Discover.

4-26-16

RE: Request for Qualifications: 16STR37 – MO 370 Discovery Bridge and I-70 Blanchette Bridge Shared Use Paths Project
TAP – 7303 (615)

Dear Consultant:

The City of St. Charles is interested in securing professional services for work associated with:

MO 370 Discovery Bridge and I-70 Blanchette Bridge Shared Use Paths Project

This project includes design and construction to provide protection for on-bridge bicycle and pedestrian shared use paths utilizing the outside shoulders of MO 370 Discovery Bridges and separates these paths from motor vehicle traffic by installing physical barriers. The project will provide 6 ft. wide shared use paths and 8 ft. wide outside shoulders for traffic. Barriers are added along both Eastbound and Westbound 370 to provide 6 ft. wide shared use paths accommodating bi-directional pedestrian travel and directional bicycle travel. This project is along the national Mississippi River Trail and provides connectivity to several trails in the region. Trail connection improvements will be completed at Boschert Greenway Trail connections, The St. Charles trail connection to the Katy Trail and Boschert Greenway is being completed by a MDNR Recreational Trails Program grant. This proposed TAP project is part of the feasibility study that was funded by cooperative effort between the Cities of St. Charles, Bridgeton, and Maryland Heights, and Great Rivers Greenway (GRG) to improve bike and pedestrian connectivity across the Missouri River. The project increases the safety and connectivity amongst the Boschert Greenway, Katy Trail, Earth City Levee Trail, and Mississippi River Trail. The existing outside shoulders of MO 370 are 9.5 ft. wide. Bicyclists and pedestrians use these shoulders to cross the Missouri River. The proposed improvements will add a 16 in. wide physical barrier along MO Route 370 to protect pedestrians and bicyclists from motor vehicle traffic.

Also, the project includes a conceptual and preliminary design of providing bicyclist and pedestrian access across the Missouri River at eastbound IS 70 Blanchette Bridge. The new bridge crossing will connect the Katy Trail and Riverwoods Trail.

Department of Public Works

Engineering Division

City of Saint Charles
200 North Second Street
Saint Charles, MO 63301
636.949.3237
www.stcharlescitymo.gov

Tentative Project Schedule	Due Date/Sequence
Consultant Solicitation	5/12/16
Select Consultant	5/26/16
Design Notice To Proceed	8/9/16
Concept Plan	9/13/16
Obtain Environmental Clearances	12/28/16
Preliminary Plan	1/24/17
Right of Way Plan	4/1/17
Utility Coordination	5/1/17
Final PS&E	7/15/17
Bid	8/12/17
Construction	6/1/18
Final Close Out	7/15/18

The estimated total cost of this project is $3,000,000.00.

A location map for this project, the East-West Gateway TIP application, and a copy of the scoring criteria that will be used as the basis for selection is attached for your information. Supporting TIP application information is available at:

http://www.ewgateway.org/TransAlternatives/transalternatives.htm

http://www.ewgateway.org/pdffiles/library/trans/tip/TAPRecommendedProj-010716.pdf

The project goals, basic scope, and other information are described in the attached Project Charter. The City will supply digital aerial photography and GIS topography to the consultant selected for the project if requested. The consultant will be required to supplement this information with any necessary surveys.

DBE firms must be listed in the MRCC DBE Directory located on MoDOT's website at www.modot.gov, in order to be counted as participation towards an established DBE Goal. We encourage DBE firms to submit letters of interest as prime consultants for any project they feel can be managed by their firm.

It is required that your firm's Statement of Qualification (RSMo 8.285 through 8.291) and an Affidavit of Compliance with the federal work authorization program along with a copy of your firm's E-Verify Memorandum of Understanding (15CSR 60-15.020) be submitted with your firm's Letter of Interest.

RFQ RESPONSE INSTRUCTIONS:

I. Roster Requisite (MUST be included for consideration)

In satisfying ordinance compliance, a copy of the firm's State of Missouri Corporate Certificate of Authority (for each professional service applicable - i.e., Architecture, Professional Engineer, or Land Surveying), a copy of individual professional's State of Missouri Registration Certificate, and a letter of intent to assign an applicable professional (the requisite need not designate the individual) to each project awarded. (Note: If this information has been submitted previously, please indicate the date of submission.)

Other Requisite Information:

A. "Subcontracted" Professional Services:

Since it is recognized that some firms do not employ all necessary professional disciplines to accomplish a given project in-house and that those firms commonly "subcontract", those firms intending to do so must forward the earlier noted roster requisite information for all firms which will be performing auxiliary "subcontracted" services. An example might be as follows:

The principle firm (Engineering) employs in-house architects, landscape architects, civil engineers (structural and highway design backgrounds) but intends to "subcontract" for geotechnical (soil analysis) services. Roster requisite information on the "subcontracted" firm(s) must be included.

B. Professional Liability:

The principle firm must submit an indication of existing professional liability (errors and omissions) insurance, or the ability to obtain such insurance, in an amount sufficient to cover the estimated construction cost of the project.

The principle firm is expected to provide such additional coverage as may be necessary to cover any "subcontracted" services.

II. INITIAL SELECTION FACTOR INFORMATION

The following considerations are intended to be evaluated by the Review Group. The below listings are not in any order of priority.

A. General experience and capabilities in the type of work required:

1. Preparation of construction plans for MO 370 Discovery Bridge and I-70 Blanchette Bridge Shared Use Paths Project.
2. Construction cost efficiency. (value engineering)
3. Familiarity with design requirements.
4. Professional staff.

B. Quality of previous projects describing that past project delivery has been:

1. On Time.
2. On Budget.
3. With Quality.

C. Recent Experience showing accuracy of construction project cost estimates:

1. Provide a list of your firm's last 3 similar projects*.
2. Record of project time – estimate vs. actual for design and construction.
3. Accuracy of construction cost estimates for the previously listed projects. Include the engineers estimate, low bid, and final construction cost.
4. Name of the representative project manager(s) for your firm on each described project.

D. Community Relations:

1. Experience with community relations including evidence of sensitivity to citizen concerns. (i.e., reaction to neighboring and concerned citizen comments reflected in design change and/or public explanation, etc.)

2. Explanation of community relations approach for this project.

E. Technical Approach:

Describe your firm's technical approach to the project including how your firm can achieve the project goals, deal with the project conditions, and meet the project standards. Include any other project information you may feel is relevant or important for consideration.

F. Current workload and adequate staffing:

1. Provide a list of current projects and their anticipated completion schedules.
2. Provide your firm's anticipated design schedule this project.

G. Proposal meets the City's time requirements / project schedule:

Describe your firms philosophy regarding meeting the City's established project schedule, including any efforts that may be needed to get back on schedule in case of slippage in the schedule occurs.

H. Quality assurance and control:

Describe methods or procedures your firm has used to provide assurance and control of quality on past projects and include how your firm will achieve quality for this project.

I. Project Management Approach:

Describe your firm's Project Management Approach to this Project.

* Regarding reference projects, information submitted must include project sponsoring agency name, address, and phone number; and a contact person with phone number (if different than above) is desirable.

Three (3) copies of your RFQ response submittal for this project must be received no later than 2:00 p.m., local time, Thursday May 12th, 2016. Submittals should be clearly labeled as MO 370 Discovery Bridge Shared Use Paths RFQ.

Submit information to:

Mark Edward Rees, P.E.
Project Manager
City of St. Charles
200 North Second Street, Room 202
St. Charles, MO 63301

We thank you for your interest in this project and should you have any questions, please feel free to contact me at (636) 949-3502, via email at mark.rees@stcharlescitymo.gov.

Sincerely,

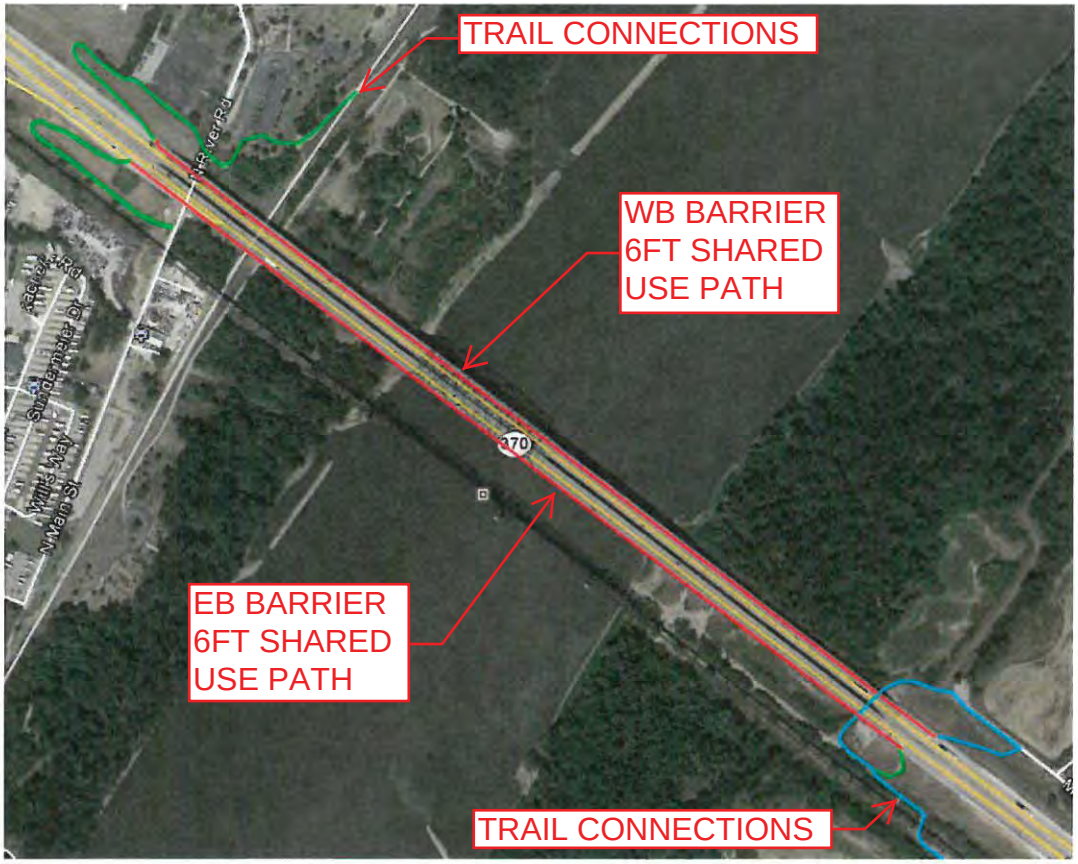
Mark Edward Rees, P.E.
Project Manager

Cc: Kevin Corwin, P.E., PLS, City Engineer
Brad Temme, P.E., Sr. Project Manager – Design

Enclosures:
Project Location Map
East West Gateway TIP Application and Attachments
Project Charter
Scoring Criteria for Selection

City of St. Charles, St. Charles County, **MO 370 Discovery Bridge Shared Use Paths**	
Federal Aid No.:	Project # TAP – 7303(615)
Location:	Missouri Route 370 Discovery Bridge
Proposed Improvement:	Construction of Shared Use Paths with Barrier and Fencing on the East and West Bound MO 370 Discovery Bridges.
Length:	0.66 miles
Approximate Construction Cost:	$3,000,000.00
DBE Goal Determination	*10%*
Consultant Services Required:	The engineering responsibilities may include but are not limited to the following: The preparation of Conceptual plans, Preliminary plans, Contract plans. Design services may include, right of way plans, surveying, title research, geotechnical investigations, public involvement, environmental and historic preservation services/permits, contract documents, assisting with the bidding process, construction support/construction inspection, utility coordination/permits and traffic controls including the preparation of PS&E and final documents, project administration and management.
Other Comments:	
Contact:	Mark Edward Rees, P.E. Project Manager City of St. Charles 200 North Second Street, Room 202 St. Charles, MO 63301 Phone: (636) 949-3502 Email: Mark.Rees@stcharlescitymo.gov
Deadline:	2:00 pm, Thursday May 12th, 2016
Submit • Statement of Qualifications • Affidavit of Compliance with the federal work authorization program • E-Verify Memorandum of Understanding	

MISSOURI ROUTE 370 DISCOVERY BRIDGE:
ON-BRIDGE SHARED USE PATHS



City of St. Charles
Consultant Selection Criteria
Project Name: **Project Name**

Criteria	Weight	Responsive Firms													
		Firm #1		Firm #2		Firm #3		Firm #4		Firm #5		Firm #6		Firm #7	
		Raw Score (1-5)	Weighted Score	Raw Score (1-5)	Weighted Score	Raw Score (1-5)	Weighted Score	Raw Score (1-5)	Weighted Score	Raw Score (1-5)	Weighted Score	Raw Score (1-5)	Weighted Score	Raw Score (1-5)	Weighted Score
General experience and capabilities in this type of work	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quality of previous projects	10%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recent experience showing accuracy of construction project cost estimates	5%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Community relations including evidence	5%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consultant's thorough research and technical approach to the project	25%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Current workload and adequate staffing	10%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proposal meets City's time schedule	15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QA/QC Plan	5%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Management Approach	10%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	100%		0.00		0.00		0.00		0.00		0.00		0.00		0.00

Summary

Project Application Form

Transportation Alternatives Program (TAP)

2015 Call for Projects

Bicycle and Pedestrian Projects

For the St. Louis, Missouri Region

Submitting Agency: City of St. Charles

Project Title: Missouri Route 370 Discovery Bridge - On-Bridge Shared Use Paths

Applications Due: Monday, December 7, 2015 by 4:00 PM

EAST-WEST GATEWAY
Council of Governments
Creating Solutions Across Jurisdictional Boundaries

TRANSPORTATION ALTERNATIVES PROGRAM APPLICATION FORM

This project application form is for the bicycle and pedestrian type projects, including Safe Routes to School (SRTS) infrastructure and non-infrastructure projects. There is a separate project application form for the community improvement and environmental mitigation activities**.** If your agency is interested in applying for those activities, please obtain the application form from the East-West Gateway website: www.ewgateway.org, or contact the East-West Gateway staff for more information.

Please refer to the Project Development Workbook for more information on the program requirements, scoring criteria, and available funding. The Project Development Workbook is available on the East-West Gateway website.

The call for projects begins September 29, 2015 and ends on December 7, 2015 at 4:00 p.m. Applications received after the deadline will not be accepted. Submit the completed application and necessary attachments electronically to rachael.pawlak@ewgateway.org. Please submit one application per email. Electronic copies can also be delivered on a CD or USB drive. You will receive an email confirmation within one business day of submittal. If you do not receive confirmation or have questions about the application, contact Rachael Pawlak at 314/421-4220.

Viewing and utilizing the application will require the installation of Adobe Reader. A free download of the software can be obtained here: http://get.adobe.com/reader/. Rename the PDF file using the following format: 2015TAP_[Sponsor]_[Project Name].pdf. **Please save the application to your computer before filling out the necessary information.**

Project sponsors wanting feedback on applications may submit a preliminary copy by October 29, 2015 to Rachael Pawlak at rachael.pawlak@ewgateway.org. East-West Gateway staff will review the applications submitted and will return comments by email by November 6, 2015. If a preliminary application is submitted for feedback, a final application must still be submitted by December 7, 2015.

Applicants must also submit one (1) hard copy (including attachments) to:
East-West Gateway Council of Governments
Attention: Rachael Pawlak
Gateway Tower
One Memorial Drive, Suite 1600
St. Louis, MO 63102-2451

The information provided in this application is public record.

If you have any questions, contact Rachael Pawlak at 314/421-4220 or rachael.pawlak@ewgateway.org.

Applications are due Monday, December 7, 2015 by 4:00 PM

PROJECT CHECKLIST

The evaluation and scoring of all projects will be based on the answers provided in the application and the attachments submitted. Materials that must be submitted include: project application fee, application form, required signatures, detailed cost estimate, project location map, and a typical section. All other materials are not required, but aid in the evaluation and scoring process.

The materials should be submitted in the following order.

Project Application:

- ☑ Project application fee – ½ of one percent of federal funds requested
- ☑ Completed Transportation Alternatives Program application
- ☑ Required signatures: Financial Certification of Matching Funds, Person of Responsible Charge Certification, Right-of-Way Acquisition Certification Statement, Policy on Reasonable Progress Certification, Notification of Title VI Requirements

Attachment A:

- ☑ Detailed cost estimate – use Estimate of Project Costs excel file provided by East-West Gateway

Attachment B:

- ☑ Project location map – project location will be used to determine both the PUI and EJ score
- ☑ Photographs of existing conditions
- ☐ Drawings or preliminary sketches of the proposed project
- ☑ Typical section – not applicable for SRTS non-infrastructure projects

Attachment C:

- ☐ Bicycle and/or pedestrian police crash reports
- ☑ Documentation of an approved or adopted plan, ordinance, and/or policy – **do not attach entire plan documents, only include the necessary pages**
- ☑ Coordination letter from the agency with jurisdiction over facility, if applicable
- ☑ Letters of support: endorsements or petitions from associations, boards, school districts, citizens, businesses, etc.
- ☐ Documentation of public involvement process: public meeting minutes, newspaper clippings, press announcements, etc.
- ☐ Student Tally Form and Parent Survey – only applicable for Safe Routes to School non-infrastructure projects

SUBMITTAL TYPE (CHECK ONE):

- ☐ Preliminary application (for comments) – Due October 29, 2015
- ☑ Final application – Due December 7, 2015

PROJECT IDENTIFICATION

Project title:
Missouri Route 370 Discovery Bridge - On-Bridge Shared Use Paths

Sponsoring agency: City of St. Charles	Contact information – name, title, agency, mailing address, phone, e-mail: Kevin Corwin, City Engineer City of St. Charles 200 North Second Street St. Charles, MO 63301 (636) 949-3237 Kevin.Corwin@stcharlescitymo.gov
Secondary sponsor agency (if applicable):	
Project type: ☒ Bicycle and/or pedestrian facility ☐ Safe routes for non-drivers *(includes SRTS infrastructure projects)*	
Project status: ☒ New project ☐ Continuation of TAP/STP-S/CMAQ project ☐ Add to existing non-federally funded project	Is this application request for a piece of a larger project (phase) or the entire length of project? ☒ Phase ☐ Full project

TIP ID # of existing project:

PROJECT LOCATION * *Project sponsor must include a map clearly showing the exact project location(s) and extents in Attachment B.*

Name of street or facility to be improved:
Missouri Route 370 Discovery Bridge

Project limits – north/west reference point, cross street, or intersection: West bridge approach slab/Boschert Greenway Trail	Municipality and county: City of St. Charles, St. Charles County
Project limits – south/east reference point, cross street, or intersection: East bridge approach slab Missouri Bottom Road and Earth City Levee Trail	Municipality and county: City of Bridgeton, St. Louis County

For SRTS infrastructure applications, list the names and addresses of the school(s) that will directly benefit from the project. ***Provide support letters from the affected schools**.

ROADWAY INFORMATION * *Provide the following information for the road(s) of the facility or adjoining to the off-road facility.*

Federal functional classification of road (per East-West Gateway): Freeway/Expressway	Width of outside paved shoulder (current and proposed): 9'-5" current, 8'-0" proposed
Speed limit of street (current and proposed): 60 mph current and proposed	Number of through lanes (current and proposed): 3 lanes each direction current and proposed
Outside lane width (current and proposed): 12' current and proposed	Lane width (current and proposed): 12' lanes current and proposed
Annual Average Daily Vehicular Traffic (AADT): 59,724 AADT per MoDOT 2013 Traffic Volume Map	

PROJECT MANAGEMENT INFORMATION

Does the sponsoring agency own and maintain this facility? *If no, a letter of support for this project is required from the facility owner.*

☐ Yes ■ No ☐ Unknown

Status of right-of-way acquisition:

■ All acquired or none needed

☐ In process

☐ Not started

If applicable, list the number of parcels to be acquired *(all properties, permanent and/or temporary easements, TSCL, and other rights-of-way)*:

Will the project traverse any public property, such as a public park that has used federal funds *(i.e., Land and Water Conservation Funds)* in the past?

☐ Yes ■ No ☐ Unknown

Does the project traverse any property owned by a railroad?

☐ Yes ■ No ☐ Unknown

Estimated completion (construction) month/year:

10/2018

UTILITY INFORMATION * *Project sponsor must coordinate with utilities prior to construction.*

Will the project require the relocation of any utilities?

■ Yes ☐ No ☐ Unknown

If yes, which utility companies will need to be coordinated with (i.e., electric, phone, gas, water, cable tv, sewer, other):

Ameren Electric (Lighting)

Give details concerning potential utility conflicts, problems, or issues:

Ameren to provide power for lighting

MAINTENANCE INFORMATION * *TAP funds are not available for on-going maintenance activities such as mowing and snow removal.*

List any regular maintenance tasks anticipated over the next 25 years:

Debris removal, re-striping, replace light bulbs

Estimated annual cost to maintain facility and identify funding source:

$2,000/year City of St. Charles Street Funds

PROJECT READINESS

Is the project identified in an approved or adopted plan, policy, or ordinance?

■ Yes ☐ No ☐ Unknown

Name of adopted plan, policy, or ordinance:

City of St. Charles Long Range Transportation Plan

Adoption date of plan, policy, or ordinance:

January 6, 2015

What planning has been completed to date?

■ Conceptual Plan ☐ Preliminary Plan ☐ Final Plan

PROJECT DEVELOPMENT SCHEDULE *Many stages can occur concurrently.*

Activity Description	State Date (MM/YYYY)	Finish Date (MM/YYYY)	Time Frame (Months)
Receive notification letter	02/2016	02/2016	
Execute agreement (project sponsor and DOT)	02/2016	04/2016	2
Engineering services contract submitted and approved	04/2016	06/2016	2
Obtain environmental clearances (106, CE-2, etc.)	02/2016	12/2016	10
Public meeting/hearing	06/2016	07/2016	1
Develop and submit preliminary plans	07/2016	10/2016	3
Preliminary plans approved	10/2016	12/2016	2
Develop and submit right-of-way plans	n/a	n/a	
Review and approval of right-of-way plans	n/a	n/a	
Submit and receive approval for notice to proceed for right-of-way acquisition (A-Date)	n/a	n/a	
Right-of-way acquisition	n/a	n/a	
Utility coordination	07/2016	04/2017	9
Develop and submit PS&E	12/2017	04/2017	4
District approval of PS&E/advertise for bids	04/2017	06/2017	2
Submit and receive bids for review and approval	06/2017	08/2017	2
Project implementation/construction	08/2017	06/2018	10

FINANCIAL PLAN *Fiscal years are federal fiscal years (October 1 through September 30). Federal funds must not exceed 80% of the total cost.*

Activity	Starting Federal Fiscal Year	Total Phase Cost	TAP Funds Requested	Sponsor Share	Sponsor Share Percentage
PE/Planning/Environmental Studies	FY 2016	$ 220,000	$ 104,500	$ 104,500	50 %
Right-of-Way	FY n/a	$ 0	$ 0	$ 0	0 %
Implementation	FY 2018	$ 2,670,000	$ 1,335,000	$ 1,335,000	50 %
Construction Engineering	FY 2018	$ 110,000	$ 55,000	$ 55,000	50 %
TOTAL PROJECT COST		$ 3,000,000	$ 1,500,000	$ 1,500,000	50 %

Identify the source(s) of local matching funds:	$1,500,000 City of St. Charles
Have the matching funds been secured (provide details):	Yes, Funds are from CIP allocations or transfer to City's CIP
Has the project received funds programmed from other funding sources (provide details):	No
If the project is part of a larger federally funded roadway or transit improvement, describe it:	n/a

PROJECT DESCRIPTION

Provide a brief description of the purpose of the project and the scope of work. If the project can be broken down into constructible segments of $1,000,000, please provide information on each segment.

This project provides protection for on-bridge bicycle and pedestrian shared use paths utilizing the outside shoulders of Missouri Route 370 Discovery Bridge and separates these paths from motor vehicle traffic by installing physical barriers. Barriers are added along both Eastbound and Westbound 370 to provide 6 foot wide shared use paths accommodating bi-directional pedestrian travel and directional bicycle travel. Physical barriers will greatly reduce the level of stress across 370 bridge. Barrier locations are depicted in red on attached project location map. This project is along the national Mississippi River Trail and provides connectivity to several trails in the region. Trail connection improvements will be completed at Boschert Greenway Trail connections, The St. Charles trail connection to the Katy Trail and Boschert Greenway is being completed by a MDNR Recreational Trails Program grant. This proposed TAP project is part of an overall cooperative initiative between the Cities of St. Charles, Bridgeton, and Maryland Heights, and Great Rivers Greenway (GRG) to improve bike and pedestrian connectivity across the Missouri River. The project increases the safety and connectivity amongst the Boschert Greenway, Katy Trail, Earth City Levee Trail, and Mississippi River Trail.

COMMUNITY SUPPORT

Describe the public involvement activities to date on the proposed project:

The project has been presented to the City Council who supports the project and provided authorization to submit this TAP application. There are several letters of support from various community groups, attached to this application.

PROPOSED FACILITY INFORMATION

Describe the existing conditions of the bicycle/pedestrian environment where the proposed facility will be constructed *(i.e., are bike lanes or sidewalks present? If so, give width of each existing facility)*:

The existing outside shoulders of Mo Route 370 are 9.5 ft wide. Bicyclists and pedestrians use these shoulders to cross the Missouri River. The proposed improvements will add a 16" wide physical barriers along MO Route 370 to protect pedestrians and bicyclist from motor vehicle traffic. The project will provide 6 ft. wide shared use paths and 8 ft wide outside shoulders.

Does the proposed project incorporate any of the following bicycle-related improvements?

- [x] Separated bike lane/cycle track/protected bike lane
- [x] Shared-use path/trail
- [ ] Arterial sidepath
- [ ] Bicycle lane
- [ ] Marked shared roadway (shared-lane markings, “sharrow”)
- [ ] Paved shoulder
- [ ] Wayfinding, bicycle racks or parking, or other end of trip facilities
- [ ] Other

Describe other:

Does the project incorporate any innovative bicycle treatments *(i.e., pavement colorings, bike boxes, bike detection, etc.)*?

- [x] Yes
- [ ] No
- [ ] Unknown

If yes, describe:

16" wide physical barriers with fencing on top of the barriers to protect bicyclists from motor vehicle traffic

Does the proposed project incorporate any of the following pedestrian-related improvements?

- ☐ Sidewalks
- ☐ Sidewalk/roadway separation
- ☐ Curb ramps
- ☐ Pedestrian signal heads and push buttons
- ☐ Marked crosswalks
- ■ Wayfinding, furniture, or other ends of trip facilities
- ■ Pedestrian-scale lighting
- ☐ Other

Describe other:

Proposed project length – feet/miles:	Proposed pavement material(s):
1.8 Miles	Existing Concrete Pavement

Width of the proposed facility *(provide width information for all proposed facility types)*:
6 ft. wide shared use paths with 16" wide barriers; traffic lanes will be 12 ft. wide

How many residential/commercial driveways are on the proposed segment?
Residential driveways: n/a
Commercial driveways: n/a

How many streets/alleys does the proposed facility cross?
None

Is there a documented safety issue for pedestrians, bicyclists, and other non-drivers in the project area?
■ Yes ☐ No ☐ Unknown

If yes, 1) describe the documented safety issue and 2) explain the expected safety benefits of the project. **Provide the police report for each crash involving a pedestrian and/or bicyclist with your application.*

There is no physical protection between bicyclists/pedestrians and motor vehicle traffic. The attached MO State Highway Patrol Accident Report documents 1 incident where a pedestrian (Bridgeton Police Officer) was struck along the shoulder. This project will provide physical barriers to protect pedestrains/bicyclists from motor vehicle traffic.

Although only documented via on-site verification, there is currently no lighting along the MO 370 Bridge. This project will provide pedestrian level lighting as a safety benefit for the pedestrians/ bicyclists utilizing the proposed pathway facility. Lighting allows bicyclists and pedestrians to navigate safely as co-users of the pathway.

Is the project area currently ADA compliant?
■ Yes ☐ No ☐ Unknown

If no, does the project scope include upgrading facilities to ADA compliance? **All applicants are required by law to comply with the Americans with Disabilities Act (ADA) of 1990 for project accessibility.*
☐ Yes ☐ No ☐ Unknown

Does the project incorporate any of the following traffic calming and/or design improvements?

- ■ Pedestrian safety
- ☐ Speed control
- ☐ Volume control
- ☐ None

If the project incorporates any traffic calming or design improvements, describe the improvements *(i.e., bulb-outs, median barriers, center islands, roadway markings, improved signage and signals, etc.)*. Also explain how this improvement will reinforce a safe environment for pedestrians and/or bicyclists.

The project will install new barriers that will provide separation from the high speed traffic on MO Route 370, bike safe grates at the bridge drains, and lighting for safety after dark.

Does the project comply with the guidelines set forth by the *American Association of State Highway and Transportation Officials (AASHTO)* Guide for the Development of Bicycle Facilities (2012, 4th Edition), the *National Association of City Transportation Officials (NACTO)* Urban Bikeway Design Guide (2014, 2nd Edition), and/or the *Institute of Transportation Engineers (ITE)* Designing Walkable Urban Thoroughfares: A Context Sensitive Approach?

☒ Yes ☐ No ☐ Unknown

If no, explain why the project will not comply with AASHTO, NACTO, and/or ITE guidelines:

Does the project incorporate improvements to existing transit stops or stations *(i.e., ADA landing pads, benches, shelters, etc.)*?

☐ Yes ☒ No ☐ Unknown

If yes, explain the improvements:

Does the project improve access to transit stops, stations, park-and-ride lots, or other major transit facilities?

☐ Yes ☒ No ☐ Unknown

If yes, describe how the proposed project integrates with transit service:

Does the project serve an activity center, employment center, or community resource *(i.e., a business district, university, college, school, retail center, medical facility, park, etc.)*?

☒ Yes ☐ No ☐ Unknown

If yes, list all major activity centers, employment centers, and/or community resources (planned or existing) that the project directly serves:

N. 3rd St in St. Charles has several shopping centers, restaurants, and businesses including Boeing. Earth City Expressway is along an industrial area with several businesses including Trane & The-Rx Corp.

Explain how the project will serve and enhance access to the activity centers, employment centers, or community resources identified above:

Physical barriers will greatly reduce the level of stress crossing the Missouri River along MO Route 370. The increase in safety will encourage more bicyclists/pedestrains to use the pathways for commute to work or recreation.

Indicate the connectivity of the bicycle/pedestrian facilities resulting from the project:

☒ Project fills a gap between existing bicycle/pedestrian facilities
☐ Project intersects an existing bicycle/pedestrian facility
☐ Project extends an existing bicycle/pedestrian facility
☐ Project is a new isolated bicycle/pedestrian segment

Does the project provide a connection that reduces a barrier to use and functionality? *Examples of barriers include: 1) natural or man-made barriers (interstates, railroads, rivers); 2) arterial streets whose cross streets lack the combination of a low-stress approach and a safe crossing; and 3) breaks in the street grid, forcing traffic to use arterials to access the local streets.*

☒ Yes ☐ No ☐ Unknown

If yes, describe the barrier:

The Missouri River is a major barrier for pedestrians/bicyclists traveling between St. Charles and St. Louis counties. MO Route 370 provides access across the Missouri River. However, the lack of physical separation from high speed motor vehicle traffic (60 mph posted) deters all but the most confident bicyclists from traveling across the Missouri River along MO Route 370.

Does the project include significant benefits which address water quality, energy efficiency, or other environmental improvements *(i.e., pervious surfaces, rain gardens, LED lighting, solar powered fixtures, etc.)*?

☐ Yes ☒ No ☐ Unknown

If yes, describe the environmental improvements:

Provide any additional information that you would like to share:

This project provides physical barriers and lighting along MO Route 370 Discovery Bridge which will increase safety and greatly reduce the level of stress for bicyclists/pedestrians traveling across the Missouri River. This project is along the national Mississippi River Trail and provides connectivity to several trails in the region including the Boschert Greenway, Katy Trail, and Earth City Levee Trail.

The Safe Routes to School Non-Infrastructure (SRTS N-I) Project Application Form (pages 9-12) has been removed by East-West Gateway staff because the sponsor is not applying for this project type, and therefore the application form is empty.

TRANSPORTATION ALTERNATIVES PROGRAM REQUIRED SIGNATURES

FINANCIAL CERTIFICATION OF MATCHING FUNDS

This is to ensure sufficient funds are available to pay the non-federal share of project expenditures for the following project to be funded under the provisions of the Moving Ahead for Progress in the 21st Century (MAP-21).

Project Title: Missouri Route 370 Discovery Bridge - On-Bridge Shared Use Paths

Local Match Amount: $1,500,000

Sponsoring Agency: City of St. Charles

Chief Elected Official (or Chief Executive Officer):

Name (print): Sally A. Faith, Mayor

Signature: Sally A Faith

Date: 12/3/15

Attest:

City Clerk: Laura L. Whitehead

Signature:

Date: 12/3/15

Chief Financial Officer:

Name (print): Gina Jarvis, Director of Finance

Signature: Gina Jarvis

Date: 12/2/15

PERSON OF RESPONSIBLE CHARGE CERTIFICATION

The key regulatory provision, 23 CFR 635.105 – Supervising Agency, provides that the State Transportation Agency (STA) is responsible for construction of federal-aid projects, whether it or a local public agency (LPA) performs the work. The regulation provides that the STA and LPA must provide its full-time employee to be in "responsible charge" of the project.

The undersigned employee(s) of the project sponsor will act as person of responsible charge. If at any point the employee leaves the LPA, the LPA is responsible for finding a suitable replacement and notifying East-West Gateway. If the person of responsible charge is found to not be a full-time employee of the LPA, it will result in the loss of federal funds for this project. One employee can act as person of responsible charge for all three phases.

Person of Responsible Charge – Design Phase

Name (print): Brad Temme

Title: Design Sr. Project Manager Email: Brad.Temme@stcharlescitymo.gov

Signature:

Date: 12/2/15

Person of Responsible Charge – Right-of-Way Acquisition Phase

Name (print): Brian Faust

Title: Right-of-Way Specialist Email: Brian.Faust@stcharlescitymo.gov

Signature:

Date: 12/2/15

Person of Responsible Charge – Construction Phase

Name (print): Steve Noonan

Title: Construction Sr. Proj Manager Email: Stephen.Noonan@stcharlescitymo.gov

Signature:

Date: 12/3/15

RIGHT-OF-WAY ACQUISITION CERTIFICATION STATEMENT

The State Department of Transportation and the Federal Highway Administration (FHWA) have the right and responsibility to review and monitor the acquisition procedures of any federally funded transportation project for adherence to The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. Those projects found in non-compliance may jeopardize all or part of their federal funding.

A. The Project Sponsor hereby certifies that any right-of-way, and/ or permanent or temporary easements necessary for this project, obtained prior to this application, were acquired in accordance with The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

B. The Project Sponsor also certifies that any additional right-of-way, and/or permanent or temporary easements, subsequently required to complete the project, will be acquired according to The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Sally A. Faith
Name (print)

Signature

Mayor
Title

12/3/15
Date

Attest:

City Clerk: Laura L. Whitehead

Signature:

Date: 12/3/15

POLICY ON REASONABLE PROGRESS CERTIFICATION

Following on the next page is a copy of the policy on reasonable progress adopted by the East-West Gateway Council of Governments Board of Directors.

The undersigned representative of the project sponsor hereby certifies that s(he) has read this policy and understands its requirements. The representative acknowledges that failure to meet all of the reasonable progress requirements could result in federal funds being revoked and returned to the regional funding pool, as dictated by the policy.

Sally A. Faith
Name (print)

Sally A Faith
Signature

Mayor
Title

12/3/15
Date

Attest:

City Clerk: Laura L. Whitehead

Signature:

Date: 12/3/15

POLICY ON REASONABLE PROGRESS

Reasonable Progress

For projects or programs included in the Transportation Improvement Program (TIP), "reasonable progress" will have been made if the project has advanced to the point of obligating all federal funds programmed for that project in the current fiscal year, regardless of the phase of work (*i.e., preliminary engineering, right-of-way acquisition, or plans specifications and estimates*). If a project fails to obligate the programmed federal funds by September 30 of the current year, the funding will be forfeited and returned to the regional funding pot. Actual progress toward implementation is measured against the schedule submitted by the project sponsor in the project application.

Policy Procedures and Enforcement

Projects that do not obligate all federal funds by the Board approved suspense date will be removed from the TIP and the federal funds associated with those projects will be returned to the regional funding pool for redistribution. The removal of projects from the TIP will require no further Board action and the sponsor will have to repay any federal funds already spent if the funding is forfeited.

If a project is realizing delays that will put the federal funding at risk of forfeiture (*i.e., not meet a September 30 deadline*), the project sponsor will have the opportunity to ask for consideration of a "one-time extension" in their project schedule. The one-time extension can only be requested for the implementation/construction phase of the project. The extension request will only be considered once a year, and has to be made before June 1 of the current fiscal year of the TIP.

To be considered for this extension the project sponsor has to demonstrate on all counts: a) the delay is beyond their control and the sponsor has done due diligence in progressing the project; b) federal funds have already been obligated on the project or in cases that no federal funds are used for PE and/or ROW acquisition, there has been significant progress toward final plan preparation; and c) there is a realistic strategy is in place to obligate all funds.

One-time extensions of up to three (3) months may be granted by East-West Gateway staff and one-time extensions greater than three (3) months, but not more than nine (9) months, will go to the Board of Directors for their consideration and approval. Projects requesting schedule advancements will be handled on a case-by-case basis, subject to available funding, and are subject to the Board adopted rules for TIP modifications.

Project Monitoring

An extensive monitoring program has been developed to help track programmed projects and ensure that funding commitments and plans are met. Monthly tracking reports are developed and posted on the East-West Gateway website, utilizing project information provided by the project sponsor, IDOT and MoDOT district offices. Additionally, project sponsors are contacted at least every three (3) months by East-West Gateway staff for project status interviews.

NOTIFICATION OF TITLE VI REQUIREMENTS

Title VI

A recipient of any federal funds from the U.S. Department of Transportation ("DOT") must comply with federal statutes, regulations, executive orders, and other pertinent directives that govern nondiscrimination in federally assisted programs. Below is a list of the statutes and regulations that may apply to a recipient's program; however, other federal requirements regarding nondiscrimination may be imposed by DOT.

A. Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. §§ 2000d *et seq*.
B. All requirements imposed by or pursuant to the Code of Federal Regulations, Title 49: Transportation, Subtitle A: Office of the Secretary of Transportation, Part 21: *Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964.*

As part of federal requirements, a recipient of funds from DOT must ensure that it has written policies and procedures in place to ensure nondiscrimination in its programs, up to and including, developing a Title VI Plan.

Nondiscrimination

A recipient of any federal funds from the U.S. Department of Transportation ("DOT") must comply with federal statutes, regulations, executive orders, and other pertinent directives that govern nondiscrimination in federally assisted programs. Below is a list of the statutes and regulations that may apply to a recipient's program; however, other federal requirements regarding nondiscrimination may be imposed by DOT.

A. Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000d, and implementing regulations at 49 CFR Part 21 – *Nondiscrimination in Federally Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act*.
B. The equal employment opportunity provisions of 49 U.S.C. § 5332 and Title VII of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000e *et seq.*, and implementing regulations, including;
    1. 41 CFR Part 60 – *Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor.*
C. Title IX of the Education Amendments of 1972, as amended, 20 U.S.C. §§ 1681 *et seq.*, and implementing regulations at 49 CFR Part 25 – *Nondiscrimination on the Basis of Sex in Education Programs or Activities Receiving Federal Financial Assistance*.
D. Section 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. § 794, and the Americans with Disabilities Act of 1990, as amended, 42 U.S.C. §§ 12101 *et seq.*, and implementing regulations, including:
    1. 49 CFR Part 37—*Transportation Services for Individuals with Disabilities (ADA)*.
    2. 49 CFR Part 27—*Nondiscrimination on the Basis of Handicap in Programs and Activities Receiving or Benefiting from Federal Financial Assistance*.
    3. 36 CFR Part 1192 and 49 CFR Part 38—*Americans with Disabilities (ADA) Accessibility Specifications for Transportation Vehicles*.
    4. 28 CFR Part 35—*Nondiscrimination on the Basis of Disability in State and Local Government Services*.

5. 28 CFR Part 36—*Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities.*
6. 41 CFR Subpart 101 – 119—*Accommodations for the Physically Handicapped.*
7. 29 CFR Part 1630—*Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act.*
8. 47 CFR Part 64, Subpart F—*Telecommunications Relay Services and Related Customer Premises Equipment for the Hearing and Speech Disabled.*
9. 36 CFR Part 1194—*Electronic and Information Technology Accessibility Standards.*
10. 49 CFR Part 609—*Transportation for Elderly and Handicapped Persons.*
11. Federal civil rights and nondiscrimination directives implementing those federal laws and regulations, unless the federal government determines otherwise in writing.

E. The Age Discrimination Act of 1975, as amended, 42 U.S.C. §§ 6101 *et seq.*, and implementing regulations at 49 CFR Part 90 – *Nondiscrimination on the Basis of Age in Programs or Activities Receiving Federal Financial Assistance.*

F. The Age Discrimination in Employment Act, 29 U.S.C. §§ 621 through 634, and implement regulations of the U.S. Equal Employment Opportunity Commission 29 CFR Part 1625—*Age Discrimination in Employment Act.*

G. The Drug Abuse Office and Treatment Act of 1972, as amended, 21 U.S.C. §§ 1101 *et seq.*, the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, as amended, 42 U.S.C. §§ 4541 *et seq.*, and the Public Health Service Act of 1912, as amended, 42 U.S.C. §§ 290dd through 290dd-2.

H. Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 42 U.S.C. § 4321 note, and DOT Order 5620.3 at Federal Register Vol. 62 No. 18377—*Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.*

I. Executive Order 13166 – Improving Access to Services for Persons with Limited English Proficiency, 42 U.S.C. § 2000d – 1 note, and implementing policy guidance at Federal Register Vo. 70 No. 74087—*DOT Policy Guidance Concerning Recipients' Responsibilities to Limited English Proficiency (LEP) Person.*

By submitting its application as part of the TIP process and signing below, the Project Sponsor certifies that it has reviewed the federal requirements regarding nondiscrimination in federally assisted programs and believes that the Project Sponsor complies with the required policies and procedures. Also, the Project Sponsor acknowledges its understanding that if the Project Sponsor does not have the required policies and procedures in place prior to federal funds being obligated, then the Project Sponsor's project may become ineligible for federal funding.

Sally A. Faith
Name (print)

Signature

Mayor
Title

12/3/15
Date

Attest:

City Clerk: Laura L. Whitehead

Signature:

Date: 12/3/15

ATTACHMENT A

Estimate of Project Costs

Project Sponsor:	City of St. Charles
Project Title:	Missouri Route 370 Discovery Bridge On-Bridge Path
Date:	7-Dec-15

Specific Roadway Items

Item	Quantity	Unit	Unit Price	Amount
Mobilization	1	LS	$54,000.00	$54,000.00
Traffic Control	1	LS	$180,000.00	$180,000.00
Concrete - CIP Single Faced Barrier	7,910	LF	$80.00	$632,800.00
Fence on top of barriers,	15,820	LF	$55.00	$870,100.00
Approach Pathways	1,700	LF	$131.00	$222,700.00
				$0.00
			SUBTOTAL	**$1,959,600.00**

Specific Bicycle Items

Item	Quantity	Unit	Unit Price	Amount
				$0.00
			SUBTOTAL	**$0.00**

Specific Pedestrian Items

Item	Quantity	Unit	Unit Price	Amount
				$0.00
			SUBTOTAL	**$0.00**

Specific Transit Items

Item	Quantity	Unit	Unit Price	Amount
				$0.00
			SUBTOTAL	**$0.00**

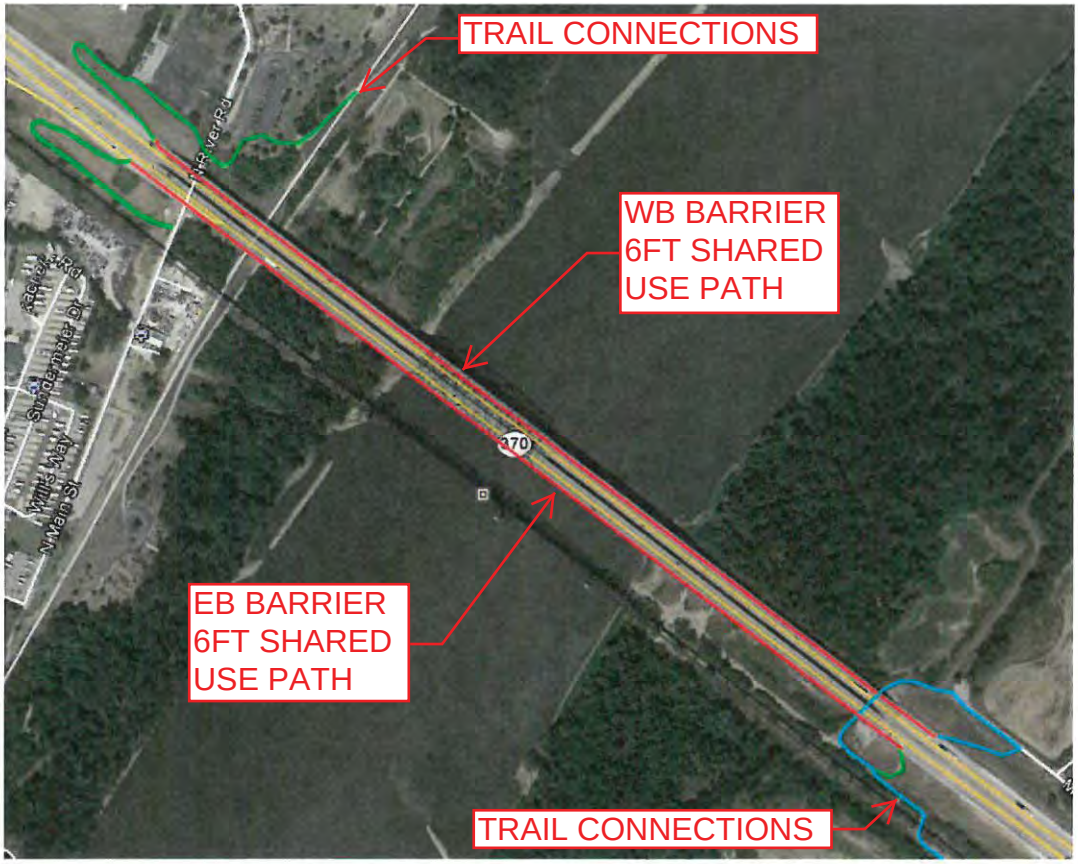
Miscellaneous Other Items

Item	Quantity	Unit	Unit Price	Amount
Pedestrian Lighting	80	Each	$3,500.00	$280,000.00
				$0.00
			SUBTOTAL	**$280,000.00**

Construction Cost Total	**$2,239,600.00**
Contingency	**$300,400.00**
Inflation	**$130,000.00**
Preliminary Engineering	**$220,000.00**
Right-of-Way	**$0.00**
Construction Engineering/Inspection	**$110,000.00**
Project Total *	**$3,000,000.00**

ATTACHMENT B

MISSOURI ROUTE 370 DISCOVERY BRIDGE:
ON-BRIDGE SHARED USE PATHS



Photographs of Existing Conditions

MO Route 370 Discovery Bridge Eastbound Shoulder looking East

Bicyclists and pedestrians use the existing shoulder to cross the Missouri River along MO Route 370 Discovery Bridge. This project will add physical barriers to separate and protect the bicyclists and pedestrians from motor vehicle traffic.

MO Route 370 Shoulder Pavement Condition

Existing concrete shoulder pavement and concrete bridge decking is in good condition, therefore no concrete pavement improvements are included with the project.

Photographs of Existing Conditions

MO Route 370 Eastbound Approach - Existing Conditions

MO Route 370 Eastbound Approach – Rendering of Proposed Improvements

This project will add physical barriers to separate and protect the bicyclists and pedestrians from motor vehicle traffic.

Photographs of Existing Conditions

MO Route 370 Eastbound Bridge Midspan - Existing Conditions

MO Route 370 Eastbound Bridge Midspan - Rendering of Proposed Improvements

Photographs of Existing Conditions

Western Trail Connection at MO Route 370 Westbound in City of St. Charles looking West

Western trail connections located in City of St. Charles are in poor condition. This project will replace approximately 1,700 linear feet of asphalt pathways to improve the trail connections in City of St. Charles.

Eastern Trail Connection at MO Route 370 Eastbound in City of Bridgeton looking West

Eastern trail entrances in City of Bridgeton are in good condition and no existing asphalt pathway improvements in City of Bridgeton are included with project.

Photographs of Existing Conditions

MO Route 370 Eastbound at MO River Greenway Trail Entrance looking West

Project will add physical barriers along MO Route 370 from the western trail entrances in the City of St. Charles to the eastern trail entrances in City of Bridgeton.

MO Route 370 Eastbound at MO River Greenway Trail Entrance looking East

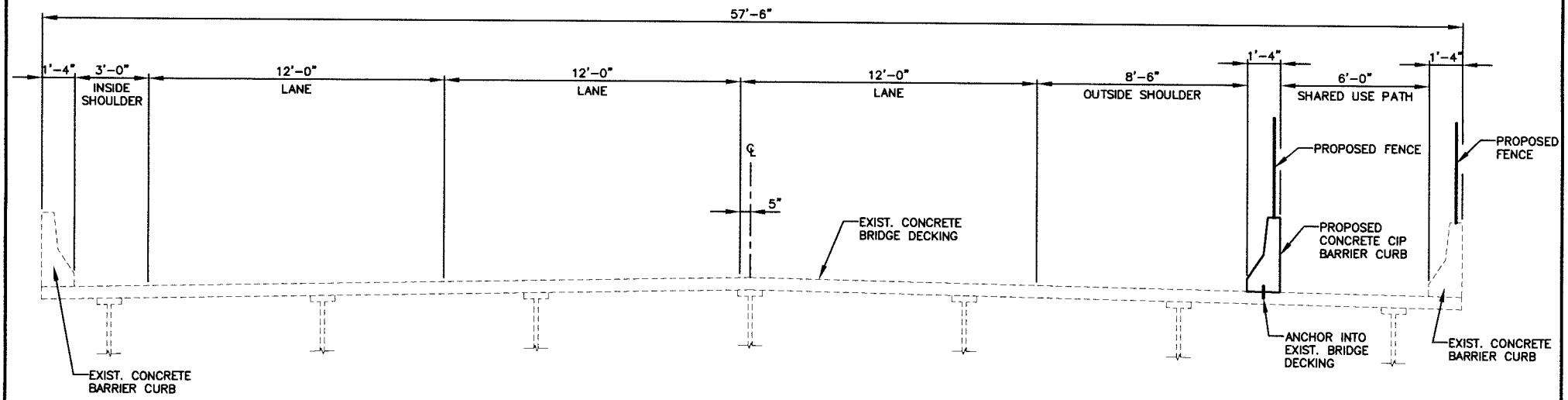
Eastern trail entrances in City of Bridgeton are in good condition and no existing asphalt pathway improvements in City of Bridgeton are included with project.

Photographs of Existing Conditions

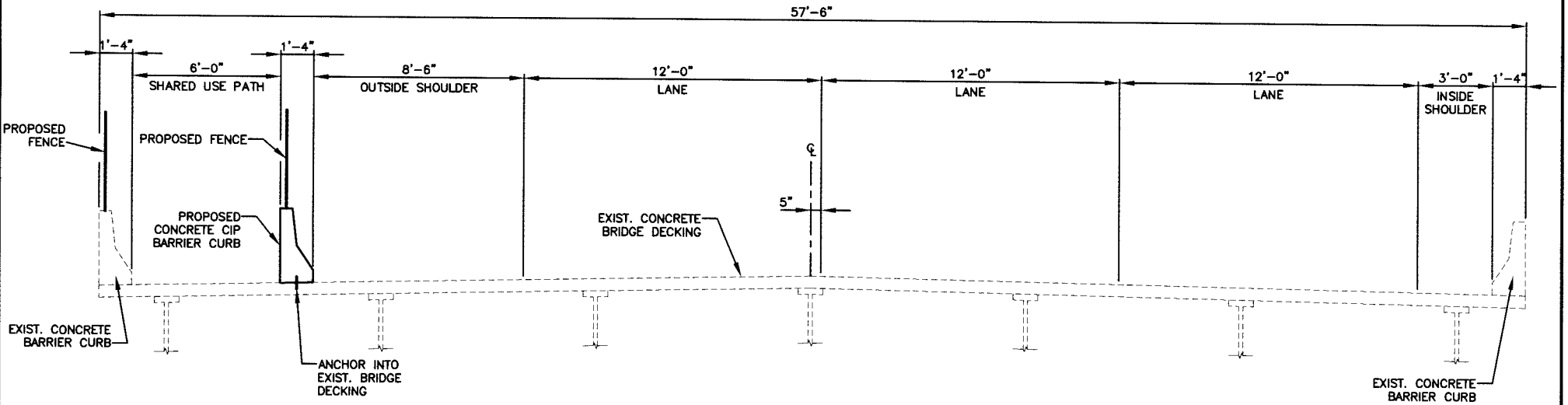
MO Route 370 Outside Barrier Bump Outs with Conduit

Project will provide new lighting along MO Route 370 for the shared use path. New light poles will utilize existing barrier bump outs and existing conduit wherever feasible.

MO ROUTE 370 DISCOVERY BRIDGE - ON-BRIDGE SHARED USE PATHS
TYPICAL SECTIONS



TYPICAL SECTION – MO RTE 370 BRIDGE EASTBOUND
NOT TO SCALE



TYPICAL SECTION – MO RTE 370 BRIDGE WESTBOUND
NOT TO SCALE

ATTACHMENT C

SPACE USED FOR BARCODE

1 - AGENCY NAME AND ORI: MISSOURI STATE HIGHWAY PATROL / MOMHPCC00

LEFT THE SCENE	CLEARED	ACCIDENT CLASSIFICATION	PROPERTY DAMAGE ONLY	NUMBER INJURED	NUMBER KILLED	REPORT / CASE / INCIDENT NUMBER
☐ YES ☒ NO	☐ YES ☐ NO		☐	2	0	01131000216

NUMBER OF VEHICLES INVOLVED	ACCIDENT DATE	ACCIDENT TIME (MIL.)	TIME NOTIFIED (MIL.)	TIME ARRIVED (MIL.)	INVESTIGATION DATE
4	01/13/2010	0805	0819	0821	01/13/2010

2 - LOCATION

COUNTY	MUNICIPALITY	BEAT / ZONE	TRP / DIST / PCT	INVESTIGATED AT SCENE
St. Louis 095	Bridgeton 0300	01	C	☒ YES ☐ NO

ON	DISTANCE FROM	LOCATION	INTERSECTING STREET OR ROADWAY		
MO 370	____ FEET ____ MILES	☐ AFTER ☐ BEFORE ☒ AT	BRIDGE (A4557)		
ROADWAY DIRECTION	**SPEED LIMIT**		**SPEED LIMIT**	**GEO - CODE**	**GPS LONGITUDE W**
E	60		60	NA	090 27 50.0
ROAD MAINTAINED BY	☒ 1. STATE ☐ 2. COUNTY ☐ 3. MUNICIPAL ☐ 4. PRIVATE PROPERTY ☐ 5. OTHER				**LATITUDE N** 038 47 42.0

3 - DAMAGE TO PROPERTY OTHER THAN VEHICLES ☒ NONE

GIVE OWNER'S NAME AND ADDRESS, DESCRIPTION OF PROPERTY, AND DAMAGE.

