





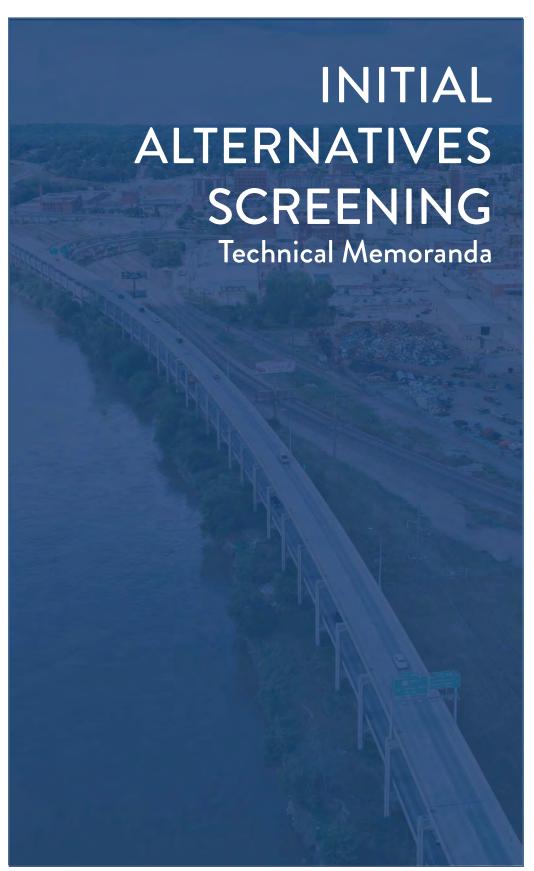




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#### Technical Memorandum 1

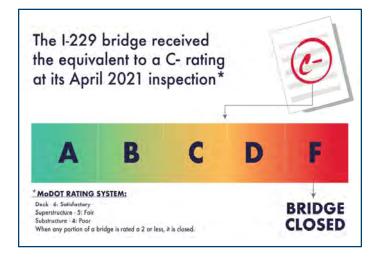
## Bridge Rehabilitation Study

To understand the existing condition of the I-229 double-decker bridge it was important to conduct a thorough analysis of the bridge that included reviewing previous inspection reports and conducting independent field inspections to determine the long-term maintenance needs of the structure. That analysis included developing a detailed cost estimate for both the immediate rehabilitation needs and the longer-term needs required to maintain the existing structure over a fifty-year period.

#### 1.0 Existing Conditions of the Bridges

Construction of the existing I-229 double-decker bridge was completed between 1976 and the early 1980s. Current conditions indicate several problems noted in the bridge inspection reports completed by MoDOT, which were verified and quantified by the Hg Consult team's field evaluation. Starting from the top of the bridge, the barrier curb has many spalls and delamination throughout. The concrete overlay has many spalls, patches, and delamination throughout, and the deck below shows signs of cracking, efflorescence, spalls, and delamination throughout the bottom side. The mainline expansion joints are presently holding up well from a previous rehabilitation, but the ramp expansion joints are failing and are a constant maintenance need for MoDOT's district bridge crew.

The superstructure paint condition is poor throughout and some of the concrete girder ends have minor deterioration. Some miscellaneous problems at bearings and girder ends exist as well, with the worst corrosion at the fracture critical steel cap beam at Bent 79. The substructure has deficiencies noted throughout; mainly spalling and delamination at the bottom of the cap beams underneath expansion joints and spalling and delamination of the columns. There are many miscellaneous areas of repairs needed including



lighting, bridge approach slabs, guard rail, slope protection and drainage.

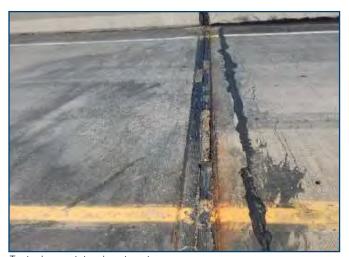
Figure 1 provides a sampling of the photo log developed during the field inspection showing just some of the existing bridge conditions that need to be addressed. Copies of the previous inspection reports as well as the photo log of the field inspection can be provided if requested.

#### 2.0 No-Build Alternative

The No-Build alternative only includes routine maintenance and closing the bridge if anything other than routine maintenance is required. With this approach, pothole patching is assumed to be routine maintenance, but joint removal and pouring back open joints are not. The No-Build alternative is not a viable option as it goes against MoDOT's mission. MoDOT does whatever it takes to get bridges and roadways back in service as fast as possible due to unforeseen circumstances. In fact, under the No-Build alternative the bridge would have been closed because of the repairs needed at Bent 79. In addition, the recent non-routine joint repair completed on the ramps would have likely required closure of the ramps within a few



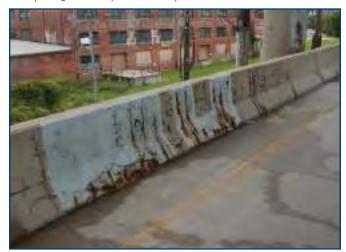
## Figure 1 Photo Log Samples from Bridge Field Inspections



Typical ramp joint deterioration



Typical cap under expansion joints with deterioration, delamination, and spalling with reinforcement exposed



Damaged or deteroriating barrier walls



Typical approach slab deterioration





Source: Garver Field Inspections



# Figure 1 (Continued) Photo Log Samples from Bridge Field Inspections



Pack rust and section loss



Typical column delamination and spalling with exposed reinforcement.



Missing or damaged impact attenuators







Source: Garver Field Inspections



months to years. Routine maintenance alone cannot keep a structure of this size open for long when a major rehabilitation project is a pressing need.

#### 3.0 Rehabilitation of the Existing Structure

The purpose of the Rehabilitation alternative is to develop a long-term maintenance plan for the existing I-229 bridges. Rehabilitation is needed for the bridges to remain in service for another 50 years and will need to cover the following components:

- Barrier curb needs full replacement or extensive repair including replacing sections.
- Concrete overlay is in poor condition and needs replacement. The deck will need repairs at the same time.
- Ramp and mainline expansion joints need replacement with the rehabilitation, currently anticipated to occur in 2025. The typical life span for a joint replacement is 25 years.
- Miscellaneous girder end and bearing repairs will need to be made.
- Sandblasting and repainting of the steel girders, bearings, cap beams, and columns.
- Bent cap repairs at Bent 79 will need to be completed before the rehabilitation anticipated in 2025.
- Substructure will need fiber wrap repairs consistent with the previous repair project. Also need formed and unformed repair on the columns and caps.
- Lighting, bridge approach slabs, and drainage need to be repaired or replaced.
- Slope protection needs rubblized and rock added in locations.
- Guardrail needs to be brought up to standard.

The rehabilitation of the existing structure will need to occur in two distinct phases with on-going maintenance occurring periodically between the initial rehabilitation and a second rehabilitation in 2050.

#### 3.1 2025 Repairs Needed

In general, the rehabilitation anticipated for 2025 will include removal of the concrete wearing surface

and a hydrodemolition of the deck followed by a new concrete wearing surface. Additionally, all expansion joints and barrier will be replaced. The steel superstructure will be sandblasted and recoated throughout, and various substructure units will have fiber wrap, formed and unformed repairs completed.

The detailed cost estimates of the anticipated 2025 repairs are shown in **Table 1**. The cost of the 2025 repairs is estimated to be between \$46 million and \$51 million. More detailed cost breakdowns used to develop the cost information in **Table 1** can be provided upon request.

#### 3.2 2050 Repairs Needed

The 2025 repairs should last 25 +/- years, so another rehabilitation will be required to provide a 50-year life span. The 2050 estimates provide for a second major rehabilitation, which typically lasts 25 years. At the end of 2075, another extensive rehabilitation project would include deck replacement, superstructure replacement, or bridge replacement.

In general, the rehabilitation anticipated and estimated for 2050 will include removal of the concrete wearing surface, a hydrodemolition of the deck, a new concrete wearing surface, and all joints being replaced. The steel superstructure units will be sandblasted and recoated only at the expansion joints and various substructure locations will have fiber wrap, formed and unformed repairs completed. The detailed cost estimates of the anticipated 2050 repairs are also shown in Table 1. The cost of the 2050 repairs is estimated to be between \$32 million and \$36 million.<sup>1</sup>

The cost estimate to complete both major rehabilitations, not counting additional annual maintenance or the 2075 rehabilitation, would be between \$78 million and \$87 million.<sup>1</sup>

<sup>1.</sup> The initial cost estimates are preliminary and based on 2019 prices (\$2019). More refined cost estimates will be developed during the design process.



Table 1
Summary of Estimated Costs for 2025
& 2050 Bridge Rehabilitations

	Year 2025 Estimate (\$2019)		Year 2050 Estimate (\$2019)	
Bridge#/Activity	Low	High	Low	High
A2225 NBL	17,683,100	18,969,700	11,935,600	13,457,200
A2225 SBL	18,159,800	19,567,400	12,421,100	13,888,700
A2226	1,057,500	1,184,500	678,500	805,500
A2227	923,600	1,034,600	610,600	721,600
A2228	1,590,700	1,761,700	1,017,000	1,205,300
A2229	1,708,800	1,902,000	1,089,500	1,280,700
A2230	1,804,600	2,010,400	1,157,600	1,382,400
A2231	1,581,700	1,783,900	998,800	1,201,000
Mobilization	1,350,000	2,400,000	1,500,000	1,700,000
Guard Rail	35,500	35,500	35,500	35,500
Traffic Control	150,000	200,000	150,000	200,000
Lighting	100,000	150,000	100,000	150,000
Bridge Approach Slabs	50,000	196,000	50,000	196,000
Misc. Repairs	105,000	105,000	105,000	105,000
Totals	46,300,300	51,300,700	31,849,200	36,328,900

Source: Cost Estimates developed by Garver. The initial cost estimates are preliminary and based on 2019 prices (\$2019). More refined cost estimates will be developed during the design process.



#### 4.0 Conclusion

In conclusion, based on the inspection reports and field verification of the existing I-229 structure the following conclusions include:

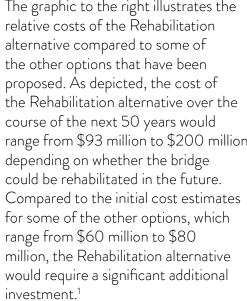
- No-Build Alternative. The No-Build alternative is not a viable solution. The rehabilitation of the bridge is necessary to keep the level of service and meet the expectations of the local drivers. MoDOT has demonstrated they do not want to close bridges for emergency repairs and leave commuters with unexpected delays. In the past, MoDOT has worked diligently to get bridges that have been closed due to unforeseen circumstances added to the Statewide Transportation Improvement Program (STIP) or accelerated into the STIP. MoDOT has yet to abandon a structure in place. While the No-Build alternative is not a viable option, it has been, based on requirements outlined by FHWA, carried forward as a basis to compare the other initial and Reasonable Alternatives.
- Rehabilitation of the Existing Structure Alternative. The Rehabilitation alternative has also been found to not be a viable solution. While a significant investment could be made to prolong the life of the existing structre, in the end the bridge is still approaching the end of its useful life. That being said, MoDOT would still be required to make additional annual investments to maintain the facility, and in approximately 25 years the facility would need to either have another major rehabilitation completed or would need to be replaced.

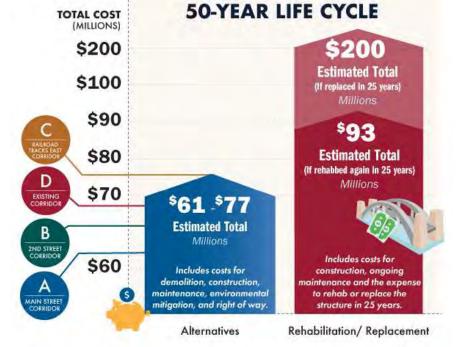
The graphic to the right illustrates the relative costs of the Rehabilitation alternative compared to some of the other options that have been proposed. As depicted, the cost of the Rehabilitation alternative over the course of the next 50 years would range from \$93 million to \$200 million depending on whether the bridge could be rehabilitated in the future. Compared to the initial cost estimates for some of the other options, which range from \$60 million to \$80 million, the Rehabilitation alternative would require a significant additional investment.1

The No-Build alternative has been determined to not be a viable alternative but will be carried forward, based on FHWA quidance, as a baseline to compare the other initial and Reasonable Alternatives.

The Rehabilitation of the **Existing Structure alternative** has also been determined to not be a viable alternative and has been recommended for elimination.\*

\*More details about the recommendation for both alternatives can be found in Technical Memorandum 2 - Initial Alternatives Screening.





<sup>&</sup>lt;sup>1</sup>The initial cost estimates are preliminary and based on 2019 prices (\$2019). More refined cost estimates will be developed during the design process.



#### Technical Memorandum 2

### Initial Alternatives Screening

#### 1.0 Overview

Interstate 229 (I-229) begins at I-29 near Amazonia, Missouri, then travels south through St. Joseph, Missouri where it intersects with U.S. Route 59 and U.S. Route 36 and then turns east to intersect with I-29 again on the south end of St. Joseph (Figure 1). A portion of I-229, commonly referred to as the I-229 "double-decker" bridge (I-229 bridge), carries northbound traffic on its top deck and southbound traffic on the bottom deck along the Missouri River and the west side of the St. Joseph Central Business District (CBD). MoDOT has identified the need to complete a major rehabilitation of this section of I-229 and, through this study, is evaluating whether that option is the preferred approach to this need or whether there is a better long-term strategy.

This technical memorandum identifies twenty-one (21) Initial Alternatives that have been developed as possible strategies to achieving the overall project need. Each of those, including the No-Build strategy, is described, the potential advantages and disadvantages are listed, the overall ranking relative to the screening criteria has been identified, and the public reaction to those alternatives discussed. Based on that information, the conclusion of this memo is to recommend for the elimination of seventeen (17) Initial Alternatives and to carry forward four (4) Reasonable Alternatives for further refinement and screening.

#### 2.0 Alternative Screening Methodology

The heart of the I-229 NEPA Study is the development and evaluation of alternatives to meet the overall project need and to achieve as many of the project's goals as practicable. For this project, three overarching needs have been identified (See Chapter 1 of the Environmental Assessment for additional details):

- To Provide a Long-Term Solution for the Condition of the I-229 Bridge
- To Maximize Travel Mobility and Accessibility
- To Provide Consistency with Local Land Use

This first level of screening utilized a list of quantitative and qualitative items developed to provide the best relative assessment of the Initial Alternatives possible based on available data. Each of the Initial Alternatives were assigned a ranking from one to five for each of the criteria based upon the perceived impact relative to the other Initial Alternatives. Rankings for each category of criteria were then averaged so as not to unnecessarily provide more weighting to any one criterion. Figure 21, at the end of this tech memorandum, provides the results of this initial screening. Each of the categories along with an explanation of the evaluation criteria are provided in the following sections.

### 2.1 Need: Provide a Long-Term Solution for the Condition of the I-229 Bridge

For each alternative, the ability to achieve the initial project need of improving the physical condition of the I-229 bridge was ranked based on the relative improvement and the length of time added to the lifespan of the bridge. Alternatives that removed the bridge entirely ranked the best (5), followed by those alternatives that utilized shorter, rehabilitated portions of the bridge (4), those that repurposed the entire length of bridge (3), the full rehabilitation (2), and then the No-Build (1).

