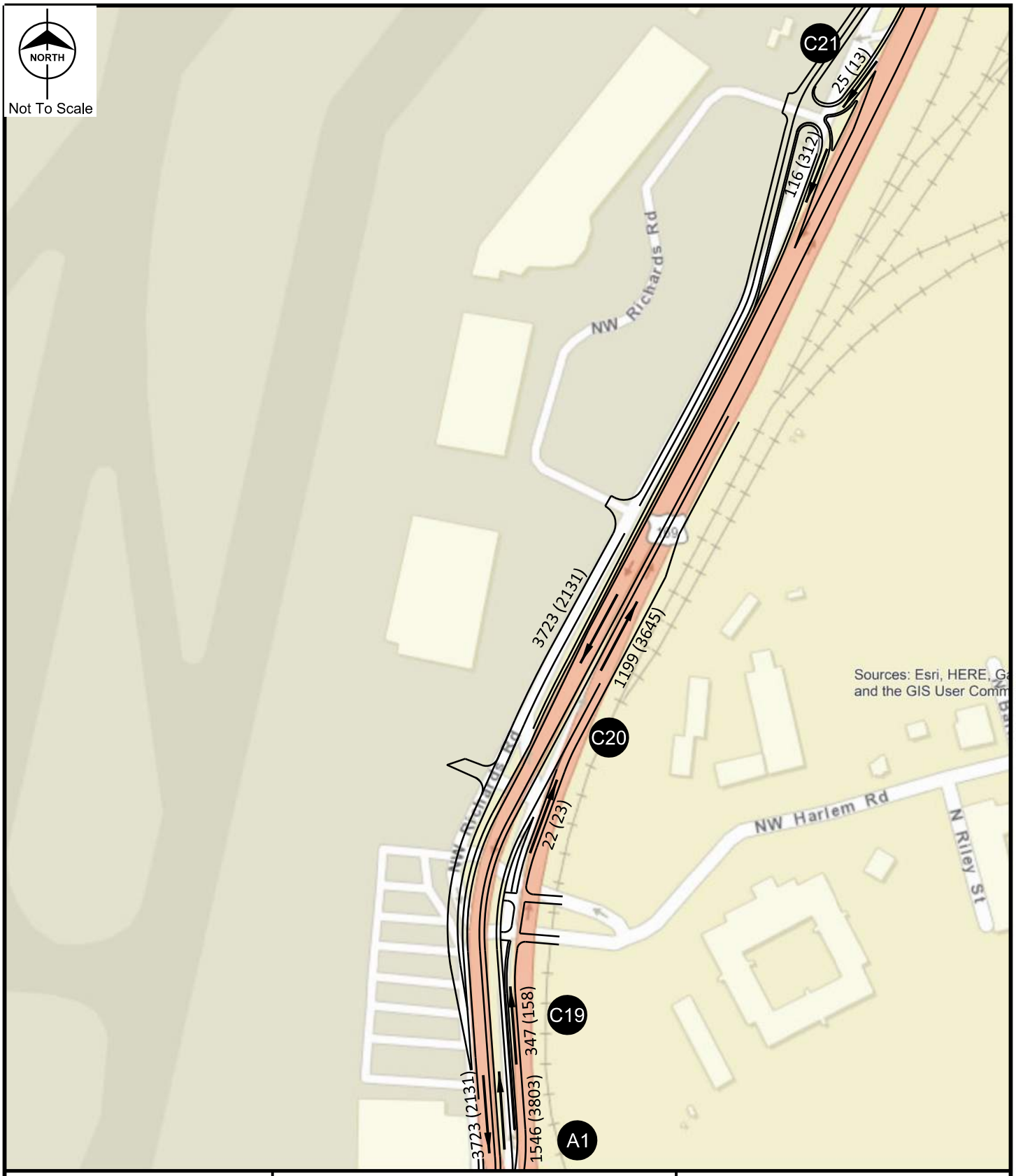
LEGEND

- X Study Intersection
- Signalized
- STOP Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Central Alternative

Exhibit 4.3

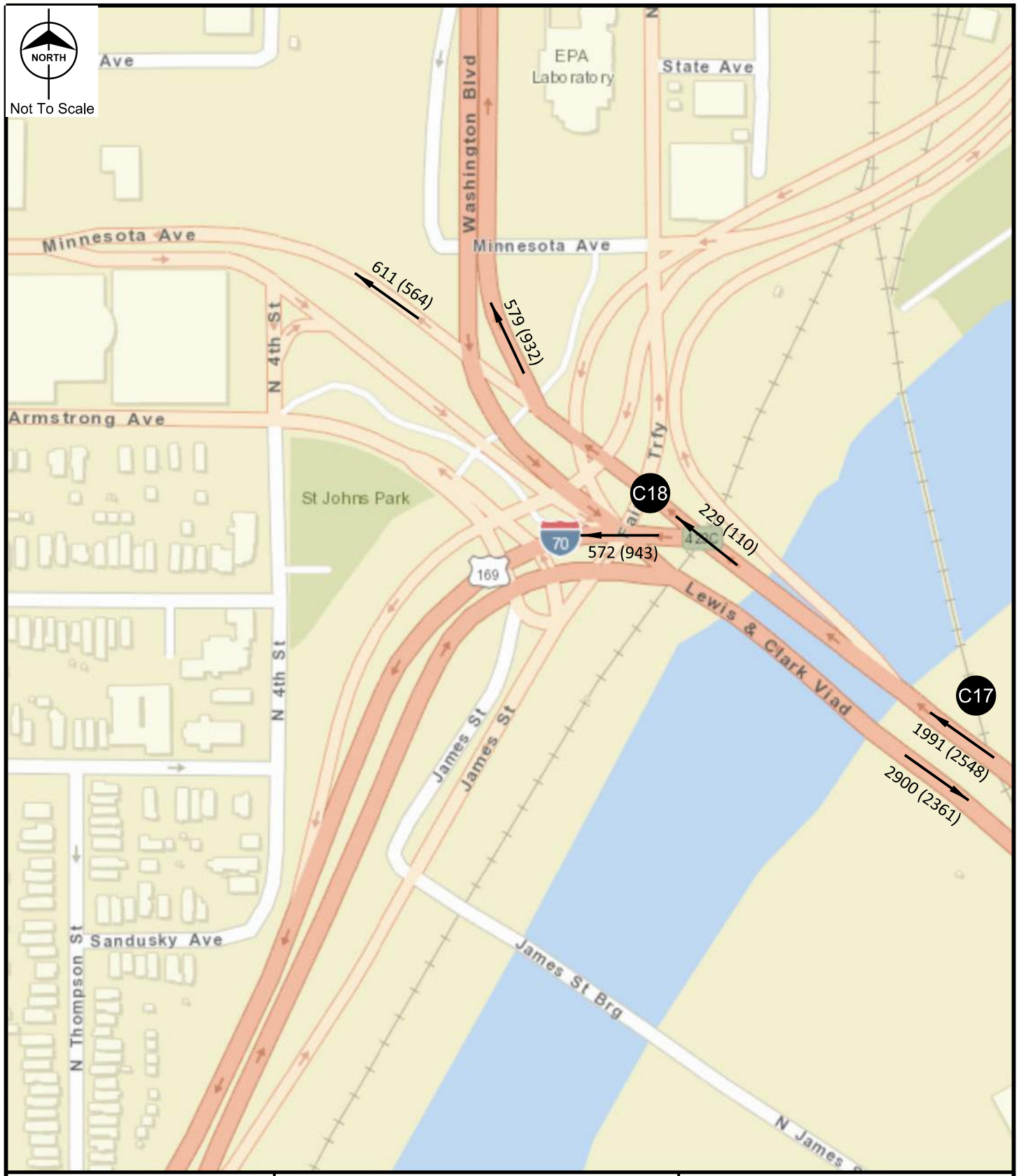
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Central Alternative

Exhibit 4.4

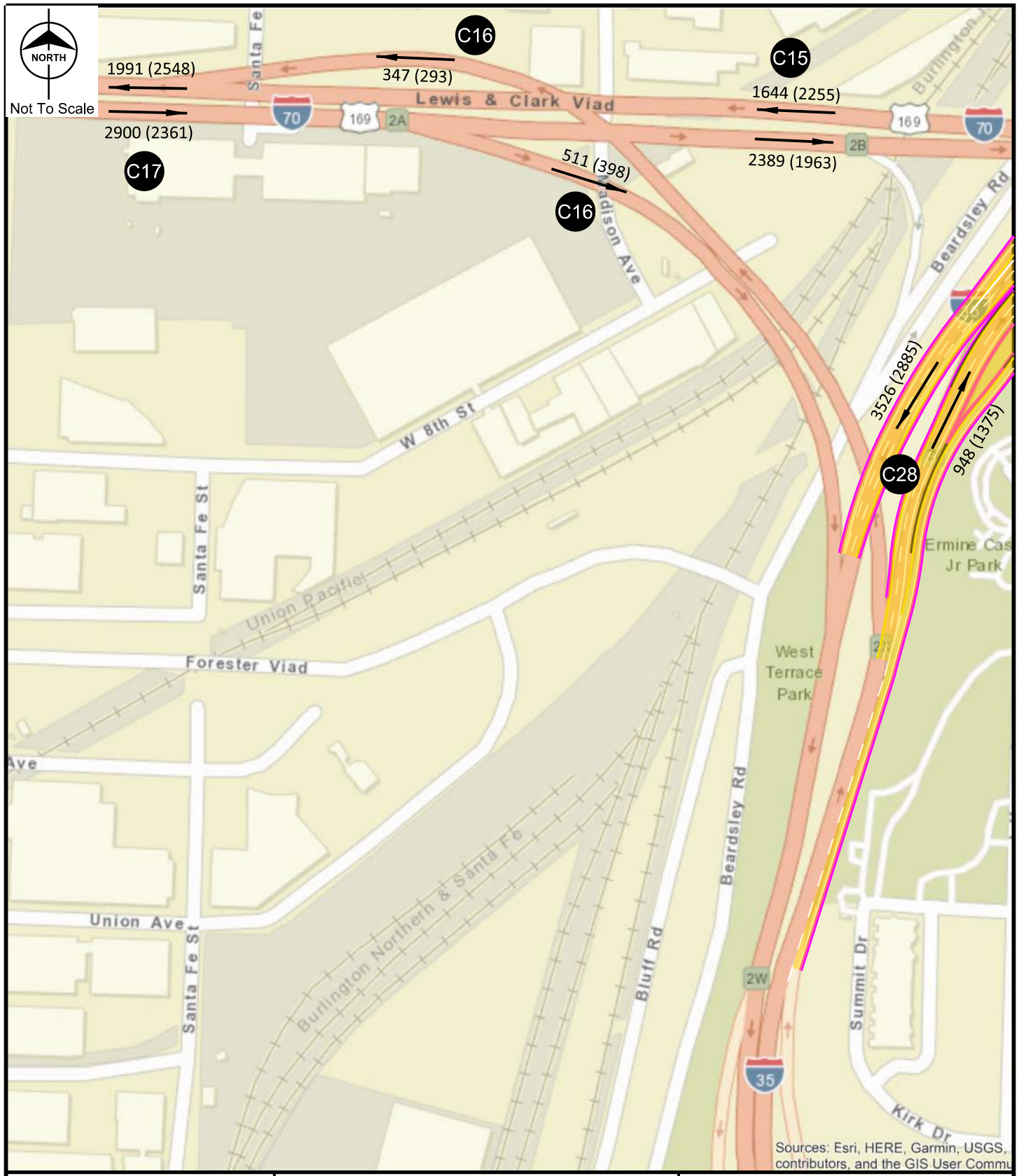
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Central Alternative

Exhibit 4.5

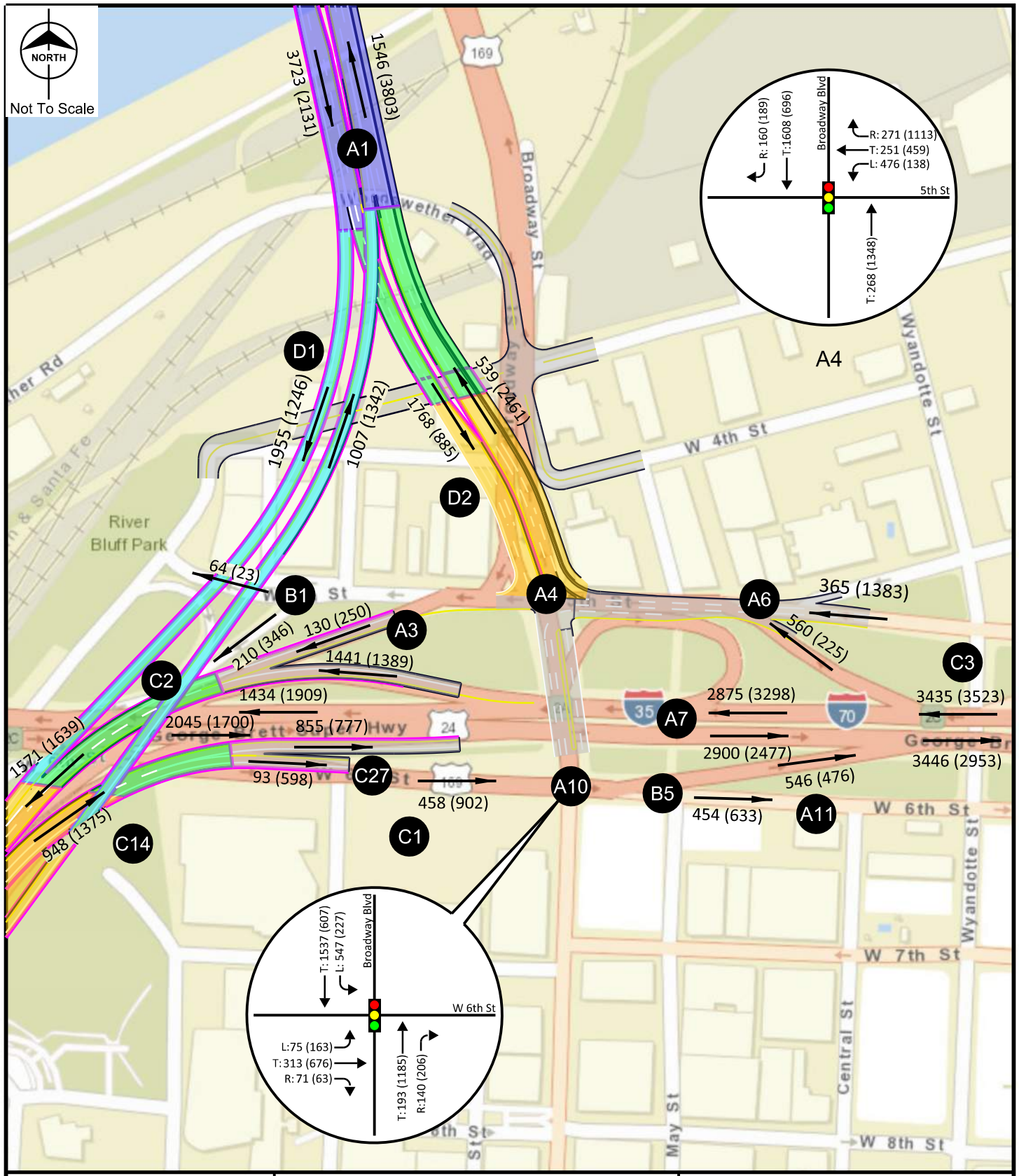
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Central Alternative

Exhibit 4.6

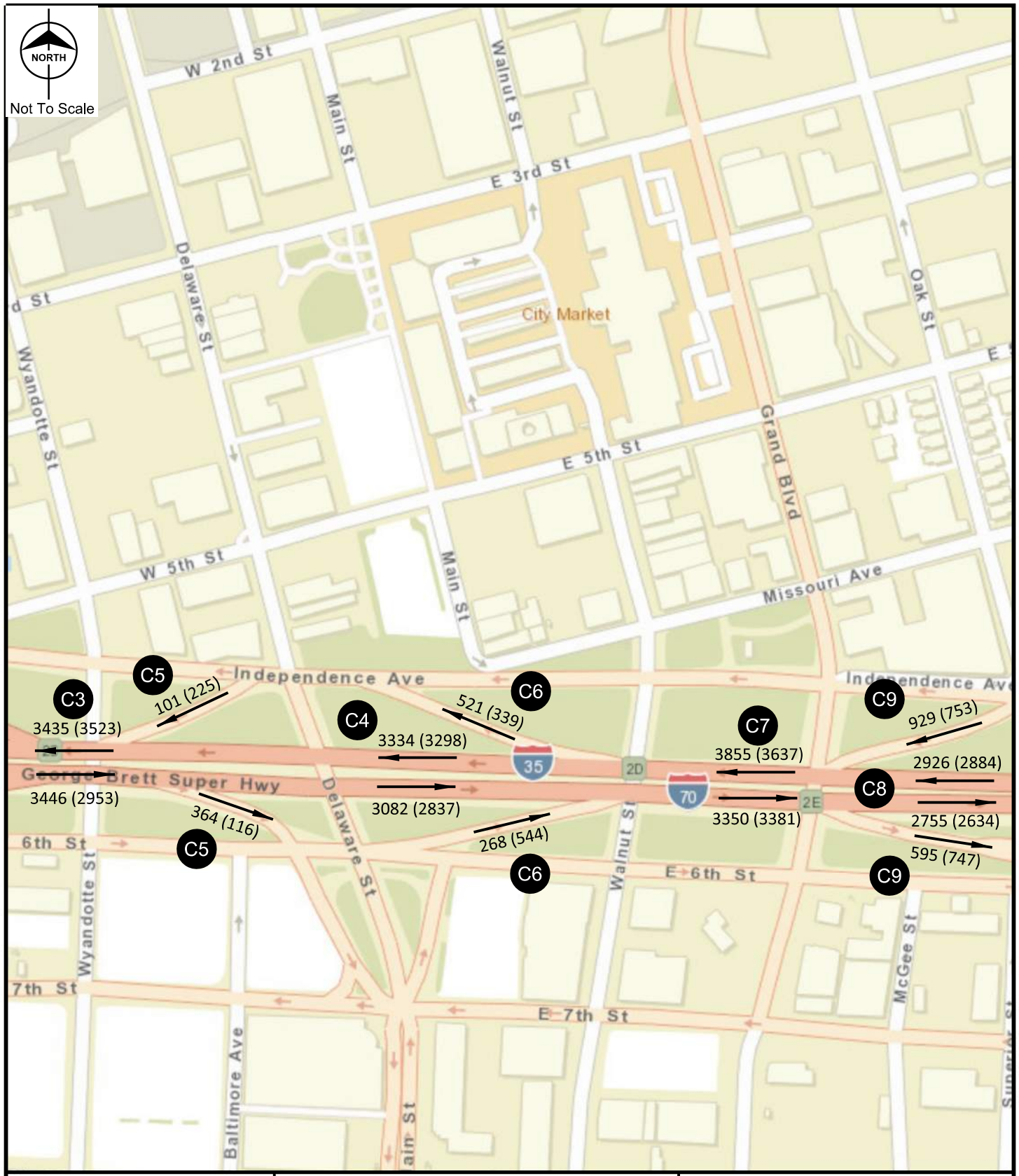
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Central Alternative

Exhibit 4.7

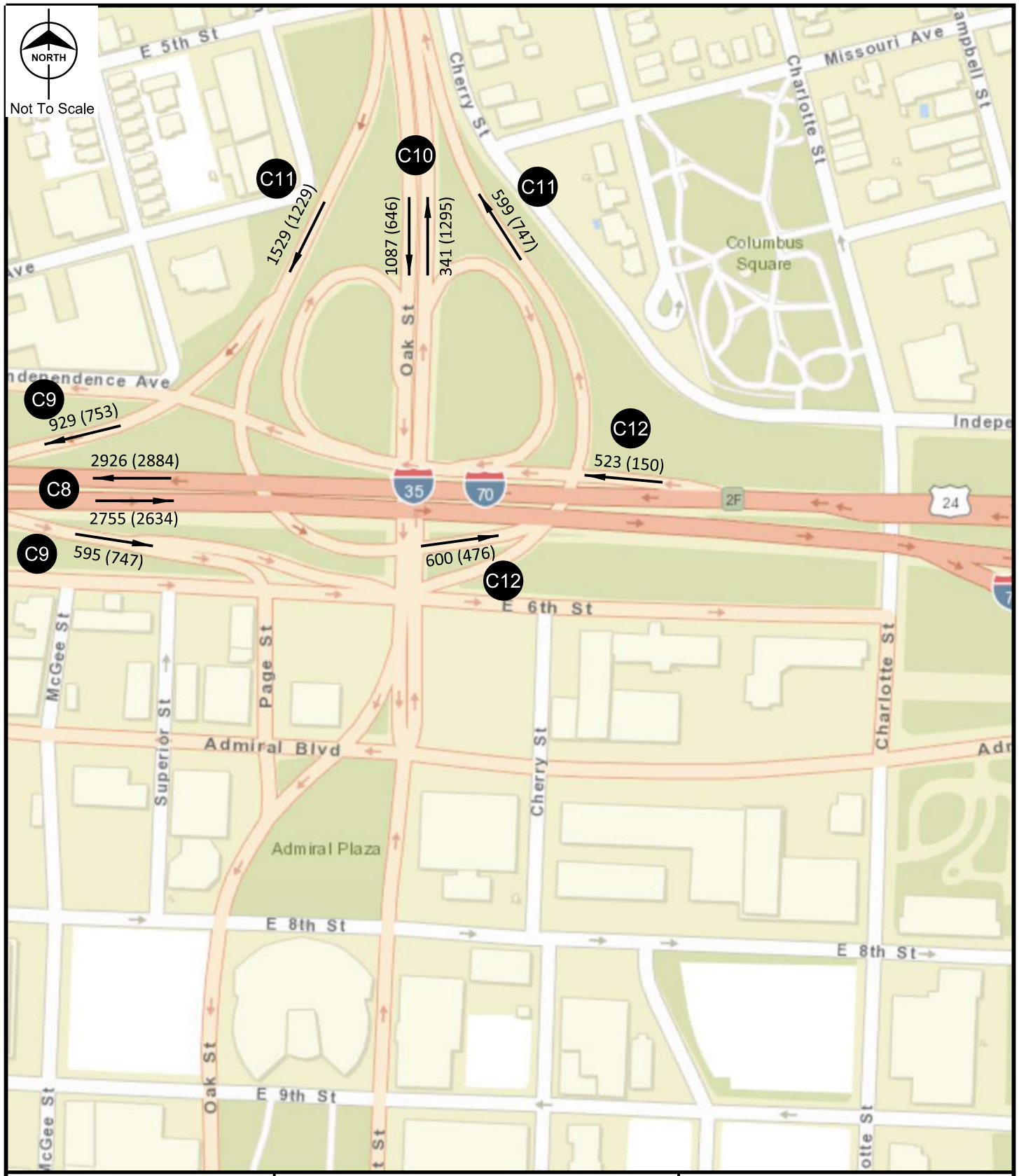
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Central Alternative

Exhibit 4.8

LEGEND

- X — Study Intersection
- Signalized
- STOP — Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Central Alternative

Exhibit 4.9

date	July 2019
designed	T. Cope

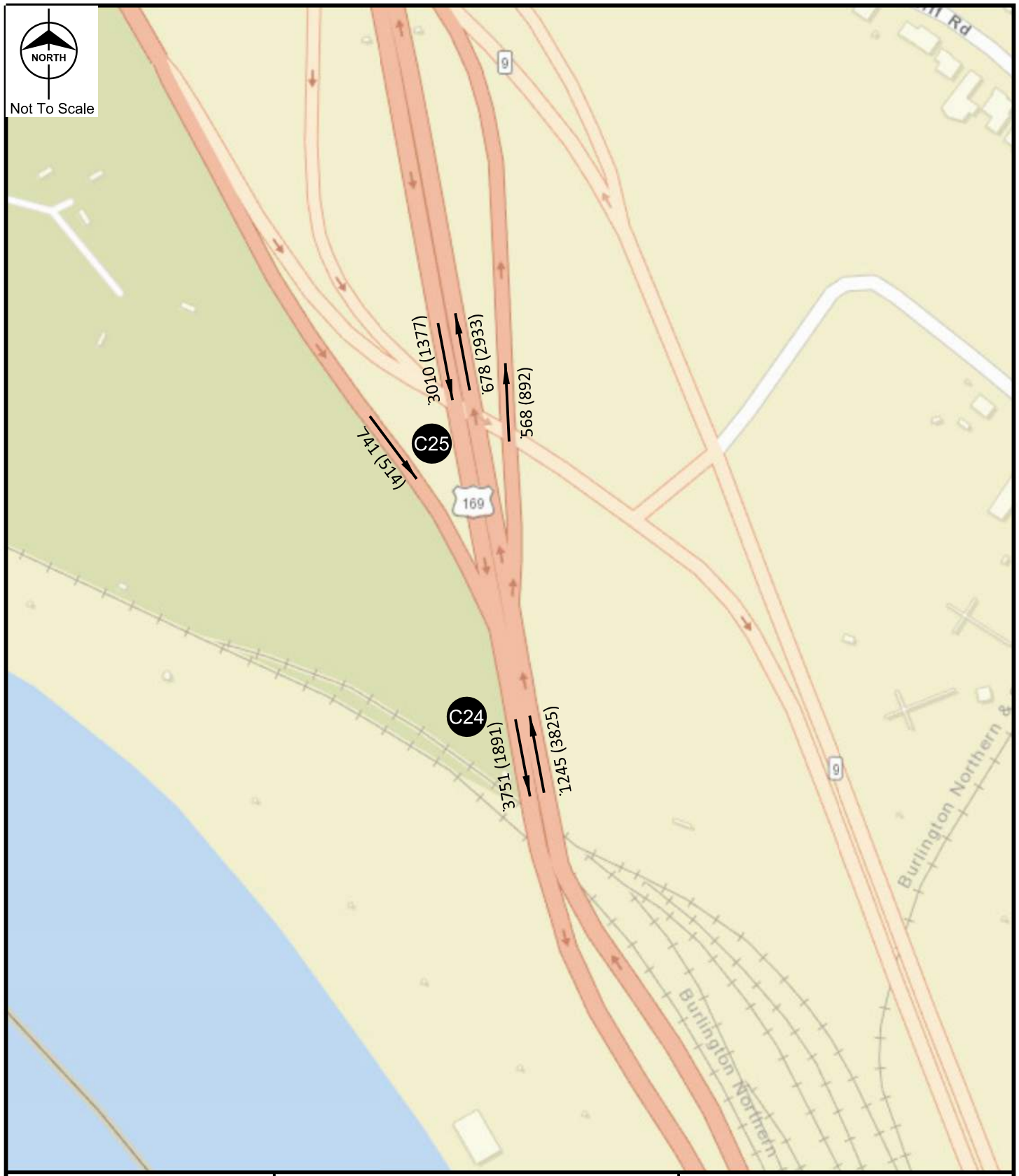
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Adjacent Alternative
(Option 3)

Exhibit 5.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Adjacent Alternative
(Option 3)

Exhibit 5.2

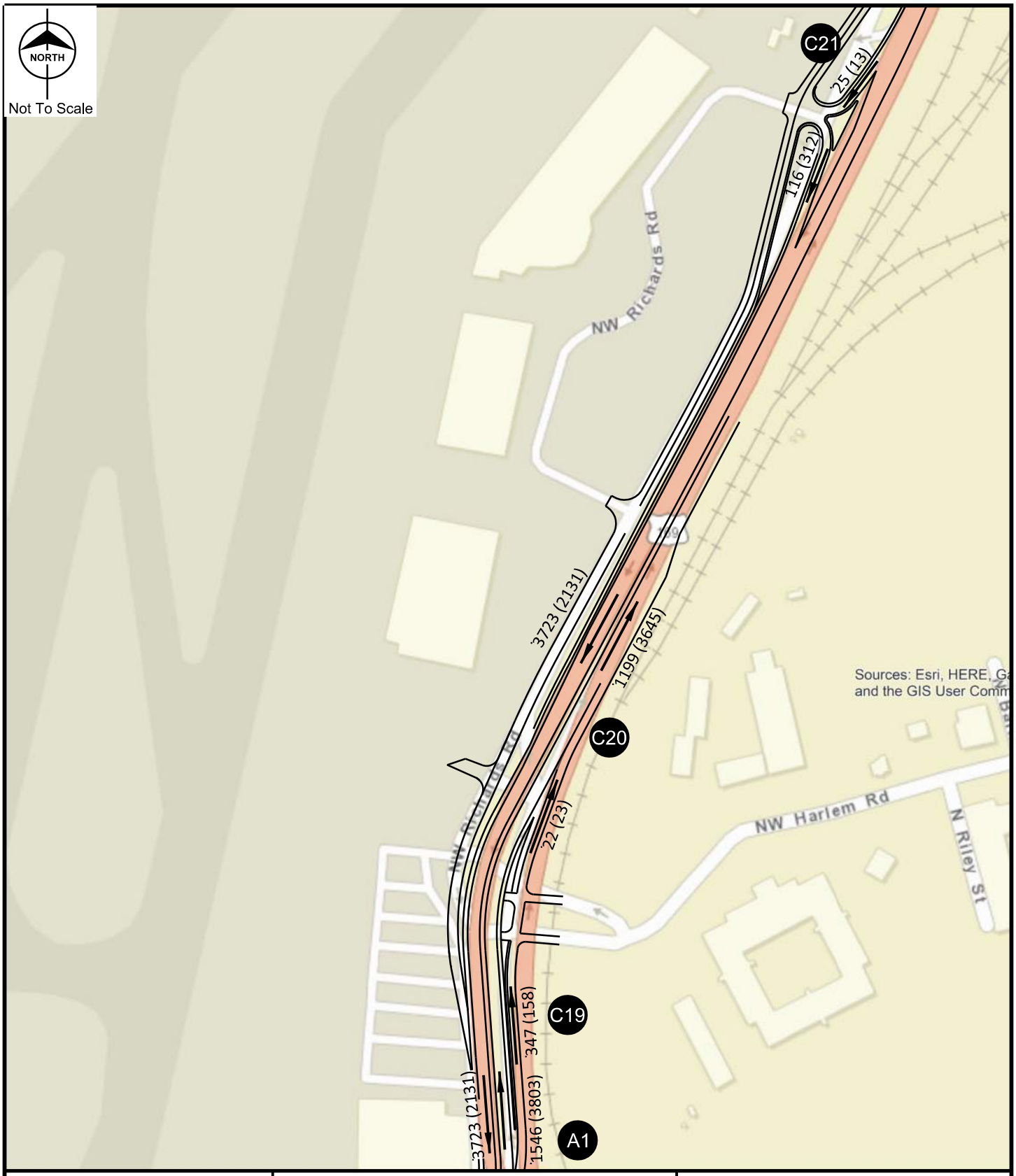
LEGEND

- X — Study Intersection
- Signalized
- STOP — Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Adjacent Alternative
(Option 3)

Exhibit 5.3

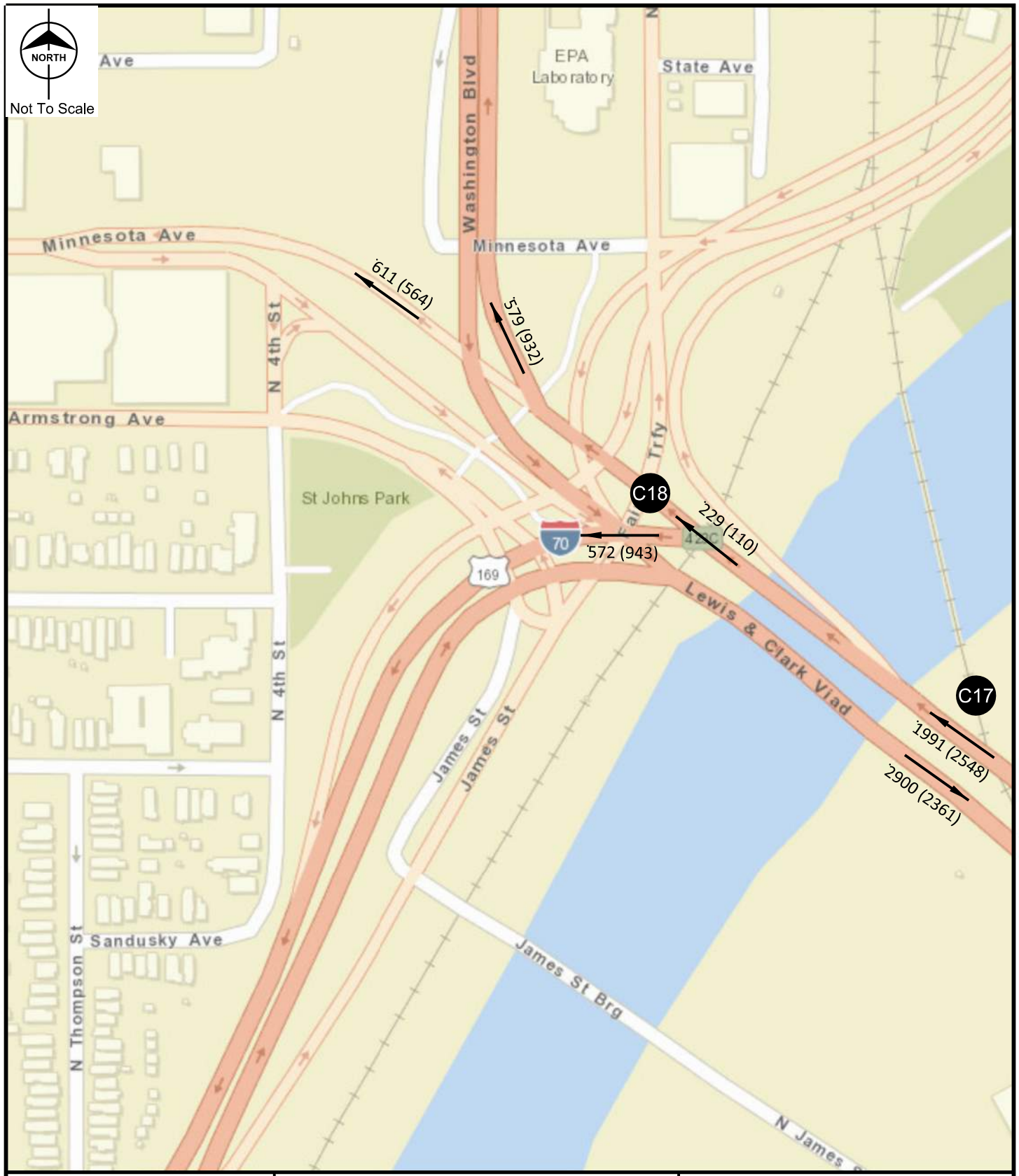
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Adjacent Alternative
(Option 3)