☐ MoDOT

4. DRIVER 1

DRIVER'S FULL NAME (LAST, FIRST, MI): No Driver

ADDRESS (STREET, CITY, STATE, ZIP):

DRIVER LICENSE NUMBER / ID NUMBER	STATE	TYPE OF LICENSE	MC ENDORSEMENT
NA	NA	☐ 1. OPERATOR CLASS ____ ☐ 2. CDL CLASS ____ ☐ 3. PERMIT ☐ 4. UNLICENSED ☐ 5. MC ONLY ☐ UNKNOWN	☐ YES ☐ NO ☐ NA

PROOF OF INSURANCE	INSURANCE COMPANY		POLICY NUMBER
☒ YES ☐ NO ☐ NOT REQUIRED	American Family	☐ DRIVER ☒ VEHICLE	☐ NA 249099550285

VEHICLE 1

YEAR	MAKE	MODEL	COLOR
2005	Lexus	R33	White

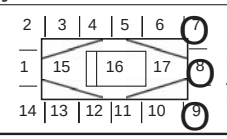
LIC. PLATE NO.	STATE	YEAR	VIN	TOTAL NO. OF OCCUPANTS
WD7N2M	MO	2011	2T2HA31U95C058958	1

VEHICLE OWNER NAME (LAST, FIRST, MI) / COMMERCIAL CARRIER: Clark, Ann McCormick, 104 Misty View Lane, Saint Peters, MO, 63376

ADDRESS (STREET, CITY, STATE, ZIP) ☐ SAME AS DRIVER

VEHICLE DAMAGE (Circle all damaged areas) ☐ NONE

INITIAL IMPACT NO. ☐ NA 8



18 - Undercarriage
19 - Windshield
20 - Burned
21 - Towed Unit
22 - Cargo

TOWED FROM SCENE ☐ YES ☒ NO

TOW CO. INFORMATION: NA

5. DRIVER 2

DRIVER'S FULL NAME (LAST, FIRST, MI): No Driver

ADDRESS (STREET, CITY, STATE, ZIP):

DRIVERS LICENSE NUMBER / ID NUMBER	STATE	TYPE OF LICENSE	MC ENDORSEMENT
NA	NA	☐ 1. OPERATOR CLASS ____ ☐ 2. CDL CLASS ____ ☐ 3. PERMIT ☐ 4. UNLICENSED ☐ 5. MC ONLY ☐ UNKNOWN	☐ YES ☐ NO ☐ NA

PROOF OF INSURANCE	INSURANCE COMPANY		POLICY NUMBER
☒ YES ☐ NO ☐ NOT REQUIRED	State Farm	☐ DRIVER ☒ VEHICLE	☐ NA 488540C1125F

VEHICLE 2

YEAR	MAKE	MODEL	COLOR
1998	Ford	F150	Silver

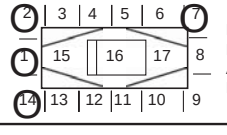
LIC. PLATE NO.	STATE	YEAR	VIN	TOTAL NO. OF OCCUPANTS
SE9R75	MO	2011	1FTRF1762WNB25468	1

VEHICLE OWNER NAME (LAST, FIRST, MI) / COMMERCIAL CARRIER: Alexander, Myron Hilliard, 14 Sea Pines Court, O'Fallon, MO, 63366

ADDRESS (STREET, CITY, STATE, ZIP) ☐ SAME AS DRIVER

VEHICLE DAMAGE (Circle all damaged areas) ☐ NONE

INITIAL IMPACT NO. ☐ NA 7



18 - Undercarriage
19 - Windshield
20 - Burned
21 - Towed Unit
22 - Cargo

TOWED FROM SCENE ☐ YES ☒ NO

TOW CO. INFORMATION: NA

6 - WITNESS ☐ NONE IDENTIFIED

NAME OF WITNESS	ADDRESS (STREET, CITY, STATE, ZIP)	TELEPHONE NO.
Crump, Jerry Timothy	3366 Glendale Ave, Saint Charles, MO, 63301	636-345-1938
NA		
NA		
NA		

SPACE USED FOR BARCODE

1 - AGENCY NAME AND ORI: MISSOURI STATE HIGHWAY PATROL / MOMHPCC00

LEFT THE SCENE	CLEARED	ACCIDENT CLASSIFICATION	PROPERTY DAMAGE ONLY	NUMBER INJURED	NUMBER KILLED	REPORT / CASE / INCIDENT NUMBER
☐ YES ☒ NO	☐ YES ☐ NO		☐	2	0	01131000216

NUMBER OF VEHICLES INVOLVED	ACCIDENT DATE	ACCIDENT TIME (MIL.)	TIME NOTIFIED (MIL.)	TIME ARRIVED (MIL.)	INVESTIGATION DATE
4	01/13/2010	0805	0819	0821	01/13/2010

2 - LOCATION

COUNTY	MUNICIPALITY	BEAT / ZONE	TRP / DIST / PCT	INVESTIGATED AT SCENE
St. Louis 095	Bridgeton 0300	01	C	☒ YES ☐ NO

ON	DISTANCE FROM	LOCATION	INTERSECTING STREET OR ROADWAY	SPEED LIMIT	GEO - CODE	GPS LONGITUDE
MO 370	____ FEET ____ MILES	☐ AFTER ☐ BEFORE ☒ AT	BRIDGE (A4557)	60	NA	W 090 27 50.0

ROADWAY DIRECTION	SPEED LIMIT	GPS LATITUDE
E	60	N 038 47 42.0

ROAD MAINTAINED BY ☒ 1. STATE ☐ 2. COUNTY ☐ 3. MUNICIPAL ☐ 4. PRIVATE PROPERTY ☐ 5. OTHER

3 - DAMAGE TO PROPERTY OTHER THAN VEHICLES ☒ NONE

GIVE OWNER'S NAME AND ADDRESS, DESCRIPTION OF PROPERTY, AND DAMAGE.

☐ MoDOT **See Page 1.**

4. DRIVER 3

DRIVER'S FULL NAME (LAST, FIRST, MI): No Driver

ADDRESS (STREET, CITY, STATE, ZIP):

DRIVER LICENSE NUMBER / ID NUMBER	STATE	TYPE OF LICENSE	MC ENDORSEMENT
NA	NA	☐ 1. OPERATOR CLASS ____ ☐ 2. CDL CLASS ____ ☐ 3. PERMIT ☐ 4. UNLICENSED ☐ 5. MC ONLY ☐ UNKNOWN	☐ YES ☐ NO ☐ NA

PROOF OF INSURANCE	INSURANCE COMPANY		POLICY NUMBER
☒ YES ☐ NO ☐ NOT REQUIRED	Daniel Henry Company	☐ DRIVER ☒ VEHICLE	☐ NA AL002-08

VEHICLE 3

YEAR	MAKE	MODEL	COLOR
2009	Ford	Crown Victoria	White

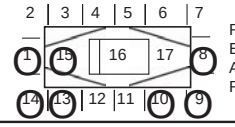
LIC. PLATE NO.	STATE	YEAR	VIN	TOTAL NO. OF OCCUPANTS
304	MO	NA	2FAHP71V09X134688	0

VEHICLE OWNER NAME (LAST, FIRST, MI) / COMMERCIAL CARRIER: City of Bridgeton, 11955 Natural Bridge, Bridgeton, MO, 63044

ADDRESS (STREET, CITY, STATE, ZIP): ☐ SAME AS DRIVER

VEHICLE DAMAGE (Circle all damaged areas) ☐ NONE

INITIAL IMPACT NO. ☐ NA 9



18 - Undercarriage
19 - Windshield
20 - Burned
21 - Towed Unit
22 - Cargo

TOWED FROM SCENE: ☒ YES ☐ NO

TOW CO. INFORMATION: Hoods, 314-291-7862

5. DRIVER 4

DRIVER'S FULL NAME (LAST, FIRST, MI): Bryant, Steven Casey, #8 Emmons Court, O'Fallon, MO, 63366

ADDRESS (STREET, CITY, STATE, ZIP):

DRIVERS LICENSE NUMBER / ID NUMBER	STATE	TYPE OF LICENSE	MC ENDORSEMENT
S173242002	MO	☒ 1. OPERATOR CLASS E ☐ 2. CDL CLASS ____ ☐ 3. PERMIT ☐ 4. UNLICENSED ☐ 5. MC ONLY ☐ UNKNOWN	☐ YES ☐ NO ☒ NA

PROOF OF INSURANCE	INSURANCE COMPANY		POLICY NUMBER
☒ YES ☐ NO ☐ NOT REQUIRED	Progressive	☐ DRIVER ☒ VEHICLE	☐ NA 516533578

VEHICLE 4

YEAR	MAKE	MODEL	COLOR
2001	Chevrolet	Monte Carlo	Silver

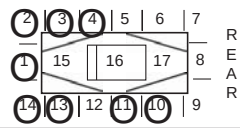
LIC. PLATE NO.	STATE	YEAR	VIN	TOTAL NO. OF OCCUPANTS
PEOG9L	MO	2011	2G1WW12E319349905	1

VEHICLE OWNER NAME (LAST, FIRST, MI) / COMMERCIAL CARRIER: Bryant, Steven Casey, #8 Emmons Court, O'Fallon, MO, 63366

ADDRESS (STREET, CITY, STATE, ZIP): ☒ SAME AS DRIVER

VEHICLE DAMAGE (Circle all damaged areas) ☐ NONE

INITIAL IMPACT NO. ☐ NA 14



18 - Undercarriage
19 - Windshield
20 - Burned
21 - Towed Unit
22 - Cargo

TOWED FROM SCENE: ☒ YES ☐ NO

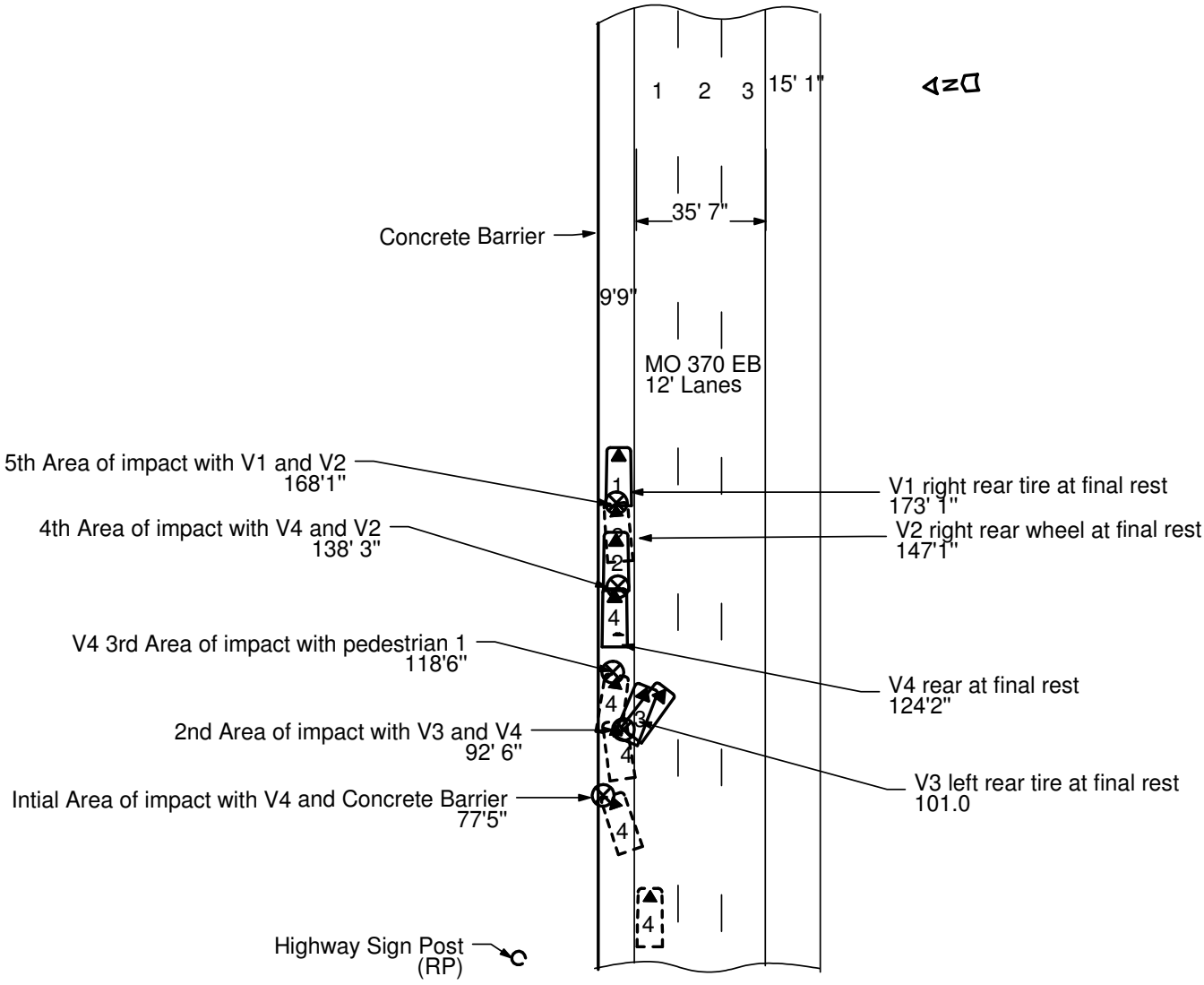
TOW CO. INFORMATION: Hoods, 314-291-7862

6 - WITNESS ☐ NONE IDENTIFIED

NAME OF WITNESS	ADDRESS (STREET, CITY, STATE, ZIP)	TELEPHONE NO.
NA		
NA		
NA		
NA		

7. COLLISION DIAGRAM | Direction Prior to Impact (circle one) V1 N (E) S W V2 N (E) S W V3 N (E) S W V4 N (E) S W | Est. Speed - Fatals Only V1 NA V2 NA V3 NA V4 NA

INDICATE NORTH



INDICATE ROAD NAMES REQUIRED UNLESS DELAYED REPORT DIAGRAM NOT TO SCALE

8. EVIDENTIARY PHOTOS TAKEN

☒ YES ☐ NO BY WHOM Bridgeton Police Department AVAILABLE FROM Jefferson City-Traffic Division

RECONSTRUCTION - Includes Narrative, Diagram, & Photo(s)

☐ YES ☒ NO BY WHOM NA

9 - CODES

SEAT LOCATION

FR	SR	TR
FC	SC	TC
FL	SL	TL

XX - Not Known
P - Pedestrian
B - Bicycle
M - Motorcycle
OE - Occupant - Enclosed Load Area
OU - Occupant - Unenclosed Load Area
CP - Commercial Passenger
SV - Other (Explain in Remarks)

INJURY
1. Fatal
2. Disabling
3. Evident - Not Disabling
4. Probable - Not Apparent
5. None Apparent
6. Unknown

TRANSPORTED (Medical Treatment)
1. No
2. EMS
3. Other
4. Unknown

EJECTION
1. NA
2. No
3. Partially
4. Totally
5. Unknown

AIR BAG FRONT
1. None / NA
2. Deployed
3. Not Deployed

AIR BAG SIDE
1. None / NA
2. Deployed
3. Not Deployed

SAFETY DEVICES
1. None
2. Not Used
3. Shoulder Belt Only
4. Lap Belt Only
5. Shoulder and Lap Belt
6. Child Restraint
7. Helmet Used
8. Helmet Not Used
9. Use Unknown

10 - DRIVERS

NAME / ADDRESS	DATE OF BIRTH MM-DD-YYYY	SEX	VEH. NO.	SEAT LOC.	INJ.	TRANS-PORT	EJEC-TION	AIR BAG F	AIR BAG S	SAF DEV	TELEPHONE NO.
[X] NA — DRIVER 1 - SAME ADDRESS AS ABOVE			1								
[X] NA — DRIVER 2 - SAME ADDRESS AS ABOVE			2								

11 - OTHER OCCUPANTS & PEDESTRIANS (SAD = SAME AS DRIVER)

NAME / ADDRESS	DATE OF BIRTH MM-DD-YYYY	SEX	VEH. NO.	SEAT LOC.	INJ.	TRANS-PORT	EJEC-TION	AIR BAG F	AIR BAG S	SAF DEV	TELEPHONE NO.
Dickherber, William Ryan 11955 Natural Bridge, Bridgeton, MO, 63044	07/21/1981	M	3	P1	2	2	1	1	1	1	314-739-7557
Clark, Ann McCormick 104 Misty View Lane, Saint Peters, MO, 63376	06/08/1953	F	1	FL	5	1	2	3	3	5	636-447-9074
Alexander, Myron Hilliard 14 Sea Pines Court, O'Fallon, MO, 63366	12/03/1962	M	2	FL	5	1	2	1	1	5	314-517-5193
NA											
NA											
NA											

12. VEHICLE BODY TYPES AUTOMOBILES / SPECIAL VEHICLES

V1	V2	
[ ]	[ ]	1. Passenger Car
[ ]	[ ]	2. Station Wagon
[X]	[ ]	3. Sport Utility Vehicle
[ ]	[ ]	4. Limousine (6-15 for hire)
[ ]	[ ]	5. Van (8 or less with driver)
[ ]	[ ]	6. Small Bus (9-15 with driver)
[ ]	[ ]	7. Bus (16 or more with driver)
[ ]	[ ]	8. School Bus (less than 16 with driver)
[ ]	[ ]	9. School Bus (16 or more with driver)
[ ]	[ ]	10. Motorcycle — 2 Wh. / 3 Wh. / 4 Wh. / 5 Wh. or More / Unknown
[ ]	[ ]	11. ATV
[ ]	[ ]	12. Motorized Bicycle
[ ]	[ ]	13. Pedalcycle
[ ]	[ ]	14. Motor Home / Camper
[ ]	[ ]	15. Farm Implements
[ ]	[ ]	16. Construction Equipment
[ ]	[ ]	17. Other Transport Device
[ ]	[ ]	18. Unknown
[ ]	[X]	19. Pick-up
[ ]	[ ]	20. Single-unit Truck: 2 axles, 6 tires
[ ]	[ ]	21. Single-unit Truck: 3 or more axles
[ ]	[ ]	A. Vehicle Pulling Another Unit(s)1-21 only
[ ]	[ ]	22. Truck Tractor With No Units
[ ]	[ ]	23. Truck Tractor With One Unit
[ ]	[ ]	24. Truck Tractor With Two Units
[ ]	[ ]	25. Truck Tractor With Three Units
[ ]	[ ]	26. Other Heavy Truck

GCVW Rating (not licensed weight) 19-26 only
[X] Less than or equal to 10,000 lbs.
[ ] 10,001 - 26,000 lbs.
[ ] Greater than 26,000 lbs.

13. EMERGENCY VEHICLE INVOLVEMENT

[ ] NA

V1	V2	
[ ]	[ ]	1. Police
[ ]	[ ]	2. Fire
[ ]	[ ]	3. Ambulance
[ ]	[ ]	4. Other (must check "A")
[ ]	[ ]	A. Emergency Vehicle on Emergency Run

V1-NA
V2-NA

14. HAZARDOUS MATERIALS

[X] NA

V1	V2	
[ ]	[ ]	Placard Displayed
[ ]	[ ]	1. Gases in Bulk
[ ]	[ ]	2. Solids in Bulk
[ ]	[ ]	3. Liquids in Bulk
[ ]	[ ]	4. Explosives
[ ]	[ ]	5. None
[ ]	[ ]	A. Hazardous Materials' Cargo Released / Spilled

15. ACCIDENT TYPE

[ ] 1. On Roadway
[X] 2. Off Roadway

COLLISION INVOLVING
[ ] 1. Animal
[ ] 2. Pedalcycle
[X] 3. Fixed Object
[ ] 4. Other Object
[ ] 5. Pedestrian
[ ] 6. Train
[ ] 7. MV in Transport
[ ] 8. MV on Other Roadway
[ ] 9. Parked MV

NON-COLLISION
[ ] 10. Overturning
[ ] 11. Other Non-Collision

TWO VEHICLE COLLISION
[ ] 60. Head On
[ ] 61 . Rear End
[ ] 62. Sideswipe - Meeting
[ ] 63. Sideswipe - Passing
[ ] 64. Angle
[ ] 65. Backed Into
[ ] 67. Other

16. TRAFFIC CONDITIONS

V1	V2	
[ ]	[ ]	1. Normal
[ ]	[ ]	2. Accident Ahead
[X]	[X]	3. Congestion Ahead

17. VEHICLE ACTION / SEQUENCE OF EVENTS

1.Going Straight
2.Overtaking
3.Making Right Turn
4.Right Turn on Red
5.Making Left Turn
6.Making U Turn
7.Skidding / Sliding
8.Slowing / Stopping
9.Start in Traffic
10. Start From Parked
11. Backing
12. Stopped in Traffic
13. Parked
14. Changing Lanes
15. Avoiding
16. Crossover Median
17. Crossover Centerline
18. Crossing Road
19. Airborne
20. Ran Off Road - Right
21. Ran Off Road - Left
22. Overturn / Rollover
23. Fire / Explosion
24. Immersion
25. Jackknife
26. Cargo Loss / Shift
27. Equipment Failure
28. Separation of Units
29. Returned to Road
30. Collision Inv. Pedestrian
31. Collision Inv. Pedalcycle
32. Collision Inv. Train
33. Collision Inv. Animal (enter code - explain)
34. Collision Inv. MV in Transport
35. Collision Inv. Parked Motor Vehicle
36. Collision Inv. Fixed Object (enter code - explain)
37. Collision Inv. Other Object (explain)
38. Other - Non Collision

V1 [ ] Unknown
13 / 34 / NA / NA / NA / NA / NA
33. Animal Code NA
36. Fixed Object Code NA / NA / NA

V2 [ ] Unknown
13 / 34 / 34 / NA / NA / NA / NA
33. Animal Code NA
36. Fixed Object Code NA / NA / NA

Animal, Fixed Object, and Inattention Codes explained in narrative.

9 - CODES

SEAT LOCATION

FR	SR	TR
FC	SC	TC
FL	SL	TL

XX - Not Known
P - Pedestrian
B - Bicycle
M - Motorcycle
OE - Occupant - Enclosed Load Area
OU - Occupant - Unenclosed Load Area
CP - Commercial Passenger
SV - Other (Explain in Remarks)

INJURY
1. Fatal
2. Disabling
3. Evident - Not Disabling
4. Probable - Not Apparent
5. None Apparent
6. Unknown

TRANSPORTED (Medical Treatment)
1. No
2. EMS
3. Other
4. Unknown

EJECTION
1. NA
2. No
3. Partially
4. Totally
5. Unknown

AIR BAG FRONT
1. None / NA
2. Deployed
3. Not Deployed

AIR BAG SIDE
1. None / NA
2. Deployed
3. Not Deployed

SAFETY DEVICES
1. None
2. Not Used
3. Shoulder Belt Only
4. Lap Belt Only
5. Shoulder and Lap Belt
6. Child Restraint
7. Helmet Used
8. Helmet Not Used
9. Use Unknown

10 - DRIVERS

NAME / ADDRESS	DATE OF BIRTH MM-DD-YYYY	SEX	VEH. NO.	SEAT LOC.	INJ.	TRANS-PORT	EJEC-TION	AIR BAG F	AIR BAG S	SAF DEV	TELEPHONE NO.
[X] NA DRIVER 3 - SAME ADDRESS AS ABOVE			3								
[ ] NA DRIVER 4 - SAME ADDRESS AS ABOVE	06/01/1983	M	4	FL	4	2	2	2	1	5	636-379-8912

11 - OTHER OCCUPANTS & PEDESTRIANS (SAD = SAME AS DRIVER)

NAME / ADDRESS	DATE OF BIRTH MM-DD-YYYY	SEX	VEH. NO.	SEAT LOC.	INJ.	TRANS-PORT	EJEC-TION	AIR BAG F	AIR BAG S	SAF DEV	TELEPHONE NO.
NA											
NA											
NA											
NA											
NA											
NA											

12. VEHICLE BODY TYPES AUTOMOBILES / SPECIAL VEHICLES

V3 V4

- [X] [X] 1. Passenger Car
- [ ] [ ] 2. Station Wagon
- [ ] [ ] 3. Sport Utility Vehicle
- [ ] [ ] 4. Limousine (6-15 for hire)
- [ ] [ ] 5. Van (8 or less with driver)
- [ ] [ ] 6. Small Bus (9-15 with driver)
- [ ] [ ] 7. Bus (16 or more with driver)
- [ ] [ ] 8. School Bus (less than 16 with driver)
- [ ] [ ] 9. School Bus (16 or more with driver)
- [ ] [ ] 10. Motorcycle — — — 2 Wh. / 3 Wh. / 4 Wh. / 5 Wh. or More / Unknown
- [ ] [ ] 11. ATV — — — —
- [ ] [ ] 12. Motorized Bicycle
- [ ] [ ] 13. Pedalcycle
- [ ] [ ] 14. Motor Home / Camper
- [ ] [ ] 15. Farm Implements
- [ ] [ ] 16. Construction Equipment
- [ ] [ ] 17. Other Transport Device
- [ ] [ ] 18. Unknown
- [ ] [ ] 19. Pick-up
- [ ] [ ] 20. Single-unit Truck: 2 axles, 6 tires
- [ ] [ ] 21. Single-unit Truck: 3 or more axles
- [ ] [ ] A. Vehicle Pulling Another Unit(s) 1-21 only
- [ ] [ ] 22. Truck Tractor With No Units
- [ ] [ ] 23. Truck Tractor With One Unit
- [ ] [ ] 24. Truck Tractor With Two Units
- [ ] [ ] 25. Truck Tractor With Three Units
- [ ] [ ] 26. Other Heavy Truck

GCVW Rating (not licensed weight) 19-26 only
- [ ] [ ] Less than or equal to 10,000 lbs.
- [ ] [ ] 10,001 - 26,000 lbs.
- [ ] [ ] Greater than 26,000 lbs.

13. EMERGENCY VEHICLE INVOLVEMENT

V3 V4 — [ ] NA

- [X] [ ] 1. Police
- [ ] [ ] 2. Fire
- [ ] [ ] 3. Ambulance
- [ ] [ ] 4. Other (must check "A") **V4-NA**
- [ ] [ ] A. Emergency Vehicle on Emergency Run

14. HAZARDOUS MATERIALS [X] NA

V3 V4

- [ ] [ ] Placard Displayed
- [ ] [ ] 1. Gases in Bulk
- [ ] [ ] 2. Solids in Bulk
- [ ] [ ] 3. Liquids in Bulk
- [ ] [ ] 4. Explosives
- [ ] [ ] 5. None
- [ ] [ ] A. Hazardous Materials' Cargo Released / Spilled

15. ACCIDENT TYPE

- [ ] 1. On Roadway
- [X] 2. Off Roadway

COLLISION INVOLVING
- [ ] 1. Animal
- [ ] 2. Pedalcycle
- [X] 3. Fixed Object
- [ ] 4. Other Object
- [ ] 5. Pedestrian
- [ ] 6. Train
- [ ] 7. MV in Transport
- [ ] 8. MV on Other Roadway
- [ ] 9. Parked MV

NON-COLLISION
- [ ] 10. Overturning
- [ ] 11. Other Non-Collision

TWO VEHICLE COLLISION
- [ ] 60. Head On
- [ ] 61 . Rear End
- [ ] 62. Sideswipe - Meeting
- [ ] 63. Sideswipe - Passing
- [ ] 64. Angle
- [ ] 65. Backed Into
- [ ] 67. Other

16. TRAFFIC CONDITIONS

V3 V4

- [ ] [ ] 1. Normal
- [X] [ ] 2. Accident Ahead
- [ ] [X] 3. Congestion Ahead

17. VEHICLE ACTION / SEQUENCE OF EVENTS

1. Going Straight
2. Overtaking
3. Making Right Turn
4. Right Turn on Red
5. Making Left Turn
6. Making U Turn
7. Skidding / Sliding
8. Slowing / Stopping
9. Start in Traffic
10. Start From Parked
11. Backing
12. Stopped in Traffic
13. Parked
14. Changing Lanes
15. Avoiding
16. Crossover Median
17. Crossover Centerline
18. Crossing Road
19. Airborne
20. Ran Off Road - Right
21. Ran Off Road - Left
22. Overturn / Rollover
23. Fire / Explosion
24. Immersion
25. Jackknife
26. Cargo Loss / Shift
27. Equipment Failure
28. Separation of Units
29. Returned to Road
30. Collision Inv. Pedestrian
31. Collision Inv. Pedalcycle
32. Collision Inv. Train
33. Collision Inv. Animal (enter code - explain)
34. Collision Inv. MV in Transport
35. Collision Inv. Parked Motor Vehicle
36. Collision Inv. Fixed Object (enter code - explain)
37. Collision Inv. Other Object (explain)
38. Other - Non Collision

V3 [ ] Unknown

13 / 34 / NA / NA / NA / NA / NA

33. Animal Code NA

36. Fixed Object Code NA / NA / NA

V4 [ ] Unknown

01 / 08 / 21 / 36 / 35 / 30 / 35

33. Animal Code NA

36. Fixed Object Code 40 / NA / NA

Animal, Fixed Object, and Inattention Codes explained in narrative.

18. PROBABLE CONTRIBUTING CIRCUMSTANCES

V1	V2	
☐	☐	1. VehicleDefects (explain)
☐	☐	2. Traffic Control Inoperable or Missing
☐	☐	3. Improperly Stopped on Roadway
☐	☐	4. Speed - Exceeded Limit
☐	☐	5. Too Fast for Conditions
☐	☐	6. Improper Passing
☐	☐	7. Violation Signal / Sign
☐	☐	8. Wrong Side (not passing)
☐	☐	9. Following Too Close
☐	☐	10. Improper Signal
☐	☐	11. Improper Backing
☐	☐	12. Improper Turn
☐	☐	13. Improper Lane Usage / Change
☐	☐	14. Wrong Way (One-Way)
☐	☐	15. Improper Start From Park

P1	P2		
☐	☐	☐	☐ 16. Improperly Parked
☐	☐	☐	☐ 17. Failed to Yield
☐	☐	☐	☐ 18. Alcohol
☐	☐	☐	☐ 19. Drugs
☐	☐	☐	☐ 20. Physical Impairment (explain)
☐	☐	☐	☐ 21. Inattention (explain)

P1 ____ P2 ____ V1 ____ V2 ____

☒ ☐ ☒ ☒ 22. None

19. PEDESTRIAN INVOLVEMENT

☐ NA

P1	P2	
☐	☐	1. At Intersection
☒	☐	2. Not At Intersection

CROSSING ROAD

☐	☐	3. With Signal
☐	☐	4. Against Signal
☐	☐	5. No Signal
☐	☐	6. Diagonally
☐	☐	7. Within Crosswalk
☐	☐	8. Within Marked Crosswalk

☒	☐	9. Behind / In Front of Parked Car
☒	☐	10. With Traffic
☐	☐	11. Against Traffic
☐	☐	12. Getting On / Off Vehicle
☐	☐	13. Standing / Lying / Sitting on Road
☐	☐	14. Pushing / Working on Vehicle
☒	☐	15. Other Working
☐	☐	16. Playing on Road
☐	☐	17. Off Roadway

20. VISION OBSCURED

V1	V2	
☐	☐	1. Windshield
☐	☐	2. Load on Vehicle
☐	☐	3. Trees / Brush
☐	☐	4. Building
☐	☐	5. Embankment
☐	☐	6. Signboards
☐	☐	7. Hillcrest
☐	☐	8. Parked Cars
☐	☐	9. Moving Cars
☐	☐	10. Glare
☐	☐	11. Other (explain)
☒	☒	12. Not Obscured

21. TRAFFIC CONTROL

V1	V2	
☐	☐	1. Construction Zone
☐	☐	2. Other Work Zone
☐	☐	3. School Zone
☐	☐	4. Stop Sign
☐	☐	5. Electric Signal
☐	☐	6. RR Signal / Gate
☐	☐	7. Yield Sign
☐	☐	8. Officer / Flagman
☐	☐	9. No Passing Zone
☐	☐	10. Turn Restricted
☐	☐	11. Signal on School Bus
☒	☒	12. None

22. ROAD CHARACTER

ALIGNMENT
- ☒ 1. Straight
- ☐ 2. Curve

PROFILE
- ☒ 1. Level
- ☐ 2. Grade
- ☐ 3. Hillcrest

23. LIGHT CONDITION
- ☒ 1. Daylight
- ☐ 2. Dark with Street Lights On
- ☐ 3. Dark with Street Lights Off
- ☐ 4. Dark - No Street Lights
- ☐ 5. Indeterminate (explain)

24. WEATHER CONDITION
- ☒ 1. Clear
- ☐ 2. Cloudy
- ☐ 3. Rain
- ☐ 4. Snow
- ☐ 5. Sleet
- ☐ 6. Freezing (temp.)
- ☐ 7. Fog / Mist
- ☐ 8. Indeterminate (explain)

25. ROAD CONDITION
- ☐ 1. Dry
- ☒ 2. Wet
- ☐ 3. Snow
- ☐ 4. Ice
- ☐ 5. Slush
- ☐ 6. Mud
- ☐ 7. Standing Water
- ☐ 8. Moving Water
- ☐ 9. Other (explain)

26. ROAD SURFACE
- ☒ 1. Concrete
- ☐ 2. Asphalt
- ☐ 3. Brick
- ☐ 4. Gravel
- ☐ 5. Dirt / Sand
- ☐ 6. Multi-Surface

27 - COMMERCIAL MOTOR VEHICLE (Complete for each commercial vehicle involved.)

A. CMV CRITERIA

Answer the following to determine if this section should be completed.

1. Does this accident involve any of the following:

1.a person fatally injured; or
2.a person transported for medical attention; or
3.a vehicle towed from the scene of the accident

- ☐ NO - DO NOT COMPLETE
- ☒ YES - GO TO NUMBER 2

2. Examine each vehicle to determine if it is a commercial vehicle based on the following:

1.a truck with GCVWR of more than 10,000 lbs. and engaged in commerce; or
2.a bus or school bus (9 or more including driver); or
3.a vehicle with a hazardous materials placard

- ☒ NO - DO NOT COMPLETE
- ☐ YES - COMPLETE SECTIONS B - E

B. CARRIER ID NUMBER

V1 ICC NO. MC _____ USDOT NO. _____

V2 ICC NO. MC _____ USDOT NO. _____

C. HAZARDOUS MATERIAL PLACARD NUMBER ☐ NA

V1 4-Digit Placard Number from Diamond / Box _____ Number From Bottom of Diamond _____

V2 4-Digit Placard Number from Diamond / Box _____ Number From Bottom of Diamond _____

D. TRAFFICWAY
- ☐ 1. Two-Way; Not Divided
- ☐ 2. Two-Way; Divided; Unprotected Median
- ☐ 3. Two-Way; Divided; Positive Median Barrier
- ☐ 4. One-Way; Not Divided

E. CARGO BODY TYPE

V1	V2	
☐	☐	1. Enclosed Box
☐	☐	2. Cargo Tank
☐	☐	3. Flatbed
☐	☐	4. Dump
☐	☐	5. Concrete Mixer
☐	☐	6. Auto Transporter
☐	☐	7. Garbage / Refuse
☐	☐	8. Grain, Chip, Gravel
☐	☐	9. Pole Trailer
☐	☐	10. Other

28 - NARRATIVE / STATEMENTS (If additional room is necessary, attach a separate sheet.)

According to statements from Driver 1, 2, 4 along with Pedestrian 1 and Witness 1, as well as evidence at the scene, this accident occurred on MO 370 eastbound, at the Discovery Bridge, in St. Louis County Missouri. Vehicle's 1, 2 and 3 were on the left shoulder of the road. Vehicle 1 was in front of vehicle 2. Vehicle 2 was in front of vehicle 3. Vehicle 3 was an emergency vehicle that had its emergency lights activated. Pedestrian 1 was a Bridgeton Police Officer investigating a traffic accident. Pedestrian 1 was in front of vehicle 3 and behind vehicle 2 walking eastbound, on the left shoulder. Vehicle 4 was traveling eastbound, in lane 1. Vehicle 4 came upon congested traffic. Vehicle 4 avoided striking a vehicle, in lane 1. Vehicle 4 ran off the road to the left. Vehicle 4 struck the concrete barrier with the front left of vehicle 1 (Initial Area of Impact). Vehicle 4 the struck vehicle 3 with the right front of vehicle 4 on the left rear of vehicle 3, on the left shoulder (2nd Area of Impact). Vehicle 4 then struck Pedestrian 1 with the front of vehicle 4, on the left shoulder (3rd Area of Impact). Vehicle 4 then struck vehicle 2 with the front of vehicle 4 on the rear of vehicle 2, on the left shoulder (4th Area of Impact). Vehicle 2 was then pushed into vehicle 1 on the left shoulder (5th Area of Impact).

Driver 1 said she had been involved in another accident. Driver 1 said she was on the shoulder and felt an impact from the rear. Driver 1 said she remembered seeing the officer get hit.

Driver 2 said he was a stranded motorist. Driver 2 said he saw vehicle 4 run off the roadway, strike the cruiser and then strike the officer. Driver 1 said vehicle 4 then struck his vehicle on the left shoulder of the roadway.

Pedestrian 1 said he stopped to investigate a traffic accident. Pedestrian 1 said he was walking up to check on the individuals involved in the accident. Pedestrian 1 said he remembered getting struck and flipped over the median wall.

Driver 4 said he was traveling eastbound. Driver 4 said the sun was glaring in his eyes and he couldn't see very well. Driver 4 said he suddenly saw a vehicle in front of him. Driver 4 said he remembered avoiding to the left and hitting the wall.

Witness 1 said he was traveling behind vehicle 4. Witness 1 said traffic stopped and driver 4 swerved to the left to avoid striking the

29. REPORTING OFFICER SIGNATURE	DSN / BADGE NO.	BEAT / ZONE	TROOP / DIST / PCT
E. D. Phillips	880	1	C

REVIEWING OFFICER 1 SIGNATURE	DSN / BADGE NO.	REVIEWING OFFICER 2 SIGNATURE	DSN / BADGE NO.
Cpl Petlansky	820		

18. PROBABLE CONTRIBUTING CIRCUMSTANCES

V3	V4	
☐	☐	1. VehicleDefects (explain)
☐	☐	2. Traffic Control Inoperable or Missing
☐	☐	3. Improperly Stopped on Roadway
☐	☐	4. Speed - Exceeded Limit
☒	☐	5. Too Fast for Conditions
☐	☐	6. Improper Passing
☐	☐	7. Violation Signal / Sign
☐	☐	8. Wrong Side (not passing)
☒	☐	9. Following Too Close
☐	☐	10. Improper Signal
☐	☐	11. Improper Backing
☐	☐	12. Improper Turn
☐	☐	13. Improper Lane Usage / Change
☐	☐	14. Wrong Way (One-Way)
☐	☐	15. Improper Start From Park

P1	P2		
☐	☐	☐	☐ 16. Improperly Parked
☐	☐	☒	☐ 17. Failed to Yield
☐	☐	☐	☐ 18. Alcohol
☐	☐	☐	☐ 19. Drugs
☐	☐	☐	☐ 20. Physical Impairment (explain)
☐	☐	☐	☐ 21. Inattention (explain)

P1 ____ P2 ____ V3 ____ V4 ____

☐ ☐ ☒ ☐ 22. None

19. PEDESTRIAN INVOLVEMENT

☒ NA

P1	P2	
☐	☐	1. At Intersection
☐	☐	2. Not At Intersection

CROSSING ROAD

☐	☐	3. With Signal
☐	☐	4. Against Signal
☐	☐	5. No Signal
☐	☐	6. Diagonally
☐	☐	7. Within Crosswalk
☐	☐	8. Within Marked Crosswalk
☐	☐	9. Behind / In Front of Parked Car
☐	☐	10. With Traffic
☐	☐	11. Against Traffic
☐	☐	12. Getting On / Off Vehicle
☐	☐	13. Standing / Lying / Sitting on Road
☐	☐	14. Pushing / Working on Vehicle
☐	☐	15. Other Working
☐	☐	16. Playing on Road
☐	☐	17. Off Roadway

20. VISION OBSCURED

V3	V4	
☐	☐	1. Windshield
☐	☐	2. Load on Vehicle
☐	☐	3. Trees / Brush
☐	☐	4. Building
☐	☐	5. Embankment
☐	☐	6. Signboards
☐	☐	7. Hillcrest
☐	☐	8. Parked Cars
☐	☐	9. Moving Cars
☒	☐	10. Glare
☐	☐	11. Other (explain)
☒	☐	12. Not Obscured

21. TRAFFIC CONTROL

V3	V4	
☐	☐	1. Construction Zone
☐	☐	2. Other Work Zone
☐	☐	3. School Zone
☐	☐	4. Stop Sign
☐	☐	5. Electric Signal
☐	☐	6. RR Signal / Gate
☐	☐	7. Yield Sign
☐	☐	8. Officer / Flagman
☐	☐	9. No Passing Zone
☐	☐	10. Turn Restricted
☐	☐	11. Signal on School Bus
☒	☒	12. None

22. ROAD CHARACTER

ALIGNMENT
☒ 1. Straight
☐ 2. Curve

PROFILE
☒ 1. Level
☐ 2. Grade
☐ 3. Hillcrest

23. LIGHT CONDITION

☒ 1. Daylight
☐ 2. Dark with Street Lights On
☐ 3. Dark with Street Lights Off
☐ 4. Dark - No Street Lights
☐ 5. Indeterminate (explain)

24. WEATHER CONDITION

☒ 1. Clear
☐ 2. Cloudy
☐ 3. Rain
☐ 4. Snow
☐ 5. Sleet
☐ 6. Freezing (temp.)
☐ 7. Fog / Mist
☐ 8. Indeterminate (explain)

25. ROAD CONDITION

☐ 1. Dry
☒ 2. Wet
☐ 3. Snow
☐ 4. Ice
☐ 5. Slush
☐ 6. Mud
☐ 7. Standing Water
☐ 8. Moving Water
☐ 9. Other (explain)

26. ROAD SURFACE

☒ 1. Concrete ☐ 3. Brick ☐ 5. Dirt / Sand
☐ 2. Asphalt ☐ 4. Gravel ☐ 6. Multi-Surface

27 - COMMERCIAL MOTOR VEHICLE (Complete for each commercial vehicle involved.)

A. CMV CRITERIA

Answer the following to determine if this section should be completed.

1. Does this accident involve any of the following:

1.a person fatally injured; or
2.a person transported for medical attention; or
3.a vehicle towed from the scene of the accident

☐ NO - DO NOT COMPLETE
☒ YES - GO TO NUMBER 2

2. Examine each vehicle to determine if it is a commercial vehicle based on the following:

1.a truck with GCVWR of more than 10,000 lbs. and engaged in commerce; or
2.a bus or school bus (9 or more including driver); or
3.a vehicle with a hazardous materials placard

☒ NO - DO NOT COMPLETE
☐ YES - COMPLETE SECTIONS B - E

B. CARRIER ID NUMBER

V3 ICC NO. MC _____ USDOT NO. _____

V4 ICC NO. MC _____ USDOT NO. _____

C. HAZARDOUS MATERIAL PLACARD NUMBER ☐ NA

V3 4-Digit Placard Number from Diamond / Box _____ Number From Bottom of Diamond _____

V4 4-Digit Placard Number from Diamond / Box _____ Number From Bottom of Diamond _____

D. TRAFFICWAY

☐ 1. Two-Way; Not Divided
☐ 2. Two-Way; Divided; Unprotected Median
☐ 3. Two-Way; Divided; Positive Median Barrier
☐ 4. One-Way; Not Divided

E. CARGO BODY TYPE

V3	V4	
☐	☐	1. Enclosed Box
☐	☐	2. Cargo Tank
☐	☐	3. Flatbed
☐	☐	4. Dump
☐	☐	5. Concrete Mixer
☐	☐	6. Auto Transporter
☐	☐	7. Garbage / Refuse
☐	☐	8. Grain, Chip, Gravel
☐	☐	9. Pole Trailer
☐	☐	10. Other

28 - NARRATIVE / STATEMENTS (If additional room is necessary, attach a separate sheet.)

See 1st Narrative Page.

29. REPORTING OFFICER SIGNATURE	DSN / BADGE NO.	BEAT / ZONE	TROOP / DIST / PCT
E. D. Phillips	880	1	C

REVIEWING OFFICER 1 SIGNATURE	DSN / BADGE NO.	REVIEWING OFFICER 2 SIGNATURE	DSN / BADGE NO.
Cpl Petlansky	820		

NARRATIVE / STATEMENTS	[X] CONTINUATION [ ] SUPPLEMENT	AGENCY NAME AND ORI
ORIGINAL REPORT / CASE / INCIDENT NUMBER: 01131000216	ADDITIONAL SUPPLEMENT NO.	MISSOURI STATE HIGHWAY PATROL MOMHPCC00

SUPPLEMENTAL REPORT DATE	ACCIDENT DATE	TRP / DIST / PCT	COUNTY	
	01/13/2010	C	St. Louis	095

REPORTING OFFICER SIGNATURE	DSN / BADGE NO.	SUPPLEMENTAL REVIEWING OFFICER SIGNATURE	DSN / BADGE NO.
E. D. Phillips	880		820

vehicles in front of him.

Pedestrian 1 and Driver 4 were transported to Depaul Medical Center.

City of St. Charles Long Range Transportation Plan

City of St. Charles Public Works Department

2015

The Goal of the Long Range Transportation is to drive recommendations for future CIP submittals.

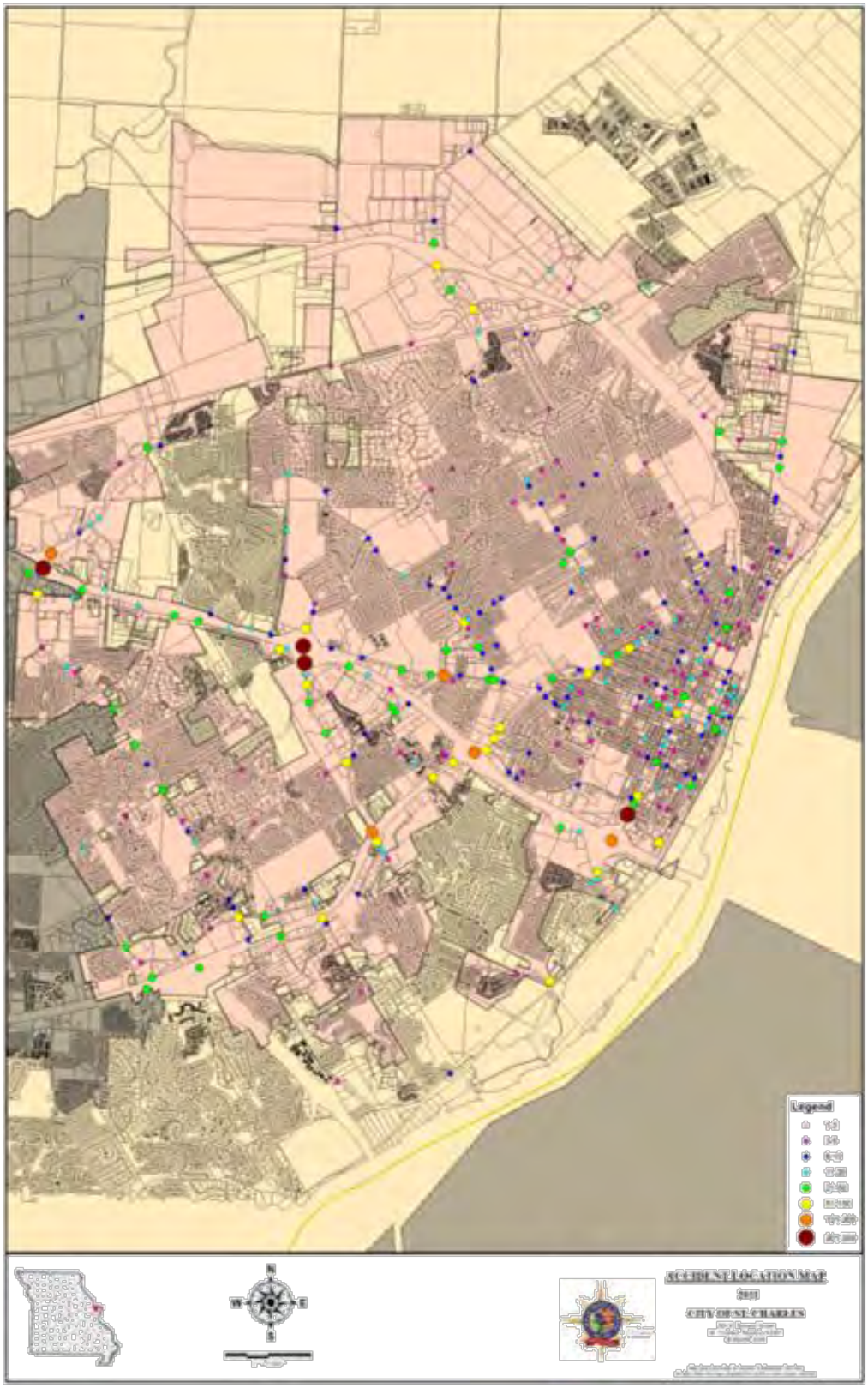
Map of Road and Intersection Projects

PROJECT STATUS

- COMPLETED
- ACTIVE
- PLANNED
- FUTURE

COMPREHENSIVE PROJECT LIST	
PROJECT	**STATUS**
Flashing Yellow Arrow Signal Improvements	ACTIVE
Comprehensive Curb & Gutter Program	PLANNED
City-Wide Bike-Ped Study	FUTURE
MO Walk-Bike On-Street System	FUTURE
SCAT System Improvements	FUTURE

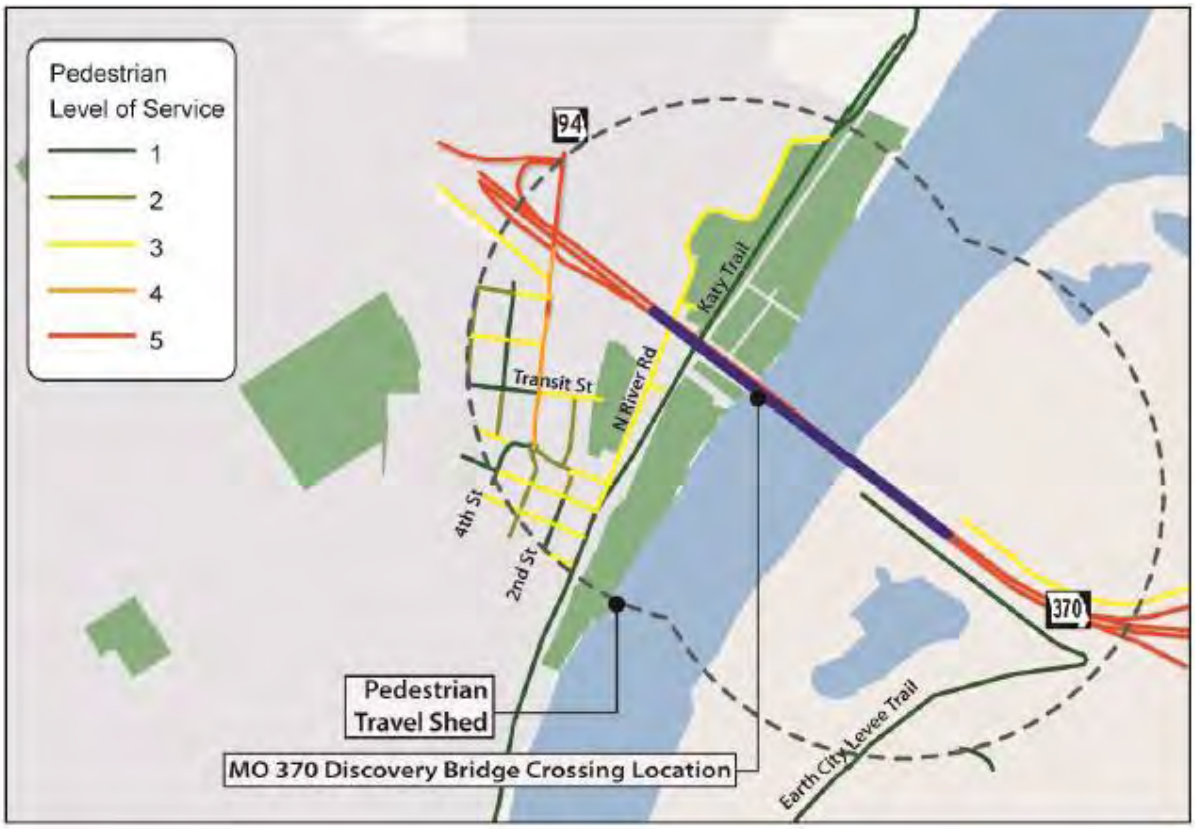
Accident Location Map



FUTURE PROJECTS

MO 370 PEDESTRIAN BRIDGE

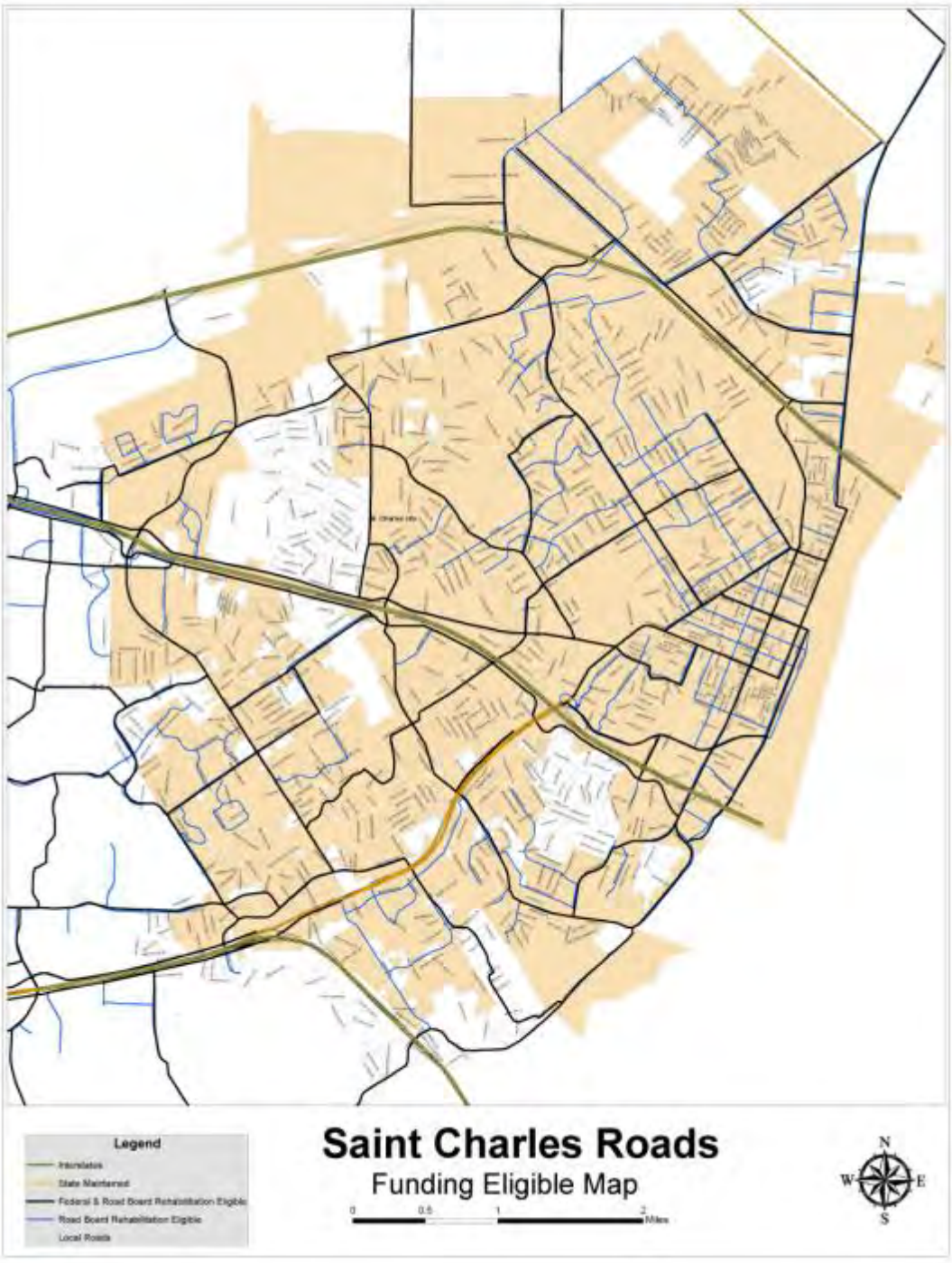
- GOAL OF PROJECT: Construct traffic barriers on MO 370 for pedestrian and bicyclist safety.
- PROJECT DESCRIPTION: Installation of a 6’ wide barrier separated pathway
- PROJECT LIMITS: Eastbound and Westbound 370 bridges
- ESTIMATED COST: $3,100,000
- OUTSIDE FUNDING: TBD
- SCHEDULE:
  - Design: Future
  - ROW: Future
  - Construction: Future
- Note: The feasibility study was completed in December 2014, the MO 370 safety improvements was determined to be a valuable addition to the I-70 crossing. This project will pursue outside funding, including but not limited to TIGER grant funds along with the I-70 crossing.