#### 2.2 Goal: Maximize Travel Mobility & Accessibility

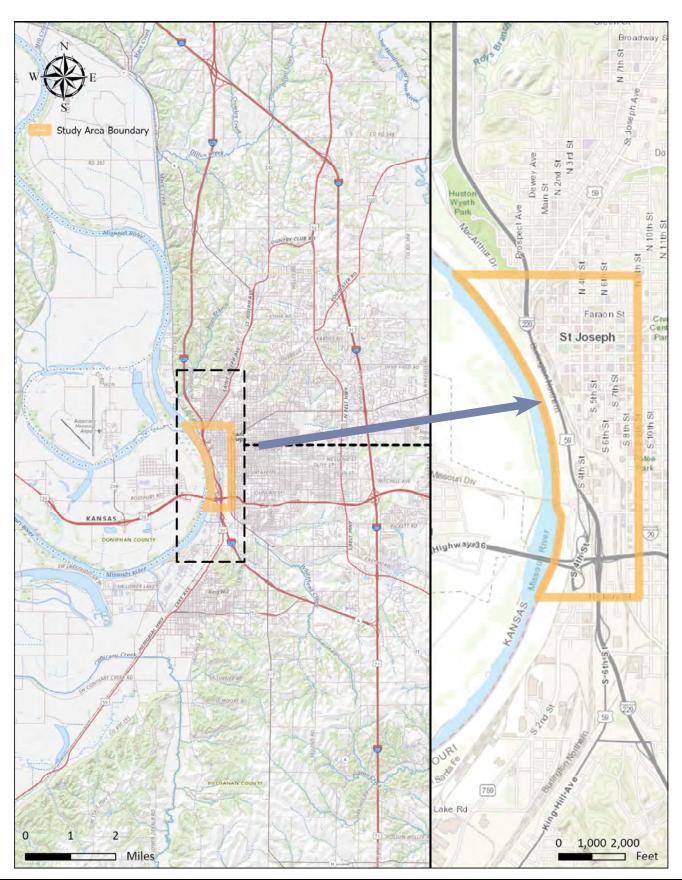
The criteria considered in the screening process related to maximizing travel mobility and accessibility included the following:

• Travel Time - Defines the amount of time that it takes to get from point A to point B. In this case,



Figure 1

Regional Map of the I-229 Corridor





how non-commercial traffic will respond to each of the Initial Alternatives and whether that will lead to increased or decreased travel time through the corridor. Alternatives which had little or no effect on travel time ranked the highest (5). The alternatives which scored a (5) were those which maintained an interstate system, followed by those which utilized an arterial system through the corridor. The alternatives which used portions of local streets, parkways, and boulevards scored lower (3, 2). The lowest scores (1) were assigned to alternatives that relied primarily on local streets and the Kansas alternatives due to the low probability of local, non-commercial, traffic utilizing this alternative and therefore travelling on the local downtown network.

- Incidents Identifies the relative change in the probability of vehicular incidents. Differences in scoring were primarily based on the facility type (city arterial, interstate, parkway, etc.) that the existing I-229 traffic would use. Alternatives which maintained an interstate system and therefore utilized interchanges (no intersections) scored the highest (5). The remaining alternatives scored lower (2-4) based on the number of intersections and, therefore, a higher probability of incidents. The lowest scores were assigned to those which had a higher level of speed with multiple conflict points.
- Freight Access & Travel Time How does the alternative impact freight access and travel time within the project corridor? The primary concern being the impact to freight destined to the Stockyards Industrial District from north of the Study Area and freight from the Stockyards Industrial District destined for locations north of the Study Area. Alternatives which had little or no effect on commercial travel time ranked the highest (5). The alternatives which scored a (5) were those which maintained an interstate system, followed by those which utilized an arterial system through the corridor (4). The alternatives which used local streets, parkways, and boulevards scored lower (3, 2). The lowest score (1) was assigned to those which highly discouraged freight traffic. The scores for Freight Access and Travel Time were based on the likelihood of commercial traffic continuing to use the corridor

- (and travel time within the corridor) as opposed to diverting to I-29 and US Route 36.
- Railroad Impacts The BNSF Railroad is a major stakeholder and they ship large quantities of freight along the rail corridor located just to the east of existing I-229. The UP Railroad also uses this facility as well as additional facilities on the south side of the Study Area. Impacts to the railroad considered were based on how well an alternative addressed existing substandard railroad clearances and the reduction or addition of vehicular traffic to at-grade railroad crossings. The highest score (5) was provided to those which removed the existing substandard vertical clearance issues and the existing at-grade conflict on 4th Street (provides a bridge at 4th Street). Alternatives which scored a (4) were those which removed the substandard vertical clearance issues but did not alter the 4th Street conflict. Alternatives which did not resolve the existing substandard vertical clearance issues or required additional bridge structure in railroad right-of way scored a (2/3). The lowest scores were those alternatives which exasperated the existing at-grade conflict on 4th Street (higher levels of traffic on 4th Street).
- Port Access The St. Joseph Port is another freight destination within the Study Area with excellent access to US Route 36 and I-229 south of US Route 36. Accessing the Port from I-229 north of US Route 36 is more difficult. This criterion considered whether the alternative eased or hindered access to the port. The highest score (5) was provided to those which moderately improved freight access to the St. Joseph Port. Alternatives which scored a (4) were those which slightly improved access to the Port. The alternatives which did not improve nor hinder access were provided a (3). The alternatives that created additional accessibility issues received a (2).

#### 2.3 Goal: Provide Consistency with Local Land Use

This goal was split into two evaluation categories including the potential each alternative would have on accommodating Riverfront development as well as downtown revitalization.



- Riverfront Access (Vehicular & Pedestrian) Alternatives that improved vehicle and pedestrian access to the Riverfront were considered. Alternatives that could accommodate direct access points to the Riverfront and were pedestrian friendly with good access for pedestrians into the downtown were considered positively. The alternatives which maintained an Interstate along the entire Riverfront scored the lowest (1). Alternatives which had an Interstate/Arterial along sections of the Riverfront scored a (4, 3, 2). Alternatives which completely removed the majority of Interstate/Arterial along the Riverfront and improved vehicular access were provided the highest score (5).
- Acres of New Land (Riverfront) Considerations were given to alternatives that opened additional land along the Riverfront within the project area to uses such as parkland or new development. The alternatives which maintained an Interstate along the entire Riverfront, therefore not accommodating (inviting) for development or parkland, scored the lowest (1). The Parkway/Boulevard options were ranked (2) because they still maintain a roadway along the entire Riverfront although more inviting. The additional alternatives were ranked systematically based on acreage of land created along the Riverfront. The highest scores (5) were given to those alternatives which completely removed a roadway from the Riverfront and opened up the largest amount of additional land in the corridor.
- automobile traffic on St. Joseph Downtown streets or improved aesthetics through the removal of bulky transportation structures (e.g., the double-decker bridge) it was considered a positive. Alternatives were evaluated primarily on densification and beautification. The highest scores (5, 4) were provided to the alternatives which encouraged the most non-commercial vehicular traffic in downtown, therefore increasing the potential for business densification. Those alternatives which did not accomplish the objectives were given lower scores (3, 2). The alternatives that scored the lowest (1) were those that took a large number of buildings and did not promote densification.

- Downtown Access (Vehicular) The I-229 Double-Decker Bridge provides excellent access into the St. Joseph Downtown. To what degree alternatives lessened this access was considered. The alternatives which created the shortest amount of time for vehicles to access the downtown were provided the highest scores (5, 4). The alternatives that utilized an arterial roadway but limited access points were scored a (3, 2). Those alternatives which removed an Interstate/Arterial and therefore increased travel time into downtown from adjacent areas received the lowest score (1).
- Developable Land (Downtown) The existing ramp facilities from I-229 into the downtown and the interchanges from US Route 59 require land that could otherwise be developed. Alternatives that provided additional developable land in these locations were ranked favorably. The alternatives which open up the most acreage of developable land were scored the highest (5). These alternatives removed the downtown ramps and the US Route 59 Interchange. Systematically as less area was opened up for additional development the alternatives scored lower. The alternatives that removed existing buildings were ranked a (1) because they removed existing developable land from the downtown area.
- Truck Traffic Truck traffic through the downtown was considered a negative. To what degree an alternative increased truck traffic through the downtown was considered. The alternatives which highly encouraged commercial traffic to use an alternative route (I-29 and US Route 36) were provided a (5). Additionally, those which maintained an Interstate and did not funnel truck traffic into downtown were scored a (5). The options which provided an acceptable truck route through downtown with minimal conflict points were ranked lower (4, 3). Alternatives which increased truck traffic on downtown streets were ranked the lowest (1,2).

#### 2.4 Engineering

In addition to the three primary needs/goals discussed above, the study also evaluated several engineering and environmental considerations in making final screening recommendations. The engineering categories consid-



ered and identified in the screening process related to the design and the impacts on system usage included:

- Constructability Considers the ease and efficiency with which a project can be built, identifying potential obstacles in order to reduce errors, delays or cost overruns. Are there floodplain concerns? Are there concerns with using an existing structure? Are there concerns with horizontal constraints? Are there concerns with vertical constraints? Are there other buildability concerns? Alternatives that required several new bridges, new bridges in the floodplain, or repurposing of the existing structure ranked the lowest (1,2). Alternatives with fewer bridge structures received more favorable scores (3,4). The highest scores (5) were provided to those which had little impact on the floodplain and very minimal new bridge structures.
- Cost Reflects the magnitude of cost anticipated, in relative terms, amongst the Initial Alternatives considered. This was lumped into three main categories; relative roadway costs, relative bridge costs, and relative bridge removal costs. The alternatives with relatively low overall construction costs were ranked the highest (4,5) while those with a large number of bridges, a new Missouri River bridge, or a large portion of new roadway were ranked the lowest (1,2,3).
- Maintenance Considers the ease and cost of maintaining various design components of a project in the future. Maintaining bridges on a per lane mile basis are generally more expensive than maintaining roadways on a per lane mile basis. Alternatives which had the highest quantity of bridge structures to maintain were provided the lowest score (1,2,3). The highest scores (4,5) were parkway/boulevard and local options because they utilized small local roadways with minimal structures.

#### 2.5 Environmental and Socio-Economic Impacts

The categories considered and identified in the screening process related to the natural and built environments included:

- Threatened & Endangered Species (T&E) and Wetlands Alternatives identified with potential T&E and wetlands impacts included those that would impact forested areas (e.g., Indiana and Northern Long Eared Bat) and/or cross the river where there are not only impacts associated with the river (e.g., pallid sturgeon), but conservation areas and numerous wetlands. Alternatives that avoided all these areas ranked the best (5), followed by those that had increasing numbers of impacts on known areas or areas with potential habitat for T&E species or wetlands (4,3,2 and 1).
- Historic Properties Those alternatives identified with potential impacts included those on new alignment that would potentially impact the Robidoux Landing, other areas of the Riverfront that contains a large amount of historic fill, documented NRHP sites or sites that might include NRHP potentially eligible structures. Alternatives that avoided all these areas/sites ranked the best (5), followed by those that had increasing numbers of impacts on known areas/sites or the high potential for impacting such sites, such as those in the downtown area where the potential for a number of undocumented historical properties exists (4,3,2 and 1).
- Hazmat Sites The potential impacts to alternatives include those on new alignment that would potentially impact the historic fill laden east riverbank, areas with industrial land use and sites with suspected or documented contamination issues. Alternatives that avoided all these areas ranked the best (5), followed by those that had increased numbers of potential sites impacted (4,3, and 2) or those sites deemed to have a high risk of contamination (1).
- Displacements Those alternatives identified with potential displacement impacts included those on new alignment and ranked relative to each other according to the number of potential displacements. Alternatives that had no displacements ranked the best (5), followed by those that had increasing numbers of displacements (4,3,2 and 1).



#### 3.0 Initial Alternatives Screening

Based on the criteria outlined above and feedback received from the public, each alternative was evaluated and then screened. This section identifies each of the twenty-one (21) Initial Alternatives developed, provides a summary of their relative scoring, as well as a final recommendation on elimination. The higher the numerical ranking the better the alternative ranked. See Figure 21, at the end of this tech memo, for the detailed screening criteria and rankings. In addition, figures portraying each of the Initial Alternatives, except for the No-Build and Rehabilitation alternatives, are included within the discussion of each alternative.

#### 3.1 No-Build Alternative

Under the No-Build alternative, the existing double-decker bridge would be left in place. Only routine maintenance and repair of the existing bridge would occur. There would be no widening of the bridge, no improvement of roadway or bridge profiles, no major rehabilitation, and no replacement of the existing bridge. Due to its deteriorated condition, the I-229 double-decker bridge would fall into a significant state of disrepair causing the bridge to eventually be load posted and ultimately closed - potentially within the next few years.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 1. The Study Team will not recommend this alternative as a preferred alternative but is required under the NEPA process to carry this alternative forward to serve as a basis of comparison for the other alternatives.

#### 3.2 Rehabilitation of Existing Bridge

This alternative would leave in place the I-229 double-decker bridge and assumes within the next five to seven years that MoDOT would complete a major rehabilitation of the structure that would include the removal of the concrete wearing surface, a hydro-demolition of the deck, and a new concrete wearing surface. Additionally, all expansion joints and barriers would be replaced. The steel superstructure would be sandblasted and recoated throughout, and various substructure units would have fiber wrap, formed and unformed repairs completed. This alternative also assumes ongoing routine maintenance in addition to the major rehabilitation and would likely require an additional major rehabilitation in another 25 to 40 years.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 2. The Study Team recommends that this alternative be eliminated from further consideration.

#### 3.3 Repurpose Existing Bridge Alternatives

This set of alternatives was developed with the idea of retaining portions of the existing double-decker bridge and repurposing it to achieve desired results. Two repurposing alternatives were developed and evaluated

Table 1

No-Build Alternative Recommendation

Overall Ranking	Advantages	Disadvantages	
2.8	<ul> <li>Little to no environmental impacts</li> <li>Travel is safe and efficient in the near term</li> <li>Good access into the downtown in the near term</li> <li>Freight movements into and out of the stock-yards and the downtown are readily accommodated in the near term</li> </ul>	<ul> <li>Deteriorating conditions will soon lead to load postings and eventually closure in the next few years</li> <li>Not consistent with local land use plans</li> <li>High maintenance costs</li> <li>Substandard railroad clearances</li> <li>Does not meet the Purpose and Need</li> </ul>	
	Recommendation		
Keep (NEPA Required)			



including removing a portion of the bridge between the downtown ramps and removing the top deck and widening the bottom deck.

RPE-03: Bridge Removal between Downtown Ramps. This alternative (Figure 2) would remove at least a portion of the Interstate classification between US Route 36 and US Route 59. Between the downtown ramps, I-229 would be decommissioned, the double-decker bridge removed, and traffic routed through downtown via a reconnection at South 3rd Street. The double-decker bridge would remain south of the Charles Street and Edmond Street ramps and would require rehabilitation and maintenance. All the downtown ramps would remain in their current location. Francis Street, Felix Street, Edmond Street, Charles Street, and South 3rd Street would potentially require improvements for increased vehicular traffic including freight. Between the two ramps the Missouri River Riverfront would become open space without any vehicular traffic between the two ramps.

An additional option would remove the top deck and have two-way, two-lane traffic on the lower deck. This option eliminates the Francis Street and Edmond Street ramps and would open additional space for development. In this option the south connections to the Stockyards Expressway would be like the 4-Lane Single Deck Alternative in the next Section.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 3. The Study Team recommends that this alternative be eliminated from further consideration.

RPE-14: 4-Lane Single Deck. This alternative (Figure 3) would repurpose the existing double-decker bridge and maintain an Interstate system through the corridor between the Burlington Northern Railroad and the Missouri River. The top deck of the existing double-decker bridge would be removed, and an additional bridge system would be constructed adjacent and level with the lower deck. The new bridge system would likely require bank stabilization on the Missouri River and/or for the Burlington Northern Santa Fe (BNSF) Railroad tracks to be shifted east and right-of-way (ROW) acquired. Charles Street would become a single lane offramp into downtown for northbound Interstate traffic (previous on-ramp for southbound Interstate traffic). Francis Street would provide single lane on-ramps for both southbound and northbound Interstate traffic. The Francis Street ramp would be constructed with a fork to split northbound and southbound traffic. The southbound Francis Street on-ramp would require a flyover be constructed over I-229 to reconnect. Southbound Interstate traffic would not have direct downtown access. The Interstate would have on and off-ramps connecting Stockyards Expressway. A flyover would be

Table 2

Rehabilitation of Existing Bridge Recommendation

Overall Ranking	Advantages	Disadvantages
3.4	<ul> <li>Little to no environmental impacts</li> <li>Travel is safe and efficient</li> <li>Good access into the downtown</li> <li>Freight movements into and out of the stock-yards and the downtown are readily accommodated</li> <li>Maintains interstate highway designation</li> </ul>	<ul> <li>High overall costs</li> <li>High maintenance costs</li> <li>Not consistent with local land use plans</li> <li>Substandard railroad clearances</li> <li>Not meet Purpose &amp; Need to provide a long-term solution for the condition of the I-229 bridge.</li> </ul>
Recommendation		
Eliminate	The Rehabilitation alternative has been found to not be a viable solution. While a significant investment could be made to prolong the life of the existing structure, the bridge is still approaching the end of its useful life. For these reasons, it was recommended that this alternative not be carried forward.	