Exhibit 5.4

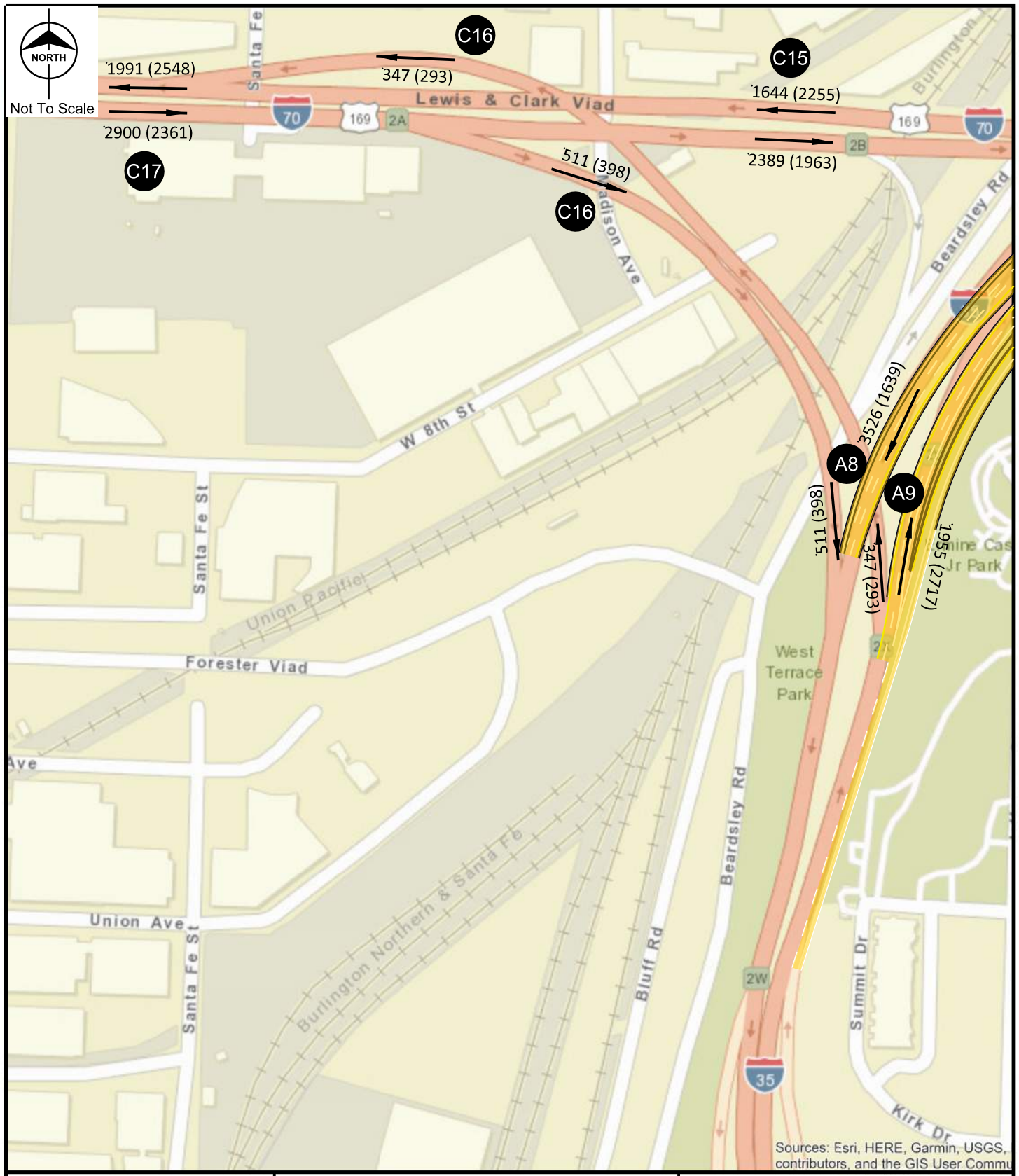
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Adjacent Alternative (Option 3)

Exhibit 5.5

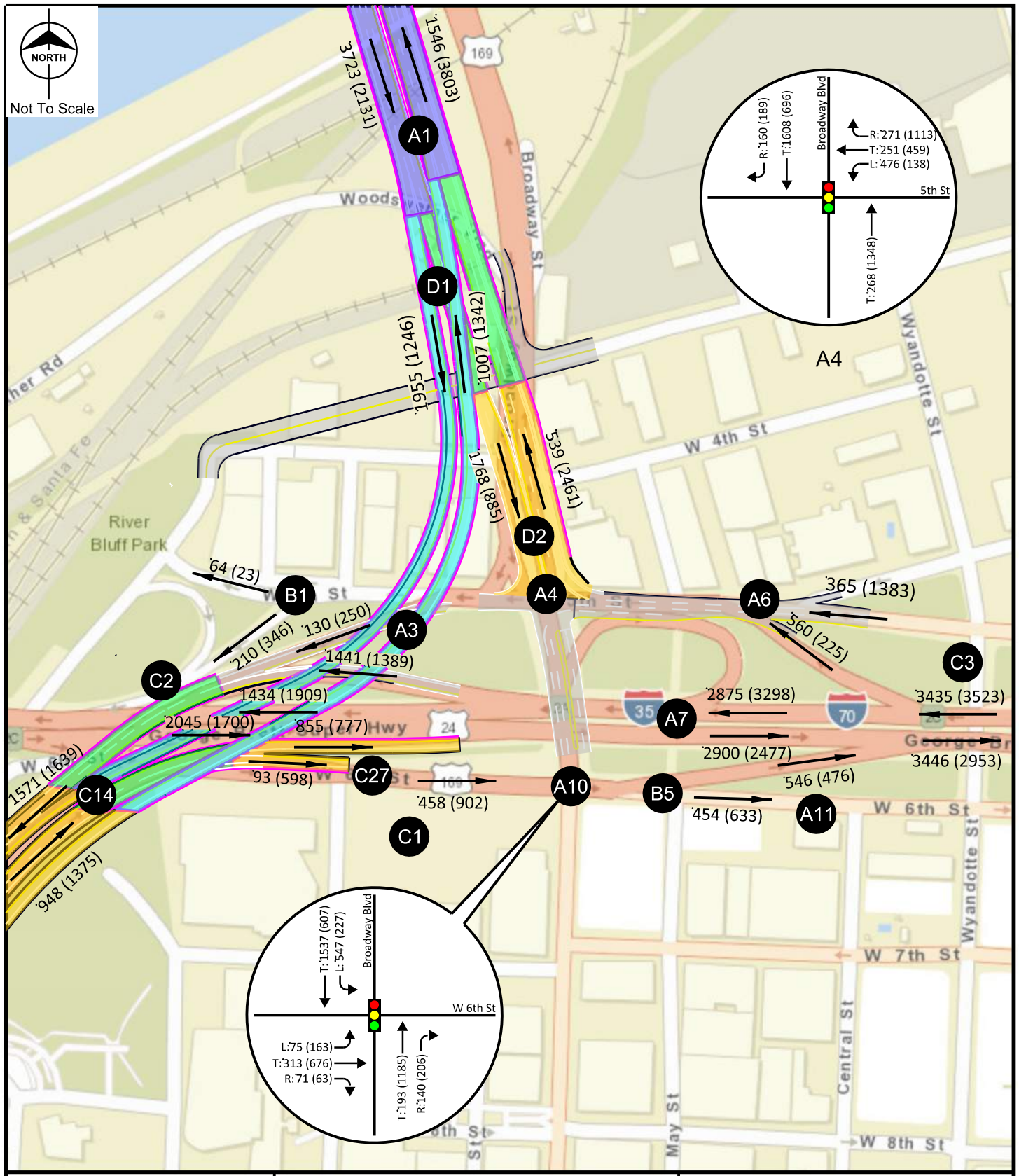
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Adjacent Alternative (Option 3)

Exhibit 5.6

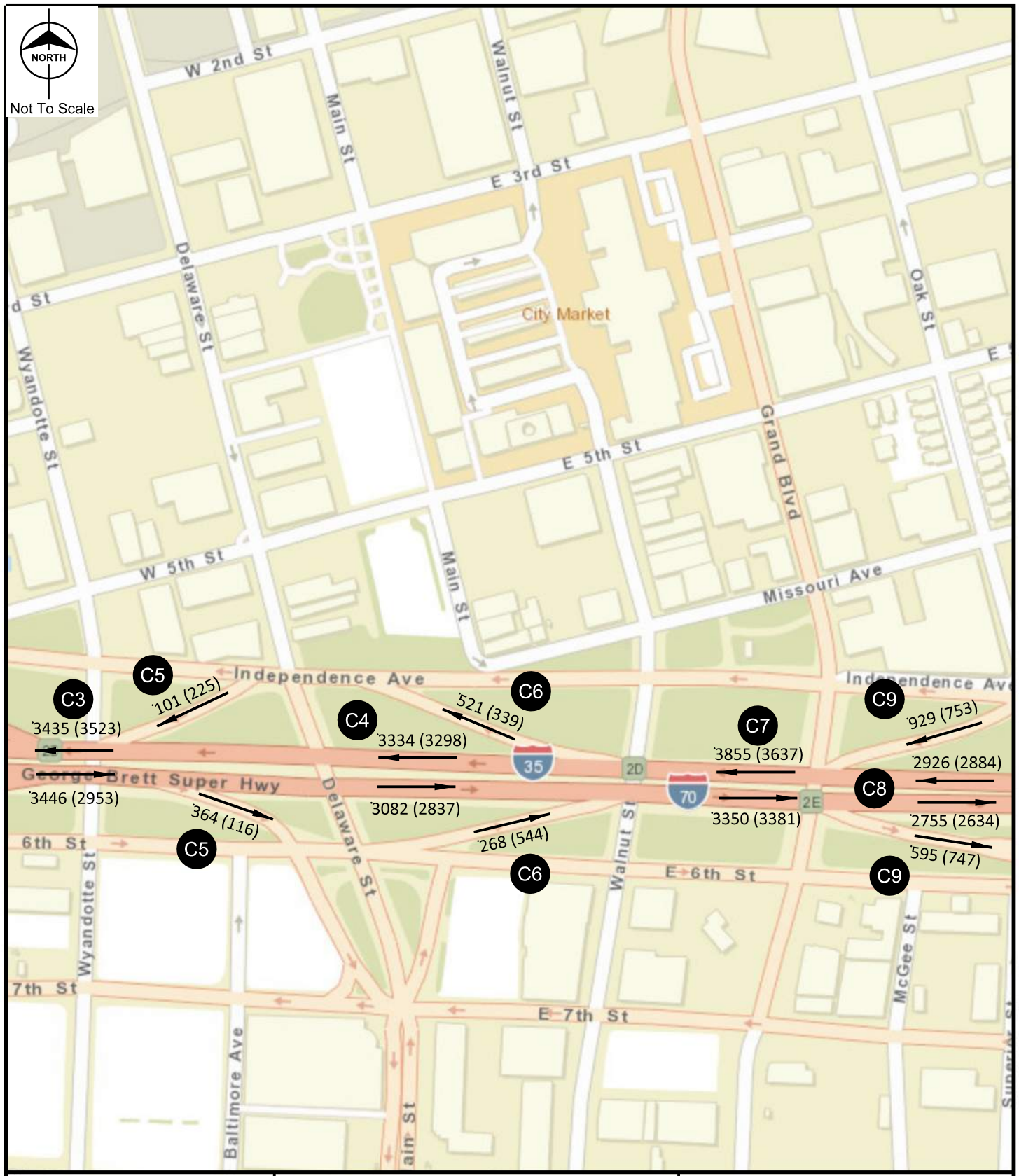
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Adjacent Alternative (Option 3)

Exhibit 5.7

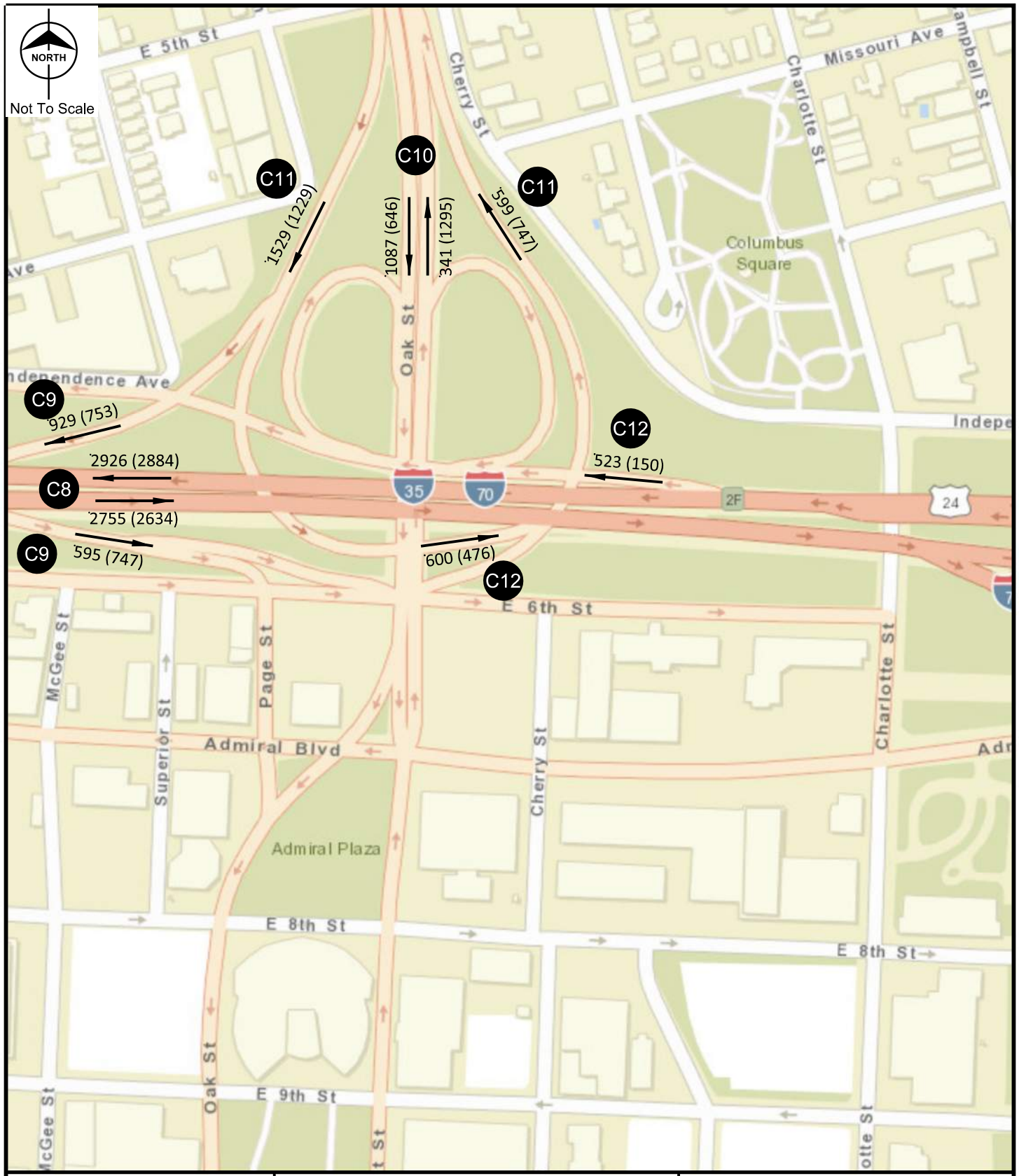
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build Adjacent Alternative (Option 3)

Exhibit 5.8

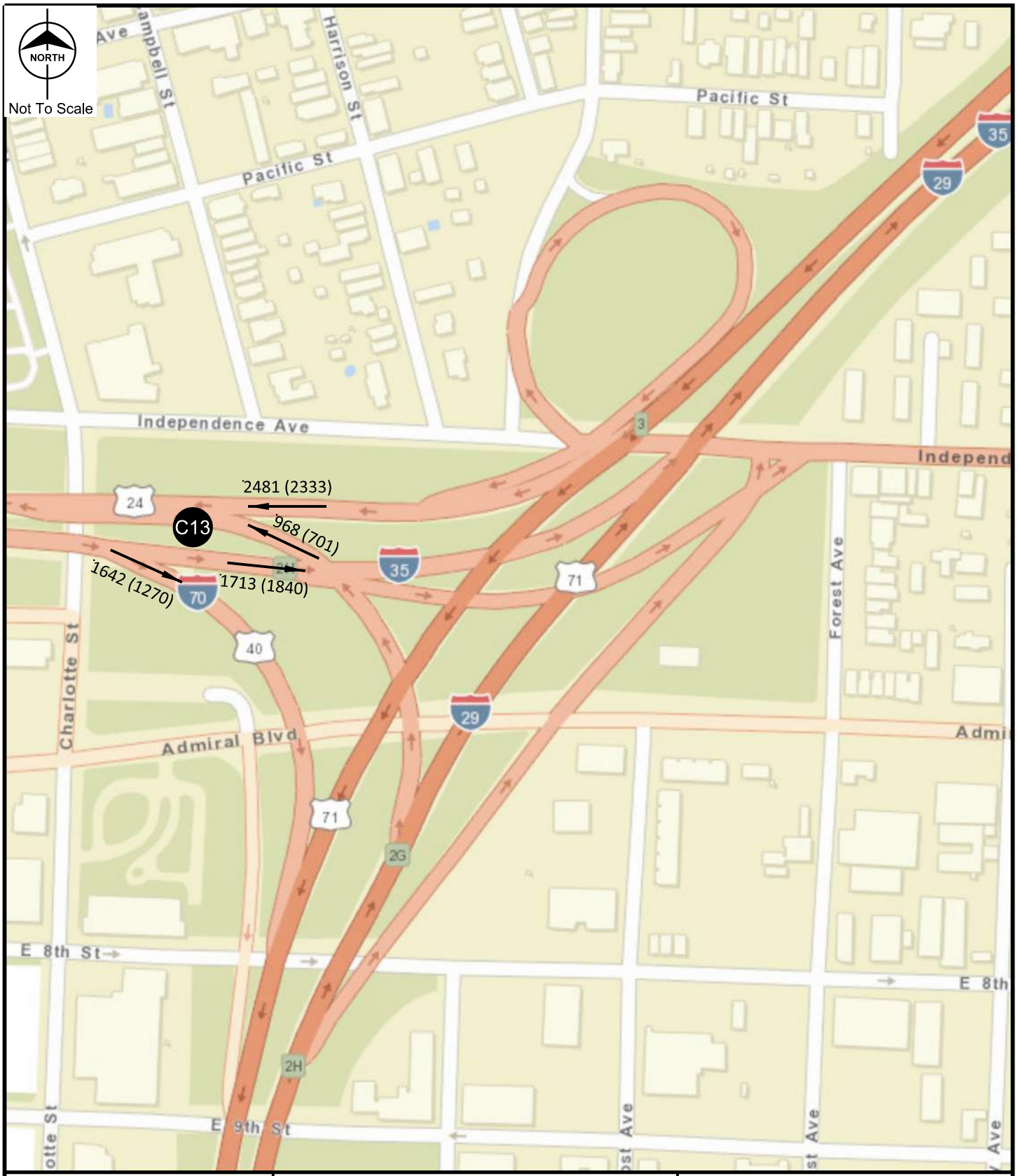
LEGEND

- X — Study Intersection
- Signalized
- STOP — Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build Adjacent Alternative
(Option 3)

Exhibit 5.9

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build West Alternative

Exhibit 6.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build West Alternative

Exhibit 6.2

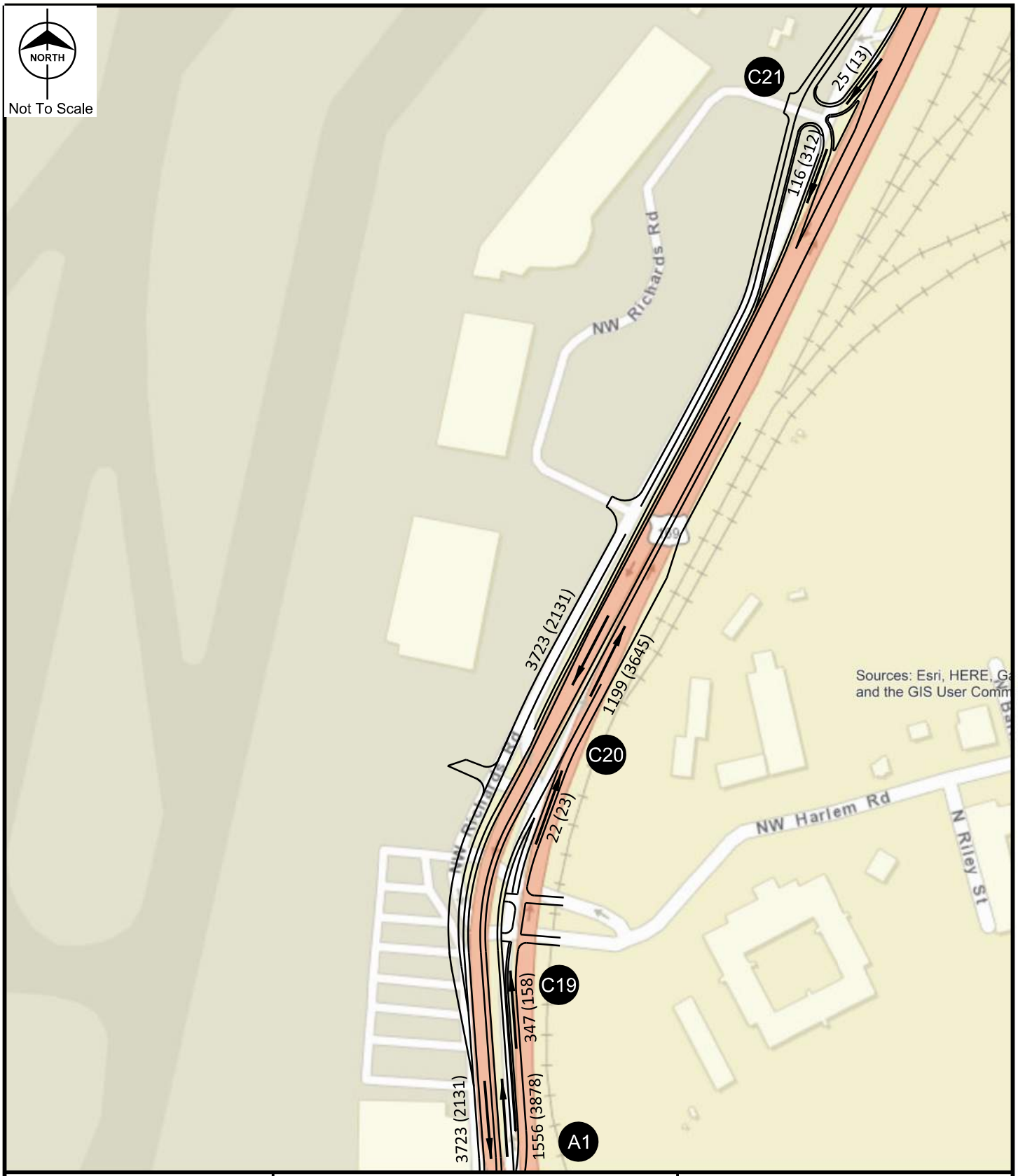
LEGEND

- X Study Intersection
- Signalized
- STOP Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build West Alternative

Exhibit 6.3

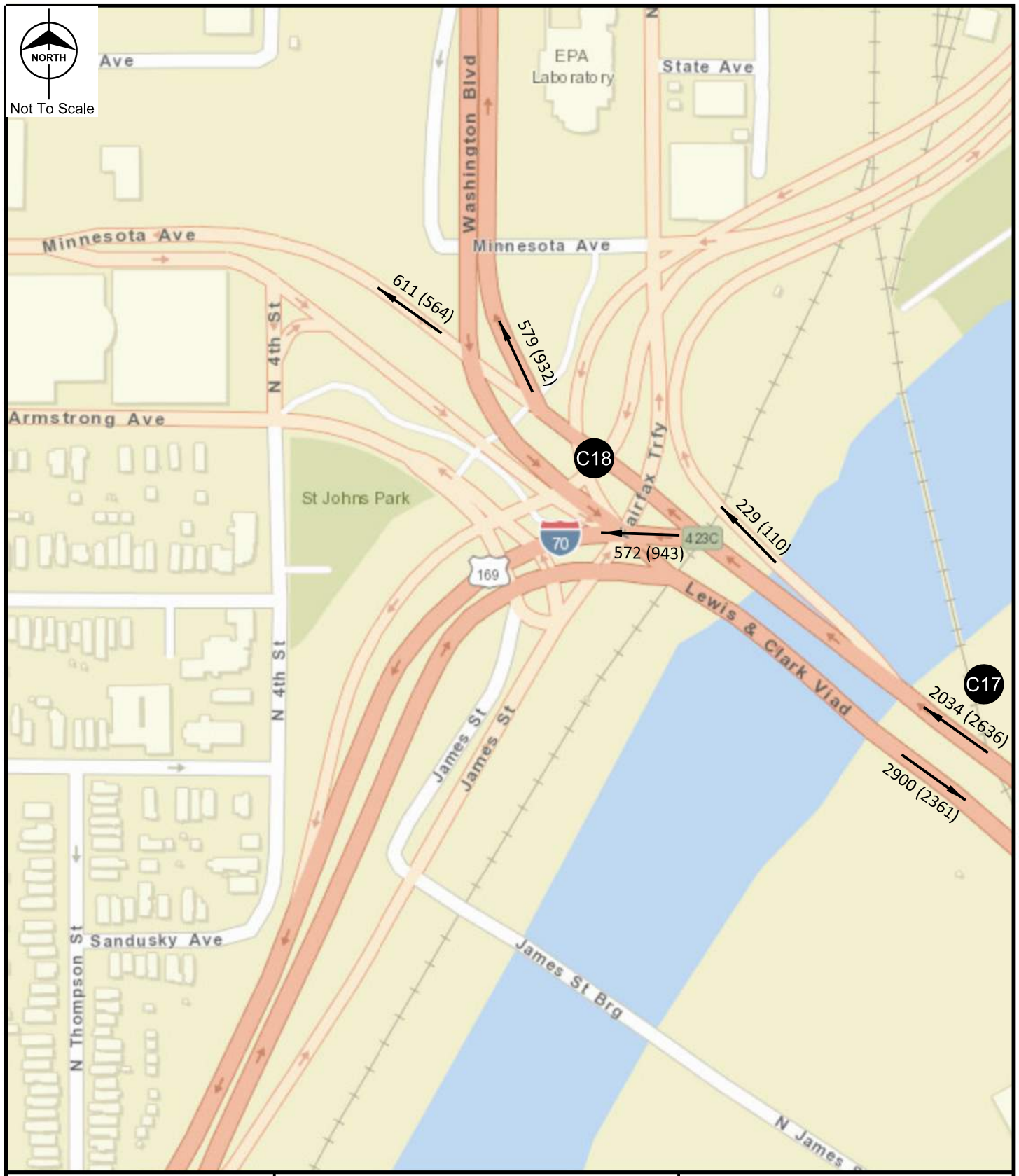
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build West Alternative

Exhibit 6.4

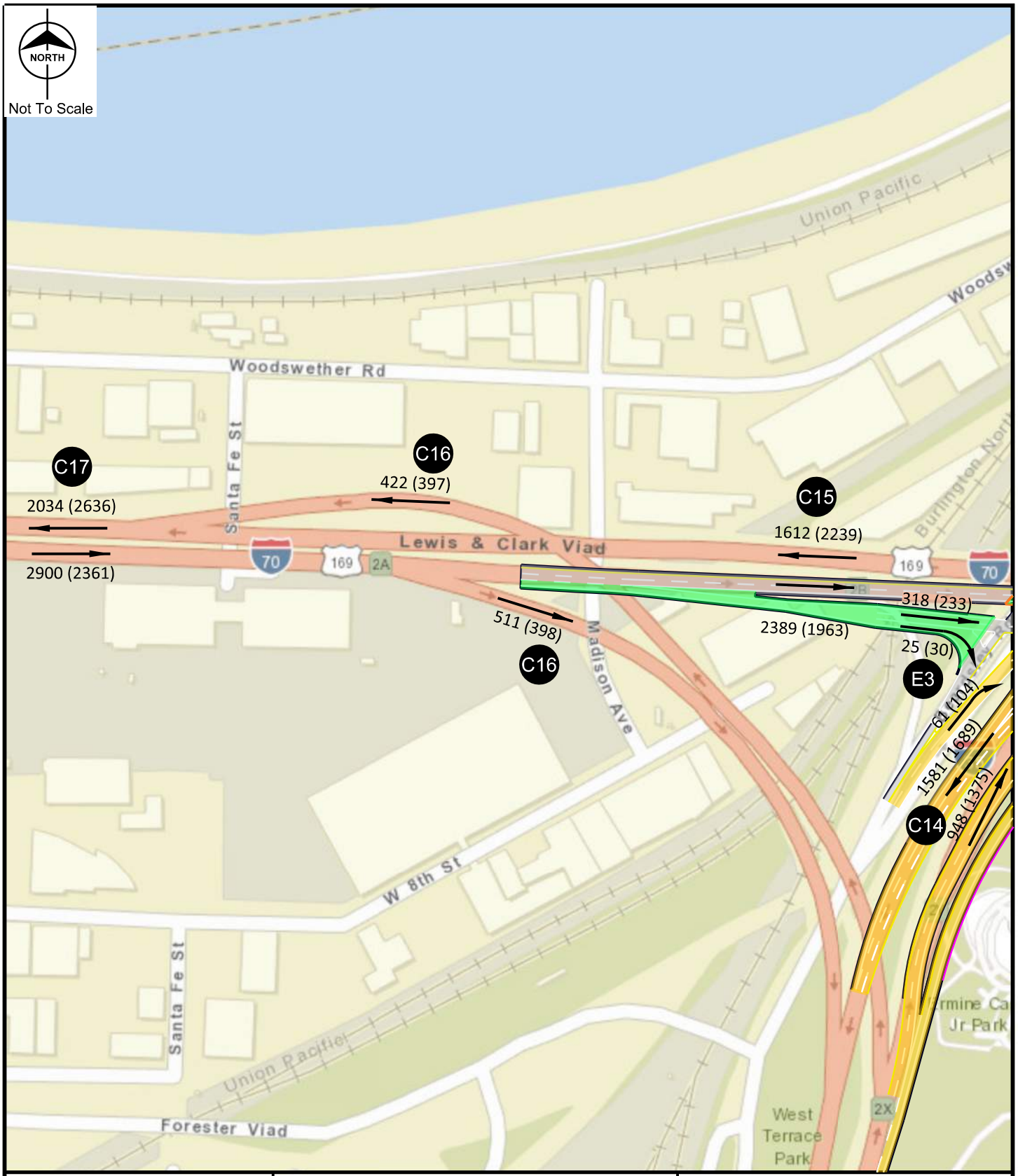
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build West Alternative