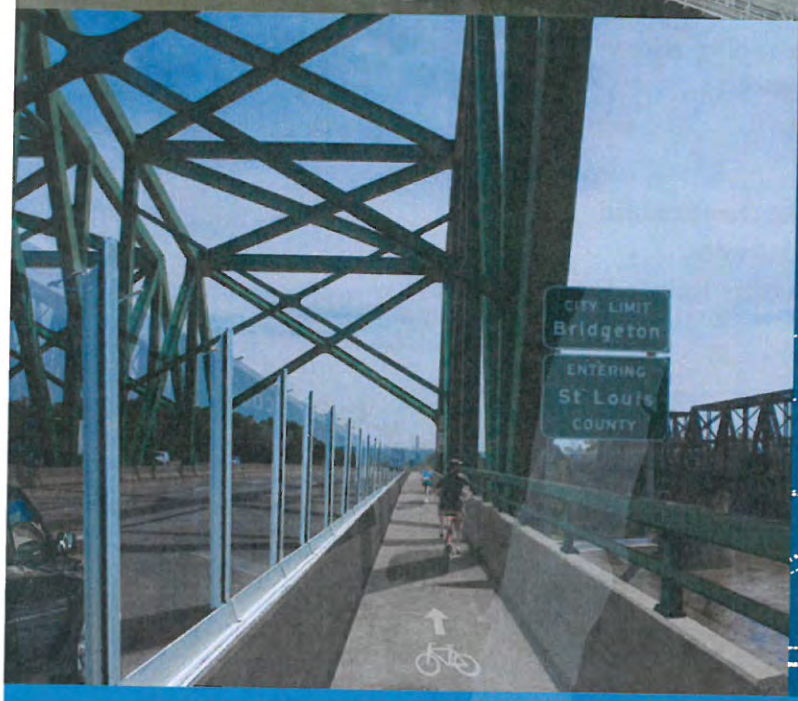

Pedestrian
Level of Service
1
2
3
4
5
94
Katy Trail
N River Rd
Transit St
4th St
2nd St
370
Pedestrian
Travel Shed
MO 370 Discovery Bridge Crossing Location
Earth City Levee Trail

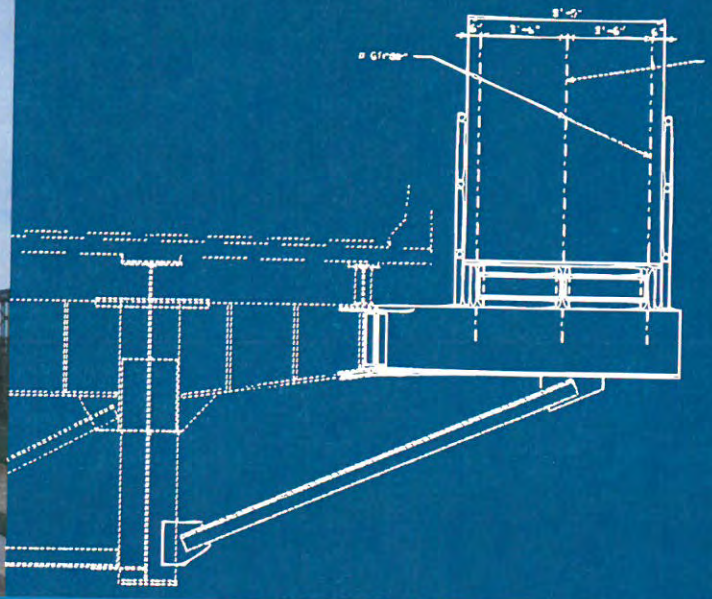

CITY LIMIT
Bridgeton
ENTERING
St Louis
COUNTY

EAST-WEST GATEWAY FUNCTIONAL CLASSIFICATION

COUNTY ROAD BOARD FUNDING ELIGIBLE MAP







Missouri River Crossing

Feasibility Study and Preliminary Engineering Effort for a Bicycle and Pedestrian Crossing from St. Charles County to St. Louis County

Great Rivers Greenway
CLEAN | GREEN | CONNECTED | TRAILS

City of MARYLAND HEIGHTS

City of Saint Charles Missouri Convention & Visitors Bureau

CITY OF Bridgeton MISSOURI

MoDOT

December 2014

Acknowledgements

Thank you to the following entities who provided support through staff time, representation in meetings, comments on technical details, meeting space and funding for the study:

- City of Bridgeton
- City of Maryland Heights
- City of St. Charles
- Great Rivers Greenway
- Missouri Department of Transportation

Committee

The core committee managing this initiative was the group of agencies who provided funding for the project. These individuals comprised the feasibility study committee:

- City of Bridgeton – Walt Siemglusz
- City of Maryland Heights – Mark Levin
- City of St. Charles – Brad Temme, Kevin Corwin, Gary Elmestad
- Great Rivers Greenway – Todd Antoine, Patrick Owens,
- Missouri Department of Transportation – Tom Evers, Kurt Gribble, Lisa Kuntz

Table of Contents

1 Executive Summary

1.1 Project Team

The Missouri River Bicycle and Pedestrian Crossing Feasibility Study represents a joint effort by:

- City of St. Charles
- City of Bridgeton
- City of Maryland Heights
- Great Rivers Greenway
- Missouri Department of Transportation

Figure 1: A bicyclist using the existing shoulder bike lane on MO 370 to cross the Missouri River

1.2 Project Purpose

The purpose of this project is to investigate the feasibility of potential river crossing alternatives and determine the most suitable alignment to increase connectivity across the river near downtown St. Charles. The crossing alternatives, which are described below, represent logical crossing points that take advantage of existing resources and facilities.

1.3 Preferred Alternative

The feasibility study, following extensive review and investigation, determined that the I-70 Eastbound Blanchette Crossing was the highest ranking alternative based on the evaluation criteria. The study also finds merit in pursuing a barrier-separated facility on MO 370 to improve connectivity in conjunction with the I-70 Eastbound Blanchette Crossing. The completion of these two connections will provide safe and improved access across the Missouri River that will increase access to jobs, recreation, and shopping. The total costs of these improvements, including engineering costs, are $16.6M for the I-70 Eastbound Blanchette Crossing and $3.1M for the MO 370 barrier-separated crossing. The project is proposed to be phased in order to complete these improvements as funding becomes available. Next steps in the process will be to secure funding to commence final design of the selected alternatives.

Figure 2: A view of I-70 Eastbound Blanchette Memorial Bridge from its eastern abutment

1.4 Crossing Alternatives

Each of the four crossing alternatives are illustrated and described below. Figure 7 on the following page identifies each crossing location, as well as the 3-mile study area buffer surrounding all crossing locations.

1.4.1 I-70 Eastbound Blanchette Bridge

Figure 3

Description: Cantilevered bicycle and pedestrian bridge with an eight-foot deck attached to the eastbound Interstate 70 Blanchette Memorial Bridge.

Feasibility: Feasible

Cost Effectiveness: 3.47% Rate of Return (ROR)

Demand: High

1.4.2 Old Route 115 Bridge Location

Figure 4

Description: New standalone 16-foot wide bicycle and pedestrian bridge located along the alignment of the demolished Old Route 115 / St. Charles Rock Road Bridge.

Feasibility: Feasible from a design and construction perspective, but infeasible due to significant cost.

Cost Effectiveness: -9.16% ROR

Demand: Medium

1.4.3 Missouri Route 370 Discovery Bridge On-Bridge Path

Figure 5

Description: On-bridge bicycle and pedestrian paths utilizing the outside shoulders of Missouri Route 370 Discovery Bridge (the 370 Bridge) and separated from motor vehicle traffic by physical barriers. Each path supports and allows bi-directional pedestrian travel and directional bicycle travel.

Feasibility: Feasible.

Cost Effectiveness: 4.26% ROR

Demand: Low

1.4.4 Missouri Route 370 Discovery Bridge Cantilever Path

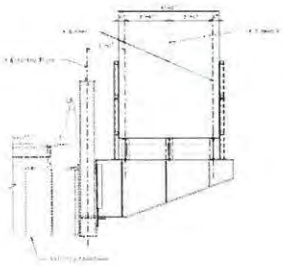


Figure 6

Description: Cantilevered bicycle and pedestrian bridge with an eight-foot deck attached to the westbound Missouri Route 370 Discovery Bridge.

Feasibility: Feasible.

Cost Effectiveness: 0.37% ROR

Demand: Low

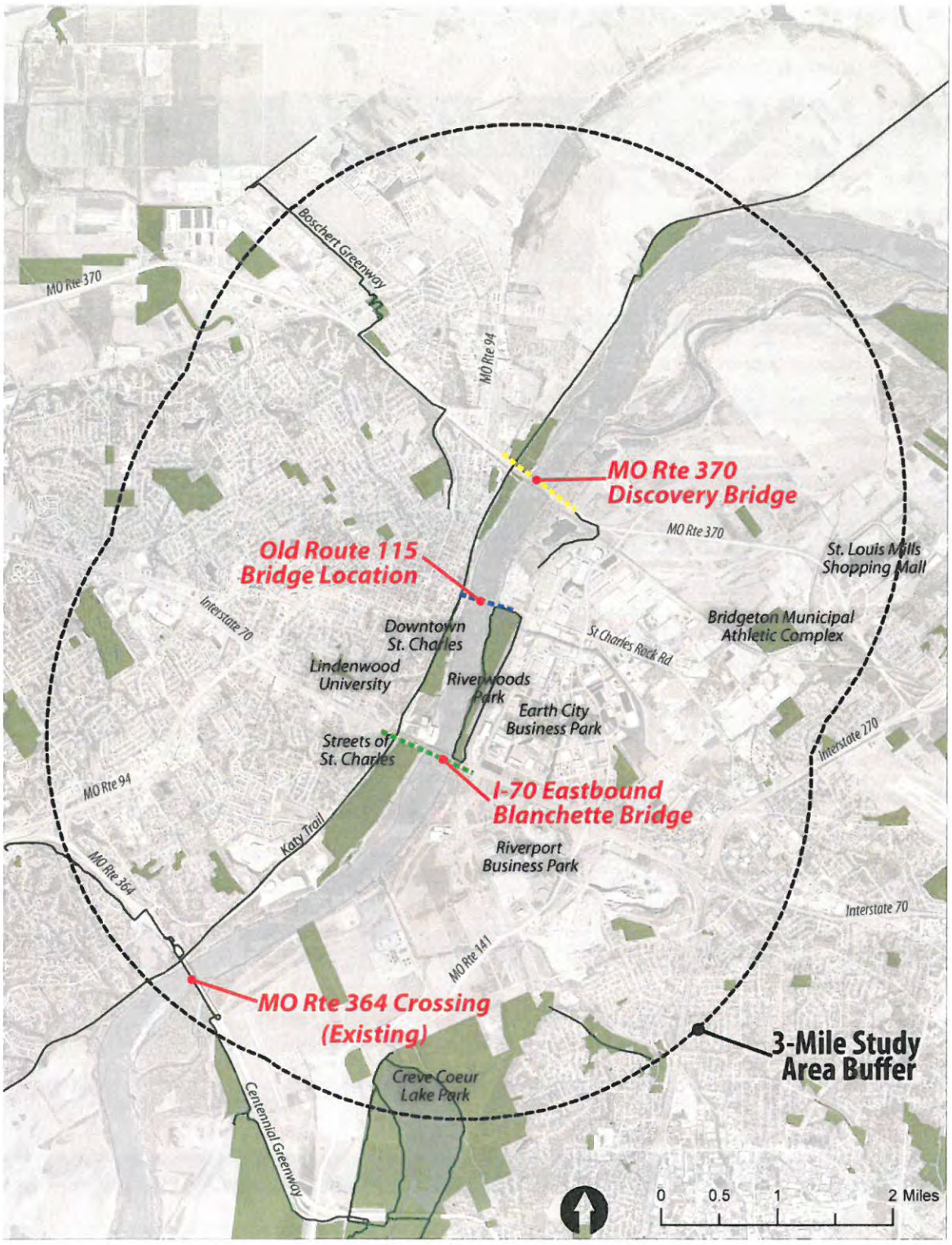


Figure 7: Proposed Missouri River Crossing Alternatives

1.5 Evaluation Criteria and Results

Table 1: Evaluation Criteria and Results

Qualitative Criteria	Impact	Route 115	I-70 Bridge	370 On-Bridge	370 Cantilevered
Bicycle / Pedestrian Safety & Comfort	High	●	◕	◑	◕
Vehicular Motorist Safety	High	●	◑	○	◑
Environmental Impact	High	○	◑	●	◑
Traffic Impact	High	●	◑	○	◑
Aesthetic Experience of Users	Medium	●	◑	◑	◑
Drainage Impacts of Improvements	Medium	○	◕	●	◕
Signage	Low	●	◑	○	◑
Visual Impacts	Low	●	◑	○	◑
Total Qualitative Rating		6	4.5	3	4.5
Quantitative Criteria	**Impact**	**Route 115**	**I-70 Bridge**	**370 On-Bridge**	**370 Cantilevered**
Construction Cost*	High	○	◑	●	◑
Construction Cost (including engineering fees)		$56.7 M	$16.6 M	$3.1 M	$15.2 M
Maintenance Cost	Medium	◕	◕	◑	◕
Travel Demand	High	◑	●	○	○
Right-of-Way Availability	High	○	◑	●	◕
Life Cycle Cost of Improvements	High	○	◑	●	◑
Structural Capacity	High	-	◑	●	◑
Impact to Missouri River Navigation	High	○	●	●	●
Connectivity to nearby sidewalk network	High	◕	◑	○	○
Connectivity to bicycle street network	High	◕	◑	○	○
Connectivity to Katy Trail	High	◑	●	○	○
Connectivity to Riverwoods Park	High	●	◑	○	○
Connectivity to Creve Coeur Park Trail	High	○	●	○	○
Connectivity to Earth City Levee Trail	High	●	◑	●	●
User Experience	High	●	◑	◑	◑
Total Quantitative Rating		6.25	9.5	7	5.5
Total Rating		12.25	14	10	10

Rating Key:

● - The alternative does an excellent job of addressing the criterion and/or makes substantial improvements in the criteria category;

◕ - The alternative does a good job at addressing the criterion and/or makes improvements in the criteria category;

◑ - The alternative does an adequate job of addressing the criterion and/or makes some improvements in the criteria category;

○ - The alternative segment does not adequately improve on the intent of the criterion, or negatively impacts the criteria category;

- - The criterion does not apply.

2 Introduction

2.1 Study Background

The communities that comprise the St. Louis Metropolitan Region have a strong history of collaboration and partnerships, particularly as it relates to trail planning and development. Well-established municipalities like Bridgeton, Maryland Heights, and St. Charles and regional entities like St. Charles County, St. Louis County, Great Rivers Greenway District, and the Missouri Department of Transportation (MoDOT) have made significant strides to connect their constituents to the places that are important to them: outstanding schools and universities, beautiful parks and open spaces, lively community and recreation centers, bustling commercial districts, and other destinations that bring people together.

As these regional partnerships have strengthened over the years, so too has their collective capacity to address significant challenges. For a region whose rivers once served as the arteries of the growing nation's transportation network, the Mississippi and Missouri Rivers now present challenges to local and regional transportation, particularly for bicyclists and pedestrians. In St. Charles County and west St. Louis County, the Missouri River represents a significant barrier between adjacent municipalities, neighborhoods, employment centers, commercial destinations, and parks. For decades, almost all Missouri River crossings in the St. Louis Metro Area either explicitly prohibited non-motorized users or did not provide adequate facilities to support safe and comfortable crossing for bicyclists and pedestrians. Although the Missouri Route 370 Discovery Bridge permits bicycle and pedestrian travel on the outer shoulders, vehicle speeds and a lack of separation from motor vehicles render the bridge un-crossable for most bicyclists and pedestrians. The next closest crossing for non-motorized users is the Missouri Route 364 Veterans Memorial Bridge, approximately 5.25 miles to the south.

Over the last few years, the City of St. Charles began to engage neighboring municipalities and relevant regional agencies to discuss this lack of a safe, comfortable, and convenient bicycle and pedestrian river crossing. Working in partnership with Bridgeton, Maryland Heights, MoDOT, and Great Rivers Greenway, the City applied for 2014 TIGER discretionary funding for the construction off-road trail improvements, on-street bicycle and pedestrian facilities, and a new bicycle and pedestrian crossing along Interstate 70. The application process strengthened the working relationships among these key agencies and solidified their commitment to developing "a non-motorized transportation network that is coordinated and complete."

2.2 Purpose of the Feasibility Study

The purpose of this project is to investigate the feasibility of potential Missouri River crossing alternatives and determine the most suitable alignment to increase connectivity across the river near downtown St. Charles. Based upon criteria identified at the onset of this study and refined by the City of St. Charles and its project partners, the evaluation process incorporates key factors such as structural capacity, bicycle and pedestrian demand, user comfort and experience, and capital and maintenance costs in order to compare alternatives and identify a preferred option.

Each alignment alternative will provide certain advantages to surrounding communities. Greater facility demand means more trips made by more people. Each alignment will be assessed with quantitative and qualitative criteria established at the onset of the study by the City of St. Charles and its project partners.

3 Crossing Locations and Scenarios

Three crossing locations and scenarios were identified and developed for analysis. Two of these crossings utilize existing bridge structures, the I-70 Blanchette Memorial Bridge and the Missouri Route 370 Discovery Bridge, and the third utilizes the bridge alignment of the demolished Missouri Route 115 Bridge, also known as the Old St. Charles Bridge. Each of these crossing options are shown below in Figure 8.

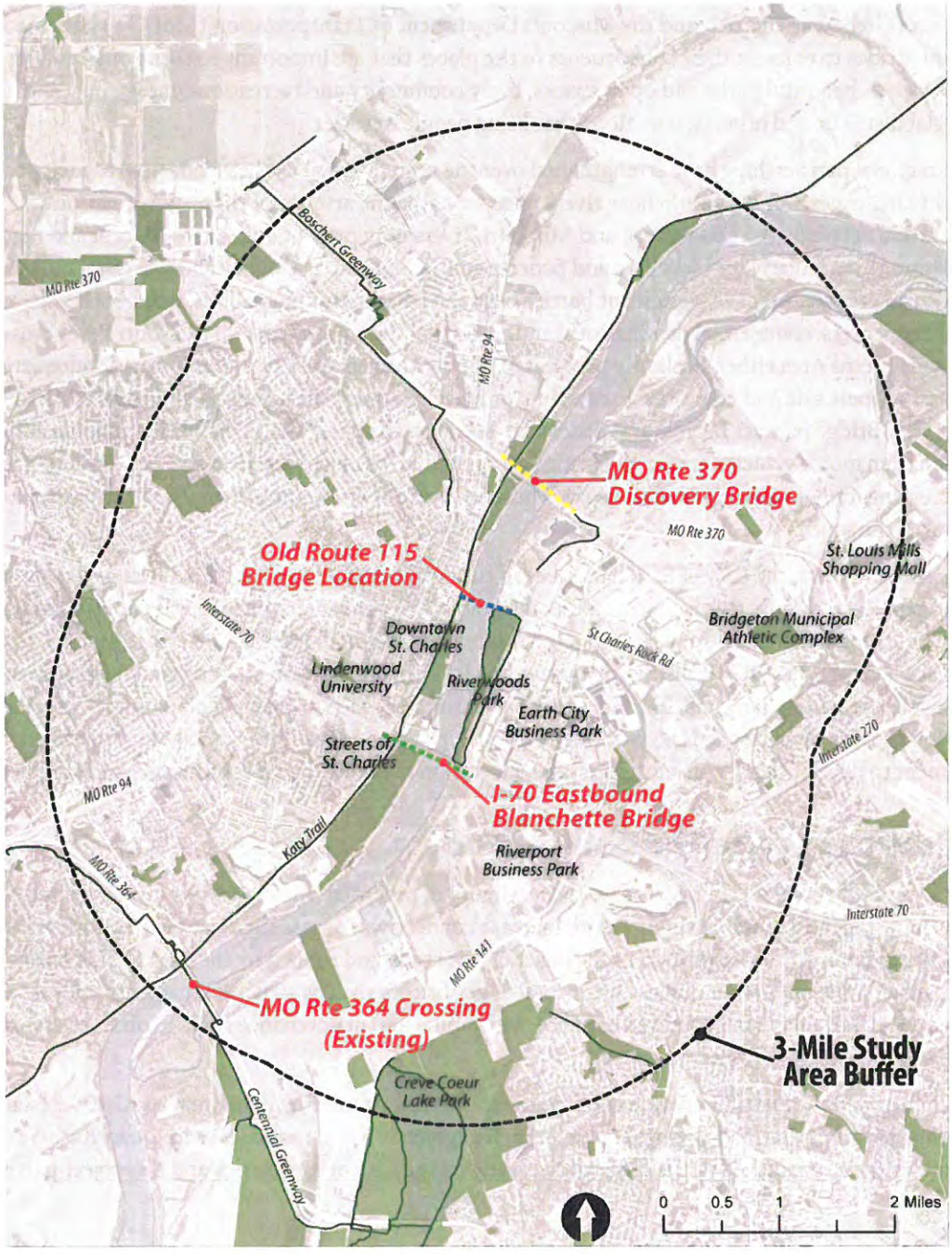


Figure 8: Proposed Missouri River Crossing Alternatives

3.1 Alternative One: I-70 Blanchette Memorial Bridge

3.1.1 Current Conditions

The Blanchette Memorial Bridge consists of two bridges that carry Interstate 70 traffic across the Missouri River. Over 150,000 vehicles use the Blanchette Memorial Bridge each day, more than any other major bridge over in the St. Louis Metro Area. At present, there are no bicycle or pedestrian facilities on the bridge. The nearest crossings for non-motorized travel are the MO Route 364 Veterans Memorial Bridge (3 miles to the southwest) and MO Route 370 Discovery Bridge (2.5 miles to the north).

Figure 9: View of Blanchette Memorial Bridge looking south from Riverwoods Park in Bridgeton, MO.

3.1.2 Proposed Crossing Scenario

This southernmost crossing location of the three identified in this study consists of a new bicycle and pedestrian pathway on a cantilevered attachment along the south side of the existing I-70 eastbound bridge. The pathway will be outside of the existing roadway barrier and truss, and will be protected by fencing on both sides. The pathway will be eight feet clear width, with a 12-foot wide overlook section between piers 15 and 16.

Four alternate scenarios have been developed for the west abutment of the pathway, all of which will be ADA compliant with a maximum grade of 5% (1:20):

West Abutment, Alternate One: A ground level pathway on the south side of the eastbound bridge, extending westward from the Katy Trail, across South Main Street, and up the existing roadway embankment to the west abutment of the existing eastbound bridge.

West Abutment, Alternate Two: A structure that will connect the west end of the bridge crossing to ground level, just west of South Main Street that will cross South Main Street at grade and connect to the Katy Trail at grade.

West Abutment, Alternate Three: A new ramp structure between the Katy Trail and Main Street with an elevated pathway to the cantilever attachment to the bridge. This option is not feasible due to power lines that run along the south side of I-70 restricting and structure immediately south of the I-70 eastbound bridge.

West Abutment, Alternate Four: A new ramp structure east of the Katy Trail with an elevated pathway to the cantilever attachment to the bridge. This option is not feasible due to this structure being in the floodplain and a no rise certificate cannot be secured for this type of structure.

Two alternate scenarios have been developed for the east abutment of the pathway, both of which will be ADA compliant with a maximum grade of 5% (1:20):

East Abutment, Alternate One: A new ground level pathway on the south side of the existing eastbound bridge extending eastward along the existing embankment to the top of the adjacent levee for a connection with a future trail along the top of the levee, and down the existing embankment westward then under I-70 to connect with the south end of the existing Riverwoods Trail.

East Abutment, Alternate Two: A new ramp structure on the south side of the existing eastbound bridge and adjacent to Span 17 or Span 18 of said bridge. The ramp structure will connect the elevated pathway with ground level. Access to the south end of the Riverwoods Trail and the future trail along the top of the levee will be by ground level pathways. This option is not feasible due to the structure being located in the floodplain and a no-rise certificate for the structure is not possible.

Figure 10: Riverwoods Park and the recently completed trail loop abut the westbound Blanchette Bridge and would connect to a future bicycle and pedestrian crossing in this scenario.

3.2 Alternative Two: Missouri Route 370 Discovery Bridge On-Bridge Path

3.2.1 Existing Conditions

The existing Missouri Route 370 Discovery Bridge consists of two truss bridges crossing the Missouri River. The existing outside shoulder in each direction allows for (one-way) bicycle travel with marked bike lanes and (bidirectional) pedestrian travel (non-designated shoulder outside of the bike lane), and paved pathways exist at each end of the bridge for non-motorized users to enter and exit the highway. At the eastern abutment, MoDOT and Great Rivers Greenway District have recently improved the ground level pathways leading to the bridge. At the western abutment, the existing pathways are in varying levels of disrepair and are not compliant with current ADA standards. The Discovery Bridge is also part of the Mississippi River Trail (MRT), a national bicycle and pedestrian trail that follows the banks of the Mississippi River from its headwaters at Lake Itasca in Minnesota to Venice, Louisiana near the mouth of the river.

Figure 11: Bicyclists and pedestrians use this narrow shoulder to cross the Missouri River on the Discovery Bridge.

3.2.2 Proposed Crossing Scenario

This crossing scenario will improve the existing on-bridge bikeway and allow pedestrian use by separating the pathways from motor vehicle travel lanes with a Type FT Barrier extending from the existing guardrail openings on the west end of each bridge to the existing ground level pathways near the east end of the bridges. Each pathway will be six feet in width and will provide for bidirectional travel for pedestrians and one way travel for bicyclists in the same direction as motor vehicle traffic, consistent with the current configuration for non-motorized travel.

At the western abutment of the bridge, the bicycle and pedestrian pathway would utilize existing and future ground-level pathways to connect to the planned trail along Highway 94 to the west and to the Katy Trail to the east.

Figure 12: Existing trail connections at the west abutment are in poor condition, which may deter potential users' perception of the quality and safety of the bridge crossing itself.

At the eastern abutment of the bridge, the facility would utilize the existing ground level pathways to connect the new barrier-separated crossings to Missouri Bottom Road and the existing Riverwoods Trail.

Figure 13: Photo of the trail connection from eastbound MO 370 to the Earth City Levee Trail. Off to the left, the trail continues under MO 370 to support westbound travel across the bridge and into St. Charles.

3.3 Alternative Three: Missouri Route 370 Discovery Bridge Cantilevered Path

3.3.1 Existing Conditions

Existing conditions for this alignment option are the same as for Option 3 and are described above.

3.3.2 Proposed Crossing Scenario

This proposed crossing scenario consists of a new elevated bicycle/pedestrian pathway on a cantilevered attachment along the North Side of the existing WB MO 370 Bridge A4557. The 8' wide pathway will be outside of the existing roadway barrier and truss, and will be protected by a fence on both sides of the pathway. The elevated pathway will follow the grades of the existing bridge.

West Abutment: The existing and future (by others) at-grade pathways on the North side of WB Route 370 will connect the planned trail along Highway 94 to the West and to the Katy Trail to the East with the West end of the cantilevered path on WB MO 370 Bridge. The portion of the at-grade pathway that connects the West end of the WB MO 370 Bridge to the Katy trail is included in this study. The pathway on the existing roadway embankment will be ADA compliant with a maximum grade of 5% (1:20). The remainder of the at-grade pathway will follow existing grades. The existing opening in the guardrail near the West end of the MO 370 Bridge will be closed and the bike lane markings on the right roadway shoulder will be removed.

East Abutment: An at-grade pathway on the North side of WB MO 370 will connect the new cantilevered pathway at the East end of the bridge with Missouri Bottom Road and the North end of the existing Earth City Levee Trail. The existing opening in the guardrail near the East end of the bridge will be closed and about 150 feet of new at-grade pathway will be constructed.

3.4 Alternative Four: Old Route 115 Bicycle and Pedestrian Crossing

3.4.1 Current Conditions

The Old Route 115 Bridge was one of the first bridges to carry pedestrians, motor vehicles, and even trolleys from the City of St. Charles into St. Louis County. Opened to traffic in 1904, the bridge connected St. Charles Rock Road in St. Louis County to the intersection of Adams St. and Second Street in Downtown St. Charles. The bridge was in use for more than 80 years until its closure in 1992 and subsequent demolition in 1997. A small portion of the eastern approach still remains today in the City of Bridgeton's Riverwoods Park and provides a scenic viewpoint overlooking the Missouri River and Downtown St. Charles.

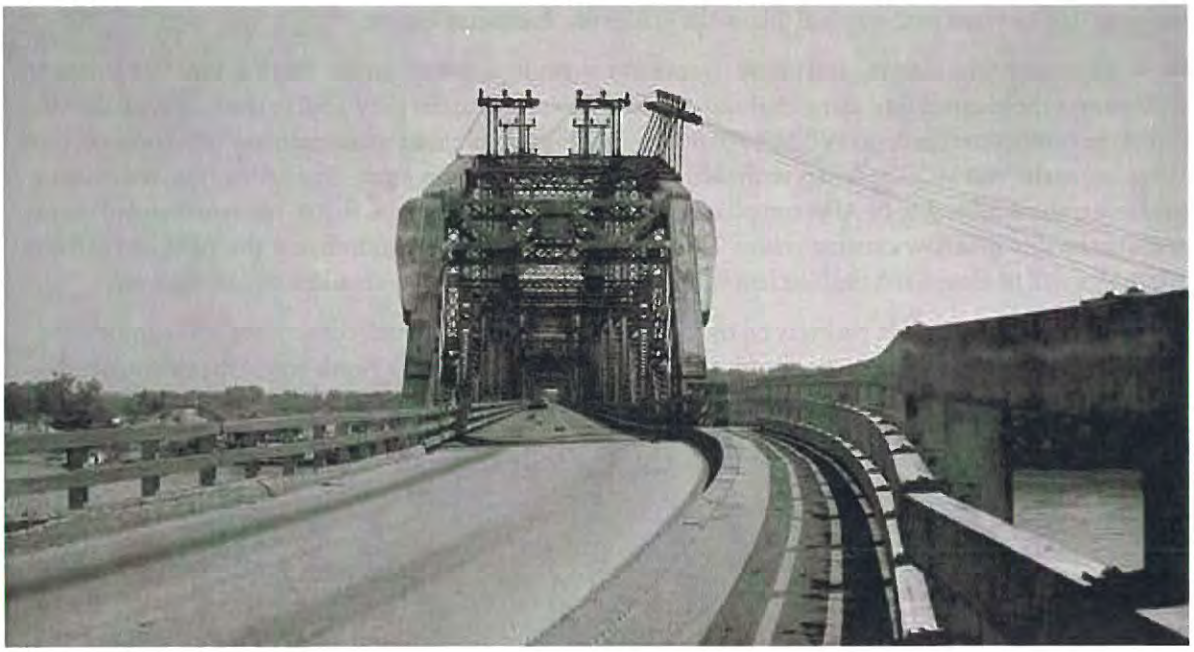


Figure 14: Photo of the west approach of the Old Route 115 Bridge, with two lanes of motor vehicle traffic and sidewalk (Source: Library of Congress, Prints & Photographs Division, HAER, HAER MO,92-SAICH,31-7).

3.4.2 Proposed Crossing Scenario

This crossing location would provide a new bicycle and pedestrian bridge over the Missouri River along the alignment of the Old Route 115 Bridge. The new bridge structure would provide a 16-foot wide bidirectional shared use path for non-motorized users.

West Abutment, Alternate One: At the west end of the bridge, a new ramp structure on the west side of the Katy Trail will connect the elevated bridge deck to ground level surface streets, sidewalks, and the Katy Trail. This structure will be in an existing parking lot that is heavily utilized by adjacent businesses.

East Abutment, Alternate One: At the east end of this bridge option the bridge would extend to with a ground level pathway leading to nearby Riverwoods Trail, close to the site of the touchdown point of the Old Route 115 Bridge.

Figure 15: The embankment of the east approach of the Old Route 115 Bridge still stands today at the north end of Riverwoods Park and provides a scenic view of downtown St. Charles across the Missouri River.

East Abutment, Alternate Two: A second option for a landing of the new pedestrian bridge would be on a new ramp structure that will connect the bridge to ground level just east of the river bank, near the existing Riverwoods Trail.

All ramp structures would provide pathways with ADA compliant maximum grades of 5% (1:20).

4 Alternatives Analysis

In order to analyze and compare alignment alternatives, the City of St. Charles and its project partners developed a set of evaluation criteria at the on-set of the project. These evaluation criteria offer quantitative and qualitative metrics whereby alignment alternatives can be compared to one another on specific attributes, including structural capacity, environmental impacts, non-motorized transportation demand, and estimated conceptual construction cost.

This chapter of the study is divided into seven sections:

4.1. Structural Evaluation

4.2. Maintenance of Traffic during Construction

4.3. Inspection and Maintenance Analysis

4.4. Environmental Analysis

4.5. Connectivity and Quality of Service

4.6. Active Transportation Demand

4.7. Aesthetics and Visualization

4.1 Structural Evaluation

This section of the study expands on each alternative concept described in the previous section in order to determine structural capacity/suitability and develop conceptual construction cost estimates. The following table presents a summary of the alternatives and results of this study.

Table 2: Crossing Alternatives and Estimated Conceptual Construction Cost

Alternative		Recommended Clear Pathway Width	Pathway Width Limited by Existing Structure?	Estimated Conceptual Construction Cost
1	I-70 Eastbound Bridge Cantilevered Pathway	8'-0"	Structural limits: independent structure in multi-girder spans, 8' maximum FRP deck in 3-girder and truss spans, 5 lanes with SW LL or 6 Lanes with SW closed	$15.0 million
2	MO 370 Westbound Barrier Separated Pathway	6'-0"	MoDOT's preferred alternative based on consideration of inspection and future lane reconfiguration is one way, 6' wide, barrier separated pathways on EB and WB Mo370	$2.8 million
3	MO 370 Westbound Cantilevered Pathway	8'-0"	Structural limits: independent structure in prestressed girder spans, 8' maximum FRP deck and no FWS in plate girder spans	$13.7 million
4	New Cable-Stayed Bridge on Old MO 115	16'-0"	N/A	$51.1 million
5	New Plate Girder Bridge on Old MO 115	16'-0"	Navigation requirement for 800 feet of horizontal clearance makes this alternative unfeasible	N/A

The Westbound I-70 Bridge is explicitly excluded from the scope of this feasibility study. As part of our study, we contacted MoDOT and confirmed the Department's position that only the Eastbound I-70 Bridge be considered as a candidate for a bicycle/pedestrian pathway.

Following is a discussion of the configurations, structural evaluations, pathway concepts, and conceptual construction cost estimates of the various alternatives considered in the I-70 Bicycle/Pedestrian Facility Feasibility Study.

4.1.1 Alternative 1: I-70 Eastbound Cantilevered Pathway

4.1.1.1 Configuration

Figure 16 shows the proposed pathway layout for the Eastbound (EB) I-70 Bridge and the ground level approaches. This alternative consists of the following three elements:

1. A new at-grade pathway on the South side of I-70 EB, extending westward from the Katy Trail, across South Main Street, and up the existing roadway embankment to the West Abutment of the existing I-70 EB Bridge. The pathway from the Katy Trail to the base of the existing roadway embankment will follow existing grades. The pathway on the existing roadway embankment will be Americans with Disabilities Act (ADA) compliant with a maximum grade of 5% (1:20). This approach pathway is approximately 1,240 feet long and is shown in green on the left side of Figure 16. Our development of the concept for this ground level approach included consideration of the following options:
    1.1. Crossing South Main Street on an elevated structure to separate bicycle/pedestrian users from roadway traffic. This option was rejected because a) the traffic on South Main Street is expected to be low enough that a safe at-grade crossing can be provided; and b) the cost of the elevated structure plus the cost of approximately 400 feet of 5% grade required to transition from the elevated crossing to ground level will be significantly greater than an at-grade crossing and pathway.
    1.2. A new ramp structure on the South Side of I-70 Eastbound and just East of the Katy Trail. The ramp structure will connect the Katy Trail with the elevated pathway attached to the bridge. The ramp structure will provide pathways with ADA compliant maximum grades of 5% (1:20). This option was rejected because a) the cost of approximately 1,100 feet of ramp required to transition from bridge level to ground level near the Katy Trail is greater than the cost of remaining on the bridge for approximately 450 feet and then transitioning to the elevation of the Katy trail with an at-grade pathway; and b) locating the ramp structure near the Katy Trail will also involve construction in the flood plain (which required additional analysis and permits) and may require relocating the electrical power lines near the trail.
2. A new elevated bicycle/pedestrian pathway on a cantilevered attachment along the South Side of the existing EB I-70 Bridge A3292. The existing 3,793 foot long bridge consists from west to east of 8 multi-girder spans, each about 90 feet long; 5 three-girder spans, each ranging from 218 feet to 242 feet in length; 3 main truss spans, each ranging from 450 feet to 480 feet in length; 2 three-girder spans, each about 219 feet long; and 1 multi-girder span about 95 feet long, see Figure 17. The pathway will be outside of the existing roadway barrier and truss, and will be protected by a fence on both sides of the pathway. The elevated pathway will follow the grades of the existing bridge. The proposed bridge mounted pathway is shown in red on Figure 16.

Figure 16: EB I-70 Bike/Pedestrian Cantilevered Attachment Pathway Layout

3. A new at-grade pathway on the South side of I-70 EB, extending from the existing East Abutment, eastward along the existing embankment to the top of the adjacent levee for a connection with a future trail along the top of the levee, and down the existing embankment westward then under I-70 to connect with the South end of the existing Riverwoods Trail (shown in blue on Figure 16). The pathway on the existing roadway embankment will be ADA compliant with a maximum grade of 5% (1:20), while the remainder of the ground mounted pathway will follow existing grades. This approach pathway is approximately 1,940 feet long and is shown in green on the right side of Figure 16. Our development of the concept for this ground level approach included consideration of the following option:
   3.1. A new ramp structure on the South Side of I-70 Eastbound and adjacent to Span 17 or Span 18 of the existing bridge. The ramp structure will connect the elevated pathway attached to the bridge with ground level. The ramp structure will provide pathways with ADA compliant maximum grades of 5% (1:20). Access to the South end of the Riverwoods Trail and the future trail along the top of the levee will be by ground level pathways. The pathway on the existing roadway embankment will be ADA compliant with a maximum grade of 5% (1:20), while the remainder of the ground mounted pathway will follow existing grades. This option was rejected because a) the cost of approximately 1,100 feet of ramp required to transition from bridge level to ground level is greater than the cost of remaining on the bridge for approximately 500 feet and then transitioning to the elevation of the trail connections with at-grade pathways; and b) locating the ramp structure near Pier 17 or 18 will also involve construction in the flood plain.

4.1.1.2 Structural Evaluation

Figure 17 shows the general plan and elevation of the EB I-70 Bridge A3292. The structure from west to east consists of 8 steel multi-girder spans, 5 three-girder spans, a three span continuous truss, 2 three-girder spans, and 1 multi-girder span.

The following paragraphs summarize the methodology and the results of our structural evaluation of the truss spans of EB I-70 Bridge A3292 with the proposed cantilevered sidewalk.

1. Sidewalk (SW) is envisioned as cantilevered from the side of the south truss using connection details similar to those developed for the EB US 54 Bridge Jefferson City Bridge A4497 sidewalk project (see Figure 20 for general concept).
2. The sidewalk will consist of an 8-ft clear width Fiber Reinforced Polymer (FRP) riding surface with fences on both sides (same as Bridge A4497).
3. Per Bridge A4497 load rating analysis (previously performed by Jacobs) the sidewalk all-inclusive mass (weight) is 375 lb/ft.
4. The centerline of sidewalk is assumed to be 6.5 ft outboard of the centerline of the south truss line. With this location the lever arm factor for the south truss is 1.09. Combined with the unit weight of 375 lb/ft and the panel lengths of 30 ft, this results in a sidewalk dead load (DL) to each truss panel point of 12.3 kips.
5. Note that the navigation lights and a pier access ladder will need to be modified to allow for the presence of the cantilevered sidewalk.
6. Per the plan general notes each truss line was originally designed for 2.25 lanes. Our independent computations indicate that for five lanes (maximum under AASHTO Section 3.6 for the 68-ft roadway) the maximum distribution factor (DF) is 2.13. With six lanes (12'-11'-11'-11'-11'-12') the maximum DF is 2.29. Therefore, the plan DF of 2.25 appears to be based on the use of six lanes, perhaps with different widths than those assumed here.
7. Per the project criteria the SW will be treated as an additional lane with lane reduction factors handled accordingly. With this assumption the maximum DF for 5 lanes plus SW is 2.95 lanes, which implies an increase in the live load of about 31% (2.95/2.25 = 1.31). Note that our previously developed HS20 inventory rating factors for the truss are 1.77 (suspended span), 2.03 (cantilever arm) and 1.22 (anchor arm). Therefore, our initial thinking was that the anchor arm would be overstressed with the SW included.
8. The Jacobs in-house program P7308 was used to evaluate the truss for the SW loading. The DL was input as 12.3 kips per panel point (bottom chord). The SW live load (LL) was input as an equivalent lane of HS20 loading with no impact, calculated as follows: 75 psf x 8' wide x lever factor 1.09 x 0.75 lane reduction factor / 640 lb/ft of HS20 loading = 0.766 lanes. Note that when using P7308 a concentrated load is included with the lane load per AASHTO so that the SW load is slightly overestimated. Based on an influence line analysis the overestimation ranges from about 10% to as high as 24%. The approach taken was that for those members with overstresses with vehicle plus SW loads that a more precise value of the SW load effect would be computed using influence lines.
9. The total system DL (exclusive of the SW) was taken from the stress sheets in the plans. Note that the plan values include the Future Wearing Surface (FWS) of 15 psf of roadway. The vehicular live load plus impact (LL+I) results were also taken from the stress table, therefore being for 2.25 lanes (based on six lanes loaded).

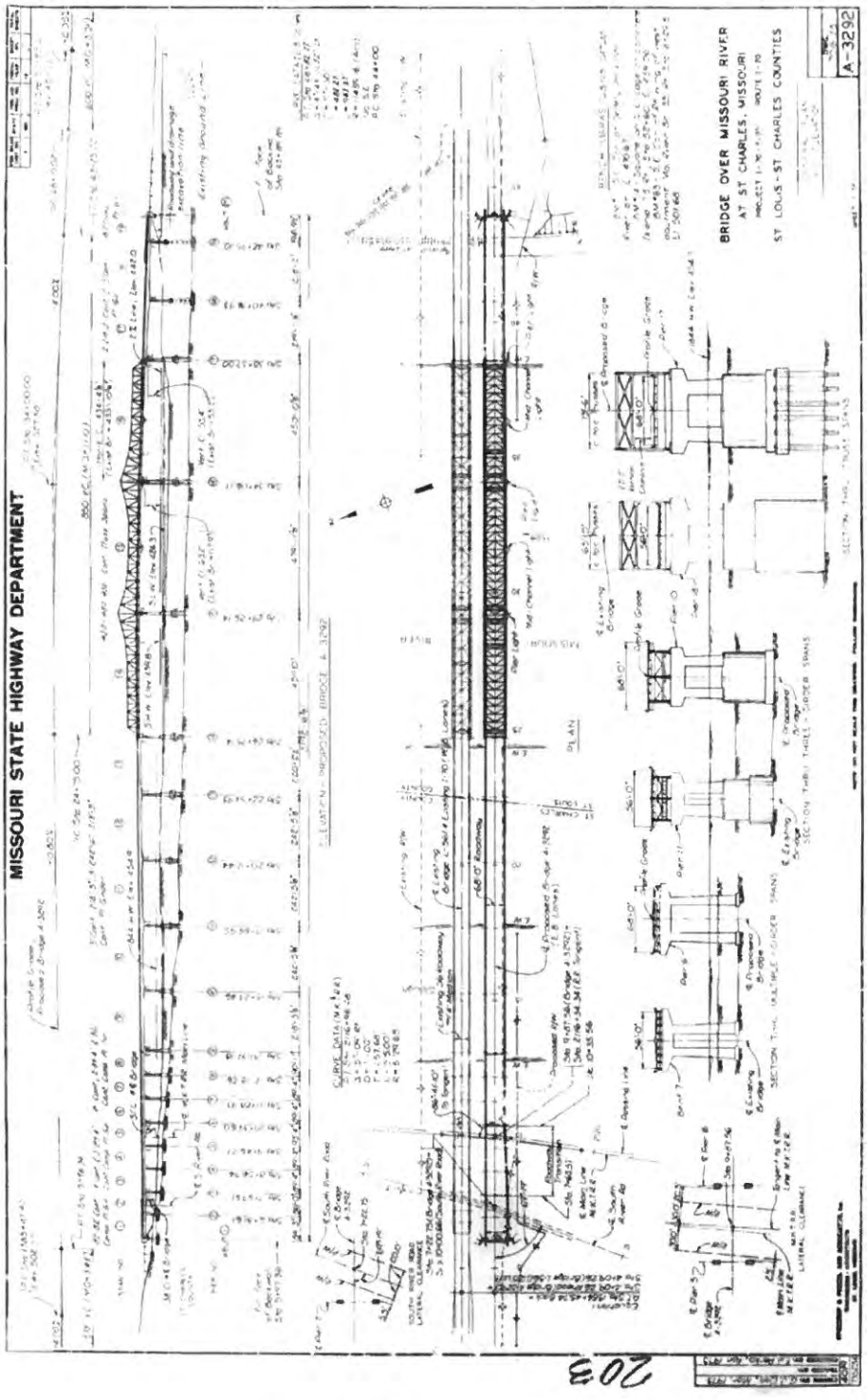


Figure 17: EB I-70 General Plan and Elevation

10. A spreadsheet was used to check capacity/demand (C/D) ratios for all truss members. In this terminology, a C/D ratio less than 1.0 indicates that the component does not have sufficient capacity to resist the calculated demands, while a C/D ratio greater than 1.0 indicates that the component has greater capacity than required to resist the anticipated demands. The bulk of the basic member property information was taken from the rating calculations previously completed for this truss. The Load Factor Design (LFD) approach was used based on the 17th edition of AASHTO.
11. Our results indicate that member L17-L19 has a C/D ratio of 0.95 and the C/D ratio for member U18-U20 is 1.0. Other low values were 1.07 at member L23-U22 and 1.06 at member L13-U14. By using a more accurate SW load effect from the influence lines the C/D ratio at member L17-L19 is increased to 0.97. Reducing the vehicular LL+I DF to 2.13 (max for five lanes) increases the C/D ratio still further to 0.996 or approximately 1.0. Note that member L17-L19 is the governing member (C/D ratio of 1.22) from our previous rating calculations. This finding is the governing factor in limiting the pathway width to 8 feet because increasing the pathway width will increase the demands and require modification of the truss to increase capacity.
12. Therefore, the truss spans have adequate capacity for the additional SW (DL + LL) loading with the restriction of simultaneously carrying a maximum of 5 lanes of vehicular traffic.
13. Although the clear roadway width of 68 feet allows for a maximum of 5 standard 12 foot wide lanes with a total of 8 feet of shoulders, it may be necessary at some point in the future to operate the bridge with 6 lanes of traffic, presumably on a temporary basis. We calculate that for 6 EB lanes: 12', 11', 11', 11', 11', 12', with no shoulders, the maximum truss LL + I DF is 2.29, which is a 2% increase from the original design DF of 2.25. We also calculate that for 3 lanes EB and 3 lanes WB: 11', 10', 10', 10', 10', 11', with a 6' center median and no outside shoulders, the maximum truss LL + I DF is 2.26. We also note that the weight of a temporary Missouri Type F center barrier required to provide 3 lanes EB and 3 lanes WB, weighs 433 lb/ft, is less than the weight of the 15 psf FWS, or 1,020 lb/ft, included in the design DL, but not yet installed on the bridge. We re-evaluated our C/D ratios for the 6 lane configurations noted above, plus the SW dead load but with no SW live load, and find the minimum C/D ratio of 1.14 in member L17-L19. Therefore, the truss is adequate for operation with 6 lanes of traffic with the sidewalk installed but closed to bicycle/pedestrian traffic in this presumably temporary configuration. During final design, it should be determined if the provision for FWS should be eliminated, as we concluded for the US54 Bridge A4497 Bike/Pedestrian project.
14. The SW increases the reactions to the south truss bearings by about 10%. This is within the service load allowable for steel bearing on concrete. The pier cantilevers (at Piers 14-17) were evaluated for both shear and moment using the LFD approach. The pier cap cantilevers are adequate for the increased load.
15. In final design the truss joints and perhaps other truss components will need to be studied further along with a possible more detailed look at the substructures. This effort is beyond the scope of this feasibility study.
16. The centerline of the sidewalk on the truss spans is about 9.25 feet from the roadway gutter line. For the adjacent girder spans the centerline of sidewalk is about 6.6 feet from the roadway gutter line. Therefore, as the sidewalk leaves the truss, the sidewalk centerline must be moved about 2.5 feet laterally. This can be accomplished over several floorbeam spaces on the girder spans or by a direct right angle transition at Piers 14 and 17. Details for this alignment adjustment are not part of this preliminary concept study.
17. The typical floorbeams in the truss spans were designed for six lanes of traffic. The addition of the cantilever bracket to support the sidewalk will induce a negative moment into that end of the floorbeam resulting in a reduction in the positive moments. The negative moment will be within the capacity of the floorbeam to resist without modifications. Therefore, by inspection, the addition of the sidewalk system when connected to the floorbeam in a manner similar to that used for EB US 54 Bridge A4497 will not require any strengthening of the typical floorbeam.

The following paragraphs summarize the methodology and the results of our structural evaluation of the multi-girder and plate girder approach spans of EB I-70 Bridge A3292 with the proposed cantilevered sidewalk.

1. The sidewalk (SW) will consist of an 8-ft clear width FRP riding surface with fences on both sides, similar to the EB US 54 Bridge Jefferson City Bridge A4497 sidewalk project.
2. The sidewalk all-inclusive mass (weight) is assumed to be 375 lb/ft, the same as used for the truss spans. However, this estimate should be reviewed during final design.
3. A preliminary MDX Software run for multi-girder approach Spans 1-8 shows that the exterior and first interior girders do not have adequate capacity to support an attached SW. Based on this analysis, Spans 1-8 are overstressed with a controlling C/D ratio for Moment of 0.47 located in Span 7. It is also noted from the results that all span are overstressed with multiple locations have Ratings < 1.0. Because these spans are about 90 feet each, the most cost effective solutions are to either support the SW on independent girders and substructures, similar to the details used in Spans 1-2 of Bridge A4497, or to transition to grade with a ramp structure, similar to the structure in Span 5 of Bridge A4497.
4. In the girder spans, the SW is envisioned as cantilevered from the side of the south exterior girder of 3-Girder Approach Spans 9-13 and 17-18 by extending the existing floor beam cantilevers and using new diagonal members to brace the new cantilever end to existing exterior girder.
5. The centerline of sidewalk was assumed to be 15.875 ft outboard of the centerline of Girder G3. With this location the lever arm factor is 1.09. Combined with the unit weight of 375 lb/ft and the panel lengths of 24.25 ft, resulting in a sidewalk dead load (DL) to each floor beam cantilever point of 10.5 kips.
6. Per the plan general notes, the approach span girders were originally designed for 2.0 lanes per girder.
7. Per the project criteria the SW will be treated as an additional lane with lane reduction factors handled accordingly. The DF were calculated utilizing the same lever arm methodology as the 2010 ratings calculations by Jacobs, modified for sidewalk loading and lane reduction factors.
8. The following results are summarized from the MDX runs of the 3-Girder spans:
   8.1. Spans 9-13 generally have adequate capacity to support the new SW. Only two (2) locations have C/D ratios for Shear Stress < 1.0. Span 9 at a location 150' east of Pier 9 with a C/D ratio of 0.96 and Span 13 at a location 68.25' east of Pier 13 with a C/D ratio of 0.96. It is anticipated that with refinement of loading conditions Spans 9 & 13 will have adequate capacity to support the proposed SW with nominal shear reinforcement or no strengthening. This finding also supports the recommendation to limit the width of the pathway to 8 feet.
   8.2. Spans 17-18 have adequate capacity to support the proposed sidewalk without strengthening.
9. Based on these analyses, we conclude that 3-Girder Approach Spans 9-13 and 17-18 are adequate for the additional SW loading with the restriction in future to carrying a maximum of 5 lanes of vehicular traffic or 6 lanes of vehicular traffic and no SW LL.
10. Based on the analysis of the truss piers 14-17 being adequate it is assumed that the approach span piers are also adequate to support the additional weight from the SW.
11. Other approach span components will need to be studied further along with a more detailed look at the substructures during final design.

4.1.1.3 Pathway Concept

Based on the findings of the structural evaluation of both the main truss spans and the 3-Girder spans, we recommend that the clear width of the pathway be limited to 8 feet, which eliminates the need to install significant modifications to increase the structural capacity of these spans. The recommended maximum clear width of 8 feet is based on the use of a FRP deck, which is the lightest of the common deck alternatives of

concrete and steel. This is the same conclusion that reached on the evaluation of Bridge A4497 for a pathway addition in Jefferson City.

Figure 18 shows the concept for the pathway in Spans 1 – 8 and 19. In these spans, the multi-girder superstructure does not have sufficient capacity to support the addition of the pathway to the exterior and first interior girders. Consequently, the pathway will be supported on independent girders in the spans, and on cap beam extensions with independent columns and footings at the piers. This is the same configuration that was used in Spans 1 and 2 of Bridge A4497.

Figure 19 shows the concept for the pathway in Spans 9 – 13 and 17 – 18. In these spans, the pathway will be supported on extensions of the floorbeams of the existing 3-Girder system.

Figure 20 shows the concept for the pathway in Spans 14 – 16. In the spans, the pathway will be supported on brackets cantilevered from the main truss panel points. The typical pathway clear width will be 8 feet; however, the pathway will be widened near Piers 15 and 16 to provide overlooks with 12 feet of clear width. These are the same details that we used on Bridge A4497.

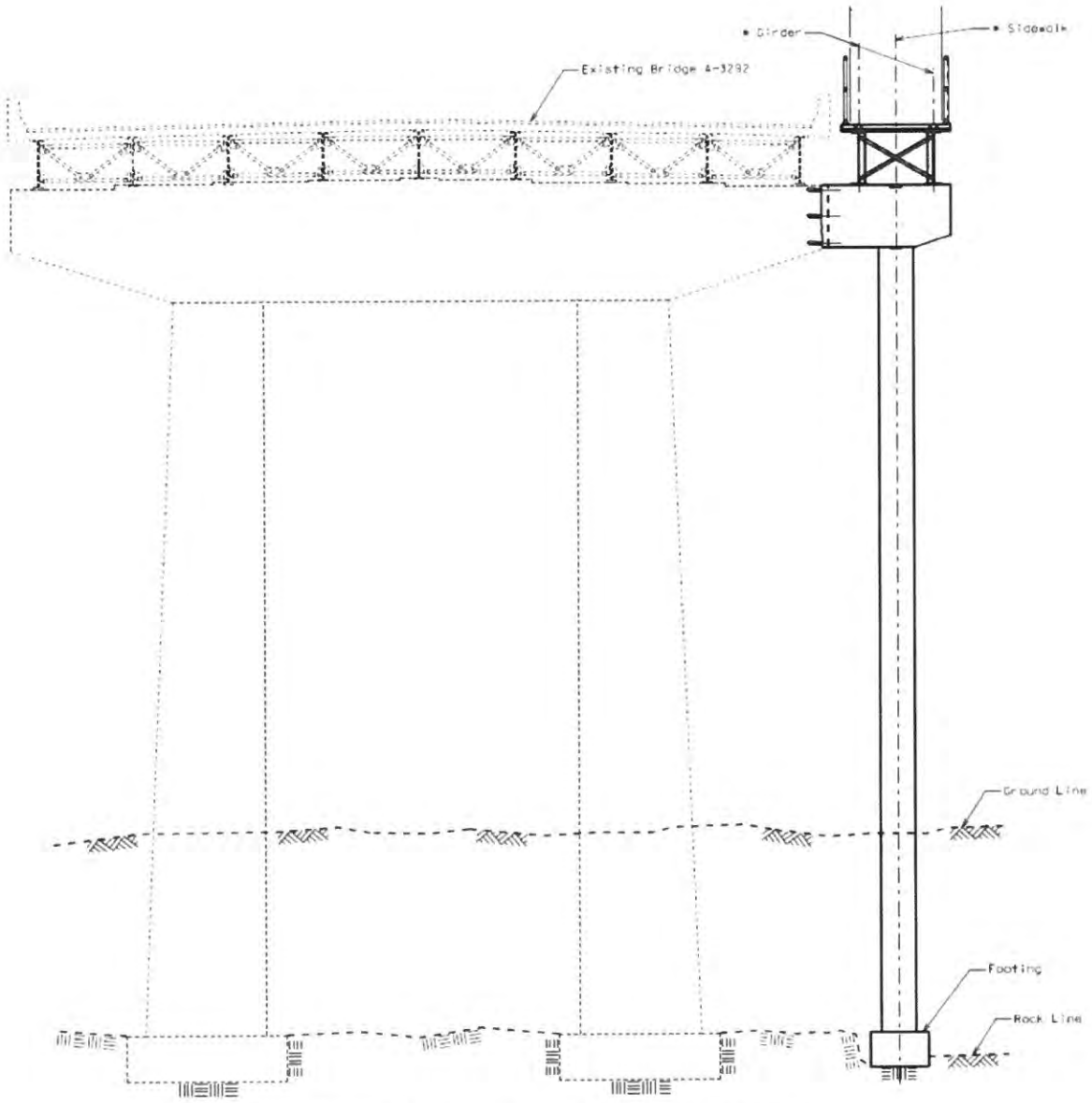


Figure 18: Pathway Concept in Multi-Girder Spans

4.1.1.4 Conceptual Construction Cost Estimate

Based on the concepts and details described above, our conceptual construction cost estimate for Alternative 1 is $15.0 million. The details of our estimate are presented in the appendix of this study.