Note: This alternative was originally presented to the public as the No-Build alternative. However, based on further input from FHWA, the No-Build alternative was redefined as a No Action alternative, while rehabilitation of the existing bridge is now defined as an independent build alternative.



Figure 2

RPE-03: Bridge Removal between

Downtown Ramps



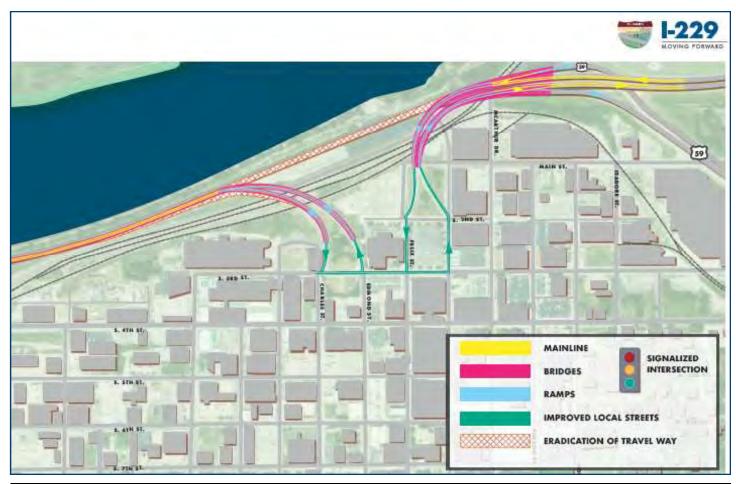
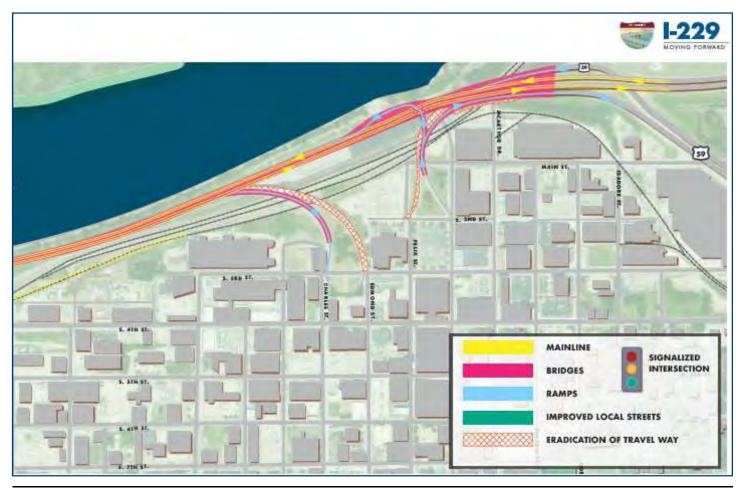




Figure 3

RPE-14: 4-Lane Single Deck





#### RPE-03: Bridge Removal between Downtown Ramps Recommendation



Overall Ranking	Advantages	Disadvantages
3.1	Downtown St. Joseph access to "Interstate" would generally be maintained through local connections to the Interstate     Property impacts would be minimal     Provides open space between the downtown ramps for Riverfront access and/or development	<ul> <li>Interstate traffic would be required to exit and reenter the Interstate via downtown local streets</li> <li>A large portion of the existing I-229 double-decker bridge will need rehabilitation and long-term maintenance</li> <li>Substandard bridge clearances over railroad remain</li> </ul>
	Recomme	ndation
Eliminate	This alternative keeps a large portion of the existing double-decker structure requiring extensive rehabilitation and diverts traffic for short distances onto the city street network. For these reasons, this alternative has been recommended for elimination from further consideration.	

Table 4

#### RPE-14: 4-Lane Single Deck Recommendation

Overall Ranking	Advantages	Disadvantages
2.9	Interstate system maintained through corridor accommodating freight traffic	<ul> <li>Likely requires Missouri River bank stabilization and/or BNSF relocated further east and acquisition of ROW</li> <li>High maintenance cost for upkeep of significant bridge structures</li> <li>Southbound Interstate traffic does not have direct downtown access</li> <li>Restricts open space along the river for development</li> <li>Substandard bridge clearances over railroad remain</li> <li>Potential historic and hazmat impact associated with new development in historic fill laden floodplain of the east riverbank, historic Robidoux Landing site, as well as bridge structure piers at the south end penetrating the capped Farmland Pesticide Superfund site at 4th and Seneca Streets</li> </ul>
Recommendation		
Eliminate	This alternative would result in impacts to both the Missouri River and the BNSF rail lines, still require the rehabilitation of the existing lower structure, without the benefits to the Downtown. For these reasons, this alternative has been recommended for elimination from further consideration.	

required over I-229 for the northbound on-ramp from the Stockyards Expressway.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 4. The Study Team recommends that this alternative be eliminated from further consideration.

#### 3.4 Interstate Options

Existing I-229 and the double-decker bridge are currently classified as an "interstate" – that is, a high-speed controlled access freeway that is part of the Interstate Highway System. To maintain an interstate designation any new facility would be required to be built in accordance with the rules and regulations of the interstate system. The following alternatives would remove the existing double-decker bridge and replace it with a roadway that would meet those requirements

and still be classified as an interstate facility.

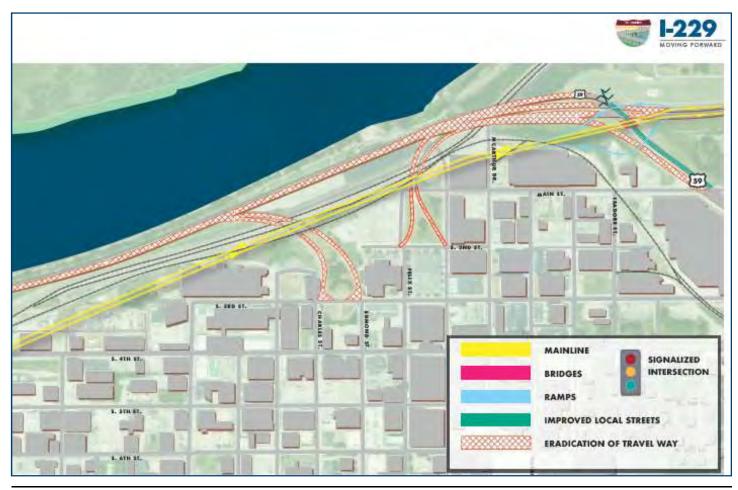
IS-18: Interstate East of Tracks. In this alternative (Figure 4), the double-decker bridge would be removed and I-229 reconstructed on the east side of the BNSF tracks. The Interstate would be generally constructed at-grade. A bridge would be required on the north end for a new interchange between US Route 59 and I-229. One bridge would be required on the south to maintain 4th Street traffic and an existing railroad spur. There would not be any interchanges between US Route 59 and US Route 36. There would be limited impacts to the Riverfront and this alternative would provide potential developable land along the Riverfront, but would impede both pedestrian and vehicular access from downtown to the river. Access to downtown and the Stockyards Expressway would be more limited. The Stockyards traffic would access I-229 via a signalized



Figure 4

IS-18: Interstate East of Tracks







intersection on US Route 36. I-229 would remain an Interstate and therefore would have controlled access, a minimum design speed, no signalization, and maintain a high level of service with a 4-lane configuration.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 5. The Study Team recommends that this alternative be eliminated from further consideration.

IS-09: System to System 1-Lane Ramps. This alternative (Figure 5) would leave the Interstate classification through the entire corridor. In this alternative, the double-decker bridge would be removed and I-229 reconstructed. The Interstate would be constructed with long, one-lane elevated ramps connecting Interstate stubs at both ends of the project. The one lane ramps would reduce the impacts to the Riverfront and the BNSF. Each of the ramps would be elevated therefore maintaining rail traffic. Northbound Interstate traffic would access downtown via Patee Street instead of Edmond Street. Southbound Interstate traffic would access downtown via Edmond Street instead of Felix Street. Flyovers would be required along the Missouri River near the downtown ramps for diverging lanes. Significant bridge structures would be required on the south to reconnect the Stockyards Expressway, Highway 36, and the Interstate. The Southbound I-229 ramp would be constructed over Highway 36. I-229 would remain an Interstate and therefore would have controlled access, a minimum design speed, no signalization, and maintain a high level of service.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 6. The Study Team recommends that this alternative be eliminated from further consideration.

IS-08: 4-Lane Diverging. This alternative (Figure 6) would leave the Interstate classification through the entire corridor. In this alternative, the double-decker bridge would be removed and I-229 reconstructed. The Interstate would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in generally the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River. The width of Interstate would likely require bank stabilization on the Missouri River and/or for the Burlington Northern Railroad tracks to be shifted east and ROW acquired. Bridges would be provided as necessary to maintain rail traffic and provide connections to the downtown. Northbound Interstate traffic would access downtown via 4th Street approximately one block north of Mitch-

Table 5

IS-18: Interstate East of Tracks Recommendation

Overall Ranking	Advantages	Disadvantages	
3.5	Removal of the I-229 existing bridge structure along the Missouri River  Low maintenance costs of bridge structures with complete removal of the double-decker bridge and minimal bridges reconstructed  I-229 traffic would be maintained with the same level of service therefore accommodating existing freight traffic.  Provides open space along the Riverfront for access and/or development  Provides "open view" of Missouri River	<ul> <li>Downtown St. Joseph access to the Interstate would be reduced and only accessible from St. Joseph Avenue</li> <li>One of the highest impacts to property</li> <li>Reduces access to the Riverfront with elimination of Francis Street</li> <li>High cost particularly due to property takings</li> <li>Additional barrier between the downtown and the Riverfront</li> <li>Interstate encroaches upon the downtown impeding development and revitalization in the near vicinity</li> <li>Potentially higher risk of encountering historic or hazmat properties and higher number of property impacts due to the amount of new right-of-way in more urbanized area capped Farmland Pesticide Superfund site at 4th and Seneca Streets</li> </ul>	
	Recommendation		
Eliminate	This alternative would have significant impacts to existing businesses currently located east of the BNSF tracks, would have a high risk of environmental impacts to both historic cultural sites and hazardous material sites, and would have large costs associated with right-of-way acquisition. For these reasons, this alternative has been recommended for elimination from further consideration.		



Figure 5

IS-09: System to System 1-Lane Ramps



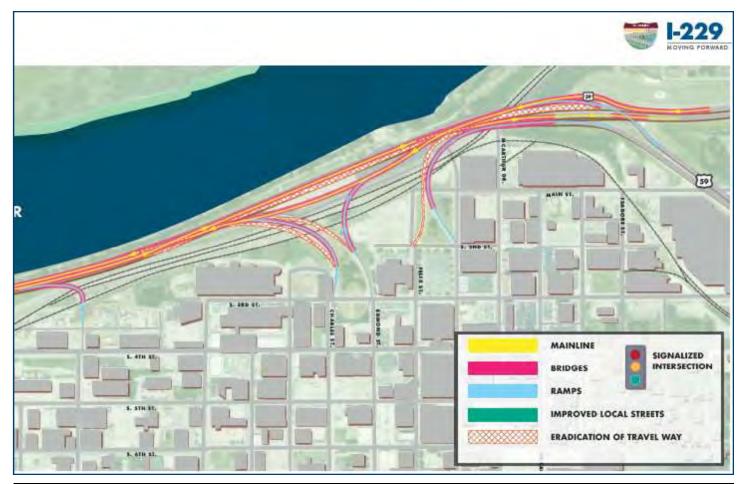
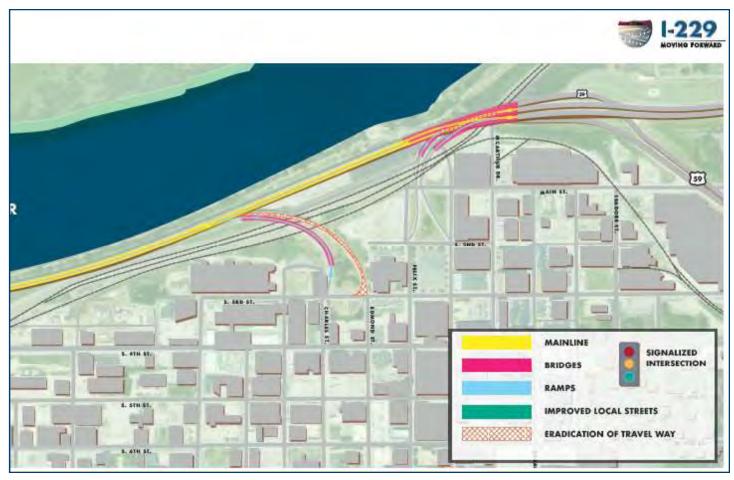




Figure 6
IS-08: 4-Lane Diverging





#### IS-09: System to System 1-Lane Ramps Recommendation



Overall Ranking	Advantages	Disadvantages
3.5	<ul> <li>I-229 traffic would be maintained with a high level of service therefore accommodating existing freight traffic</li> <li>Downtown St. Joseph access to the Interstate would generally be maintained through local connections to the Interstate</li> </ul>	<ul> <li>Pedestrian / vehicular traffic and development along the Riverfront would be limited</li> <li>Flyovers would be required at the north and south connections and to downtown St. Joseph which leads to long term maintenance costs of bridge structures</li> <li>Northbound access from I-229 to downtown St. Joseph would be moved south to Patee Street</li> <li>Long term maintenance cost of one lane bridge structures through the entire corridor</li> <li>Potential historic and hazmat impacts associated with east riverbank underlying fill and Farmland Pesticide Superfund site</li> </ul>
Recommendation		
Eliminate	This alternative would require the construction of two independent bridge structures along the existing alignment without improving the ability to develop the Downtown. The additional costs of the structures, along with the other disadvantages, have resulted in this alternative being recommended for elimination from further consideration.	

ell Avenue (alternatively access could be provided at Patee Street with additional property impacts). Ingress and egress from I-229 to Stockyards Expressway and St. Joseph Avenue would be maintained. Bridge structures would be required at the north and south connections with flyovers for diverging traffic. I-229 would remain an Interstate and therefore would have controlled access, a minimum design speed, no signalization, and maintain a high level of service with a 4-lane configuration.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 7. The Study Team recommends that this alternative be eliminated from further consideration.

#### 3.5 Main/2nd St. Extension Options

This series of alternatives utilizes the existing corridor along the southern half of the Study Area, crosses over the BNSF railroad and then ties into the existing street network on the western side of the downtown. The intent of these alternatives is to shift the current alignment east of the Riverfront to help open up development but still provide accessibility into the downtown.

NIS-13: Roundabouts. This alternative (Figure 7) would remove the Interstate classification between US Route 36 and US Route 59. In this section, I-229 would be decommissioned, the double-decker bridge removed, and a 4-lane principal arterial constructed. The 4-lane principal arterial would be constructed at-grade (el-

evated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River except for a section between Messanie Street and Francis Street. The width of the 4-lane section would likely require bank stabilization on the Missouri River and/or the BNSF tracks to be shifted east and ROW acquired. On the north, the 4-Lane arterial would cross over the BNSF at 2nd Street which would connect to the Interstate and downtown utilizing a roundabout and the existing ramps for Felix Street and Francis Street. On the south, the 4-lane principal arterial would connect the Stockyards Expressway, 4th Street, and I-229 with a roundabout. Two significant new bridges toward the south end of the project and toward the north end are proposed to get over the BNSF Railroad. Concrete aprons could be provided in the roundabouts to accommodate freight traffic. The Red Lion Hotel parking lot could be reconstructed south of the building with the removal of the Charles Street and Edmond Street ramps.

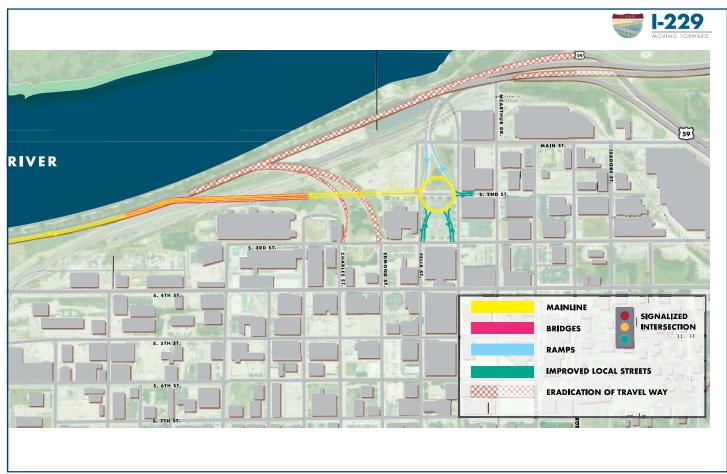
The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 8. The Study Team recommends that this alternative be carried forward as a Reasonable Alternative.