Exhibit 6.5

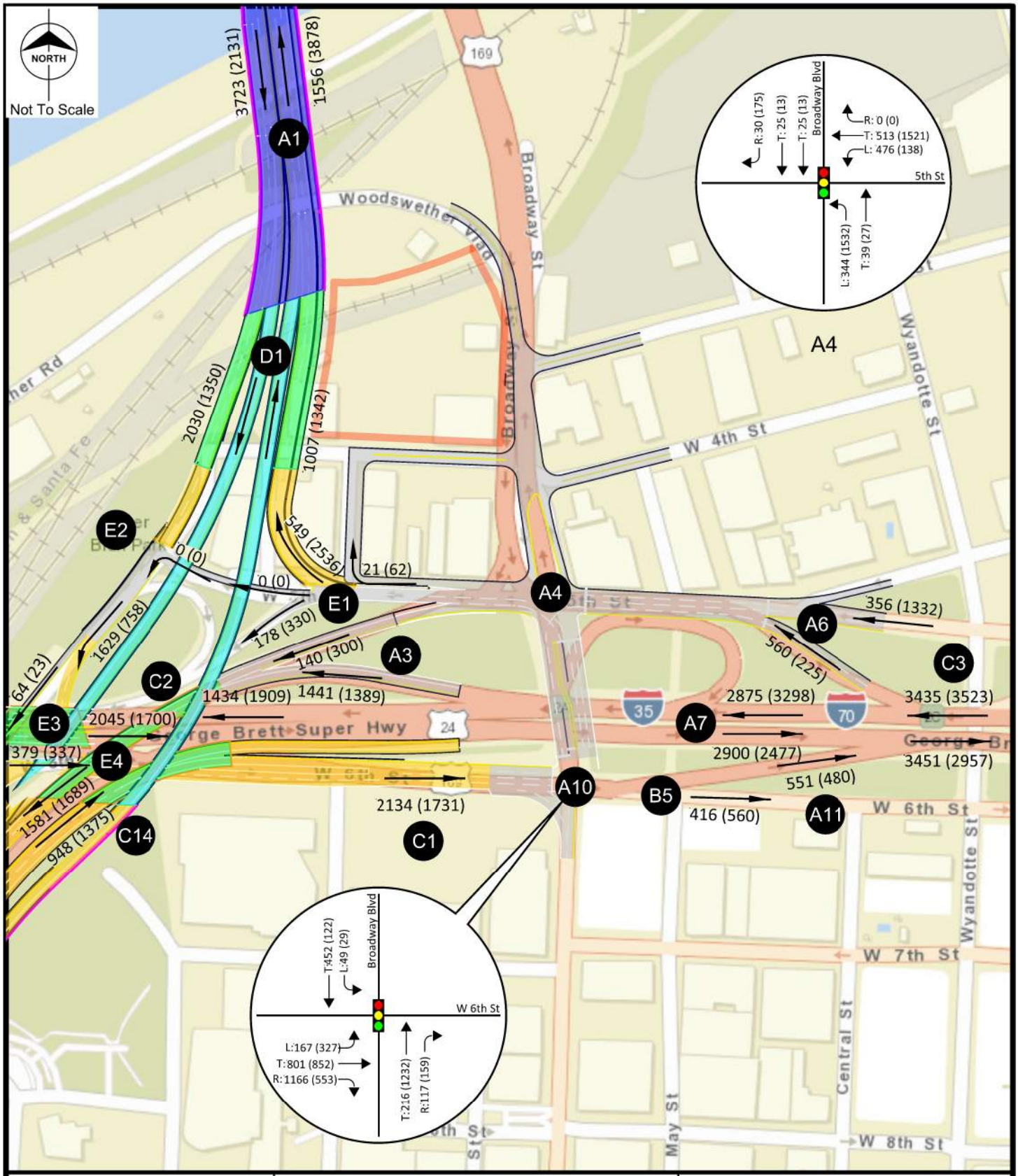
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build West Alternative

Exhibit 6.6

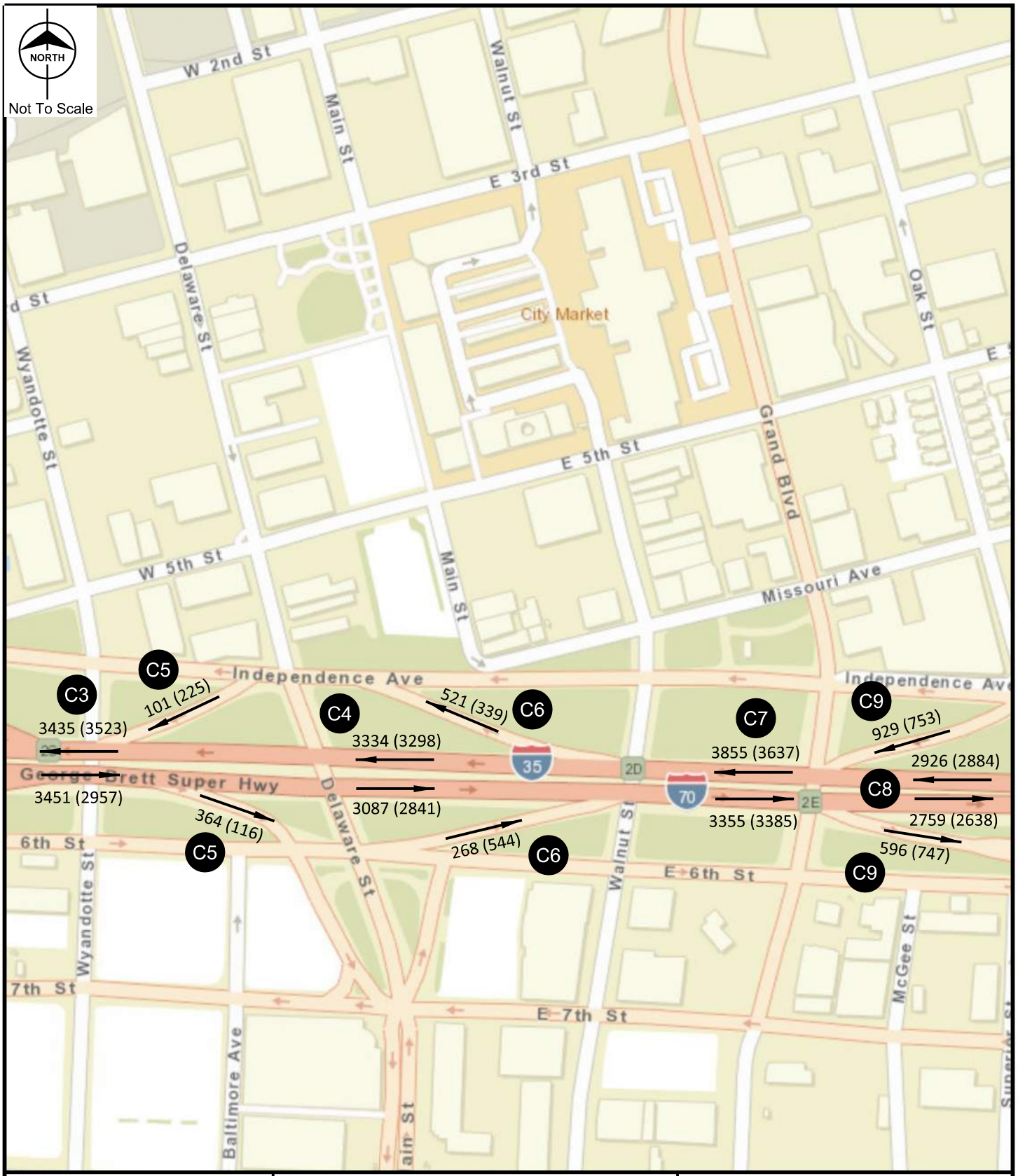
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build West Alternative

Exhibit 6.7

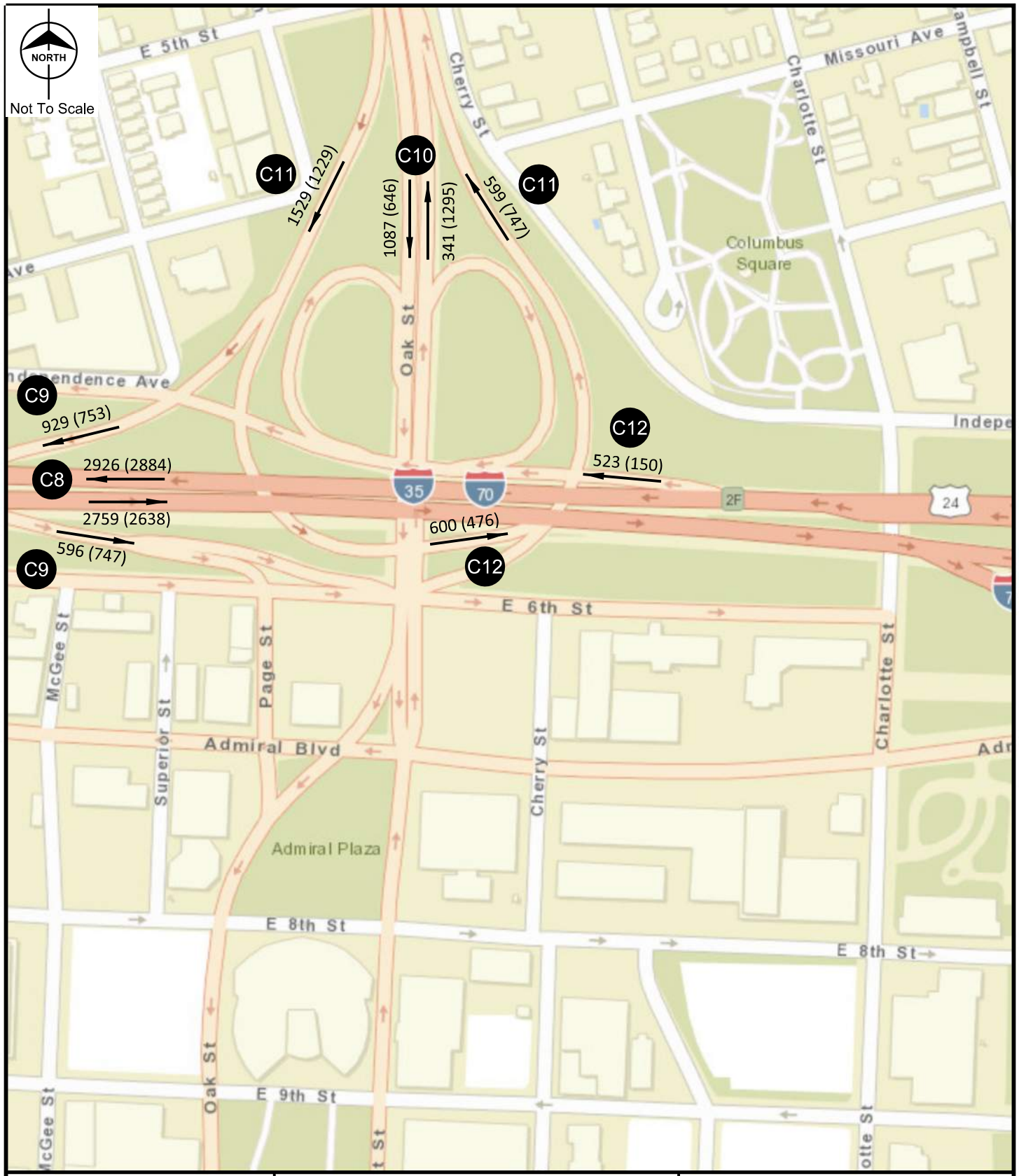
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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2025 Build West Alternative

Exhibit 6.8

date	July 2019
designed	T. Cope

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2025 Build West Alternative

Exhibit 6.9

date	July 2019
designed	T. Cope

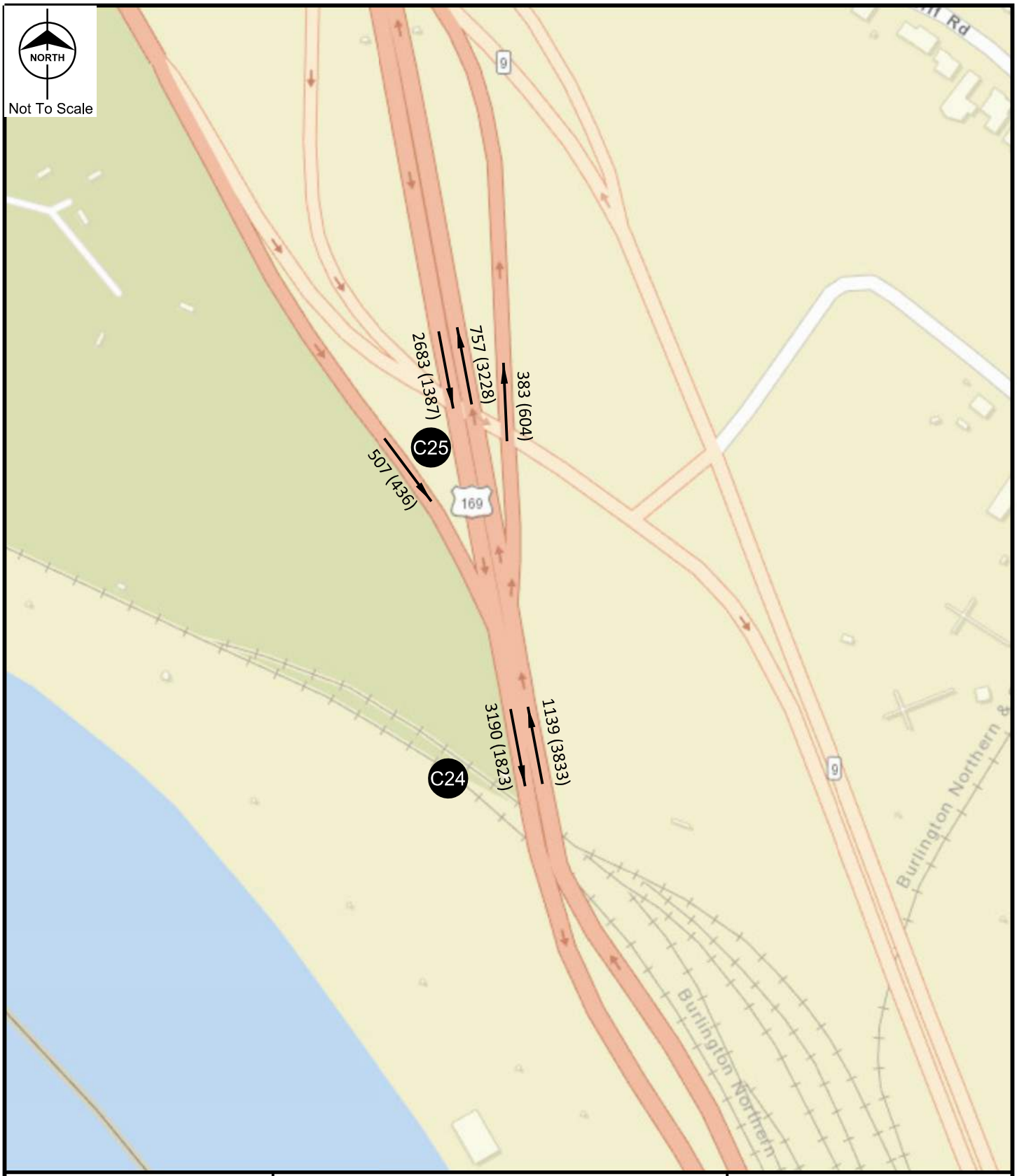
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2045 No-Build

Exhibit 7.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2045 No-Build

Exhibit 7.2

LEGEND		MOVEMENT
X	Study Intersection	L: Left
	Signalized	T: Through
STOP	Stop Controlled	R: Right
	Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

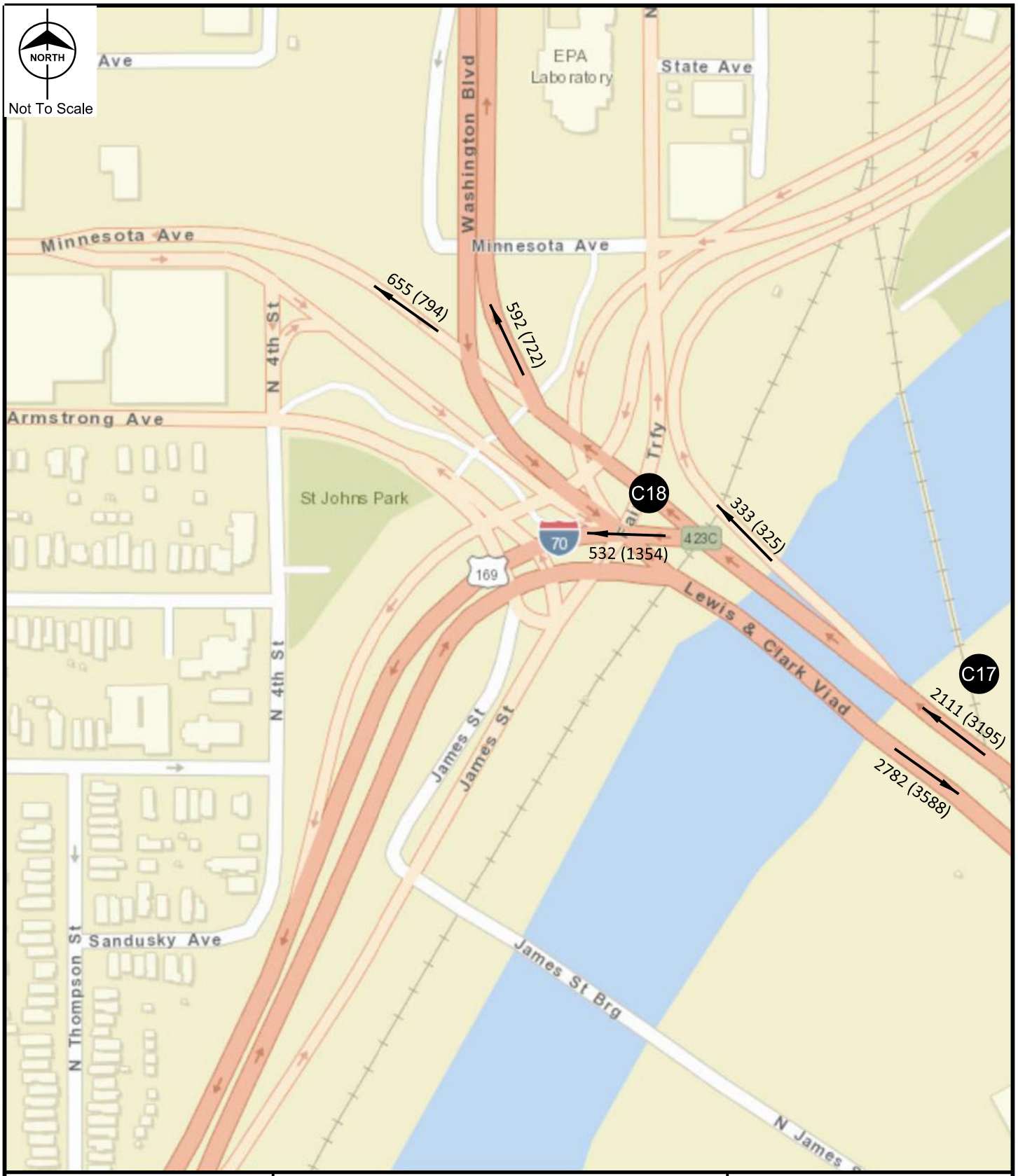
Missouri Department of Transportation

2045 No-Build

Exhibit 7.3

LEGEND	MOVEMENT
Study Intersection	L: Left
Signalized	T: Through
Stop Controlled	R: Right
Roundabout	U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 No-Build

Exhibit 7.4

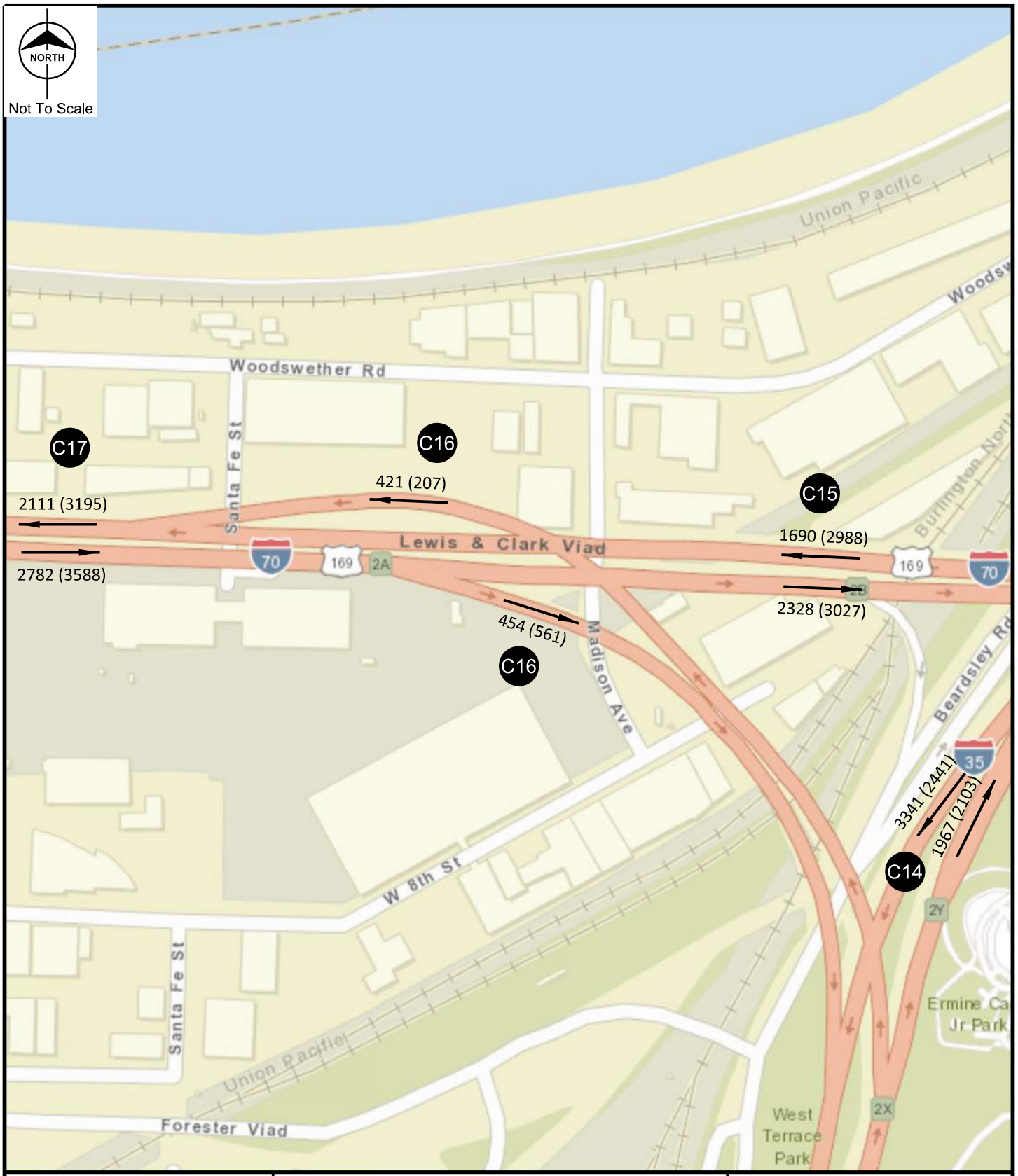
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 No-Build

Exhibit 7.5

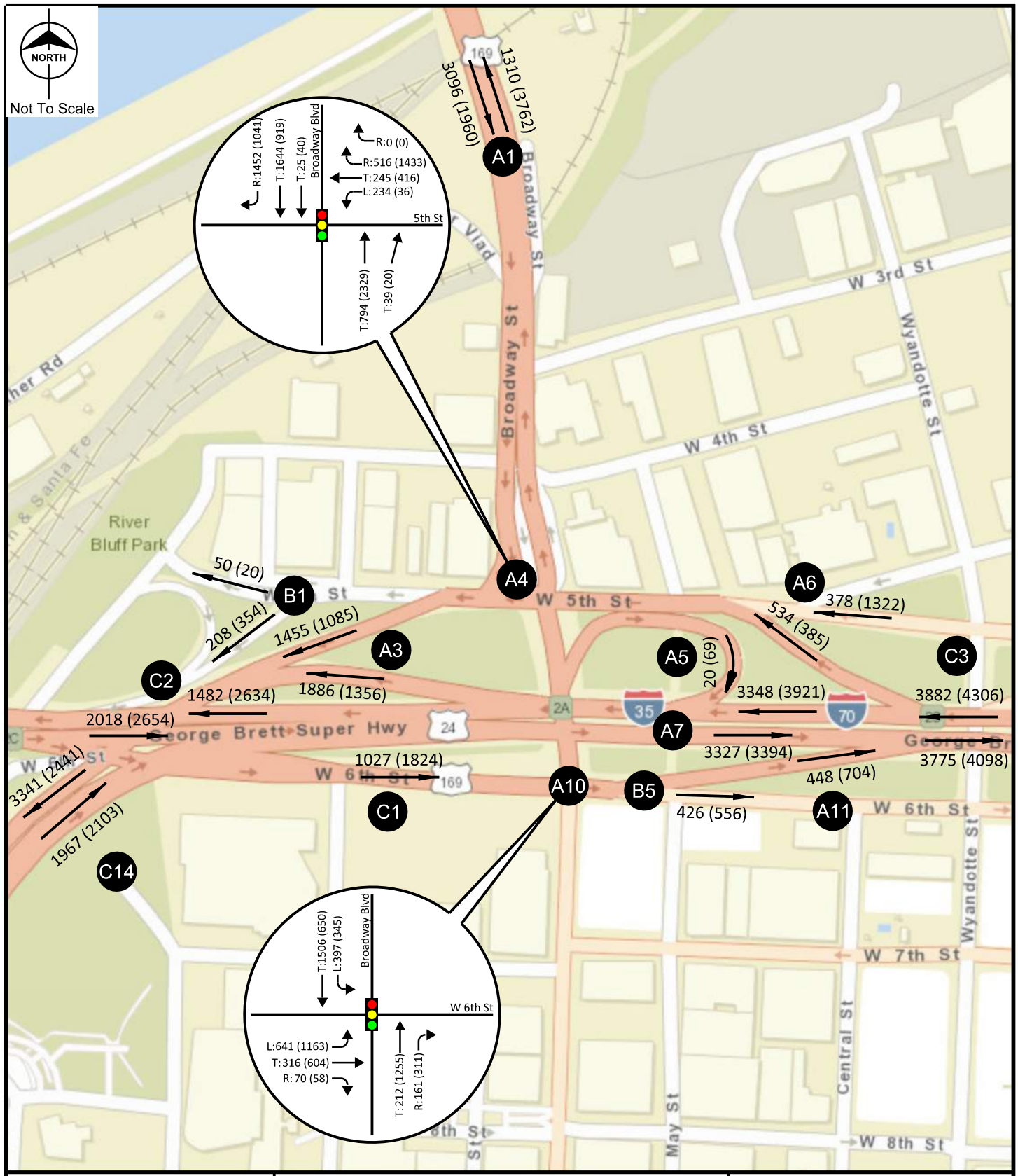
LEGEND

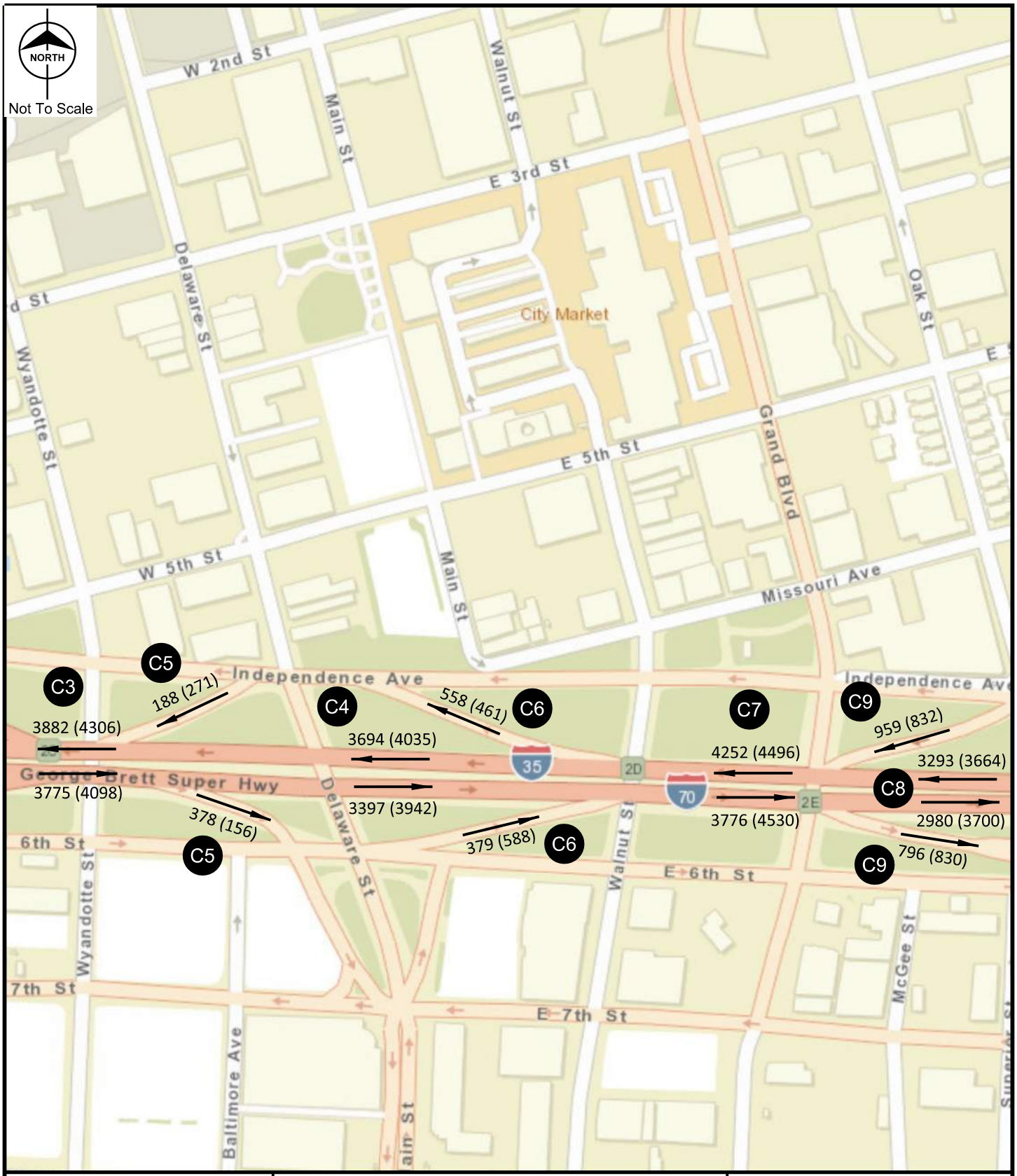
- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour


NORTH
Not To Scale
3096 (1960)
1310 (3762)
A1
R:1452 (1041)
T:1644 (919)
T:25 (40)
Broadway Blvd
R:0 (0)
R:516 (1433)
T:245 (416)
L:234 (36)
5th St
T:794 (2329)
T:39 (20)
Broadway St
W 3rd St
Wyandotte St
W 4th St
River Bluff Park
A4
W 5th St
50 (20)
B1
208 (354)
1455 (1085)
A3
C2
1482 (2634)
1886 (1356)
2018 (2654)
George Brett Super Hwy
24
2A
35
70
A6
378 (1322)
534 (385)
A5
20 (69)
3348 (3921)
C3
3882 (4306)
A7
3327 (3394)
3775 (4098)
448 (704)
1027 (1824)
W 6th St
169
3341 (2441)
1967 (2103)
C1
C14
A10
B5
426 (556)
A11
W 6th St
Wyandotte St
W 7th St
Central St
May St
W 8th St
T:1506 (650)
L:397 (345)
Broadway Blvd
W 6th St
L:641 (1163)
T:316 (604)
R:70 (58)
T:212 (1255)
R:161 (311)
BURNS McDONNELL
Missouri Department of Transportation
2045 No-Build
Exhibit 7.6
date July 2019
designed T. Cope
LEGEND
Study Intersection
Signalized
Stop Controlled
Roundabout
MOVEMENT
L: Left
T: Through
R: Right
U: U-Turn
XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 No-Build