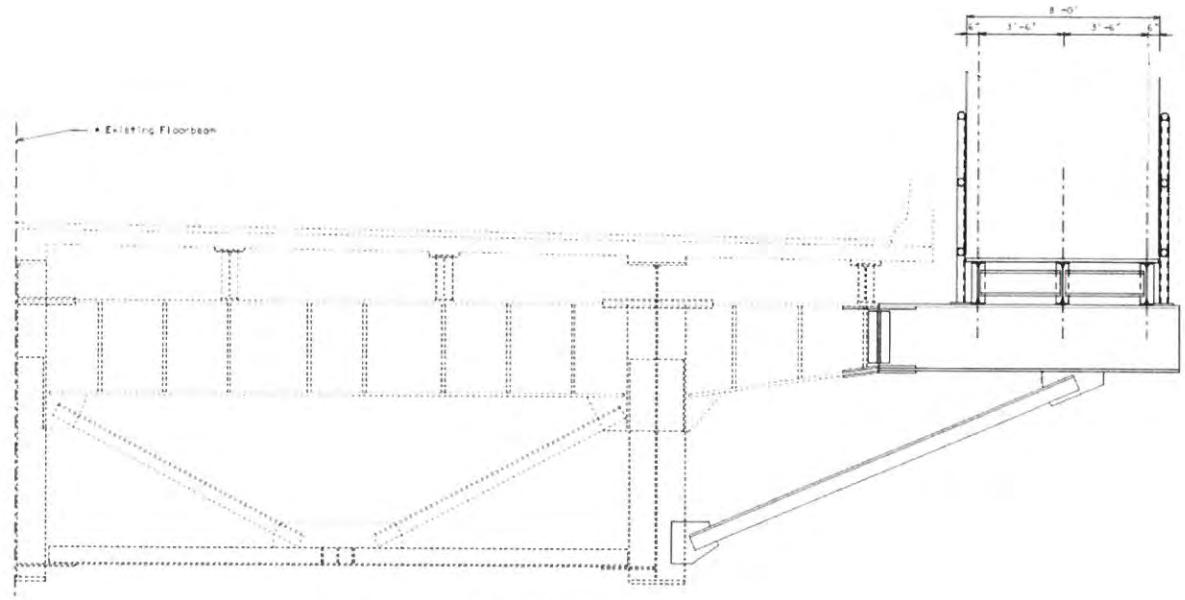


Figure 19. Pathway Concept in 3-Girder Spans

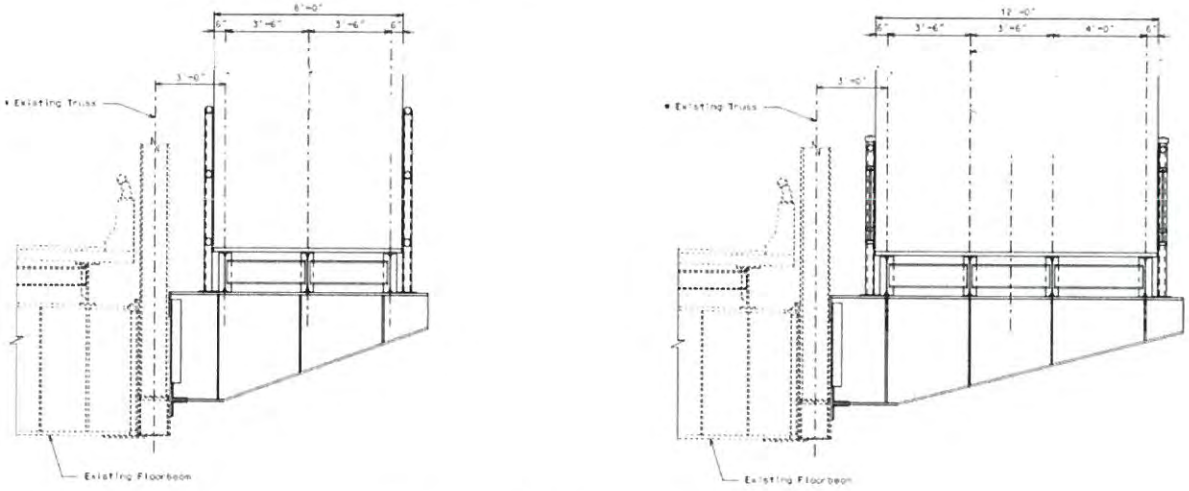


Figure 20. Pathway Concept in Truss Spans

4.1.2 Alternative 2: MO 370 Westbound Barrier Separated Pathway

4.1.2.1 Configuration

Figure 21 shows the proposed barrier separated pathway layout for the Westbound (WB) MO 370 Bridge and the ground level approaches. This alternative consists of the following three elements:

1. The existing and future (by others) at-grade pathways on the North side of WB Route 370 will connect the planned trail along Highway 94 connecting to the Boschert Greenway to the West and to the Katy Trail to the East with the existing opening in the guardrail near the West end of the existing WB MO 370 Bridge. The portion of the at-grade pathway that connects the West end of the WB MO 370 Bridge to the Katy trail is included in this study. The pathway on the existing roadway embankment will be ADA compliant with a maximum grade of 5% (1:20). The remainder of the at-grade pathway will follow existing grades. This approach pathway is approximately 1,130 feet long and is shown in green on the left side of Figure 21.
2. New Type FT Barrier will be added to the existing roadway from the existing opening in the guardrail near the West end of the WB Route 370 Bridge A4557, along the right shoulder of the existing bridge, to the existing ground level pathway near the East end of the WB Route 370 Bridge, thereby separating vehicle traffic from bicycle and pedestrian traffic. This portion of the pathway will require approximately 3,960 feet of barrier and is shown in red on Figure 21.
3. The existing at-grade pathway on the North side of WB MO 370 will connect the new barrier separated crossing with Missouri Bottom Road and the North end of the existing Riverwoods trail. This portion of the pathway is shown in blue on Figure 21 and has been recently reconstructed, so no additional work on this approach pathway is included in this feasibility study.

4.1.2.2 Structural Evaluation

Figure 22 shows the general elevation of the MO 370 Bridge A4557. The 3,455 foot long structure from west to east consists of 11 spans of precast concrete girders, each about 110 feet long; 1 truss span of 625 feet, 3 plate girder spans ranging from 210 to 250 feet each; and 8 precast concrete girder spans, each 120 feet long. The existing roadway deck is 57'-6" wide, which provides for two 16" wide barriers, 9'-5" right and left shoulders, and three 12 foot traffic lanes.

The following paragraphs summarize the methodology and results of our structural evaluation of WB MO 370 Bridge A4557 with a barrier separated pathway.

1. The sidewalk (SW) is envisioned as being 6 feet wide that will be created by reducing the roadway width available for vehicular traffic. The existing roadway deck width will remain unchanged. The existing right exterior barrier will be retained and augmented by placing a chain link fence or other type of railing system on top of it to increase the height to about 6 feet. A new 16 inch wide concrete Type FT roadway barrier with rail extension to achieve about a 6-ft height will be constructed to separate the sidewalk from the vehicular roadway.
2. The addition of a new barrier and the conversion of a portion of the deck to an 6-ft sidewalk will reduce the usable vehicular roadway width to 47'. This would likely be striped as three 12-ft lanes with a shoulder width of 11' divided between left and right shoulders (perhaps 8' right and 3'-0" left).
3. The weight of the additional barrier is estimated to be 340 lb/ft, exclusive of any additional fence.
4. The investigation included the truss span (Unit 4), steel girder spans (Unit 5) and concrete multiple beam spans (Units 1-3 and 6-8), see Figure 22.

Figure 21: WB MO 370 Bike/Pedestrian Barrier Separated Pathway Layout

5. Per the design plans each truss line was designed for 1.8 lanes of traffic (allowable stress design was used for the truss members). Based on independent calculations this appears to be achieved with three lanes loaded; with four lanes loaded the Distribution Factor (DF) decreases to 1.72 and with five lanes loaded the DF is 1.90. Note that based on the AASHTO standards the existing 54'-10" roadway would have required that the bridge be designed for four lanes. Five lanes of traffic would not likely have been considered in the original design.
6. Per the stress sheet, the truss member design included a bending moment. It is not clear what the source of this moment is, but it may simply be due to the member self-weight. For purposes of the present investigation the effect of the bending moment in the member check was based on the allowable unit stress and the bending moment shown in the stress table. This bending moment effect was then combined with the computed direct force C/D ratio to determine the total C/D ratio.
7. Per the project criteria the SW will be treated as a traffic lane with lane reduction factors handled accordingly. With this assumption, the maximum DF occurs with for 2 lanes plus SW and is 1.90 lanes per truss or slightly greater than the original design DF of 1.80.
8. Our investigation considered various combinations of vehicular traffic lanes with the SW loading and included the additional barrier.
9. The Jacobs in-house program P7308 was used to evaluate the truss for the SW loading and the additional barrier DL. The DL was input as 17.7 kips per panel point (bottom chord). The SW was input as 31.2 kips per panel point (75 psf x 8' wide x 52' panel) for 1.0 SW lanes. The resulting member forces were then multiplied by the appropriate fractional parts per the various load

combinations being checked. For the top and bottom chords the entire span was loaded with SW LL. For the diagonals influence lines were used to determine the appropriate loading pattern.

10. The total system DL (exclusive of the new SW barrier) was taken from the stress sheets in the plans. Note that this would include the FWS of 35 psf of roadway. The vehicular live load plus impact (LL+I) results were also taken from the stress table. These were divided by 1.80 to develop results for 1.0 lanes of traffic and these values were multiplied by the appropriate fractional parts of lanes per the various loading cases checked.
11. A spreadsheet was used to determine C/D ratios for all truss members. The gross and net member areas and the Kl/r ratios used in the check were taken from the design plan stress sheet. The Load Factor Design approach was used based on the 17th edition of AASHTO.
12. Since the bridge has a high dead load to live load ratio it is expected that the C/D relationship looks much better when considered under the ASHTO LFD requirements rather than allowable stress design (ASD) used in the original design. Consequently, we converted the plan ASD member forces to factored member forces and checked the members by LFD. Our results indicate that the top chord governs. The lowest C/D ratio for top chord members was 1.29 in the original design. With the addition of the SW in combination with four traffic lanes (lanes less than 12 feet wide) the lowest C/D ratio is 1.25. As a further check we evaluated the Group I case of 1.5(D+L+I), recommended in the AASHTO Guide Specification for Load Factor Design of Truss Bridges and the lowest resulting C/D ratio for this case was 1.19.
13. Therefore the truss is adequate for the SW configuration even in combination with four lanes of vehicular traffic. Note that in this arrangement the roadway lanes will be less than 12 feet wide (about 11.375 feet on average with no shoulders). This would correspond to a possible temporary case when additional lanes are desired to be used in this corridor.
14. The typical intermediate truss floorbeam was briefly evaluated. The increase in bending moment is very slight from the addition of the SW barrier. Additionally, the effect of the SW in place of a vehicular lane appears to lead to negligible increase in the LL moment.
15. The reactions to the piers are likely not changed very much by the change in roadway layout to include the SW, therefore, these components were not investigated.
16. In final design the truss joints and perhaps other truss components will need to be studied further along with a possible more detailed look at the substructures. It is, however, expected that these components will have sufficient capacity to handle the revised arrangement.
17. Our investigation of the steel girder span LL DF indicates that the change in deck arrangement to incorporate a SW will not lead to an increase in this factor. Similarly our investigation of the typical concrete beam span indicates that the change in deck arrangement will not lead to an increase in design moments.
18. Review of the plans indicate that some provisions have been made for using the existing right shoulder as a bike path (the shoulder is signed as part of the Mississippi River Trail – MRT). This has included localized use of flat plates over the widest finger plate expansion devices. Other details (other finger plates and drain inlets, for example) will require review to judge suitability and possible modification to be compatible with the SW.

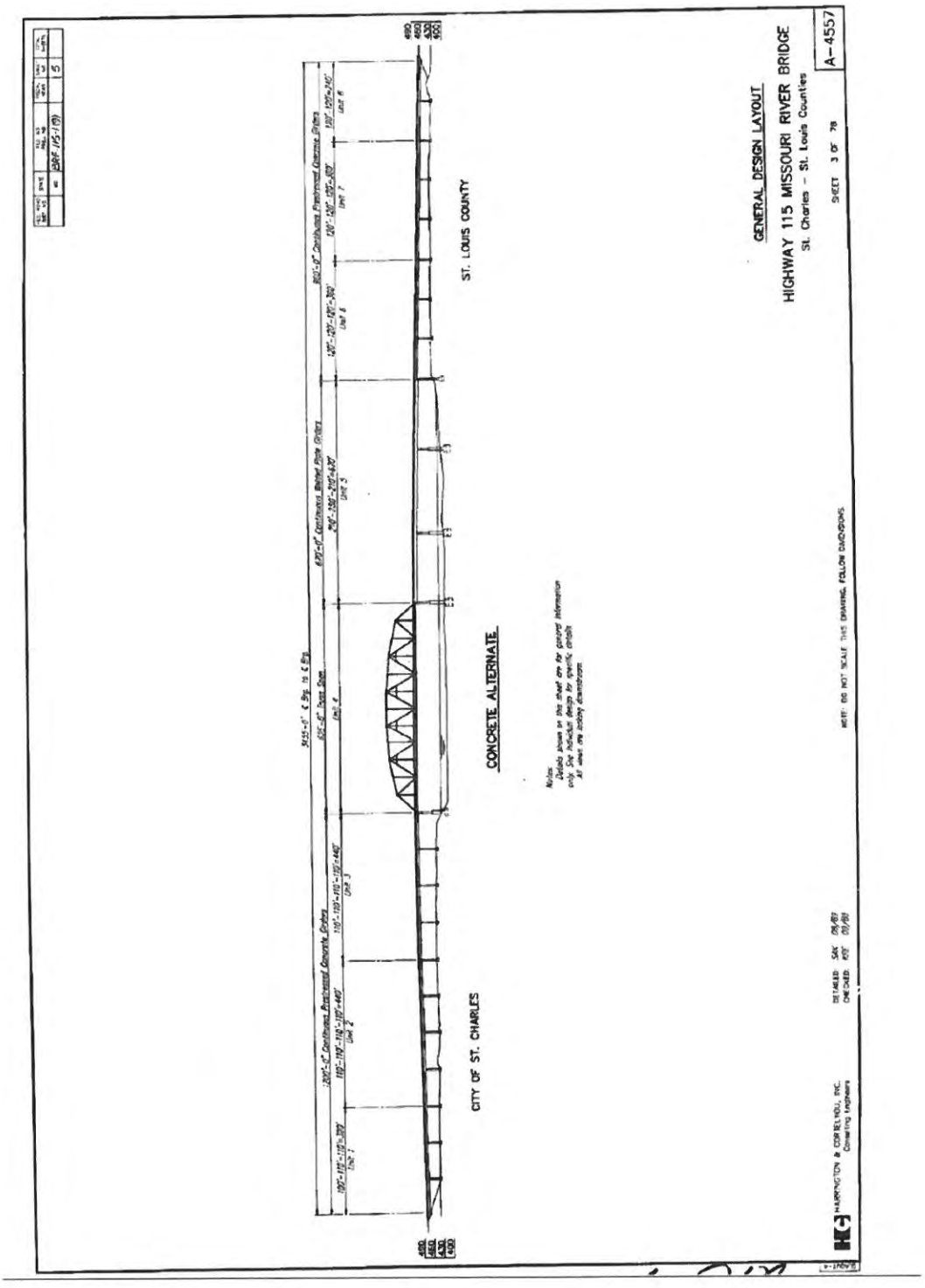


Figure 22. WB MO 370 Elevation

4.1.2.3 Pathway Concept

Based on our evaluation, the maximum width of a barrier separated path on Bridge A4557 is governed by the traffic lane and shoulder configuration instead of the structural capacity of the bridge. The following table shows alternatives for pathway width and traffic lane configurations.

Table 3: Pathway Width and Traffic Lane Configuration Alternatives

Pathway clear width with 16" wide barrier	Traffic lanes (12'-0" standard)	Total shoulder width	Right shoulder width	Left shoulder width
6'-0"	3 @ 12'-0"	11'-6"	8'-6"	3"-0"
6'-0"	4 @ 11'	3'-6"	1'-9"	1'-9"
8'-0"	3 @ 12'-0"	9'-6"	6'-6"	3'-0"
8'-0"	4 @ 11'-4 ½"	0'-0"	0'-0"	0'-0"
10'-0"	3 @ 12'-0"	7'-6"	6'-6"	1'-0"
10'-0"	4 @ 10'-10 ½"	0'-0"	0'-0"	0'-0"

As shown above, 3 standard 12 foot traffic lanes can be provided with reduced shoulders and both 8'-0" and 10'-0" pathway clear widths; however, operation with 4 traffic lanes will require no shoulders and sub-standard width lanes for both the 6'-0" and 10'-0" pathway clear widths. If operation with 4 traffic lanes in the future is a necessary constraint, the alternatives include striping with no shoulders and less than standard width lanes, or removing the barrier separated pathway from the bridge deck when converting to 4 lanes and possibly adding a cantilevered pathway.

Review of the impact of a barrier separated pathway on maintenance and inspection of the bridge reveals that the Aspen Aerial A-62 under bridge inspection trucks used by MoDOT cannot reach over an 8'-0" wide barrier separated path located on the right shoulder to inspect the right side of the bridge. Solutions to this issue include the following alternatives:

1. 8'-0" clear barrier separated path on the right shoulder with inspection from an Aspen A-75 on the left shoulder and inspection of the upper portions of the right side of the truss from a manlift or conventional bucket truck.
2. 10'-0" clear barrier separated path on the right shoulder with inspection from an Aspen A-62 on the left shoulder and in the pathway on the right shoulder.
3. 6'-0" clear barrier separated paths on the right shoulders of both WB and EB bridges with inspection of the right side of the bridge with an Aspen A-62 reaching over the paths. With a 6'-0" clear path, there is room for 3 lanes @ 12'-0, 3'-0" left shoulders (same as existing), and 8'-6" right shoulders, and the path on each bridge would be marked for one way bicycle and pedestrian use.

Future operation of the MO 370 Bridges with 4 lanes may require removal of the barrier separated paths to maximize the available roadway deck for traffic lanes and shoulders, regardless of the choice of 6'-0", 8'-0", or 10'-0" pathway widths. Based on review of the current and projected traffic usage of MO 370, MoDOT concluded that it will not be necessary to go to 4 traffic lanes on either bridge in the near future and that their preferred and acceptable alternative is one way 6'-0" clear width barrier separated paths on both WB and EB MO 370 Bridges. This solution provides the largest right shoulder in the current 3 lane configuration, allows

inspection of the right side of the bridge using their Aspen A-62 inspection truck reaching over the pathway, and provides the most roadway width for future 4 lane operations with reduced lanes and shoulders.

Figure 23 shows the Bridge A4557 roadway deck configured for a 6'-0" barrier separated path on the right shoulder. We recommend revising the roadway drains along the right barrier to be parallel with the barrier and equipped with bicycle safe gratings as part of this alternative.

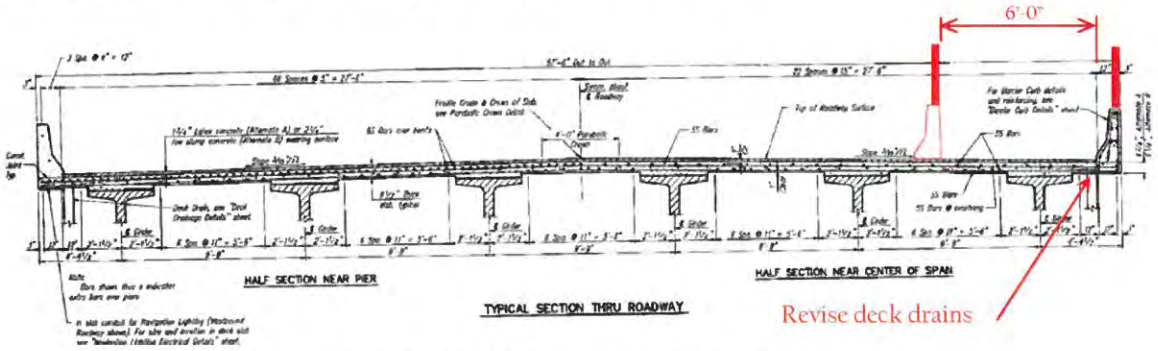


Figure 23. WB MO 370 Barrier Separated Pathway Concept

Figure 24 shows the proposed barrier separated pathway layout for WB and EB MO 370 Bridges and the ground level approaches. This alternative consists of the three elements discussed above for WB MO 370 with the addition of ground level pathways on the EB side, and one way bicycle and pedestrian use of both

pathways. The discussion of structural evaluation and conclusions of the WB MO 370 Bridge also applies to the EB Bridge.

Figure 24: WB and EB MO 370 One Way Barrier Separated Pathway Layout

4.1.2.4 Conceptual Construction Cost Estimate

Based on the concepts and details described above, our conceptual construction cost estimate for Alternative 2 on WB MO 370 is $1.4 million. The details of our estimate are presented in the appendix of this study. If a second barrier separated pathway is planned for EB MO 370, our conceptual construction cost estimate for Alternative 2 is $2.8 million for both WB and EB.

4.1.3 Alternative 3: Route 370 Westbound Cantilevered Pathway Attachment

4.1.3.1 Configuration

Figure 25 shows the proposed cantilevered attachment pathway layout for WB MO 370. This alternative consists of the following three elements:

1. The existing and future (by others) at-grade pathways on the North side of WB Route 370 will connect the planned trail along Highway 94 to the West and to the Katy Trail to the East with the West end of the cantilevered path on WB MO 370 Bridge. The portion of the at-grade pathway that connects the West end of the WB MO 370 Bridge to the Katy trail is included in this study. The pathway on the existing roadway embankment will be ADA compliant with a maximum grade of 5% (1:20). The remainder of the at-grade pathway will follow existing grades. This approach pathway is

approximately 1,000 feet long and is shown in green on the left side of Figure 25. The existing opening in the guardrail near the West end of the MO 370 Bridge will be closed and the bike lane markings on the right roadway shoulder will be removed.

2. A new elevated bicycle/pedestrian pathway on a cantilevered attachment along the North Side of the existing WB MO 370 Bridge A4557. The 3,455 foot long structure from west to east consists of 11 spans of precast concrete girders, each about 110 feet long;1 truss span of 625 feet, 3 plate girder spans ranging from 210 to 250 feet each; and 8 precast concrete girder spans, each 120 feet long, see Figure 22. The pathway will be outside of the existing roadway barrier and truss, and will be protected by a fence on both sides of the pathway. The elevated pathway will follow the grades of the existing bridge. The proposed bridge mounted pathway is shown in red on Figure 25.
3. An at-grade pathway on the North side of WB MO 370 will connect the new cantilevered pathway at the East end of the bridge with Missouri Bottom Road and the North end of the existing Riverwoods trail. The portion of the pathway is shown in blue on the right side of Figure 25 and has been recently reconstructed, so no additional work on this approach pathway is included in this feasibility study. The existing opening in the guardrail near the East end of the bridge will be closed and about 150 feet of new at-grade pathway shown in green on the right side of Figure 25 will be constructed.

4.1.3.2 Structural Evaluation

By inspection, the precast girder spans (Units 1, 2, 3, 6, 7, and 8 in Figure 22) cannot likely support the addition of a cantilevered pathway. Because the spans in these units are each 100 to 120 feet long, the most economical solution is to support the pathway on independent girders and substructures, or to transition to ground level with a ramp structure. This is the same conclusion that we reached for similar spans on Bridge A4497 in Jefferson City.

The following paragraphs summarize the methodology and results of our structural evaluation of the truss spans (Unit 4) of WB MO 370 Bridge A4557 with a cantilevered pathway attachment.

4. Sidewalk (SW) is envisioned as cantilevered from the side of the north truss using connection details similar to those developed for the Jefferson City Bridge sidewalk project (see Figure 20 for general concept).
5. The sidewalk will consist of an 8-ft clear width FRP riding surface with fences on both sides.

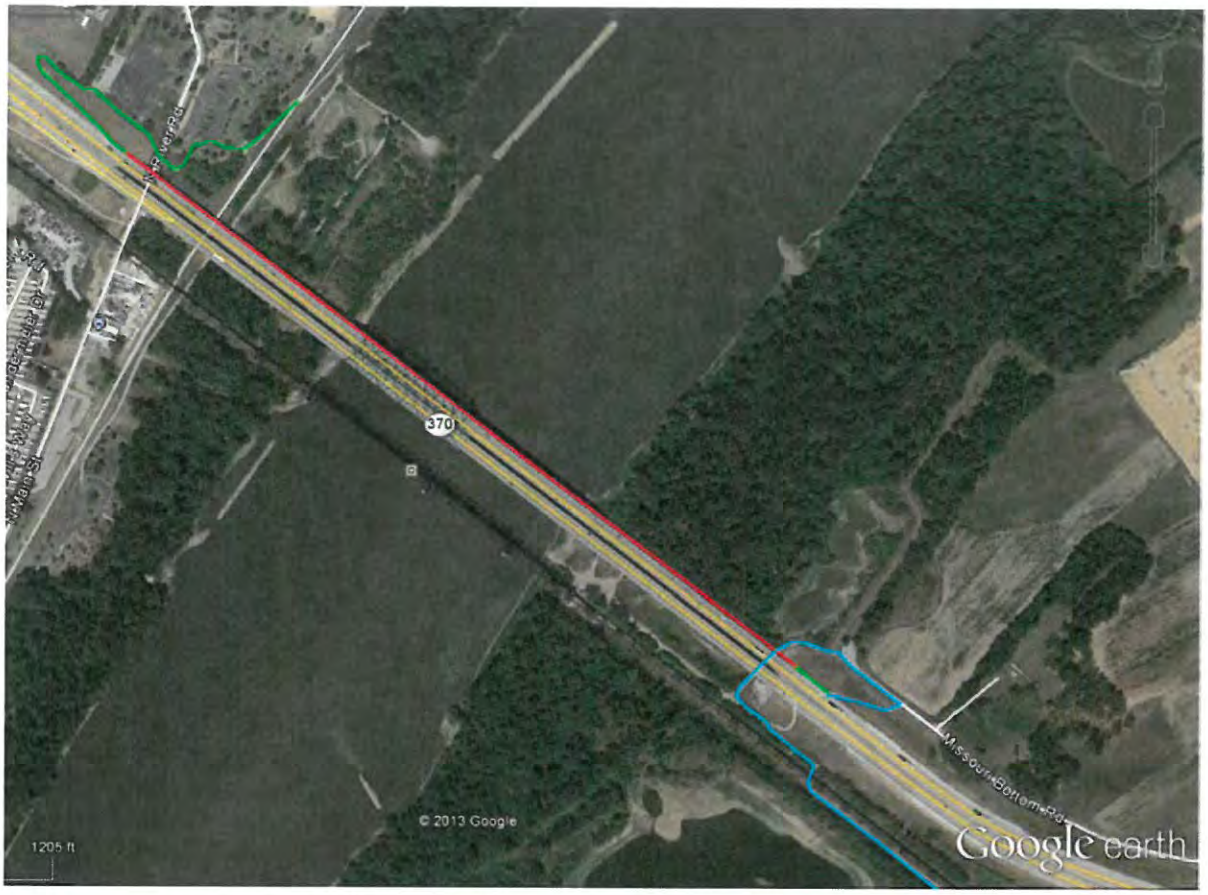


Figure 25: WB MO 370 Bike/Pedestrian Cantilevered Attachment Pathway Layout

6. Per Bridge A4497 load rating analysis the sidewalk all-inclusive mass (weight) is 375 lb/ft.
7. The centerline of sidewalk was assumed to be 6.5 feet outboard of the centerline of the north truss line.
8. The lever arm for a cantilevered path on the north truss is (61+6.5)/61 = 1.11.
9. The truss joint spacing is 52 feet along the bottom chord. Therefore, SW Dead Load (DL) = 52 * .375 * 1.11 = 21.6 kips per joint and SW Live Load (LL) = 52 * 8 * .075 * 1.11 = 34.6 kips per joint.
10. The Jacobs in-house program PFA was used to analyze the truss with SW DL and SW LL and the results were combined with the plan loads listed on the Stress Sheet. For the top and bottom chords the entire span was loaded with SW LL. For the diagonals influence lines were used to determine the appropriate loading patterns.
11. The plan Distribution Factor (DF) is 1.80, which corresponds to 3 lanes loaded. With the cantilevered path and the plan roadway width, the DF for 2 lanes loaded is 1.54 and for 4 lanes loaded is 1.72. The plan LL+I, based on DF= 1.8 lanes per truss, was ratioed by DF2 Lanes/1.80 and DF 4 lanes/1.80 to obtain LL+I for 2 and 4 lanes loaded.
12. Per the stress sheet, the truss member design included a bending moment. It is not clear what the source of this moment is, but it may simply be due to the member self-weight. For purposes of the present investigation the effect of the bending moment in the member check was based on the allowable unit stress and the bending moment shown in the stress table. This bending moment effect was then combined with the computed direct force C/D ratio to determine the total C/D ratio.

13. Note, the plan DL values include a FWS allowance of 35 psf, which has not yet been installed. If necessary, additional capacity for the cantilevered pathway can be obtained eliminating the provision for FWS.
14. A spreadsheet was used to determine C/D ratios for all truss members based on the LFD approach from the AASHTO 17th edition.
15. Our results indicate that the top chord governs. With the addition of a cantilevered SW in combination with both three, or four traffic lanes, the lowest C/D ratio is 1.14. As a further check we evaluated the Group I case of 1.5(D+L+I), recommended in the AASHTO Guide Specification for Load Factor Design of Truss Bridges and the lowest resulting C/D ratio for this case was 1.12.
16. Based on the results of this analysis, the truss is adequate for the cantilevered SW configuration, even in combination with four lanes of vehicular traffic. In this arrangement with the cantilevered SW, the existing 54'-10" roadway will provide 4 – 12'-0" lanes and 6'-10" total for shoulders (6'-0 right and 10" left).

The following paragraphs summarize the methodology and results of our structural evaluation of the plate girder spans (Unit 5) of WB MO 370 Bridge A4557 with a cantilevered pathway attachment.

1. Structural Model of Exterior Girder. The program MDX was used to analyze a base line girder model of the exterior girder with the AASHTO Load and Resistance Factor Design (LRFD) provisions. By inspection, the interior girder will not govern the sidewalk attachment. The Tributary DL was calculated. It should be noted that the effective slab width for composite action was per LRFD criteria. In addition, only the structural slab was considered in the composite section properties. The 2 " low slump wearing surface was not included in the composite section properties. The load of the low slump wearing surface was applied as a composite load assuming it was poured after the 5 " structure deck had fully cured.
   Once initial analysis was complete, the dead load deflection from MDX was compared to the "Total Dead Load Deflection Diagram" from sheet 31 of the Contract 4 plans. The computed deflections were about 10% smaller than the plan deflections, which could be attributed to miscellaneous steel or concrete weight and assumed effective section properties. Additional dead load was added as a non-composite load (249 lb/ft) to approximately match DL deflections on record drawings.
   The model with the additional DL was taken as the base model. By inspection of tributary slab width and plate girder plans, it is reasonable that the exterior girder has reserve capacity. The interior girder and exterior girder have the same cross section, but the interior girder is subjected to more DL and LL. It is reasonable to assume the interior girder controlled the original design.
2. Additional Cantilevered Sidewalk Dead Load and Live Load. The dead load of the 8 foot wide FRP deck sidewalk attachment was taken as approximately 375 lb/ft, consistent with the other investigations in this study. When including the moment arm from the attachment point, the load is increased by a factor of 1.485 to 557 lb/ft. This DL was applied to the structure as non-composite point loads at increments consistent with the cross frame spacing.
   The sidewalk will be 8' wide and will have a live load of 75 psf. Therefore, the linear design sidewalk live load is 600 lb/ft. This load will be increased to 891 lb/ft in the MDX analysis to adjust for the magnification due to the moment arm, which is 1.485.
3. MDX Model with Sidewalk Dead Load and no Live Load. The dead load of the sidewalk was added to the base model in conjunction with the basic LRFD HL-93 design live load. This resulted in a minimum C/D ratio of 1.08. Note: This is based on the full 35 psf FWS present on the structure. Therefore, the Unit 5 is capable of carrying the dead load of an 8' wide FRP deck cantilevered sidewalk with the LRFD HL-93 design live load and no sidewalk live load.

4. MDX Model with Sidewalk Dead Load and Live (w or w/o FWS). The sidewalk live load is an additional live load case and effects the multiple presence factor (MPF) factor used for the HL-93 design case. The governing load case is two roadway lanes loaded with the sidewalk live load. The live load was multiplied by a MPF of 90%, per the project LFD criteria. This is conservative because LRFD 3.6.1.1.2 allows an 85% MPF for LRFD. This load case resulted in a minimum C/D ratio of 0.92 when full FWS was present on the structure.
   When the 35 psf FWS load was removed from the analysis the minimum C/D ratio was 0.98, which is a slight overstress for the full sidewalk live load case.
5. Conclusions from Analysis. Based on this analysis, adding an 8 foot wide FRP deck to Unit 5 of Bridge A4557 is a feasible alternative. The exterior girder can carry the added dead load of the sidewalk and is only slightly overstressed with full sidewalk live load on the structure and no FWS.
   In addition, it may be possible to reduce the dead load of the sidewalk to improve the D/C ratio. The weight of the 8 foot wide FRP sidewalk deck (375 lb/ft) was based on the Load Rating Analysis Report for the Tied Arch Truss (Bridge A4497) over the Missouri River in Jefferson City, Missouri. This linear weight of sidewalk deck also included the weight of the support bracket. The span of the sidewalk support beams between panel points on the Tied Arch Truss is a maximum of 33'-8 ". The required span for the sidewalk support beams on Unit 5 of Bridge A4557 would be the spacing of the cross frames, which is no greater than 25 feet. Therefore, the size of the sidewalk support beams and support brackets can possibly be reduced in final design for the reduced span length.

4.1.3.3 Pathway Concept

Based on the results of our evaluation, we recommend limiting the width of a cantilevered pathway to 8 feet with a FRP deck and details similar to those used on the A4497 pathway in Jefferson City. We also recommend eliminating the provision for a FWS in Unit 5. These limitations will eliminate, or minimize the need for structural modifications to the plate girders in Unit 5 (see Figure 22).

Because the framing system of the plate girder spans of Unit 5 does not use floor beams like the corresponding spans in EB I-70 Bridge A3292, our concept for the cantilevered pathway in Unit 5 is similar to the steel brackets shown in Figure 20 for the truss spans of EB I-70 Bridge A3292, except that in Unit 5 the bracket would be connected directly to exterior girder. During final design, the cross frames spaced at 25 feet unit this unit will need to be evaluated for their capacity to resist the loads from the cantilevered pathway.

We recommend supporting the pathway on independent girders and substructures in the precast girder spans of Units 1, 2, 3, 6, 7, and 8 (see Figure 22). Our concept for these girders and substructure additions is similar to that shown in Figure 18for EB I-70 Bridge A3292. We also recommend that during final design, the cost of using precast concrete girders be compared with the cost of steel plate girders for these spans.

Our concept for the cantilevered pathway in the truss span of Unit 4 (see Figure 22) is the same as shown in Figure 5 for the truss spans of EB I-70 Bridge A3292.

4.1.3.4 Conceptual Construction Cost Estimate

Based on the concepts and details described above, our conceptual construction cost estimate for Alternative 3 is $13.7 million. The details of our estimate are presented in the appendix of this study.

4.1.4 Alternative 4: New Cable-Stayed Bicycle/Pedestrian Bridge along Old Route 115 Alignment

4.1.4.1 Configuration

Figure 10 shows the proposed layout for a new bicycle/pedestrian bridge along the Old Route 115 alignment in downtown St. Charles. This original highway bridge at this location was removed in 1997. This alternate consists of the following three elements.

1. A new ramp structure that connects the elevated bridge deck with ground level at the West end of the bridge near the Katy Trail. The pathway on the ramp will be ADA compliant with a maximum grade of 5% (1:20). We estimate that the bridge deck will be about 50 feet above the ground at the end of the bridge, so this structure will contain about 1,000 feet of ramp.
2. A new cable-stayed bicycle/pedestrian bridge with cable unit spans of 360', 800', and 360', as shown in Figure 27. Based on a letter from the United States Coast Guard dated November 17, 2014 (included in appendix) the left descending pier should be in line with the edge of the left bank dikes, and a horizontal clearance of at least 800 feet is required in the navigation span. The vertical clearance required for this bridge is 81.0 feet above zero on the St. Charles gauge (Elevation 413.585 NGVD 29), which is similar to the vertical clearance provided under the EB I-70 Bridge. This concept provides a clear pathway width of 16 feet on the bridge and 5 foot high railings on both sides.
3. A new ramp structure that connects the elevated bridge deck with ground level at the east end of the bridge near the Riverwoods Trail. The pathway on the ramp will be ADA compliant with a maximum grade of 5% (1:20). We estimate that the bridge deck will be about 50 feet above the ground at the end of the bridge, so this structure will contain about 1,000 feet of ramp. During final design, the cost of extending the bridge to transition to grade can be compared to the cost of the ramp structure to determine the most cost effective alternative.

4.1.4.2 Conceptual Construction Cost Estimate

Based on the concepts and details described above, our conceptual construction cost estimate for Alternative 4 is $51.1 million. The structural quantities for our estimate are based in part on the information reported for the cable-stayed bicycle/pedestrian bridge over the Missouri River at Omaha, Nebraska – Council Bluffs, Iowa. The details of our estimate are presented in the appendix of this study.

Figure 26: Layout of New Bicycle/Pedestrian Bridge on Old Route 115 Alignment

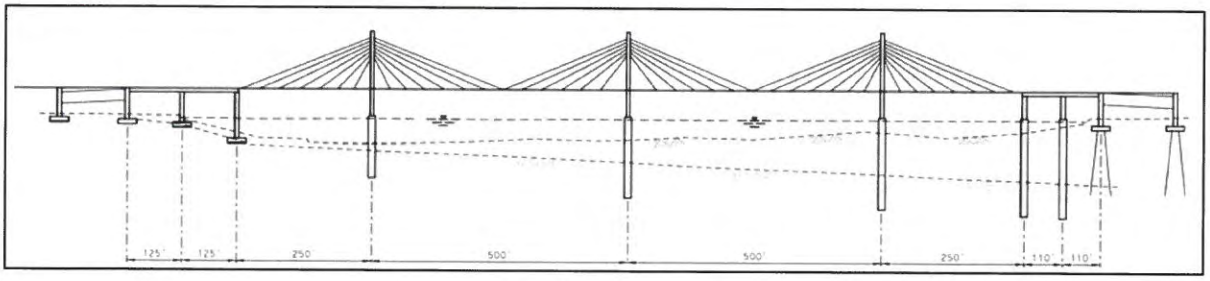


Figure 27: Cable-Stayed Bridge Alternative

4.1.5 Alternative 5: New Plate Girder Bicycle/Pedestrian Bridge along Old Route 115 Alignment

4.1.5.1 Configuration

The configuration shown in Figure 28 was also considered as a possibility for this crossing based on our initial estimates of the required horizontal clearance in the navigation span. The ramps at the start and end of this bridge are the same as described in Items 1 and 3 of the configuration description of Alternate 4. This alternate differs from Alternate 4 in that the cable-stayed main span is replaced by a 400', 500', 400' welded plate girder unit, and the approach spans are revised as shown in Figure 28. Like Alternate 4, this concept provides a clear pathway width of 16 feet and 5 foot high railings on both sides.

This alternative was considered in the feasibility study because for spans of about 500 feet, this structural system is expected to be cost competitive with similar length cable-stayed spans. However, based on the USCG requirement for 800 feet of horizontal clearance in the navigation span, the plate girder alternative is not likely to be cost competitive with a similar length cable-stayed structure, and may not be practical from the design and construction perspectives. Therefore, we conclude that this alternative is not feasible.

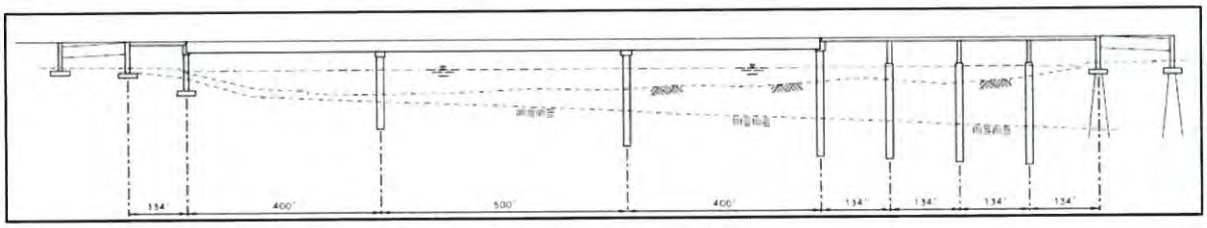


Figure 28. Plate Girder Bridge Alternative

4.2 Maintenance of Traffic during Construction

This section of the study proposes preliminary concepts for maintenance of traffic during construction of the bike/pedestrian facility crossing over the Missouri River at St. Charles. The maintenance of traffic concepts were developed for two of the proposed alternatives: 1) construction of a cantilevered bike/pedestrian facility on the eastbound (EB) I-70 Blanchette Bridge, and 2) construction of a barrier separated bike/pedestrian facility on the westbound (WB) MO 370 Bridge over the Missouri River. MoDOT and MUTCD Standards for maintenance of traffic will be followed for the design of this project.

The construction of the bike/pedestrian facility will be similar to the recent construction of a bike/pedestrian facility constructed on the US 54 bridge over the Missouri River at Jefferson City. Figure 29 shows a picture of the construction staging and work zone for that project and similar construction staging and work zone can be used for this project, as detailed in Figure 30.

Figure 29: US 54 Construction Staging

4.2.1 Maintenance of Traffic for Eastbound I-70 Alternative

Due to the limited shoulder width on the EB I-70 Bridge over the Missouri River it is recommended that the right lane of EB I-70 from the 5th Street southbound on ramp to past the levee on the east side of the bridge be closed using a temporary traffic control barrier. The traffic barrier could be set 2 feet south of the existing lane line to provide a recovery area for traffic in the adjacent lane. As shown in the typical section for the bridge in Figure 2, the remaining 4 lanes would remain in place as 11-foot lanes and the existing 6-foot 6-inch inside

shoulder would remain with a temporary 2-foot shoulder for the outside lane. This would give the contractor about 13 feet to work from on the existing bridge.

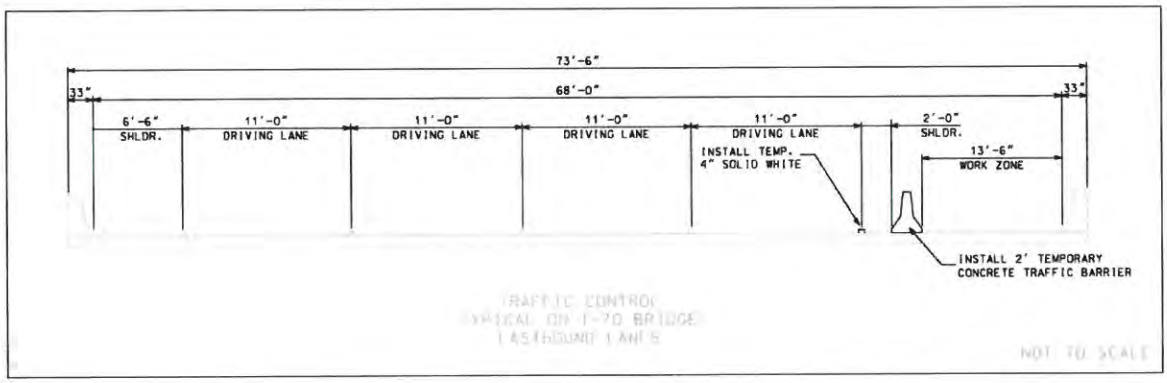


Figure 30: Proposed Eastbound I-70 Blanchette Bridge Typical Section

This proposed maintenance of traffic alternative would require the 5th Street northbound to I-70 eastbound ramp be closed during the project and the traffic detoured to MO 94 via westbound Veterans Memorial Parkway. This ramp was also closed during the recent WB I-70 Blanchette Bridge Rehabilitation Project. The closure of the ramp is necessary due to the limited merge area that would be available when the right lane is closed and the ramps close proximity to the work zone for the proposed approach to the bike/pedestrian facility. During the WB Blanchette Bridge Rehabilitation Project a temporary signal was installed at the Veterans Memorial Parkway and northbound MO 94 connector intersection for the detour. The temporary signal should be evaluated again to see if it would be justified because of the detoured traffic.

Reducing the bridge from 5 lanes to 4 lanes in the eastbound direction would likely cause a small increase in congestion on I-70 during peak hours and may require some traffic to either divert to other Missouri River crossings or adjust their travel time. I-70 was reduced to 3 lanes in each direction during the WB Blanchette Bridge Rehabilitation Project and even though there was an impact to traffic, it was mostly contained to the peak hours. This project would have less of an impact to traffic because the bridge is only being reduced to 4 lanes and only in the eastbound direction.

If needed by the contractor during construction, the right lane adjacent to the work zone could be temporarily closed during overnight hours but could be required to remain open the rest of the time. The speed limit for the work zone would be reduced from the existing 60 mph to 50 mph during construction.

Figure 31 shows the proposed temporary traffic control near the 5th Street interchange and would continue to the east end of the bridge. The right lane that is being closed is the existing add-lane from the southbound 5th Street entrance ramp so traffic entering from this ramp would now be required to merge. During the WB Blanchette Bridge Rehabilitation Project a ramp meter was installed on the southbound 5th Street entrance ramp and could be considered for this project as well.

Figure 31: Proposed Eastbound I-70 Lane Closure

4.2.2 Maintenance of Traffic for Westbound MO 370 Alternative

With the proposed construction of the new barrier for the bike/pedestrian facility adjacent to the right lane of westbound MO 370, the traffic lanes will need to be shifted to the left and a temporary traffic barrier be placed to protect the work zone. As shown in the typical section in Figure 32, with the lanes shifted to the left, there is a 2-foot inside shoulder, 3 11-foot lanes, and a 2-foot outside shoulder. This would give the contractor about 15 feet to work in to place the new permanent barrier. No ramps would be affected for this proposed work zone.

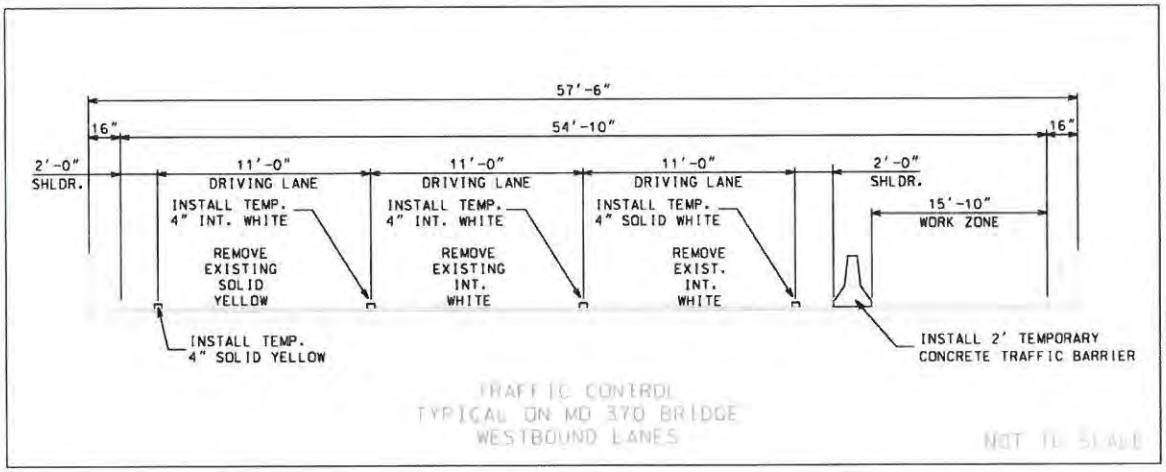


Figure 32: Westbound MO 370 Bridge Cross Section

If needed by the contractor during construction, the right lane adjacent to the work zone could be temporarily closed during overnight hours but could be required to remain open the rest of the time. The speed limit for the work zone will be reduced from the existing 60 mph to 50 mph during construction.

4.3 Inspection and Maintenance Analysis

Future inspection and maintenance are critical components of the evaluation of various bicycle and pedestrian crossing alternatives. This section of the report assesses the maintenance and inspection impacts of placing bicycle and pedestrian facilities along the I-70 Eastbound Blanchette Bridge and along the MO Route 370 Discovery Bridge.

4.3.1 I-70 Eastbound Blanchette Bridge

The section of the report assesses the maintenance and inspection impacts of placing a pedestrian walkway / bicycle path (walkway) along the south side of the Eastbound Blanchette Bridge (Bridge No. A3292). The walkway would run the full length of the bridge and be attached or adjacent to structural steel simple beam spans (Span Nos. 1 thru 8, and Span 19), structural steel three-girder system spans (Span Nos. 9 thru 13, 17 and 18) and structural steel cantilevered truss spans (Span Nos. 14 thru 16). The various types of spans are shown in Figure 36 and cross sections of the proposed walkway adjacent to the various span types are depicted below in Figure 33, Figure 34, and Figure 35.

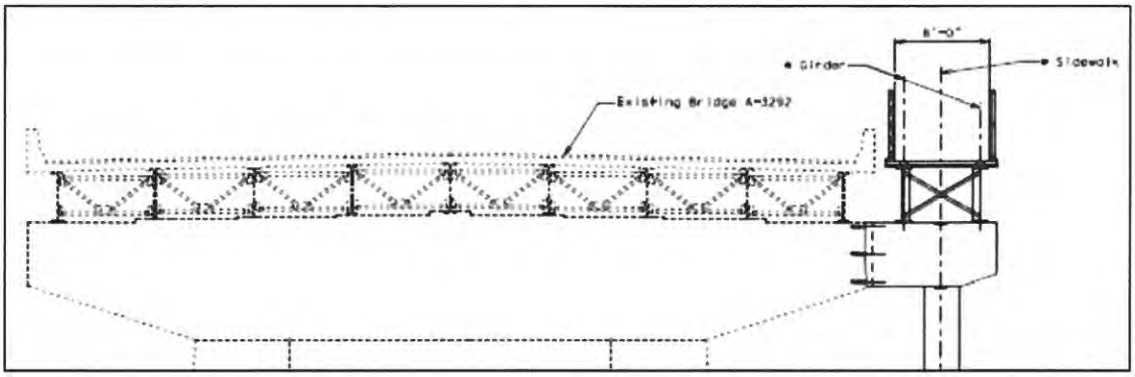


Figure 33: Proposed walkway adjacent to the beam spans

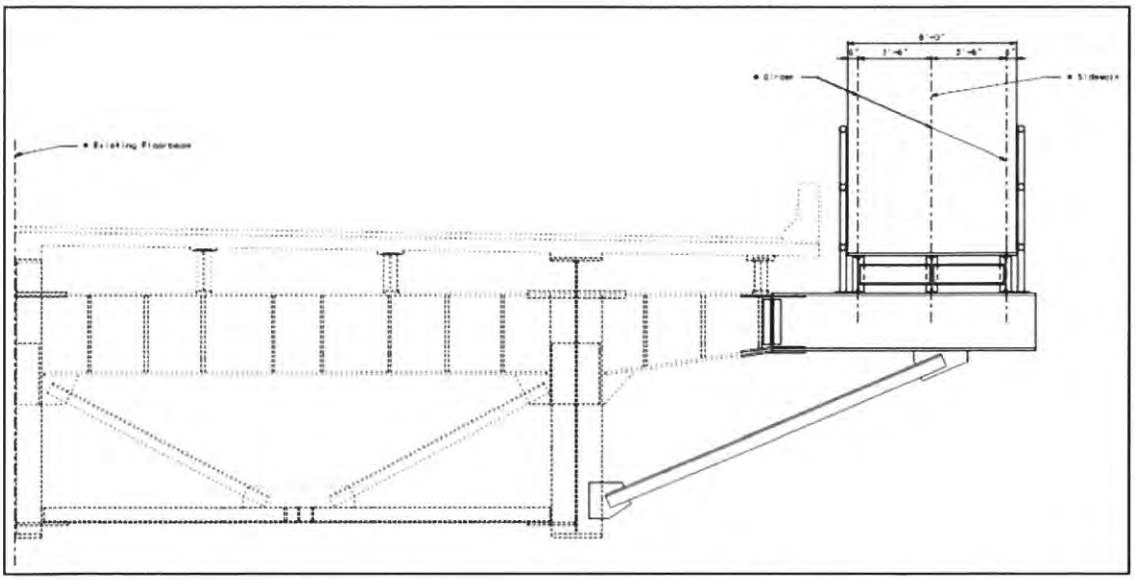


Figure 34: Proposed walkway adjacent to the three-girder system spans

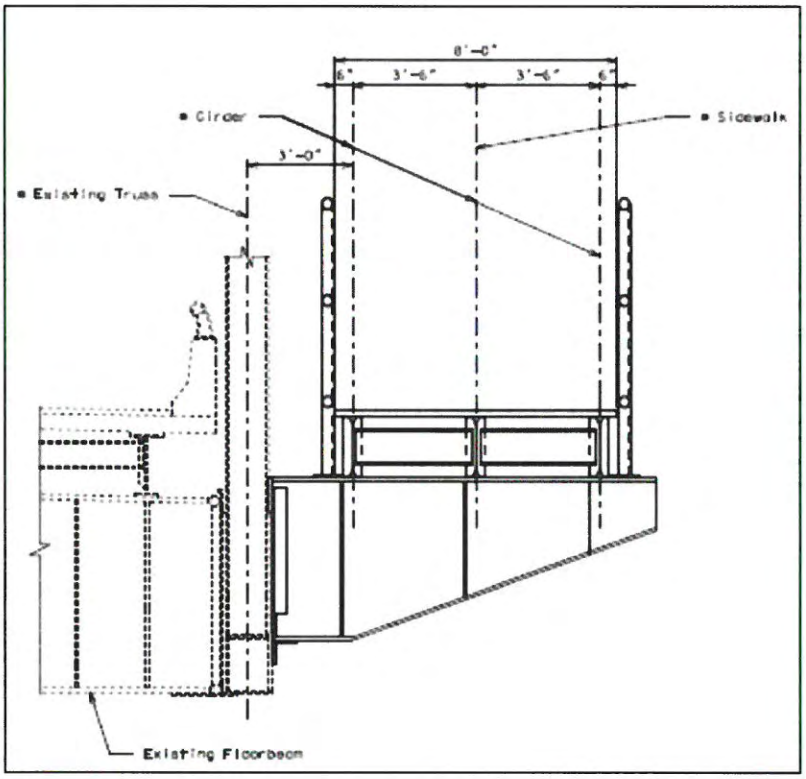


Figure 35: Proposed walkway adjacent to the truss spans

Figure 36: Looking west along south side of EB Blanchette Bridge. Beam span on right, three-girder system spans in middle and truss spans on left.

Missouri Department of Transportation (MODOT) typically uses an under-bridge inspection vehicle (UBIU) to inspect and maintain the below-deck portions of the superstructure of the bridge. These UBIU vehicles are mounted on a truck chassis and utilize a series of articulating booms to reach out, down and under the bridge (see Figure 37 and Figure 38). Discussions with the MODOT Supervising Bridge Inspection Engineer and MODOT's St. Louis Region Bridge Engineer revealed the various type of UBIU's used in the area, which include the Aspen Aerial UB50, the Aspen Aerial A-62 and on occasion, an Aspen Aerial A-72 that is rented for use on wider bridges. Discussions also revealed that MODOT might add an Aspen Aerial B32 to their inventory of inspection vehicles. Specs on these UBIU's are attached, including the available reach and movements of the articulating booms. MODOT also utilizes manlifts such as an Elliot I85F to perform inspection and maintenance on the upper reaches of the truss spans, but it is not believed that the proposed walkway would interfere with the use of these vehicles.

Figure 37: Aspen Aerial A62 in use

Figure 38: Aspen Aerial A62 in use

The typical roadway width of the existing EB Blanchette Bridge is 68'-0". With the two jersey barriers, the out-to-out deck width is 71'-3". The widest point of the roadway is in Spans 1 and 2 where the ramp from 5th St. in St. Charles merges onto mainline I-70. The roadway width in this area is 76'-0" with an out-to-out deck width equal to 79'-3".

In the truss spans, a 71'-3" out-to-out deck width exists with a narrow gap between the backside of the barrier and the roadway face of the vertical truss members. The out-to-out width of the structural steel of the truss spans is approximately 75'-2". The distance from the roadway face of the barrier to the exterior face of the vertical truss members is approximately 3'-7".

Based on the proposed walkway sketches above and the design plans from the Jefferson City Bridge (Bridge No. A4497) in Jefferson City, MO (see Figure 39), the following dimensions are assumed between the roadway face of the barrier and the outside face of the walkway structure for the EB Blanchette Bridge:

Table 4: EB Blanchette Bridge Cantilever Path Dimensions

Location	Distance
Beam Spans	11'-6"** to 13'-6"
Three-Girder System Spans	11'-6"** to 13'-6"
Truss Spans – Typical	13'-6" *
Truss Spans – Overlook at Piers 15 and 16	17'-6"

* Mid-Channel Nav-Aid Light will typically add 1'-0" to this, but can be worked around during an inspection

** Minimum. Requires bend in walkway alignment

The surface of the walkway is assumed to be at the same elevation as the adjacent roadway and the fence is assumed to be 6-ft above the walkway surface (see Figure 39).

Figure 39: Walkway along the downstream side of Bridge A4497 in Jefferson City

The following paragraphs summarize the impacts on inspection and maintenance due to locating the proposed walkway along the south side of the Eastbound Blanchette Bridge.

4.3.1.1 UBIU Reach / Accessibility

Two things to consider when looking at the available UBIU's vs. the proposed walkway configuration is the reach of the UBIU and also how the UBIU is unfolded from its truck chassis to position the booms in a useful position.

The width of the EB Blanchette Bridge is such that it requires inspection with a UBIU from both the north and south sides of the bridge to gain adequate coverage to meet the requirements of the National Bridge Inspection Standards (NBIS).

Of the available UBIU's listed above, the A-62 appears to be able reach out over the proposed walkway and back underneath the structure to perform inspections in the beam spans and the three-girder system spans, if the distance from the barrier to the outside of the path is reduced from the 13'-6" required in the truss spans to 11'-6" in these spans. It would also appear feasible to maneuver the UBIU booms to inspect the areas between the existing bridge superstructure and the proposed walkway structure, but the walkway would increase the time required for the inspection as there will be additional walkway support framing to maneuver around.

With a maximum reach of 13'-0", it does not appear that any of the available UBIU's would be able to reach out past the walkway and provide inspection or maintenance access in the truss spans from the south side of the bridge as the distance between the face of the barrier and the outside of the walkways structure exceeds the reach of the main horizontal boom of the various UBIU's. A quick search of other UBIU's did not reveal any models (truck-mounted or towable) that would be able to provide access in the truss spans.

With the proposed walkway installed along the south side of the truss spans, it will not be possible to inspect the areas on the underside of the walkway, which includes the walkway support framing, the lower chord of the truss and the lower portions of the gusset plates as shown in Figure 40. The lower chord of the truss, the gusset plates and the floorbeams all require a hands on fracture-critical inspection every two years. Portions of the upstream (south) truss above the walkway could be inspected from the walkway and from MODOT's manlift vehicles. The majority of the underside of this truss span could be inspected from a rental Aspen A-75 from north side of the bridge. Alternatives for inspecting the areas that are not accessible by UBIU are discussed below.