NIS-12: 3 or 4 Lane Option Down Main Street. This



Figure 7
NIS-13: Roundabouts





#### IS-08: 4-Lane Diverging



Overall Ranking	Advantages	Disadvantages	
3.5	I-229 traffic would be maintained with a high level of service therefore accommodating existing freight traffic     Downtown St. Joseph access to the Interstate would generally be maintained through local connections to the Interstate	<ul> <li>Pedestrian / vehicular traffic and development along the Riverfront would be greatly reduced</li> <li>Flyovers would be required at the north and south connections and to downtown St. Joseph which leads to long term maintenance costs of bridge structures</li> <li>Northbound access from I-229 to downtown St. Joseph would be moved from Edmond Street south near Mitchell Avenue</li> <li>At-grade rail crossing on 4th would remain. Additional congestion with a new ramp proposed just south of the crossing</li> <li>Likely requires bank stabilization on the Missouri River and/or for the Burlington Northern Railroad tracks to be shifted east and ROW acquired</li> <li>Potential historic and hazmat impacts associated with east river bank underlying fill and Farmland Pesticide Superfund site</li> </ul>	
	Recommendation		
Eliminate	This alternative would require bank stabilization along the Missouri River and/or shifting of the BNSF rail line without improving the ability to develop the Riverfront. The additional costs associated with the structures and required fly-overs, along with the other disadvantages, have resulted in this alternative being recommended for elimination from further consideration.		

Table 8
NIS-13: Roundabouts

Overall Ranking	Advantages	Disadvantages	
3.6	Downtown St. Joseph access to the "Interstate" would generally be maintained through local connections to the Interstate     Provides open space along the Riverfront for access and/or development     Provides "open view" of Missouri River along the Riverfront     Minimal potential property impacts near location of the roundabouts	<ul> <li>Interstate through traffic would be required to exit I-229 and reenter I-229</li> <li>Space requirements for the construction of the roundabouts</li> <li>Potential threatened and endangered species/wetland impacts (forested area along river bank at south roundabout)</li> <li>Potential floodplain impacts due to placement of new fill</li> <li>Potential hazmat impacts associated with going through industrial areas and along the edge of the Farmland Pesticide Superfund site</li> </ul>	
	Recommendation		
Keep	This alternative provides a high level of service for access into the downtown, improves accessibility to the Riverfront, is compatible with the Riverfront Master Plan, and provides opportunities for "gateway" enhancements at the roundabouts. For these reasons, this alternative has been recommended to be carried forward as a Reasonable Alternative.		

Note: While there was overall support from the public and local officials for this alternative there was specific concern related to the use of roundabouts at the intersections. As the study progressed to the screening of Reasonable Alternatives, the roundabouts were replaced with traditional signalized intersections.

alternative (Figure 8) would remove the Interstate classification between US Route 36 and US Route 59. In this section, I-229 would be decommissioned, the double-decker bridge removed, and a 3 or 4 lane principal arterial constructed. The principal arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River except for a section between US Route 59 and Sylvanie Street. If 3-lane, the turn lane could be eliminated along the Missouri River therefore mitigating bank stabilization needs and/or BNSF impacts. Main Street would cross over the BNSF track

with a bridge. Eighty foot of ROW is available along Main Street. Signalized intersections may be required at Francis Street and St. Joseph Avenue. On the south end of the project, the bridge configuration would remain largely as-is except for a flyover connecting northbound Stockyards Expressway to the new arterial.

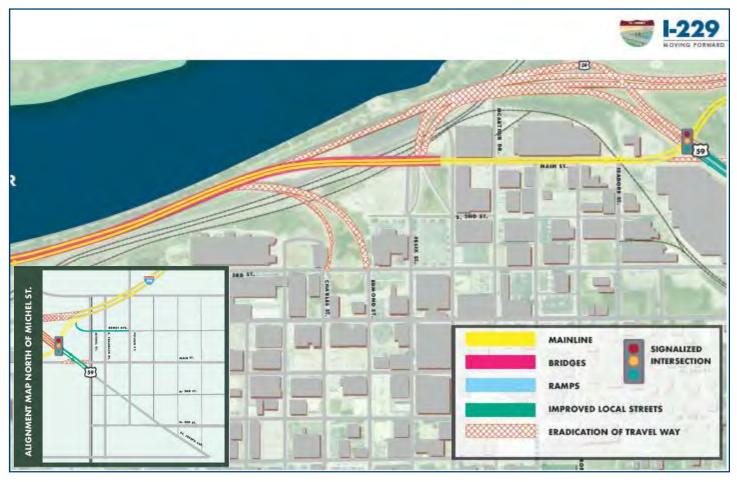
The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 9. The Study Team recommends that this alternative be eliminated from further consideration.

NIS-11: 3 or 4 Lane Down 2nd & Main Streets. This alternative (Figure 9) would remove the Interstate classification between US Route 36 and US Route



Figure 8
NIS-12: 3 or 4 Lane Option Down Main Street









Overall Ranking	Advantages	Disadvantages	
3.8	Downtown St. Joseph access to the "Interstate" would generally be maintained through local connections to the Interstate at Francis Street     Provides open space along the Riverfront for access and/or development     Minimal property impacts	The Level of Service for Interstate traffic would be somewhat reduced Interstate traffic would be required to exit I-229 and re-enter I-229 via downtown local streets Potential floodplain impacts due to placement of new fill Potential hazmat impacts associated with going through industrial areas and Farmland Pesticide Superfund site	
	Recommendation		
Eliminate	This alternative was like the next alternative (NIS-11) and the recommendation was to merge the positive features of each into a revised Reasonable Alternative.		

Table 10
NIS-11: 3 or 4 Lane Down 2nd & Main Streets

Overall Ranking	Advantages	Disadvantages	
3.9	Downtown St. Joseph access to the "Interstate" would generally be maintained through local connections to the Interstate     Provides open space along the Riverfront for access and/or development     Provides "open view" of Missouri River along the Riverfront     Minimal property impacts	The Level of Service for Interstate traffic would be reduced Interstate traffic would be required to exit I-229 and re-enter I-229 via downtown local streets Potential floodplain impacts due to placement of new fill Potential hazmat impacts associated with going through industrial areas and Farmland Pesticide Superfund site	
	Recommendation		
Keep	Keep  This alternative provides a high level of service for access into the downtown, improves accessibility to the Riverfront, and is compatible with the Riverfront Master Plan. For these reasons, this alternative has been recommended to be carried forward as a Reasonable Alternative.		

59. In this section, I-229 would be decommissioned, the double-decker bridge removed, and a 3 or 4 lane arterial constructed. The arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River except for the section between US Route 59 and Messanie Street. If 3-lane, the turn lane could be eliminated along the Missouri River therefore mitigating bank stabilization needs and/or BNSF impacts. The 3 or 4 lane arterial would cross over the railroad at 2nd Street and would tie into Main Street on either the east or west side of the electrical substation. Eighty foot of ROW is available along Main Street. Signalized intersections may be required at Francis Street, Felix Street, and St. Joseph Avenue. A bridge would be required to bring the new arterial over the BNSF tracks. On

the south end, the bridge configuration would remain largely as-is except for a flyover connecting north-bound Stockyards Expressway to the new arterial.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 10. The Study Team recommends that this alternative be carried forward as a Reasonable Alternative.

#### 3.6 Parkway/Boulevard Options

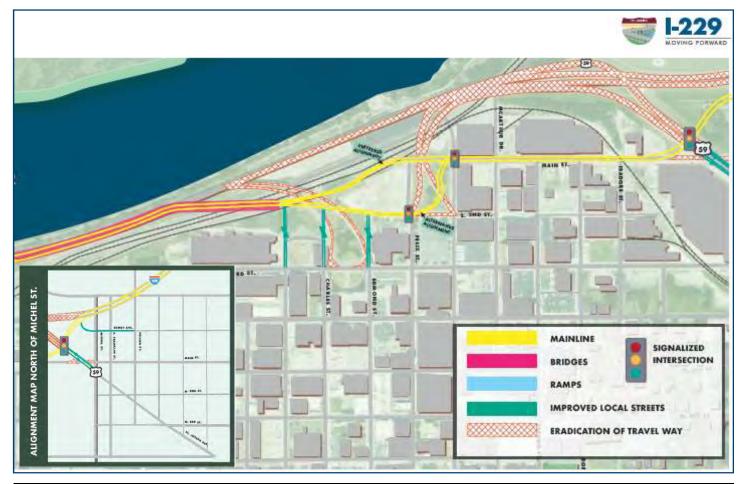
Removing the interstate designation from I-229 opens opportunities to do different things along the Riverfront and modify how connections are made into the downtown. This series of alternatives focuses on integrating boulevards/parkways into the downtown area, especially along the Riverfront.

NIS-19: McArthur Drive Extension. This alternative (Figure 10) removes the Interstate classification



Figure 9
NIS-11: 3 or 4 Lane Down 2nd & Main Streets







between Highland Avenue and Highway 36. In this section, I-229 is decommissioned and the double-decker bridge removed. A scenic 2-lane parkway/boulevard would be constructed from McArthur Drive on the north end of the project to a new roundabout at the south end of project. The 2-lane parkway/boulevard would be constructed at-grade (elevated as necessary to comply with floodplain and stormwater drainage requirements) in generally the same location as the existing double-decker bridge between the BNSF Railroad and the Missouri River. The roundabout would connect the Stockyards Expressway, 4th Street, I-229 and the new parkway. The parkway would have limited access. Dependent upon traffic patterns an extension of a local street, such as Prospect Avenue or Isadore Street, could connect with the new parkway to provide an intermediate access point to the parkway between Highland Avenue and the proposed roundabout. A bridge is proposed along the new parkway/boulevard to cross the BNSF Railroad near Jules Street. The new bridge would eliminate the direct connection between Jules Street and McArthur Drive. It is proposed in this alternative to bring I-229, from about Michel Street to the ramps on the south side of the Highland Avenue Interchange, down to the grade of the local street network. This would allow the neighborhood in this vicinity

to be reconnected. Sixth Street, 4th Street, 3rd Street, Michel Street, Franklin Street, and Poulin Street could be improved to handle increased traffic volumes on the local street network. The City of St. Joseph's Boulevard Master Plan proposes adding McArthur Drive to the boulevard and parkway system. Presumably, most freight traffic currently utilizing the existing double-decker would move to the US Route 36 and I-29 corridors. Dependent upon an analysis of safety, highway capacity, and turning movements, upgrades to US Route 36 and I-29 would be considered to address the increased freight volumes along those corridors.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 11. The Study Team recommends that this alternative be eliminated from further consideration.

NIS-16: Parkway Option. This alternative (Figure 11) removes the Interstate classification from US Route 36 to at least Highland Avenue. In this section I-229 is decommissioned, the double-decker bridge removed, and a scenic 2-lane parkway constructed. The 2-lane parkway would be constructed at-grade (elevated as necessary to comply with floodplain and stormwater drainage requirements) in generally the same location as the existing double-decker bridge between the BNSF tracks

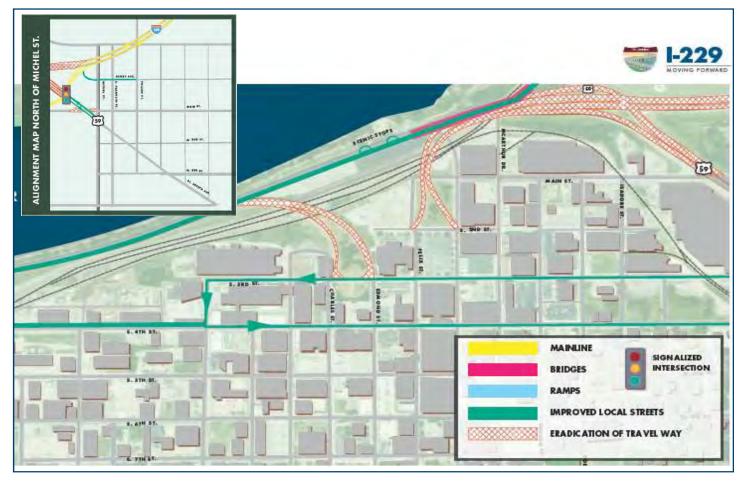
Table 11
NIS-19: McArthur Drive Extension

Overall Ranking	Advantages	Disadvantages	
3.8	Low maintenance cost Low impact to the Riverfront Provides "open view" of the Missouri River along the Riverfront  It is a second to the Missouri River along the Riverfront  The second to the Missouri River along the Riverfront  The second to the Missouri River along the Riverfront  The second to the Riverfront along the	<ul> <li>Lower level of service through corridor</li> <li>Congestion of 4-lane at-grade railroad crossing on 4th Street</li> <li>Potential threatened and endangered species/wetland impacts near forested area at south roundabout and new bridge in forested area at north end near Huston Wyeth Park</li> <li>Potential impacts to historic Robidoux Landing site with new bridge and local street improvements impacting potentially historic buildings</li> <li>Potential hazmat impacts based on construction along Riverfront fill area and industrial properties/Farmland Pesticide Superfund site at south end</li> </ul>	
Recommendation			
Eliminate	While this alternative provides the opportunity to make substantial improvements to the Riverfront it would require existing I-229 traffic to utilize the existing street network which was a concern expressed by both the public, the local businesses and the city staff. For these reasons, this alternative has been recommended to be eliminated as a Reasonable Alternative.		



Figure 10
NIS-19: McArthur Drive Extension





#### NIS-16: Parkway Option



Overall Ranking	Advantages	Disadvantages		
3.8	<ul> <li>Low maintenance cost</li> <li>Low impact to the Riverfront and BNSF</li> <li>Provides "open view" of the Missouri River along the Riverfront</li> <li>Removal of at-grade railroad crossing on 4th Street</li> </ul>	<ul> <li>Lower level of service through corridor</li> <li>Potential floodplain and hazmat impact due to construction along Riverfront floodplain and fill area</li> <li>Additional potential hazmat impacts with bridge near South 4th Street in industrial area/Farmland Pesticide Superfund site</li> </ul>		
Recommendation				
Eliminate	This alternative provides similar benefits to the community as the McArthur Street Extension option but does not provide a connection to proposed or existing parkway facilities. In addition, the alternative would require existing I-229 traffic to utilize the existing street network which was a concern expressed by both the public, the local businesses and the city staff. For these reasons, this alternative has been recommended to be eliminated as a Reasonable Alternative.			

and the Missouri River. The parkway would have limited access with potential connections to West Chestnut Street, West Rosine Street, St. Joseph Avenue (via Louis Street), and Duncan Street. The new parkway would have bridges over the BNSF on the north end of the study corridor and on the south end. Fourth Street could have a bridge over the BNSF tracks for better connectivity to the Stockyards Expressway. Fourth Street, 6th Street, and Duncan Street (+/- 60' ROW on all three) could be improved to assist local traffic with access to the Interstate and St. Joseph Avenue. I-229 and US Route 36 traffic would utilize 6th Street, St. Joseph Avenue, and the new parkway system. Stockyards Expressway traffic would utilize 4th Street, St. Joseph Avenue, and the new parkway system. The new parkway would provide connections to several parks including Mitchell Park, Bartlett Park, and Wyeth Park and become part of the existing parkway system within the City of St. Joseph. Presumably, freight traffic currently utilizing the existing double-decker would move to the US Route 36 and I-29 corridors. Dependent upon an analysis of safety, highway capacity, and turning movements, upgrades to US Route 36 and I-29 would be considered to address the increased freight volumes along those corridors.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 12. The Study Team recommends that this alternative be eliminated from further consideration.