Exhibit 7.7

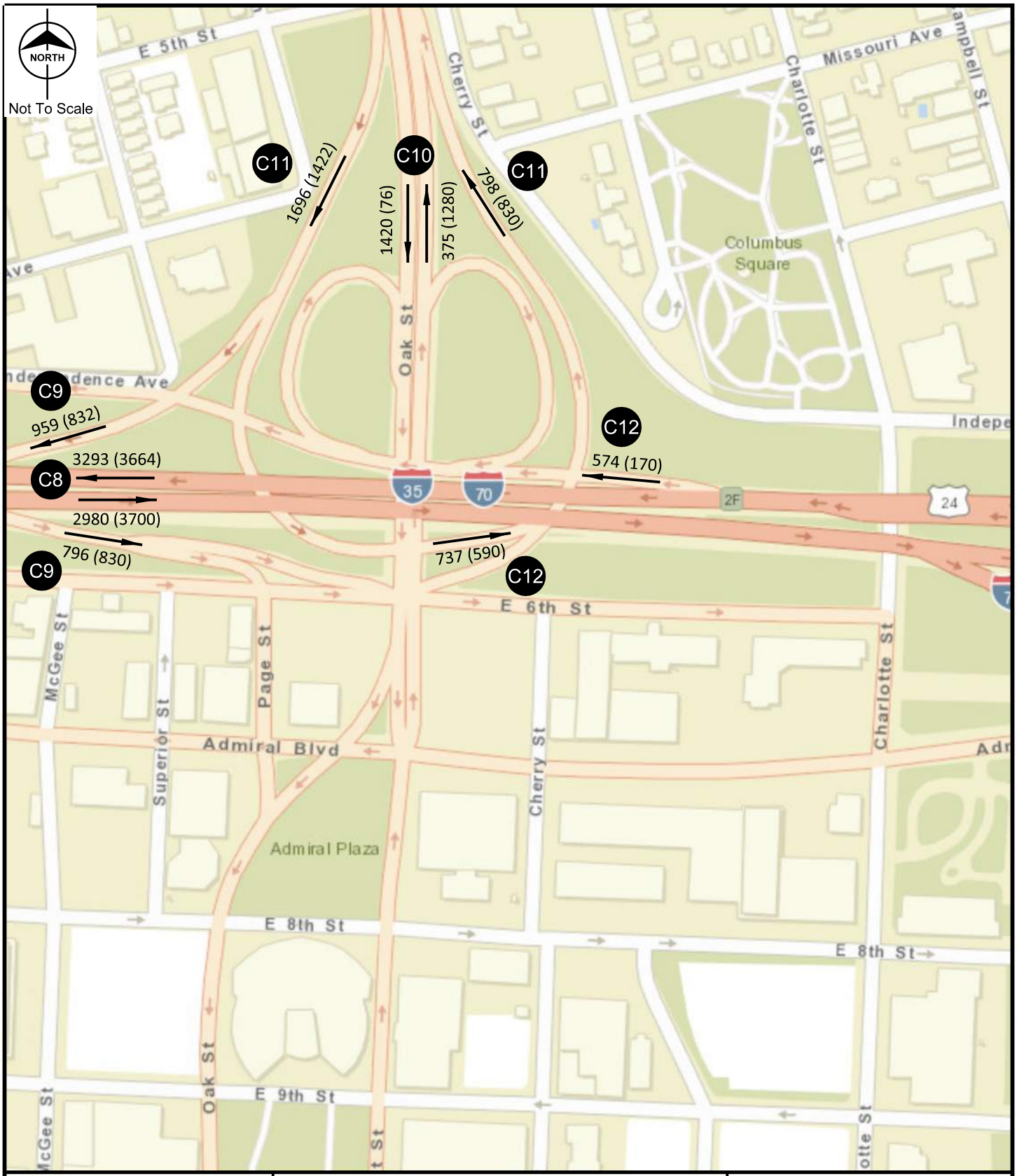
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 No-Build

Exhibit 7.8

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 No-Build

Exhibit 7.9

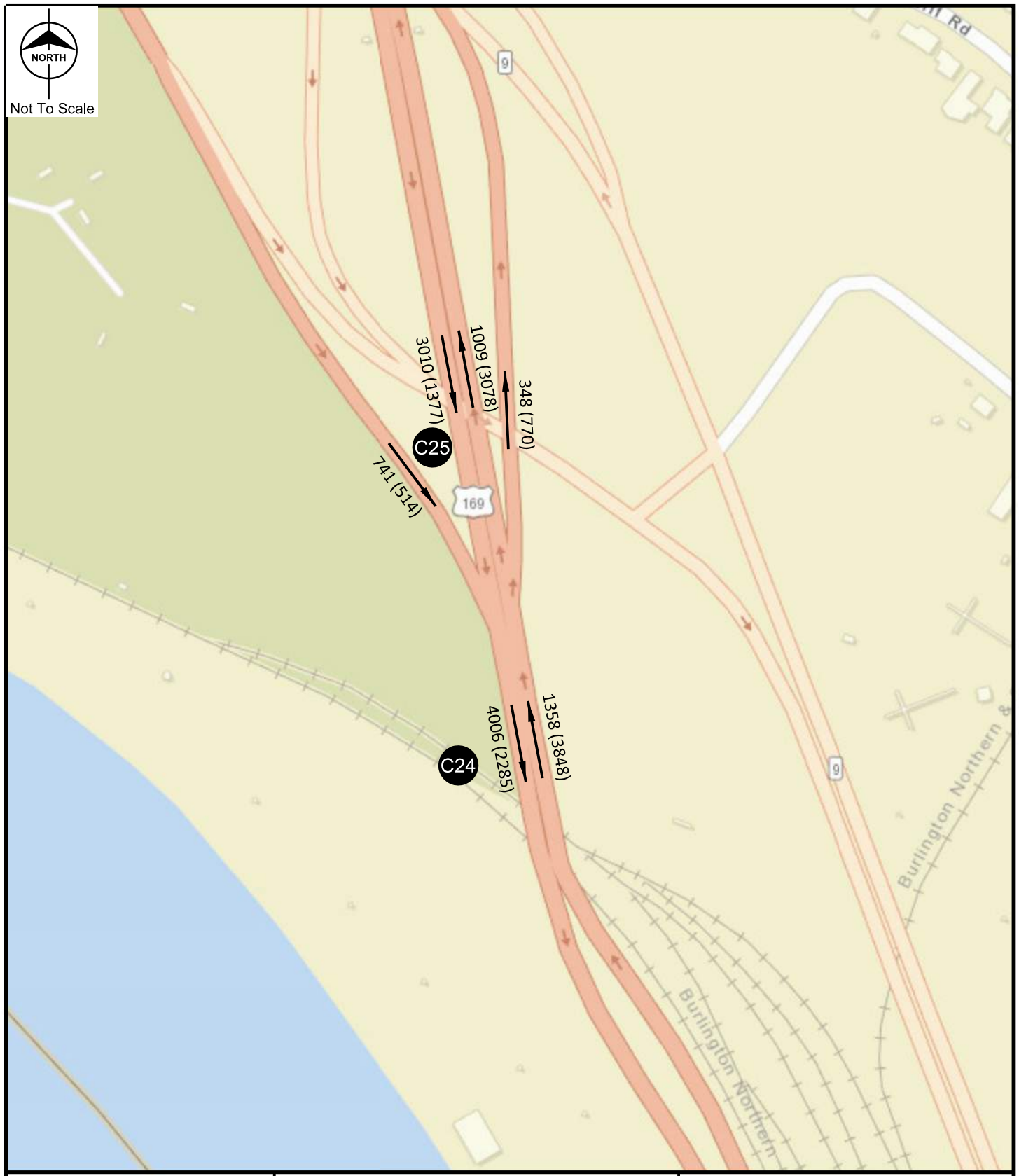
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Roundabout

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build Central Alternative

Exhibit 8.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour



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date July 2019

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Missouri Department of Transportation

2045 Build Central Alternative

Exhibit 8.2

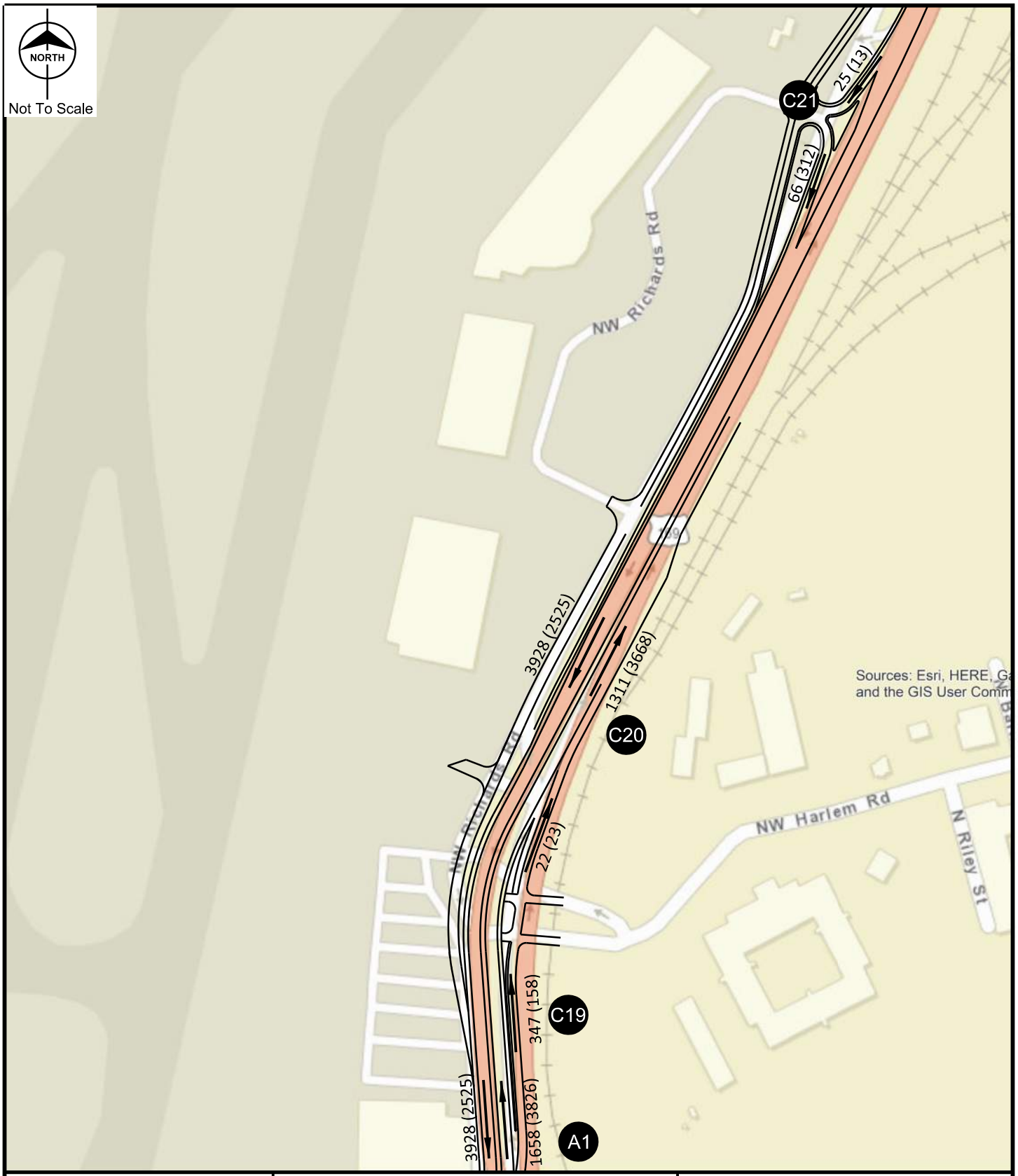
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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Missouri Department of Transportation

2045 Build Central Alternative

Exhibit 8.3

date	July 2019
designed	T. Cope

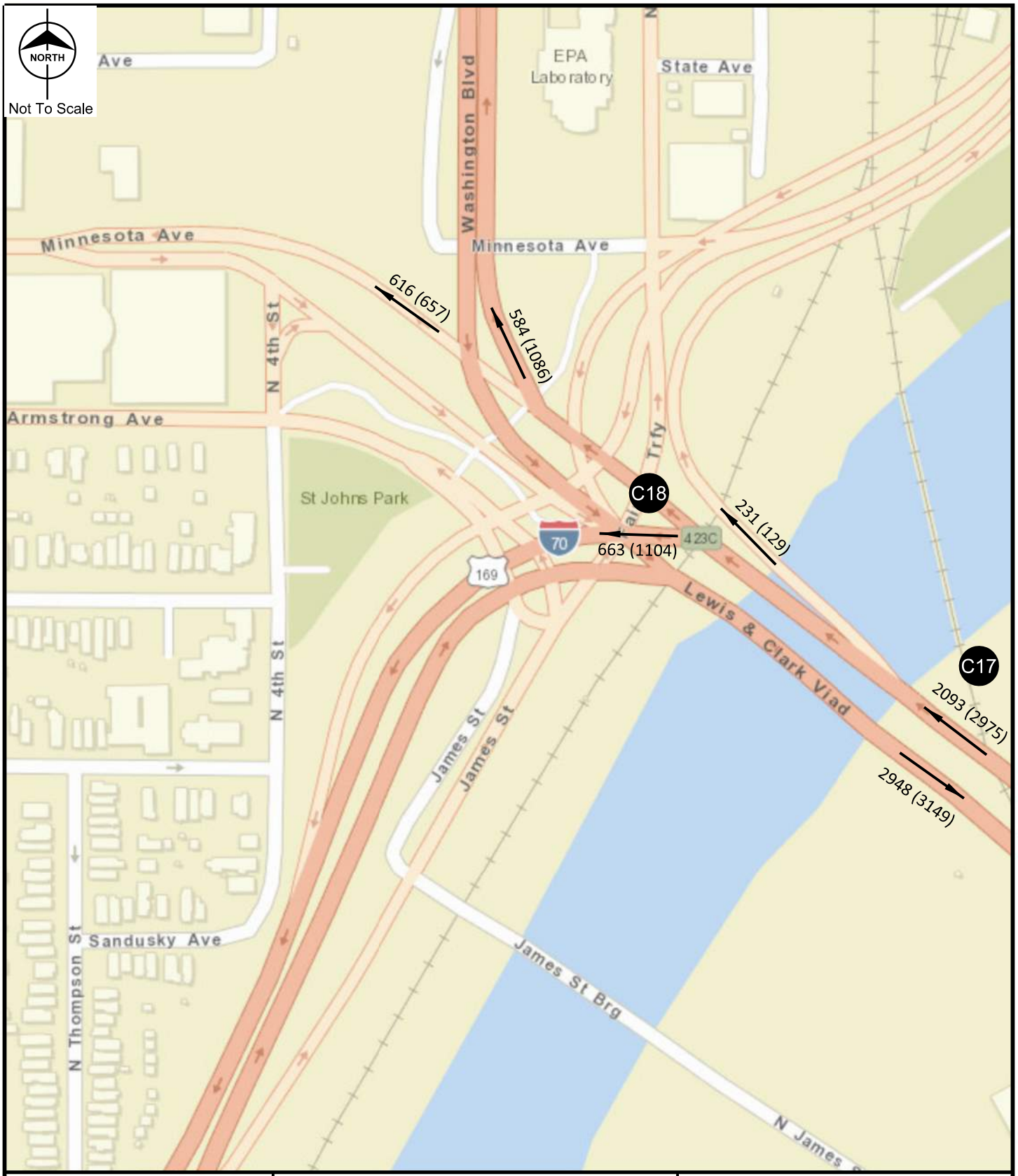
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build Central Alternative

Exhibit 8.4

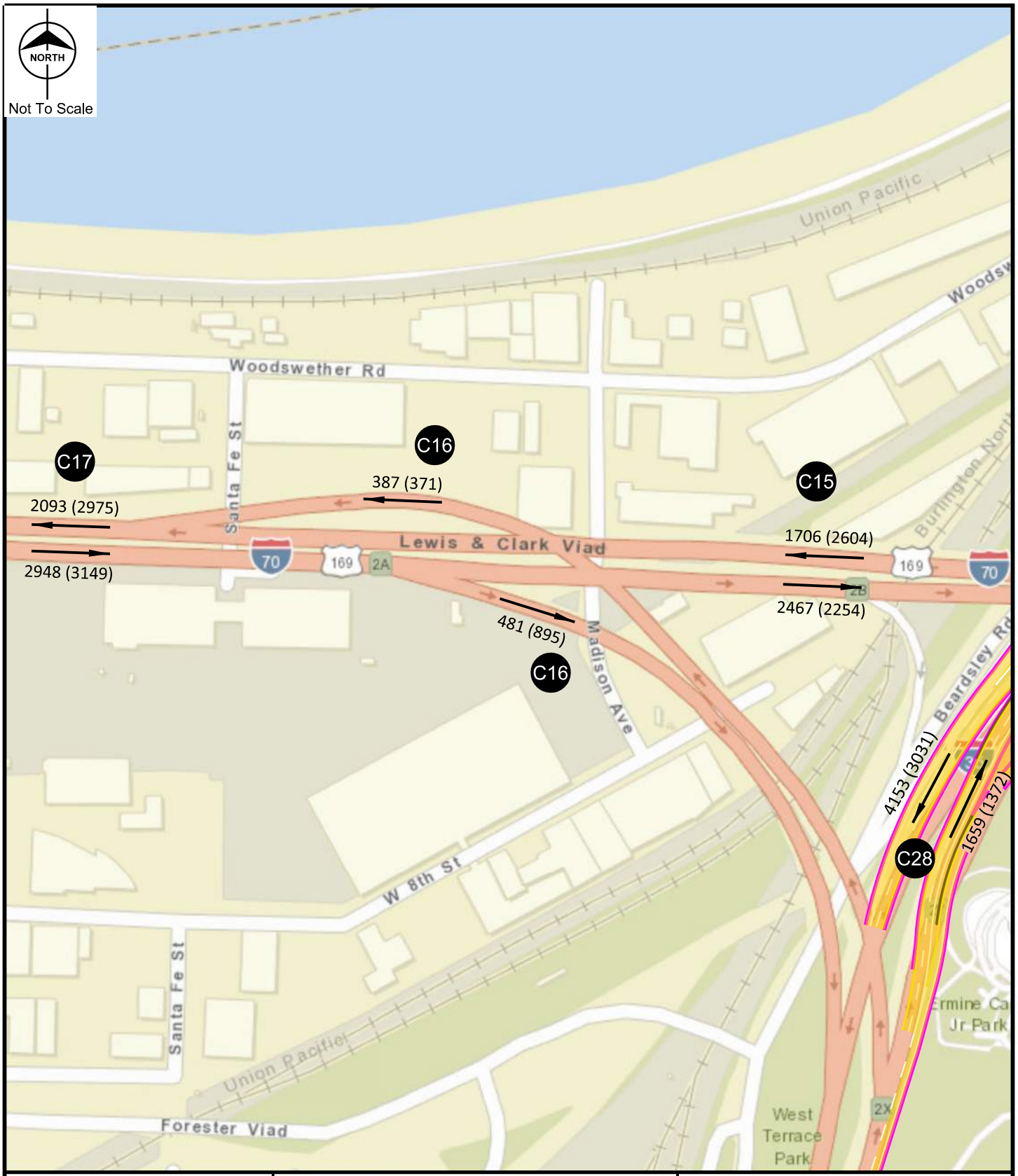
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build Central Alternative

Exhibit 8.5

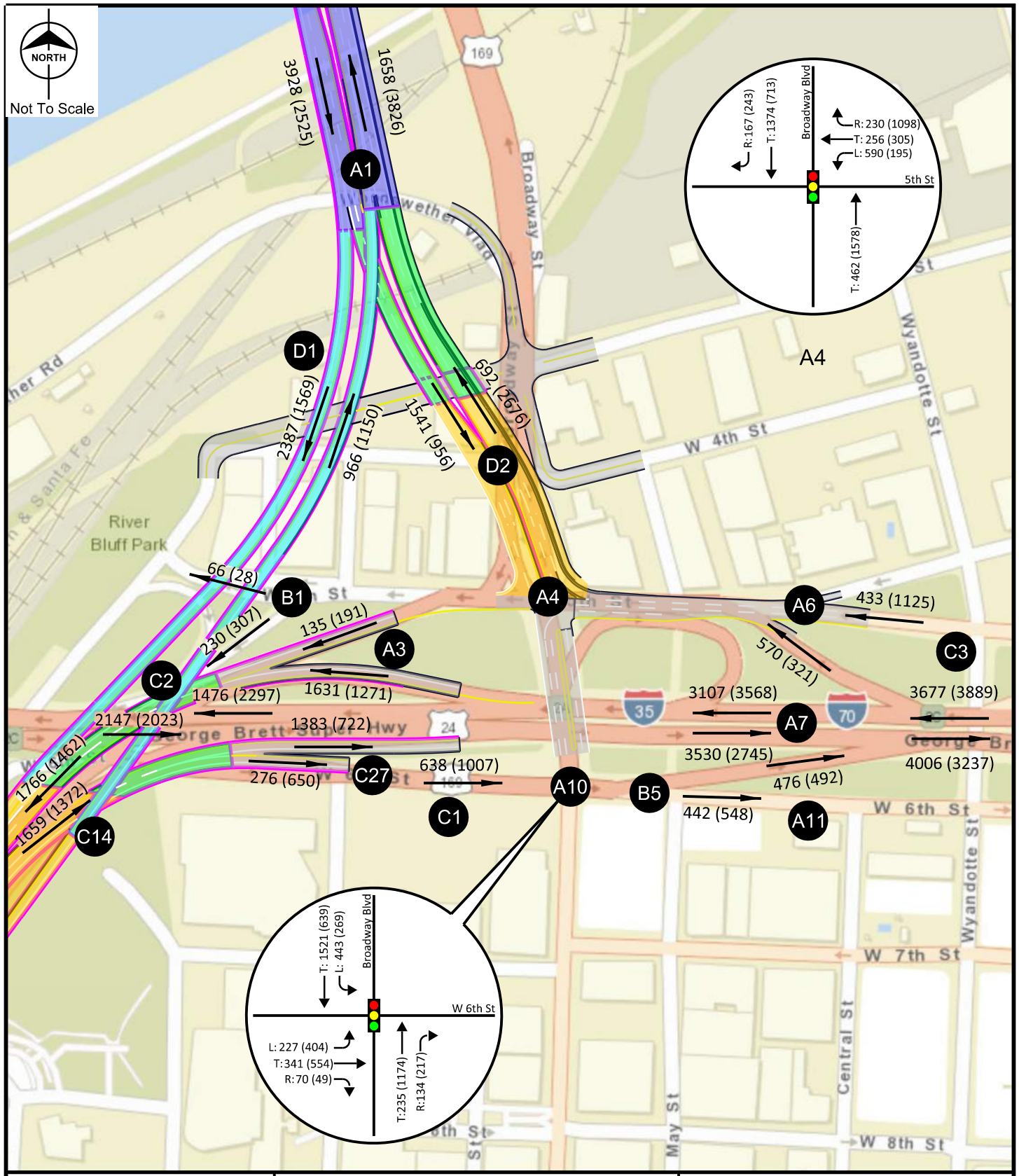
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
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2045 Build Central Alternative

Exhibit 8.6

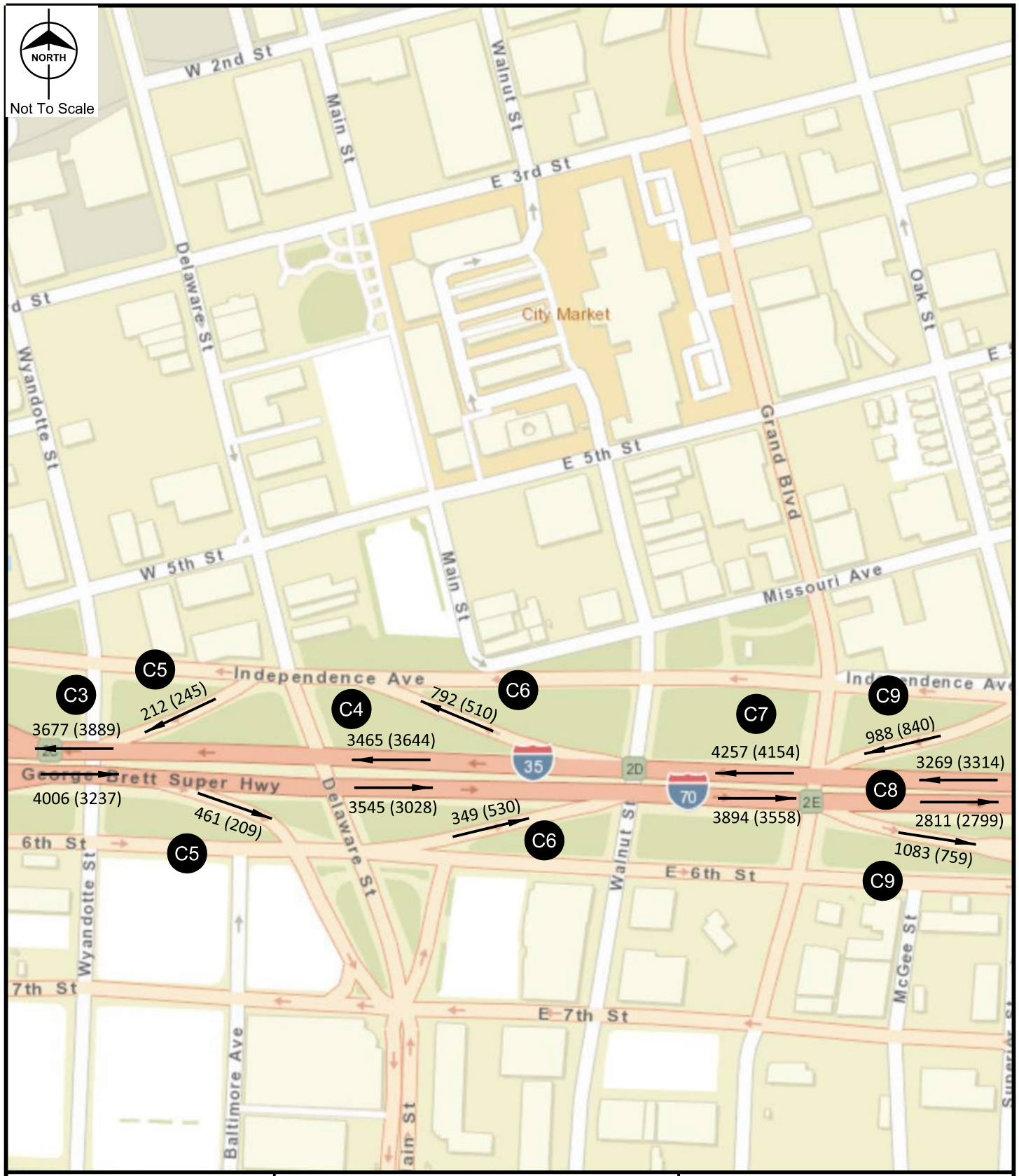
LEGEND

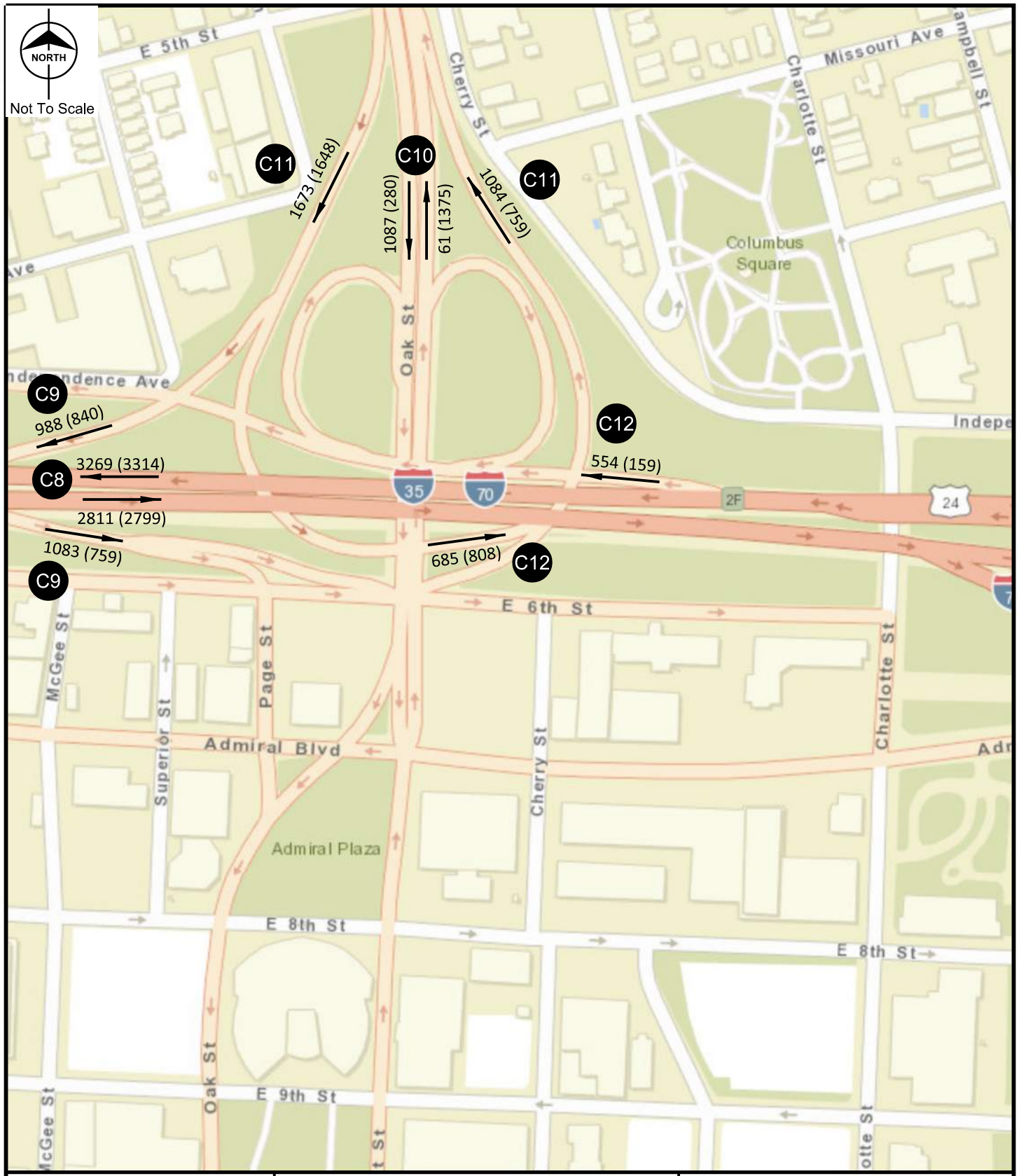
- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour


NORTH
Not To Scale
W 2nd St
Main St
Walnut St
E 3rd St
Delaware St
Wyandotte St
City Market
Oak St
E 5th St
Grand Blvd
W 5th St
Missouri Ave
Independence Ave
C3
C5
212 (245)
3677 (3889)
C4
C6
792 (510)
3465 (3644)
C7
4257 (4154)
C9
988 (840)
3269 (3314)
George Brett Super Hwy
4006 (3237)
461 (209)
3545 (3028)
349 (530)
35
2D
70
2E
3894 (3558)
C8
2811 (2799)
1083 (759)
6th St
E 6th St
7th St
E 7th St
Baltimore Ave
McGee St
BURNS McDONNELL
date July 2019
designed T. Cope
Missouri Department of Transportation
2045 Build Central Alternative
Exhibit 8.7
LEGEND
Study Intersection
Signalized
Stop Controlled
Flyover Bridge Structure
Long Span River Bridge Structure
New Roadway Pavement with Adjacent Walls
Short Span Bridge Structures
XX (XX) AM (PM) Peak Hour
MOVEMENT
L: Left
T: Through
R: Right
U: U-Turn



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2045 Build Central Alternative

Exhibit 8.8

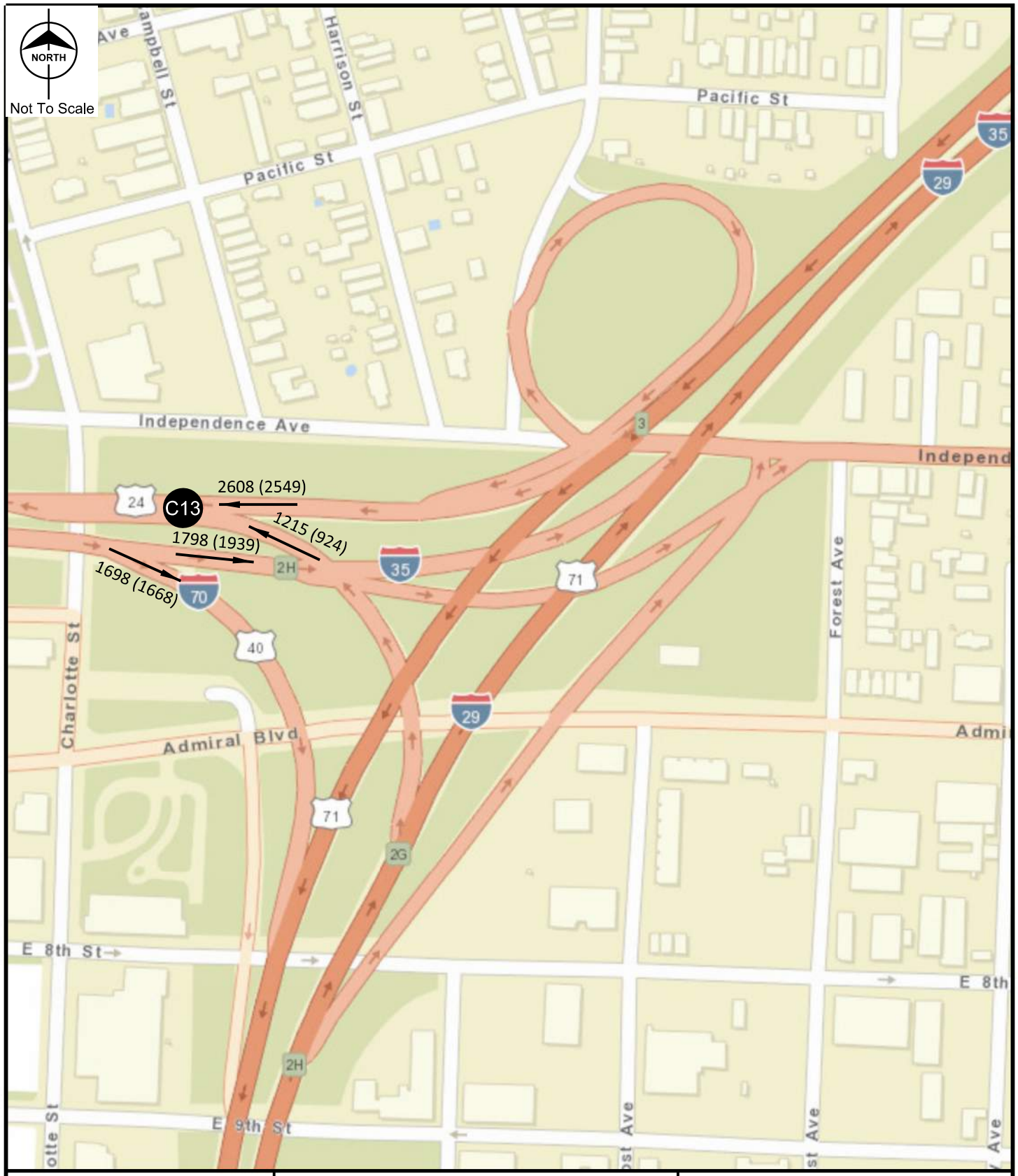
LEGEND

- X — Study Intersection
- Signalized
- STOP — Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2045 Build Central Alternative