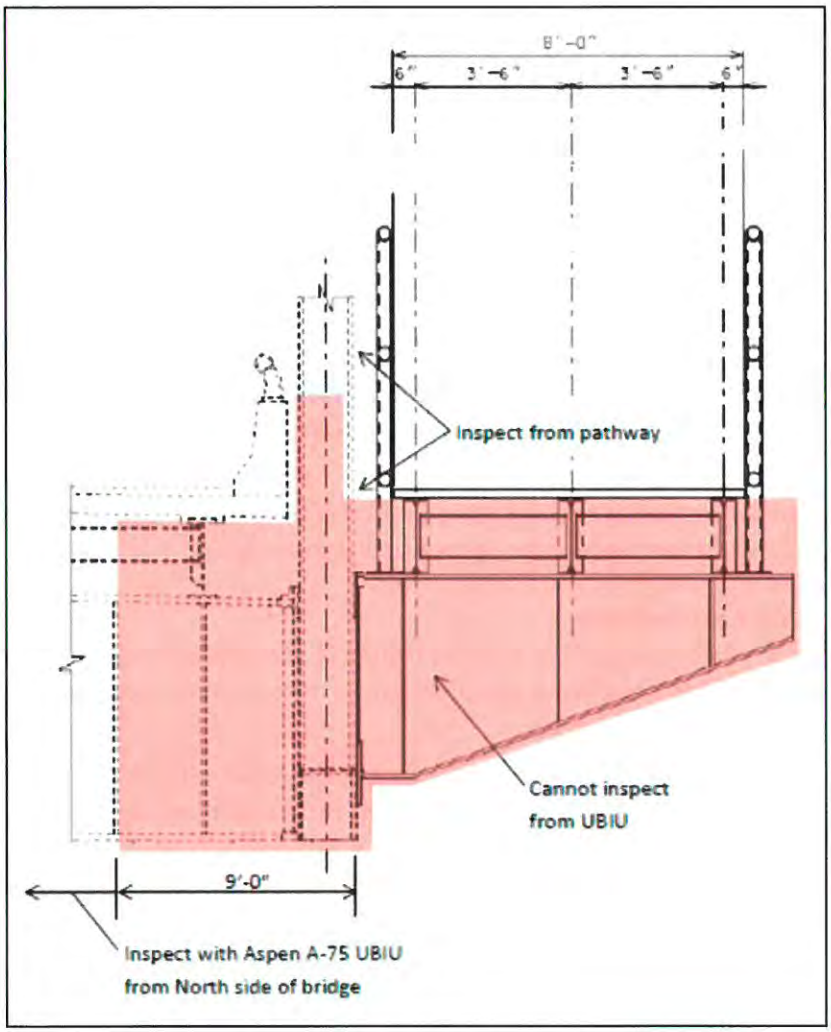


Figure 40: Areas of Eastbound Blanchette Bridge truss span unable to be inspected with proposed walkway installed

Even if UBIU's were able to provide access, which they cannot with a pathway located on the south side of the EB Blanchette Bridge, an additional consideration for constructing walkways adjacent to a truss span is how the UBIU booms unfold from the truck chassis. It takes some maneuvering of the booms in conjunction with forward and backward movements of the truck to thread the full lengths of the booms and the platform

between the truss verticals and diagonals. The panel spacing on the EB Blanchette truss span is 30-ft and the top of the barrier rail is approximately 4-ft above the roadway deck elevation. Unfolding these booms typically requires as much horizontal clearance as can be obtained to thread the booms through the truss. The booms are typically maneuvered horizontally as close to the top of the barrier as can be safely achieved to utilize this area of greatest clearance. The top of the walkway fence is an additional 2-ft above this, which would reduce the available horizontal distance for getting the UBIU booms through the truss. Refer to Figure 39 and Figure 41 for visual aids. These clearance needs are true of almost any truss, but trusses with larger panel spacings would provide more horizontal clearance.

In discussions with the MODOT Supervising Bridge Inspection Engineer, he did indicate that MODOT is unable to utilize their UBIU with the pathway on the downstream side of the Jefferson City Bridge. Due to that bridge being narrower, MODOT is able to inspect everything from a UBIU placed adjacent to the upstream barrier.

Figure 41: UBIU in use in truss span along south side of Bridge A3292

4.3.1.2 Current Maintenance Activities

An additional consideration for the EB Blanchette Bridge is the fact that some members of the truss spans have experienced some significant maintenance over the years based on the structural details of the bridge and are these or similar members are envisioned to warrant more attention in the future.

Pack rust has developed in the splash zone (area typically designated as the region from the lower chord up to about 10-ft above the roadway) on some of the truss verticals and diagonals between their main structural steel channels and their welded coverplates. This pack rust has imparted a force at these locations that has

pried apart these components and has caused some cracking in the welds between the channels and the coverplates of some of these vertical and diagonal compression members. These areas require ready access to make these repairs. Figure 42 and Figure 43 provide a snapshot of a cracked member and a repair of a member. Alternatives for performing this work are discussed below.

Figure 42: Cracked weld in truss vertical member

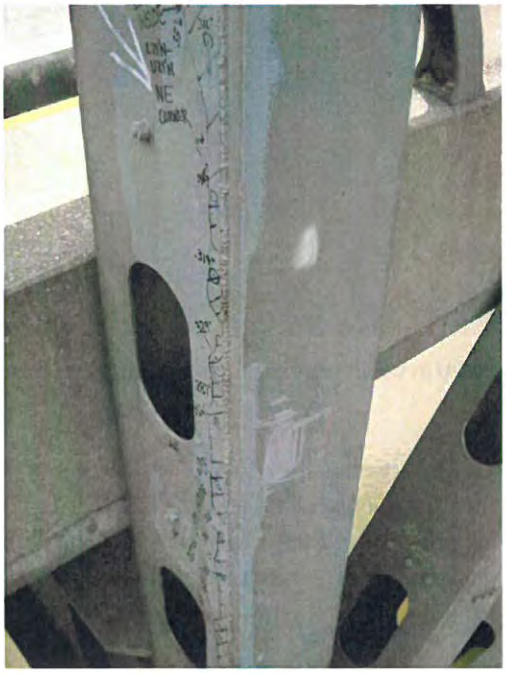


Figure 43: Repair of weld in truss vertical member

4.3.1.3 Additional Considerations

Some modifications would also need to be made to the existing ladder system that provides access to the nav-aid lights at the truss piers to allow construction of the walkway (see Figure 44). This type of modification was also required on the Jefferson City Bridge and can be worked out during final design.

Figure 44: Looking east along the south side of the EB Blanchette Bridge at the typical ladder system at the main river piers

4.3.1.4 Available Alternatives for Adequate Inspection and Maintenance Access

A few alternatives for providing proper access for NBIS Inspections in the truss spans would be to rig the structure with cables or ropes and perform the inspection by climbing or to perform the inspection from a manlift mounted on a jack up barge in the river.

It may also be possible to use the sidewalk as a work platform for making the truss repairs if areas of the fence adjacent to the truss members are easily removable. Locking mechanisms would need to be employed such that they are only removable by MODOT employees. These details would need to be worked out during the design phase.

In discussing this issue with MoDOT, it was suggested that an alternative may be Bucket Boat by Harcon Corporation (563 Strasburg Road, Paradise, PA 17562. Phone: (717) 687-9294. Email: info@harconcorp.com), which is pictured in Figure 45. Bucket Boat specifications, as taken from the company's website:

- Vertical reach to bottom of bucket: 60'
- Working height: 65'
- **Lateral reach:** 27' - 9" from center of boat
- Bucket rating: 440 lb.
- **Width:** 18' - 2" (with outriggers deployed)
- Length: 30'
- **Weight:** 18,000 lb.
- Min. traveling under-clearance: 9' 2"
- Min. working under-clearance: 9' 10"
- Draft: 12

Figure 45: Harcon Bucket Boat

The maximum working height of 65 feet may not allow the necessary access to the underside of the bridge, depending on the river stage at the time of inspection. The record drawings list the minimum clearance above the 2% flow line (Elev 442) as 53.4 feet near Pier 17 and 63.2 feet near Pier 16, so a 65 foot maximum working height may not be adequate to perform an "arm's reach inspection" of the underside of the bridge. Harcon does not currently have boats with greater reach.

Harcon was contacted and provided the following cost information:

- Bucket Boats: $4,000/day, $3,600/day/wk (5 eight hr days or 4 ten hour days), or $3,400/day/mo. By extension, $18,000/wk, $68,000/mo.
- OT is $250/hr. Our clock begins when we leave the ramp and ends when we've returned.
- Roundtrip, mob/demob of $2.80/mile. From Paradise to St. Louis is 828 miles, roundtrip is 1,656 miles x 2.80= $ 4,558.00.
- Combined costs for 1 week in site with mob/demob is $22,558.00.

We also obtained the following cost information from Massman Construction Co. to provide a barge, crane, towboat, 75' personnel lift and operating personnel for the Blanchette River Bridge inspection near St. Charles, MO on the Missouri River are as follows:

- Mobilization and Demobilization = $6,500.00/Total
- Daily rate for Equipment and Operating Personnel per 8-hour, straight time day, 8-hour Minimum = $7,316.00/Day
- Overtime Rate,1.5 Time = $1,055.00/HR
- Overtime Rate, 2.0 Time = $1,210.00/HR
- Equipment Standby-Rate for Non-Inspection Days = $3,658.00/Day

This works out to $43,080 for a 5 – 8 hour day work week with mobilization and demobilization.

If river based inspection of I-70 EB can be combined with inspection of one or more of I-70 WB, MO 370 EB and WB, MO 364 EB and WB , and I64 EB and WB, the mobilization cost can be spread over several bridges.

River based inspection also provides the significant advantage eliminating the need for traffic control on the roadway while this work is performed.

4.3.2 MO 370 with Barrier Separated Paths

As noted in the previous discussion of inspection of EB I-70 Bridge A3292, MoDOT typically uses an Aspen Aerial A-62, and occasionally rents an Aspen A-75 for inspection of bridges such as EB and WB MO 370 Bridge A4557. Figures 1 and 2 show the movement range of the A-62 and A-75 inspection trucks, respectively.

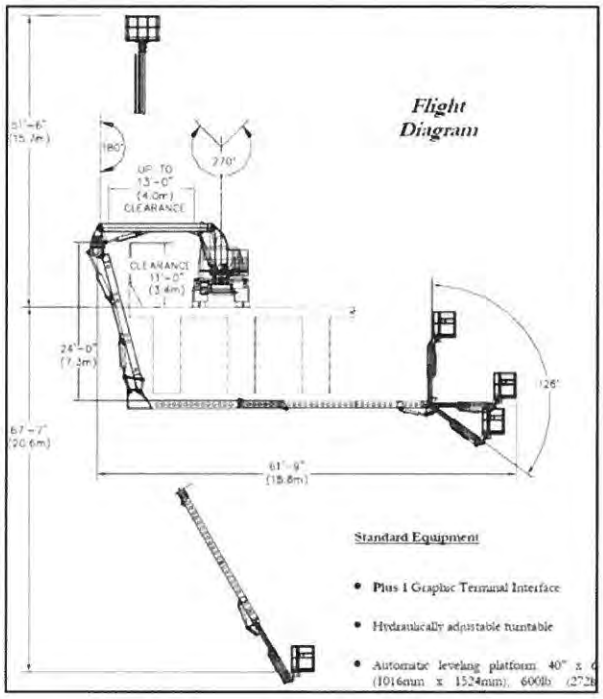


Figure 46: Aspen A-62 Movement Range

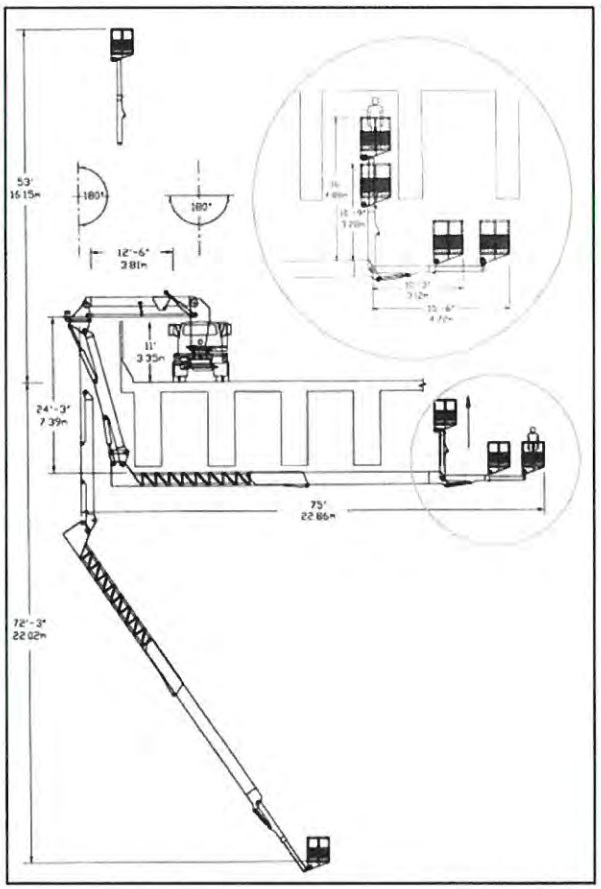


Figure 47: Aspen A-75 Movement Range

Following is a summary of the implications on bridge inspection caused by adding 8' or 10' wide barrier separated paths on the right shoulders of WB and/or EB MO 370.

1. Based on record drawings, the out-to-out dimension of the MO 370 truss is 61'-0 + about 28" = 63'-4". So an Aspen A-62 with a 61'-9" maximum reach cannot reach the outside of the right side of the bridge from the left shoulder. An Aspen A-75 with a 75'-0 maximum reach can likely inspect the lower portions of the right side of the bridge from the left shoulder with a combination of boom rotations.
2. With an 8'-0 wide path and a 16" barrier on the right shoulder, the record drawings show the distance from the right curb line to the outside of the right truss is 16" + 8'-0 + 16" – 2'-9 + 4'-6 + 28"/2 = 13'-7". The maximum standoff distance for an Aspen A-62 is 13'-0 and for an Aspen A-75 is 12'-6; therefore, neither of the inspection trucks can reach from the right roadway shoulder over an 8'-0 wide barrier separated path to inspect the right side of the trusses. This also means that it may be difficult to use either the A-62 or the A-75 on the right shoulder to inspect the portions of the right side of the truss above the bridge deck. This may be easier to do with a manlift or a conventional bucket truck without the under bridge capabilities of the Aspen units.
3. Based on discussion with MoDOT, a barrier separated pathway needs to be 10' wide to allow an inspection truck to inspect the bridge from the pathway.

Based on bridge inspection and maintenance considerations, the barrier separated pathway alternatives for MO 370 include:

1. 8'-0" clear width barrier separated paths on the right shoulders both the WB and EB MO 370 bridges with inspection from an Aspen A-75 on the left shoulder and inspection of the upper portions of the right side of the truss from a manlift or conventional bucket truck. This path configuration can be operated as one way bicycle and pedestrian travel. The pathways will likely need to be removed for future permanent operation with 4 lanes with reduced lanes and/or shoulders.
2. 10'-0" clear width barrier separated path on the right shoulder of either WB or EB MO 370 with inspection from an Aspen A-62 on the left shoulder and in the pathway on the right side of the bridge. This path configuration allows for two way bicycle and pedestrian travel and for 3 lanes @ 12'-0", a 3'-0" left shoulder (to clear the drains) and 4'-6" right shoulder. The pathway will likely need to be removed for future permanent operation with 4 lanes with reduced lanes and/or shoulders.
3. 6'-0" clear width barrier separated paths on the right shoulders of WB and EB MO 370 with inspection of the right side of the bridge with an Aspen A-62 reaching over the paths. This path configuration allows for one way bicycle and pedestrian travel and for 3 lanes @ 12'-0", a 3'-0" left shoulder (to clear the drains) and 8'-6" right shoulder. The pathway may not need to be removed for permanent operation with 4 lanes with reduced lanes and shoulders.

4.4 Environmental Analysis

The following section of the study summarizes the results of our preliminary analysis of the environmental impacts of bicycle/pedestrian crossings of the Missouri River along 1) the Eastbound (EB) I-70 Blanchette Bridge, 2) the West Bound (WB) MO 370 Discovery Bridge, and 3) a new bridge on the old Route 115 alignment at St. Charles; along with the associated connections to the Katy Trail on the St. Charles side and other planned and existing trails on the St. Louis County side of these crossings.

4.4.1 Wetlands and Waters of the U.S.

Under Section 10 of the Rivers and Harbors Act of 1899 (22 USC 403), a permit is required for construction of any structure in or over any navigable water of the United States, or the accomplishment of any other work affecting the course, location, condition, or physical capacity of such waters. Similarly, under Section 404 of the Clean Water Act of 1982 (33 USC 1344), a permit is required to excavate in or discharge dredged or fill material into the Waters of the United States.

Based on imagery obtained from US Fish and Wildlife National Wetland Inventory, there are Freshwater Forested Scrub/Shrub Wetlands in the immediate area of the proposed crossings, but the location of the bridge piers should not impact any wetlands. More detailed wetland delineation would need to be conducted in order to determine whether any actual impacts would occur.

If the preferred alternative involves the construction of a new bridge across the Missouri River, permits from USEPA, the Army Corps of Engineers, and the US Coast Guard will be required.

4.4.2 Air Quality

Since this is a bike and pedestrian facility, air quality issues are not a consideration. Air quality impacts during construction will need to be evaluated and mitigated.

4.4.3 Noise

Since this is a bike and pedestrian facility, noise issues are not a consideration. Noise impacts during construction will need to be evaluated and mitigated.

4.4.4 Section 4(f) and 6(f)

There are several local parks and facilities in the immediate areas of the proposed alternatives. A detailed review of these parks will need to be completed to determine whether there are any 4(f) or 6(f) impacts. Some of the parks in the area include:

- Louis Bangert Memorial Wildlife Area
- Frontier Park
- Jean Baptiste Point Dusable Park
- Riverwoods Park
- Katy Trail State Park

4.4.5 Cultural Resources

There are many historic sites and districts within the City of St. Charles. Coordination with the Missouri State Historic Preservation Office (SHPO) will be required to determine the actual impacts on these sites. Some of the properties/districts in the area are:

- Frenchtown Historic District—roughly bounded by North 5th, Clark, and French Streets, and the Missouri River
- St. Charles Historic District—bounded by Madison, Second, Jefferson, and the alley behind the 100 block of South Main Street
- Old City Hall—Central Avenue and Main Street

Comprehensive research would need to be conducted to determine the visual and aesthetic impacts on historic and/or archaeological sites in the areas of the proposed structures.

4.4.6 Biological Resources (Threatened and Endangered Species, Wildlife, etc.)

The following list contains species that are known to or are believed to occur in St. Charles County and St. Louis County (US Fish and Wildlife Service).

- Least Tern (Stema antillarum)
- Scaleshell Mussel (Leptodea leptodon)
- Pallid Sturgeon (Scaphirhynchus albus)
- Decurrent False Aster (Boltonia decurrens)
- Running Buffalo Clover (Trifolium stoloniferum)
- Indiana Bat (Myotis sodalis)
- Gray Bat (Myotis grisenscens)
- Northern Long-Eared Bat (Myotis septentrionalis)

More detailed research would need to be conducted to determine the actual locations of these species and the impacts any of the alternatives may have.

4.4.7 Forested Areas

Detailed research would need to be conducted to determine the direct impact each alternative may have on adjacent forested areas, particularly the area just to the south of the Blanchette Bridge.

4.4.8 Socioeconomic

The areas immediately adjacent to all three alternatives have very low or no residential communities. Therefore, socioeconomic impacts are not expected.

4.4.9 Right-of-Way

Generally, the width of MoDOT-owned right-of-way is 280 feet. Any additional right-of-way would need to be purchased from adjacent property owners. If any properties are impacted, the project would need to adhere to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

4.4.10 Agricultural Areas

Detailed research would need to be conducted to determine the impact each alternative may have on adjacent agricultural areas. No significant impacts are anticipated to agricultural areas.

4.4.11 Conclusion

With both the EB Blanchette Bridge and WB MO-370 Bridge alternatives, impacts will be minimal and there does not appear to be any fatal flaws that would prohibit the completion of the project.

The new bridge on the old Route 115 Bridge option across the Missouri River would require permits from USEPA, the Army Corps of Engineers, and the US Coast Guard. These permits should not prohibit the completion of the project, but would require a more in depth environmental survey and report.

4.5 Connectivity and Quality of Service

4.5.1 Introduction

This section of the study provides an analysis of bicycle and pedestrian connectivity for the travel sheds surrounding each of the three crossing locations. This analysis takes into account connectivity within the existing bicycling and walking networks, quality and comfort of existing bicycling and walking facilities, accessibility of local and regional destinations, relative route directness, and existing barriers to non-motorized travel. The results of this analysis will inform the final evaluation and selection of an alternative.

4.5.2 Methodology

In general, many elements of the built environment impact conditions for active transportation. Trip length, facility quality and grade are all elements that influence potential walking and bicycling trips. This analysis uses "travel sheds" (described in greater detail below) to define the study area and considers both quantitative and qualitative factors that are likely to influence the active transportation potential of each Missouri River crossing scenario.

4.5.2.1 Defining Travel Sheds

A "travel shed" or "commute shed" is a defined area surrounding a destination (or transportation link) that represents the service area for that facility. Travel sheds for transit and motor vehicles can sometimes include an entire region, since these modes are capable of covering great distances during a single commute. Since pedestrians and bicyclists are limited by travel speed, travel sheds for these modes are correspondingly smaller than that of motorized modes. According to the U.S. National Household Travel Survey (NHTS), over 75 percent of walking trips (made for all trip purposes) are shorter than one mile and nearly 85 percent of cycling trips are shorter than five miles.

Based on these findings, an assumption was made that each potential bridge crossing examined in this report would primarily serve the active travelers in its immediate vicinity. This vicinity, or "travel shed", was defined using the distances provided by the NHTS data – roughly one mile for pedestrians and five miles for cyclists. A further assumption was made that these distances were best expressed as radii of one half mile and three miles, from the endpoints of each potential bridge alignment, which accounts for an active traveler's need to cross a bridge in order to reach destinations on the opposite side of the Missouri River.

These travel sheds, a one half mile walk shed and three mile bike shed, represent the active transportation market areas: the communities where people are most likely to make a walking or cycling trip that crosses the Missouri River.

4.5.2.2 Origins and Destinations

Various origins and destinations are found within the travel shed of each alignment option. Pedestrian trips are likely to serve office and retail jobs, transit connections and other destinations within a half mile of each bridge touchdown point. Bicycle trips are likely to serve a larger number of origins and destinations within the larger three mile travel shed. Due to the greater range of people on bicycles, the bridge is likely to serve more bicycle commute and utilitarian (trips made for shopping, or other errands) than pedestrian commute and utilitarian trips. Both bicycle and pedestrian trips have a high potential for recreational trips, given the existing and planned trail network.

4.5.2.3 Barriers

Barriers to travel may be defined as missing or fragmented network connections, low quality bicycle or pedestrian facilities, or intersections and interchanges that do not provide protected crossing opportunities It also is defined as facilities that do not meet Crime Prevention Through Environmental Design (CPTED) principles or otherwise feel unsafe by making users feel isolated, topography or unsupportive land use. This feasibility study and evaluation of alignments primarily considers aspects of the existing transportation network rather than bridge aesthetics or CPTED design principles, which will be considered in greater detail in a separate part of the overall analysis of options.

4.5.2.4 Traffic, Network Conditions, and Facility Quality

The presence of motor vehicle traffic, network completeness and facility quality all play a role in the active transportation potential in each alignment option. Generally speaking, as separation from motor vehicle traffic increases, so does the attractiveness - in terms of safety and comfort - of a bicycle or pedestrian facility. If bicycles and pedestrians are sharing space with motor vehicle traffic, the amount of traffic and presence of heavy vehicles (such as freight) can depress facility usage. Finally, if continuous network connections are not provided, facility usage will also be depressed. If significant enough, any one of these factors may completely repress usage of a high quality facility. In essence, no one will use a fantastic bridge if they cannot reach it.

The segment-based Pedestrian Level of Service Analysis (PLOS) measures pedestrian safety using four factors: posted speed limit, roadway width (number of travel lanes), pedestrian buffer (on-street parking or bicycle lanes), and the presence of sidewalks. Table 5 outlines the scoring methodology of the PLOS analysis. The PLOS follows a five-point scale, with 1 representing the highest comfort level. Generally, more pedestrian space on a lower speed roadway segment correlates to a higher comfort level. Where sidewalks are only provided on one side of the roadway, pedestrian comfort degrades on multi-lane roadways since pedestrians are forced to cross more than two lanes of traffic to reach that sidewalk. Bicycle lanes or on-street parking act as buffers between pedestrians and motor vehicle traffic, increasing comfort.

Table 5: Pedestrian Level of Service Segment Scoring Matrix

Pedestrian Space	Speed Limit (mph)					
	<= 25 mph		30 - 35 mph		>= 40 mph	
	2 lanes	> 2 lanes	2 lanes	> 2 lanes	2 lanes	> 2 lanes
Complete sidewalk on both sides next to a buffer	1	1	1	1	2	3
Complete sidewalk on both sides	1	1	2	3	3	4
Complete sidewalk on one side next to a buffer	2	2	2	3	3	4
Complete sidewalk on one side	2	3	3	4	4	5
No dedicated space next to a buffer	2	3	3	4	4	5
No dedicated space	3	3	4	5	5	5

4.5.2.5 Low Stress Network Connectivity

The construction of a separated non-motorized bicycle and pedestrian facility can significantly improve opportunities for cross-river trips for commute, utilitarian, and recreation trips. The figures above identify all bicycle facilities within a 3-mile radius of each bridge that are characterized by low levels of traffic stress (LTS 1 or LTS 2). Most adults and children feel safe and comfortable bicycling on these facilities, which include shared use paths and trails, low-speed, low-volume neighborhood streets, and roadways with dedicated bicycle lanes and buffered bike lanes on lower traffic roadways. Each of the figures we provide for Low-Stress Bikeways will show how each individual alternative creates new opportunities for cross-river trips, effectively expanding the bicycle network into areas previously considered too far or too difficult to reach.

4.5.2.6 Bridge Grade

Grade can be a determining factor in a bicyclist or pedestrian decision to use a roadway or bridge facility. Research has indicated that some bicyclists may start to detour from a given route with grades as low as 2 percent. These findings indicate that grade is a key factor in determining facility quality and should be considered carefully during subsequent stages of analysis. This preliminary study states that no facility shall be have a grade of more than 5 percent, but does not evaluate grade of approaches between alignments.

4.5.3 Analysis

4.5.3.1 Option One: I-70 Blanchette Memorial Bridge

Origins and Destinations

The Blanchette Bridge crossing option connects to a diversity of residential, commercial, recreation, and employment destinations on both sides of the Missouri River and lands near the heart of historic St. Charles. In St. Louis County, the crossing will include a direct tie in to Riverwoods Park and the existing section of the Missouri River Greenway to the north. Other nearby destinations within the immediate bike shed include Hollywood Casino, Earth City Business Park, Riverport Business Park, and Verizon Wireless Amphitheater. Within a three-mile bike shed are Creve Coeur Lake Memorial Park, and the Centennial Greenway.

In St. Charles County, the crossing touches ground immediately adjacent to Streets of St. Charles, a recently-completed 1,000,000 square foot mixed use development, Historic Main Street in St. Charles City, Katy Trail State Park, and the Bangert Island Wildlife Area. Also within the half-mile walk shed are Ameristar Casino, the St. Charles Center shopping area, and multiple single-family and multi-family residential neighborhoods. Extending further out into the three mile bike shed, there are even more residential neighborhoods and popular destinations, including Lindenwood University, Frenchtown Historic District, Family Arena, the Boschert Greenway, the Centennial Greenway, Jean Baptiste Point DuSable Park, Blanchette Park, and McNair Park.

Pedestrian Connectivity

Interstate 70 bisects the pedestrian walk shed at the base of the Blanchette Bridge. However, there are multiple north-south roadways within this half-mile radius around the bridge landing. It will be important to make the connection from the new bridge and areas to the north (across I-70) offering enhanced access to the bridge. In St. Louis County, additional work is needed to connect to existing pedestrian facilities. Both Riverport Business Park and Earth City Business Park can only be accessed by way of MO 141, making pedestrian trips difficult without additional, more direct connections. In total, only 46% of the roadways (3.1 of 6.8 centerline miles) within the half-mile radii around the bridge location possess sidewalks. Most roadways in St. Charles County include sidewalks. Some lack sidewalks but are low-volume neighborhood

roadways with little motor vehicle traffic. Other segments of key arterials and collectors like 5th Street and Arena Parkway lack sidewalks as well. These missing sidewalk segments pose challenges for pedestrian mobility and access to a potential Missouri River crossing. Figure 48 below displays the pedestrian level of service on roadways surrounding the bridge. The mean pedestrian level of service in this area is 2.8, indicating a moderate level of service for pedestrian travel.

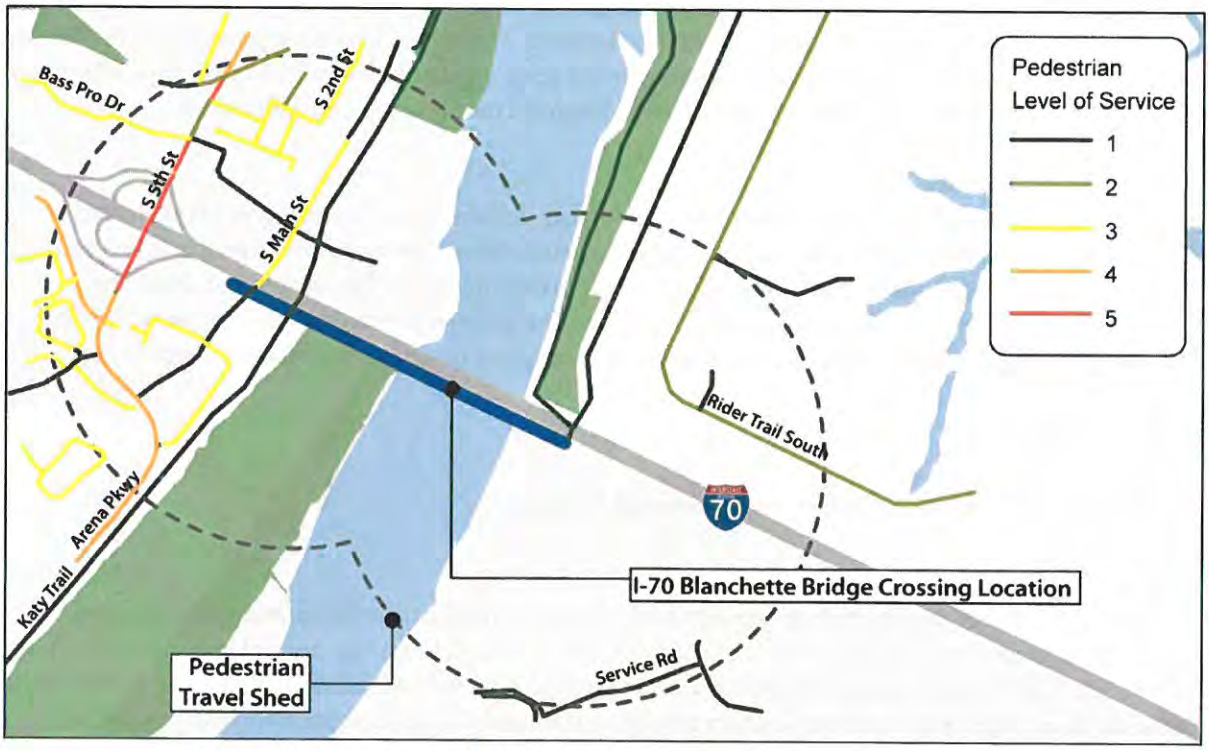


Figure 48: Pedestrian Level of Service, I-70 Blanchette Bridge Crossing Location

Bicycle Connectivity

With the addition of the Blanchette Bridge bicycle and pedestrian crossing option, bicyclists benefit from enhanced connectivity on both sides of the river. In St. Charles, the Katy Trail, the dense grid of neighborhood streets in Downtown St. Charles, and even the Boschert Greenway offer adjacent neighborhoods and commercial districts comfortable and convenient access to the bridge location. Neighborhoods further from the bridge, particularly south of Interstate 70, are challenged by the lack of on-street bicycle facilities, and lesser degree of connectivity afforded by the suburban development patterns, but can be enhanced through the development of the Gateway Bike Plan network.

In St. Louis County, the network of roadways and off-street trails is relatively sparse, and as a result bicyclists must often travel on higher speed roadways to reach the bridge crossing. While destinations like Creve Coeur Park and the McKelvey Woods Trail are better served by this bridge crossing option than either of the other potential crossing locations, future trail development will greatly enhance bicycle connectivity to destinations further from the bridge. Higher connectivity is evident around Riverport Business Park and St. Charles Rock Road, both of which have convenient access to the crossing location through trails and on-street bikeways.

Figure 49 shows the low-stress bikeway network within the two and 3 mile radius of the Blanchette Bridge crossing alternative. When comparing the existing catchment area for each crossing location displayed in Figure 50 to the catchment areas resulting from the Blanchette Bridge crossing displayed in Figure 51, the

contrast is stark, particularly in St. Louis County. Mean trip length to the I-70 crossing would be 2.0 miles, and mean trip length to both the MO Route 364 and MO Route 370 bridge crossings would decrease as well, which is a benefit of this option.

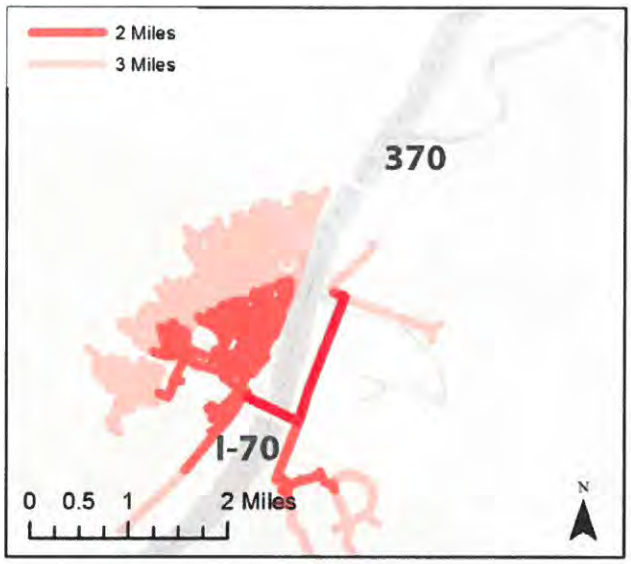


Figure 49: Two- and three-mile low stress bicycle network surrounding the I-70 Blanchette Bridge Crossing Location

Barriers

There are barriers to active transportation in the area surrounding the Blanchette Bridge. Most importantly, future connections to the existing infrastructure are needed to provide solid access across I-70. In St. Louis County, the existing Missouri River Greenway connects only to St. Charles Rock Road, nearly 1.4 miles north of the bridge. Interstate 70 bisects the travel shed, restricting north-south travel to the future Missouri River Greenway and MO Route 141, a limited access highway with high travel speeds and a free-flowing, cloverleaf intersection at Interstate 70. While there is a higher degree of connectivity in St. Charles County, there are still enhancements needed to bicycle and pedestrian facilities near the Blanchette Bridge to reinforce connectivity, which can be addressed to eliminate the existing barriers.

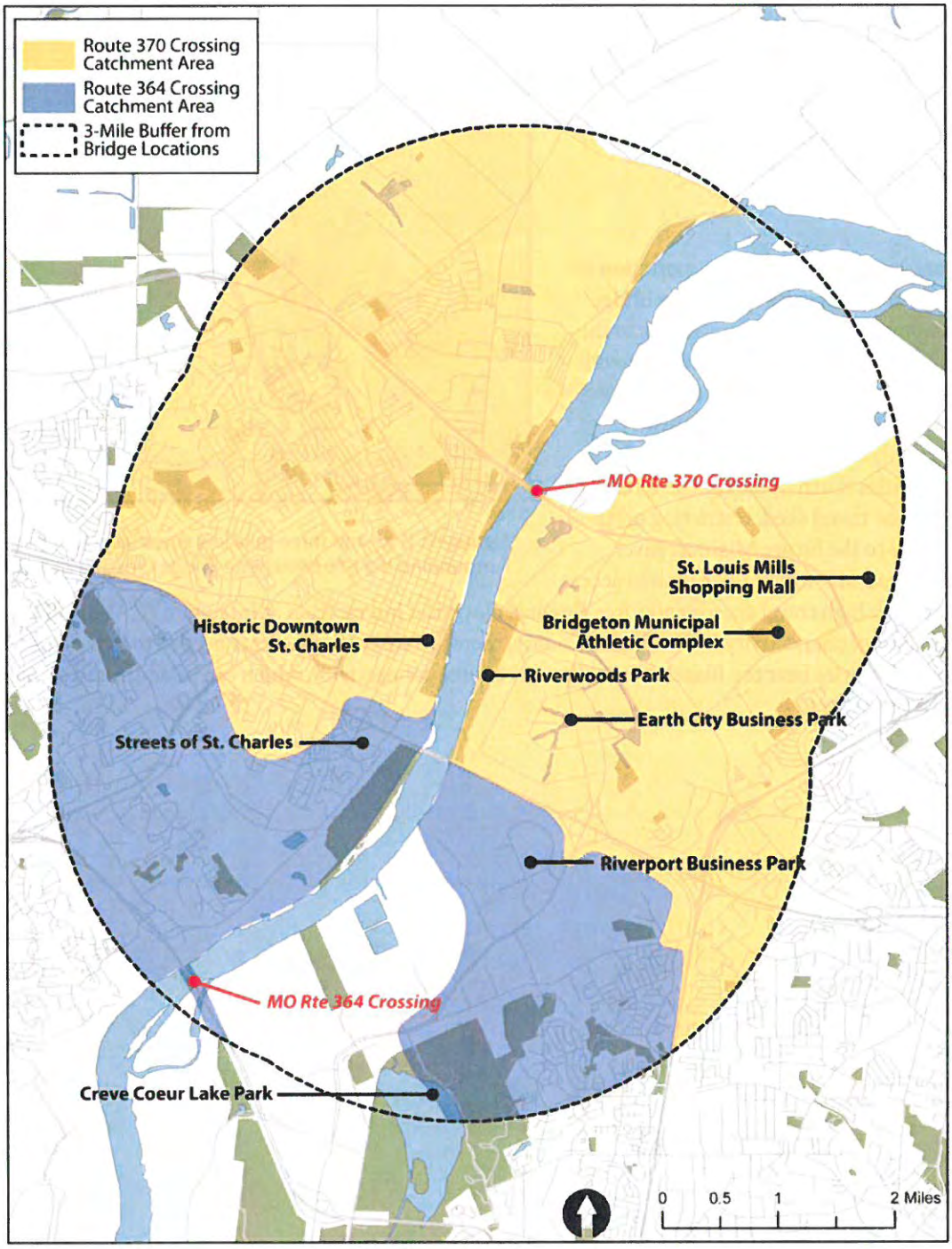


Figure 50: Current Bicycle Connectivity

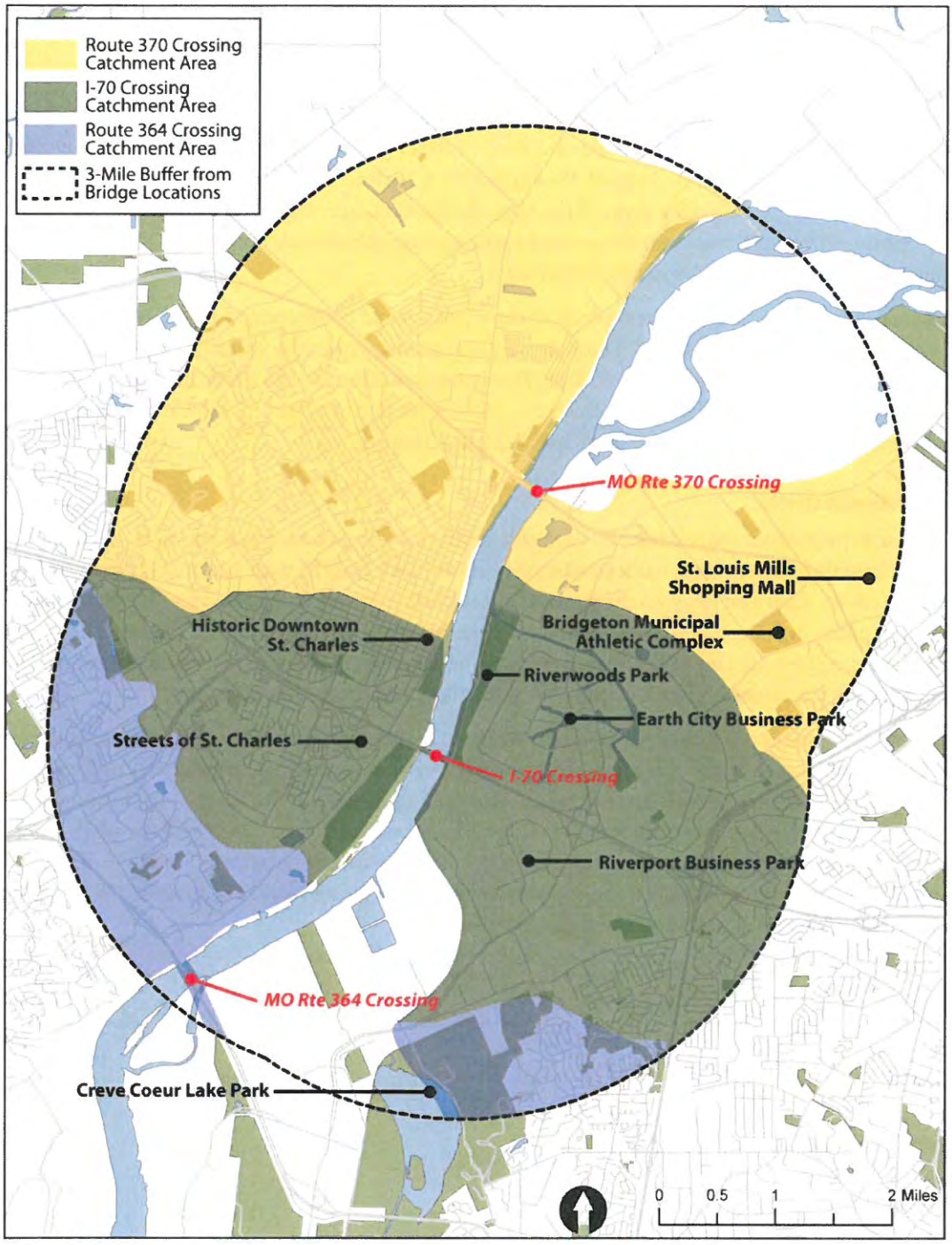


Figure 51: Bicycle Connectivity, Interstate 70 Blanchette Bridge Crossing Option

4.5.3.2 Option Two: Old Route 115 Bicycle and Pedestrian Crossing

Origins and Destinations

The Old Route 115 crossing option lands near historic Main Street St. Charles. Within the half-mile walking distance of the bridge's landing in St. Charles are some of the city's cultural and recreational destinations, including the Frenchtown Historic District, Downtown St. Charles, Frontier Park, and Katy Trail State Park. Within the three-mile bike shed are many of the same destinations accessible from the Blanchette Bridge crossing option, with additional destinations and residential neighborhoods north of MO Route 370 accessible via the Katy Trail and Boschert Greenway.

In St. Louis County, the bridge touches ground in the northern end of Riverwoods Park, tying into the Earth City Levee Trail and Riverwoods Trail. There are no destinations within the immediate travel shed aside from Riverwoods Park and the Earth City Levee Trail. Destinations within the three mile bike shed include Hollywood Casino, Verizon Wireless Amphitheater, Riverport Business Park, Earth City Business Park, and one additional location, the Bridgeton Municipal Athletic Complex.

Pedestrian Connectivity

The contrast in pedestrian connectivity for each side of this crossing location is stark. In St. Charles, pedestrians benefit from a grid network consisting of short block lengths with a relatively complete sidewalk network. The Katy Trail also ties into the pedestrian network, expanding opportunities for recreational trips. In St. Louis County, however, despite the presence of the Riverwoods Park Trail and the Earth City Levee Trail, there are no sidewalks on any nearby roadways, and employment destinations in nearby Earth City Business Park are inaccessible given the lack of a pedestrian connection from the west.

Level of service within the half-mile pedestrian travel shed is shown in Figure 52 on the following page. As a whole, and in comparison to the other potential crossing locations, pedestrian connectivity and levels of service within the half-mile pedestrian travel shed surrounding the Old Route 115 crossing location are better, as would be expected from this bridge location. Sidewalks are present on nearly 83% of the area's 15 miles of roadways, and more than 75% of roadways within the study area are characterized by a PLOS of 1 or 2, which correspond to a very safe, comfortable, and enjoyable pedestrian environment. The mean PLOS in the area is 1.9, indicating high levels of pedestrian level of service.

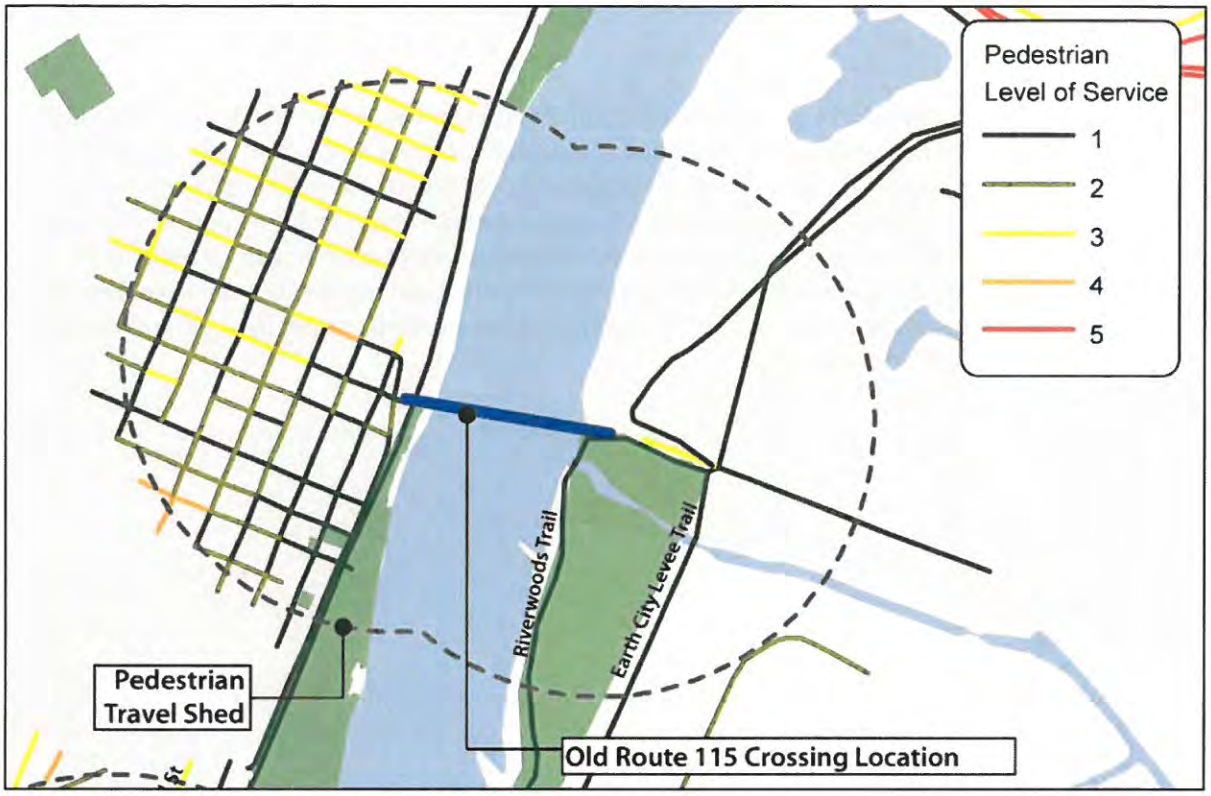


Figure 52: Pedestrian Level of Service, Old Route 115 Crossing Location

Bicycle Connectivity

The addition of a bicycle and pedestrian bridge along the Old St. Charles Bridge alignment would provide an improvement for bicycle connectivity within the surrounding communities, as shown in Figure 54 on page 73. Figure 53 to the right shows the low-stress bikeway network within a two and three mile radii of the Old Route 115 Bridge crossing alternative. . The large numbers of households and jobs served by this bridge crossing alternative (28,600 and 56,110, respectively) reflect the connection of this bridge crossing with the bicycle facilities that surround it. Mean trip distance to each of the bridge crossings ranges from 0.9 miles to 2.0 miles, a decrease when compared to the current conditions. In St. Charles, the residential neighborhoods surrounding Downtown St. Charles benefit the most from a new connection across the river at this location. In St. Louis County, Bridgeton residents west of Interstate 270 benefit as well. Neighborhoods on the periphery of the study area,

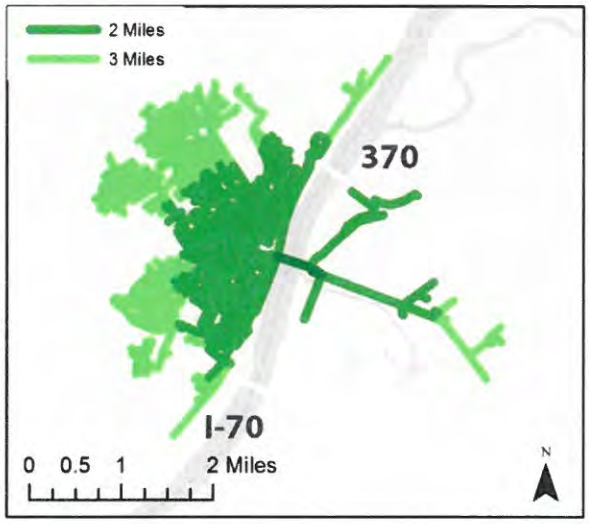


Figure 53: Two- and three-mile low stress bicycle network surrounding the Old Route 115 Crossing Location

such as those south of Interstate 70 and east of Interstate 270, see marginal improvements in connectivity, but still face many of the same barriers to bicycle travel, as discussed further below.

Barriers

There are a number of barriers to bicycling and walking in the area surrounding the Old Route 115 crossing option. While the traditional gridiron street network in historic Downtown St. Charles provides route options for non-motorized travel, one way streets, occasional sidewalk gaps, steep hills, and the lack of a formal bicycle route or wayfinding system deter bicycle and pedestrian travel. Further away from the bridge, suburban development patterns, dangerous intersections, and Interstate 70 deter bicyclist activity. In St. Louis County, bicyclists are faced with circuitous routing options that add trip distance and force them to travel along high-speed arterial roadways that lack the facilities necessary to support bicycle travel beyond the most experienced and confident riders.

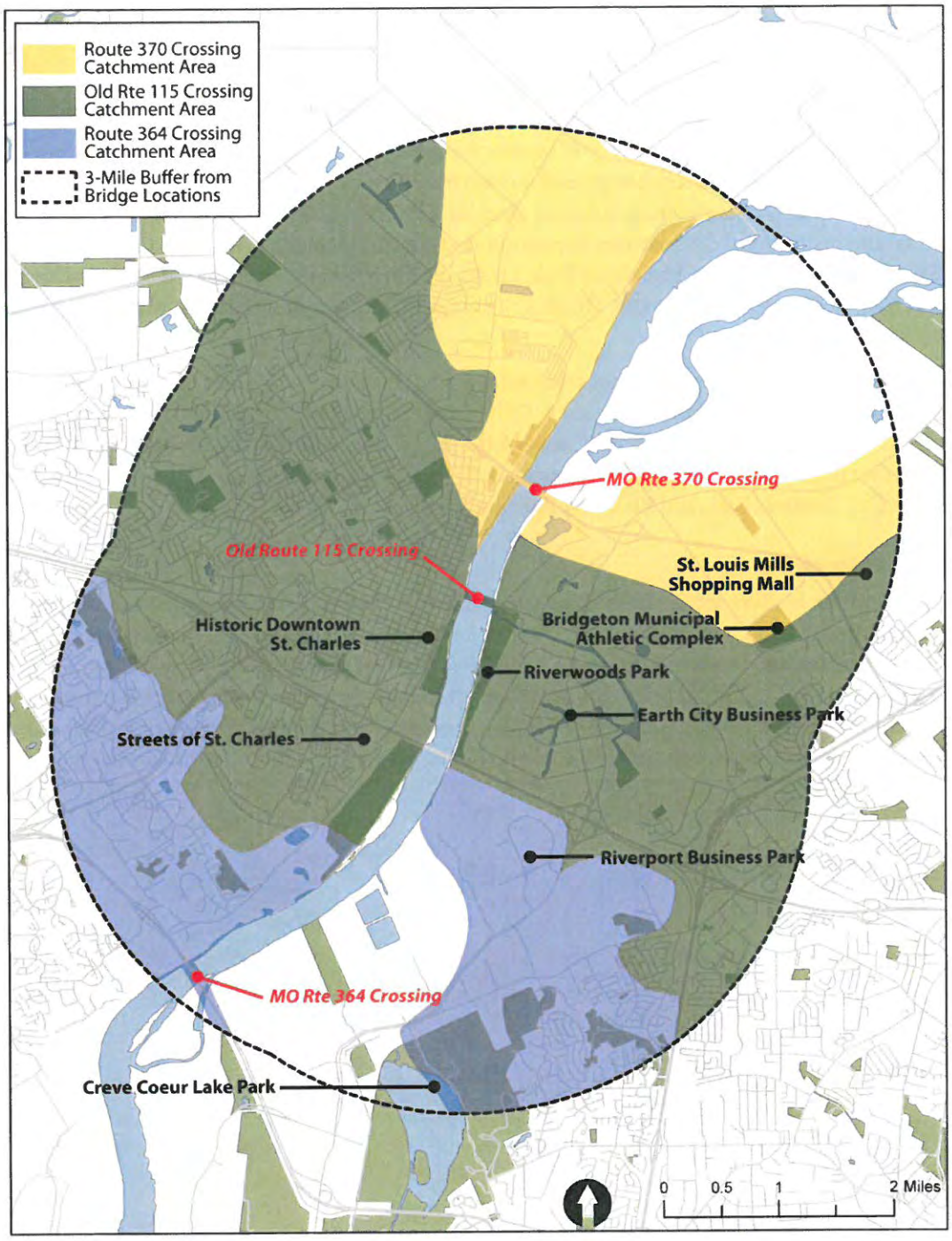


Figure 54: Bicycle Connectivity, Old Route 115 Crossing Option

4.5.3.3 Option Three: Missouri Route 370 Discovery Bridge

Origins and Destinations

Of the three alternatives, the Discovery Bridge option connects to the fewest trip origins and destinations within walking and bicycling distance. The Discovery Bridge enters St. Charles County further north than both other crossing options and touches ground immediately west of Jean Baptiste Point DuSable Park and Katy Trail State Park. Within the three mile bike shed are a diversity of recreation, residential, office, commercial and institutional destinations. Significant destinations include the Boschert Greenway, New Town St. Charles, Fox Hill Park, Blanchette Park, Lindenwood University, Frenchtown Historic District, Ameristar Casino, Boeing, Downtown St. Charles, Streets of St. Charles, Frontier Park, and Bangert Island Wildlife Area.

In St. Louis County, little development has occurred near the Discovery Bridge, and most of the surrounding land uses are agricultural or industrial in nature. Only a short segment of the existing Missouri River Greenway is within the half-mile walking distance from the Discovery Bridge. Additional destinations within biking distance include St. Louis Mills shopping mall, Bridgeton Municipal Athletic Complex, Riverwoods Park, Earth City Business Park, and Riverport Business Park.

Pedestrian Connectivity

Current pedestrian levels of service reflect the lack of sidewalks and pedestrian facilities surrounding the MO 370 Discovery Bridge in both St. Louis and St. Charles Counties. Of the 11.3 miles of roadways within the half-mile pedestrian travel shed surrounding the MO 370 Discovery Bridge, only 40% possess sidewalks. The intersection of MO 370 and MO 94 presents significant challenges for pedestrians, with many turning movements and significant traffic volumes. The bridge crossing is another challenge for pedestrians, in that there are only striped bike lanes on the bridge and no formal pedestrian facility. As evident in Figure 55, there

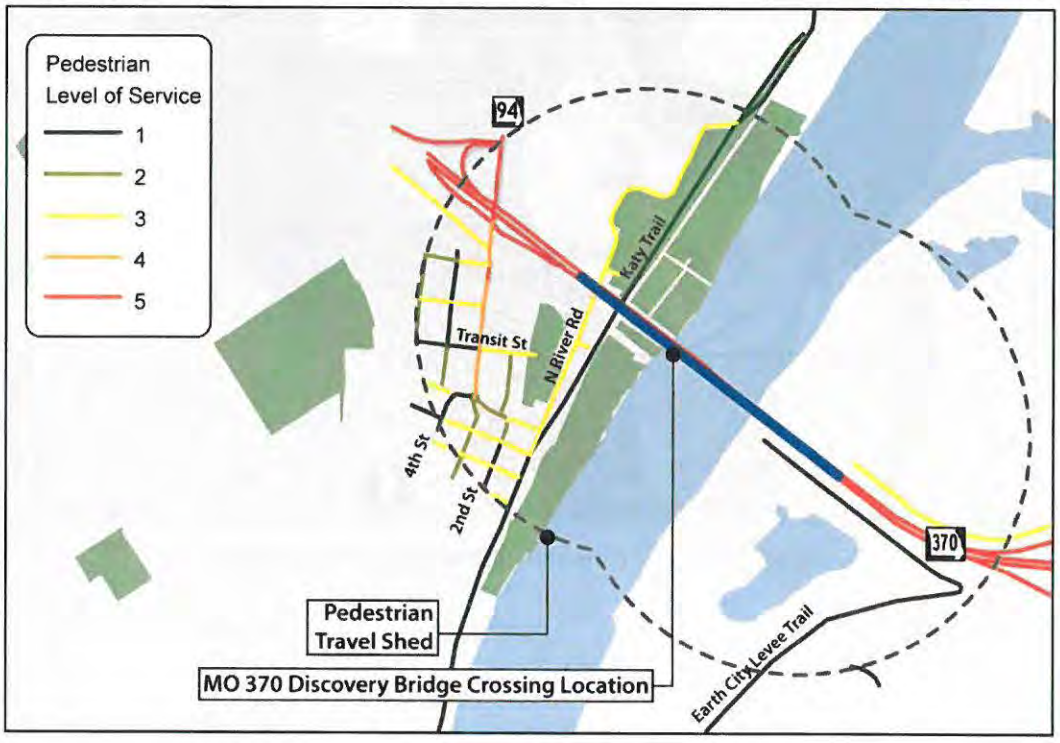


Figure 55: Pedestrian Level of Service, MO 370 Discovery Bridge Crossing

are few accessible corridors for pedestrians within the half-mile pedestrian travel shed surrounding the bridge. The mean pedestrian level of service in this area is between PLOS D and PLOS E, indicating a generally poor level of service for pedestrians. Only 38% of roadways and trails are characterized by PLOS 1 or PLOS 2, which include trails and streets with low speeds, sidewalks, and often buffers between pedestrian and motor vehicle facilities. If trails are removed from these calculations, the percentage decreases further to just 22%.