NIS-15: Dewey Avenue Extension. This alternative (Figure 12) removes the Interstate classification between Highland Avenue and US Highway 36. In this

section, I-229 is decommissioned, the double-decker bridge removed, and a scenic 2-lane boulevard constructed with a connection to the boulevard on Dewey Avenue. The 2-lane boulevard would be constructed at-grade (elevated as necessary to comply with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River. The boulevard would begin at US Route 59 and Dewey Avenue and connect to Duncan Street (+/- 60' ROW); there would not be direct access from the downtown to the boulevard. The boulevard would have a bridge over the BNSF Railroad at the north end of the study corridor and at the south end. Fourth Street, 6th Street, St. Joseph Avenue, Duncan Street, Poulin Street, and Michel Street could be improved to assist local traffic with access to the Interstate and St. Joseph Avenue. I-229 and US Route 36 traffic would utilize 4th Street, 6th Street, St. Joseph Avenue, and an arterial extension from I-229. Stockyards Expressway traffic would utilize 4th Street, St. Joseph Avenue, and an arterial extension from I-229. On the north, the I-229 existing vertical alignment would be modified to match the elevations of the surrounding local street network providing better connectivity between neighborhoods currently divided by the interstate. On the south, a new signalized intersection is proposed to replace the I-229 and US Route 36 interchange. The new boulevard would more directly connect several parks including Mitchell Park, Bartlett Park, and Wyeth Park and become part of the existing boulevard and parkway system within the City of St. Joseph. Presum-



Figure 11
NIS-16: Parkway Option



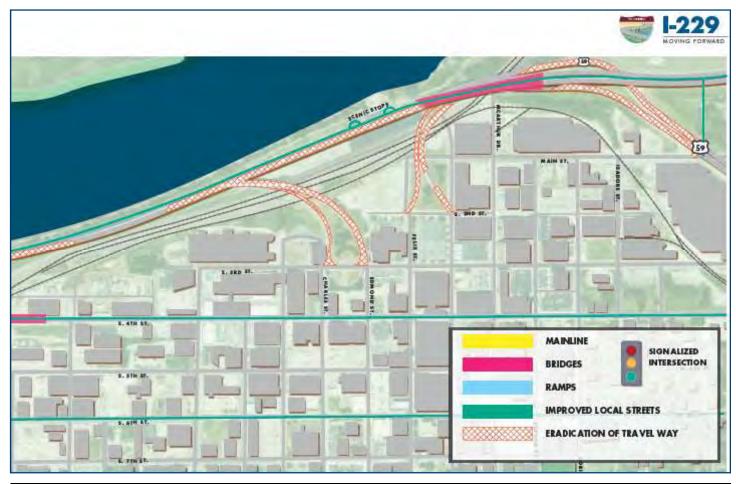
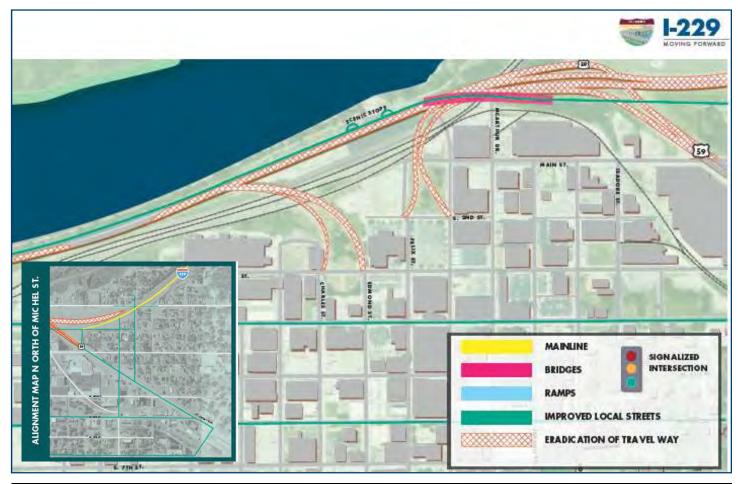




Figure 12
NIS-15: Dewey Avenue Extension





#### NIS-15: Dewey Avenue Extension



Overall Ranking	Advantages	Disadvantages		
3.9	<ul> <li>Low maintenance cost</li> <li>Low impact to the Riverfront and BNSF</li> <li>Provides "open view" of the Missouri River along the Riverfront</li> <li>Minor potential threatened and endangered species impacts associated with forested area near south roadway bridge</li> </ul>	<ul> <li>Lower level of service through corridor</li> <li>Potential congestion at Highway 36 and I-229 intersection</li> <li>Floodplain and potential hazmat impact due to construction along Riverfront floodplain and fill area</li> </ul>		
Recommendation				
Eliminate	This alternative provides similar benefits to the community as the McArthur Street Extension option but does not provide a connection to proposed or existing parkway facilities. In addition, the alternative would require existing I-229 traffic to utilize the existing street network which was a concern expressed by the public, the local businesses and the city staff. For these reasons, this alternative has been recommended to be eliminated as a Reasonable Alternative.			

ably, most freight traffic currently utilizing the existing double-decker would move to the US Route 36 and I-29 corridors. Dependent upon an analysis of safety, highway capacity, and turning movements, upgrades to US Route 36 and I-29 would be considered to address the increased freight volumes along those corridors.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 13. The Study Team recommends that this alternative be eliminated from further consideration.

#### 3.7 Arterial Along Riverfront Options

This series of alternatives takes advantage of the existing right-of-way but instead of replacing the existing facility with an interstate level facility it would instead include non-interstate roadway options.

NIS-07: 4 Lane with Intersections at Edmond & Felix Streets. This alternative (Figure 13) would remove the Interstate classification between US Route 36 and US Route 59. In this section, I-229 would be decommissioned, the double-decker bridge removed, and a 4-lane principal arterial constructed. The 4-lane principal arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River. The width of the 4-lane section would likely require bank stabilization on the Missouri River and/or the BNSF tracks to be shifted east and ROW acquired. Along the corridor between US Route 36 and US Route 59 there would be three signalized intersections. On the north, there would be two signalized Y-intersections with long arcing bridges

from Edmond Street and Felix Street over the BNSF Railroad. The Felix Street signal would be elevated, and the Edmond Street signal would be at-grade. Acute traffic movements would be restricted. On the south, a 4-way signalized intersection is proposed to connect the Stockyards Expressway and South 4th Street to the new 4-lane principal arterial. Ramps would be provided for the Highway 36 interchange.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 14. The Study Team recommends that this alternative be carried forward as a Reasonable Alternative.

NIS-01: Elevated T- Intersection. This alternative (Figure 14) removes the Interstate classification between US Route 36 and US Route 59. In this section, I-229 is decommissioned, the double-decker bridge removed, and a 4-lane principal arterial constructed. The 4-lane principal arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in generally the same location as the existing double-decker bridge between the Burlington Northern Railroad tracks and the Missouri River. The width of the 4-lane section likely requires bank stabilization on the Missouri River and/or for the BNSF tracks to be shifted east and ROW acquired. Along the corridor between US Route 36 and US Route 59 there would be two signalized intersections. On the north, an elevated signalized T-Intersection would connect downtown with access to Francis Street and Felix Street. Locating the elevated T-Intersection near Francis Street takes advantage



Figure 13
NIS-07: 4 Lane with Intersections at Edmond & Felix Streets



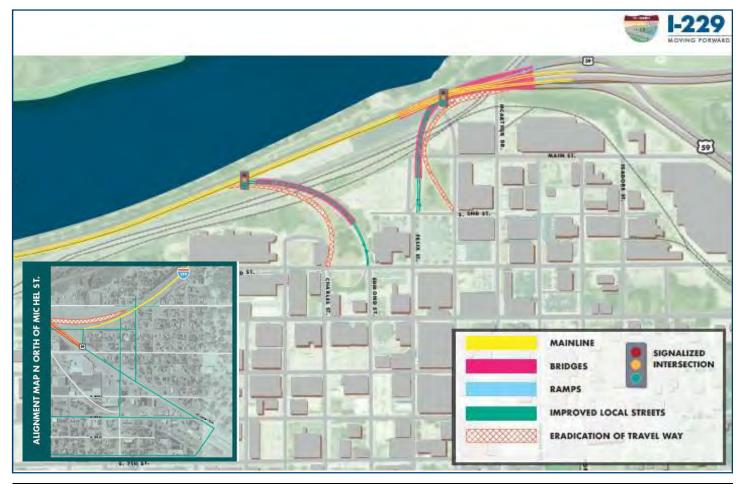
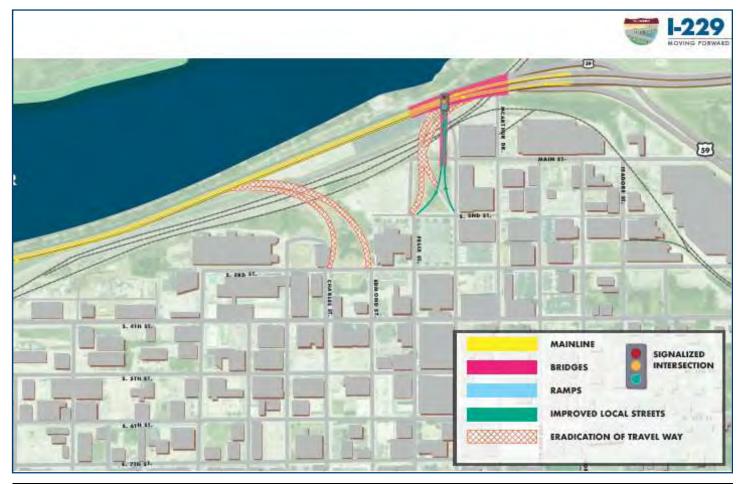




Figure 14
NIS-01: Elevated T- Intersection





# NIS-07: 4 Lane with Intersections at Edmond & Felix Streets



Overall Ranking	Advantages	Disadvantages								
3.6	Interstate traffic would have a slightly lower level of service but would still accommodate existing traffic Downtown St. Joseph access to the "Interstate" would generally be maintained via the y-intersections at Edmond and Felix Streets Provides "open view" of Missouri River along the Riverfront Minimal potential property impacts near south end bridges	<ul> <li>Due to the narrowness of the corridor, a 4-lane principal arterial would limit potential Riverfront development</li> <li>Skewed intersections (i.e. Y-intersections) not desirable in terms of safety</li> <li>Potential floodplain impacts due to placement of fill</li> <li>Potential historic and hazmat impacts associated with east riverbank underlying fill and Farmland Pesticide Superfund site</li> </ul>								
	Recomme	endation								
Keep	Keep  This alternative was supported by the city staff and the general public and provided the necessary accessibility for trucks into and out of the Stockyards and Downtown. For these reasons, this alternative has been recommended to be carried forward as a Reasonable Alternative.									
		Note: During the Reasonable Alternatives screening phase this alternatives was modified slightly to include a southbound slip ramp to better accommodate truck traffic at the 4th Street intersection and included modifications to the ramps into downtown at Edmonds and Felix Streets.								

Table 15
NIS-01: Elevated T- Intersection

Overall Ranking	Advantages	Disadvantages						
3.6	<ul> <li>Interstate traffic would have a slightly lower level of service but would still accommodate existing traffic</li> <li>Downtown St. Joseph access to the "Interstate" would generally be maintained via the elevated signalized T-Intersection</li> <li>Provides "open view" of Missouri River along the Riverfront</li> <li>Minimizes the number of bridges/ramps</li> <li>Minimal property impacts at the north (parking lot) and south ends</li> </ul>	<ul> <li>Due to the narrowness of the corridor, a 4-lane principal arterial would limit potential Riverfront development</li> <li>Access to the new principal arterial from downtown would be via a signalized intersection</li> <li>Potential threatened and endangered species/wetland impacts due to the forested area along the riverbank at the south end</li> </ul>						
	Recommendation							
Eliminate	This alternative would impact the Missouri River floodplain, provide a barrier to Riverfront access, would not be compatible with the Riverfront Master Plan, and would require an elevated T-intersection on structure that would not be desirable. For these reasons, this alternative has been recommended for elimination from further consideration.							

of the already needed bridge over the BNSF tracks and therefore minimizes the number of bridges/ramps required. The proposed split ramp from downtown to the elevated T-Intersection connects the existing one-ways at Francis Street and Felix Street; however, an alternative option could be a single ramp connection to Francis Street if Francis Street is converted to a two-way. On the south, a 4-way signalized intersection connecting the Stockyards Expressway and South 4th Street to the new 4-lane principal arterial is proposed. Ramps would be provided for the Highway 36 interchange from the new principal arterial.

The overall ranking for this alternative, along with its

relative advantages and disadvantages are provided in Table 15. The Study Team recommends that this alternative be eliminated from further consideration.

# 3.8 Local Street Options

This series of alternatives removes the I-229 connection between US Route 36 and US Route 59 and replaces it with improvements to the local street network to accommodate access into the downtown. With the majority of existing I-229 traffic destined to locations not on I-229 the intent of these alternatives is to better utilize the existing street network to make those connections. Based on that intent, the team developed

Table 16

# NIS-06: One-Way Pairs 3rd and 4th Streets, Michel and Franklin Streets



Overall Ranking	Advantages	Disadvantages							
4.2	<ul> <li>Low maintenance costs of bridge structures and complete removal of double-decker bridge</li> <li>Provides open space along the Riverfront for access and/or development</li> <li>Minimal potential property impacts near south end bridge</li> <li>Provides "open view" of Missouri River</li> <li>Removal of at-grade railroad crossing on 4th Street</li> </ul>	<ul> <li>Decreased level of service for Interstate traffic with routing on local collector streets through downtown</li> <li>Potential hazmat impacts associated with industrial sites and Farmland Pesticide Superfund site</li> </ul>							
	Recommendation								
Eliminate	This alternative included a new bridge along 4th Street that would impact a known hazardous waste site. In addition, this alternative relied on the use of one-way streets which was contrary to the City's desire to eliminate one-way pairs. For these reasons, this alternative has been recommended for elimination from further consideration.								

three Initial Alternatives that met that desire.

NIS-06: One-Way Pairs 3rd and 4th Streets, Michel and Franklin Streets. This alternative (Figure 15) removes the Interstate classification between US Route 36 and US Route 59. In this section, I-229 is decommissioned, the double-decker bridge removed, and nothing constructed in its current location therefore opening the Riverfront. Traffic is routed through downtown on local collector streets including 6th Street, 4th Street, 3rd Street, Michel Street, Franklin Street, and Poulin Street (+/- 60' ROW for 6th, 4th, and 3rd Street, +/- 50' ROW for Michel, Franklin, and Poulin Street). These local collector streets might require improvements for increased traffic flow. Fourth Street would have one-way traffic northbound and 3rd Street would have one-way traffic southbound. Franklin Street would have one-way traffic westbound and Michel Street would have one-way traffic eastbound. Stockyards Expressway traffic could route through downtown via 4th Street, 3rd Street, Michel Street, and Franklin Street (all 1-way streets). Two alternative alignments are proposed on the south connecting the Stockyards Expressway to 3rd Street and 4th Street with a bridge or bridges over the BNSF Railroad. On the north, this alternative proposes the vertical alignment of I-229 be modified to match the elevations of the local street network allowing more vehicular and pedestrian connections between the neighborhoods east and west of I-229. Presumably, most freight traffic currently utilizing the existing double-decker would move to the US Route 36 and I-29 corridors.

Dependent upon an analysis of safety, highway capacity, and turning movements, upgrades to US Route 36 and I-29 would be considered to address the increased freight volumes along those corridors.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 16. The Study Team recommends that this alternative be eliminated from further consideration.