Exhibit 8.9

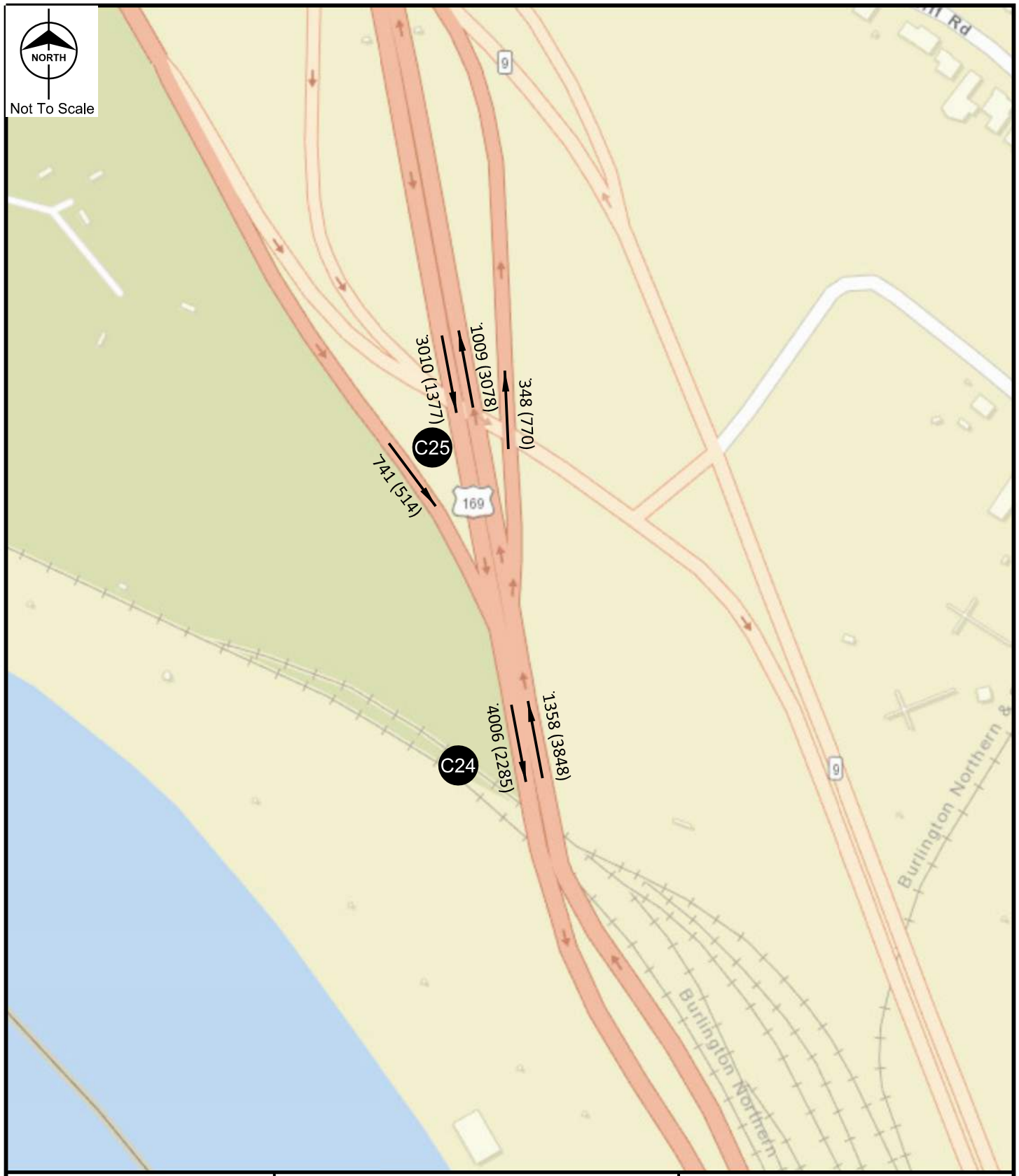
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

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2045 Build Adjacent Alternative (Option 3)

Exhibit 9.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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2045 Build Adjacent Alternative
(Option 3)

Exhibit 9.2

date	July 2019
designed	T. Cope

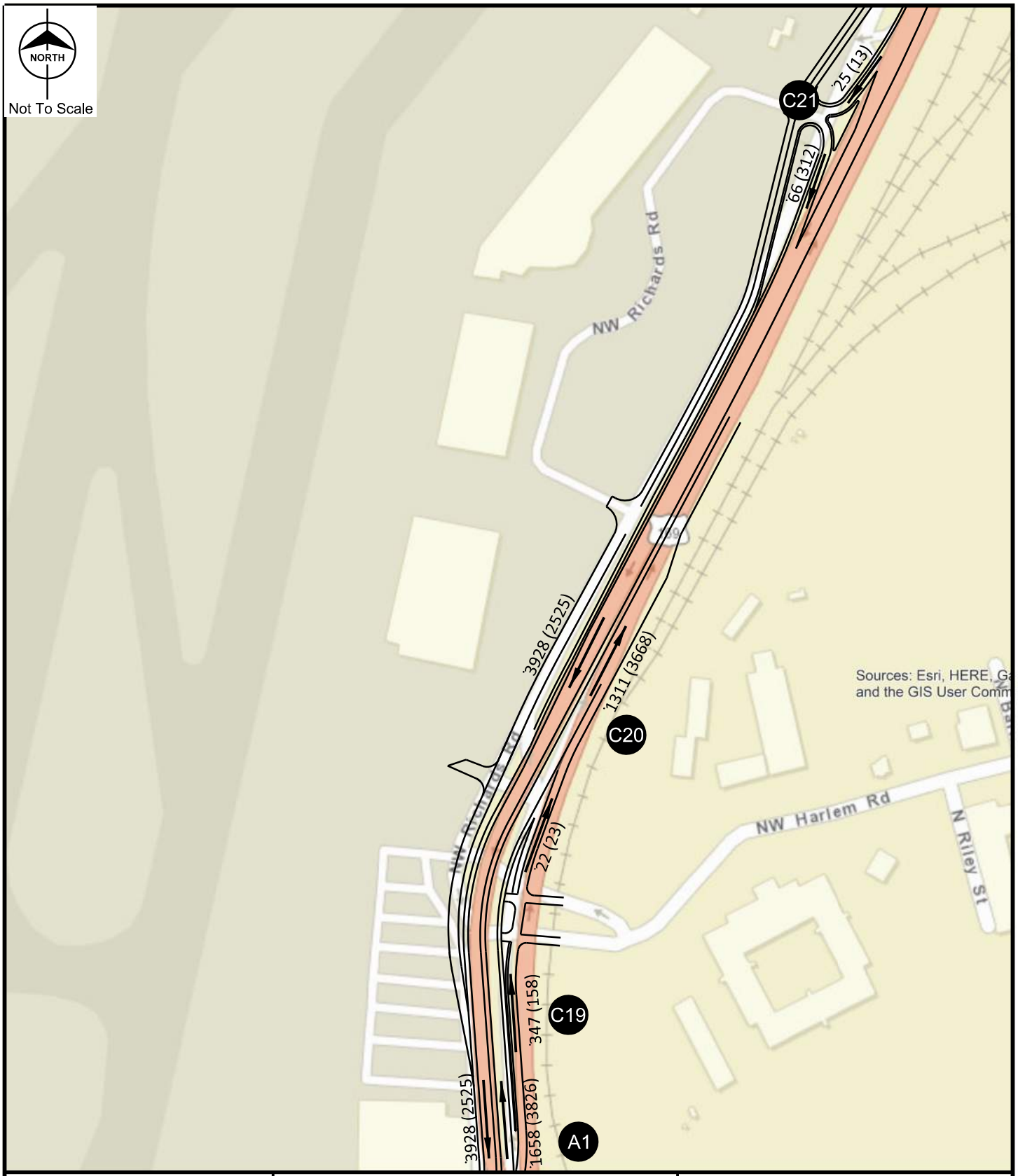
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build Adjacent Alternative (Option 3)

Exhibit 9.3

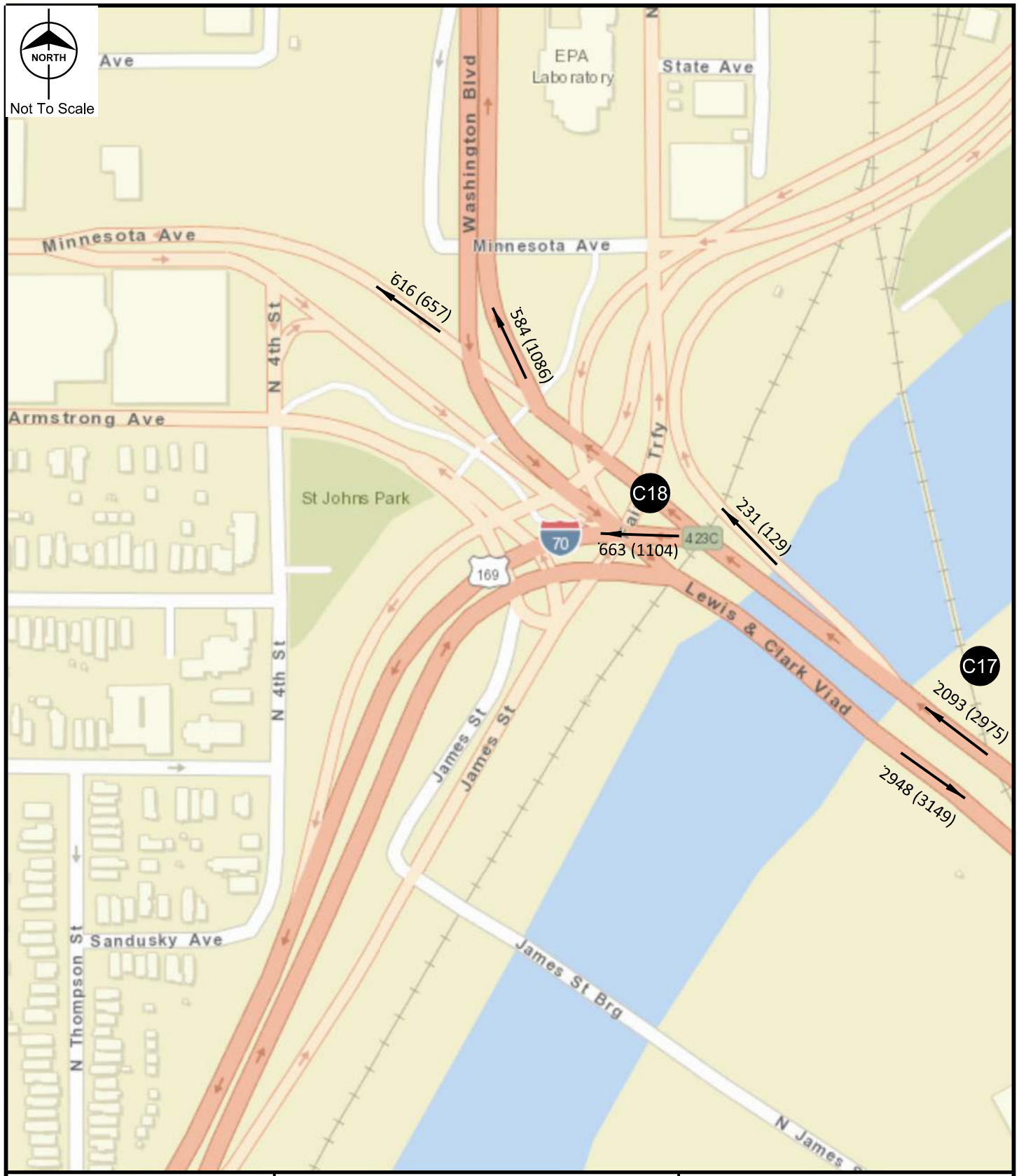
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build Adjacent Alternative (Option 3)

Exhibit 9.4

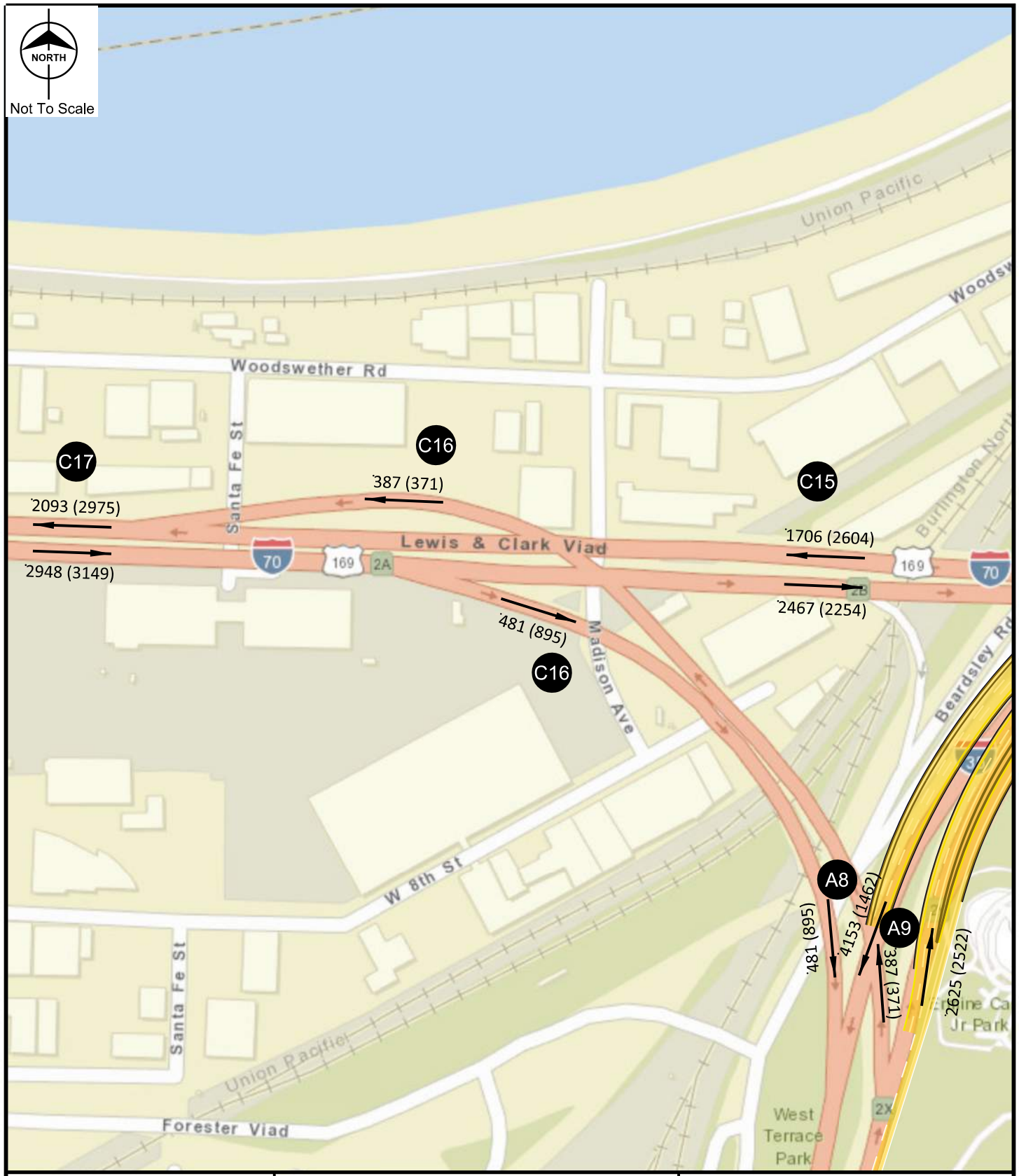
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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date	July 2019
designed	T. Cope

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2045 Build Adjacent Alternative (Option 3)

Exhibit 9.5

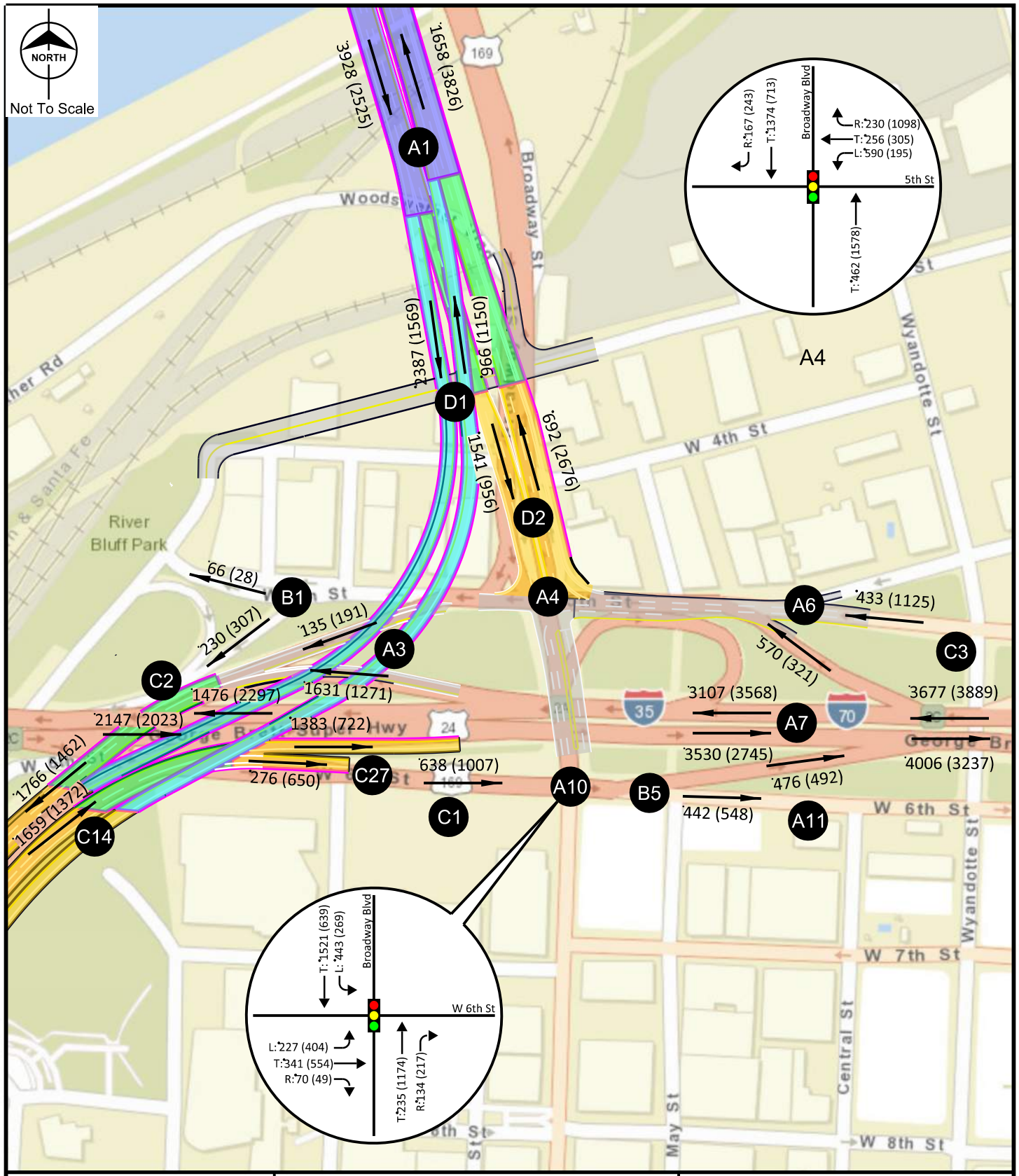
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date July 2019

designed T. Cope

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2045 Build Adjacent Alternative (Option 3)

Exhibit 9.6

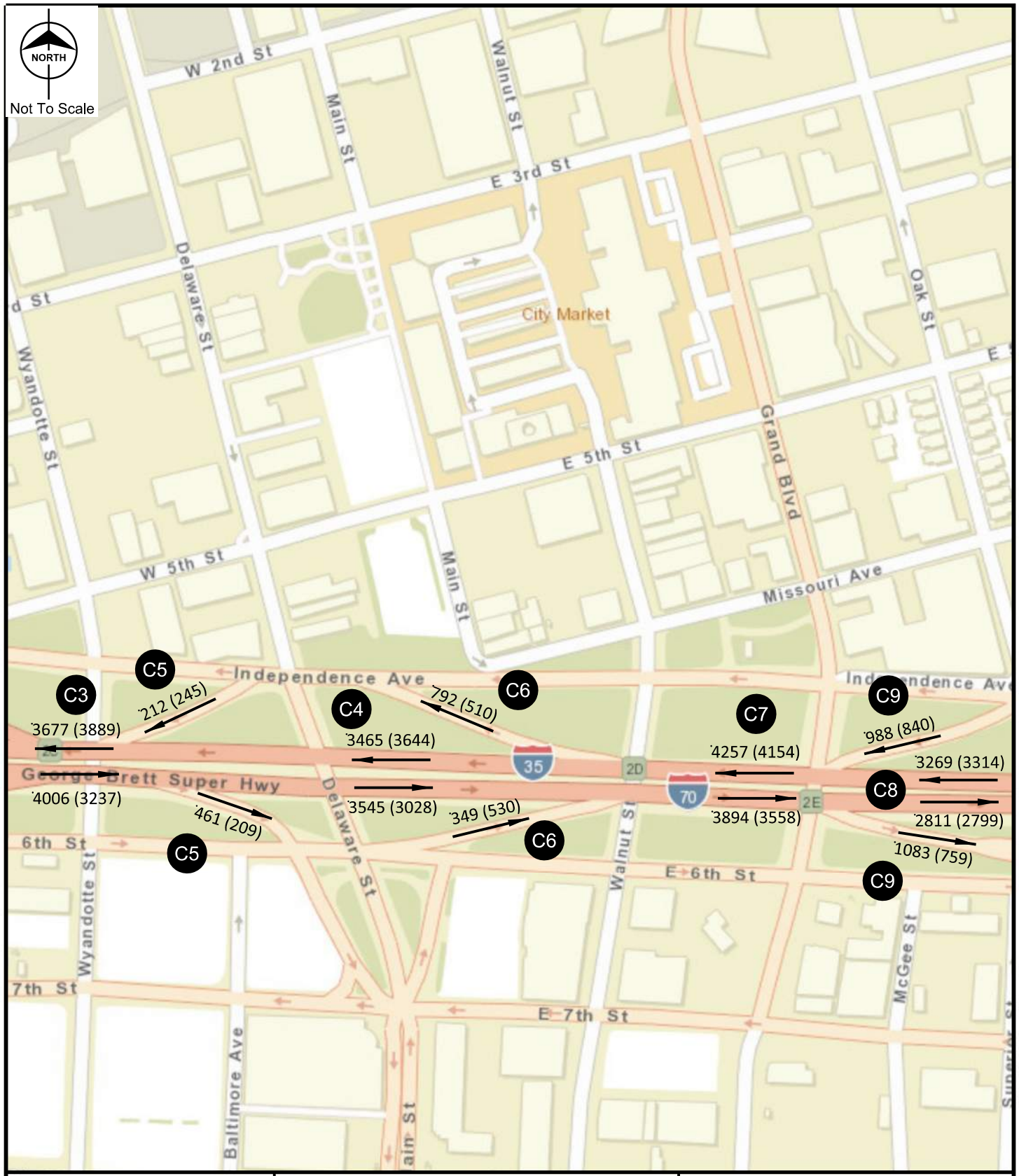
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour


NORTH
Not To Scale
W 2nd St
Main St
Walnut St
E 3rd St
Delaware St
Wyandotte St
City Market
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Grand Blvd
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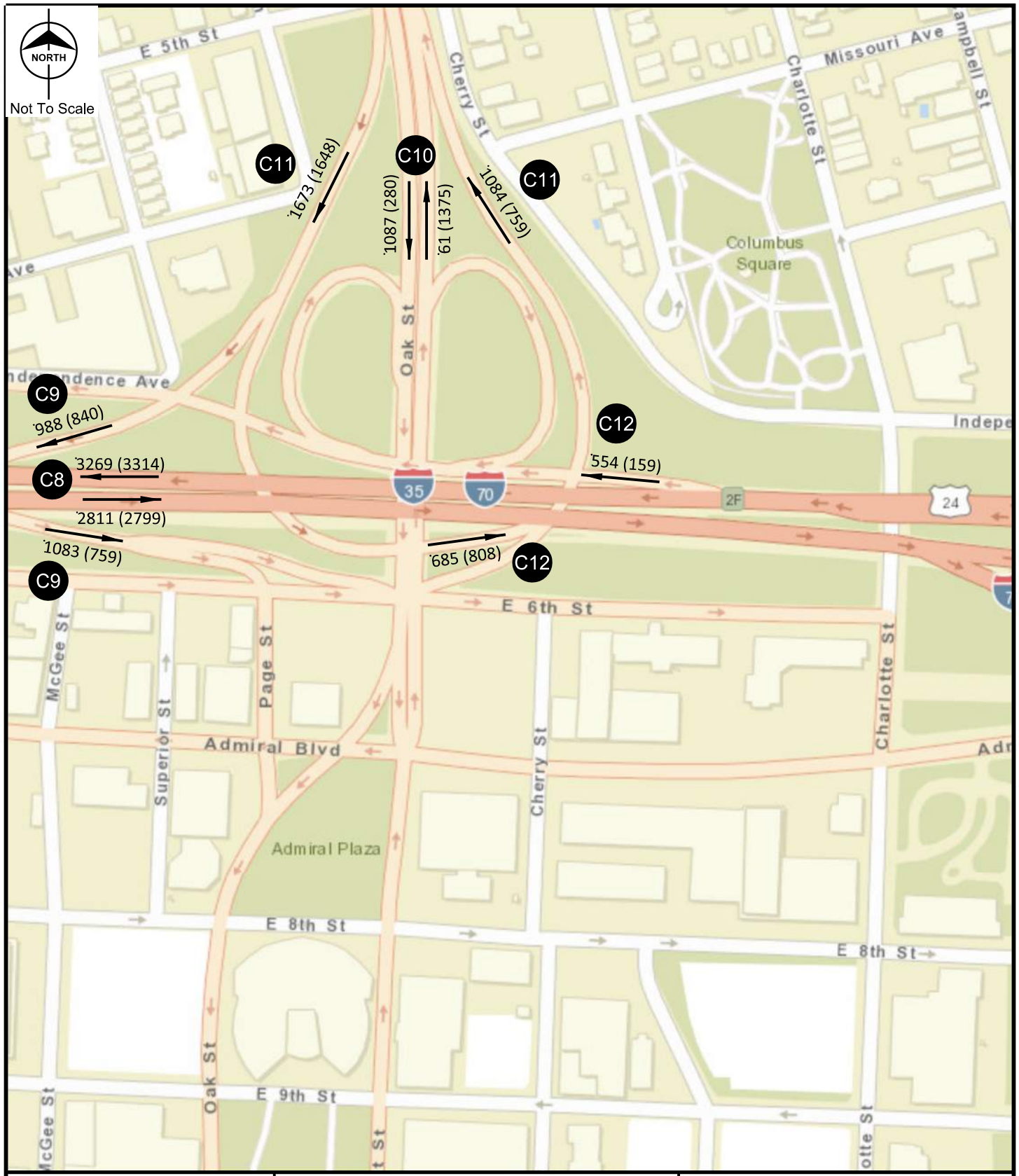
E 6th St
7th St
E 7th St
Baltimore Ave
McGee St
BURNS McDONNELL
Missouri Department of Transportation
2045 Build Adjacent Alternative (Option 3)
Exhibit 9.7
date July 2019
designed T. Cope
LEGEND
Study Intersection
Signalized
Stop Controlled
Flyover Bridge Structure
Long Span River Bridge Structure
New Roadway Pavement with Adjacent Walls
Short Span Bridge Structures
XX (XX) AM (PM) Peak Hour
MOVEMENT
L: Left
T: Through
R: Right
U: U-Turn



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date July 2019

designed T. Cope

Missouri Department of Transportation

2045 Build Adjacent Alternative (Option 3)

Exhibit 9.8

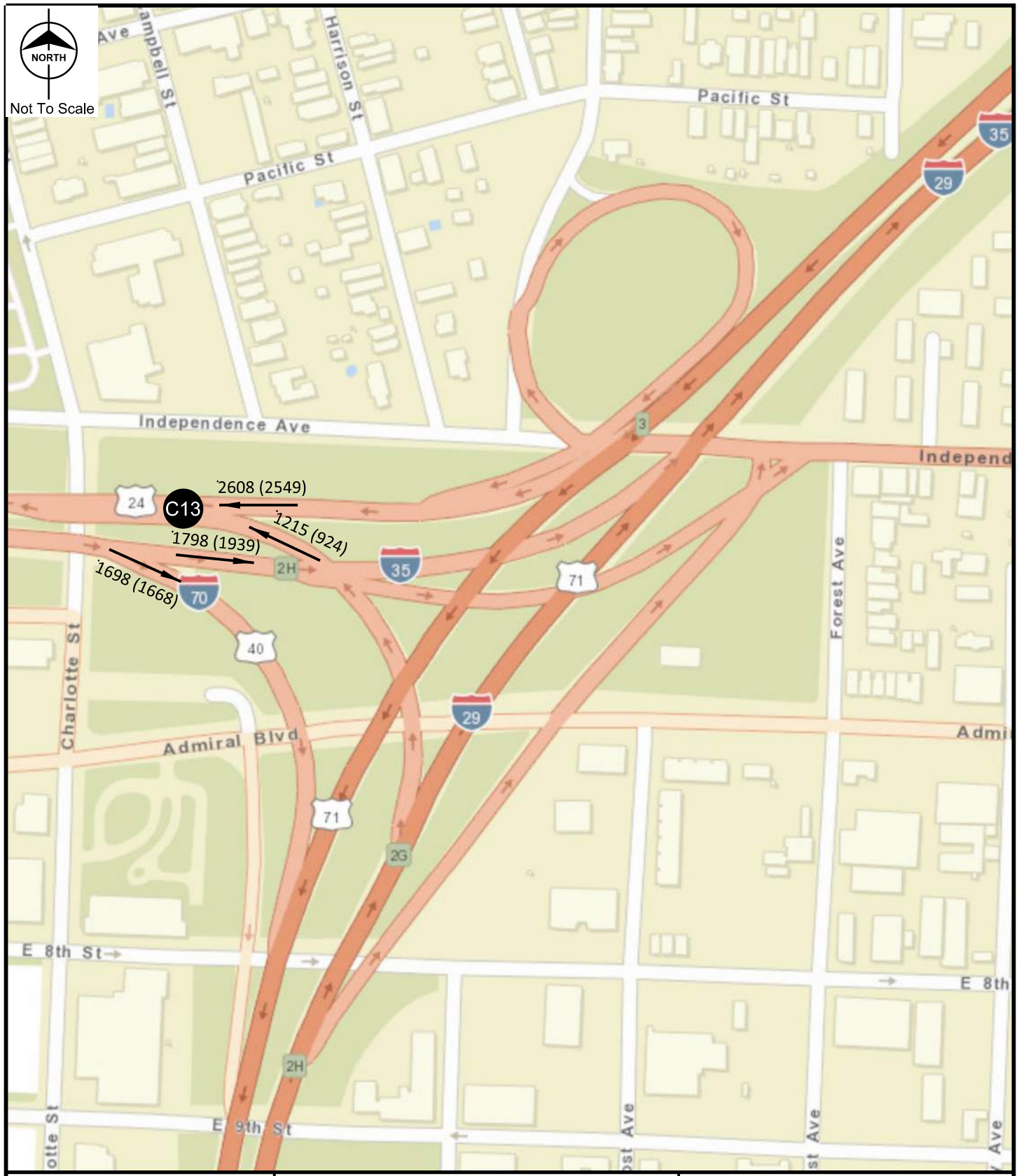
LEGEND

- X Study Intersection
- Signalized
- STOP Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



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date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build Adjacent Alternative (Option 3)