Bicycle Connectivity

With improvements to the bicycle and pedestrian crossing on the MO 370 Discovery Bridge, bicyclists will see only marginal improvements in connectivity, as displayed in Figure 56. The catchment area, shown in Figure 57 for this option, will increase slightly serving an additional 580 households and 1,200 jobs. Mean trip distance to the MO Route 370 bridge expands slightly from 2.8 miles to 3.2 miles, reflecting the increased desirability due to the bridge improvements. Aside from these bridge improvements, the same challenges face bicyclists as before: very few bicycle facilities (particularly in St. Louis County), a low degree of roadway connectivity, poor bicycle level of travel stress on many area roads, and circuitous routing for most bicycle trips.

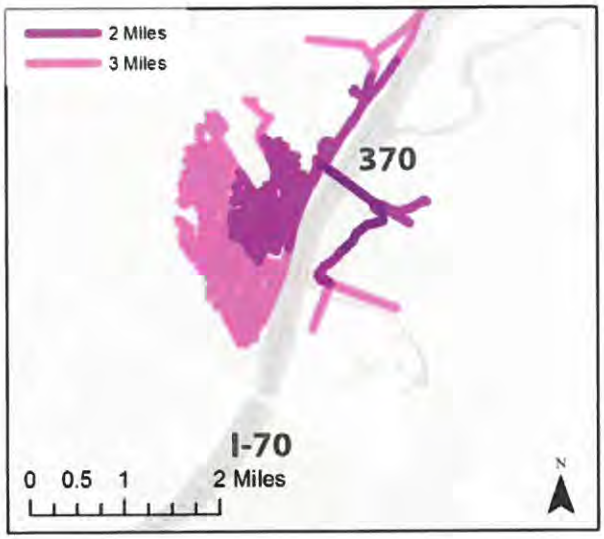


Figure 56: Two- and three-mile low stress bicycle network surrounding the Missouri Route 370 Crossing Location

Barriers

Barriers to active transportation surrounding the Discovery Bridge crossing option include a notable lack of bicycle and pedestrian facilities, particularly along MO Route 94 north of MO Route 370, MO Route 141, and MO Route 370 itself. While segments of MO 370 and MO 141 are designated as signed bicycle route as part of the Mississippi River Trail, the lack of separation from high-speed vehicle traffic (MO 370 has a posted speed limit of 60 mph) deters all but the most confident bicyclists from traveling in this area. The lack of destinations within close proximity to the bridge also limit the utility of this crossing option. The majority of trip destinations and origins are located to the south of MO Route 370, adding significant distance to cross-river trips.

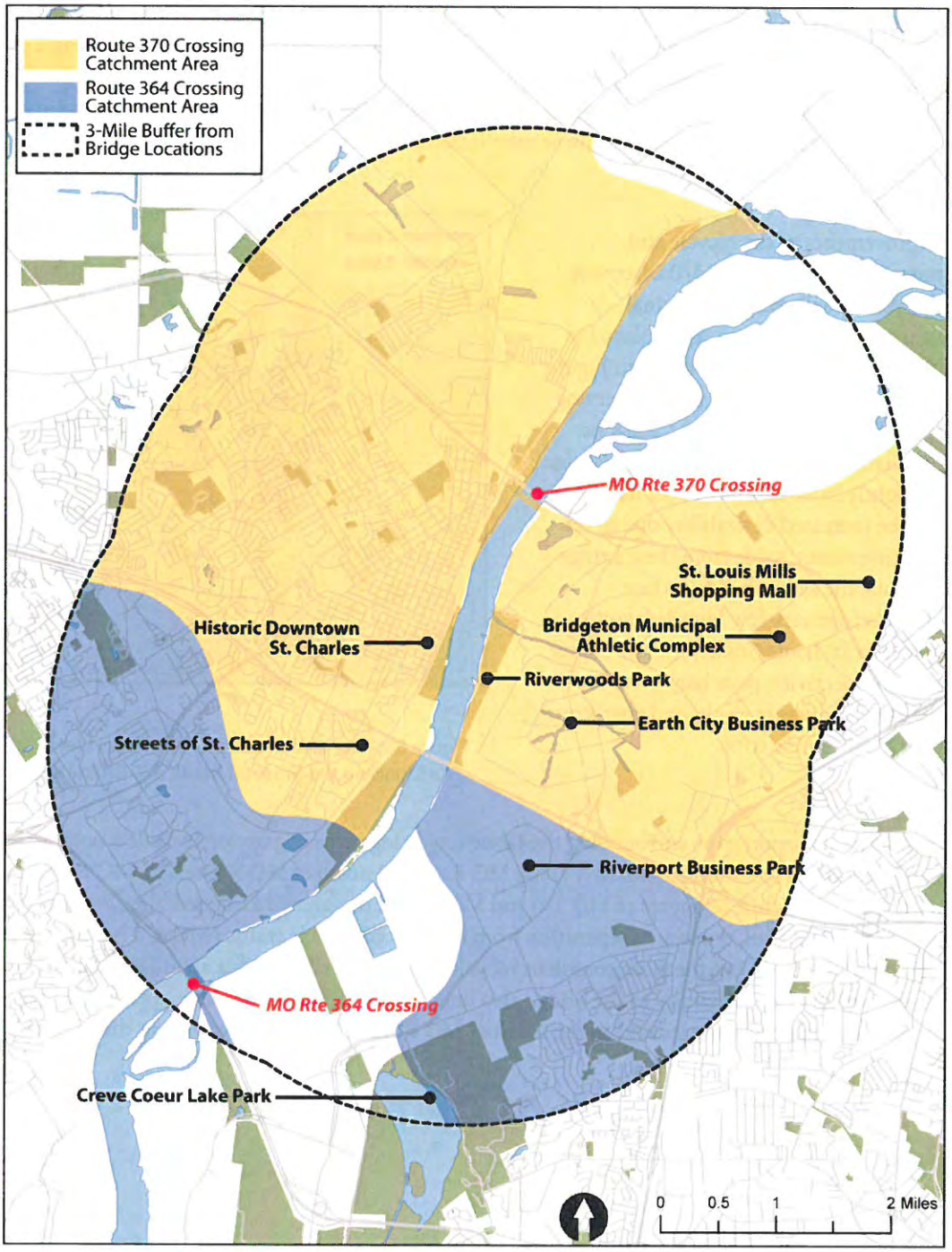


Figure 57: Bicycle Connectivity, MO 370 Discovery Bridge Crossing Option

4.5.4 Conclusion

The levels of connectivity within the bicycling and walking travel sheds surrounding each of the crossing alternatives are strong indicators of existing conditions for walking and bicycling, and of the potential impact that each crossing would have on cross-river trips. Because many of the same barriers exist within each of the crossing alternative travel sheds, including the lack of adequate facilities for bicycle and pedestrian travel, low levels of connectivity within the street network, and long distances between land uses, characteristics unique to each crossing alternative ultimately determine which crossing will provide the greatest benefit.

Differences in the presence, quality and character of the pedestrian facilities surrounding each crossing alternative are presented in Table 6 below. In terms of network density, total sidewalks and trails, percent of network with sidewalks and trails, and mean pedestrian level of service, the Old Route 115 crossing option is the most connected to the existing infrastructure.

Table 6: Pedestrian Connectivity and Level of Service Metrics

Alignment Option	MO 370		I-70		Old Rte 115	
Centerline miles of roadway and trails	11.3		6.8		14.95	
Centerline miles of sidewalk and trails	4.57		3.1		12.5	
Percent of network with sidewalk or trails	40%		46%		83%	
Mean PLOS	3.6		2.8		1.9	
Level of Service (miles and % of total)						
PLOS 1	3.4	30%	2.2	32%	7.0	47%
PLOS 2	0.9	8%	0.9	13%	4.6	31%
PLOS 3	2.7	24%	2.3	34%	3.0	20%
PLOS 4	0.4	4%	0.9	14%	0.3	2%
PLOS 5	4.0	35%	0.5	8%	0.0	0%

As described in Table 7 on the following page, the new separated on MO Route 370 will provide a slight service advantage for bicycles but none for pedestrians since the 6' separated facility suggested by MoDOT is the width of a bikeway and passing is not accommodated. It will attract a minimal amount of people to this crossing. The average mean to key destinations served is slightly longer due to the attractiveness and area served. The Old Route 115 and I-70 crossings are relatively similar in terms of number of destinations served. However, Old Route 115 serves the greatest number of households and has the greatest impact on mean trip distance to key destinations. This crossing would improve crossing conditions for the greatest number of people.

Table 7: Bicycle Connectivity Metrics

Crossing Alignment Scenario	Destinations Accessed	Mean Trip Distance (Mi.)	Households Served	Jobs Served
MO Rte 370 (Existing)	9	2.8	26,060	55,550
Mo Rte 364	3	4.2	17,120	16,970
MO Rte 370 (New Facility)	9	3.2	26,640	56,750
Mo Rte 364	3	5.4	16,540	15,760
Old Route 115	8	1.8	28,600	56,110
MO Rte 370	2	0.9	2,150	2,850
Mo Rte 364	3	2.0	12,430	13,560
I-70	9	2.0	13,150	36,150
MO Rte 370	4	2.0	19,910	30,190
Mo Rte 364	2	3.7	10,120	6,180

The MO 370 Discovery Bridge crossing's location and lack of surrounding development limit its potential to serve most bicycle and pedestrian trips. Aside from the Katy Trail and the future Missouri River Greenway, there are no dedicated bicycle facilities and very few sidewalks surrounding the bridge. The crossing's value lies in its potential to serve regional bicycle trips and recreational bicycling trips.

The Interstate 70 Blanchette Memorial Bridge has a more significant impact on non-motorized connectivity than the MO 370 Discovery Bridge. Like each of the three options, the existing Katy Trail provides excellent north-south connectivity in St. Charles, providing access to adjacent neighborhoods and commercial districts. Because the crossing scenario calls for a connection to the Riverwoods Trail to the north, this option allows for users to access the bridge in St. Louis County without having to travel through the intersection of Interstate 70 and MO 141, one of the busiest intersections in the study area.

The Old Route 115 crossing has the closest proximity to Downtown St. Charles, residential neighborhoods, and Earth City Business Park, which would make it a more attractive alternative for utilitarian trips. Again, like the MO 370 Discovery Bridge, this crossing option also suffers from a lack of bicycle and pedestrian facilities that connect to meaningful destinations, particularly on the St. Louis County side of the river. The significant improvement to bicycle connectivity in St. Louis County also adds considerable value to this crossing option as well, particularly for residents of Bridgeton and northern Maryland Heights. The most attractive quality of this crossing alternative is the relatively well-established network of existing facilities surrounding the bridge in St. Charles, including the Katy Trail. For the reasons discussed above, the Old Route 115 Bicycle and Pedestrian Crossing is the most connected to the existing system of bicycle and pedestrian connectivity facilities.

In summary, the Old Route 115 crossing is located closest to the existing network of bicycle and pedestrian facilities and households, the I-70 crossing improves access to major destinations but has fewer households nearby, and the MO 370 crossing has the least amount of connectivity, but is an existing crossing on the Gateway Bike Plan network. However, when comparing overall benefits in connectivity, the Old Route 115 crossing alternative would provide similar benefits as the combined project of completing the I-70 crossing

and improvements at the MO 370 crossing. The combined I-70 and MO 370 project will reach the greatest number of households and destinations and will provide the greatest opportunity for low stress connections on both sides of the Missouri River. Figure 58 below shows the low-stress bikeway network within the two and 3 mile radius of the combined I-70 and MO 370 alternatives. This option will reach the greatest number of households and destinations and will provide the greatest opportunity for low stress connections on both sides of the Missouri River.

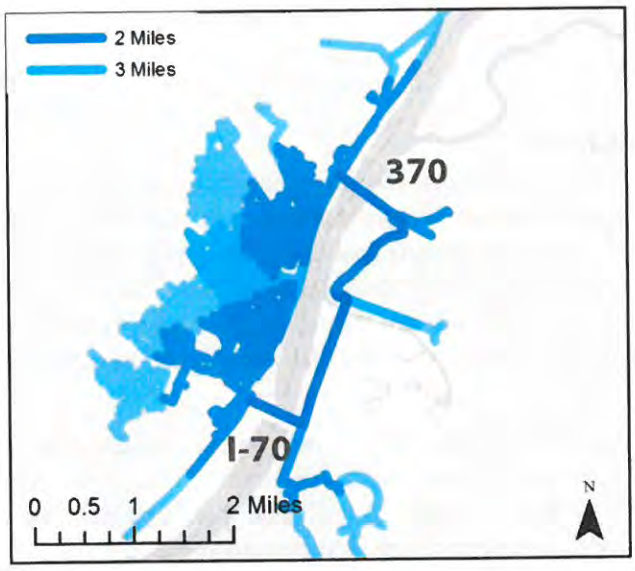


Figure 58: Two- and three-mile low stress bicycle network surrounding the I-70 and MO 370 Crossing Locations

4.6 Active Transportation Demand

This section of the study provides an analysis of bicycle and pedestrian demand for the travel sheds surrounding each of the three crossing locations. This analysis takes into account connectivity within the existing bicycling and walking networks, quality and comfort of existing bicycling and walking facilities, accessibility of local and regional destinations, relative route directness, and existing barriers to non-motorized travel. The results of this analysis will inform the final evaluation and selection of an alternative.

4.6.1 Methodology

4.6.1.1 Defining Travelsheds

A "travel shed" or "commute shed" is a defined area surrounding a destination (or transportation link) that represents the service area for that facility. Travel sheds for transit and motor vehicles can include an entire region, since these modes are capable of covering great distances during a single commute. Since pedestrians and bicyclists are limited by travel speed, travel sheds for these modes are correspondingly smaller than that of motorized modes. According to the U.S. National Household Travel Survey (NHTS), over 75 percent of walking trips (made for all trip purposes) are shorter than one mile and nearly 85 percent of cycling trips are shorter than five miles.

Based on these findings, an assumption was made that each potential bridge crossing examined in this report would primarily serve the active travelers in its immediate vicinity. This vicinity, or "travel shed", was defined using the distances provided by the NHTS data – roughly one mile for pedestrians and five miles for cyclists. A further assumption was made that these distances were best expressed as radii of one half mile and three miles, from the endpoints of each potential bridge alignment, which accounts for an active traveler's need to cross a bridge in order to reach destinations on the opposite side of the Missouri River.

These travel sheds, a one half mile walk shed and three mile bike shed, represent the active transportation market areas: the communities where people are most likely to make a walking or cycling trip that crosses the Missouri River.

4.6.1.2 Active Transportation Demand Factors (Quantitative Demand Analysis)

After establishing travel sheds for each potential crossing location, a set of factors were identified to measure and compare the potential active transportation demand for each crossing scenario. Quantitative factors include population, number of jobs (employment), and bicycle and pedestrian trip demand. These factors are described below.

Population and Employment Estimate

Existing population and employment data were compiled for the bicycling and walking travel sheds for each crossing location using 2010 Census data using block group level data. Because this data does not directly correspond to the travel sheds, it was determined that each block group that was either completely or partially within the travel shed would be included in the assessment.

Estimated Bicycle and Pedestrian Trip Demand

In order to project bicycle and pedestrian trip demand for each crossing scenario, estimates were determined using the following method:

1. Identify existing population and employment figures using the 2010 Census data for the one half mile and three mile travel sheds for each crossing location.

2. Using data provided by East West Gateway Council of Governments, identify population and employment growth rates.
3. Apply these growth rates to the 2010 population and employment figures to project these outward thirty years to 2040.
4. Calculate existing commute mode share for bicycling and walking using 2008-2012 American Community Survey transportation analysis zone (TAZ) level data[1].
5. Apply the commute mode share to the existing and future population and employment figures to determine the number of people walking and bicycling commute trips in each crossing location travel shed.
6. Calculate non-work-related trips using multipliers for utilitarian and recreational/social trips from the National Household Travel Survey.

It is important to note that the estimated number of walking and bicycling trips refers to all trips within the one half mile and three mile travel sheds, not all of these walking and bicycling trips include crossing the Missouri River. Many of these trips occur entirely within one county.

4.6.2 Analysis

4.6.2.1 Option One: I-70 Blanchette Memorial Bridge

Population and Employment

The Blanchette Bridge crossing option serves the largest residential and employment populations of the three alignment alternatives. This is due in large part to the land use patterns in both St. Louis and St. Charles Counties, where growth has radiated outward from dense nodes of development along Interstate 70. There are approximately 60,000 residents and 64,000 jobs within the three mile bike shed of the Blanchette Bridge. Portions of both Earth City and Riverport Business Parks are within a half mile of the Blanchette Bridge, as are multiple residential neighborhoods in St. Charles. Future growth in population and employment in the travel shed surrounding the Blanchette Bridge is expected to occur at the lower rates than both of the other crossings, a reflection of the areas status as mostly developed. Modest gains of 6,000 residents and 13,000 jobs will still create additional demand for bicycle and pedestrian facilities.

Bicycle and Pedestrian Trip Demand

There are more walk and bike trips in the Blanchette Bridge travel sheds than either of the two crossing alternatives. With identical walk and bike commute mode share as the Old Route 115 crossing location travel sheds, these greater figures are a result of higher population and employment figures, particularly within the half-mile pedestrian travel shed. Table 8 below displays current and future walking and bicycling trips within the surrounding travel sheds. This is the only crossing location in which there are more walking trips (5,134) than bicycling trips (4,122). With slower growth rates for both population and employment, projected walk and bike trips will raise to 5,971 and 4,773 by 2040, respectively. While these gains appear modest, they assume a constant rate of walk and bike mode share over time. As such, additional gains are a result of growing populations, not a shift in travel choices. If the bike and walk mode shares double, the gains increase significantly to a projected 11,905 pedestrian trips and 10,589 bicycle trips.

[1] A TAZ is a special area delineated by state, regional, and/or local transportation officials for tabulating traffic-related data, especially journey-to-work and place-of-work statistics.

Table 8: I-70 Bridge Bicycling and Walking Activity

	Current (2010)	Future (2040)
Walk Trips		
Commute	558	649
Recreation/Social	2,176	2,531
Utilitarian	2,399	2,791
Total	5,134	5,971
Bike Trips		
Commute	557	645
Recreation/Social	2,674	3,096
Utilitarian	891	1,032
Total	4,122	4,773
Combined Trips		
Commute	1,115	1,294
Recreation/Social	4,850	5,627
Utilitarian	3,291	3,823
Total	9,255	10,744

4.6.2.2 Option Two: Old Route 115 Bicycle and Pedestrian Crossing

Population and Employment

The Old Route 115 Bicycle and Pedestrian Crossing serves the second greatest population (54,000) and number of jobs (59,000) jobs. Portions of Earth City Business Park and historic Downtown St. Charles are within walking distance, and nearby residents and employees will benefit from the increased connectivity provided by the bridge. With an estimated 5 percent increase in population and 45 percent increase in jobs, the Old Route 115 Bicycle and Pedestrian Crossing would provide added benefit to the thousands of new workers and residents in the area. Population and employment figures are projected to rise to 57,000 and 85,000, respectively, by 2040.

Bicycle and Pedestrian Trip Demand

Current walking and bicycling trips (3,211 and 4,270, respectively) in the travel sheds of the Old Route 115 crossing location are a reflection the low active transportation modal share of journey to work trips (3.9 percent for walking and 0.5 percent for biking). Table 9 displays the current and future walking and bicycling trips in the area surrounding the Old Route 115 crossing location. With considerable population and employment growth in the area over the next thirty years, these figures rise to 4,223 walking trips and 5,380 bicycling trips by 2040, assuming no change in mode share. When the mode share for walking and bicycling are doubled, projected 2040 pedestrian and bicycle commute trips increase substantially to 8,501 and 10,530, respectively.

Table 9: Old Route 115 Crossing Location Bicycling and Walking Activity

	Current (2010)	Future (2040)
Walk Trips		
Commute	349	459
Recreation/Social	1,361	1,790
Utilitarian	1,501	1,974
Total	3,211	4,223
Bike Trips		
Commute	577	727
Recreation/Social	2,770	3,490
Utilitarian	923	1,163
Total	4,270	5,380
Combined Trips		
Commute	926	1,186
Recreation/Social	4,131	5,280
Utilitarian	2,424	3,137
Total	7,481	9,603

4.6.2.3 Option Three: Missouri Route 370 Discovery Bridge

Population and Employment

The Discovery Bridge serves the smallest residential and employment populations of all three crossing alternatives, with just 44,000 and 52,000, respectively. The vast majority of these populations are located south of Highway 370 and fall within the travel sheds of the other two crossing alternatives. Given the availability of developable land to the north of MO Route 370, the high projected growth rates for both population and employment can have a significant impact on future travel patterns in the coming years. By 2040, population is estimated to increase 14 percent to 50,000, and employment to increase 70 percent to 89,000.

Bicycle and Pedestrian Trip Demand

Current walking and bicycling trips in the travel sheds for the MO Route 370 Discovery Bridge are the lowest of all three crossing locations. Table 10 shows the number of current and projected bicycling and walking trips taking place within the travel sheds surrounding the Route 370 Bridge. Pedestrian commute trips in particular are incredibly sparse given the lack of population and employment within the half-mile pedestrian travel shed. Because recreation/social and utilitarian trip calculations are dependent upon commute trips, they appear extremely low as well. The quality of the proposed facility on the barrier separated option will not encourage any more pedestrian trips since it will be 6' wide, which is essentially a directional bike lane. As residential and employment populations rise over the next three decades, however, bicycle trips will increase to approximately 5,853, the highest of the three crossing locations. Because of the low number of projected pedestrian trips, however, the Route 370 Bridge crossing location has the lowest number of combined trips,

both current (4,048) and projected (5,863). This assumes no change in bicycle or pedestrian mode share for journey to work trips. Given the small current and projected residential populations within a the half-mile pedestrian travel shed, even a significant increase in walking mode share will result in a minimal increase in walking commute trips. A ten-fold increase in walking mode share to 1 percent, for example, would result in only 11 total trips. A doubling of the bicycle mode share from 0.6 percent to 1.2 percent, on the other hand, would more than double the projected bicycle trips, increasing from a projected 5,853 at 0.6 percent to 12,328 at 1.2 percent.

Table 10: MO Route 370 Bridge Bicycling and Walking Activity

	Current (2010)	Future (2040)
Walk Trips		
Commute	0	1
Recreation/Social	0	4
Utilitarian	0	4
Total	0	9
Bike Trips		
Commute	547	791
Recreation/Social	2,626	3,797
Utilitarian	875	1,266
Total	4,048	5,853
Combined Trips		
Commute	547	792
Recreation/Social	2,626	3,801
Utilitarian	875	1,270
Total	4,048	5,863

4.6.3 Conclusion

The demand for bicycle and pedestrian facilities, including new or improved crossings over the Missouri River, will increase over time. Significant employment growth in the region will increase access to job opportunities for residents in St. Charles, Bridgeton, Maryland Heights, and surrounding communities. Journey to work and other relevant Census data indicate the greatest demand for bicycle and pedestrian facilities is in the travel sheds of the Blanchette Bridge crossing location, as shown in Table 11 below.

Table 11: Current and Future Demand

Crossing Location	Walk Trips		Bike Trips		Combined Trips (Walk and Bike)	
	Current (2010)	Future (2040)	Current (2010)	Future (2040)	Current (2010)	Future (2040)
MO Route 370 Discovery Bridge	0	9	4,048	5,853	4,048	5,863
Old Route 115 Crossing Location	3,211	4,223	4,270	5,380	7,481	9,603
I-70 Blanchette Memorial Bridge	5,134	5,971	4,122	4,773	9,255	10,744

Strong projected employment and population growth in the northern portions of the study area are reflected in the substantial increase in bicycle trips within the MO 370 Discovery Bridge three mile travel shed. Despite the expected growth in this area, the I-70 Blanchette Memorial Bridge crossing location would serve the greatest number of potential users based on both current and projected figures.

The table above assumes no change in the walk and bike mode share. As Great Rivers Greenway continues to construct the River Ring network of interconnected trails and greenways, a number of which are located within the study area, and local and state agencies continue to implement bicycle and pedestrian infrastructure projects, it is likely that bicycling and walking will become more viable transportation choices. In addition, growth and development within the study area, as indicated in the regional TAZ data, will bring area residents closer to employment opportunities, shopping, and entertainment activities. These changes to the built environment are likely to change local transportation patterns and can help to increase the number of people who choose to walk and bike to work, to the store, or for other trip purposes. This in turn increases the mode share for walking and biking. While there are no mode share targets for walking and bicycling in the St. Louis Region to serve as a guidepost for this study, an examination of modest and substantial increases in walk and bike mode share reveals the potential increase in walking and bicycling trips, and in turn demand for a more connected system for non-motorized transportation. Table 12 depicts this no-change assumption, a doubling of walk and bike mode share assumption, and a significant increase assumption (10 percent walk, 2.5 percent bike).

Table 12: Future Demand with Mode Share Growth Scenarios

Crossing Location	Current Walk Mode Share	Future Walk Trips			CurrentBike Mode Share	Future Bike Trips		
		No Change	Double	10% of total		No Change	Double	2.5% of total
MO Route 370 Discovery Bridge	3.9%	9	18	1,003	0.5%	5,583	12,328	25,693
Old Route 115 Crossing Location	3.9%	4,223	8,501	10,902	0.5%	5,380	10,530	26,322
I-70 Blanchette Memorial Bridge	0.1%	5,971	11,905	11,905	0.6%	4,773	10,589	26,485

As Table 12 indicates, mode share increase scenarios can significantly impact the demand for bicycle and pedestrian facilities. While most bicycling and walking trips within the travel sheds surrounding each crossing location will not be cross-river trips, the increased connectivity afforded by a new bicycle and pedestrian crossing will expand opportunities for both local and regional non-motorized travel. As the City of St. Charles and its local partners continue to implement bicycle and pedestrian projects throughout the study area, and as future growth and development brings people closer to the places they frequently visit, bike and walk mode share are sure to increase. Even in the two bike and walk mode share increase scenarios in Table 12, the I-70 Blanchette Memorial Bridge crossing would continue to serve the greatest number of potential users.

4.7 Aesthetics and Visualization

The physical attributes of a bicycle and pedestrian facility, particularly a bridge or crossing facility, have a significant impact on the user's experience, sense of safety and comfort, and overall enjoyment. Factors like path width and surface, grades, separation from motor vehicle traffic, lighting, signage, and even public art and other aesthetic elements factor into the user experience. This section of the study analyzes the potential of each alignment option to incorporate best practices to create a safe, positive, and memorable experience for bicyclists, pedestrians, and other bridge users. A supplementary overview of best practices in bicycle and pedestrian crossing design is included in the appendix of this study.

4.7.1 Option One - I-70

4.7.1.1 Quantitative Analysis

User Experience

The design for the I-70 crossing is limited to an 8ft pathway to be attached to the existing structure. This pathway is to be shared by bicyclists and pedestrians. This does not meet the AASHTO recommended minimum width for this type of facility. Given the narrow width for the trail, it is expected that conflicts will arise between different user groups. Signage and pavement markings will help to delineate specific space on the sidewalk for bicyclists and pedestrians. Many multi-use paths address such safety conflicts by segregating users, either providing completely separate pathways for bicyclists and pedestrians, or striping separate space for users on the same path (e.g. bikes stay left, pedestrians stay right). The 8ft width is not sufficient to stripe a center line or other division for its entire length.

We recommend the use of pavement markings placed at intervals to illustrate the shared use of the facility by bicyclists and pedestrians. While this would not create a "defined" space as would an unbroken dividing stripe, it would reinforce the informal shared usage.

I-70 is the major highway crossing of the Missouri River in the area and accommodates significant vehicular traffic. Since this is a major cross country route, many of these vehicles are trucks which create significant noise and wind as they pass. The proposed pathway is approximately 6ft from the eastbound travel lanes. Sound measurements should be made to determine the level of noise. If the noise is above 85 dBA, a noise barrier is recommended to minimize the negative impacts of the excessive noise and improve the user experience.

Given the long span of the I-70 crossing (3,800 ft), it will be important to minimize the out of direction travel for bicyclists and pedestrians. A ramp structure and connection to the existing Katy Trail on the west bank will be very important to minimize the out of direction travel for these bridge users. On the east bank, connections to the existing levee trails and future connections to the Earth City business park will provide the least out of travel distance for bicyclists and pedestrians.

The grades of the pathway will match the existing I-70 crossing structure which does not exceed 4%. This is within the recommended AASHTO guidance for grades for bicycle facilities. When the approach ramps are designed, the grade should not exceed 5% and should ideally be 3% - 4%.

4.7.1.2 Qualitative Analysis

Bicyclist and Pedestrian Comfort

The primary, and possibly only, access from west would be a long ramp/stair structure at the Katy Trail. The east approach will likely follow a new trail alignment along the levee. Given the proximity of the existing bridge approach structure to the river and the limited opportunities to connect to existing trails, there are no option for additional access points at east or west approaches.

This option provides ample opportunities to integrate lighting into the pathway structure. Lighting can be incorporated into the new structure, such as handrails. It will be important to design the lighting so that it does not interfere with driver vision or any local dark sky ordinances.

There is opportunity to integrate noise and weather barriers into the new pathway structure. These structures can perform multiple functions. The noise barrier can also function as a required safety barrier/guardrail.

Attractiveness: Aesthetic Experience of Users

The proposed multi-use pathway for the I-70 Bridge offers good opportunities to create a unique and aesthetically appealing experience of users of the pathway. The mostly new construction of the pathway structure allows significant control over design of the pathway, which can include high quality materials and finishes, overlooks, and opportunities for interpretation.

Opportunities to include overlooks at the center 2 bridge piers have been identified. These offer active travelers a place to stop and rest, as well a place to observe activities on the river and wildlife. Overlooks area also opportunities to provide interpretive information that enriches the experience of the bridge users.

Signage

Because of its proximity and certain connections to both the Missouri River Greenway trails in St. Louis County and the Katy Trail in St. Charles County, which links to multiple existing Great Rivers Greenway facilities, opportunities are available to incorporate Great Rivers Greenway signage and branding. Wayfinding signage will be the most visible and important signage and branding element for this particular alignment. These wayfinding signs, pavement markings, and other distinctive visual elements can strengthen the identity and continuity of the regional trail network and support a more uniform and navigable experience for bicyclists and pedestrians in the surrounding area. However, proximity to adjacent interstate motor vehicle traffic, structural capacity of the bridge, minimal width for on-bridge interpretive and informational signs, and other constraints may limit the extent to which these signage and branding elements can be incorporated to the bridge's design.

Visual Impacts

The visual impacts of a new pathway will be minimal for people viewing the structure from the shore. The pathway will be attached to the outside of the existing structure and will be visible only from the south side of the I-70 crossing. The scale of the attached structure is small compared to the overall bridge.

The following visualizations show before and after views of the proposed pathway structure.

Figure 59: I-70 Midspan, Before

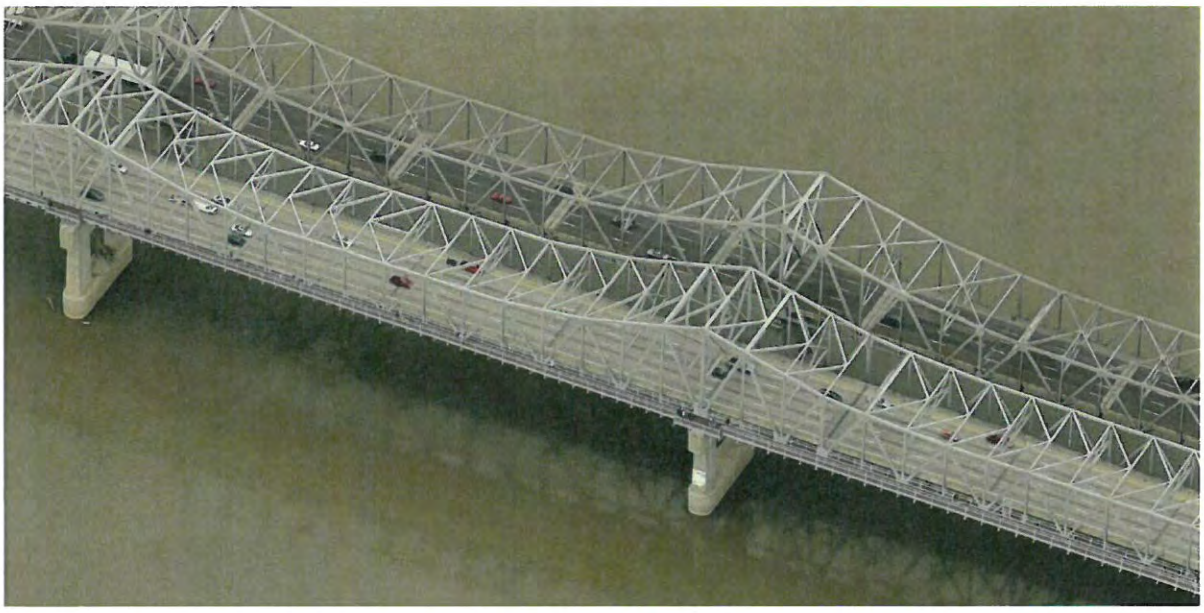


Figure 60: I-70 Midspan, After

Figure 61: I-70 Approach, Before

Figure 62: I-70 Approach, After

4.7.2 Option Two - St. Charles Rock Road

4.7.2.1 Quantitative Analysis

User Experience

A new crossing at St. Charles Rock Road would provide an opportunity to have the most control over the user experience from the perspective of the design of the trail, proximity to motorized traffic, distance travelled and grades.

The minimum standards for pathway design would easily be attainable with the new bridge design. Given the potential for a new civic landmark and attracter for new users, it is recommended that the minimum standards be exceeded.

Proximity to motorized traffic is not an issue, as the new bridge would be approximately 4,000 ft from both the I-70 and 370 crossings. This distance will limit the noise impacts from motor vehicles.

The length of the main span of the new crossing would be similar to the other crossings. Given the new construction, there is an opportunity for the ramps to connect directly to existing bicycle and pedestrian infrastructure. The grade for the approaches and main span should be 3% - 4%.

4.7.2.2 Qualitative Analysis

Bicycle and Pedestrian Comfort

This option provides the greatest opportunities to accommodate bicyclist and pedestrian comfort in the form of multiple connections at each end, lighting, etc.

Attractiveness: Aesthetic Experience of Users

A new river crossing provides an opportunity to create a unique aesthetically appealing experience and civic landmark. There are opportunities to include high quality materials and finishes, overlooks, and opportunities for interpretation.

Signage

The St. Charles Rock Road alignment option provides the greatest opportunity to incorporate Great Rivers Greenway's unique signage, branding, and identity. Similar to the other two alignment options, wayfinding signage would be incorporated into the design to direct bridge users to nearby destinations and active travel facilities. Interpretive signs, banners, pavement markings, unique artwork, and other branding elements can also contribute to the user experience while strengthening the presence of and user familiarity with Great Rivers Greenway.

Visual Impacts

A new pedestrian and bicycle bridge at the St. Charles Rock Road alignment would be a major new structure in the built environment. The new bridge would be visible from both banks of the river and the adjacent highway bridges: I-70 and 370. There is potential that this bridge could be a new civic landmark for the community and be an attraction for visitors, similar to the Bob Kerrey Bridge in Omaha, Nebraska.

The following visualizations show before and after views of a new bridge at this alignment.

Figure 63: Old Route 115 Crossing Approach, Before

Figure 64: Old Route 115 Crossing Approach, After

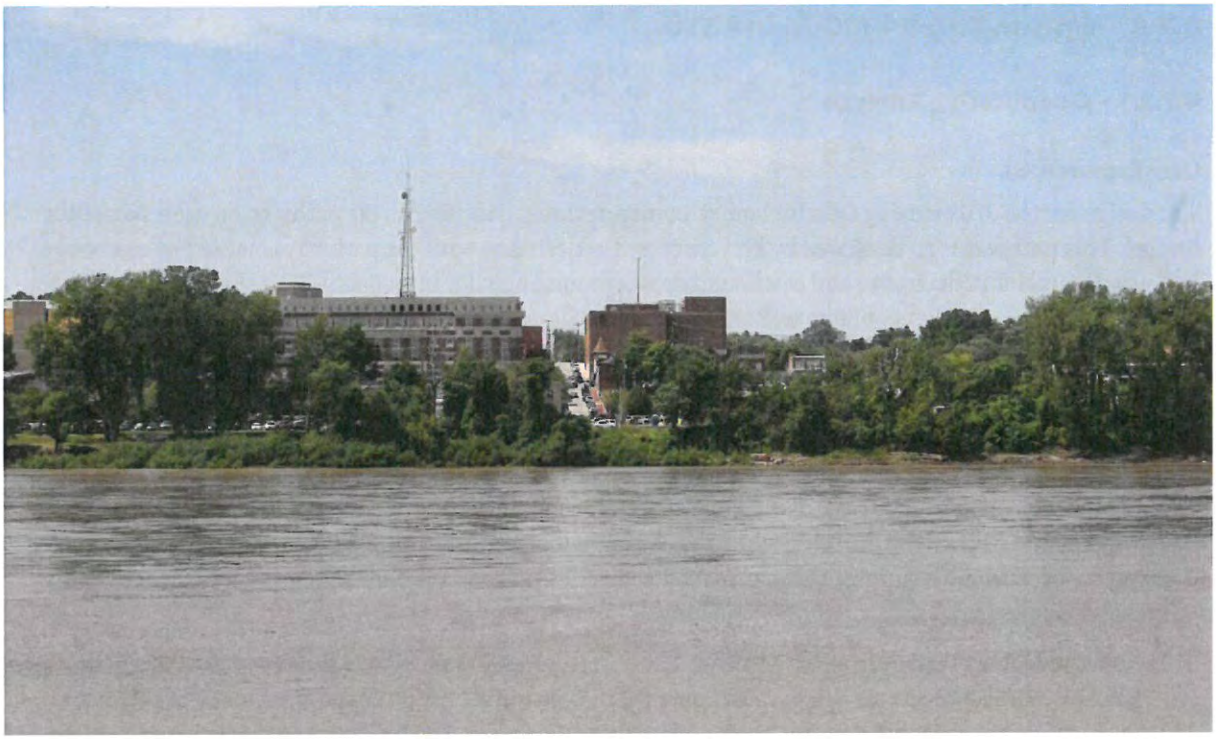


Figure 65: Old Route 115 Crossing Midspan, Before

Figure 66: Old Route 115 Crossing Midspan, After

4.7.3 Option Three – MO Route 370

4.7.3.1 Quantitative Analysis

User Experience

The design for the 370 crossing calls for lane re-configurations to include an 8ft pathway on each side of the bridge. This pathway is to be shared by bicyclists and pedestrians with the pathways marked as eastbound and westbound for pedestrians, and eastbound or westbound only for bicyclists. Given the narrow width for the trail, it is expected that conflicts will arise between different user groups. Signage and pavement markings will help to delineate specific space on the sidewalk for bicyclists and pedestrians. Many multi-use paths address such safety conflicts by segregating users, either providing completely separate pathways for bicyclists and pedestrians, or striping separate space for users on the same path (e.g. bikes stay left, pedestrians stay right).

Pavement markings should be placed at regular intervals to illustrate the general separation of bicycles to the inside and pedestrians to the outside. While this would not create a "defined" space as would an unbroken dividing stripe, it would reinforce the informal bikes inside / pedestrians outside segregation that currently occurs and results in the smoothest observed flows.

370 is a major highway crossing of the Missouri River in the area and accommodates over 59,000 vehicles per day. Because 370 also functions as a by-pass route for I-70 interstate traffic congestion, many of vehicles on 370 are trucks which create significant noise and wind as they pass. The proposed pathway is approximately 6ft from the adjacent travel lanes. Sound pressure levels should be measured, and if the noise is above 85 dBA, a noise barrier is recommended to minimize the traffic noise and improve the user experience.

Given the long span of the 370 crossing (3,455 ft), it will be important to minimize the out of direction travel for bicyclists and pedestrians. A ramp structure and stairs connecting directly to the existing Katy Trail on the west bank will be very important to minimize the out of direction travel for these bridge users. On the east bank, connections to the existing Earth City Levee Trail and future connections to the Earth City business park will provide the least out of travel distance for bicyclists and pedestrians.

The grades of the pathway will match the existing 370 crossing, which is likely within the recommended AASHTO guidance for grades for bicycle facilities. When the approach ramps are designed, the grade should not exceed 5% and should ideally be 3% - 4%.

4.7.3.2 Qualitative Analysis

Bicycle and Pedestrian Comfort

From the west approach, the primary access to the crossing for bicyclists would be along the existing ramps connecting from River Road. There is an opportunity to improve these ramps to comply with recommended design standards and provide a direct connection to the Katy Trail. The existing ramps that connect to the Earth City Levee Trail and Missouri Bottom Road on the east end of the bridge will provide access to the bridge for bicyclists and pedestrians.

Options to provide lighting for this pathway option will be more limited than the other alignments. With minimal new construction, lighting fixtures would need to be mounted on the existing structure. It will be important to design the lighting so that it does not interfere with driver vision or any local dark sky ordinances.

There is opportunity to integrate noise and weather barriers into the new pathway structure. These structures can perform multiple functions. The noise barrier can also function as a required safety barrier/guardrail.

Attractiveness: Aesthetic Experience of Users

The proposed multi-use pathway for the 370 bridge offers limited opportunities to create a unique and aesthetically appealing experience of users of the pathway. The opportunities are mainly limited to high quality materials and finishes.

High quality materials and finishes increases the attractiveness of the pathway to active travel users. Given the design of the multi-use path, there is no space to include overlooks without significant modification to the existing barriers.

Signage

Similar to the I-70 option, signage opportunities along the 370 alignment will be limited primarily to wayfinding signs, regulatory signs, and pavement markings. While these wayfinding signs will reinforce the Great Rivers Greenway brand and provide important directional guidance to bicyclists and pedestrians using the crossing, physical constraints on the bridge itself limit opportunities for additional signage, such as interpretive signs, informational signs, banners, and environmental graphics. However, there may be locations along the approaches at each end of the bridge to accommodate additional signage and branding elements.

Visual Impacts

The visual impacts of a new pathway will be minimal for people viewing the structure from the river bank. The pathway will be visible only to drivers on the bridge.

The visualizations on the following pages show before and after views of the proposed pathway structure.

Figure 67: Mo 370 Approach, Before

Figure 68: MO 370 Approach, After

Figure 69: MO 370 Midspan, Before

Figure 70: MO 370 Midspan, After

4.8 Cost-Benefit Analysis

4.8.1 Introduction

The Missouri River Crossing cost-benefit analysis (CBA) expands on the methodology suggested by the National Cooperative Highway Research Program (NCHRP) Report 552: *Guidelines for Analysis of investments in Bicycle Facilities* by incorporating detailed local demographic information and utilizing new data and research that has become available since *Guidelines for Analysis* was published in 2006.

One notable methodology enhancement is the consideration of benefits from both bicycling and walking activity, using different impact areas for each mode. By comparison, NCHRP methodology attempts to measure only bicycling benefits, and does not quantify pedestrian benefits for shared-use paths. Another improvement is the estimate of utilitarian (non-commute) and school trips in addition to work commute trips. This addition helps capture the full range of walking and bicycling activity in the project area. The Missouri River Crossing CBA also considers local travel patterns, trip distances, and public health data to create a detailed, complete picture of benefits generated by the proposed bicycle and pedestrian facilities.

A major advantage of this CBA approach is the ability to quantify benefits at a line-item level for each distinct type of benefit associated with the project. This allows benefits to quantified and compared for each TIGER grant selection criterion. **This also means the Missouri River Crossing CBA omits calculation of recreational benefits of the project from the analysis, so that it can be evaluated solely on its merits as a transportation facility** in accordance with TIGER grant selection guidelines. By contrast, the standard NCHRP CBA includes recreational benefits that often make up 90 percent of the calculated value of bicycle projects. These methodology improvements should be considered when comparing CBA results for this project with other TIGER grant applications.

Economic benefits have been evaluated on the basis of aggregate mode shift to walking and bicycling modes facilitated by the new multimodal transportation network created by the Missouri River Crossing. Monetized benefits resulting from this shift has been estimated for the following benefit types:

- Reduced cost of vehicle emissions
- Reduced external costs of travel (traffic congestion, collisions, and roadway maintenance)
- Reduced healthcare costs
- Reduced household transportation spending

Monetized economic benefits for future years have been discounted at a 7 percent annual rate over a 20 year evaluation period with three to four years for project construction (depending on the alternative) and 20 years for project benefits.

4.8.2 Baseline Data Inputs

4.8.2.1 Demographics

The Missouri River Crossing CBA considers several population groups within two project impact areas: a half-mile buffer area for walking impacts and a three-mile buffer area for bicycling impacts. These geographies are standard areas of influence used by bicycle and pedestrian planning professionals and were recently acknowledged by the Federal Transit Administration in *the Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under the Federal Transit Law* that went into effect August 19, 2011. Population groups within these areas were quantified using the following sources:

Employed Population

BCA Input: Employed population

Source: 2009-2013 *American Community Survey (ACS) 5-Year Estimates*, U.S. Census Bureau.

Method: The number of employed people within the walking and bicycling impact areas was captured for Census Tracts with their geographic center located within a half-mile or three mile buffer of the proposed alternatives. The U.S. Census Bureau Journey to Work mode split data was used in conjunction with transportation analysis zone (TAZ) level data for St. Charles County and St. Louis County.

Student Population

BCA Input: K-12 student population, College student population

Source: 2009-2013 *American Community Survey (ACS) 5-Year Estimates*, U.S. Census Bureau.

Method: The population of K-12 and college-enrolled (undergraduate, graduate, and doctoral) students living within the walking and bicycling impact area were captured for Census Tracts with their geographic center located within the project impact areas. For years following the baseline year, K-12 and college student populations were assumed to hold constant as a share of the total population in the area. The U.S. Census School Enrollment data was used in conjunction with TAZ level data for St. Charles County and St. Louis County.

4.8.2.2 Travel Patterns

Baseline mode share data was collected for driving, bicycling, and walking activity among the different demographic groups listed above. The following data sources were used to estimate mode split for each group:

Employed Population

BCA Input: Mode split of employed population (Journey to Work)

Source: 2009-2013 *American Community Survey (ACS) 5-Year Estimates*, U.S. Census Bureau.

Student Population

BCA Input: 2010 *Safe Routes to School (SRTS) Travel Data*, National Center for Safe Routes to School[2]; *Data Extraction Tool*, 2009 National Household Travel Survey (NHTS)[3]

Source: 2009-2013 *American Community Survey (ACS) 5-Year Estimates*, U.S. Census Bureau.

Method: Travel to school mode shares for driving, bicycling, and walking were based on national survey data for baseline conditions found in schools at the beginning of Safe Routes to Schools programs. College student mode shares were based on travel survey data from the 2009 National Household Transportation Survey.

4.8.2.3 Travel Patterns – Trip Length and Purpose

Area residents will use the Missouri River Crossing for more than just work commute trips. To capture the full range of walking and bicycling activity, an estimated number of non-commute trips were extrapolated from work trips based on data from the 2009 NHTS.[4] NHTS shows that for every work trip Americans make

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[2] http://www.saferoutesinfo.org/resources/collateral/SRTS_baseline_data_report.pdf

[3] http://nhts.ornl.gov/det/Extraction3.aspx

[4] http://nthts.ornl.gov/tables09/Login.aspx?ReturnUrl=/tables09/ae/TableDesigner.aspx

by bicycle, they also make an average of 1.61 utilitarian (non-commute) trips by bicycle. For walking, this ratio is 4.32.

To accurately estimate the relative benefits resulting from each type of bicycling and walking trip, each trip was weighted according to the average distance for a trip of that purpose. Trip distance multipliers were also provided by NHTS, except trip distance for K-12 students traveling to school which was provided by *2010 Safe Routes to School Travel Data*. Average trip distances were assigned as follows:

- Bicycling trips:
  - Work commute trips: 3.54 miles
  - College commute trips: 2.09 miles
  - Utilitarian trips: 1.89 miles
  - K-12 school trips: 0.77 miles
- Walking trips:
  - Work commute trips: 0.67 miles
  - College commute trips: 0.48 miles
  - Utilitarian trips: 0.67 miles
  - K-12 school trips: 0.36 miles

4.8.3 Forecasts and Assumptions

4.8.3.1 Demographics

Future estimates were created by using linear growth rates to match St. Charles County and St. Louis County 2040 population and demographic forecasts by TAZ for the bicycling and walking impact areas. These growth rates were used to create annual estimates for each year evaluation period.

4.8.3.2 Travel Patterns

The Missouri River Crossing will have a strong influence on travel patterns in the bicycling and walking impact areas. Bicycling and walking mode shift curves were forecasted for each population group.

Employed Population

Mode shift forecasts for work commute trips within the bicycling and walking impact areas was based on mode shares documented by ACS Journey to Work data for other communities that have made comparable investments in bicycling and walking transportation.

College Student Population

For K-12 students, bicycling and walking growth rates were scaled to match the forecast growth rates for work commute trips.

K-12 Student Population

For K-12 students, bicycling and walking rates were scaled to match the forecast growth rates for work commute trips.

4.8.3.3 Estimating Change from Baseline

For each year in the CBA period, forecasted mode shift was used with demographic data to estimate increases over baseline for the following figures:

- Work commute bicycling/walking users and number of trips
- College commute bicycling/walking users and number of trips
- K-12 student bicycling/walking users and number of trips
- Number of utilitarian (non-commute) bicycling/walking trips, based on NHTS trip purpose ratios from number of work and college bicycling/walking users

Each trip was weighted by distance according to the transportation mode and purpose of the trip. Each new bicycling and walking trip was assumed to have a chance to replace a trip of any other mode equal to the baseline mode split for that trip type, with bicycling or walking removed from the total mode split. For example, if baseline drive alone mode share was 80 percent for college trips, with baseline bicycling mode share at 5 percent, a trip shifted to bicycling was assumed to have a 80 percent out of 95 percent chance (100 percent mode split – 5 percent bicycling, removed) of replacing a drive alone trip, or about 84.2 percent. The replacement of carpool trips was weighted according to the average number of persons in the carpool. For example, a bicycle trip replacing a carpool trip of a person in a 2-person carpool was given slightly less than half the weight of replacing a drive alone trip, to account for average national occupancy of carpools of 2.4 persons/trip). These assumptions allow estimates for the following figures:

- Reduced vehicle trips
- Reduced VMT

The number of bicycling and walking users and VMT reduced were used in conjunction with benefit multipliers to monetize the benefits of the forecasted mode shift by year.

4.8.4 Benefit Multipliers

Based on available research, the following types of benefits were quantified using the increased number of bicycling/walking users and reduced VMT forecast annually:

- Reduced cost of vehicle emissions
    - Carbon dioxide
    - Carbon monoxide
    - Hydrocarbons
    - Particulate matter
    - Nitrous oxides
- Reduced external costs of vehicle travel
    - Traffic congestion
    - Traffic collisions
    - Roadway maintenance
- Reduced healthcare costs
- Reduced household transportation spending

Multipliers used to translate new bicycling/walking users and reduced VMT into the benefits listed above were drawn from the following sources:

4.8.4.1 Vehicle Emissions Rates

Emissions Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks (EPA report 420-F-05-022). [5]

- Carbon dioxide: 369 g/VMT
- Carbon monoxide: 12.4 g/VMT
- Hydrocarbons: 1.36 g/VMT
- Particulate matter: 0.0052 g/VMT (PM10) and 0.0049 g/VMT (PM2.5)
- Nitrous oxides: 0.95 g/VMT

4.8.4.2 Emissions Costs

NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks (Table VIII-5).[6]

- Volatile organic compounds: $1,700/ton
- Particulate matter: $168,000/ton
- Nitrous oxides: $4,000/ton

Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866.[7]

- Carbon dioxide cost appreciation: 2.5% year
- Carbon dioxide: $36.03/ton

Notes: Value of $35.10 per metric ton in 2007 adjusted to 2014 values by applying the minimum 2.5% annual appreciation per guidance in *Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 128666.* Converted from metric tons to tons in US customary units.

4.8.4.3 External Vehicle Travel Costs

Crashes vs. Congestion – What's the Cost to Society? AAA, 2008 and 2011.[8]

- Traffic collisions for metro area size under 500,000: $0.34VMT
- Traffic congestions for metro area size under 500,000: $0.05/VMT

Notes: Cost of crashes divided by 5.98, ratio of crash to congestion costs.

Kitamura, R., Zhao, H., and Gubby, A. R. *Development of a Pavement Maintenance Cost Allocation Model.* Institute of Transportation Studies – University of California, Davis.[9]

- Roadway maintenance: $0.15/VMT

Notes: Adjusted to 2013 values using the Bureau of Labor Statistics Inflation Calculator.[10]

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[5] http://www.whatcomsmarttrips.org/pdf/Emission%20Facts%202005.pdf
[6] http://www.nhtsa.gov/DOT/NHTSA/Rulemaking/Rules/Associated%20Files/CAFE_2008_PRIA.pdf
[7] http://www.eere.energy.gov/buildings/appliance_standards_commerical/pdfs/scm_finalrule_appendix15a.pdf
[8] http://www.camsys.com/pubs/2011_AAA_CrashvCongUpd.pdf; http://www.camsys.com/pubs/AAA.pdf
[9] http://pubs.its.ucdavis.edu/publication_detail.php?id=19
[10] http://www.bls.gov/data/inflation_calculator.htm

4.8.4.4 Vehicle Operating Costs

Average Cost of Owning and Operating an Automobile.[11] 2011 Bureau of Transportation Statistics.

- Reduced household transportation costs: $0.596/VMT

2012 National Transportation Statistics (Table 3-17: Average Cost of Owning and Operating an Automobile, 2012). Research and Innovative Technology Administration, Bureau of Transportation Statistics.[12]

- Appreciation: 2.12%/year

Notes: Average annual growth in cost of owning and operating a motor vehicle from 1994-2008; used to approximate the increasing cost of motor vehicle transportation and energy prices.

4.8.4.5 Health Benefits

State Indicator Report on Physical Activity, 2014. Centers for Disease Control and Prevention, Atlanta, GA: U.S. Department of Health and Human Services, 2014.[13]

Notes: Assumes a percentage of new bicycling and walking users equal to the baseline physical inactivity rates for each individual moving from physically inactive to active, resulting in healthcare cost savings.

Chenoweth, D. (2005). *The Economic Costs of Physical Inactivity, Obesity, and Overweight in California Adults: Health Care, Workers' Compensation, and Lost Productivity.*[14]

- Healthcare cost savings: $529.48

Notes: Represents a recent, midrange estimate of health benefits of replacing driving with bicycling, estimates range up to $1,175 per person per year according to Krizek et al., *Guidelines for Analysis of Investments in Bicycle Facilities*, NCHRP Report 552, Transportation Research Board, 2006.

4.8.5 Responsibility for Benefits

The Missouri River Crossing will provide a valuable bicycle and pedestrian connection between St. Charles County and St. County, but it won't exist in a vacuum. The CBA includes a factor to simulate the importance of future improvements inside the project areas and their responsibility for creating mode shift. To calculate the project's share of responsibility for mode shift over the 20-year evaluation period, several assumptions were made:

- Bicycle and pedestrian investments across the improvement areas continue at the same rate as currently allocated ($50,000 per year).
- Mode shift begins after project completion.
- The influence of county investments in bicycle and pedestrian infrastructure will be distributed equally by population. If 25 percent of St. Charles County's population is in the project area that year, then 25 percent of bicycle and pedestrian investments will be spent in the area that year.
- The responsibility of bicycle and pedestrian investments for mode shift over the baseline is cumulative. In 2016, if a cumulative total of $10 million has been invested in the project area, with $9

[11] http://rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_tranportation_statistics/html/table_0_3_17.html
[12] http://rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_tranportation_statistics/html/table_0_3_17.html
[13] http://www.cdc.gov/physicalactivity/downloads/PA_State_Indicator_Report_2010.pdf
[14] http://www.cdph.ca.gov/healthinfo/healthyliving/nutrition/Documents/CostofObesityToplineReport.pdf

million of that being investments from TIGER, then TIGER's share of responsibility for benefits accrued that years is $9 million/$10 million, or 90%.