NIS-17: One-Way Pairs 5th & 6th Streets. This alternative (Figure 16) removes the Interstate classification between US Route 36 and US Route 59. In this section, I-229 is decommissioned, the double-decker bridge removed, and nothing constructed in its place therefore opening the Riverfront. Traffic is routed through downtown on local collector streets including 6th Street, 5th Street, 4th Street, Francis Street, and Felix Street (+/- 60' ROW for 6th, 5th, and 4th Street, +/- 50' ROW for Francis and Felix Street). All these local collector streets would receive improvements for increased traffic flow (5th Street would be extended to the south impacting private property). Sixth Street would be one-way traffic northbound and 5th Street would be one-way traffic southbound. Francis Street would be one-way traffic westbound and Felix Street would be one-way traffic eastbound. I-229 and US Route 36 traffic would be routed through downtown utilizing 6th Street, 5th Street, Felix Street, and Francis Street (all one-way streets). Stockyards Expressway traffic would also be routed through downtown via 4th Street, Felix Street, and Francis Street (4th Street would remain two-way). A bridge on the



Figure 15
NIS-06: One-Way Pairs 3rd and 4th Streets,
Michel and Franklin Streets



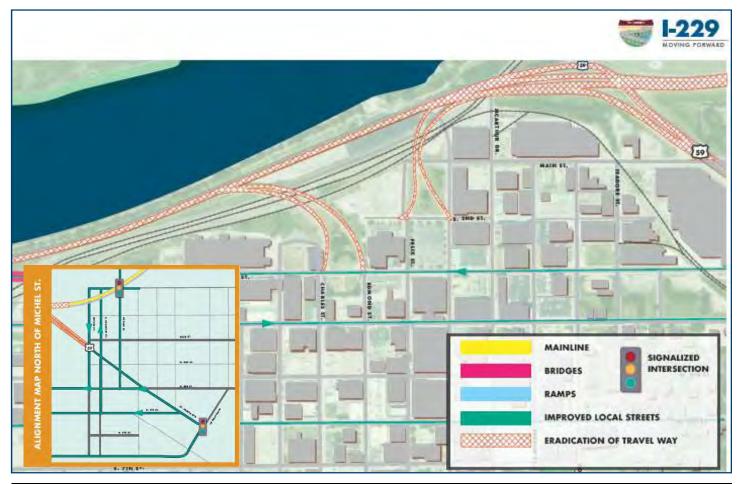
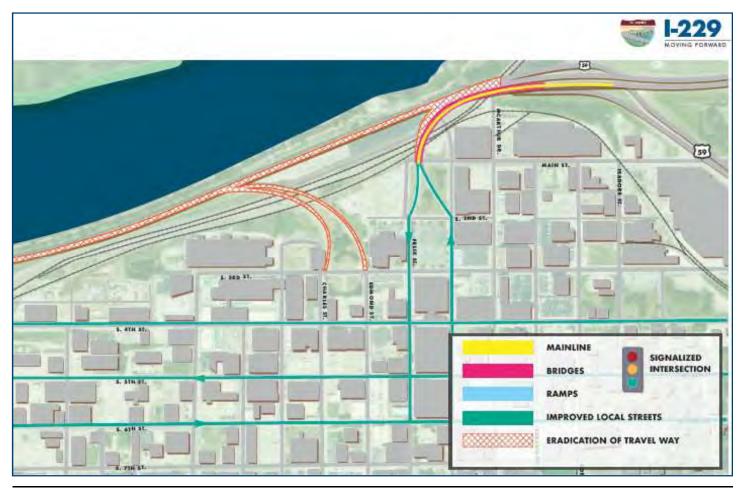




Figure 16
NIS-17: One-Way Pairs 5th & 6th Streets





# NIS-17: One-Way Pairs 5th & 6th Streets



Overall Ranking	Advantages	Disadvantages						
3.8	<ul> <li>Low maintenance costs of bridge structures and complete removal of double-decker bridge</li> <li>Provides open space along the Riverfront for access and/or development</li> <li>Provides "open view" of Missouri River</li> </ul>	<ul> <li>Decreased level of service for Interstate traffic with routing on local collector streets through downtown</li> <li>Moderate property impacts for extension of 5th Street</li> <li>Potential impacts to historic Robidoux Landing site and local street improvements impacting potentially historic buildings</li> <li>Potential hazmat impacts associated with industrial sites near 5th St. extension</li> </ul>						
	Recomme	ndation						
Eliminate	This alternative requires an extension of 5th Street resulting in additional impacts to buildings and the need for additional right-of-way. In addition, this alternative relied on the use of one-way streets which was contrary to the City's desire to eliminate one-way pairs. Compared to the other Local Street Options, this alternative has the worst overall rank and, therefore, has been recommended for elimination from further consideration.							

north is proposed to connect Felix Street and Francis Street to I-229. Bridge structures are also proposed at the Highway 36 and 5th Street and 6th Street intersections to address US Route 36 traffic movements. This alternative proposes utilizing the existing signalized intersections on US Route 36 and improving them to accommodate new 5th Street and 6th Street connections. Presumably, a large amount of freight traffic currently utilizing the existing double-decker would move to the US Route 36 and I-29 corridors. Dependent upon an analysis of safety, highway capacity, and turning movements, upgrades to US Route 36 and I-29 would be considered to address the increased freight volumes along those corridors.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 17. The Study Team recommends that this alternative be eliminated from further consideration.

NIS-04: Arterials East. This alternative (Figure 17) removes the Interstate classification between US Route 36 and US Route 59. In this section, I-229 is decommissioned, the double-decker bridge removed, and nothing constructed in its place therefore opening the Riverfront. Traffic is routed through downtown on local collector streets including 6th Street, 4th Street, Francis Street, and Felix Street (+/- 60' ROW for 6th and 4th Street, +/- 50' ROW for Francis and Felix Street). All these local collector streets might require improvements for increased traffic flow. I-229 and US Route 36 traffic would be routed through downtown utilizing 6th Street, Felix Street, and Francis Street. Stockyards Expressway traffic would also be routed through downtown via 4th Street, Felix Street, and

Francis Street. Two bridges are proposed. One bridge on the north connecting Felix Street and Francis Street to I-229 and one bridge on the south connecting 4th Street to the Stockyards Expressway. Presumably, a significant amount of freight traffic currently utilizing the existing double-decker would move to the Highway 36 and I-29 corridors. Dependent upon an analysis of safety, highway capacity, and turning movements, upgrades to US Route 36 and I-29 would be considered to accommodate the increased freight volumes along those corridors.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 18. The Study Team recommends that this alternative be eliminated from further consideration.

# 3.9 Kansas Side Options

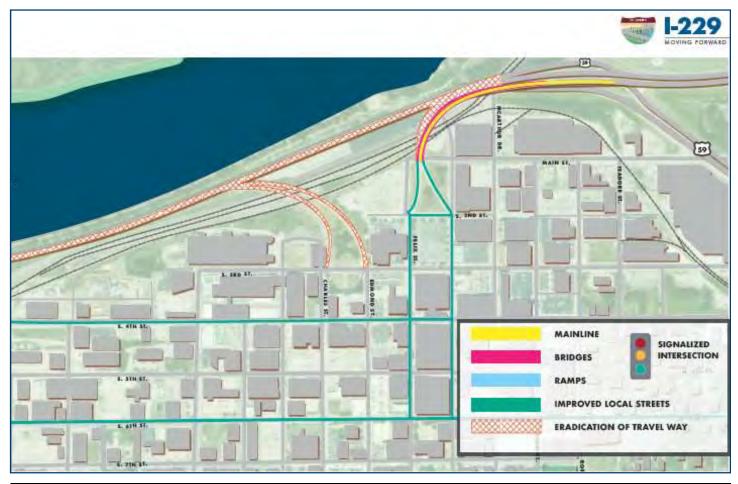
As the initial development of alternatives began, the study team was approached by the City of St. Joseph requesting the team evaluate alternatives that shifted I-229 west across the Missouri River. The City was interested in providing a second crossing and additional access into the Rosecrans Memorial Airport. Based on that feedback, the team developed two Initial Alternatives that satisfied that request.

NIS-10: Kansas Side from US Route 59. This alternative (Figure 18) consists of the relocation of the main-line I-229 corridor from the east side of the Missouri River to the west side of the Missouri River. I-229 would cross over the Missouri River from just north of the downtown area at the intersection of US Route 59, St. Joseph Ave, and I-229. At this location a new interchange facility would accommodate the connec-



Figure 17
NIS-04: Arterials East





# NIS-04: Arterials East



Overall Ranking	Advantages	Disadvantages						
4.1	Low maintenance costs of bridge structures and complete removal of double-decker bridge     Provides open space along the Riverfront for access and/or development     Provides "open view" of Missouri River     Removal of at-grade railroad crossing on 4th Street	<ul> <li>Downtown St. Joseph access to the Interstate would be reduced</li> <li>Decreased level of service for Interstate traffic with routing on local collector streets through downtown</li> <li>Potential hazmat impacts associated with industrial sites near 4th St bridge extension and Farmland Pesticide Superfund site</li> </ul>						
	Recomme	ndation						
Eliminate	This alternative is compatible with the Riverfront Master Plan, provides additional developable land, and is consistent with the City's desire not to have one-way pairs. However, based on feedback from the public, local businesses and city staff there was concern with this alternative resulting in a significant increase in traffic, especially truck traffic, onto the local street network. For this reason, this alternative has been recommended for elimination from further consideration.							

tions on the north end of the alignment shift and cross over the Missouri River to the west on an elevated bridge structure. The bridge structure would be approximately 2,700 feet long and span the Missouri River and its floodway. The alignment would then turn south and generally follow Old Highway 36, Vernon St, to the intersection with US Route 36 on the west side of the Missouri River. A reconstructed interchange would be needed at this location to accommodate this connection.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 19. The Study Team recommends that this alternative be eliminated from further consideration.

NIS-20: Kansas Side from Cook Road. This alternative (Figure 19) consists of the relocation of the mainline I-229 corridor from the east side of the Missouri River to the west side of the Missouri River. Interstate 229, near Cook Road, would curve to the west and cross over the Missouri River. The bridge structure would be approximately 2,700 feet long and span the Missouri River and its floodway. At this location a new interchange facility would accommodate connections to Cook Road. After crossing the river into Kansas, the alignment would then turn south and generally follow NW 23rd Road along the east side of the Rosecrans Memorial Airport providing connections to the airport. It would continue due south and connect to the existing 238 and US Route 36 interchange.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 20. The Study Team recommends that this alternative be eliminated from further consideration.

# 3.10 Non-Build Options

New Technology – Autonomous Vehicles Options. The recent developments in autonomous and connected vehicles (AV/CVs), or driverless vehicles, is a closely watched technological development. AV/CVs are programmed vehicles that operate in pre-mapped driving areas, navigating between fixed and moving obstacles. These can also be connected vehicles communicating with other AV/CVs to optimize traffic flow for the desired travel speed. The theoretical advantages of AV/CV technology include significantly increasing the efficiency of the transportation network so that traffic queues, delays and accidents would approach zero. This new technology is currently being tested in a variety of ways.

A stand-alone AV/CV alternative could not be thoroughly evaluated at this time due to the conceptual nature of the technology. However, these technologies could potentially be incorporated in the future as they are implemented.

Transit Options. A transit concept would consist of improvements to transit service in the Study Area to potentially serve some of the travel market carried by I-229. Fixed route services, as well as on-demand transit services, are currently available through several providers including: Ride and OATS. It is not anticipated that ridership on any future expansion of transit services would have a measurable impact on the number of vehicles using the I-229 corridor. Due to low traffic demand on I-229 and the lack of addressing freight needs, a transit alternative was not carried forward. Any impacts to current or future transit plans, if necessary, will be discussed in the NEPA document.



Figure 18
NIS-10: Kansas Side from US Route 59



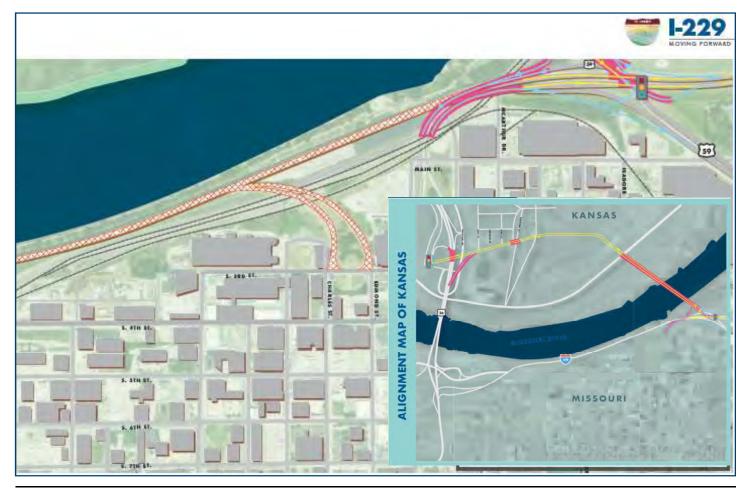
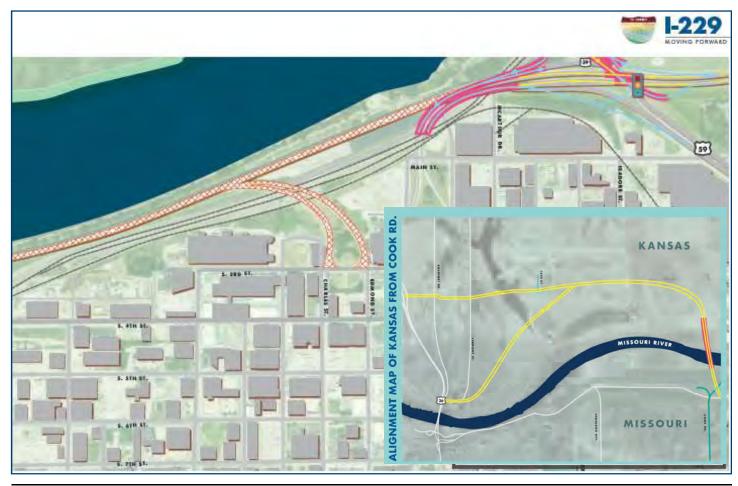




Figure 19
NIS-20: Kansas Side from Cook Road





# NIS-10: Kansas Side from US Route 59



Overall Ranking	Advantages	Disadvantages						
3.0	Removal of I-229 existing bridge structure from the heart of downtown St. Joseph I-229 traffic would bypass downtown and decrease traffic impacts to the downtown area Elimination of the presence of I-229 along the Missouri Riverfront that frees up the property for Riverfront development Minor potential displacements on the west side of the river	<ul> <li>Large up-front cost, including a new 2,700-foot bridge structure over the Missouri River</li> <li>Major reconstruction of two interchanges at north and south connections</li> <li>Long-term maintenance costs of a long bridge structure over a major river</li> <li>Increased traffic at signals east of the river on Highway 36</li> <li>Impact to Dupree Memorial Conservation Area</li> <li>Highest potential for threatened and endangered species / wetland impacts due to a new Missouri River crossing, including the pallid sturgeon; largest amount of forested areas and potential Indiana Bat/Northern Long-eared Bat habitat; large number of wetlands on the west side of the river; and Huston Wyeth Park</li> <li>Impact greatest amount of floodplain in areas more prone to flooding on the west side of the river</li> <li>Potential impacts to historic Robidoux landing site and historic east riverbank fill, as well as potential hazmat impacts due to east riverbank fill</li> </ul>						
		Recommendation						
Eliminate	This alternative requires an additional Missouri River crossing, does not address the overall project need, and would impact a conservation area. While the study acknowledges the communities desire to provide a second access into the airport, this study was never intended to address that need. For these reasons, this alternative has been recommended for elimination.							

Table 20
NIS-20: Kansas Side from Cook Road

Overall Ranking	Advantages	Disadvantages							
3.2	Removal of I-229 existing bridge structure from the heart of downtown St. Joseph Elimination of the presence of I-229 along the Missouri Riverfront that frees up the property for Riverfront development A second ingress/egress to the Rosecrans Memorial Airport Minor potential displacements on the west side of the river	<ul> <li>Large up-front cost, including a new 2,700-foot bridge structure over the Missouri River, new interchange at Cook Road, extension of Cook Road and nearly six miles of new highway</li> <li>Long-term maintenance costs of a long bridge structure over a major river</li> <li>Increased traffic at signals east of the river on Highway 36</li> <li>Does not accommodate the major traffic movements including traffic traveling to and from St. Joseph Avenue to the South End and traffic traveling to and from St. Joseph Avenue to the east side of town on Highway 36</li> <li>Highest potential for threatened and endangered species/wetland impacts due to a new Missouri River crossing, including: the pallid sturgeon; largest amount of forested areas, including Carolyn Sheridan Logan Memorial Wildlife Area and Sunbridge Hills Conservation Area on the east bank; potential for Indiana Bat/Norther Long-eared Bat habitat; and large amount of wetlands on the west side of the river</li> <li>Impact greatest amount of floodplain in areas more prone to flooding on the west side of the river</li> </ul>							
	Recommen	ndation							
Eliminate	This alternative requires an additional Missouri River crossing, does not address the overall project need, and would impact conservation areas. While the study acknowledges the communities desire to provide a second access into the airport, this study was never intended to address that need. For these reasons, this alternative has been recommended for elimination from further consideration.								