Exhibit 9.9

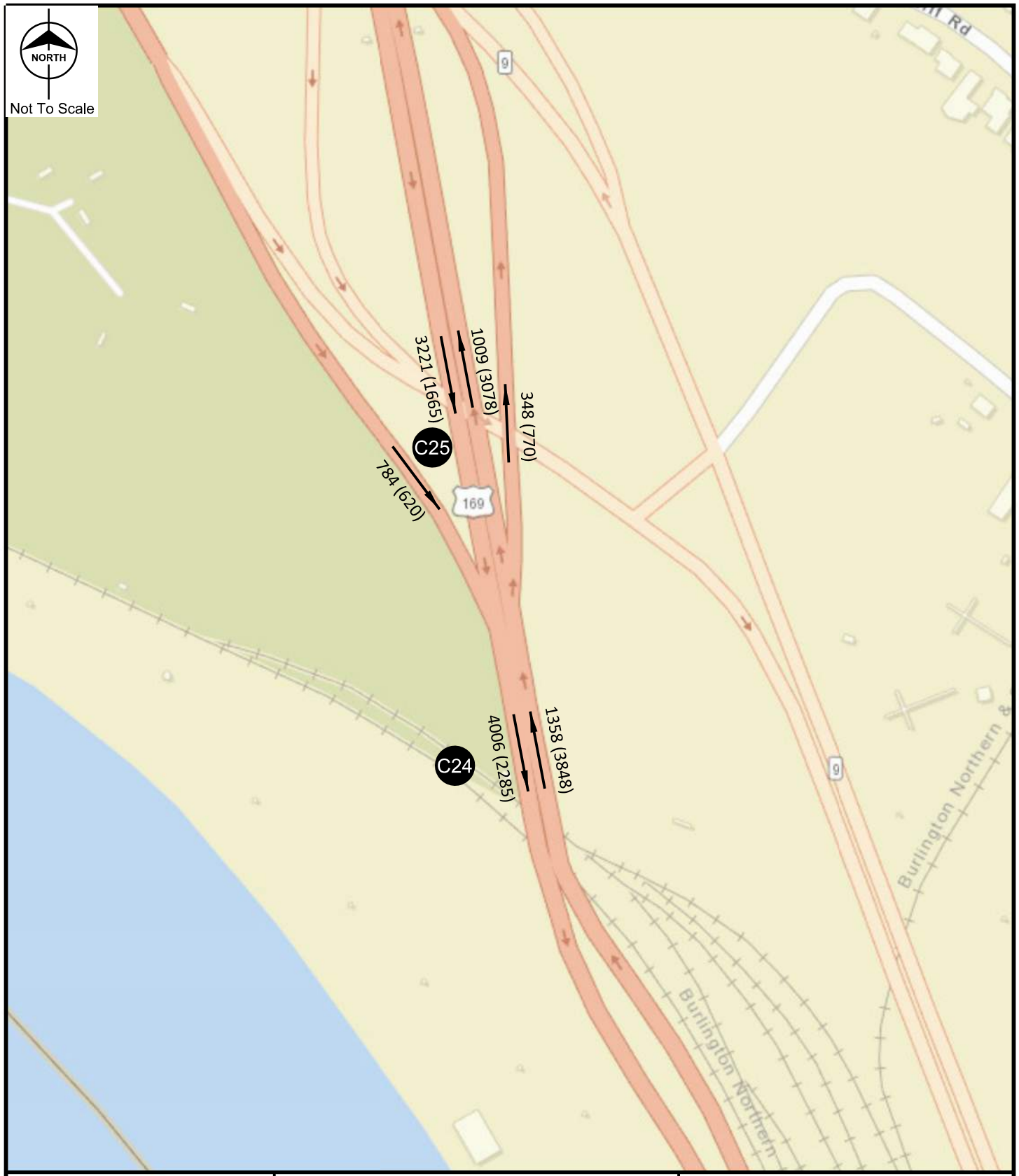
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.1

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



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date July 2019

designed T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.2

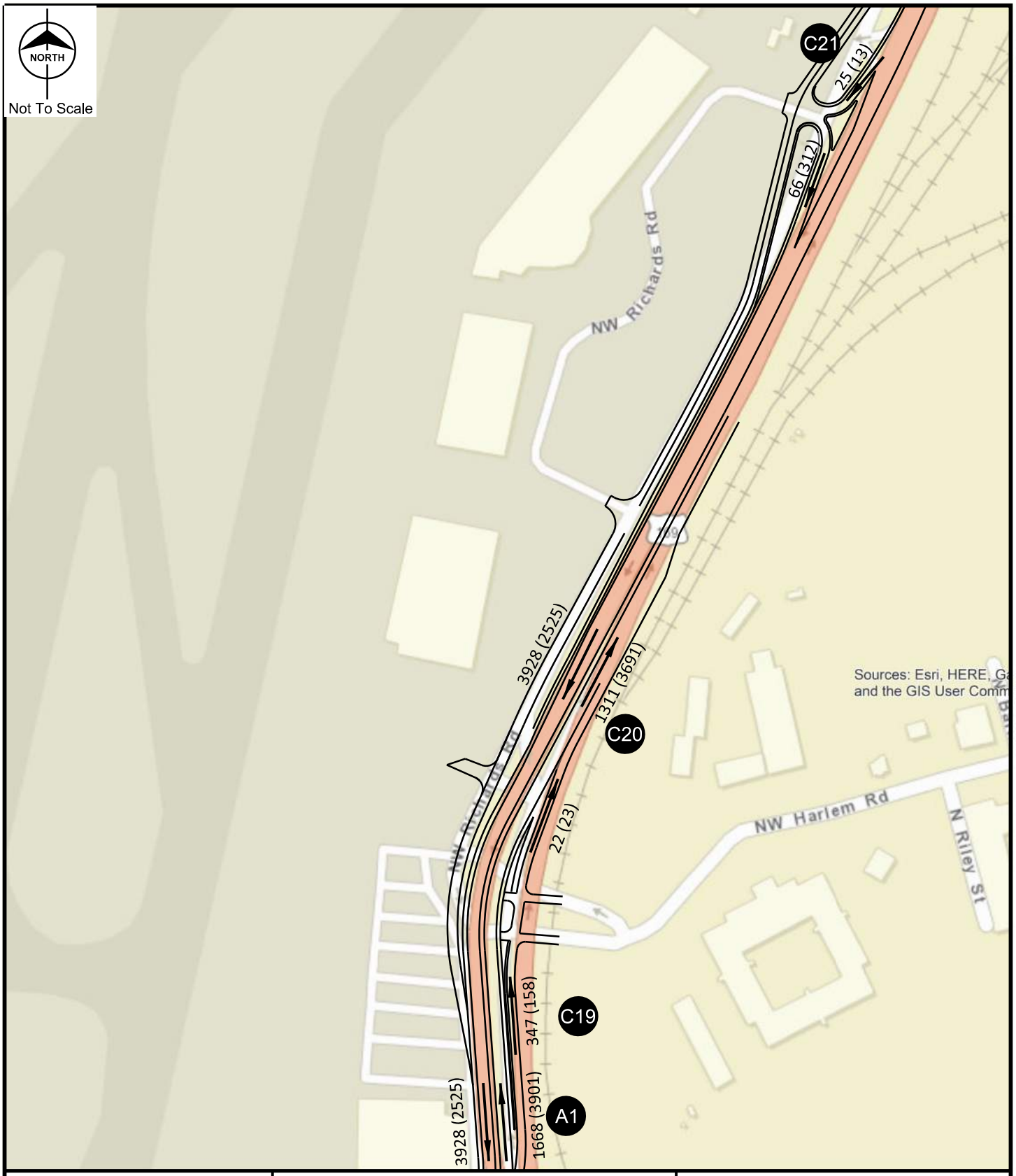
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.3

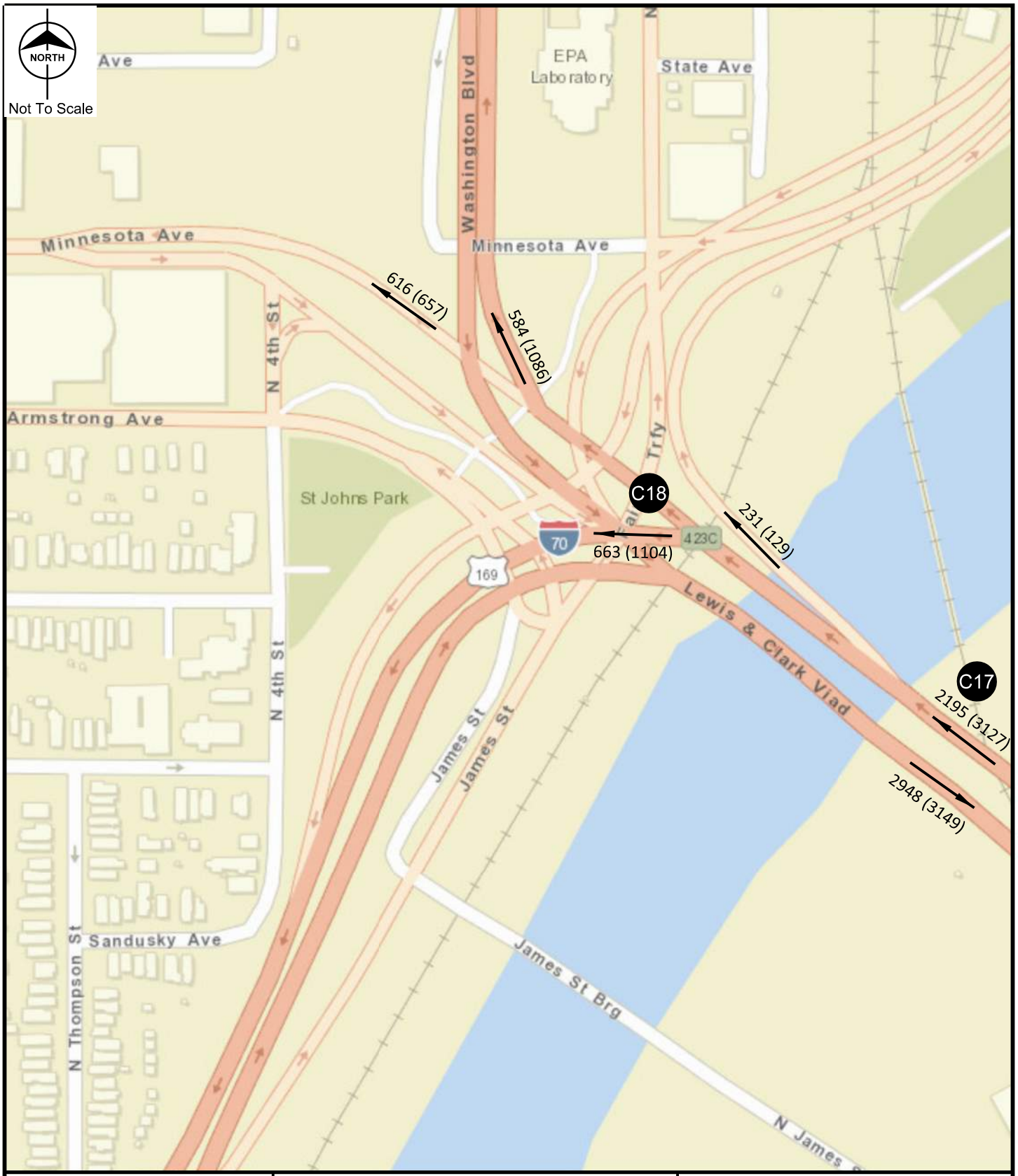
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.4

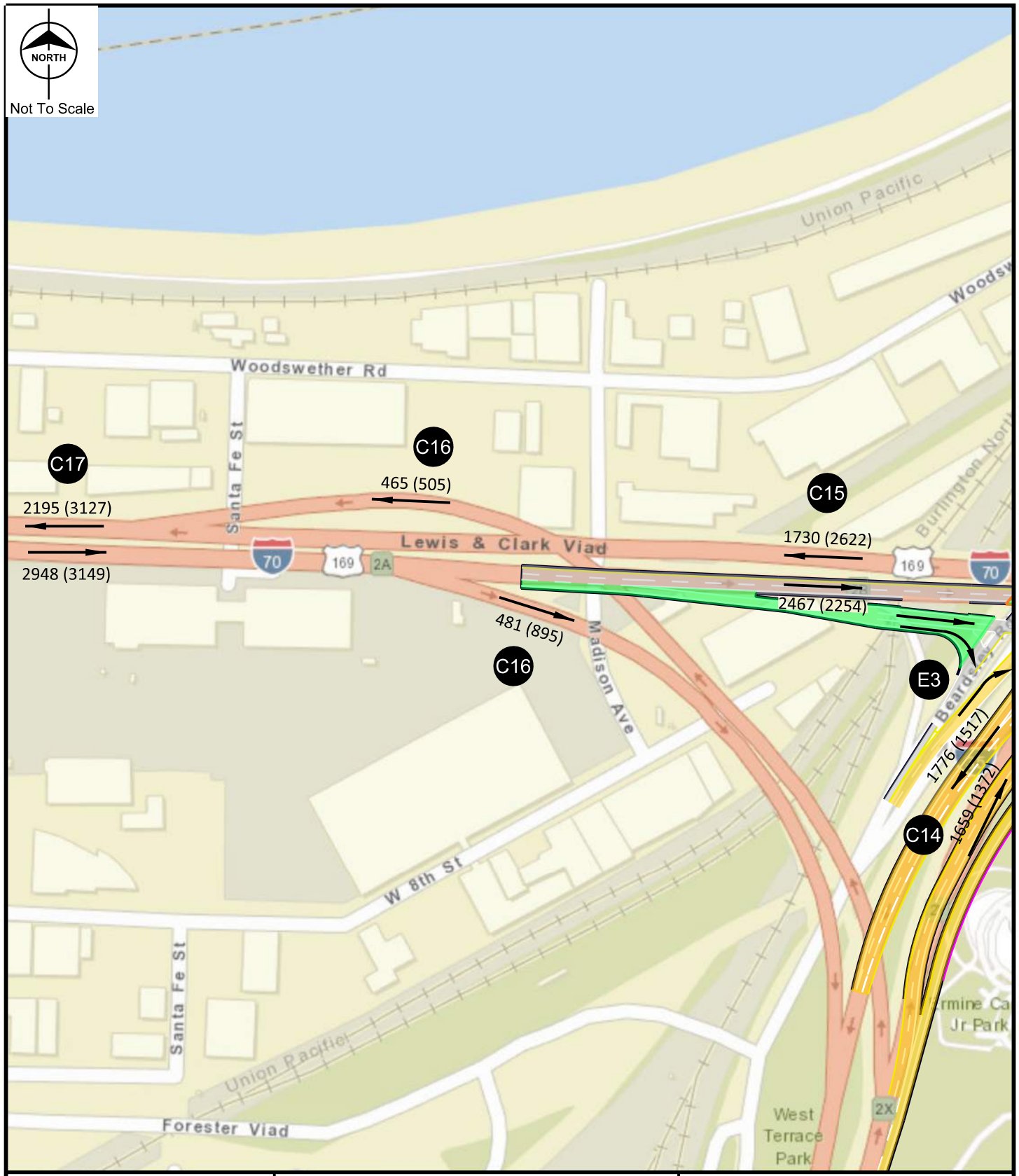
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.5

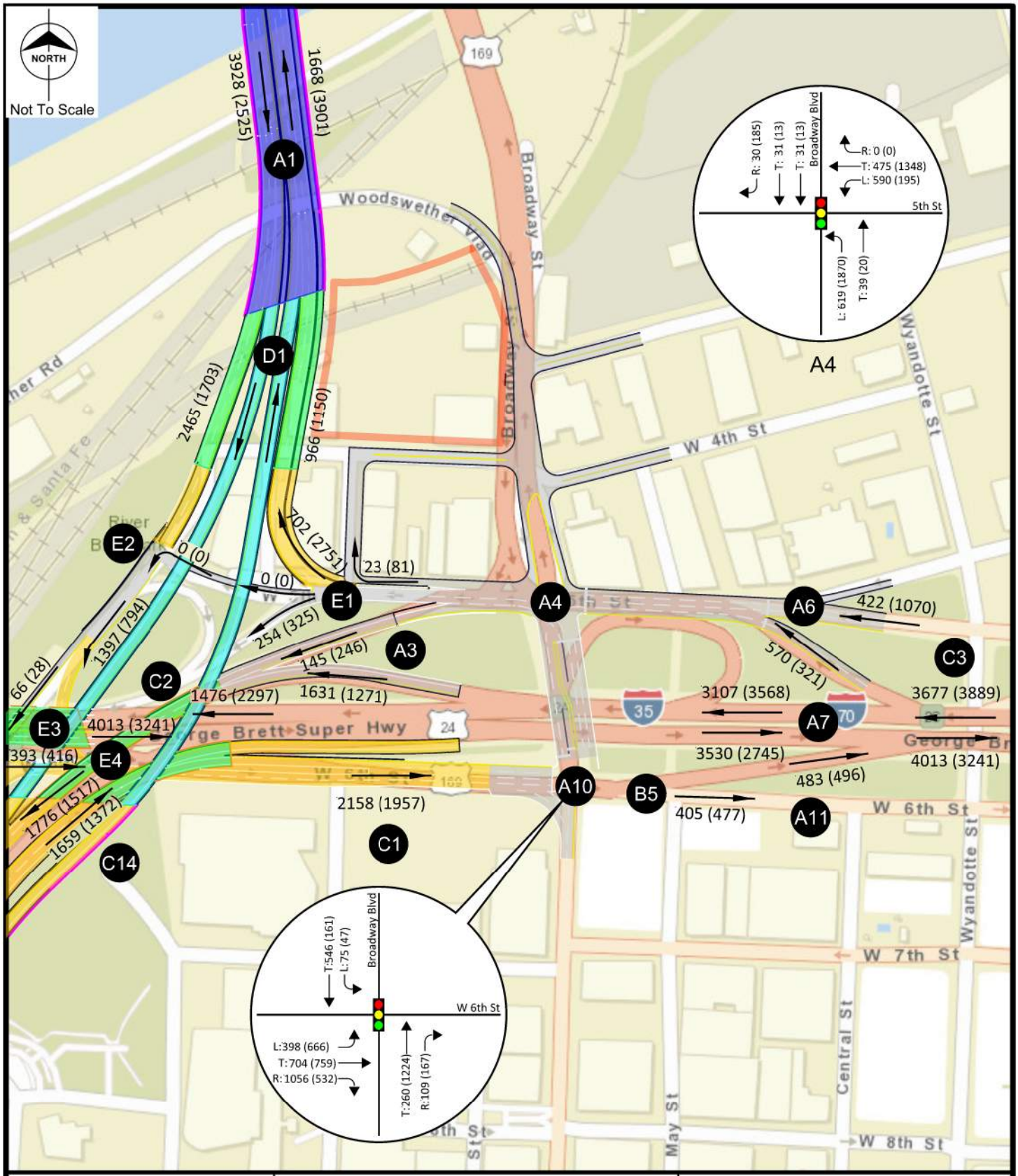
LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.6

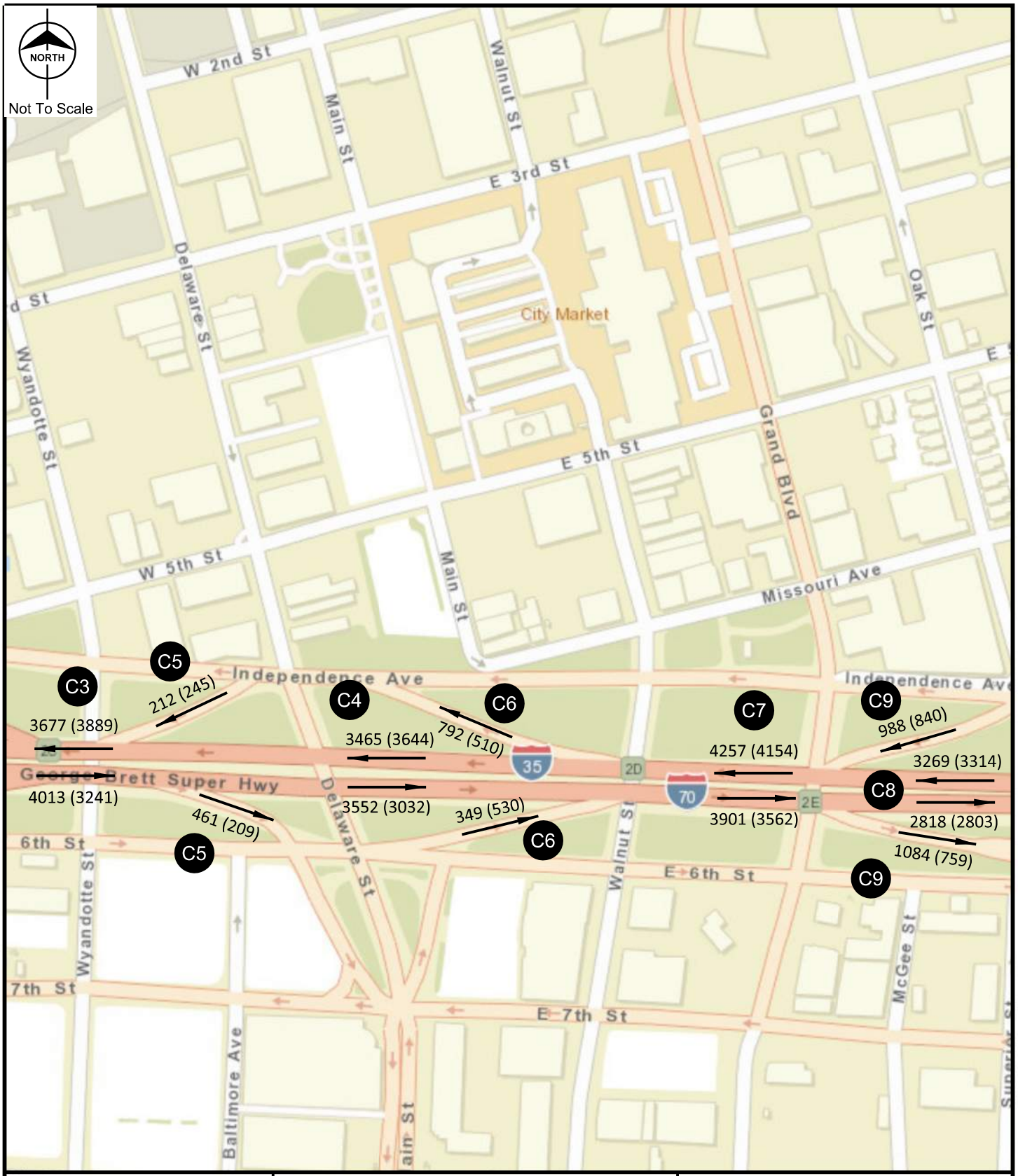
LEGEND

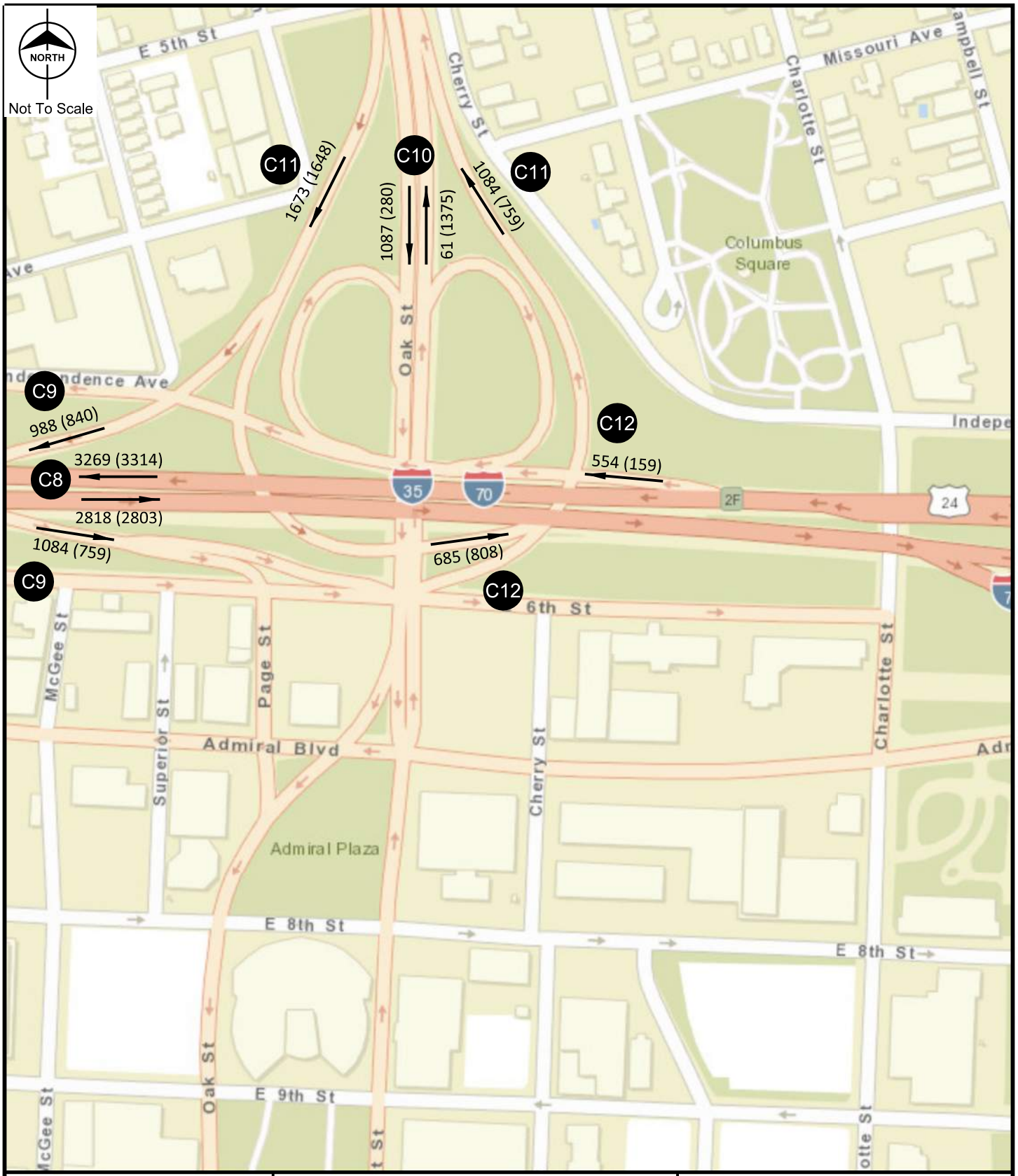
- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

MOVEMENT

- L: Left
- T: Through
- R: Right
- U: U-Turn

XX (XX) AM (PM) Peak Hour


NORTH
Not To Scale
W 2nd St
Main St
Walnut St
E 3rd St
Delaware St
Wyandotte St
City Market
Oak St
E 5th St
Grand Blvd
W 5th St
Missouri Ave
Independence Ave
C3
C5
212 (245)
3677 (3889)
C4
C6
792 (510)
3465 (3644)
C7
4257 (4154)
C9
988 (840)
3269 (3314)
George Brett Super Hwy
4013 (3241)
461 (209)
3552 (3032)
349 (530)
3901 (3562)
C8
2818 (2803)
1084 (759)
35
70
2D
2E
6th St
E 6th St
7th St
E 7th St
Baltimore Ave
McGee St
BURNS McDONNELL
date July 2019
designed T. Cope
Missouri Department of Transportation
2045 Build West Alternative
Exhibit 10.7
LEGEND
Study Intersection
Signalized
Stop Controlled
Flyover Bridge Structure
Long Span River Bridge Structure
New Roadway Pavement with Adjacent Walls
Short Span Bridge Structures
XX (XX) AM (PM) Peak Hour
MOVEMENT
L: Left
T: Through
R: Right
U: U-Turn



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.8

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn



BURNS McDONNELL

date	July 2019
designed	T. Cope

Missouri Department of Transportation

2045 Build West Alternative

Exhibit 10.9

LEGEND

- Study Intersection
- Signalized
- Stop Controlled
- Flyover Bridge Structure
- Long Span River Bridge Structure
- New Roadway Pavement with Adjacent Walls
- Short Span Bridge Structures

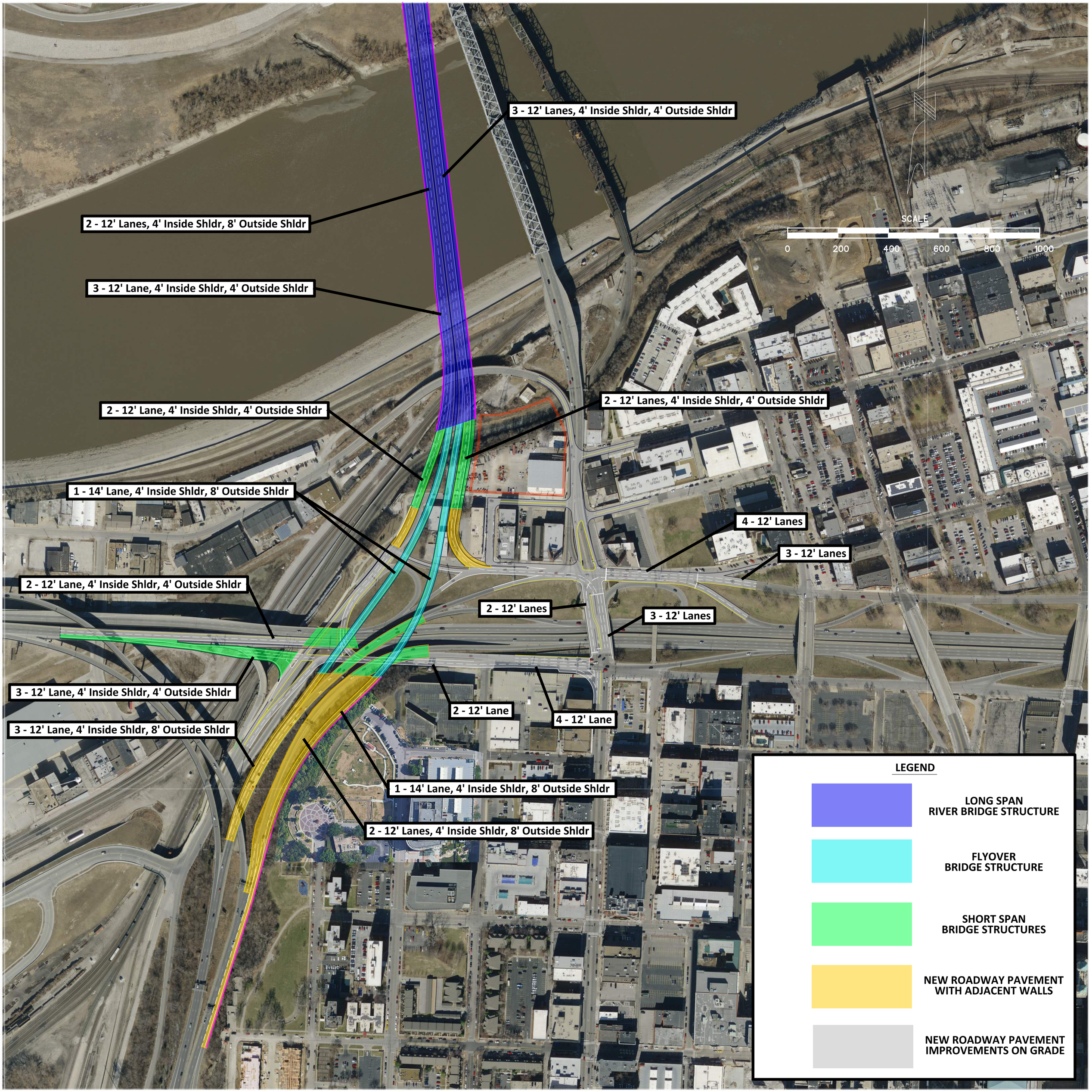
XX (XX) AM (PM) Peak Hour

MOVEMENT

L: Left
T: Through
R: Right
U: U-Turn

APPENDIX I

Roadway Typical Section Data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2 - 12' Lanes, 4' Inside Shldr, 8' Outside Shldr
3 - 12' Lane, 4' Inside Shldr, 4' Outside Shldr
2 - 12' Lane, 4' Inside Shldr, 4' Outside Shldr
1 - 14' Lane, 4' Inside Shldr, 8' Outside Shldr
2 - 12' Lane, 4' Inside Shldr, 4' Outside Shldr
3 - 12' Lane, 4' Inside Shldr, 4' Outside Shldr
3 - 12' Lane, 4' Inside Shldr, 8' Outside Shldr
2 - 12' Lanes, 4' Inside Shldr, 4' Outside Shldr
4 - 12' Lanes
3 - 12' Lanes
2 - 12' Lanes
3 - 12' Lanes
2 - 12' Lane
4 - 12' Lane
1 - 14' Lane, 4' Inside Shldr, 8' Outside Shldr
2 - 12' Lanes, 4' Inside Shldr, 8' Outside Shldr
SCALE
0
200
400
600
800
1000
LEGEND
LONG SPAN
RIVER BRIDGE STRUCTURE
FLYOVER
BRIDGE STRUCTURE
SHORT SPAN
BRIDGE STRUCTURES
NEW ROADWAY PAVEMENT
WITH ADJACENT WALLS
NEW ROADWAY PAVEMENT
IMPROVEMENTS ON GRADE

APPENDIX J

Noise Measurement Data Sheets and Photographs

Site MV1A

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Broadway - Buck O'Neil Bridge**
Site/Address	**W. 5th St. / I-35**
Observer Name	**Ryan Mountain**

General Meteorological Conditions

Temperature(s)	**41 degrees F**	**42% Humidity**
Wind Speed(s)	**12 mph**	**25% Dew Point**
Wind Direction(s)	**South-Southwest**	**30.18" Pressure**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	**3:50 PM**	**4:17 PM**
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)



Site MV1A

Validation of Modeled Sound Levels—Field Log

Period #	Start Time	Event Description(s) (include event start and stop)
1	**4:05 PM**	**Jet**
2	**4:07 PM**	**Loud engines x 2**
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Validation of Modeled Sound Levels--Traffic Count Data Sheet

MV1A					MV1A					MV1A				
I-35 SB Ramp (closest to SLM)					I-35/I-70 **EB** (2 lanes combined)					I-35 N / I-70 EB Ramp (farthest from SLM)				
Auto	MT	HT	Bus	Mot.	Auto	MT	HT	Bus	Mot.	Auto	MT	HT	Bus	Mot.
348	5	20	0	0	274	4	35	0	0	637	11	19	0	1
1392	20	80	0	0	1096	16	140	0	0	2548	44	76	0	4

Notes:

Started at 4:00 PM
Ended at 4:15 PM

All Video Recorded

Date 12-5-2018 Page 1 of 2

Site MV1B

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Broadway - Buck O'Neil Bridge**
Site/Address	**W. 5th St.**
Observer Name	**Ryan Mountain**

General Meteorological Conditions

Temperature(s)	**41 degrees F**	**42% Humidity**
Wind Speed(s)	**12 mph**	**25% Dew Point**
Wind Direction(s)	**South-Southwest**	**30.18" Pressure**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	**4:17 PM**	**4:17 PM**
Calibration Level	**113.8**	

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)



Site MV1B

Validation of Modeled Sound Levels—Field Log

Period #	Start Time	Event Description(s) (include event start and stop)
1	**4:29 PM**	**Chain clanking on truck**
2	**4:31 PM**	**Train whistle in background**
3	**4:33 PM**	**Plane**
4	**4:36 PM**	**Plane-Jet and Train horn**
5	**4:37 PM**	**Motorcycle**
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Validation of Modeled Sound Levels--Traffic Count Data Sheet

MV1B						MV1B						MV1B					
I-35 SB Ramp (closest to SLM)						I-35/I-70 **EB** (2 lanes combined)						I-35 N / I-70 E Ramp (farthest from SLM)					
Auto	MT	HT	Bus	Mot.		Auto	MT	HT	Bus	Mot.		Auto	MT	HT	Bus	Mot.	
316	1	29	3	0		242	13	35	0	0		311	5	17	0	1	
1264	4	116	12	0		968	52	140	0	0		1244	20	68	0	4	

Notes:

Started at 4:25 PM
Ended at 4:40 PM

All Video Recorded

Date 12-5-2018 Page 1 of 2

Site MV2A

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Broadway - Buck O'Neil Bridge**
Site/Address	**Hwy 9 EB**
Observer Name	**Ryan Mountain**

General Meteorological Conditions

Temperature(s)	**40 degrees F**	**49% Humidity**
Wind Speed(s)	**6 mph**	**25% Dew Point**
Wind Direction(s)	**South**	**30.17" Pressure**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	**5:06 PM**	
Calibration Level	**113.7**	

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)



Site MV2A

Validation of Modeled Sound Levels—Field Log

Period #	Start Time	Event Description(s) (include event start and stop)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Validation of Modeled Sound Levels--Traffic Count Data Sheet

MV2A						MV2A				
Hwy 9 EB (2 lanes of traffic)						Hwy 9 WB (2 lanes of traffic)				
Auto	MT	HT	Bus	Mot.		Auto	MT	HT	Bus	Mot.
252	3	1	0	0		398	4	2	0	0
504	6	2	0	0		796	8	4	0	0

Notes:

Started at 5:07 PM
Ended at 5:22 PM

All Video Recorded

MV2A is within MoDOT ROW



▲View of MV-1A & B location from W. Independence Avenue. View is to the southeast.