4.8.6 Discounting

The prorated stream of benefits was then discounted using the a 7 percent rate as endorsed in the Federal Register grant announcement, and compared with the stream of construction and maintenance costs associated with the project.

4.8.7 Cost-Benefit Analysis Results

The costs and benefits of the following five alternatives were analyzed:

- I-70 EB Cantilever
- Old Rte. 115 – New Bridge
- Rte. 370 EB&WB On-Bridge
- Combination of I-70 EB Cantilever and Rte. 370 EB&WB On-Bridge
- Rte. 370 Cantilever

In order to evaluate the future benefits of the five alternatives, the growth in bicycle and pedestrian mode share over the 20-year analysis period was estimated by reviewing mode shift patterns in similar bicycle and pedestrian investments. Table 13 shows the initial baseline mode share for walking and bicycling in the impact areas and the assumed mode share 20 years after the completion of the project.

Table 13: Mode Share Assumptions

Impact Area		Baseline; 20 Years after Construction				
		I-70 EB Cantilever	Old Rte. 115	Rte. 370 On-Bridge	Comb. I-70 and Rte. 370	Rte. 370 Cantilever
Walking Impact Area (<0.5 mile)	Employed population	3.32%; 5.32%	3.78%; 5.78%	0.08%; 1.08%	2.23%; 4.235	0.08%; 2.08%
	College student population	8.07%; 12.93%	9.18%; 14.05%	0.19%; 2.62%	5.43%; 10.29%	0.19%; 5.05%
	School children population, K-12	17.32%; 27.75%	19.72%; 30.15%	0.40%; 5.62%	11.66%; 22.09%	0.40%; 10.84%
	Adult utilitarian	3.32%; 5.32%	3.78%; 5.78%	0.08%; 1.08%	2.23%; 4.23%	0.08%; 2.08%
Bicycling Impact Area (<3 miles)	Employed population	0.24%; 2.24%	0.48%; 2.48%	0.59%; 1.59%	0.22%; 2.22%	0.59%; 2.59%
	College student population	0.70%; 6.53%	1.40%; 7.23%	1.71%; 4.63%	0.65%; 6.48%	1.71%; 7.54%
	School children population, K-12	0.85%; 7.91%	1.69%; 8.75%	2.07%; 5.60%	0.78%; 7.84%	2.07%; 9.13%
	Adult utilitarian	0.24%; 2.24%	0.48%; 2.48%	0.59%; 1.59%	0.22%; 2.22%	0.59%; 2.59%

Based on the assumed mode shift resulting from each alternative, several project benefits were calculated and are presented in Table 2. The I-70 Cantilever, Combined I-70 and Rte. 370 On-Bridge, and Rte. 370 Cantilever result in the greatest reduction in vehicle-miles travelled (50,493,000 VMT, 52,264,000 VMT, and 43,301,000 VMT, respectively). The Old 115 (New Bridge) alternative results in the greatest increase in property value

($1,267,000). The I-70 Cantilever and Combined I-70 and Rte. 370 On-Bridge alternative result in the greatest reduction in household transportation costs ($8,709,000 and $9,002,000 respectively).

Table 14: General Benefits

Project Benefits*	I-70 EB Cantilever	Old Rte. 115	Rte. 370 On-Bridge	Comb. I-70 and Rte. 370	Rte. 370 Cantilever
Non-Motorized Transportation Benefits					
Increased Bicycling Trips	24,102,000	15,191,000	5,677,000	25,934,000	22,355,000
Increased Walking Trips	5,424,000	1,270,000	119,000	1,917,000	506,000
Reduced Vehicle Trips	24,697,000	13,719,000	4,806,000	23,306,000	18,930,000
Reduced Vehicle Miles Traveled	50,493,000	30,175,000	11,014,000	52,264,000	43,301,000
Real Estate Value Benefits					
Increase in Residential Property Value	$791,000	$1,267,000	$12,000	$803,000	$7,000
Sustainability Benefits					
Reduced Hydrocarbons (pounds)	151,000	90,000	33,000	157,000	130,000
Reduced Particulate Matter (pounds)	1,000	1,000	0	1,000	1,000
Reduced Nitrous Oxides (pounds)	106,000	63,000	23,000	109,000	91,000
Reduced Carbon Monoxide (pounds)	1,380,000	825,000	301,000	1,429,000	1,184,000
Reduced Carbon Dioxide (pounds)	41,077,000	24,548,000	8,960,000	42,517,000	35,226,000
Reduced Hydrocarbons Emission Costs	$41,000	$23,000	$9,000	$42,000	$22,000
Reduced Particulate Emission Costs	$55,000	$31,000	$12,000	$56,000	$30,000
Reduced Nitrous Oxides Emission Costs	$112,000	$64,000	$25,000	$116,000	$62,000
Reduced Carbon Monoxide Emission Costs	$554,000	$348,000	$187,000	$540,000	$323,000
Reduced Carbon Dioxide Emission Costs	151,000	90,000	33,000	157,000	130,000
Economic Competitiveness Benefits					
Reduced Traffic Congestion Costs	$737,000	$422,000	$165,000	$761,000	$405,000
Livability Benefits					
Healthcare Cost Savings of Newly Active People	$3,737,000	$2,243,000	$884,000	$4,040,000	$2,194,000
Reduced Household Transportation Costs	$8,709,000	$4,988,000	$1,945,000	$9,002,000	$4,787,000
Safety Benefits					
Reduced Vehicle Collision Costs	$5,009,000	$2,869,000	$1,119,000	$5,178,000	$2,753,000
State of Good Repair Benefits					
Reduced Roadway Maintenance Costs	$2,246,000	$1,286,000	$502,000	$2,322,000	$1,235,000

* Increase over baseline; totals over 20-year evaluation period. All dollar values discounted and rounded to the nearest thousand

Taking these benefits into account, the five alternatives each present varying net-present values, internal rates of return, and construction-related jobs (See Table 3). The net-present value is the difference between the present value of cash inflows and the present value of cash outflows. In other terms, it is a method of calculating your return on investment, or ROI, for a project or expenditure. Internal rate of return is the discount rate that makes the net present value of all cash flows from a particular project equal to zero. The internal rate of return can be thought of as the rate of growth a project is expected to generate, and the actual rate of return that a given projects ends up generating will often differ from its estimated rate of return. An internal rate of return higher than the standard discount rate indicates that one should go ahead with a project, and when choosing among alternative projects, a higher internal rate of return is preferred. However, comparing the internal rate of return between projects of varying sizes is may be misleading. Net-present value is a better cross-project comparison measure.

Of the five alternatives evaluated (See Table 3), all alternatives had a positive internal rate of return except the Old 115 (New Bridge) (-9.16% IRR). The two projects with the highest net-present values were I-70 Cantilever and Rte. 370 Cantilever ($7,629,518 and $5,420,973, respectively).

Table 15: Cost-Benefit Analysis Results

	I-70 EB Cantilever	Old Rte. 115	Rte. 370 On-Bridge	Comb. I-70 and Rte. 370	Rte. 370 Cantilever
Costs					
Capital Costs	$16,600,000	$56,700,000	$3,200,000	$19,800,000	$15,200,000
Annual Maintenance Costs	$47,640	$47,640	$47,640	$95,280	$76,900
Return on Investment					
Net-Present Value	$7,629,518	-$31,527,028	$1,998,253	$5,420,973	$209,861
Internal Rate of Return	3.47%	-9.16%	4.26%	2.74%	0.37%
Construction-Related Jobs*	216	737	42	258	198

* Rounded to the nearest job.

5 Conclusion

The selection of a bicycle and pedestrian river crossing is based on a range of important criteria, established by the Project Team including conceptual construction cost, structural considerations, environmental concerns, connectivity, demand, aesthetic characteristics, and user experience. The framework and analysis is intended to not only establish the feasibility of the river crossing, but also measuring each crossing alternative's ability to meet evaluation criteria to identify a crossing location that will provide the greatest value to the communities that abut the Missouri River, and connect to the key destinations. The purpose of this memorandum is to outline the process whereby bicycle and pedestrian facility alignment options for crossing the Missouri River can be evaluated and compared.

5.1 Evaluation Criteria and Rating Method

Each crossing alignment option has been screened against the individual evaluation criteria to measure the extent to which an alignment meets each criterion, and to serve as a basis for comparing the performance of alignment options against one another. Each of the criteria is weighted based on its impact on the progress or result of the project. The ratings for each alignment option do not result in a total "score" that will indicate the correct option to advance; rather, the ratings provide qualitative and quantitative guidance to inform a discussion of trade-offs by Project Team members. In cases where an individual criterion is not applicable, a rating was not assigned for that criterion. The general evaluation rating method for qualitative criteria is shown in Table 16 below.

Table 16: Qualitative Evaluation Criteria Rating Method

Rating	
●	The alternative does an excellent job of addressing the criterion and/or makes substantial improvements in the criteria category
◕	The alternative does a good job at addressing the criterion and/or makes improvements in the criteria category
◑	The alternative does an adequate job of addressing the criterion and/or makes some improvements in the criteria category
○	The alternative segment does not adequately improve on the intent of the criterion, or negatively impacts the criteria category
-	The criterion does not apply

The evaluation criteria have been separated into two categories: qualitative and quantitative. Qualitative criteria focus more bridge details and attributes that can be observed and compared to one another, but not easily measured, while quantitative criteria can be measured in a manner that allows for direct comparison. Table 17 lists the qualitative evaluation criteria that are used to evaluate each alignment alternative, and Table 18 on the following page lists the quantitative evaluation criteria.

Table 17: Qualitative Evaluation Criteria

Criteria	Impact	Measures	Documentation
Bicycle / Pedestrian Safety & Comfort	High	Assessment of user safety or perception of safety (e.g., feeling of isolation, connections to surrounding land uses) Assessment of opportunities for eyes on the trail (e.g., location within proximity of neighbors who "watch the trail") Assessment of opportunities to include additional access points (stairs, ramps, etc.) to increase connections and minimize the feeling of being trapped Assessment of opportunities to include noise barriers, weather barriers, and lighting	September 19, 2014, Alta Aesthetics and Visualization Memo, and November 10, 2014, Connectivity Memo.
Vehicular Motorist Safety	High	Assessment of the degree to which the segment impacts motor vehicle safety	October 31, 2014 Jacobs Maintenance of Traffic Memo.
Environmental Impact	High	Assessment of the extent to which the segment passes through designated wildlife habitat Assessment of the extent to which the segment passes through designated wetlands Assessment of difficulty of mitigating impacts to natural resources Assessment of restoration opportunities	November 11, 2014 Preliminary Environmental Analysis Memo.
Traffic Impact	High	Assessment of disruption to the traveling public during construction and maintenance of the improvements Assessment of the extent of measures necessary to address the issue safely	October 31, 2014 Jacobs Maintenance of Traffic Memo.
Aesthetic Experience of Users	Medium	Assessment of opportunities to incorporate aesthetic improvements to the project Assessment of opportunities to create a unique, aesthetically appealing bicycle and pedestrian crossing Opportunities for views, scenic experiences, wildlife, interpretation	September 19, 2014, Alta Aesthetics and Visualization Memo
Drainage Impacts of Improvements	Medium	Assessment of drainage impacts on adjacent structures and properties	November 11, 2014 Preliminary Environmental Analysis Memo.
Signage	Low	Assessment of opportunities to incorporate Great Rivers Greenway themes, signage, branding and programs	September 19, 2014, Alta Aesthetics and Visualization Memo
Visual Impacts	Low	Assessment of visual impacts of a new bicycle and pedestrian crossing facility on trail and river users	September 19, 2014, Alta Aesthetics and Visualization Memo

Table 18: Quantitative Evaluation Criteria

Criteria	Impact	Measures	Documentation
Construction Cost	High	Construction Costs for the alternative.	November 10, 2014, Jacobs Summary of Structural Evaluation Memo
Maintenance Cost	Medium	Average annual cost for maintaining the bicycle/pedestrian facility	October 9, 2014, Jacobs Inspection and Maintenance Memo
Travel Demand	High	Based on the results of non-motorized demand analysis; number of people with improved access. (Minimized out of direction travel. Quality of facility. Increased potential for facility use.)	August 29, 2014, Alta Demand Analysis Memo
Right-of-Way Availability	High	Area in acre of right-of-way necessary for the project.	November 10, 2014, Jacobs Summary of Structural Evaluation Memo
Life Cycle Cost of Improvements	High	Projected life cycle cost	
Structural Capacity	High	Assessment of structural improvements necessary for the addition of the bicycle and pedestrian facility	November 10, 2014, Jacobs Summary of Structural Evaluation Memo
Impact to Missouri River Navigation	High	Assessment of crossing alignments on navigational concerns	November 17, 2014, Memo for the US Coast Guard
Connectivity to nearby street sidewalk networks	High	Connectivity ratings of connection to nearby street sidewalk networks	November 10, 2014, Connectivity Memo.
Connectivity to Katy Trail	High	Connectivity rating of connection to Katy Trail	November 10, 2014, Connectivity Memo.
Connectivity to Riverwoods Park	High	Connectivity rating of connection to Riverwoods Park	November 10, 2014, Connectivity Memo.
Connectivity to Creve Coeur Park Trail	High	Connectivity rating of connection to Creve Coeur Park Trail	November 10, 2014, Connectivity Memo.
Connectivity to Earth City Levee Trail	High	Connectivity rating of connection to Earth City Levee Trail	November 10, 2014, Connectivity Memo.
User Experience	High	Assessment of various parameters related to the user experience, including: proximity to motorized traffic, distance travelled, and grades Assessment of the degree to which the segment could be developed according to established national trail standards	September 19, 2014, Alta Aesthetics and Visualization Memo

5.2 Evaluation Results

Table 19 the evaluation results for each of the potential alignment alternatives.

Table 19: Evaluation Results

Qualitative Criteria	Impact	Route 115	I-70 Bridge	370 On-Bridge	370 Cantilevered
Bicycle / Pedestrian Safety & Comfort	High	●	◕	◑	◕
Vehicular Motorist Safety	High	●	◑	○	◑
Environmental Impact	High	○	◑	●	◑
Traffic Impact	High	●	◑	○	◑
Aesthetic Experience of Users	Medium	●	◑	◑	◑
Drainage Impacts of Improvements	Medium	○	◕	●	◕
Signage	Low	●	◑	○	◑
Visual Impacts	Low	●	◑	○	◑
Total Qualitative Rating		6	4.5	3	4.5
Quantitative Criteria	**Impact**	**Route 115**	**I-70 Bridge**	**370 On-Bridge**	**370 Cantilevered**
Construction Cost	High	○	◑	●	◑
Construction Cost (including engineering fees)		$56.7 M	$16.6 M	$3.1 M	$15.2 M
Maintenance Cost	Medium	◕	◕	◑	◕
Travel Demand	High	◑	●	○	○
Right-of-Way Availability	High	○	◑	●	◕
Life Cycle Cost of Improvements	High	○	◑	●	◑
Structural Capacity	High	-	◑	●	◑
Impact to Missouri River Navigation	High	○	●	●	●
Connectivity to nearby sidewalk network	High	◕	◑	○	○
Connectivity to bicycle street network	High	◕	◑	○	○
Connectivity to Katy Trail	High	◑	●	○	○
Connectivity to Riverwoods Park	High	●	◑	○	○
Connectivity to Creve Coeur Park Trail	High	○	●	○	○
Connectivity to Earth City Levee Trail	High	●	◑	●	●
User Experience	High	●	◑	◑	◑
Total Quantitative Rating		6.25	9.5	7	5.5
Total Rating		12.25	14	10	10

The results of the evaluation as shown in the table above provide telling information about the value that each crossing alternative provides and about the performance of each bridge based on inherent characteristics. For example as a new bridge, the Old Route 115 crossing is not limited by structural capacity considerations. However, because it is new, it will have the greatest impact on Missouri River Navigation; it will likely require the greatest cost outlay for constructions and required the greatest amount of additional right-of-way; and it will have the most significant environmental and drainage impacts. Conversely, the three existing bridge options (I-70 and the two 370 alignment options) will have the least environmental, drainage and navigation impacts, and will require little additional right-of-way acquisition.

The Route 370 alternatives, particularly the on-bridge alternative, perform worse than other alternatives with regard to bicycle and pedestrian connectivity, visual impacts and aesthetics, and user comfort, safety and experience. However, the low construction and maintenance costs, particularly for the on-bridge alternative, lack of right-of-way restrictions, and life cycle cost of improvements do add value to these alternatives.

The Old Route 115 alignment provides the greatest user experience, the highest levels of bicycle and pedestrian safety and comfort, greatest connectivity to surrounding street and trail networks, and greatest aesthetic experience for both users and observers. As a new bridge, however, there are the associated high construction costs, environmental impacts, right-of-way acquisition, and potential impacts to Missouri River navigation that limit the alternative's appeal from a feasibility standpoint.

While the Old Route 115 alignment alternative performed the best in the most number of individual criteria categories (11 compared to nine for the Route 370 on-bridge alternative, four for the I-70 alternative, and two for the Route 370 cantilevered alternative), the I-70 cantilevered bridge alternative garnered consistent positive scores for all evaluation criteria. In fact, the I-70 alternative did not receive the lowest score for any single evaluation criterion. In comparison, the Old Route 115 alternative and the Route 370 cantilevered alternative each received the lowest score for six criteria, and the Route 370 on-bridge alternative received the lowest score for 11 criteria.

For a variety of factors, the I-70 cantilevered bridge alternative performs the best when compared to the other crossing alternatives using the evaluation criteria established at the onset of this project. The I-70 alternative supports the greatest current and future demand for bicycling and walking, has minimal impact on existing transportation systems and natural environments, and provides connectivity to the greatest number of destinations, including Creve Coeur Lake Park, McKelvey Woods Trail, the Katy Trail, Riverwoods Park and Trail, Earth City Business Park, Riverport Business Park, and more. While the conceptual cost for this facility is greater than either Route 370 alternative, the value it provides far outweighs these alternatives.

5.3 Recommended Alternative

The feasibility study, following extensive review and investigation, determined that the I-70 Eastbound Blanchette Crossing was the highest ranking alternative based on the evaluation criteria. The study also finds merit in pursuing a barrier-separated facility on MO 370 to improve connectivity in conjunction with the I-70 Eastbound Blanchette Crossing. The completion of these two connections will provide safe and improved access across the Missouri River that will increase access to jobs, recreation, and shopping. The total costs of these improvements, including engineering costs, are $16.6M for the I-70 Eastbound Blanchette Crossing and $3.1M for the MO 370 barrier-separated crossing. The project is proposed to be phased in order to complete these improvements as funding becomes available. Next steps in the process will be to secure funding to commence final design of the selected alternatives.

6 Appendix

JACOBS

CONSTRUCTION "OPINION OF PROBABLE COST"

Project: St Charles Pedestrian / Bikeway Bridge – I - 70
Location: St Charles, MO
Due Date: 8/26/14

Alternative 1: **I-70 East Bound Bridge - Cantilever Path**
8' wd x 3,793'

Run Date & Time: 9/19/14 11:58 AM

	Description	Qty	Unit	Unit Cost	Item Cost	Total Marked - Up Unit Cost	Total Bid Item Cost
	Mobilization say 4%	1	ls	$396,944.01	$396,944	$564,705.40	$564,705.40
	Traffic Control say 2%	1	ls	$198,472.00	$198,472	$282,352.70	$282,352.70
	Sitework - Clear / Grub for site access	7,200	sy	$3.00	$21,600	$4.27	$30,728.86
	- Excavation, at Pier 19 / Abutments, 38cy, 3 loc + moves	3	loc	$1,700.00	$5,100	$2,418.48	$7,255.43
	- Drilled shafts w/ concrete, 4ea - 4.5'dia	105	lf	$485.55	$50,983	$690.76	$72,529.71
	- Drilled shafts w/ concrete, 3ea - 5.0'dia	101	lf	$539.50	$54,490	$767.51	$77,518.53
	- Rock Sockets 3.5'dia, 27'	260	cf	$150.00	$38,946	$213.39	$55,405.57
	- Rock Sockets 4.0'dia, 23'	289	cf	$150.00	$43,332	$213.39	$61,645.51
	- H Pile at Abutments / Pier 19 HP14 x 79, 3 loc + moves	741	lf	$72.15	$53,463	$102.64	$76,058.41
	Concrete - Columns	153	cy	$750.00	$114,525	$1,066.97	$162,926.97
	- Column Caps	64	cy	$950.00	$60,515	$1,351.50	$86,090.60
	- Column Pile Cap	7	cy	$500.00	$3,700	$711.32	$5,263.74
	- Abutments	25	cy	$700.00	$17,500	$995.84	$24,896.07
	Metals - Welded Plate Girders at Spans 1 - 8, 19	411,706	lbs	$2.22	$912,856	$3.15	$1,298,658.64
	- Cross frames / laterals at Spans 1 - 8, 19	20,129	lbs	$3.68	$74,083	$5.24	$105,392.94
	- Deck / fence support at Span 1 - 8, 19	34,281	lbs	$3.68	$126,168	$5.24	$179,491.06
	- Welded Brackets at Spans 9 - 13, 17 - 18	166,578	lbs	$8.42	$1,402,388	$11.98	$1,995,082.36
	- Stringers, deck / fence support at Spans 9 - 13, 17 - 18	313,632	lbs	$3.68	$1,154,296	$5.24	$1,642,138.21
	- Welded Brackets at Spans 14 - 16	132,739	lbs	$8.42	$1,117,504	$11.98	$1,589,797.20
	- Stringers, deck / fence support at Spans 14 - 16	275,724	lbs	$3.68	$1,014,778	$5.24	$1,443,656.63
	Fencing - Chain Link, 6', outside	3,794	lf	$93.56	$354,980	$133.11	$505,006.18
	- Chain Link, 5' bridge side	3,794	lf	$83.96	$318,555	$119.45	$453,187.31
	- Ornamental Fence	57	lf	$285.60	$16,279	$406.30	$23,159.14
	Decking - FRP	30,512	sf	$47.98	$1,463,979	$68.26	$2,082,704.21
	Intermediate and Finish Paint System	1	ls	$459,000.00	$459,000	$652,988.26	$652,988.26

Project: St Charles Pedestrian / Bikeway Bridge -- I - 70
Location: St Charles, MO Alternative 1: **I-70 East Bound Bridge - Cantilever Path** **Run Date & Time: 9/19/14 11:58 AM**
Due Date: 8/26/14 **8' wd x 3,793'**

	Description	Qty	Unit	Unit Cost	Item Cost	Total Marked - Up Unit Cost	Total Bid Item Cost
	Bearing Pad Assemblies	1	ls	$529,000.00	$529,000	$752,572.53	$752,572.53
	Electrical - Navigation Lighting System Mods	1	ls	$99,000.00	$99,000	$140,840.61	$140,840.61
	Approach Pathways - St Charles side	1,240	lf	$131.00	$162,440	$186.36	$231,092.40
	- St Louis side	1,940	lf	$131.00	$254,140	$186.36	$361,547.79
	Total Directs:				**$10,519,016**		
	Gen. Contractor Indirects / Mark-ups / Fees:						
	General Conditions / Proj. Mngmnt.	5.0%			$525,951		
	Sales/Use Tax	6.0%			Exempt		
	Bond / insurance	1.0%			$150,000		
	GC's Ovrhd & Profit	5.0%			$559,748		
	Total Project Indir. / MU / Fees:	11.75%			**$1,235,699**		
	Sub-Total:				**$11,754,715**		
	Escalation, assume 2 yrs out to mid-construction	6.09%			$715,862		
	Total Estimated Construction Cost:				**$12,470,577**		
	Construction Contingency	20.00%			$2,494,115		
	Grand Total:				**$14,964,693**		**$14,964,693**

Notes / Clarifications::
1) All work assumed to be done on normal working hours.

Use for Bond / Ins
$15,000,000

Total MU
$4,445,677

$493 S/sf

JACOBS

CONSTRUCTION "OPINION OF PROBABLE COST"

Project: St Charles Pedestrian / Bikeway Bridge - MO 370
Location: St Charles, MO
Due Date: 8/26/14

Alternative 2: **MO 370 WB - Barrier Separated Path**

Run Date & Time: 9/19/14 11:58 AM

	Description	Qty	Unit	Unit Cost	Item Cost	Total Marked - Up Unit Cost	Total Bid Item Cost
	Mobilization 3%	1	ls	$26,996.19	$26,996	$38,387.90	$38,387.90
	Traffic Control say 10%	1	ls	$89,987.30	$89,987	$127,959.67	$127,959.67
	Concrete - CIP Single Faced Barrier	3,955	lf	$80.00	$316,400	$113.76	$449,912.81
	Fence on top of barriers, both sides	7,910	lf	$55.00	$435,050	$78.21	$618,630.11
	Approach Pathways - St Charles side	1,133	lf	$131.00	$148,423	$186.28	$211,053.76
	Total Directs:				**$1,016,856**		

Alternative 2: MO 370 WB - Barrier Separated Path

	Gen. Contractor Indirects / Mark-ups / Fees:						
	General Conditions / Proj. Mngmnt.	5.0%			$50,843		
	Sales/Use Tax	6.0%			Exempt		
	Bond / Insurance	1.0%			$14,000		
	GC's Ovrhd & Profit	5.0%			$54,085		
	Total Project Indir. / MU / Fees:	11.70%			**$118,928**		
	Sub-Total:				**$1,135,784**		
	Escalation, assume 2 yrs out to mid-construction	6.09%			$69,169		
	Total Estimated Construction Cost:				**$1,204,954**		
	Construction Contingency	20.00%			$240,991		
	Grand Total:				**$1,445,944**		**$1,445,944**

Use for Bond / Ins
$1,400,000

Total MU

Notes / Clarifications::
1) All work assumed to be done on normal working hours.

Note: The above cost estimate is for a pathway on WB MO 370. For pathways on both WB and EB MO 370, the estimated construction cost is $2.8 million

JACOBS

CONSTRUCTION "OPINION OF PROBABLE COST"

Project: St Charles Pedestrian / Bikeway Bridge -- MO 370
Location: St Charles, MO
Due Date: 8/26/14

Alternative 3: **MO 370 WB - Cantilever Path**
8' wd x 3455'

Run Date & Time: 9/19/14 11:58 AM

	Description	Qty	Unit	Unit Cost	Item Cost	Total Marked - Up Unit Cost	Total Bid Item Cost
	Mobilization say 4%	1	ls	$362,120.73	$362,121	515147.4501	$515,147.49
	Traffic Control say 2%	1	ls	$181,060.37	$181,060	$257,573.75	$257,573.75
	Sitework - Clear / Grub for site access	2,683	sy	$3.00	$8,050	$4.27	$11,451.81
	- Excavation at Abutments	2	loc	$1,700.00	$3,400	$2,418.39	$4,836.79
	- Drilled shafts w/ concrete, 14ea - 4.5'dia	887	lf	$485.55	$430,683	$690.74	$612,682.93
	- Drilled shafts w/ concrete, 5ea - 5.0'dia	176	lf	$539.50	$94,952	$767.48	$135,077.28
	- Rock Sockets 3.5'dia, 94'	904	cf	$150.00	$135,589	$213.39	$192,887.04
	- Rock Sockets 4.0'dia, 38'	477	cf	$150.00	$71,592	$213.39	$101,845.70
	- H Pile at Abutments, HP14 x 73	312	lf	$72.15	$22,511	$102.64	$32,023.52
	Concrete - Columns	289	cy	$750.00	$216,750	$1,066.94	$308,345.28
	- Column Caps	141	cy	$950.00	$133,950	$1,351.46	$190,555.25
	- Abutments	25	cy	$700.00	$17,500	$995.81	$24,895.24
	Metals - Welded Plate Girders at Spans, 1W - 11W, 1E - 8E	1,102,500	lbs	$2.22	$2,444,521	$3.15	$3,477,538.30
	- Cross frames / laterals at Spans, 1W - 11W, 1E - 8E	53,902	lbs	$3.68	$198,382	$5.24	$282,214.76
	- Deck / fence support at Spans, 1W - 11W, 1E - 8E	91,800	lbs	$3.68	$337,862	$5.24	$480,637.37
	- Welded Brackets at Spans, 2C - 4C	63,923	lbs	$8.42	$538,155	$11.98	$765,571.65
	- Stringers, deck / fence support at Spans, 2C - 4C	123,087	lbs	$3.68	$453,011	$5.24	$644,446.75
	- Welded Brackets at Span, 1C	29,263	lbs	$8.42	$246,360	$11.98	$350,467.33
	- Stringers, deck / fence support at Spans, 1C	163,142	lbs	$3.68	$600,430	$5.24	$854,162.76
	Fencing - Chain Link, 6', outside	3,455	lf	$93.56	$323,262	$133.10	$459,867.72
	- Chain Link, 5' bridge side	3,455	lf	$83.96	$290,092	$119.44	$412,680.53
	- Ornamental Fence	57	lf	$285.60	$16,279	$406.29	$23,158.37

Alternative 3: MO 370 WB - Cantilevered Path

	Decking - FRP	27,696	sf	$47.98	$1,328,866	$68.26	$1,890,425.13
	Intermediate and Finish Paint System	1	ls	$419,000.00	$419,000	$596,063.08	$596,063.08
	Bearing Pad Assemblies	1	ls	$483,000.00	$483,000	$687,108.51	$687,108.51
	Electrical - Navigation Lighting System Mods	1	ls	$90,398.70	$90,399	$128,599.83	$128,599.83
	Approach Pathways - St Charles side	1,133	lf	$131.00	$148,423	$186.36	$211,144.32
	Total Directs:				**$9,596,199**		
	Gen. Contractor Indirects / Mark-ups / Fees:						
	General Conditions / Proj. Mngmnt.	5.0%			$479,810		
	Sales/Use Tax	6.0%			Exempt		
	Bond / Insurance	1.0%			$136,500		
	GC's Ovrhd & Profit	5.0%			$510,625		
	Total Project Indir. / MU / Fees:	11.74%			**$1,126,935**		
	Sub-Total:				**$10,723,135**		
	Escalation, assume 2 yrs out to mid-construction	6.09%			$653,039		
	Total Estimated Construction Cost:				**$11,376,174**		
	Construction Contingency	20.00%			$2,275,235		
	Grand Total:				**$13,651,408**		**$13,651,408**

Use for Bond / Ins
$13,650,000

Notes / Clarifications::
1) All work assumed to be done on normal working hours.

JACOBS

CONSTRUCTION "OPINION OF PROBABLE COST"

Project: St Charles Pedestrian / Bikeway Bridge -- New Bridge
Location: St Charles, MO
Due Date: 8/26/14

Alternative 4: **Old Rt 115 - New Cable Stayed Bridge**
16' wd x 4050' Estmate 1 of 2

Run Date & Time: 12/4/14 4:54 PM

	Description	Qty	Unit	Unit Cost	Item Cost	Total Marked - Up Unit Cost	Total Bid Item Cost
	Mobilization say 7%	1	ls	$2,047,978.25	$2,047,978	$2,969,274.16	$2,969,274.16
	Traffic Control say .5%	1	ls	$146,284.16	$146,284	$212,091.01	$212,091.01
	Superstructure, Approach Spans 1,2,7,8 470' x 18'wd						
	Railing (5' high)	940	lf	$83.96	$78,925	$121.73	$114,430.17
	CIP Concrete Slab on Steel Girders (9" thick)	247	cy	$800.00	$197,600	$1,159.89	$286,491.60
	Reinforcing Steel (Epoxy coated, 325 lb/cy)	80,194	lb		w/ abv		w/ abv
	Welded Steel Girders (Gr 50, painted, 35 lb/sf)	296,100	lb	$2.22	$656,528	$3.21	$951,871.87
	Elastomeric Bearings (1 per girder per pier)	8	ea	$2,500.00	$20,000	$3,624.64	$28,997.13
	Shear Studs (2 @6" full Length)	3,780	ea	$4.00	$15,040	$5.80	$21,805.84
	Strip Seal Expansion Device at Ramps	36	lf	$300.00	$10,800	$434.96	$15,658.45
	Finger PL Expansion Device at Main Spans	36	lf	$700.00	$25,200	$1,014.90	$36,536.38
	Superstructure, Main Spans 3, 4, 5, 6 1500' x 18'wd						
	Railing (5' high)	3,000	lf	$83.96	$251,889	$121.73	$365,202.67
	Precast Concrete Deck w/Curb (8" thick)	762	cy	$800.00	$609,600	$1,159.89	$883,832.40
	Reinforcing Steel (Epoxy coated, 225 lb/cy)	171,413	lb		w/ abv		w/ abv
	Post Tensioning (75 lb/cy)	57,138	lb	$2.50	$142,845	$3.62	$207,104.72
	Welded Steel Girders (Gr 50, painted, 65 lb/sf)	1,755,000	lb	$2.22	$3,891,278	$3.21	$5,641,793.73
	Structural Steel Bracket @ pylons (10,000 lb ea)	30,000	lb	$8.42	$252,564	$12.21	$366,181.76
	Post Tensioning at Brackets (1,000 lb ea)	3,000	lb	$2.50	$7,500	$3.62	$10,873.92
	Shear Studs (80 per FB at 12.5 ft)	9,600	ea	$4.00	$38,400	$5.80	$55,674.48
	Elastomeric Bearings (2 per pier)	10	ea	$10,000.00	$100,000	$14,498.56	$144,985.63
	Cable Stays. 22440lf	169,710	lbs	$18.00	$3,054,780	$26.10	$4,428,992.01
	Substructure						
	Struct Steel Weldment	262,500	lb	$6.00	$1,575,000	$8.70	$2,283,523.66
	PT Bars for Weldment	10,000	lb	$2.50	$25,000	$3.62	$36,246.41
	Concrete (4,000 psi) at Piers 1,2,6,7,8,9 - Column Caps	127	cy	$950.00	$120,650	$1,377.36	$174,925.16
	- Columns	788	cy	$750.00	$591,000	$1,087.39	$856,865.07
	- Footings	333	cy	$550.00	$183,150	$797.42	$265,541.18
	Concrete (6,000 psi) at Pylons 3,4,5	1,883	cy	$1,500.00	$2,824,500	$2,174.78	$4,095,119.10
	Reinforcing Steel (uncoated)	571,575	lb		w/ abv		w/ abv

Alternative 4: Old Rt 115 - New Cable Stayed Bridge

	Reinforcing Steel (E coated)	11,725	lb		w/ abv		w/ abv
	Soil Excavation	893	cy	$25.00	$17,325	$36.25	$25,118.76
	Rock Excavation	185	cy	$150.00	$27,750	$217.48	$40,233.51
	Piles HP14x89 w/tips	7,800	lf	$72.15	$562,770	$104.61	$815,935.63
	13' dia Drilled Shaft w/.75" casing	275	lf	$7,682.06	$2,112,567	$11,137.89	$3,062,918.54
	12.5' dia Rock Socket. 120'	14,719	cf	$100.00	$1,471,875	$144.99	$2,134,007.23
	Sonic Cross Hole Logging	24	ea	$2,500.00	$60,000	$3,824.64	$86,991.38
	Ramps St Charles side	20,592	sf	$260.00	$5,353,920	$376.96	$7,762,414.61
	St louis side	16,848	sf	$260.00	$4,380,480	$376.96	$6,351,086.50
	Intermediate and Finish Paint System	1	ls	$492,000.00	$492,000	$713,329.30	$713,329.30
	Electrical - Navigation Lighting System Mods	1	ls	$105,895.62	$105,896	$153,533.43	$153,533.43
	Total Directs:				**$31,451,095**		
	Gen. Contractor Indirects / Mark-ups / Fees:						
	General Conditions / Proj. Mngmnt.	7.0%			$2,201,577		
	Sales/Use Tax	6.0%			Exempt		
	Bond / insurance	1.0%			$460,000		
	GC's Ovrhd & Profit	5.0%			$1,705,634		
	Total Project Indir. / MU / Fees:	13.89%			**$4,367,210**		
	Sub-Total:				**$35,818,305**		
	Escalation, assume 2 yrs out to mid-construction	6.09%			$2,181,335		
	Total Estimated Construction Cost:				**$37,999,639**		
	Construction Contingency	20.00%			$7,599,928		
	Increase cost from 250-500-500-250 to 360-800-360 CS spans	12.00%			$5,471,948		$5,471,948
	Grand Total:				**$51,071,515**		**$51,071,515**

Use for Bond / Ins
$46,000,000

Total MU
$14,148,473

$788 $/sf including ramps

Notes / Clarifications::
1) All work assumed to be done on normal working hours.

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314) 269-2382
Fax: (314) 269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mil/d8/westernriversbridges

16591.1/28.5 MOR
November 17, 2014

Mr. Mark Capron, P.E.
Jacobs Fellow, Project Manager
501 North Broadway
St. Louis, MO 63102

Subj: PROPOSED PEDESTRIAN BRIDGE, MILE 28.5, MISSOURI RIVER

Dear Mr. Capron:

Please refer to your email dated September 26, 2014, requesting navigational clearance requirements for the subject bridge.

For a proposed bridge in the vicinity of mile 28.5, navigation crosses from the right bank to the left bank of the river. At this location, any pier(s) in the navigation channel would likely interfere with navigation in the crossing of the channel (the deepest water/channel does not always stay in the same location nor does it necessarily follow the sailing line). Therefore, a right descending pier should be on the edge of the right bank. The left descending pier should be in line with the edge of the left bank dikes, providing an unimpeded channel in the crossing. A subsequent horizontal clearance of at least 800 feet and a vertical clearance of 81.0 feet above zero on the gauge would satisfy the reasonable needs of navigation.

Alternate locations for a proposed bridge will require further review by this office. I appreciate the opportunity to make comments regarding the needed navigation clearances early in the design process. Should you have any questions, please contact Mr. David Orzechowski at (314) 269-2382.

Sincerely,

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

6.2 United States Coast Guard Navigational Clearance Requirements Letter

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District

1222 Spruce Street, Room 2.102D
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314) 269-2382
Fax: (314) 269-2737
Email: david.a.orzechowski@uscg.mil
www.uscg.mild8/westernriversbridges

16591.1/28.5 MOR
November 17, 2014

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Sincerely,

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

6.3 Best Practices in Bicycle and Pedestrian Bridge Design

The quality, character and functionality of bicycle and pedestrian facilities can vary significantly. At river crossings, where bridges for non-motorized travel provide a vital link across a major barrier, these facility attributes are vitally important. When confronting physical barriers, active transportation facilities that are direct, safe and comfortable should be a top priority to meet the needs of active travelers. Bicycle and pedestrian bridges that do not provide a positive, unique user experience and create instill a sense of safety and comfort are often underutilized, while bridges that provide a positive, unique user experience and create a sense of safety and comfort can encourage non-motorized travel. Some exceptional bridges, like the Old Chain of Rocks Bridge over the Mississippi River, the Bob Kerrey Pedestrian Bridge over the Missouri River, or the High Trestle Trail Bridge over the Des Moines River, are even destinations in their own right, attracting visitors and increasing bicycle and pedestrian activity in the surrounding area.

While there is no single archetype of a successful bicycle and pedestrian bridge, there are a wide variety of design characteristics that enhance the user's journey and provide a safe, comfortable, and enjoyable experience. Building a great active transportation facility requires an understanding of best practices in facility design combined with insight into local conditions and trends. This memo investigates and recommends best practices related to active transportation facilities on bicycle and pedestrian bridges.

6.3.1 User Experience

For many travelers, the quality of their travel experience and surrounding environment can be just as important as trip time, trip distance, or other deciding factors. This is especially true for bicyclists, pedestrians, and other trail users, who often prioritize comfort, safety, and enjoyment over time or distance. Much of a trail or non-motorized facility user's experience is dependent upon the path itself. The design of a path affects a user's perception of accessibility, safety, efficiency and attractiveness of the facility. Incorporating best practices in path design not only creates a positive experience for all its users, it also reduces conflicts between the different active transportation groups using the facility, such as bicyclists, pedestrians, wheelchair users, skateboarders, and in line skaters. Design factors such as path width, grades, sight distances, stopping distances, and proximity to motor vehicle traffic play a significant role in determining the user experience for trails, bridges, and other non-motorized travel facilities.

Active travel facilities need to be accessible to all types of active travel users. Addressing concerns related to ease of access and convenience, grades, cross-slope, surface materials and transitions are necessary during the design process of the facility.

6.3.1.1 Path Width

The width of a bicycle and pedestrian bridge path is often determined by the facilities to which it connects, anticipated user types and volumes, and the presence of scenic overlook areas, benches, or other amenities. In instances where grades are such that cyclists (the fastest active travelers) can be expected to travel at over 20 mph, it is advisable to separate cyclists from other active travel users, particularly if two-way travel is permitted. Separation can be marked by a roll-over curb or by a change in materials. The preferred width for a two-way separated path is 16 feet (12 feet of width shared by bicyclists and pedestrians and 2-foot clearance on either side of the path). This bridge should allow bi-directional travel of all users and permit passing by faster moving runners, cyclists, or skaters. Determining appropriate path widths involves consideration of several factors:

- Anticipated pedestrian and bicycle use (e.g., volumes)
- The need for sufficient maneuvering space to avoid fixed objects (e.g., railings and barriers)
- Potential conflicts between differing users (e.g., users traveling at differing speeds, users traveling in opposite directions, users stopped on the bridge)
- Real or perceived safety issues (e.g., the "tunnel effect" created by some enclosed structures)
- Anticipated use by in-line skaters, children, or bicycles towing trailers
- Curves, intersections and areas with sight line constraints
- Steep grades where the speed differential between users in each direction is greatest
- Anticipated use by maintenance and emergency vehicles

Overcrossings wider than the recommended minimum generally best address the major considerations listed above.

The width of the path on the bridge should be at least as wide as, or wider than, connecting active travel facilities, plus an additional 2ft clear width from vertical barriers. Carrying the clear width across the structure provides minimum, horizontal shy distance from the railing or barrier and offers space to allow faster-moving cyclists and in-line skaters to avoid conflicts with other users.

In circumstances where flows are concentrated in a particular direction during peak hours (i.e. minimal bidirectional traffic exists), a center line unnecessarily reduces space for passing and maneuvering. Ideally, no center line should be included, allowing users to organize themselves according to the circumstances. By contrast, edge lines can be included from the outset since they are helpful as a means to highlight the path edges and obstacles during low light conditions.

In circumstances where pathways experience high bi-directional volumes or operational challenges such as sight distance constraints, the use of center line stripes on a path can help to clarify the operating space allocated to users travelling in opposite directions. A solid center line is used to separate opposing traffic where passing is not permitted, and a broken line where passing is permitted.

Given the expense and expected life cycle of the overcrossing, it is recommended that the path width be designed to provide an acceptable level of service (LOS) for expected active transportation use for the duration of the bridge's expected life cycle. The FHWA Shared-use Path Level of Service calculator can provide guidance on acceptable path width for various user volumes, however at high bicycle and pedestrian volumes the accuracy of the calculator is compromised.

6.3.1.2 Grades

Ideally, grades should be no greater than 3% on bridges and connecting active travel facilities. Grades greater than 3% become increasingly difficult for bicyclists, especially for longer ascents.

The AASHTO Guide for the Development of Bicycle Facilities recommends that bicycle paths be no steeper than 5%. However, this is a relatively steep incline for a prolonged amount of time, and it would be advisable to provide periodic flatter areas along the bridge for resting platforms. The Americans with Disabilities Act (ADA) stipulates that the lowest grade shall be used wherever possible and that no ramp shall ascend more than 30 inches without an intermediate landing to rest.

Whenever grades exceed 3%, an additional 4 to 6 feet of width should be added to the path to permit ascending bicyclists to overtake slower bicyclists and to provide additional space for maneuvering for descending bicyclists.

6.3.1.3 Approach Ramps: Horizontal Curves and Sight and Stopping Distances

AASHTO provides guidance for determining appropriate curve radius for various design speeds for bicycles. Given the expected limited room for ramps for the bridge, the recommended design speed for the curves at any switchbacks should be a minimum of 12 mph. Curve warning signs in compliance with MUTCD standards should be placed in appropriate locations to alert faster descending bicyclists of upcoming conditions.

Additional width is recommended at curves to provide additional maneuvering space for path users.

Sight distances along the bridge and approaches should accommodate the expected travel speed for bicycles. AASHTO provides guidance for minimum stopping distance. This guidance should also be utilized to consider sight lines for intersections, horizontal and lateral curves.

6.3.1.4 Convenience: Distance Travelled

When confronting physical barriers such as freeways or waterways, direct and comfortable connections should be a top priority when constructing an active travel network. A single major barrier such as a difficult intersection or circuitous link can render an otherwise attractive facility undesirable.

Ideally active travel connections on bridge structures and linking to local cycling, pedestrian and transit networks should be no greater than the travel distance for motorized vehicles.

Where it is necessary to divert cyclists and pedestrians to connect to local bicycle, pedestrian and transit networks, the time and distance required to make such connections should be no more than 10 percent greater relative to that same trip using a motorized vehicle.

The provision of a pathway on only one side of the bridge tends to increase travel distances and can result in cyclists travelling against the flow of traffic at access points. If a pathway is only provided on one side, grade-separated crossings should be considered on each end of the bridge to allow cyclists traveling against the flow of traffic to cross over to the other side of the roadway and proceed in a safe and legal manner.

6.3.1.5 Crime Prevention through Environmental Design (CPTED)

The American National Crime Prevention Institute suggests that proper design and effective use of the built environment can lead to a reduction in fear and incidence of crime and an improvement in the quality of life.

Active travel facilities on bridges should provide natural surveillance between active travel users to deter crime and enhance the sense of safety. Designs that avoid blank walls, use high quality materials, and provide consistent lighting and clear sight lines are the most effective at allowing facility users to see and react to one another. Regular maintenance reduces the incidents of vandalism and creates an attractive environment that discourages undesirable activities.

6.3.1.6 Lighting

For active transportation facilities, pedestrian-scale lighting is preferred to tall, highway-style lamps. Pedestrian scale lighting is characterized by shorter standards, closer spacing, lower levels of illumination (except in areas with potential conflict between users), and the use of lamps that provide better color rendition to better facilitate recognition over long distances. On bridges, light fixtures embedded in handrails that cast downward light are an option to provide well-lit pavement surfaces with low glare.

Depending on the location, average maintained horizontal illumination levels should be between 0.5 and 2 footcandles (5 to 22 lux). For personal safety, higher lighting levels may be necessary in some locations.

6.3.1.7 Vertical Circulation: Approaches/Access Points

Bridge access designs vary considerably and can include direct ramps, spiral ramps, stairs, and elevators. All of these options have implications on different user types that should be considered. A bicyclist, wheelchair user,

or elderly person can find stairs to be a significant inconvenience. Multiple options for gaining elevation to access the bridge should be provided to accommodate the widest range of active travelers.

Ramps

Ramps provide a seamless connection for wheeled users between active transportation facilities on the ground and the bridge deck. Ideally, a ramp accommodates active travelers with a gradual slope and follows the general desired direction of travel.

When space constraints require switchbacks, extra space should be provided to accommodate turns. Additionally, ramps should be wider than the bridge to allow for passing and increased maneuverability.

Stairs

Stairs are useful to pedestrians in constrained circumstances with steep grades, but do not accommodate wheelchairs or strollers. When stairs are included in a design, cyclists can also be accommodated through the use of wheel runnels.

Where stairs are used to overcome a significant grade change, runnels (thin ramps placed along staircases with bicycle tire sized grooves cut into them) should be used so that cyclists can roll their bicycles up or down the staircase with ease. Careful attention should be paid to the design of bicycle runnels. Accessibility requirements for handrails can conflict with the use of bicycle runnels, as handrails may obstruct or decrease the control of the bicycle.

6.3.1.8 Pathway Surface

The quality of the path surface and transitions should be considered to accommodate a high level of comfort for wheeled users. Transitions between paths and bridge decks should be smooth with no lips or bumps protruding more than inch. Gutter seams, drainage inlets and utility covers should be flush with the surrounding surface and oriented to prevent conflicts with the tires of wheelchairs, strollers, skates and bicycles. All surfaces should be textured in a way to be skid resistant. The use of contrasting pathway surface colors can also be used to separate user types, as seen in the example from Malmo, Sweden.

6.3.1.9 Safety Barriers

Railings are necessary for the safety of pedestrians and bicyclists. A railing height of 48 inches is recommended for bridges that include bicycle travel. Where a cyclist's handlebar may come into contact with a railing or barrier, a smooth, wide rub rail should be installed. Bridges over roadways require a barrier to prevent objects from being thrown down onto the roadway. Materials could range from chain-link to metal mesh or metal fabrics.

6.3.1.10 Noise and Weather Barriers

Bridges that accommodate high volumes of truck traffic (more than 10 percent of traffic) and which are exposed to the elements can leave active travel users exposed to uncomfortable levels of noise and wind.

The force or amplitude of sound is measured in decibels (dBA) of sound pressure. Normal speaking voices are around 65 dBA while a rock concert can be around 120 dBA. Sounds that are above 85 dBA can permanently damage one's ears. The higher the sound pressure, the less time it takes to damage one's ears. For example, a sound at 85 dBA may take as long as 8 hours to damage one's ears while a sound at 100 dBA can start to damage ear cells after 30 minutes. It is recommended that steps to mitigate noise be considered if the noise level on the path is higher than 85 dBA.

Wind is measured by both speed and direction. For pedestrians and cyclists, changes in the speed and direction of wind caused by passing motor vehicles can be unsettling. The Beaufort scale is a useful measurement tool as it considers the force of wind based on its effects on the local environment. If the wind force from passing vehicles exhibits higher than a Force 3 wind (19 km/h maximum, or the speed that can move tree branches) on those using the pathway, it is recommended that efforts to mitigate the effects of passing vehicles should be considered.

In order to protect active travel users from noise and wind, consider means to reduce these impacts with windscreens, Acrylite Soundstop or another type of solid barrier. A covered path that shields active travelers from wind, rain and snow can help protect users from the elements and may help increase use of the facilities during times of bad weather.

6.3.1.11 Wayfinding

Wayfinding is the process of finding your way to a destination, and an essential piece to any active transportation facility. In order to function properly, wayfinding information must be provided in a logical, consistent and reliable manner. Comprehensive signage and pavement markings guide active travel users to their destinations along preferred routes. Maps and/or signs should be placed at decision points along the route. Pavement markings, meanwhile, tend to support and reinforce information on signs, provided information concerning lateral positioning, turning movements and direction of travel.

For faster active travelers, including bicyclists, a three-tiered system should be implemented:

- Decision signs: marking an upcoming junction and informing travelers of the route to take in order to reach key destinations
- Turn signs: indicating where a multi-use path turns from one street or path to another
- Confirmation signs: indicating to users that they are on the correct route toward their destination
- For pedestrians and slower-moving active travelers, a decision sign is not required. A two-sign system should be implemented, consisting of turn signs and confirmation signs.

6.3.2 Attractiveness: Aesthetic Experience of Users

Implementing the elements described above will increase the usage of active travel facilities connecting to and on bridges. However, by including human scale features, rest stops and scenic viewing areas, public art, and other unique characteristics in the design of a bicycle and pedestrian bridge, the facility can function as a destination in and of itself, attracting bicyclists and pedestrians and offering a unique and memorable experience for bridge users (and even those viewing the bridge from afar).

In order to make the bridge and connecting active travel routes more attractive to potential users, consider opportunities to incorporate viewpoints and rest stops.

Rest stops should be located every 1 km or less and should be at least 4 m long and 2 m wide. Ideally a transition should be provided between the travel path and the rest area using a change in materials or color to distinguish between the two.

Viewpoints should be provided at rest stops on the bridge and should allow unobstructed views. In order to make active travel facilities inviting to users, it is recommended that the design of active travel elements consider the following principles:

- Imageability (distinctive, recognizable, memorable);
- Enclosure (visually defined by vertical elements);
- Human scale (for example, lighting on the active travel paths should be pedestrian scale);

- Transparency (degree to which one can see or perceive objects and activity); and
- Complexity and uniqueness (visual richness measured by the variety in the physical environment).

6.3.3 Signage

A new bicycle and pedestrian facility over the Missouri River will have significant impacts on regional travel, connecting regional employment centers, commercial destinations, residential neighborhoods, numerous parks, and multiple segments of the regional trail network. To ensure that users of this new facility can safely and conveniently reach destinations throughout the surrounding area, a clear and consistent signage system must be integrated into the project and surrounding active travel networks.

Because this bridge facility has regional implications and ties into the regional trail and greenway network, Great Rivers Greenway's signage and branding may be applicable to the development of wayfinding, identification, regulatory, informational, and interpretive signs as a component of this river crossing. Great Rivers Greenway's Signage Standards Guide provides comprehensive and detailed information relating to the design, placement, and maintenance of signs, banners, and even pavement markings. These standards ensure uniformity and consistency throughout the River Ring Network of interconnected greenways and trails. The following opportunities to incorporate Great Rivers Greenway themes, signage and branding should be considered in the design of a new Missouri River bicycle and pedestrian crossing facility:

- Wayfinding and directional signage to direct users to and across the bridge, as well as to nearby destinations;
- Identification signs to brand the facility itself as an important and unique component of a regional greenway network;
- Information signs to provide other useful facility information and, such as hours of operation, restricted uses or activities, and user etiquette;
- Interpretive signs to educate and engage users on potential subjects such as area history and settlement, ecology and environment, or even the construction of the bridge itself;
- Environmental graphics such as banners, pavement markings, furniture, and other placemaking elements.

In addition to these diverse signage and branding opportunities, a new bridge may also offer a unique location for Great Rivers Greenway and its partners throughout the region to host programs, events and activities that support and encourage safe use of the facility and surrounding non-motorized travel network, including organized bicycle rides, interpretive hikes and walks, and "Share the Path" checkpoints designed to foster mutual respect among facility users. The nature and type of programs and activities on a new river crossing facility will depend, in large part, on the design of the facility itself. For example, a new standalone bicycle and pedestrian bridge can be constructed to incorporate wide paths, rest areas, overlooks, and even outdoor classrooms to encourage recreational and educational programs. A narrower facility utilizing existing roadway shoulders or cantilevered to an existing bridge may not provide adequate width or appropriate level of comfort to support educational and recreational programming and amenities. In this context, programs to encourage bicyclists and pedestrians to share the path and be safe and responsible while using the bridge crossing are more appropriate. The County of Marin funded a series of "Share the Path" checkpoints on high-volume Marin County multi-use paths as a means of fostering better trail etiquette and respect between users. When possible, checkpoints occur with local law enforcement to educate path users, including bicyclists and pedestrians, about shared rights and responsibilities.

In addition to signs consistent with the Great Rivers Greenway Signage Standards Guidelines, regulatory signs will be necessary throughout the project corridor to support safe and responsible travel to and along the

bicycle and pedestrian bridge facility. Guidance for regulatory signs and pavement markings pertaining to bicycle and pedestrian facilities and operations can be found in the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD).

6.4 Levee District Coordination

alta
PLANNING + DESIGN

16141 Swingley Ridge Road, Suite 300
Chesterfield, MO 63017
(636) 537-5585 phone
(636) 537-0275 fax
www.altaplanning.com

Memorandum

TO:	Brad Temme City of St. Charles	**DATE**	September 25, 2014
		PROJECT NAME	I-70 Feasibility Bike/Ped Bridge Study
FROM:	Paul Wojciechowski	**PROJECT NUMBER**	2014-082
CC	Mark Capron		

RE Howard Bend Levee District Meeting

On September 25, I met with Dan Human the Executive Director of the Howard Bend Levee District for lunch to discuss connections from the proposed I-70 Bike/Ped. bridge to Creve Coeur Lake.

Dan indicated that Hollywood Casino is owned by Penn Gaming. Gary Necker is the contact at (314-713-6912 cell). He is the right person to talk to, and while they will not be crazy about a trail around the back side of the casino they are not adamantly oppose to a trail near them. Behind the casino is the Howard Bend Levee that is a 500 year levee with additional 3' concrete blocks on top of the levee. The initial question to pose is locating on top of the Riverport Levee to get over to Pritchard Farm Road.

The contacts at the Riverport Levee District are Ryan Hodges and Brennon Stoval. Dan has spoken with Ryan and while he is not overly excited, they are amenable to a trail on the levee.

Dan mentioned that the President of the Howard Bend District is Mr. Demi, and he is adamant on hunting and property rights. The owners from the casino south are as follows:

- R@G (Jeff Cohen) (should be OK to work with)
- Howard Bend Levee District
- MSD (Not sure if they are workable or not)
- Ortmann Farms (Ed)
- Sportport
- Dussault (Steve and Linda) May be accommodating.
- Al Moore /Boatmans/Dennis Moore (Moore Foods) Not unrealistic and may be OK
- Creve Coeur Airport (John Cournoyer and Al Sticks are older but he expects they will be concerned about the proximity to the runway.)

Dan thought it would be good to touch base with Penn Gaming and Riverport LD as next steps.

In his mind a trail on the levee is a good thing in providing access for maintenance of the levee as well as the trail use. He stated that they normally have a 10' gravel top with 3:1 gravel slopes to the in slopes of the levee. He asked about the surface being too light to handle trucks that need to repair the levee at times. I stated it could be a requirement that the surface be beefed up. Maintenance would need to be worked out, but he stated he would likely not provide negative concerns over a trail on the levee from the levee district perspective.