Non-Motorized Transportation Options. A non-motorized concept would consist of improvements to bicycle and pedestrian access in the Study Area that could potentially serve some of the travelers utilizing I-229. St. Joseph has existing trails and on-street bicycle lanes. The St. Joseph Bicycle and Pedestrian Masterplan focuses on a systematic approach to an overall network of facilities to provide links throughout the city.

It is not anticipated that usage of any future expansion of bicycle or pedestrian facilities would have a measurable impact on the number of vehicles using the I-229 corridor. Due to low traffic demand on I-229 and the lack of addressing freight needs, a non-motorized alternative was not carried forward. Any impacts to current or future facilities will be discussed in the NEPA document.

#### 4.0 Public Involvement for Initial Alternatives

Each of the Initial Alternatives, along with the results of the initial screening, the scoring of each of the criteria, as well as a general list of advantages and disadvantages of each was presented to the Core Team, the Technical Advisory Committee, as well as the general public. Feedback from each was incorporated into the final evaluation and recommendations detailed in this technical memorandum.

#### 4.1 Core Team Meeting

A Core Team meeting was held with MoDOT and FHWA staff on February 27, 2019 to present the range of Initial Alternatives and get feedback. The Core Team includes members of the study team, various discipline leaders within MoDOT, as well as representatives from FHWA. The feedback received was integrated into the screening process and assisted the team in narrowing down the Initial Alternatives to a set of Reasonable Alternatives for more detailed study.

# 4.2 Technical Advisory Committee (TAC) Meetings

A TAC meeting was also held to discuss the list of Initial Alternatives. The TAC includes staff from MoDOT, the Missouri Highway and Transportation Commission, Downtown Partnership, Triumph Foods, Hillyard, Nor-Am Ice and Cold Storage, the BNSF, Mo-Kan,

St. Joseph Area Transportation Study Organization, Downtown Association, St. Joseph Chamber of Commerce, and the City of St. Joseph. A follow up meeting was also held with additional staff from the City of St. Joseph that couldn't attend the initial meeting.

#### 4.3 Public Meeting

A public meeting was held on April 2, 2019 to present the range of Initial Alternatives and get feedback. The feedback was used along with the screening analysis to narrow down the Initial Alternatives to a set of Reasonable Alternatives for more detailed study. Each alternative was presented with a scale of 1 to 10, 1 meaning "I do not like this option" and 10 being "I really like this option." The meeting attendees were provided dots and rated the alternatives based on that scale. This same process was made available through an online survey that was open from April 2, 2019 until May 31, 2019. There were 504 individuals who participated in the survey. Input from the public input showed that there was very little variance in the responses received among the different Initial Alternatives.

#### 5.0 Additional Initial Alternative

Following the April 2019 public meeting and as the team was developing and screening the Reasonable Alternatives, city and MPO staff approached the study team about another series of alternatives that they asked the study team to consider. The study team worked through several permutations of this alternative with city/MPO staff but finally agreed to include one additional Initial Alternative in the process.

NIS-21: Boulevard Partially East of Tracks. This alternative (Figure 20) would remove the Interstate classification between US Route 36 and US Route 59. In this section, I-229 would be decommissioned, the double-decker bridge removed, and a 4-lane principal arterial constructed. The 4-lane principal arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River except for a section between Seneca Street and Francis Street. On the north, the 4-Lane



Figure 20
NIS-21: Boulevard Partially East of Tracks





Note: Since this alternative was developed after the original Initial Alternatives were developed and presented to the public the graphic above is different than the other Initial Alternatives.



arterial would cross over the BNSF at approximately Olive Street which would connect to downtown utilizing a T-intersection at Charles and Edmond Streets. On the south, the 4-lane principal arterial would connect the Stockyards Expressway, 4th Street, and I-229 with a signalized intersection. Three significant new bridges toward the south end of the project and toward the north end are proposed to get over the BNSF Railroad. The alternative would impact three known hazardous materials locations: Farmland Pesticide, Advantage Metals, and HPI.

The overall ranking for this alternative, along with its relative advantages and disadvantages are provided in Table 21. The Study Team recommends that this alternative be carried forward as a Reasonable Alternative.

#### 6.0 Recommended Reasonable Alternatives

Based on the analysis detailed earlier in this report and presented in summary in the screening matrix (Figure 21), the study team has recommended that four Reasonable Alternatives, plus the No-Build, be carried forward into the Environmental Assessment. These four reasonable options will then be evaluated in greater detail within the requirements of the NEPA process prior to the identification of the final preferred alternative.

Based on feedback from the advisory committees (Core Team and TAC) and from comments from the public, two of these alternatives have been modified slight-

ly from the original concepts presented at the public meeting and in the online survey. Any modifications have been incorporated into the Reasonable Alternative exhibits provided in the EA and discussed below.

Based on the criteria discussed in the previous section, the following alternatives are considered Reasonable Alternatives moving forward and will be the subject of detailed evaluation in the I-229 EA:

- No-Build Under NEPA, the No-Build alternative is required to be evaluated and provides a baseline from which to compare the other Reasonable Alternatives.
- Alternative A: Main Street Corridor This alternative was Initial Alternative NIS-11, 3 or 4 Lane Down 2nd & Main Streets. In this alternative, the double-decker bridge is removed. A two-to four-lane arterial road would be constructed at grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in generally the same location as the existing double-decker bridge between the railroad tracks and the Missouri River, except for the section between U.S. Route 59 and Messanie Street. This alternative would require the de-designation of I-229 as an interstate.
- Alternative B: 2nd Street Corridor This alternative was Initial Alternative NIS-13 Roundabouts and was modified to remove the roundabouts and replace with typical signalized intersections. In this alterna-

Table 21
NIS-21: Boulevard Partially East of Tracks

Overall Ranking	Advantages	Disadvantages							
3.4	<ul> <li>Minimal impacts to travel times and access.</li> <li>Provides open space along the Riverfront for access and/or development</li> <li>Provides better connectivity to 4th Street at the south end of the project</li> <li>Provides potential for southern trail access to the Riverfront</li> <li>Most feasible option for a four-lane roadway on the south end</li> </ul>	<ul> <li>Direct impacts to a potential historic site (HPI)</li> <li>Direct impacts to three high-risk hazmat sites</li> <li>Costly relocation of two existing businesses</li> <li>May require the acquisition of railroad right-of way</li> <li>North end bridge impedes the view of the river along the Riverfront</li> <li>Large bridge on the north end may impact future Riverfront and downtown development</li> </ul>							
	Recommendation								
Keep	This alternative requires the acquisition of three properties with known hazardous materials issues and MoDOT has determined that it would not take on the additional liability for cleaning up those properties. However, based on feedback from city and MPO staff and their desire to find a mechanism to improve those properties it was decided that this alternative merited additional investigation. For these reasons, this alternative has been recommended to be carried forward as a Reasonable Alternative.								



Figure 21
Initial Alternatives Screening Matrix

			ridge	n Downtown	TING		TATE OF			i/2ND 51	
			ridge	n Downtown			s			treet	Main
		Ne-Build	Rehabilitation at Existing Bridge	FPE-03: Bridge Removal Between Downtown Ramps	RPE-14: 4-Lane Single Deck	IS-18. Interstate East of Tracks	IS-09-5/stem to 5/stem - 1-Lane Ramps	IS-08-4-Lane Diverging	NIS-13; Roundabouts	NIS-12:3 or 4 Lane Opnion Down Main Street	NIS-11;3 or 4 Lane Option down 2nd & Main Streets
Address	Bridge Condition	1	2	3	3	5	5	5	4	5	5
	Travel Time	-1	19	4	5	1257	- 5	-5%	4	4	4
lity & ity	Incidents	3	5	4	5	5	5	5	4	3	-2
Travel Mobility Accessibility	Freight Operational Conditions	1	5	2	4	5	4	5-	2	3	-3
vel N	Freight Travel Time	1_	5	3	5	5	5	5	4	- 4	4
Trai	Railroad Impacts	1-1-1	2	2	1102011	1.15	3	2	4	4	4
	Port Access	1	3	2	3	3	3	4=1	4	301	3
Jse	Riverfront Access (Veh & Ped)	-3-	1	3	i	3	ĭ	1	4	4	5
pue	Acres of New Land in Riverfront	4	4	ž	1	5	-1	1.	3-	3	4
Compatible with Land Use	Downtown Revitalization	_1_	2:-	3	2	3	1 1	1	4	4	5
ble	Downtown Access (Veh)	-1	5	5	4	1	4	-4	4	3	5
npat	Developable Land Downtown	1	2	2	3	4	.2	3	3.	5	5
	Discourages Heavy Trucks Downtown	5	5	2	5. 1	-1	5	5	301	3:11	2
Engineering	Constructability	4	- 5	1	4	-3-	2	2:	3011	3:11	3
inee	Cost	6.	3	3	2	1	3	ż	3	3	3
Eng	Maintenance	5	1	2	1	3	2	2	3	3	3
1 8	T & E / Wetlands	5	5	5	5	5	5	5-	3	5	5
Ital	Historic Properties	5	5	5	4	1	4	-4	5	4	4
ıme	Public Lands	4	3	5	3:	5	4	3	4	3	4-
Environmental	Floodplains	5	- 5-	8	2	5	1	2	3	3	3
ᇤ	HazMat	-5-	5	5	3	Y	3	3	3	3	3
3	Displacements	5	5	5	5	1	5	5	4	5	-5
ڌ											
tego	Address Bridge Condition	1.0	2.0	3.0	3.0	5.0	5.0	5.0	4.0	5.0	5.0
S ×	Travel Mobility & Accessibility	1.3	4.2	2,8	4.0	4.7	4,2	4.3	3.7	3.5	3.3
ë	Compatible with Land Use	1.7	2.7	2.8	2.7	2.3	2.3	2.5	3.5	3.7	4.3
лега	Engineering	5.0	3.0	2.0	1.3	2.3	2.3	2.0	3.0	3.0	3.0
4	Environmental	4.8	5.0	5.0	3.7	3.0	3.8	3.7	3.7	3.8	4.0
	Average of the Averages	2.8	3.4	3.1	2.9	3.5	3.5	3.5	3.6	3.8	3.9



Figure 21 (Continued)
Initial Alternatives Screening Matrix

				ARKWA'			-	ARTI	ERIAL			LOCAL		KANSAS		ADD.
		NS15: McAlbur Drive Clariston	NIS 18: Parkway Option	NIS-15: Dewey Avenue Extension	NIS 21: Eculeverd Pertially, East of Tracks	NIS 22: Bouleward bash of Tracks	WS-Q7: 4-tane with intersections at Edmond & Falk Streets	NIS-23: Fiverficit with Interthenge at US-59	NIS 24: Elverfront with Spill: Interchange	NIS-01. Elevated T-Infessection	NIS-06: One-Way Pain 3rd & Hin Streets, Michel and Franklin Street.	WIS-17: One Way Pairs and & 6th Streets	NIS-84: Artemals East	NIS 10 Kansas Side from 59	NIS-20: Kansas Side from Cadi.	NIS 22 Boulevard (artinity Emmof Tracks
Addres	s Bridge Condition	-5	5	5	5	5	5	5	5	5	5	4	4	4	5	5
	Travel Time	3	2	2 1	4	11114 11	4	4	4	4	2	2	1	3	1.0	4
Travel Mobility & Accessibility	Incidents	3	3	3	2	2	2	4	3	3	2	Z	3	4	2	2
avel Mobility Accessibility	Freight Operational Conditions	1	10	4	3	3	4	4	4	3	2	2	2	3	2	3
M la	Freight Travel Time	2	4	1	- 4	3	4	-4	4	4	1	1	4-	3	-2	4
Trav	Railroad Impacts	111	5	4	-4	4	- 4	3	3.	- 4	5	4	5	14.	4	4
	Port Access	4	3	-3	4	4	5	5	5	.5	3	.3	3	3	-3	4
Se	Riverfront Access (Veh & Ped)	5.	5	.5	5	5	3	1	1	3	S	5	5	4	5	1
2	Acres of New Land in Riverfront	2	2	2	5	5	47	141	1	1	5	5	5	5	5	2
Compatible with Land Use	Downtown Revitalization	5	5	57	4	4	3	3	4	3	4	4	5	12:11	120	4
b v	Downtown Access (Veh)	1	4	-2	5	5	3	4	3	2	4	1	1	4	4	5
pati	Developable Land Downtown	5	5	5	3	3	4	4	5	4	5	-4	4	-4	5	3
	Discourages Heavy Trucks Downtown	115	11.5.11	5	2	- 4	1 - 3 <b>4</b> 1 1	11105111	nnga n	7	5	5	5 11	11.5.11	1115111	2
Engineering	Constructability	-4	4 1	74	3	3 1	1	3	3	3	5	5	5	3 1	13	g
ine	Cost	4	4	4	2	-3	3	3	-3	3	4	4	5	1	1	2
E	Maintenance	5	4	4	3	4	3	3	3	3	5	5	5	1	1	3
11 1	T & E / Wetlands	2	4	4	5	5	5	4	3	3	5	5	5	1	4.	5
重	Historic Properties	-4	4.	5	3	2	5	-4	3	5	5	3	5	3	5	3
Environmental	Public Lands	15	11.5111	5	4	1 15	4	4	3	4	5	5	5	4	2	4
viro	Floodplains	3	3	3	- 8	5	2	1 2 1	2	2	- 5	5	5	1	1	5
ᇤ	HazMat	4	3	4	T	1	3	3	3	3	4	7	5	3	.5	1
11-14	Displacements	-4	4	4	1	3	-4	- 4	4	4	-4	-3	-4	4	4	1
Š	rul note en lieu	1.50	5.6								2.6	4.0	4.0	4.0		5.0
atego	Address Bridge Condition	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	5.0	5.0
by C	Travel Mobility & Accessibility	2.3	2.5	2.3	3.5	2.8	3.8	4.0	3.8	3.8	2.5	2.3	2.5	3.3	2.3	3.5
sage	Compatible with Land Use Engineering	3.8	3.8	3.8	4.0	4.3	3.0	7.5	3.2	2.8	4.2	4.0	4.2	3.5	3.8	2.8
Averages by Categor	Environmental	4.3 3.7	4.0 3.8	4.0	3,2	3.3	2.3 3.8	3.0	3.0	3.0	4.7	3.8	5.0	2.7	3.0	3.2
	environmental	211	5.0	704	- J.L.	412	5,0	5,5	910	200		- HJ.	140	EV.	5.0	416
	Average of the Averages	3,8	3.8	3.9	3.7	3,7	3.6	3,6	3,6	3,6	4.2	3.8	4.1	3.0	3.2	3,4



tive, the double-decker bridge is removed and a two-to four-lane arterial constructed. The arterial would be constructed at grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the railroad tracks and the Missouri River, except for a section between Messanie Street and Francis Street. This alternative would require the de-designation of I-229 as interstate.

• Alternative C: Railroad Tracks East Corridor - This alternative was Initial Alternative NIS-21 Boulevard East of Tracks. In this alternative, the double-decker bridge is removed and is replaced with a new fourlane boulevard constructed at-grade (elevated as necessary for compliance with floodplain and storm requirements) east of the railroad tracks. The new structure would connect I-229 with downtown St. Joseph via a signalized intersection at Charles and Edmond streets and ramps at St. Joseph Avenue.

This alternative would require the de-designation of I-229 as an interstate.

• Alternative D: Existing Corridor - This alternative was Initial Alternative NIS-07, 4 Lane with Intersections at Edmond & Felix Streets with slight modifications to the intersection at 4th Street, access into downtown at Edmonds Street, and interchange improvements at US Route 59. In this alternative the double-decker bridge is removed and replaced with a new four-lane arterial road constructed at-grade (elevated as necessary for compliance with floodplain and stormwater requirements) in generally the same location as the existing double-decker bridge between the railroad tracks and the Missouri River. This alternative would require de-designation of I-229 as an interstate.

Additional information for each Reasonable Alternative, including maps and aerial-based renderings have been provided in Figures 22 through 25.