▲MV-1A & B looking southeast. I-70 is the primary noise source in this area.



▲MV-1A & B looking southwest toward the off-ramp from I-70 WB to I-35 SB.



▲MV-2A location along Route 9. View is to the northeast with US 169 in the background.

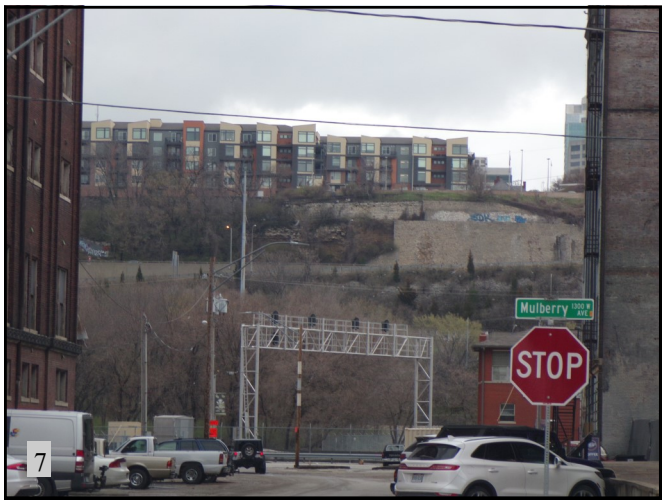


▲Intersection of US 169/Broadway Blvd./5th St. intersection. View is looking south.



▲US 169 northbound lanes north of the Missouri River. View is looking north.

Jackson and Clay Counties, MO
Broadway Buck O'Neil Bridge
On-site photographs taken Dec. 5, 2018
April 4, 2019, & Dec. 4, 2019
Garver Project No. 17177187



▲View of R-17 (JVM Apartments) from 8th St. View is to the east.



▲R-14 (Ermine Case Jr. Park overlook area). View is to the north.



▲View to the northwest from the R-14 area. I-35 is located below.



▲View of R-4 and R-5 apartment buildings with balconies. View is to the south.



◄Conover Place Condos (R-6). View is to the southwest along 5th St.



▲View of R-22 under construction. This apartment building has receivers with balconies.

Jackson and Clay Counties, MO
Broadway Buck O'Neil Bridge
On-site photographs taken Dec. 5, 2018
April 4, 2019, & Dec. 4, 2019
Garver Project No. 17177187

APPENDIX K

Noise Barrier Analysis Results

2049 E. Joyce Blvd.
Suite 400
Fayetteville, AR 72703

TEL 479.527.9100
FAX 479.527.9101

www.GarverUSA.com

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1919 to 2019

PRELIMINARY NOISE STUDY AND ABATEMENT SUMMARY MEMO

Date: December 9, 2019

To: MoDOT
Burns & McDonnell

Attn: Matt Burcham, MoDOT
Julie Sarson, Burns & McDonnell, Project Manager

From: Ryan Mountain, Garver

RE: Broadway/Buck O'Neil Bridge – Route 169
MoDOT No. 4S3085
Preliminary Noise Study & Abatement Summary

Copies To: Shari Cannon-Mackey, Burns & McDonnell, scannonmackey@burnsmcd.com
Chip Touzinsky, Garver, CETouzinsky@GarverUSA.com

This preliminary noise study technical memo serves to document the TNM results of the no-build and build alternatives for comparison purposes and the central build model conditions only with regards to noise abatement. A total of five TNM model runs were evaluated as part of this traffic noise study, which include the existing, no-build, west build alternative, central build alternative and adjacent build alternatives.

The no-build and all build alternative TNM models consisted of utilizing the validated 2016 existing conditions TNM model as a baseline for determining future (2040[1]) traffic noise impacts. The 2040 no-build scenario was modeled for comparative purposes. The majority of impacts anticipated under the projected 2040 conditions include multi-story apartment buildings with balconies. Turning movement traffic data in the form of peak hour volumes for 2040 were utilized in the preparation of the analysis. TNM modeling also included terrain lines, building rows, existing and proposed concrete parapet/safety walls, and retaining walls that serve as barriers. Solid concrete parapet walls replacing open safety walls in some locations adjacent to the proposed roadways appeared to provide some shielding of those roadways as evidenced by reduced sound levels for certain receivers. Additionally, due to the westward shift of Route 169 for all build alternatives and shielding provided by adjacent buildings between receivers and adjacent highways, some receivers that were impacted in the 2016 existing conditions model are not impacted under 2040 build conditions.

Total impacts determined for each of the three build alternatives (West, Central, and Adjacent) and the no-build conditions are summarized in **Table 1**. Under current conditions, one hundred twenty-eight (128) receivers are impacted by approaching[2] or exceeding the Noise Abatement Criteria (NAC) for Categories B or C (Residential and Parks) threshold of 67 dB(A) Leq(h). Based on the future traffic volumes for the preferred alternative (Central Build Alternative), one hundred sixty-one (161) receivers will approach[2] or exceed the 67 dB(A) Leq(h) for NAC Categories B or C.

[1] 2040/2045 disclaimer - The traffic analysis and any traffic-based environmental analysis 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 2025.
[2] Approaching the NAC B and C criteria includes receivers experiencing a noise level of 66 dB(A).

TABLE 1 Noise Study – Determination of Impacts Route 169 - MoDOT No. 4S3085	
TNM Modeled Condition	**Number of Impacts (≥66 dB(A))**
2016 Existing (Baseline)	128
2040 No-Build ((Pending R22 results))	159
2040 Central Build (Preferred Alternative)	161
2040 West Build	114
2040 Adjacent Build	158

As a result of noise impacts associated with the central build alternative, noise abatement in the form of freestanding noise walls were considered. Abatement factors considered in determining feasibility of abatement was consistent with MoDOT noise policy and is described in the detailed report. The feasibility of providing abatement at seven locations for impacted receivers identified in **Table 2** were considered and are identified on **Figures 1 and 2**. However, due to sight distance/safety and Section 4(f) park impact concerns, noise walls for these impacted receivers were determined not feasible. Two barriers (described below in the Noise Abatement section) were considered feasible locations and further evaluated.

TABLE 2 Impacted Receivers – Abatement Determined Not Feasible Route 169 - MoDOT No. 4S3085		
Receiver (R)	**Receiver Name**	**Feasibility Determination Factors**
R-4	River Market West (north building)	• Determined to be 2nd row receivers
R-5	River Market West (south building)	• Considered to be 2nd row receivers
R-14	Ermine Case Jr. Park (Overlook)	• Potentially adverse impacts to this park overlook area could occur
R-15	“Caboose” Park Trailhead	• Available right-of-way • Inability to mitigate for impacts for the entire trail system • Access constraints
R-17	JVM Apex Apartments	• No first row, ground floor receivers are impacted
R-19	River Bluff Park Trail Heads	• Available right-of-way • Inability to mitigate for impacts for the entire trail • Access constraints
R-21	O-Reilly Investments LLC	• Considered 2nd Row Receivers • No ground floor impacts

Noise Abatement
The two noise walls determined to be at feasible locations and evaluated in TNM's barrier analysis (BA) application included BA-1 and BA-2. The physical location and heights of the noise walls are summarized below. These analyses were conducted for the ground floor impacted residences at two multi-dwelling apartment buildings (R-6 and R-22), both of which have outdoor balconies. Refer to **Tables 3 and 4** for results of the feasibility evaluation.

Barrier Analysis Results for Conover Place Apartments (R-6) & Planned Industrial Expansion Authority Apartments (R-22)

BA-1
A noise wall (*BA-1*), placed within existing MoDOT right-of-way along the south edge of W. 5th Street and the I-35 off-ramp to W. 5th Street, with a length of 482 feet and a maximum height of 20 feet did not meet MoDOT feasibility criteria of achieving a 5dB(A) insertion loss (IL) for a minimum of 2 first row, impacted receivers. Although further away from the primary noise source (I-35), this wall position was chosen to be evaluated due to the ground elevation being higher than the depressed roadway section of I-35.

BA-2
A noise wall (*BA-2*), placed within existing MoDOT right-of-way along the north edge of ROW of I-35, with a length of 495 feet and a maximum height of 20 feet also did not meet MoDOT feasibility criteria of achieving a 5dB(A) insertion loss for a minimum of 2 first row, impacted receivers. This wall position was chosen as a result of being close to the primary noise source (I-35).

Results of the analyses indicate that neither of the noise walls evaluated meet MoDOT feasibility criteria. Refer to **Tables 3 and 4** for results, and **Figures 1 and 2** for noise wall locations.

TABLE 3 – BA-1
Conover Place Condominiums (R-6)
Planned Industrial Expansion Authority of KC (R-22)
Noise Barrier Summary Table - Route 169 - MoDOT No. 4S3085

1ST Row Receivers	Insertion Loss	1ST Floor	Impacted	NRDG IL - 7dB(A)	*IL 5dB(A)
1-6G-I-70B	1.5	Y	Y	N	N
1-6J-I-70B	1.2	Y	Y	N	N
1-6K-I-70B	1.3	Y	Y	N	N
1-6L-I-70B	1.3	Y	Y	N	N
1-22A-5thB	1.8	Y	Y	N	N
1-22E-5thB	1.6	Y	Y	N	N
1-22I-5thB	1.3	Y	Y	N	N
1-22M-5thB	1.3	Y	Y	N	N

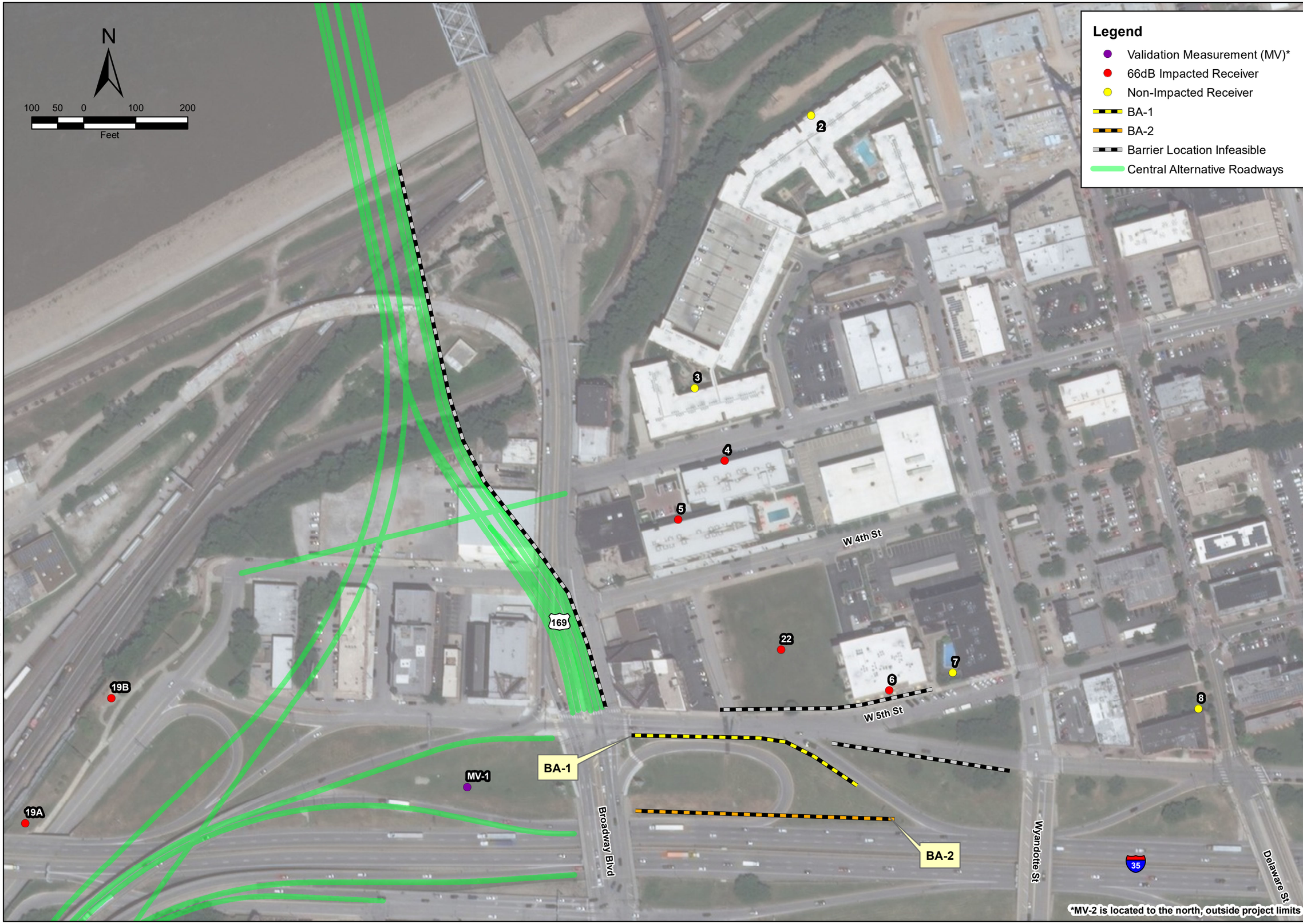
*Barrier is not feasible in that 2 impacted receivers do not receiver a minimum of 5dB(A) insertion loss.

TABLE 4 – BA-2
Conover Place Condominiums (R-6)
Planned Industrial Expansion Authority of KC (R-22)
Noise Barrier Summary Table - Route 169 - MoDOT No. 4S3085

1ST Row Receivers	Insertion Loss (IL)	1ST Floor	Impacted	NRDG IL - 7dB(A)	*IL 5dB(A)
1-6G-I-70B	1.5	Y	Y	N	N
1-6J-I-70B	0.9	Y	Y	N	N
1-6K-I-70B	1	Y	Y	N	N
1-6L-I-70B	0.9	Y	Y	N	N
1-22A-5thB	1.1	Y	Y	N	N
1-22E-5thB	1	Y	Y	N	N
1-22I-5thB	0.9	Y	Y	N	N
1-22M-5thB	0.9	Y	Y	N	N

*Barrier is not feasible in that 2 impacted receivers do not receiver a minimum of 5dB(A) insertion loss.

Attachments: 2 Figures 1 & 2



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MODOT
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BRIDGE

BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST

JOB NO.: 17177187
DATE: DEC 2019
DESIGNED BY: RCM
DRAWN BY: CPS

POTENTIAL BARRIER LOCATIONS-CENTRAL BUILD 2040

FIGURE NUMBER: 1

Document Path: L:\2017\17177187 - MoDOT KC Buck ONeal Bridge EA\GIS\Maps\Noise\Summary Memo\BWB_Summary_Central_Alternative_Figure.mxd User Name: CPSchmidt



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0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST

JOB NO.: 17177187
DATE: DEC 2019
DESIGNED BY: RCM
DRAWN BY: CPS

POTENTIAL BARRIER LOCATIONS-CENTRAL BUILD 2040

FIGURE NUMBER: 2

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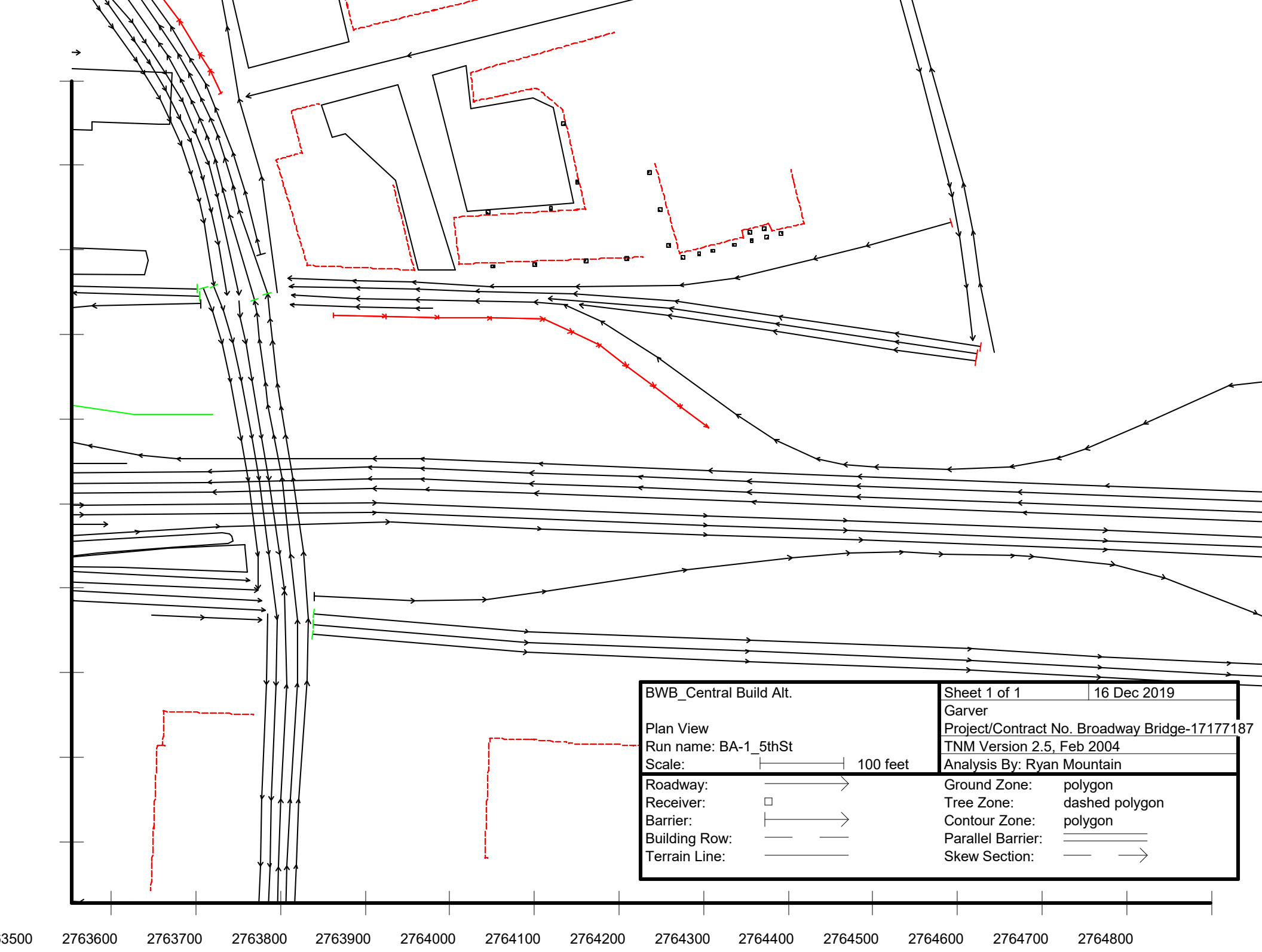
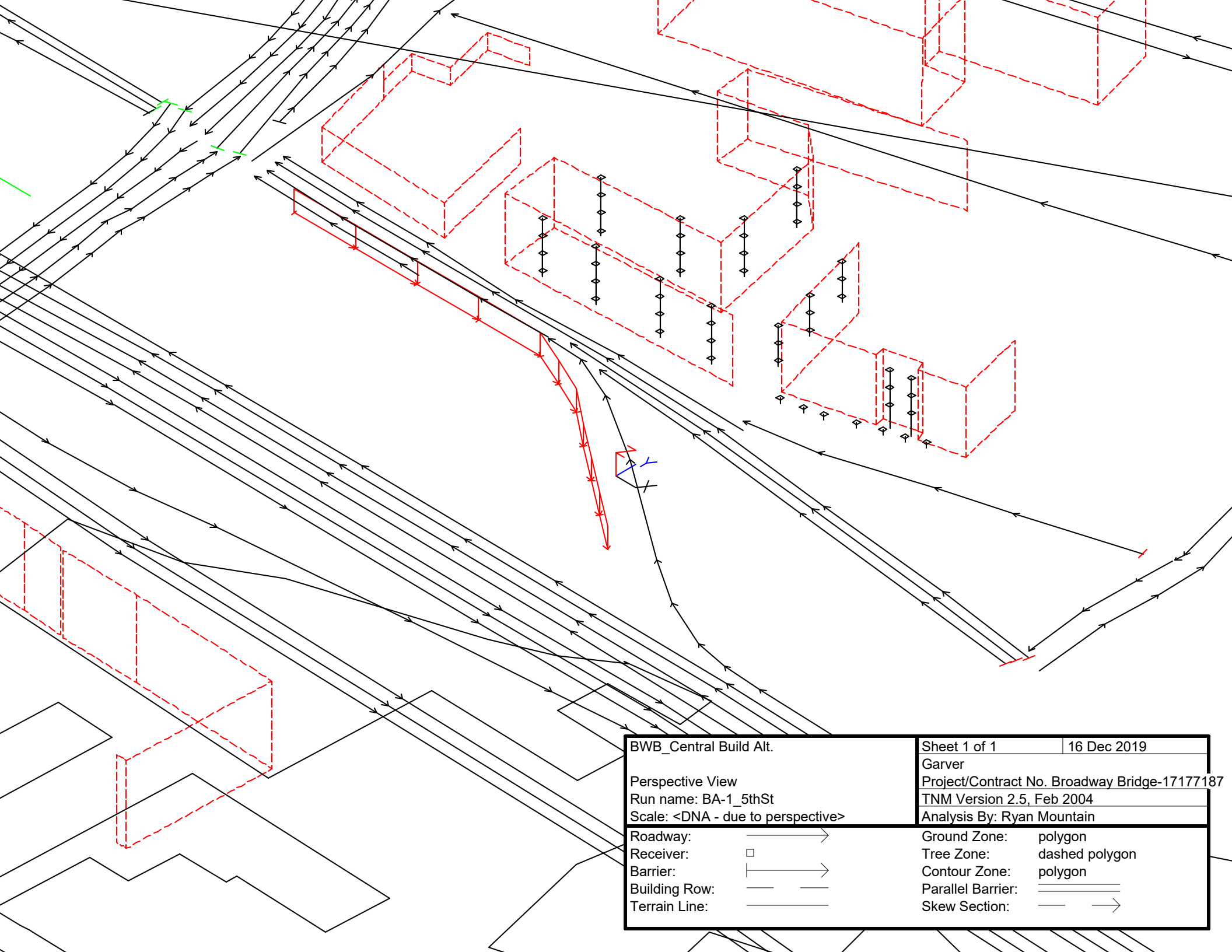
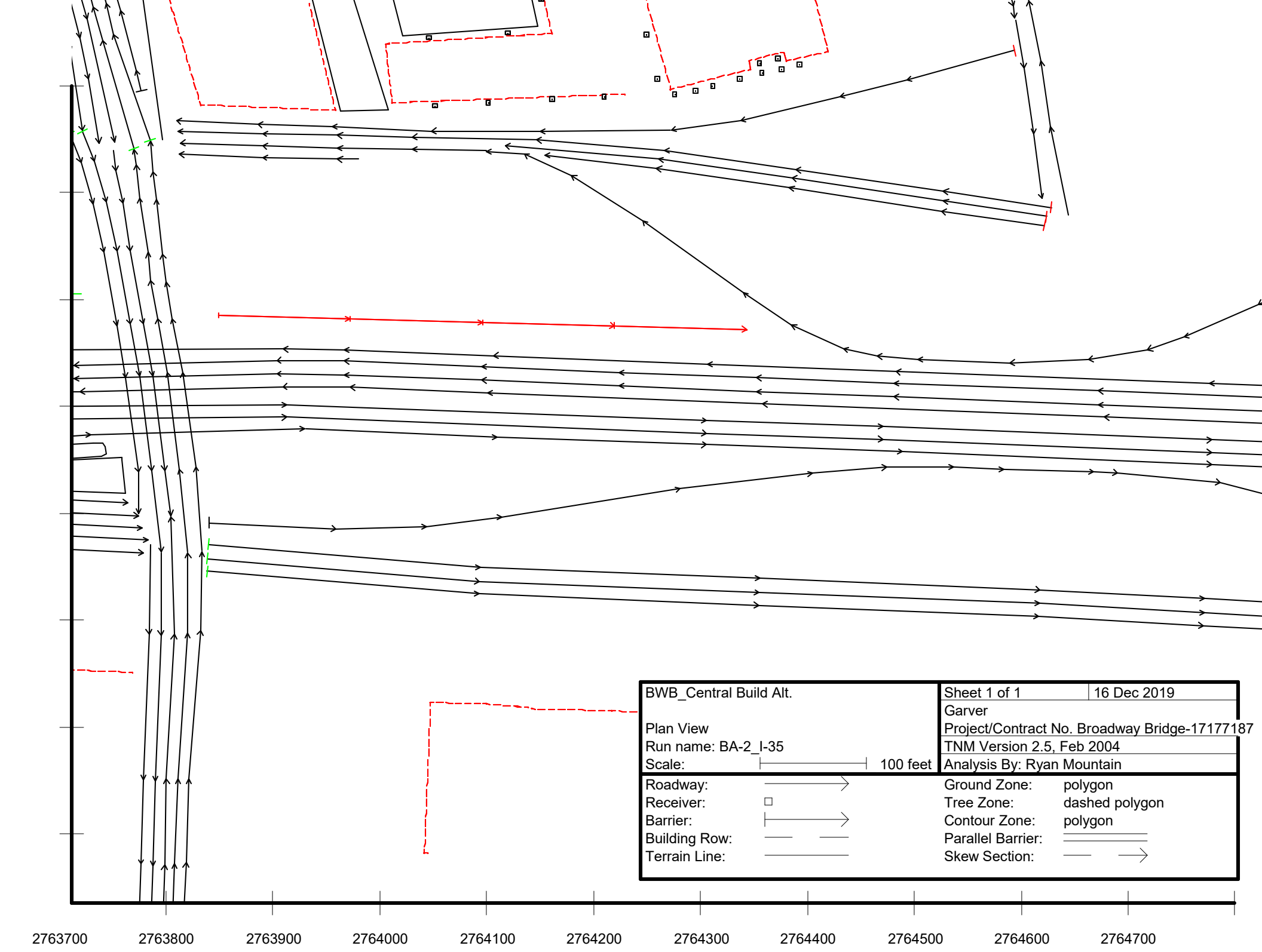

BWB_Central Build Alt.
Plan View
Run name: BA-1_5thSt
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
3500
2763600
2763700
2763800
2763900
2764000
2764100
2764200
2764300
2764400
2764500
2764600
2764700
2764800



BWB_Central Build Alt.	Sheet 1 of 1	16 Dec 2019
	Garver	
Perspective View	Project/Contract No. Broadway Bridge-17177187	
Run name: BA-1_5thSt	TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>	Analysis By: Ryan Mountain	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	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Plan View
Run name: BA-2_I-35
Scale: 100 feet
Sheet 1 of 1
16 Dec 2019
Garver
Project/Contract No. Broadway Bridge-17177187
TNM Version 2.5, Feb 2004
Analysis By: Ryan Mountain
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
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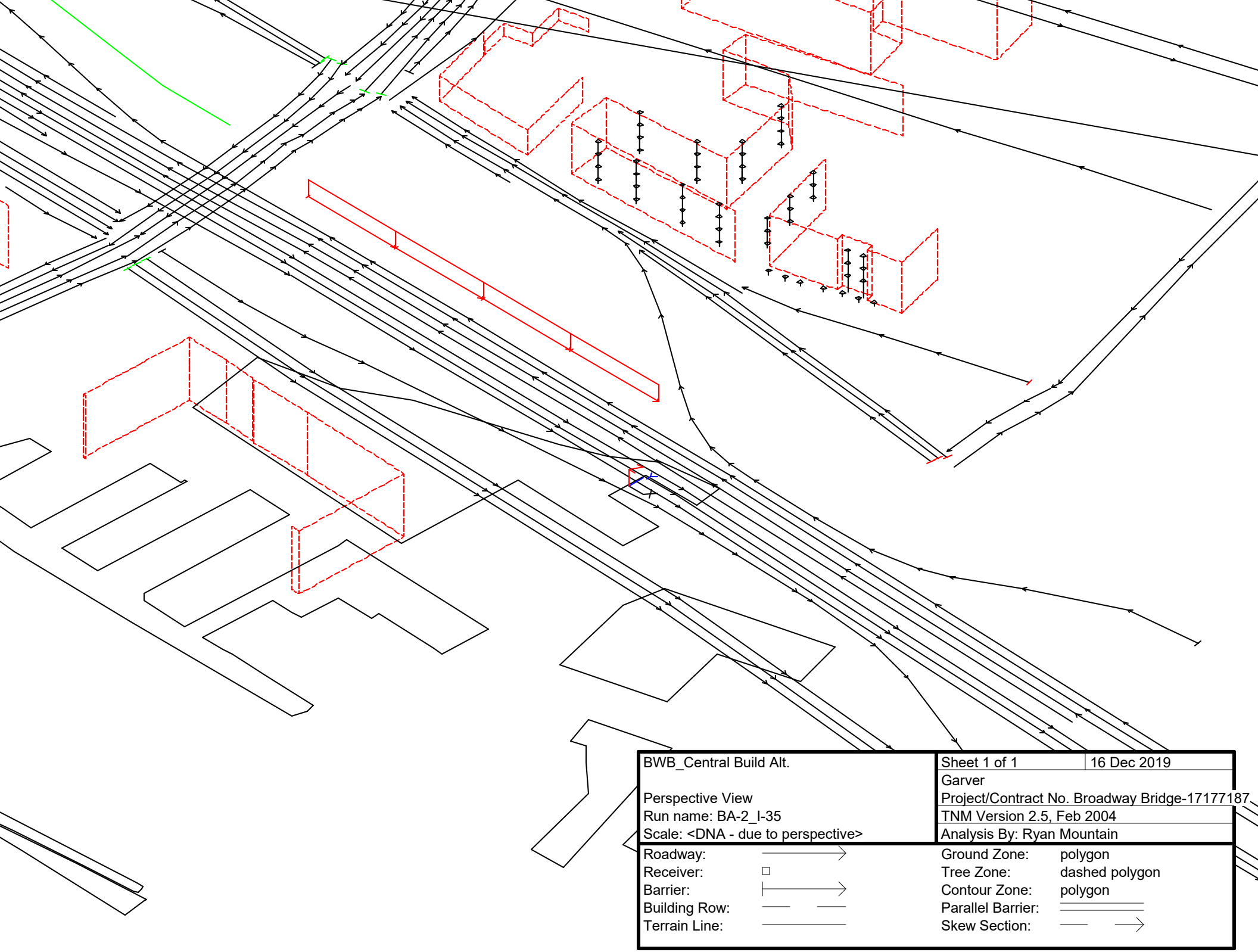
2763900
2764000
2764100
2764200
2764300
2764400
2764500
2764600
2764700



BWB_Central Build Alt.	Sheet 1 of 1	16 Dec 2019
	Garver	
Perspective View	Project/Contract No. Broadway Bridge-17177187	
Run name: BA-2_I-35	TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>	Analysis By: Ryan Mountain	

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	


GARVER

APPENDIX I – VISUAL ASSESSMENT

Visual Impact Assessment Technical Memorandum; October 1, 2019

Viewshed Renderings (Initial), presented to Section 106 Consulting Parties in August 27, 2019

TO: **Shari Cannon-Mackey,** Burns & McDonnell

FROM: **Brenda Durbahn,** Hg Consult, Inc.