Dan also stated that he brother Dave who is ED of the Monarch LD is very satisfied with the trail on that levee.

alta
PLANNING + DESIGN

16141 Swingley Ridge Road, Suite 300
Chesterfield, MO 63017
(636) 537-5585 phone
(636) 537-0275 fax
www.altaplanning.com

Memorandum

TO:	Brad Temme City of St. Charles	**DATE**	October 2, 2014
		PROJECT NAME	I-70 Feasibility Bike/Ped Bridge Study
FROM:	Paul Wojciechowski	**PROJECT NUMBER**	2014-082
CC	Mark Capron		

RE Riverport Levee District Meeting

On October 2, 2014, I met with Ryan Hodges (President) and Christy Lucido of the Riverport Levee District to discuss connections from the proposed I-70 Bike/Ped. Bridge to Creve Coeur Lake across the Riverport Levee.

I explained what the Feasibility study was to accomplish and that is the ground floor of considering a possible crossing, and connections to trails to make the crossing worthwhile. I stressed that there have not been decisions made on anything as yet, but that the I-70 crossing on the eastbound bridge looks to be the most bang for the buck based on early assessment and that it is feasible to put cross on the structure. I stated that the next step was to determine connections from the bridge to Creve Coeur Lake, and if there are red flags we need to address and identify.

I provided a connectivity study map that indicated the level of connectivity now, and the connectivity that would result from the bridge connections. They were impressed at the degree of improvement to Riverport by the I-70 option. They asked what demand is present from the connection, to which I stated that we did this analysis and would share it in the near future. I also provided information on what connections we need to make and Ryan noted that the Riverport levee provides a great access.

Ryan asked about after we cross Rte. 141 how we will connect through Pritchard Farm Road. I stated that I had not looked at ownership yet, that I wanted to get Riverport addressed first.

Ryan stated that there were a lot of concerns on the Earth City Levee that led to GRG going on the river side to avoid issues raised.

Ryan indicated that there are several important factors that have to be considered for the district to even consider allowing a trail on the top of the levee. The issues are as follows:

- The primary use of the levee is flood protection; therefore this primary use cannot be compromised.
- They have a pump station along the inside of the levee where they store fuel. In the past there have been fuel stolen and the perpetrators used the levee to access I-70 for their getaway. They need to make sure this pump station area is secured. This can be addressed by securing and screening the pump area to make it less visible and secure.
- Access of vehicles on the top of the levee must be restricted, but levee operations must be maintained. I indicated that the use of bollards other deterrents can be used to make sure only non-motorized traffic is on the levee. Ryan noted that nothing can penetrate the levee, which needs to be a consideration for the use of bollards.

November 14, 2014

- The levee top cannot be cut, only added to and the top area must be maintained.
- Paving the levee top is not a big benefit to them. They can do what they need to do right now with the gravel top.
- Both Christy and Ryan see benefits to Riverport of the trail on the levee, and Christy noted that tenants have asked about trail access.
- Trail oriented development was mentions by Christy for two sites adjacent to the level between Riverport and Hollywood.
- An issue that may arise from a Riverport business is the Amphitheater. He suspects that they may have an issue with public access on the levee to their venue since they, in the past, have had to run people off the levee during events. He assumes that the Maryland Heights police could address the access and people sitting on the levee watching concerts. He believes that locating the trail on the Hollywood side of the levee may address the issue. The area in front of the casino was to have office buildings and may find the trail an asset.
- Access on the levee for their maintenance is required, and needs to be maintained. They can minimize vehicles on the levee by providing an inside levee road so that conflicts do not occur with bikes and pedestrians.

Ryan stated that while there are issues there does not seem to be anything that indicates it is not possible at this point. His levee board will need to weigh in and he will let them know about the ideas at their next meeting.

All in all the meeting was good and they may see benefit to Riverport connectivity from the trail if it happens. They asked about timeline and I stated that funding assessment will be a key issue that will be addressed next, depending on opportunities. The first step, which is the feasibility study, will be done by December.

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www.altaplanning.com

Memorandum

TO: Brad Temme
City of St. Charles

FROM: Paul Wojciechowski
CC Mark Capron

DATE October 9, 2014
PROJECT NAME I-70 Feasibility Bike/Ped Bridge Study
PROJECT NUMBER 2014-082

RE Hollywood Casino

On October 9, 2014, I met with Hollywood Casino representative Gary Necker of Penn National (PN) Gaming. He is the facility manager for the Casino grounds. Gary was extremely positive regarding the Bridge Feasibility study and the proposed trail connection on the levee, between Riverport and the Casino. PN Gaming owns property on both sides of where the levee turns towards Rte. 141. Gary stated that the 500 year levee is actually only along the Missouri River. The levee between the casino and Riverport is really only a berm and offers no flood protection. The channels on the south side of the casino property do actually offer flood protection. This being the case he was not concerned about a trail on the top or base of the levee on their side.

Gary indicated that he saw only positive benefits to the trail since there are many guests that walk and bike. I provided a bicycle connectivity map that showed the enhancement of connectivity by the bridge connection along I-70.

Gary indicated to me that he will provide information a recommend support of the study and the trail connection along the Riverport levee to his board of management. He will let me know what they say.

In closing he agreed that the Verizon Amphitheater may have an issue with the trail on the berm, but visibility and sound is not good, and since the Maryland Heights Police would patrol the areas, there should not be a problem. If it is he thought location the trail on the base of the berm would not be an issue. His only comment was the Ameren has high voltage towers in the farm field but did not know if they need to be engaged, or what their ownership is.

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16141 Swingley Ridge Road, Suite 300
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Memorandum

TO:	Brad Temme City of St. Charles	**DATE**	November 21, 2014
		PROJECT NAME	I-70 Feasibility Bike/Ped Bridge Study
FROM:	Paul Wojciechowski	**PROJECT NUMBER**	2014-082
CC	Mark Capron		
RE	Maryland Heights Staff		

On November 21, 2014, I met with Bryan Pearl (Director of Public Works) and Mary Vaughn (Director of Parks and Recreation) regarding the I-70 Bridge Feasibility Study and to discuss issues related to using the Riverport Levee, and connections to the McKelvey Woods Greenway. To begin the meeting I described the work to date on the feasibility study and that the bridge options are all essentially feasible. I described each of the alternatives for the river crossing, and that the I-70 alternative performed the best overall.

Initially there was a brief discussion on why MoDOT did not include a bike/ped facility on the westbound bridge. Mary stated that she thought the eastbound bridge was the focus to get Maryland Heights in the mix. I indicated that that was not true and that MoDOT was the one who did not want the attachment on the westbound bridge. Bryan speculated that the tight budget led to it not being incorporated on the westbound bridge.

There was agreement that the eastbound bridge option needed to connect to the Riverwoods trail and park, but using the Riverport Levee provided a great connection from the new crossing. Crossing at Pritchard Farm Road made a lot of sense since there is an existing signal at that location that can add the signalized trail crossing. Pritchard Farm right of way is very wide and there are wide shoulders that can accommodate a trail on either side. The property owner along Pritchard Farm Road (Gose, had concerns with the McKelvey Wood Trail project running along their frontage on Creve Coeur Mill Road, but it was not a big issue, and both Mary and Bryan did not think there would be a concern that is a red flag. Either Creve Coeur Mill Road and crossing the tracks to the west or immediately crossing the tracks and connecting to the trail are both very good options. The Union Pacific will be the biggest issue, but not at existing crossings. The option that would take the trail across Creve Coeur Mill and then the track then following the south side of the railroad looks very appealing since wit will connect after crossing the three properties on the south side of the railroad. Mary thought this would be a great tie in to the McKelvey woods trail to both connect to Creve Coeur Park, as well as the Aqua Port and the new rec center that is to be constructed in the coming year.

I asked about the Riverport levee top trail proposal and if there were any issues they saw with this. Both thought this was a very good option and Mary would fully expect to maintain the trail, and the Police would police the trail, as they do with other trails. When it comes to issues Verizon may bring up with people viewing concerts from the trail, the police will have powers to keep people moving along, since it is a trail, lawn chairs will show people are not using the facilities as a trail. Also, the trail will not likely be open in the dark, since no lighting is proposed.

Paul explained that all of the adjacent owners (Hollywood and Duke Properties) are both supportive of the levee trail proposal. Overall, the proposed connections from the I-70 Bridge, to McKelvey Woods trail looks very beneficial. On a side note, it was mentioned that the chance to ask for funding was missed, which they did not elaborate on.

As a follow up to this meeting, I contacted Larry Welty of St. Louis County. There is no major red flag associated with using the Pritchard Farm ROW, but the County will need to review any proposal before it is approved. It should be

December 22, 2014

noted that there is a bridge over a creek south of Rte. 141, with minimal shoulders, and will need either widening or a separate bike/ped. Bridge constructed.

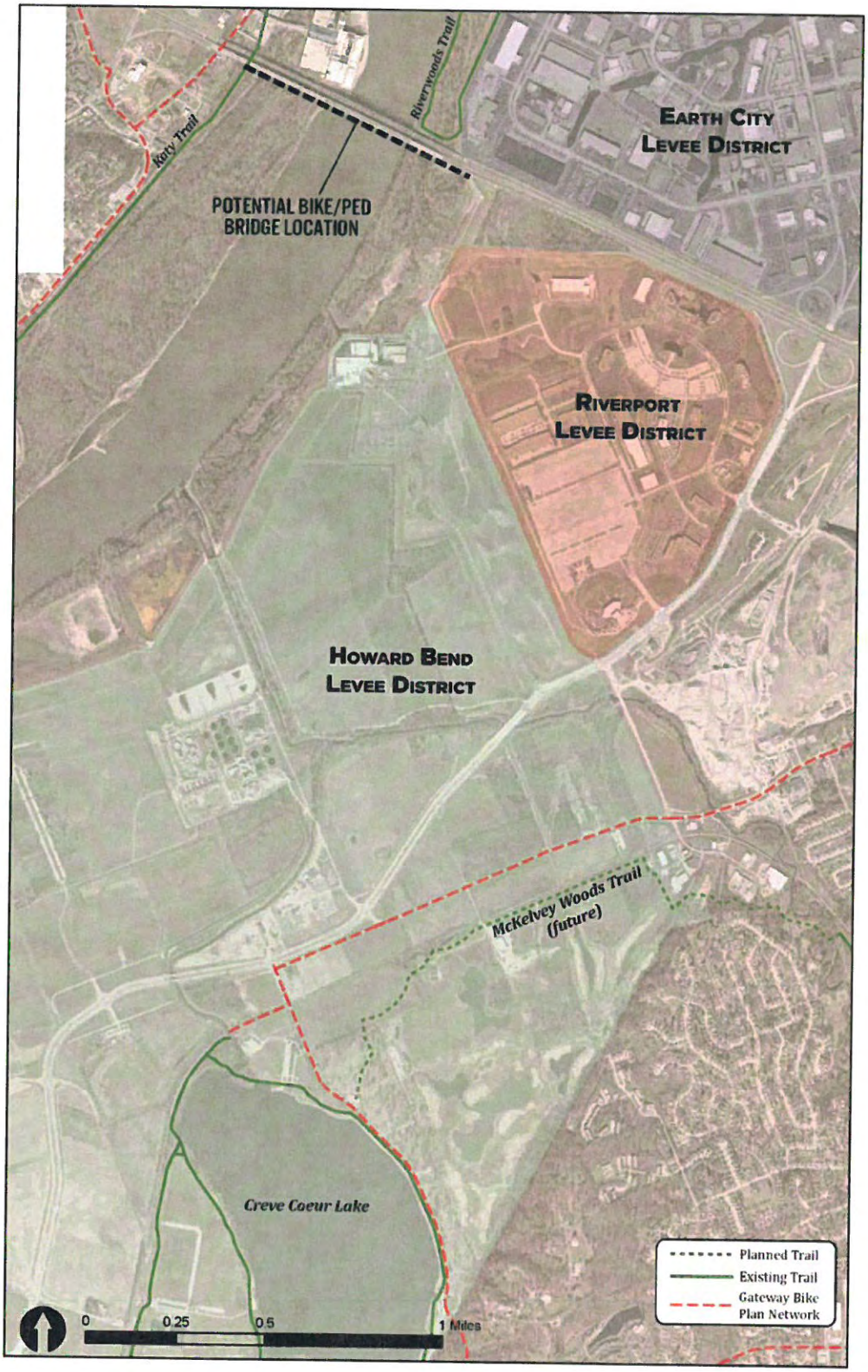

Figure 71: Levee Districts

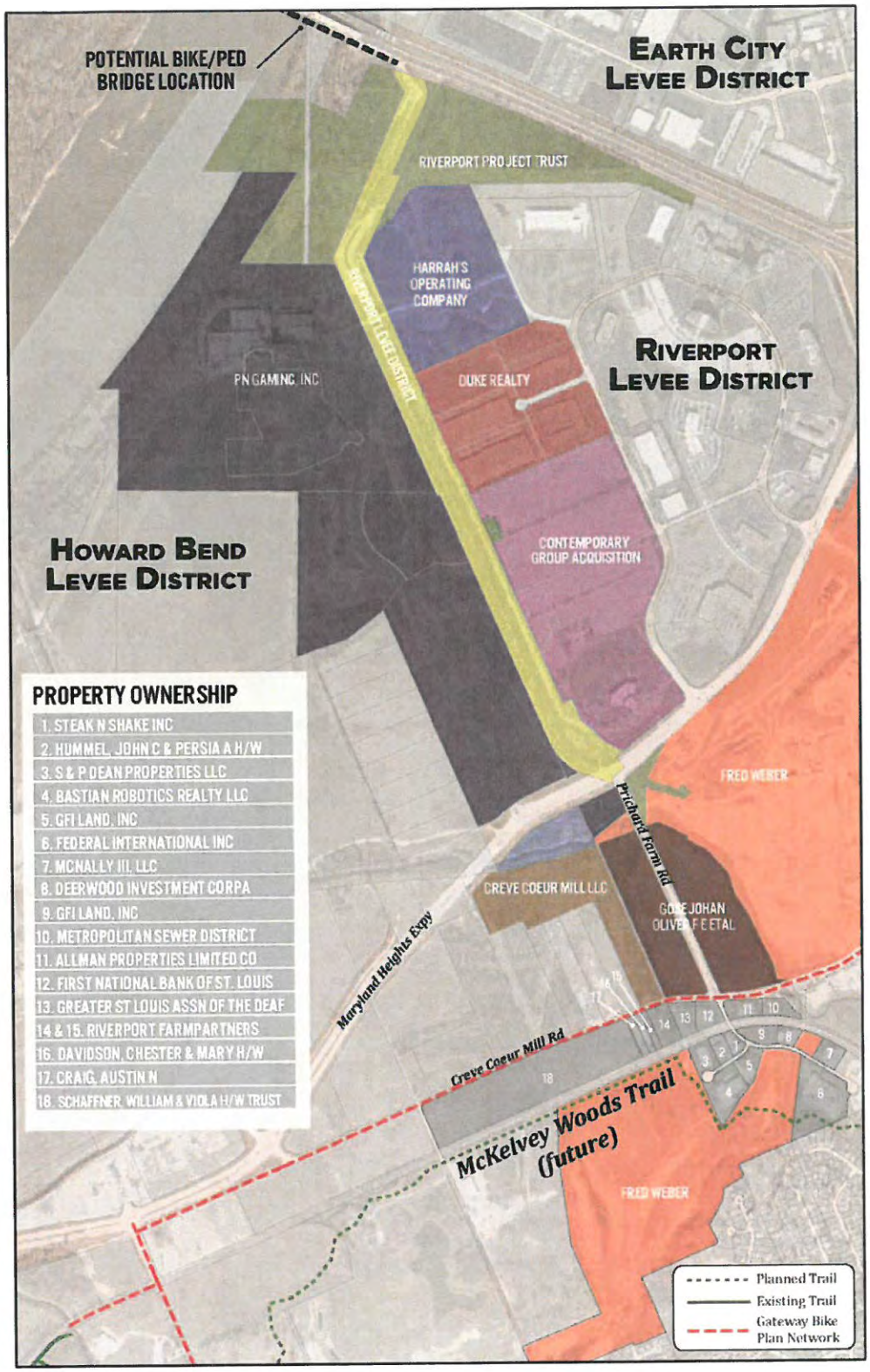

Figure 72: Property Ownership surrounding Riverport Levee

MoDOT

Missouri Department of Transportation

Gregory J. Horn, P.E.
St. Louis District Engineer

1590 Woodlake Drive
Chesterfield, Missouri 63017-5712
314.275.1500
Fax: 573.522.6475
1.888.ASK MODOT (275.6636)

November 4, 2015

Brad Temme, P.E.
Senior Project Manager
City of St. Charles
200 North Second St.
St. Charles, MO 63301

Dear Mr. Temme:

This letter is to provide MoDOT's support for St. Charles City's plan to add a barrier separated bicycle lane on Highway 370, located on the Missouri River Bridge, through the application of a Transportation Alternatives Program (TAP) Grant. This project will enhance the ability of residents, students, and customers to use multiple modes of transportation to travel to nearby places of business and destination points.

MoDOT realizes that this proposed work will be performed on MoDOT right-of-way and that we will have involvement with the specific plans for improvements on our system before construction can begin. With the financial situation that MoDOT faces, we cannot contribute any funds to this project, and if there are any improvements that would add to our system a maintenance fee would need to be assessed.

MoDOT recognizes the value of this project in safety and mobility improvements on this segment of Route 370. We look forward to working with the City of St. Charles on this project.

Let me know if you have any questions or concerns. Good luck with your application for funding.

Sincerely,

Gregory J. Horn, P.E.
St. Louis District Engineer
Missouri Department of Transportation

trailnet
BIKE WALK LIVE

address :: 411 North 10th St., Suite 202 St. Louis, MO 63101
office :: 314.436.1324
email :: info@trailnet.org
follow us :: facebook.com/trailnet twitter.com/trailnet

November 20, 2015

JoAnn Peebles
Public Works Engineering Department
City of Saint Charles
200 N Second Street
Saint Charles, MO 63301

RE: Support for the Missouri Route 370 Discovery Bridge

Dear Ms. Peebles,

Trailnet enthusiastically supports the proposed on-bridge bicycle and pedestrian shared use paths on Missouri Route 370 Discovery Bridge. Trailnet is a not-for-profit with more than 25 years of experience delivering innovative plans, programs and policies to foster healthy, active, and vibrant communities. Trailnet has a longstanding relationship with the City of St. Charles that strengthened most recently as Trailnet works with the City to create a Bicycle and Pedestrian Master Plan.

We are pleased that the project will provide a key connection across the Missouri River and connect to existing and planned bicycling and walking facilities. The project will be an asset for residents throughout the region and help to make the Mississippi River Trail more attractive to tourists from around the country.

Sincerely,

Ralph Pfremmer
Executive Director

MAKING MISSOURI A BETTER PLACE TO WALK AND RIDE A BICYCLE!

MISSOURI BICYCLE AND PEDESTRIAN FEDERATION

1709 Missouri Blvd
Ste. C #200
Jefferson City, MO 65109

MoBikeFed.org

EXECUTIVE DIRECTOR:

Brent Hugh
director@
mobikefed.org

December 9, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Kevin:

Please accept this letter of support for the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project.

These projects not only addresses much needed infrastructure improvements for the city, they will also create an environment that will foster community development and job creation. The projects will enhance the city's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling through St. Charles.

This project connects with and will enhance or create safer crossings, greater connectivity, and/or better route possibilities for these major regional and national bicycle routes and trails that pass through the project boundaries:

The improvements to these important facilities represent an expanded non-motorized system to serve regional commuters and visitors. This is a transportation investment that combines multiple modes of transportation that creates an environment for economic growth.

One of our identified goals is to create accessible bicycle and pedestrian crossings on every major river bridge in Missouri. The importance of bicycle and pedestrian access across major bridges near population centers, like the Hwy 370 bridge, puts this among our top statewide priorities for access across the river.

Access across the Hwy 370 bridge has been mentioned to us as an important issue numerous times by our members who live in and visit the area.

Sincerely yours,

Brent Hugh
Executive Director

ANN WAGNER
MEMBER OF CONGRESS
2ND DISTRICT, MISSOURI

HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515

December 1, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Mr. Corwin,

I am pleased to support the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project. These projects will benefit not only the City of St. Charles but our entire region as well.

The Missouri Route 370 Discovery Bridge Shared Use Path Project is a part of an overall cooperative between local governments to increase safety and provide connectivity. This project will foster development and improve access to local businesses and recreational opportunities. The Lincoln Elementary Safety Routes to School Project will provide sidewalks where no sidewalks are currently present within a half mile of Lincoln Elementary. Providing a safe path for children walking to school is a priority that deserves attention.

St. Charles' continued progress towards a comprehensive transportation plan provides much needed infrastructure improvements and promotes community interaction. I trust this worthy project will be given full consideration and look forward to continued efforts by the City of St. Charles to benefit our region with an enhanced transportation system.

Sincerely,

Ann Wanger
Member of Congress

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STATE CAPITOL, ROOM 428
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EMAIL: MARIA.CHAPPELLENADAL@SENATE.MO.GOV
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COMMITTEES
EDUCATION
SENIORS, FAMILIES AND CHILDREN
TRANSPORTATION, INFRASTRUCTURE & PUBLIC SAFETY
VETERANS' AFFAIRS AND HEALTH

MISSOURI SENATE

JEFFERSON CITY

MARIA CHAPPELLE-NADAL
14TH DISTRICT

November 16, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Kevin:

Please accept this letter of support for the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project. These projects will clearly provide numerous benefits for our community and region.

These projects not only addresses much needed infrastructure improvements for the city, they will also create an environment that will foster community development and job creation. The projects will enhance the city's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling through St. Charles.

I look forward to continuing to work with you and other key partners to insure an improved transportation system is in place to provide long-term benefits for our region.

Sincerely,

MARIA CHAPPELLE-NADAL
State Senator, District 14

/ceb

CAPITOL ADDRESS

State Capitol
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HOME ADDRESS
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St. Charles, MO 63301
Tele: 636-373-0952

COMMITTEES
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Life Sciences
Joint Committee on
Gaming & Wagering
Job Readiness Task Force

MISSOURI HOUSE OF REPRESENTATIVES
Anne Zerr
State Representative
District 65

December 1, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Kevin:

Please accept this letter of support for the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project. These projects will clearly provide numerous benefits for our community and region.

These projects not only address much needed infrastructure improvements for the city, they will also create an environment that will foster community development and job creation. The projects will enhance the city's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling through St. Charles.

I look forward to continuing to work with you and other key partners to insure an improved transportation system is in place to provide long-term benefits for our region.

Sincerely,

Anne Zerr

Anne Zerr

DELTA CENTER
live independently

November 6, 2015

JoAnn Peebles
Project Manager - Public Works Engineering Department
200 North Second Street
Saint Charles, MO 63301

Dear Ms. Peebles:

This letter is to support your efforts to apply for funding from the Transportation Alternative Program (TAP) administered through East-West Gateway Council of Governments to fund the following projects.

The Missouri Route 370 Discovery Bridge, An On-Bridge Shared Use Path

Provides on-bridge bicycle and pedestrian shared use paths utilizing the outside shoulders of Missouri Route 370 Discovery Bridge and separates these paths from motor vehicle traffic by installing physical barriers. Barriers are added along both Eastbound and Westbound 370 to provide 6 foot wide shared use paths accommodating bi-directional pedestrian travel and directional bicycle travel. The St. Charles trail connection to the Katy Trail and Boschert Greenway is being completed by a MDNR Recreational Trails Program grant. This proposed TAP project is part of an overall cooperative initiative between the Cities of St. Charles, Bridgeton, and Maryland Heights, as well as Great Rivers Greenway to improve bike and pedestrian connectivity across the Missouri River also described in a 2015 TIGER application. The project increases the safety and connectivity amongst the Boschert Greenway, Katy Trail, Earth City Levee Trail, and Mississippi River Trail.

Lincoln Elementary Safe Routes to School

Lincoln Elementary School was established in 1930 and is located at the intersection of Perry Street and S. 6th Street. There are several locations where no sidewalks are present within a half mile of the school. Zones of missing sidewalks surrounding schools were prioritized in the City's 2015 Long Range Sidewalk and ADA Transition Plan. The highest priority was Blackhurst-Hardin Middle School which received an SRTS grant in 2013 and was completed this year. The Lincoln Elementary School zone is now the next highest priority zone. This project adds approximately 4,500 linear feet of new 5ft wide sidewalk along Perry Street and surrounding streets. This project increases the safety of children walking to school and improves pedestrian connectivity between Lincoln Elementary School and the surrounding neighborhood.

Delta Center fully supports both of these efforts as a way to increase the personal freedom and independence of people with disabilities, as well as all people in the region.

Sincerely,

Vito Lucido

Vito Lucido
Independent Living Services Coordinator
636-926-8761 / vitolucido@dcil.org

MID-EAST AREA AGENCY on AGING

Providing. Caring. Connecting.

December 1, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Kevin:

Please accept this letter of support for the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project. The Mid-East Area Agency on Aging serves seniors in the community and we believe these projects will clearly provide numerous benefits for our community and region.

Improved walking paths help to make a community become more friendly for the senior citizens who live there. Safe and well lit areas will improve access for seniors as well as other community members.

These projects not only address much needed infrastructure improvements for the city, they will also create an environment that will foster community development and job creation. The projects will enhance the city's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling through St. Charles.

I look forward to continuing to work with you and other key partners to insure an improved transportation system is in place to provide long-term benefits for our region.

Sincerely,

Mary E. Schaefer
Executive Director

14535 Manchester Road
Manchester, MO 63011-3960
(636) 207-0847 *phone*
1 (800) AGE-6060 *toll-free*
www.mid-eastaaa.org
info@mid-eastaaa.org

12355 Natural Bridge Road, Bridgeton, Missouri 63044-2068
Phone (314) 739-7500
Fax 739-5402

City of Bridgeton

Terry W. Briggs, Mayor

December 1, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Kevin:

Please accept this letter of support for the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project. This project will clearly provide numerous benefits for our region.

This project not only addresses much needed infrastructure improvements for the region, it will also create an environment that will foster community development and job creation. The project will enhance the region's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling between St. Charles and St. Louis counties.

I look forward to continuing to work with you and other key partners to insure an improved transportation system is in place to provide long-term benefits for our region.

Sincerely,

Terry W. Briggs

Terry W. Briggs, Mayor
City of Bridgeton

December 1, 2015

Dear Kevin:

Please accept this letter of support for the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project. These projects will clearly provide numerous benefits for our community and region.

These projects not only addresses much needed infrastructure improvements for the city, they will also create an environment that will foster community development and job creation. The projects will enhance the city's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling through St. Charles.

I look forward to continuing to work with you and other key partners to insure an improved transportation system is in place to provide long-term benefits for our region.

Sincerely,

Tony & Jodi
Bike Stop Café & Outpost
St. Charles Mo
636.724.9900

CAPITOL OFFICE
State Capitol • Room 401A
201 West Capitol Avenue
Jefferson City, MO 65101-6806
Tele: (573) 751-1452
E-Mail:
Chrissy.Sommer@house.mo.gov

MISSOURI HOUSE OF REPRESENTATIVES
Chrissy Sommer
State Representative
District 106

COMMITTEES
Vice-Chairman:
Professional Registration and Licensing

Member:
General Laws
Higher Education
Property, Casualty, and Life Insurance

November 17, 2015

Kevin Corwin
City Engineer
City of St. Charles
200 N. Second Street
St. Charles, MO 63301

Dear Kevin:

As someone who knows the value of infrastructure on the success of the region and state, I support the City of St. Charles' Missouri Route 370 Discovery Bridge Shared Use Path Project and the Lincoln Elementary Safe Routes to School Project.

These projects not only address much needed infrastructure improvements for the city, but will also create an environment that will foster community development and job creation. The projects will enhance the city's multi-modal transportation plan which will improve access to local businesses and create safer and more diverse transportation options for everyone traveling through St. Charles.

These projects will clearly provide numerous benefits for our community and region.

I look forward to continuing to work with you and other key partners to insure an improved transportation system is in place to provide long-term benefits for our region.

Thanks for your consideration.

Chrissy Sommer

Rep Chrissy Sommer
District 106- St Charles MO

GRG Great Rivers Greenway

CLEAN | GREEN | CONNECTED | TRAILS

For a clean, green, connected St. Louis region

www.grgstl.org

December 4, 2015

The Honorable Sally Faith
Mayor
City of St. Charles
200 North Second Street
St. Charles, MO 63301

RE: TAP Application for Bicycle Facility on Route 370 Bridge

Dear Mayor Faith:

Great Rivers Greenway supports the City of St. Charles Transportation Alternatives Program (TAP) for bicycle improvements to the Route 370 Bridge project. This application represents an opportunity for improved connectivity over the Missouri River to improve bicyclist and pedestrian access to facilities in St. Charles and St. Louis Counties.

Great Rivers Greenway works with many partners to help connect neighborhoods and communities that provide a healthier lifestyle which serves as a catalyst for economic vitality, making the St. Louis region a better place to live. This project would connect to Great Rivers Greenway's recently completed Earth City Levee Trail in St. Louis County which provides access to the numerous business in the Earth City area. The Route 370 Bridge project would improve the overall connectivity in both counties and ultimately improve the connectivity to the KATY Trail and the Boschert Greenway in the City of St. Charles.

The improvements to the Route 370 Bridge represent an expanded non-motorized system to serve commuters and visitors. This is a transportation investment that combines multiple modes of transportation that creates an environment for economic growth.

Thank you for your efforts to champion the Route 370 Bridge project and for all your efforts to make the St. Louis region a better place to live.

Sincerely,

Susan Trautman

Susan Trautman
Executive Director

GRG Great Rivers Greenway | 6174A Delmar Boulevard | St. Louis, MO 63112 | Phone 314.436.7009 | Fax 314.436.8004

THE TREASURER OF THE CITY OF ST. CHARLES, MISSOURI

CHECK NO. 287404

DATE	INVOICE	DESCRIPTION	AMOUNT
11/17/2015	111715	TAP Funding Application Fees	10,300.00

TOTAL $10,300.00

Please Detach Here and Retain Top Portion For Your Records.

THE TREASURER OF
THE CITY OF ST. CHARLES, MISSOURI
ACCOUNTS PAYABLE ACCOUNT

COMMERCE BANK
OF ST. LOUIS
ST. LOUIS, MISSOURI
80-459/810

287404

DATE
12/04/2015

NET AMOUNT
$10,300.00

Ten Thousand Three Hundred and 00/100 Dollars

PAY
TO THE
ORDER
OF

EAST WEST GATEWAY COUNCIL OF GOVERNMENTS
ONE MEMORIAL DR
STE 1600
SAINT LOUIS, MO 63102-1714

VOID AFTER 6 MONTHS

Sally A. Faith

⑈287404⑈ ⑆101000019⑆ 175008263⑈

Public Works Department
Project Charter

Project Name: MO 370 and IS 70 Shared Use Paths

Department: Public Works

Division: Engineering

Project Number: 16STR37

Account Number: 420-500-501-873-101

Prepared By

Document Owner(s)	Project/Organization Role
Mark Rees	Project Manager

Project Charter/PMP Version Control

Version	Date	Author	Change Description
Charter V1	3/28/2016	Seggerman	• Initial Charter Creation

Online Project Plan

Status	Date	Author	Details
Design	3/28/2016	Seggerman	• ProjectManager.com setup • ProjectManager Modification/Updates

TABLE OF CONTENTS

1 PROJECT CHARTER/PMP PURPOSE

The project charter defines the vision, goals, scope, objectives, constraints, and overall approach for the work to be completed as part of this project. It is a critical element for initiating, planning, executing, controlling, and assessing the project. In addition, it serves as an agreement between the Project Team stating what will be delivered according to the budget, time constraints, risks, resources, and standards agreed upon for the project.

2 PROJECT PURPOSE AND OVERVIEW

This project includes design and construction to provide protection for on-bridge bicycle and pedestrian shared use paths utilizing the outside shoulders of MO 370 Discovery Bridges and separates these paths from motor vehicle traffic by installing physical barriers. The project will provide 6 ft. wide shared use paths and 8 ft. wide outside shoulders for traffic. Barriers are added along both Eastbound and Westbound 370 to provide 6 ft. wide shared use paths accommodating bi-directional pedestrian travel and directional bicycle travel. This project is along the national Mississippi River Trail and provides connectivity to several trails in the region. Trail connection improvements will be completed at Boschert Greenway Trail connections, The St. Charles trail connection to the Katy Trail and Boschert Greenway is being completed by a MDNR Recreational Trails Program grant. This proposed TAP project is part of the feasibility study that was funded by cooperative effort between the Cities of St. Charles, Bridgeton, and Maryland Heights, and Great Rivers Greenway (GRG) to improve bike and pedestrian connectivity across the Missouri River. The project increases the safety and connectivity amongst the Boschert Greenway, Katy Trail, Earth City Levee Trail, and Mississippi River Trail. The existing outside shoulders of MO 370 are 9.5 ft. wide. Bicyclists and pedestrians use these shoulders to cross the Missouri River. The proposed improvements will add 16 in. wide physical barriers along MO Route 370 to protect pedestrians and bicyclist from motor vehicle traffic.

Also, the project includes a conceptual and preliminary design of providing bicyclists and pedestrian access across the Missouri River at eastbound IS 70 Blanchette Bridge. The new bridge crossing will connect the Katy Trail and Riverwoods Trail.

3 PROJECT TEAM

Project Team Role	Project Team Member(s)	Contact Information
Project Manager	Mark Rees	636-949-3502 mark.rees@stcharlescitymo.gov
Sr. Project Manager	Brad Temme	636-940-4617 brad.temme@stcharlescitymo.gov
Public Works Director	Jerry Hurlbert	636-949-3237 jerry.hurlbert@stcharlescitymo.gov
City Engineer	Kevin Corwin	636-949-3237 kevin.corwin@stcharlescitymo.gov
Sr. Project Manager - Construction	Steve Noonan	636-949-3240 stephen.noonan@stcharlescitymo.gov

ROW Specialist	Brian Faust	314-609-5221 brian.faust@stcharlescitymo.gov
MoDOT Representatives	Amanda Rich- north county Traffic	314-565-4254 amanda.rich@modot.mo.gov
GRG Representative	Patrick Owens	314-932-4902 powens@grgstl.org
Construction Inspector	TBD	
Design Consultant	TBD	

3.1 [PMP – Organizational Chart]

Attach Org. Chart Exhibit

3.2 [PMP – Communications Plan]

Attach and/or specify online

4 PROJECT SCOPE STATEMENT

4.1 Goals and Objectives

Goals	Objectives
Provide Bicyclists and Pedestrian access across MO 370 Discovery Bridges	• 6’ wide shared use path on the existing bridge structures in the eastbound and westbound directions protected by concrete barrier
Provide tie-ins from the Katy Trail and Riverwood Trail up to the bridge crossings	• ADA Compliant • Low cost, reliable, low maintenance • Safe design • Limited impacts to utilities
Maintain adequate shoulders on the MO 370 Bridges	• A minimal of a 3’ inside and 8’ outside shoulder for the driving lanes shall be kept
Create a design that incorporate minimal impact to drivers	• The design will need to review the impacts on driver’s behavior from the shared use path • Create a design that can be easily constructed with limited lane closures
Bridge Drainage	• Final design will need to use the existing bridge drainage • Do not hinder or create ponding in any location

Improve safety for Bicyclists and Pedestrians	• Provide a safe and efficient shared use path design across the Missouri River
I-70 Design	• Provide a safe and efficient shared use path preliminary design crossing on eastbound I-70 Blanchette Bridge • A design that does not impact I-70 traffic flow

4.2 Statements of Work (SOW)

SOW	Owner/Prime	Due Date/Sequence
Consultant Solicitation	Rees	4/21/16
Select Consultant	Rees	5/5/16
Design Notice To Proceed	Rees	8/9/16
Concept Plan	Consultant	9/13/16
Obtain Environmental Clearances	Consultant	12/28/16
Preliminary Plan	Consultant	1/24/17
Right of Way Plan	Consultant	4/1/17
Utility Coordination	Consultant	5/1/17
Final PS&E	Consultant	7/15/17
Bid	Rees	8/12/17
Construction	MoDOT	6/1/18
Final Close Out	MoDOT	7/15/18

4.3 Milestones and Deliverables

Milestone	Deliverable
1. Consultant Contract	• Executed Contract • Updated Project Charter • Design Standards
2. Conceptual Plan	• Conceptual Plans and Alternatives Analysis
3. Preliminary PS&E Submittal	• MO 370 Preliminary Plans • I-70 Preliminary Plans
4. Preliminary Approval	• MoDOT Preliminary Plan Approval
5. Utility Relocation Plan	• Utility Relocation Plan Approval
6. Right of Way Plan Submittal	• Right of Way Plans • Sealed Right of Way and Easement Documents • A Date Request
7. Final PS&E Submittal	• Final PS&E
8. Bid	• Sealed Bids from Contractors

9. Begin Construction	• Executed Construction Contracts
10. Final Acceptance	• Lien Waivers, Final Invoice
11. Final Project Approval	• Final Reimbursement Check

4.4 Out of Scope

The project will not reconstruct or recondition any of the Katy Trial or Riverwoods Trail.

4.5 Project Funding

Source	FY 2016	FY 2017	Confidence Level
City	$110,000	$515,000	High
TAP	$110,000	$1,390,000	High
State MDFB	$515,000	$0	High

4.6 [PMP – Work Breakdown Structure]

Specified online.
Attach Executed Contracts

4.7 [PMP – Time Management Plan]

Managed online. Schedule shall be updated as frequently as weekly (e.g. daily, weekly, etc.)

4.8 [PMP – Cost Management Plan]

Cost estimates shall be stored online and provided at completion of the following tasks: Concept Plan, Preliminary Plan, Utility Relocation Plan, Right of Way Plan, and Final PS&E.

4.9 [PMP – Change Management Plan]

Managed online.

5 PROJECT CONDITIONS

If an online project plan has already been created, issues and risks can be entered online with a printed summary attached to the project charter.

5.1 Issues List

#	Description	Impact*	Priority*	Owner	Proposed Resolution
1	Coordination with MoDOT	Medium	Medium	Rees	Meet with MoDOT early on to incorporate their concerns and comments
2	Bridge Drainage	High	Medium	Consultant	Maintain adequate drainage – Methods TBD
3	Traffic Impacts	High	Medium	Consultant	Minimize impacts to drivers during construction
4	Emergency Personnel Access	High	Medium	Rees	Reasonable access to the bridge crossing and tie-ins for emergency personnel will need to be reviewed and designed
5	Separate Funding between I-70 and MO 370	Medium	Medium	Rees	Setup PO and Billing to keep preliminary I-70 design separated from MO 370 design

5.2 Risk Register

#	Description	Impact*	Likelihood*	Owner	Proposed Mitigation
1	MoDOT CE and Maintenance	High	Medium	Rees	Meet with MoDOT District personnel to review project scope and who will be inspecting and maintaining
2	Utility relocation costs	High	Medium	Rees	Utility relocation costs have been estimated by the utilities but may change as plans progress.
3	MDFB Funding Deadline	High	Medium	Rees	Money needs to be spent by September 30, 2016 but maybe extended 6 months

***Risk and Issue Criteria:**

Description	Impact	Priority	Likelihood
High	occurrence will have a substantial impact on the progress or result of the project	requires immediate follow-up and resolution	very likely to occur
Medium	occurrence will have an impact on the progress or result of the project, but within reasonable	requires follow-up before completion of next project milestone	may occur

Description	Impact	Priority	Likelihood
	tolerances		
Low	occurrence will have only minor impacts on the progress or result of the project	requires resolution prior to project completion	probably will not occur

5.3 Stakeholder Input Summary

Name	Organization	Role	Interests
Missouri Department of Transportation (MoDOT)	State	Represents the public needs and state standards	• Improved pavement bicycle/pedestrian facilities • Easy facility to maintain
Cities	St. Charles & Bridgeton	Represents residents of the surrounding area and tourism	• ADA complaint facility • Attractive • Improved wayfinding • Increased attraction
Great Rivers Greenway (GRG)	Regional Parks & Trails District	Overseeing the trail connections of St. Louis City, St. Louis County, and St. Charles County	• Connecting trails through out St. Louis • Creating greenways • Creating a connected trail wayfinding overlay
City Council Members	City	Represent the citizens of the City	• An on time and on budget project. • Good communication with the public and businesses.
Utility Companies	Utilities	Relocate their utilities	• Protecting their financial interests and preserving their rights.

5.4 [PMP – Issue and Risk Management Plan]

Managed online

6 PROJECT STANDARDS

6.1 Standards

- City of St. Charles (Design codes and plan checklist)
- Americans with Disabilities Act Accessibility Guidelines
- Manual of Uniform Traffic Control Devices (MUTCD)
- Missouri Department of Transportation (MoDOT)
    i. MoDOT Specification Book for Highway Construction
    ii. MoDOT Standard Plans for Highway Construction
    iii. MoDOT Design Criteria Manual
    iv. MoDOT LPA Manual

6.2 Permits/Outside Approvals

- MoDOT Permits
- MoDOT LPA Approval

6.3 Notes

- Project requires MoDOT LPA approval of plans, right of way, and PS&E.
- The TAP application will be made available to the consultants (placed on website).
- Feasibility Study is available upon request.

7 APPROVALS

Prepared by _____
Project Manager

Approved by _____
Consultant

_____
Design Sr. Project Manager

_____
City Engineer

_____
Public Works Director

_____
[Other/Stakeholder]

8 APPENDICES

8.1 Project Maps

8.1.1 MO 370 Site Photos

8.2 Project Organization Chart

8.3 Project Communications Plan

8.1 – Project Maps

MISSOURI ROUTE 370 DISCOVERY BRIDGE:
ON-BRIDGE SHARED USE PATHS

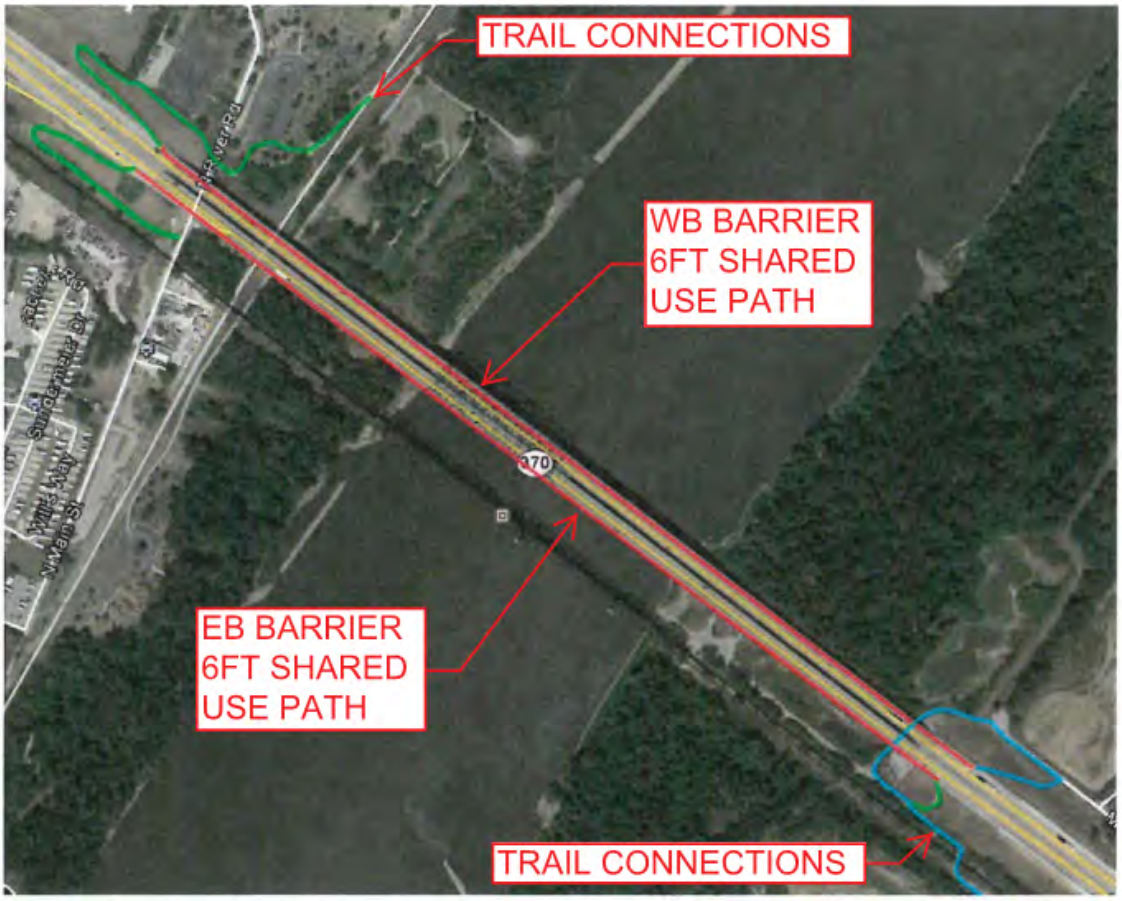

Figure 16: EB I-70 Bike/Pedestrian Cantilevered Attachment Pathway Layout

8.1.1 – MO 370 Site Photos

MO Route 370 Discovery Bridge Eastbound Shoulder looking East

MO Route 370 Eastbound Approach - Existing Conditions

MO Route 370 Eastbound Bridge Midspan - Existing Conditions

Western Trail Connection at MO Route 370 Westbound in City of St. Charles looking West

Eastern Trail Connection at MO Route 370 Eastbound in City of Bridgeton looking West

MO Route 370 Eastbound at MO River Greenway Trail Entrance looking West

MO Route 370 Eastbound at MO River Greenway Trail Entrance looking East

8.2 – Organizational Chart

8.3 – Communication Plan

Public Works Department
Project Communication Plan

MO 370 Shared Use Paths Project
16STR37
Last Updated: 3/29/2016

Planning Stakeholder Input

In preparing the project event and document communication tables below as well as performing the planning of individual communication events, the project team should always account for the following ten considerations:

1. Event – Identify the events or occasions that will be planned/held to receive stakeholder input
2. People – Identify the individuals who will be considered stakeholders and invited to offer feedback
3. Need – Identify the level of need for stakeholder input – is it just internal City Commissions, Boards, Committees, Council, etc. or should it include other public groups? Are there other individual stakeholders such as regulatory officials or critically impacted property owners and/or businesses?
4. Information – Identify the information that will need to be communicated for stakeholders
5. Format – Identify how information will be communicated (e.g., presentations, mailings, meeting, etc.), the arrangement of meeting spaces (audience, round-table, etc.), and event accessories (food, soda, audio/visual, etc.)
6. Dates/Frequency – Identify the dates and/or frequency with which communication will take place
7. Notice – Identify how notice will be given to stakeholders (i.e., how the word will be spread)
8. Feedback – Identify how stakeholder feedback will be received and collected
9. Summary – Identify who will be responsible for summarizing stakeholder input and how they are to summarize it
10. Sharing – Identify who will receive stakeholder input summaries and how they will receive it

Each stakeholder event should be planned individually with event planning sheet at the end of the Communication Plan. Completed planning sheets should be attached to the Communication Plan for reference.

Project Events Communication

Project Events Communication Table

Event	Members	Event Format and Critical Information	Schedule / Frequency
Initiation/Planning Stakeholder Input*	Consultant, Brad Temme, Mark Rees, Kevin Corwin, Jerry Hurlbert (TEAM)	Scoping Meeting to discuss the objectives and deliverables for the project	Once / During Contract negotiation
Kick-Off Meeting	Consultant, TEAM	Meeting following PMM Standard 9.9 Agenda	Once / After Council approves negotiated contract
Initial Site Assessment/ Field Check	Consultant, TEAM	On-site	Once / After Kick-Off Meeting
Risk and Issue Alerts (add necessary "clients" to PM.com)	Consultant, TEAM	Online PM.com tracking during project development	Ongoing / As needed
Project Design Progress Updates	Consultant, TEAM	Online PM.com tracking	Monthly; Street Committee RCAs
Progress Meetings	Consultant, TEAM	Meeting at City Hall to discuss design and major issues	As needed for the major milestones tracked on PM.com
Stakeholder Meetings	Consultant, TEAM, MoDOT, City of Bridgeton, GRG	Meeting Location TBD Discuss design	Meeting shortly after Kick-Off then As Needed
Public Meeting(s)*	Consultant, TEAM, Public, Council	Open House meeting with Public	After Preliminary Plans submitted and after ROW Plans submitted
Specialized Stakeholder Meeting(s)*	Consultant, TEAM, Community Advisory Group (CAG) – TBD, MoDOT, City of Bridgeton, GRG, Emergency Response Personnel	Small Meeting with CAG. City Hall conference room. Present initial data and request feedback on the design. Present proposed public meeting information and request feedback.	2 meetings during project, one after initial data is collected and once prior to the public meeting.
Construction Start/Traffic Notice	Contractor, TEAM, MoDOT, City of Bridgeton	On site or at City Hall; CMS/DMS, Media Blast	Before construction begins
Construction Progress Updates	Contractor, TEAM, MoDOT, City of Bridgeton	Meeting Location TBD	Monthly
Official Ceremonies – Ribbon Cutting	Consultant, TEAM, Public, Council, City of Bridgeton, GRG, MoDOT	On-site	At the end of the project

* Separate sheets must be attached describing the details and responsible parties for planning this event.

Project Documents Communication

Project Documents Communication Table

Document	Recipients	Responsible Party	Distribution Method
Project Charter	Consultant, TEAM	Mark Rees	Delivered at Initiation and Kick-Off Meeting
Requests for Qualifications	Consultants, TEAM	Mark Rees	Deliver through email service
Engineering Services Contract	Consultant, Clerks Office, Brad Temme, Mark Rees, Street Committee, City Council	Mark Rees	Hard copies routed after signatures
Project schedule and updates	Consultant, TEAM, CAG, MoDOT, City of Bridgeton, GRG, PM.com authorized users	Consultant, Mark Rees	Online PM.com updates
Project Progress/Status Reports	Consultant, TEAM	Consultant, Mark Rees	Email
Progress Meeting Minutes	Consultant, TEAM	Consultant	Email / Online PM.com upload
Public Meeting Minutes	Consultant, CAG, City of Bridgeton, MoDOT, GRG, Street Committee, TEAM	Consultant, Mark Rees	Email / Online PM.com upload
Stakeholder Input Summaries	TEAM, MoDOT, GRG, City of Bridgeton	Consultant	Email
Data Sharing (incl. related studies)	Consultant, Mark Rees	Mark Rees, Consultant	Hard copy / PM.com upload
IS 70 Alternatives Analysis / Concept Study	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Consultant	Hard copy / PM.com upload
Survey(s)	Mark Rees, MoDOT, City of Bridgetone	Consultant	Hard copy / PM.com upload
Preliminary Plans	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Consultant	Hard copy / PM.com upload
ROW Plans	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Consultant	Hard copy / PM.com upload
Final PS&E	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Consultant	Hard copy / PM.com upload
Traffic Impact Notices	TEAM, MoDOT, GRG, City of Bridgeton, Public	Contractor	DMS/CMS, Media Blast
Notice to Proceed	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Construction Inspector	Hard Copy and Email
Construction Progress/Status Reports	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Construction Inspector/Contractor	Email
Substantial Completion Letter	TEAM, CAG, Street Committee, MoDOT, GRG, City of Bridgeton	Contractor/Construction Inspector	Hard Copy and Email

Change Management Process

Change management process steps

Planning: Changes will be posted and managed online at PM.com. Changes will be approved and closed out as they are incorporated into the design of the project by the City project manager. Changes that require exceptions to standard design practices will be documented through the use of the design exception form.

Design: Changes will be posted and managed online at PM.com. Changes will be approved and closed out as they are incorporated into the design of the project by the City project manager. Changes that require exceptions to standard design practices will be documented through the use of the design exception form. Changes resulting in supplemental agreements will be approved at staff level or taken to Council for approval in accordance with the approved procurement process.

Utility Coordination: Changes will be posted and managed online at PM.com. Changes will be entered by the project manager or the Consultant as information becomes available from the affected utilities. As adjustments or agreements are completed to resolve conflicts corresponding changes will be closed out.

Construction: MoDOT will manage construction engineering services.

Change control levels

The City Public Works Staff will manage the change requests and status for the project in accordance with the City standards for change approval. For changes that are within staff's approval, staff will document the resolution of the change in PM.com. For changes that require Council action, staff will prepare an RCA for Council consideration. Meeting minutes from the Council Meeting along with staff documentation in PM.com will provide a record of the change resolution. Changes to the scope, cost, and schedule will all be logged and tracked online utilizing the PM.com change tracking tool.

Communication Planning Sheet for Initiation Planning / Stakeholder Meeting

Item	Description	Responsible Party
Event	Initiation Planning / Stakeholder Meeting	Mark Rees
People (Stakeholders)	Consultant, TEAM, GRG, City of Bridgeton, MoDOT	Mark Rees
Level of Need	Scoping Meeting to discuss expectations and Consultant questions	Mark Rees
Information	Existing City information, and Consultant information	Mark Rees
Format	Open meeting directed by City project manager	Mark Rees
Dates/Frequency	During contract negotiation / Once	Mark Rees
Notice	Outlook Meeting request	Mark Rees
Feedback	Agreement with Charter	Mark Rees
Summary	Meeting minutes	Mark Rees
Sharing	Background information	Mark Rees

Communication Planning Sheet for Stakeholder Meetings

Item	Description	Responsible Party
Event	Meeting between all the stakeholders to discuss and comment on conceptual plan and ROW plans	Mark Rees, Public Works Coordinator
People (Stakeholders)	TEAM, Consultant, MoDOT, GRG, City of Bridgeton	Mark Rees, Public Works Coordinator
Level of Need	Coordinate with stakeholders on what the final design will be	Mark Rees, Public Works Coordinator, Consultant
Information	Draft concept plans and ROW plans + estimate of cost	Consultant
Format	Private Meeting , City Hall	Mark Rees, Public Works Coordinator, Consultant
Dates/Frequency	After completion of conceptual and ROW plans	Mark Rees, Public Works Coordinator
Notice	Outlook Meeting request, phone call, email	Mark Rees
Feedback	Stakeholder's opinion on the improvements/design	Consultant
Summary	Meeting minutes, Stakeholder input summary	Consultant
Sharing	Email minutes and input summary to TEAM, City of Bridgeton, GRG, and MoDOT. Prepare RCA to update Street Committee.	Mark Rees, Public Works Coordinator, Consultant.

Communication Planning Sheet for Public Meetings – Two Meetings

Item	Description	Responsible Party
Event	Open House Public Meeting	Mark Rees, Public Works Coordinator
People (Stakeholders)	Consultant, TEAM, City Council, Public, City of Bridgeton, GRG, MoDOT	Mark Rees, Public Works Coordinator
Level of Need	Inform the public of the proposed plan / Required	Mark Rees, Public Works Coordinator, Consultant
Information	Displays of proposed improvements	Consultant
Format	Public Meeting , Open house format	Mark Rees, Public Works Coordinator, Consultant
Dates/Frequency	After completion of the Conceptual Plans/stakeholder meeting. After completion of ROW Plans/stakeholder meeting	Mark Rees, Public Works Coordinator
Notice	Outlook Meeting request / Public Announcements – City website, Changeable Message Boards , Direct mailing, Discover segment, social media – ask if MoDOT would be interested in publishing	Mark Rees, Public Works Coordinator
Feedback	Gather public opinion and concerns	Consultant
Summary	Meeting minutes, Stakeholder input summary	Consultant

Sharing	Email minutes and input summary to TEAM, Consultant, City of Bridgeton, GRG, and MoDOT. Prepare memo to update CAG and RCA to update Street Committee.	Mark Rees, Public Works Coordinator

Communication Planning Sheet for Specialized Stakeholder Meetings

Item	Description	Responsible Party
Event	Community Action Group (CAG) Meetings	Mark Rees, Public Works Coordinator
People (Stakeholders)	Consultant, TEAM, City of Bridgeton, GRG, and CAG	Mark Rees, Public Works Coordinator
Level of Need	Coordinate with the CAG on the progress and direction of the project	Mark Rees, Public Works Coordinator, Consultant
Information	Initial Purpose, Need, and Context/Data of the project Conceptual and ROW Plans	Mark Rees, Public Works Coordinator, Consultant
Format	Private Meetings at City Hall conference room	Mark Rees, Public Works Coordinator, Consultant
Dates/Frequency	After initial data collection, and after completion of the Conceptual and ROW Plans/ Twice	Mark Rees, Public Works Coordinator
Notice	Outlook Meeting request, phone calls	Mark Rees, Public Works Coordinator
Feedback	Gather the groups opinions and comments	Consultant
Summary	Meeting minutes, Stakeholder input summary	Consultant
Sharing	Email minutes and input summary to TEAM, Consultant, GRG, City of Bridgeton, and MoDOT. Prepare RCA to update Street Committee.	Mark Rees, Public Works Coordinator,

Communication Planning Sheet for Ground Breaking

Item	Description	Responsible Party
Event	Ground Breaking	PW Coordinator, MoDOT
People (Stakeholders)	Public, TEAM, Public Officials, Contractor, MoDOT, City of Bridgeton, GRG	PW Coordinator MoDOT
Level of Need	As desired	PW Coordinator MoDOT
Information	Public Ground Breaking	PW Coordinator, MoDOT
Format	Public gathering with elected officials; Public (Pedestrians and Bicyclists)	PW Coordinator, MoDOT

Dates/Frequency	TBD	PW Coordinator, MoDOT
Notice	Public Advertisement on City website, email correspondence with stakeholders, CMS/DMS, Media	PW Coordinator, MoDOT
Feedback	Public attendance and comments	PW Coordinator, MoDOT
Summary	Celebration of beginning of work / work completed	Public, Public Officials
Sharing	Public engagement	Public, Public Officials