DATE: **XXXXX**

SUBJECT: **US 169/Buck O'Neil Bridge Crossing of the Missouri River EA: Visual Impact Assessment (VIA) Technical Memorandum**

1.0 Introduction

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

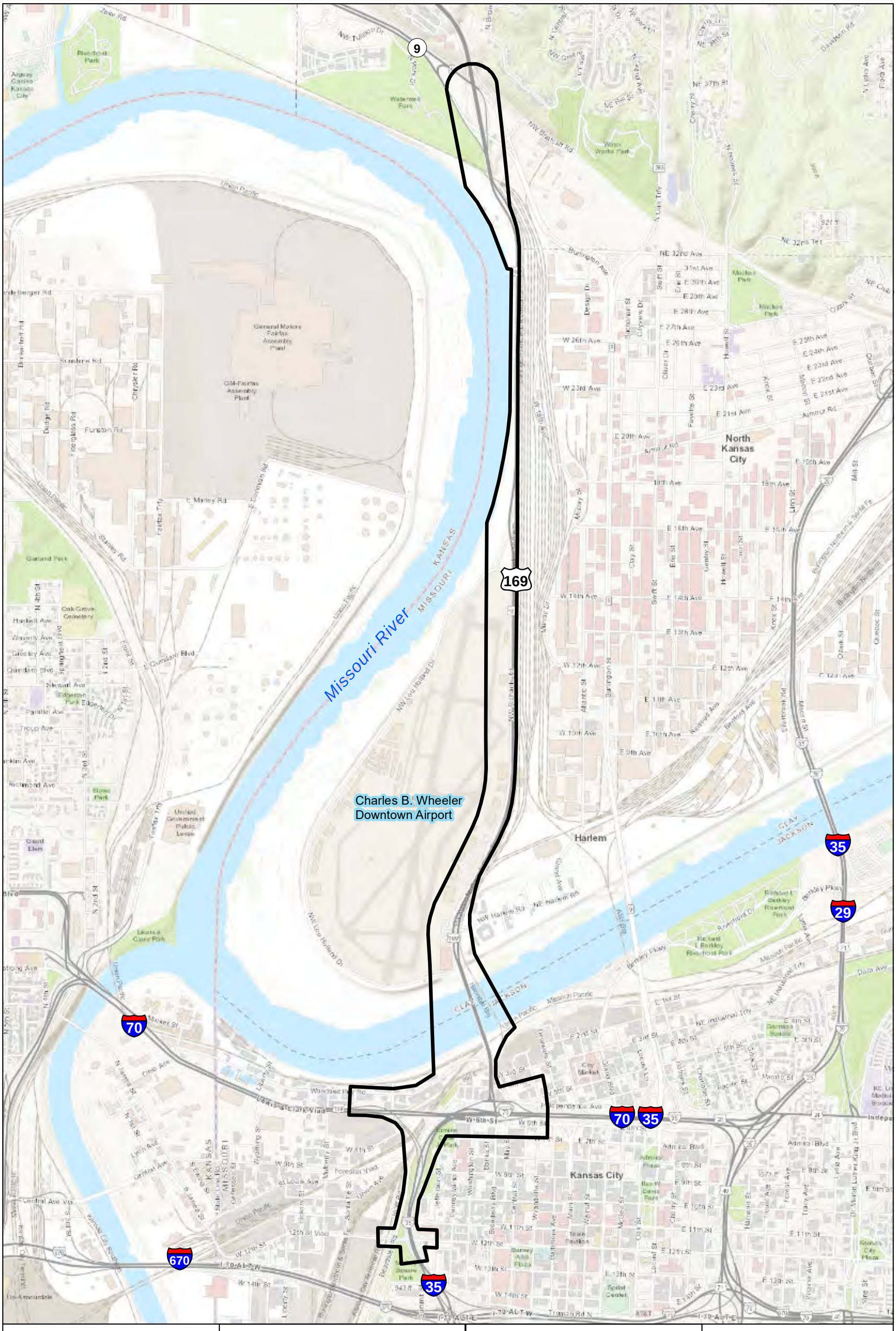
The visual impact assessment (VIA) process consists of four components. These include:

- Determining the Area of Visual Effect (AVE)
- Analyzing the Landscape Character and Experience
- Predicting Baseline Impacts
- Identifying Mitigation Options

The VIA process provides an analysis of the landscape character for the Project study area. It is also used to determine the type and degree of visual impact for various viewers, such as the roadway user, the recreational tourist, and the local resident.

2.0 Project Description

For purposes of this VIA, the Project study area is centered around the existing Buck O'Neil Missouri River Bridge; which is visible from an area approximately 1-2 miles surrounding it. This distance varies depending on the direction, terrain, and existing buildings and infrastructure allowing a view of the bridge or obscuring it from view. The study area established for the Project's Environmental Assessment is shown on the following page. In addition to the No-Build alternative there are three main Build alternatives being considered: West Alternative, Central Alternative and Adjacent Alternative with Options 1-3.


9
169
35
70
29
670
Missouri River
KANSAS
MISSOURI
Charles B. Wheeler
Downtown Airport
North
Kansas City
Harlem
Kansas City
General Motors
Fairfax
Assembly
Plant
GM-Fairfax
Assembly
Plant
Riverboat
Park
Watkins
Park
Mockbee
Park
Garland Park
Oak Grove
Cemetery
Stowe
Park
Grant
Elem
Union Pacific
Burlington Ave
NE 32nd Ave
W 26th Ave
W 23rd Ave
E 23rd Ave
E 21st Ave
E 20th Ave
W 14th Ave
E 14th Ave
W 12th Ave
E 12th Ave
E 11th Ave
W 10th Ave
E 9th Ave
W 6th St
W 5th St
E 7th St
E 18th Ave
E 16th Ave
E 15th Ave
NE 37th St
NE 32nd Ter
Armour Rd
Berkley Pkwy
Richard L.
Berkley
Riverfront
Park
Richard
L Berkley
Riverfront Park
Missouri Pacific
Stanley Rd
Chris Ave
Central Ave
Richmond Ave
Parallel Ave
Troup Ave
Stewart Ave
Edgerton
Park
Quindaro Blvd
Hardesty Ave
Wyandotte Ave
Forest Ave
Tracy Ave
Harrison St
Broadway Blvd
Baltimore Ave
Jefferson St
Wyandotte St
Oak St
Main St
Walnut St
Locust St
Cherry St
Admiral Blvd
Admiral Place
Bus W
Gates
Park
Town
Pavilion
Barney
Allen
Plaza
Spirit
Center
City
Market
Square
Park
Library
Park
Lewis &
Clark Park
Kansas City
Plaza
Independence Ave
Paseo Blvd
Troost Ave
Prospect Ave
Vine St
Lydia Ave
Flora Ave
Dalton Rd
Ozark St
Quincy St
Mill St
Lydia Ave
Ora St
Swift St
Design Dr
Oliver Dr
Howell St
Fayette St
Knox St
Lowry St
Lincoln St
Jackson St
Monroe St
Madison St
Jefferson St
Clay St
Ellis St
Lowry St
Howell St
Knox St
Lincoln St
Murray St
Atlantic St
Barrington St
Kansas Ave
Bedford Ave
Charlotte St
Madison St
Quincy St
Ozark St
Orleans St
Cherry St
Harrison St
Tracy Ave
Forest Ave
Troost Ave
Lydia Ave
Flora Ave
Vine St
Dr Martin Luther King Jr Blvd
Indepe
Admiral Blvd
Dale Ave
Mill St
Lincoln St
Lowry St
Howell St
Ellis St
Clay St
Swift St
Murray St
Knox St
Lincoln St
Quincy St
Ozark St
Oak St
Main St
Walnut St
Locust

3.0 Regulatory Context

This VIA provides information as part of the FHWA National Environmental Policy Act (NEPA) process. This VIA is based on the FHWA *Guidelines for the Visual Impact Assessment of Highway Projects* (January 2015) methodology for assessing potential visual impacts.

3.1 Visual Analysis Process

This visual analysis process 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.

Visual impact assessment (VIA) addresses beneficial as well as adverse impacts of a project on the surrounding landscape. Determining visual quality is influenced by 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 unpleasant views.

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.

The project impacts were identified by considering these elements. This VIA memorandum describes the existing conditions and the impacts of the alternatives in the foreground view within approximately 0.25 to 0.5 mile and the middle ground view (one to two miles). The background views are generally blocked by the existing built environment. Foreground, middle ground and background view distances are from a dynamic standpoint and are not from any single specific location. In this urban setting, the foreground view is predominant and, from some vantage points, may be the only view due to buildings or other obstacles.

4.0 Affected Environment

The project site is a stretch of US 169 that is bounded on the north by Missouri Route 9 and on the south by 12th Street and I-35. The Buck O'Neil Missouri River Bridge also known as the Broadway Bridge, so named for the street it carries, is located approximately halfway between Route 9 and 12th Street. It crosses the Missouri River between downtown and the Charles B. Wheeler Downtown Airport/Harlem neighborhood. Downtown Kansas City is characterized by an array of local streets, I-70 and I-35 and numerous commercial, industrial, and residential high-rise buildings common to major cities of the U.S.

These buildings are densely located and are of varying ages and types throughout the downtown. Across the Missouri River, in addition to the airport, are several office buildings of one to two stories in keeping with airport clear zone requirements. Also, some sparse single-family houses, a long-term residential motel and industrial businesses populate the Harlem neighborhood.

4.1 Area of Visual Effect

The area of project visibility is referred to as the Area of Visual Effect (AVE). It is determined by the physical constraints of the environment and the physiological limits of human sight. For this project, the AVE includes the foreground and middle ground views, generally bound by US 169 & Richards Road to the north, 12th Street/I-35 to the south, I-70 on the west, and the Heart of America Missouri River bridge on the east. The AVE focuses on foreground views within 0.25 to 0.5 mile and the middle ground views within one to two miles because views of the site beyond the middle ground are largely obscured by existing development. Existing buildings may also obscure views from locations within the AVE.

Identifying a landscape unit aids in defining it as a distinctive landscape. The two landscape units defined for this project are:

- North of the Missouri River
- Downtown including the Missouri River

4.2 Visual Character, Quality, and Viewer Population

An area's buildings, infrastructure, structures, art, and landscaping create the character of the cultural visual environment. The Project study area is in downtown Kansas City, which has a varied visual character and quality blended into a defined downtown area, including a mix of residential, commercial, industrial, and public uses.

In the context of the urban downtown setting, elements of the natural environment, with the exception of the Missouri River, are a minor feature of the visual setting because this is a highly developed area with the built environment providing much of the landscape.

The viewing population in the AVE includes residents, employees and customers/visitors at area businesses and institutions, commuters, and people passing through the area. Viewers' preferences discussed here are based on the viewer categories and visual preferences identified in the FHWA VIA Guidelines. Residents tend towards a desire to maintain the existing landscape as it is and are often interested in visual order and a natural harmony, the existing mix of uses and visual elements in the area detract from visual harmony. Merchants tend to be more permanent and prefer heightened visibility, free of competing visual intrusions. Shoppers prefer visual clarity to guide them to their destination; once at their destination, they prefer to concentrate on the shopping experience with few distractions. Commercial/industrial workers who manufacture goods and services or transport goods and services may benefit from good order and project coherence, but do not depend on those visual attributes.

4.3 North of the Missouri River

The area north of the Missouri River is urbanized with the Charles B. Wheeler Airport, office buildings, industrial businesses, and numerous railroad tracks adjacent to Broadway Avenue/US 169. The Harlem neighborhood is located north of the river and is characterized by sparsely dispersed single-family houses, industrial businesses, vacant lots and a residential motel.

- Natural environment: The composition of this area is generally incompatible to the natural environment. It has no parks and little green spaces. The limited green space is primarily confined to areas adjacent to the river and the flood control levee.
- Cultural environment: The mixed land use of this built environment gives a somewhat disordered sense of cultural order as compared to the orderly streets and buildings of downtown.
- Project environment: Alternatives on the north side of the river are on the same alignment and therefore the viewers experience of the cultural environment as they pass industrial, commercial, and governmental buildings and activities will be similar to their existing experience; however, these alternatives will provide other vantage points of the downtown and Missouri River as they utilize the new bridge.

4.4 Downtown Including the Missouri River

The Downtown is the cultural center of Kansas City and encompasses an area of approximately 6.23 mi^2 with the Missouri River at the north end, the Missouri/Kansas state line forming the west boundary, I-29 and US 70 on the east and 31st Street at the south end. The buildings are of varying heights with primary materials including brick or concrete. There are multi-story office buildings with retail on the first floor, multi-story residential buildings, local, state and federal government buildings, a 18,972 seat multi-purpose arena (Sprint Center), a convention center (Bartle Hall), museums, such as the National WWI Museum and Memorial and performing arts centers, namely the Kaufmann Center.

- Natural environment: The downtown built environment is of the composition that is generally inharmonious to the natural environment. The downtown area does have a few small parks and green spaces.
- Cultural environment: The downtown built environment provides a sense of cultural order typical of a downtown area.
- Project environment: Alternatives where the main traffic flow travels near the north edge of the downtown area will enrich the viewers experience of the downtown cultural environment as they pass industrial, commercial, and governmental buildings and activities.

5.0 Potential Impacts

Visual impacts are changes to the environment (measured by the change in the compatibility of the impact to the surrounding area) or to viewers (measured by sensitivity to the impacts). Together, the compatibility of the impact and the sensitivity of the viewers yield the degree of the impact to visual

quality. Potential impacts of the alternatives result from the most prominent element which is the bridge. These impacts are defined below:

- Compatibility of the change is defined as the ability of the environment to absorb the project with the surrounding environment by having compatible visual character. The alternative can be considered compatible or incompatible.

- Sensitivity to the change is defined by the ability of viewers to see and be affected (either negatively or positively) by the changed setting. The sensitivity to impact is based on viewer sensitivity to changes in the visual character of visual resources. Viewers are either sensitive or insensitive to impacts. By itself, the sensitivity of the impact should not be confused or conflated with the value of the impact.

- Degree of the impact is defined as either a beneficial, adverse, or neutral change to visual quality. An alternative may benefit visual quality by either enhancing visual resources or by creating better views of those resources and improving the experience of visual quality by viewers. Similarly, it may adversely affect visual quality by degrading visual resources or obstructing or altering desired views.

No Build Alternative

The No-Build Alternative does not include any construction activities. The Buck O'Neil Bridge would remain, and no new bridge would be constructed. Therefore, the No-Build Alternative would not affect visual attributes of the Study Area.

- Compatibility – The No Build Alternative will not have any visual impact changes and is considered compatible.

- Sensitivity – The viewers will not experience a changed setting and are therefore insensitive to impacts.

- Degree – The visual quality will remain unchanged and therefore would have no adverse effect.

West Alternative

This alternative is the farthest west of the existing bridge and moves the alignment to the west edge of Downtown. It provides a direct connection to I-35 and would have flyover ramps over I-70 near the Ermine Case Junior Park and Lewis & Clark historic marker.

- 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 – The viewers will experience a changed setting. The new bridge and associated ramps will be in a new location and it is proposed to be a prefab concrete or steel bridge with no tall vertical elements as it will be required to have a profile compatible with FAA airport clearance requirements given its proximity to the Charles B. Wheeler Airport. Viewers could

have a negative sensitivity to the high flyover ramps on the west edge of downtown and near the West Terrace/Ermine Case Junior Park, 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 structures. Additionally, this alternative would open up new dynamic views of the Missouri River for travelers using the new bridge. Also, viewers in some high-rise downtown buildings could experience new views of the Missouri River with the Buck O'Neil removed which would be 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 will remain similar. On the Downtown side of the river, some of the high flyover ramps could result in an altered view of the Missouri River from the Ermine Case Junior Park. However, the location of the new bridge would allow some new open views of the river from Broadway and other vantage points in the downtown which would be a positive visual quality for some viewers from the Downtown. The West Alternative is considered to have a neutral change to visual quality.



View from Ermine Case Junior Park looking north towards area of future flyover ramps



View looking northeast at Buck O'Neil Bridge from Woodswether Rd. in the approximate location of the Adjacent Alternative



View looking north from Woodswether Rd. and 3rd Street showing an area of positive impact if the bridge is removed



West Alternative

Buck O'Neil Bridge Project
Visual Impacts Assessment

10/8/19

Central Alternative

The Central Alternative is located farther to the west and upstream from the existing bridge than the Adjacent Alternative. It is shown in the figure on the next page. 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. Although many of the buildings adjacent to Landmark Lofts would be acquired with this alternative, Landmark Lofts would not.

- 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 will experience a changed setting. The new bridge and associated ramps will be in a new location and it is currently proposed to be a prefab concrete or steel bridge with no tall vertical elements as it will be required to have a profile compatible with FAA airport 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 will remain similar. 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 have a negative change to visual quality.



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



View looking west from the Ermine Case Junior Park near the Louis & Clark historic marker


KANSAS
MISSOURI
Missouri River
Richards Rd
North Kansas City
169
Charles B. Wheeler
Downtown Airport
Unified
Government
Public Levee
Harlem
Heart of America Bridge
Roadway on walls down
to meet existing grade
Spans elevated
at Harlem
(22' max. ht.)
Clay
Jackson
River Bridge elevated
over Woodswether
Viaduct
Spans elevated
over 3rd St
(25' max. ht.)
River Market
Ramps on walls
down to 5th St
70
Loop spans
elevated over I-70
(25' max. ht.)
Flyover spans
elevated over I-70
(25' max. ht.)
Flyover spans elevated
over Loop spans over I-70
(50' max. ht. over I-70)
70
35
New roadway and walls
constructed into bluff
KANSAS
MISSOURI
Ermine
Case
Junior
Park
Broadway Blvd
8th Street
Admiral
Plaza
Kansas City
Ilus W
Davis
Park
Town
Pavilion
Barney
Allis
35
N
W
E
S
0
.25
.5
Miles
Central Alternative Footprint
River Bridge
Elevated Ramps/Roadways
Ramps On Walls
Roadway On Walls
Hg Consult Inc engineers planners
Central Alternative
Buck O'Neil Bridge Project
Visual Impacts Assessment
10/8/19

Adjacent Alternative

This alternative would construct the new bridge adjacent to the existing Buck O'Neil Bridge on the west side or upstream. The figure on the following page shows the Adjacent Alternative. There are three options within this alternative with Option 1 having no direct connection to I-35, Option 2 having a future direct connection to I-35 and Option 3 having a direct connection to I-35. Options 1 and 2 would have a wide intersection at 5th Street and Broadway Boulevard. This 8-lane wide intersection would be nearly double the width it is currently. Option 3 would have ramps to Broadway Boulevard in addition to ramps connecting directly to I-35. This alternative would have the bridge coming into Downtown and connecting to Broadway Boulevard similarly to the existing bridge. With Options 2 and 3, Landmark Lofts, a multi-story residential building, would have ramps very close which would alter their viewshed.

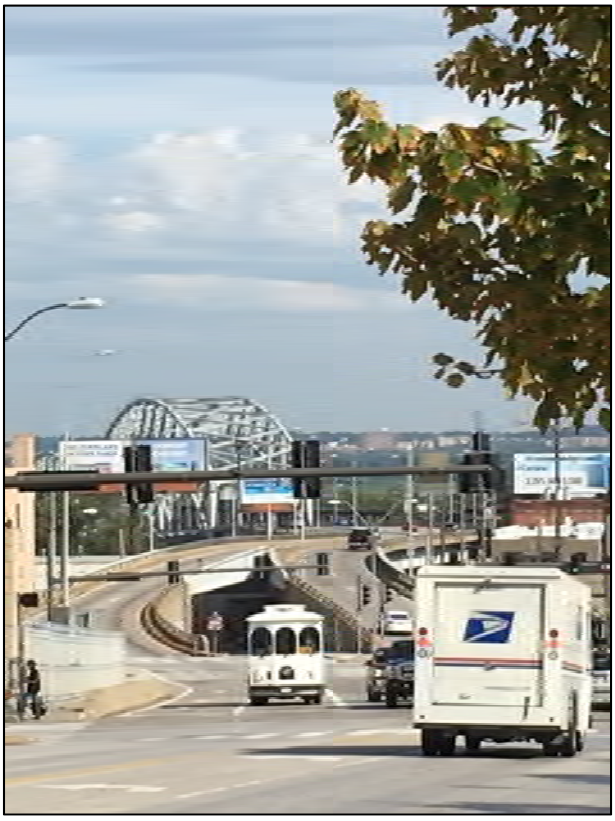
- Compatibility – The existing built environment could absorb the changes to the surrounding environment as a result of the Adjacent Alternative (Options 1-3) while maintaining a compatible visual character. The Adjacent Alternative is considered compatible with the surrounding environment.

- Sensitivity – The viewers will experience a changed setting. Under Options 1 and 2, the intersection of 5th and Broadway would be nearly twice as wide as it is currently; extending west from the Colonial Patterns building. Also, the new bridge, approaches and (potential future) associated ramps (Options 2 and 3) would be in a slightly new location and it is currently proposed to be a prefab concrete or steel bridge with no tall vertical elements as it will be required to have a profile compatible with FAA airport 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 – On the north side of the river the visual quality will remain similar as it is currently. On the downtown side including the river, some of the elevated ramps could result in the lost view of the Missouri River. The Adjacent Alternative is considered to have a neutral change to visual quality.



View looking north from Washington Street



View looking north from Broadway Boulevard and 7th Street



View looking west from Harlem showing limited view of the existing Buck O'Neil bridge



Adjacent Alternative Option 1

Buck O'Neil Bridge Project
Visual Impacts Assessment

10/8/19



Adjacent Alternative Option 2

Buck O'Neil Bridge Project
Visual Impacts Assessment

10/8/19



N
W E
S

0 .25 .5 Miles

- Adjacent Option 3 Footprint
- River Bridge
- Elevated Ramps/Roadways
- Ramps On Walls
- Roadway On Walls
- Adjacent Option 3 Alignment

Hg Consult Inc engineers planners

Adjacent Alternative Option 3

Buck O'Neil Bridge Project
Visual Impacts Assessment

10/8/19

Construction Impacts

Construction impacts, although temporary, could last for a couple of years and would involve the fastest degree of visual change for any alternative. Site clearing would involve removal of existing asphalt and landscaping. Other sources of visual effects could include construction staging areas, detours or temporary roadways, lighting, signage, heavy equipment, trailers, fences, scaffolding, cranes, and material storage. This construction work would result in visual clutter and little visual unity for viewer groups given the variety of construction activities, equipment, and stored materials that would change throughout the temporary construction period. The construction and staging areas would lack visual cohesion and have low visual quality compared with the existing conditions or the expected visual character after construction.

6.0 Conclusions

The overall visual assessments for each alternative are shown in the table below. The West Alternative would have the least impact from a visual standpoint among the Build alternatives.

Table 1: Visual Assessment Summary

Alternatives	Compatibility	Sensitivity	Visual Quality
No Build	+	o	o
West	+	o	o
Central	+	-	-
Adjacent	+	-	o
Key: + positive/beneficial; o neutral; - negative/adverse			



West Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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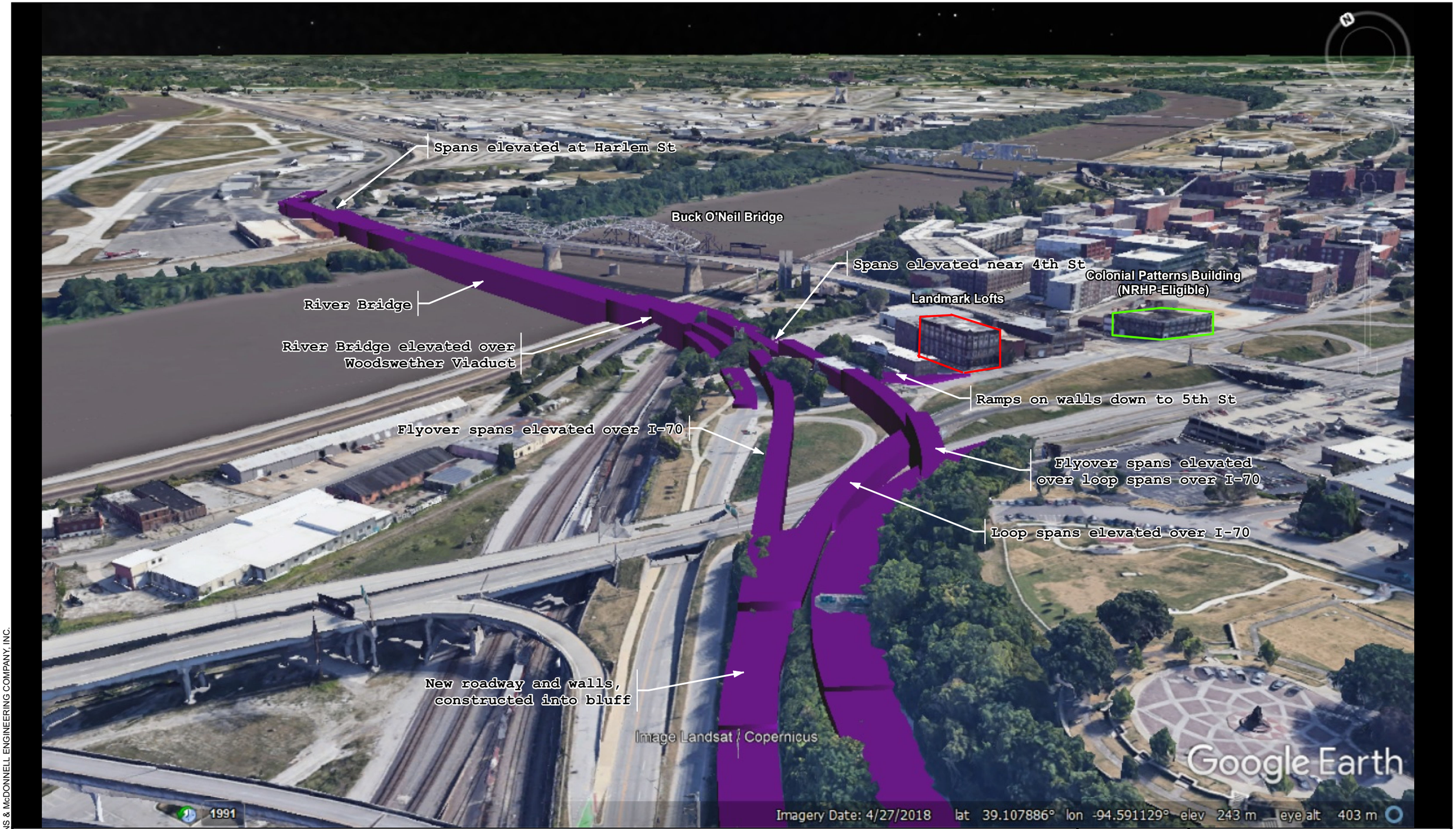

West Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Central Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Central Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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Adjacent Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View North to Landmark Lofts
150 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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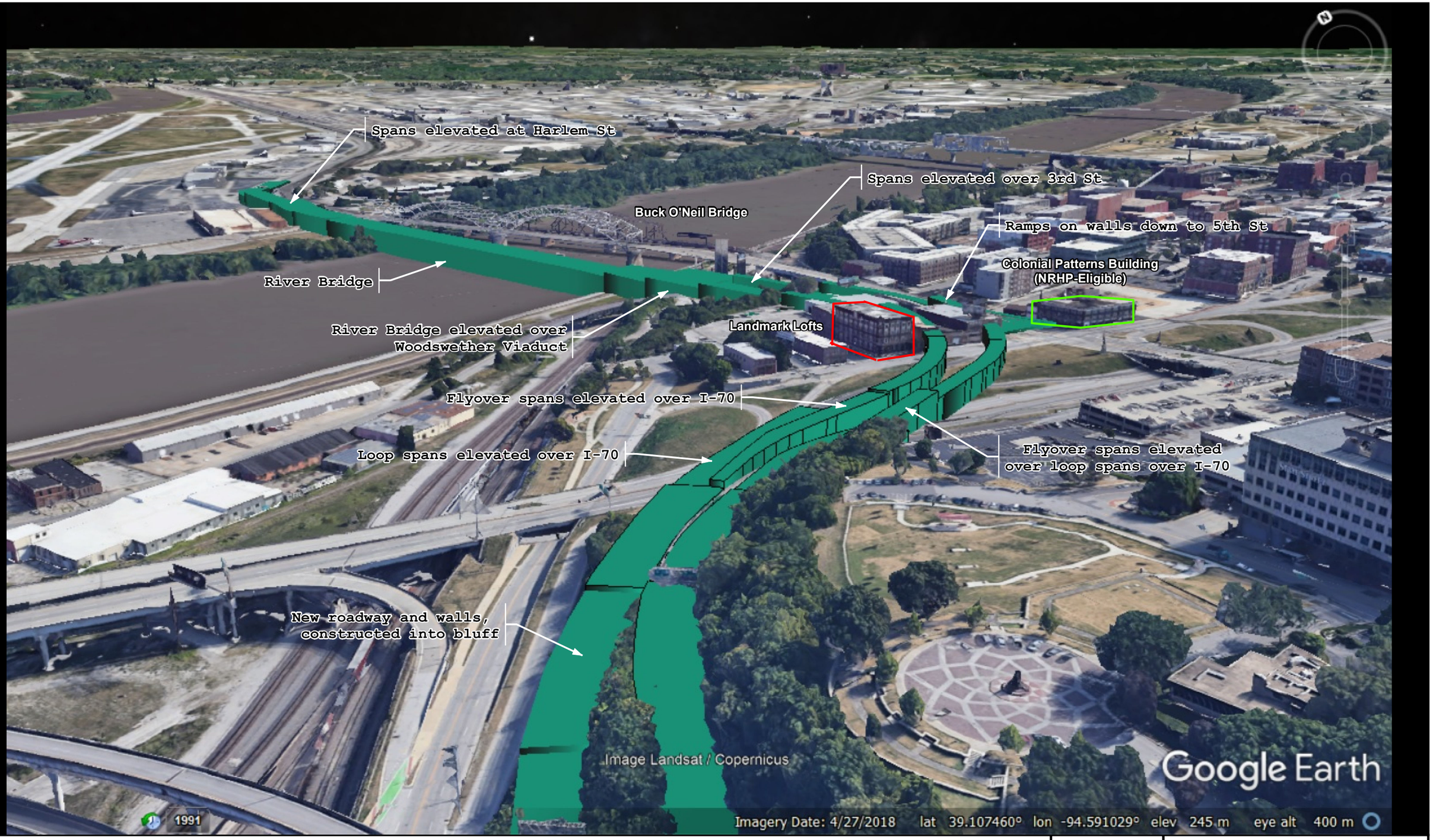

Adjacent Alignment

NORTH

0 0

Not to Scale

BURNS McDONNELL

View Northeast,
1300 Feet Above I-35
Buck O'Neil Bridge Project
Jackson & Clay Counties, Missouri

Source: ESRI; Google Earth; Burns & McDonnell Engineering Company, Inc.

Issued: 8/24/2019

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