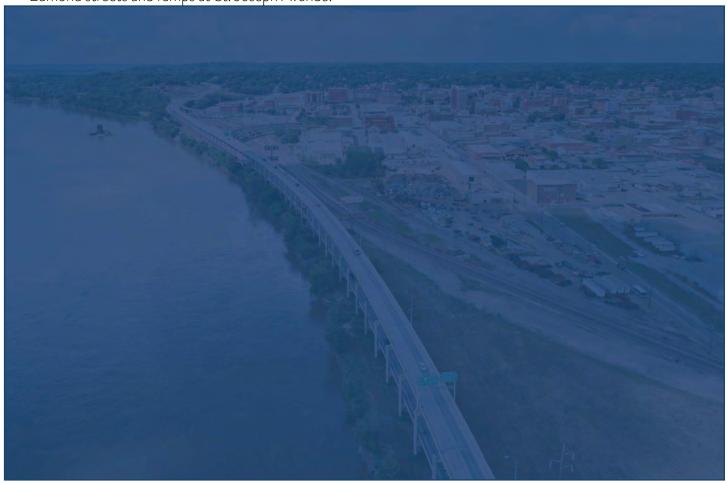




Figure 22

Reasonable Alternative A

Main Street Corridor







Figure 23
Reasonable Alternative B
2nd Street Corridor

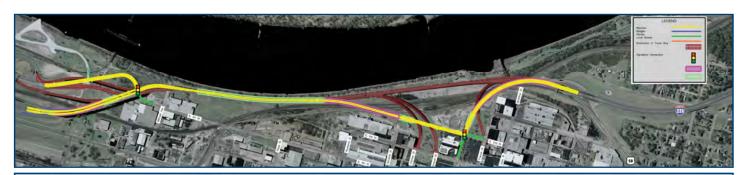






Figure 24

Reasonable Alternative C

Railroad Tracks East Corridor







Figure 25

Reasonable Alternative D

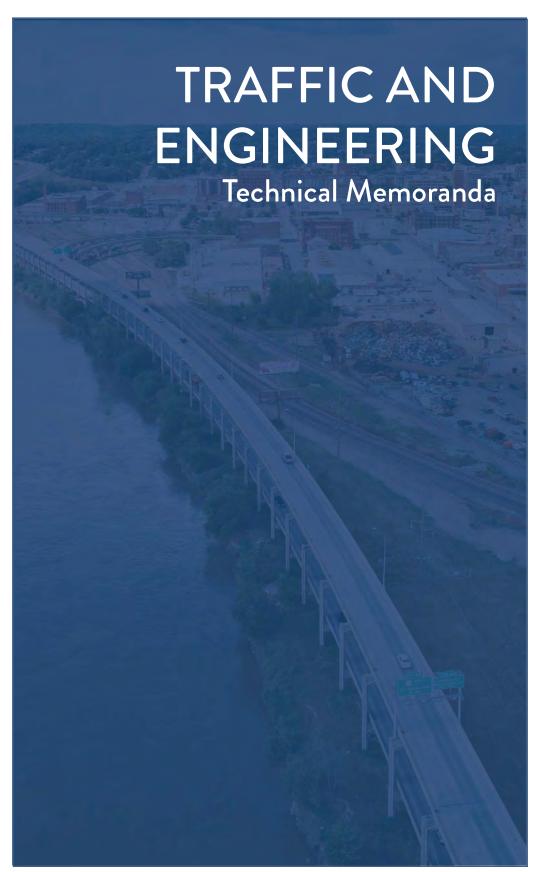
Existing Corridor













# Technical Memorandum 3

# Geotechnical Evaluation

The current I-229 double-decker bridge is located near or on the eastern bank of the Missouri River. Boring information from the existing bridge "as-built" drawings was used to develop this technical memo as was data gathered from the Missouri Geological Survey.

# 1.0 Current or Past Mining Operations

For researching past uses within the Study Area, a search of websites for St. Joseph historical mining and railroad use was conducted. Using these databases, no references were found for any historical mines near downtown St. Joseph or along the current alignment. Instead, information on active or historical mines was obtained from the Missouri Geological Survey website.

From a review of the historical mining data, there are several sand and gravel mine locations around downtown St. Joseph, but all of these were surface operations. Figure 1 shows an aerial image of where the four surface mines were located. Additional details for each of the four mine locations have been provided in Figures 2 - 5 and include the following available details:

- Previous Operations. Not currently in operation, a sand and gravel mine was located near the intersection of Francis and Main Streets, a second one south of the intersection of Vine and Locust Streets, and a third north of U.S. 36 on South 8th Street.
- Current Operations. The only sand and gravel mine that appears to be currently operating is located just south of U.S. 36 along the Missouri River.
- Deep Mines. There is no recorded history of deep mining operations in the area, such as coal or other minerals.

Since the bridge is located adjacent to the railroad, potential mining activities may be discovered near

facilities constructed along the rail line. However, a search of railroad uses did not provide any information on mining facilities.

# 2.0 Geotechnical Data

Boring information from the existing bridge plans provides a good profile of the geology along this corridor as shown in **Table 1**. Prior to design and construction additional geotechnical investigations would be prudent. The boring logs from the existing bridge drawings can be provided upon request.

Based on this information, there appears to be approximately 50 to 70 feet of sand and clay layers comprising the overburden. Below this, shale and limestone layers are present. In many borings, a layer of cobble/boulders is found just above the shale or limestone layer.

The available geotechnical information informs the development of alternatives in the following ways:

- Structural Considerations. The existing bridge foundations utilize steel H-piling founded on these rock layers. For future bridge construction, deep foundations would be required with typical bridge span configurations requiring either drilled shafts or footings supported on steel or concrete piling.
- Roadway Considerations. Based on the information provided in the existing bridge plans, the typical soil layers are sand and clay. Weak layers that would require undercutting or soil improvement methods are not apparent.

# 3.0 Reasonable Alternatives Analysis

The location of the four surface mines were compared to the layouts of each of the four Reasonable Alternatives to determine whether any of the proposed alternatives would impact a known mine locations. There are not any deep mines and the only currently operational



Figure 1
Recorded Surface Mines in and around the Study Area

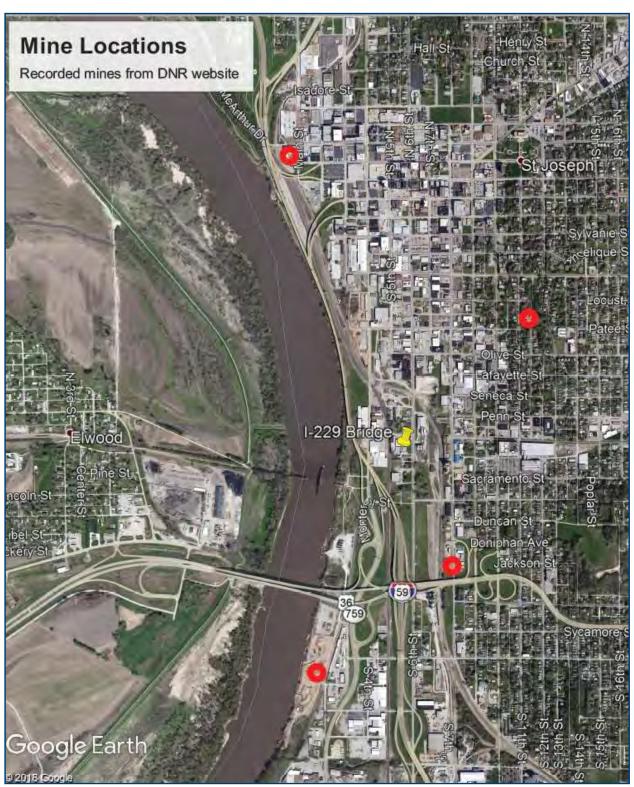




Figure 2

Surface Mine Location: Main Street and Francis Street Intersection

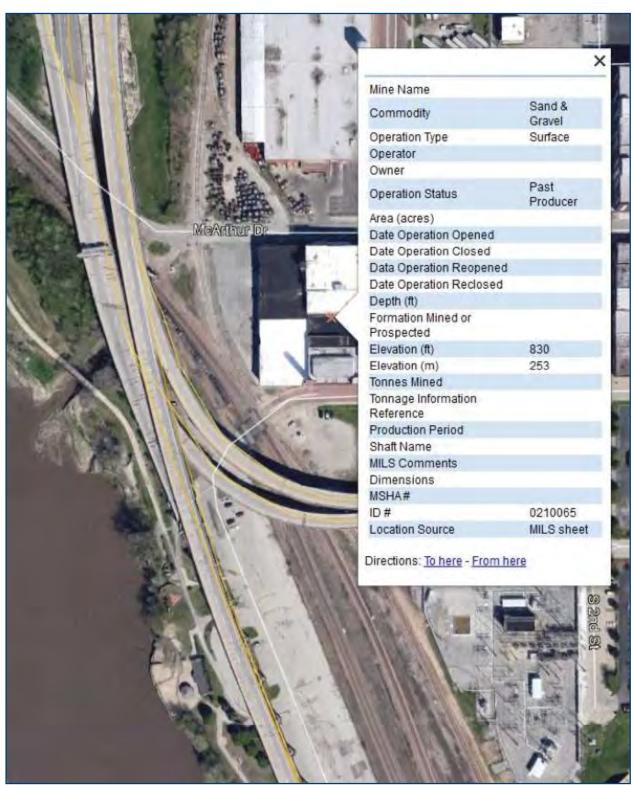




Figure 3

Surface Mine Location: Vine Street and Locust Street Intersection

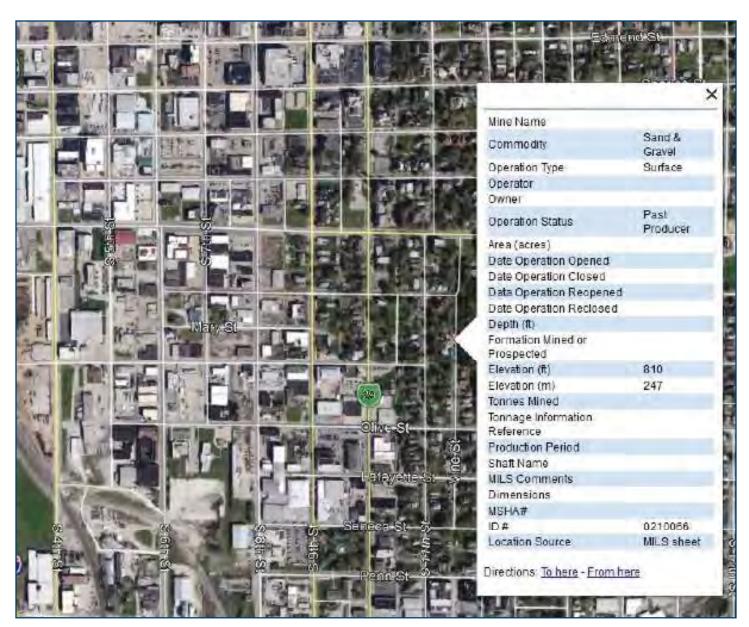




Figure 4
Surface Mine Location: South of U.S. 36
along the Missouri River

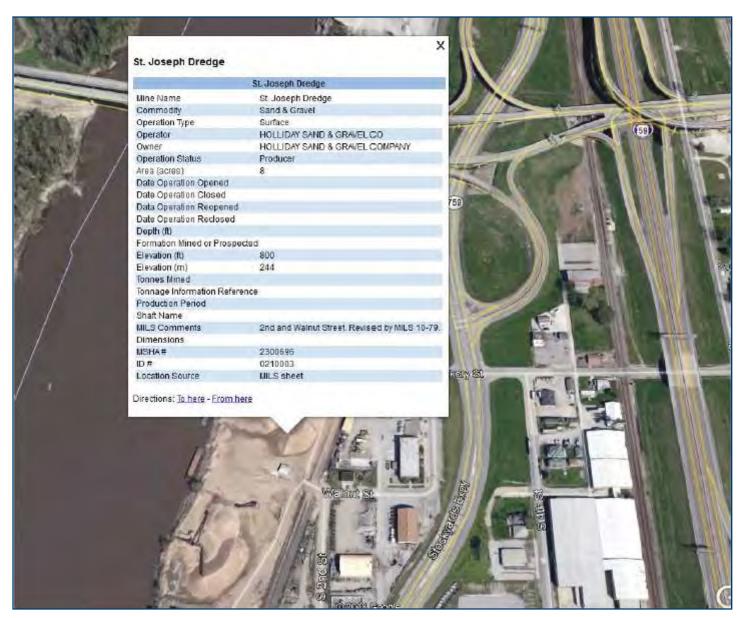




Figure 5
Surface Mine Location: South 8th Street north of U.S. 36



Source: Department of Natural Resources (DNR) Website for Recorded Mines. Aerial imagery by Google Maps.



# Table 1 Geotechnical Data for Existing Double-decker Bridge

Location	Geotechnical Layers and Elevations
End Bent 1 – Bent 9	Existing Ground Elev. 832 Medium sand, Clay, fine dense sand layers Elev. 832 – Elev. 770 Shale layer Elev. 770 – Elev. 755
Bent 10 – Bent 17	Existing Ground Elev. 824 Medium sand, Clay, fine dense sand layers Elev. 824 – Elev. 760 Shale/Limestone layers Elev. 760 – Elev. 740
Bent 18 – Bent 45	Existing Ground Elev. 822 Sand layers Elev. 822 – Elev. 760 Shale/Limestone layers Elev. 760 – Elev. 740
Bent 46 – Bent 75	Existing Ground Elev. 818 Sand layers Elev. 818 – Elev. 755 Shale/Limestone layers Elev. 755 – Elev. 735
Bent 76 – Bent 85	Existing Ground Elev. 825 Clay layers Elev. 825 – Elev. 755 Shale/Limestone layers Elev. 755 – Elev. 740
Bent 86 – End Bent 95	Existing Ground Elev. 825 Clay layers Elev. 825 – Elev. 780 Sand layers Elev. 780 – Elev. 755 Shale/Limestone layers Elev. 755 – Elev. 735
Ramp E-N, N-E	Existing Ground Elev. 826 Clay layers Elev. 826 – Elev. 792 Sand layers Elev. 792 – Elev. 765 Shale layers Elev. 765 – Elev. 748
Ramp S-E, E-S	Existing Ground Elev. 825 Sand layers Elev. 825 – Elev. 755 Shale/Limestone layers Elev. 755 – Elev. 747
Ramp N-SY, SY-N	Existing Ground Elev. 825 Clay layers Elev. 825 – Elev. 780 Sand layers Elev. 780 – Elev. 750 Shale/Limestone layers Elev. 750 – Elev. 737

Source: MoDOT As-Built Drawings

mine is located south of the Study Area. The only mine location within close proximity of any of the alternatives is the abandoned sand and gravel surface mine located at Main Street and Felix Street (Figure 2). There is a current building at that location and none of the Reasonable Alternatives are expected to impact that site.

#### References

- Missouri Geological Survey GeoSTRAT program
- Missouri Geological Survey Industrial Mines web tool
- Existing MoDOT As-Built Drawings (Bridge A2255)



# Technical Memorandum 4

# Traffic Study

# 1.0 Traffic Methodology

Described in this section is the methodology used to convert the existing (2018) traffic counts into the origin and destination volumes used for the Existing VIS-SIM models as well as the methodology for developing the forecast volumes for the No-Build and proposed Reasonable Alternatives. For this analysis, the VISSIM micro-simulation traffic model (ptvgroup.com) was used to develop existing and future traffic measures.

To determine the existing traffic volumes and routing of that traffic, two data sources were used:

- MoDOT/Metropolitan Planning Organization (MPO) Data. Missouri Department of Transportation's (MoDOT) 2018 traffic counts which were available online (retrieved February 2019), also supplemented from MPO data via Hg Consult, Inc., on February 26th, 2018.
- Streetlight Data. The StreetLight Data (SLD) was used to determine the routing splits between the origins and destinations (O/D's) in the Study Area.

A map showing the O/D's for the Study Area used in the existing model can be seen in Figure 1. These O/D's were found independently for cars/all vehicles using SLD's location-based services data source and for trucks using their navigation GPSs commercial vehicles' data. This data was the average annual daily traffic (AADT) from November 2016 to October 2017 as this was the most recent full-year data available at the time of the study. The cars/all vehicle data was retrieved from SLD on February 6, 2019 and the truck data was retrieved on March 5, 2017. While SLD's calibration option was used as the main data source, MoDOT's traffic counts were used to post process and further calibrate the traffic data as the SLD volumes varied significantly enough from the provided MoDOT counts

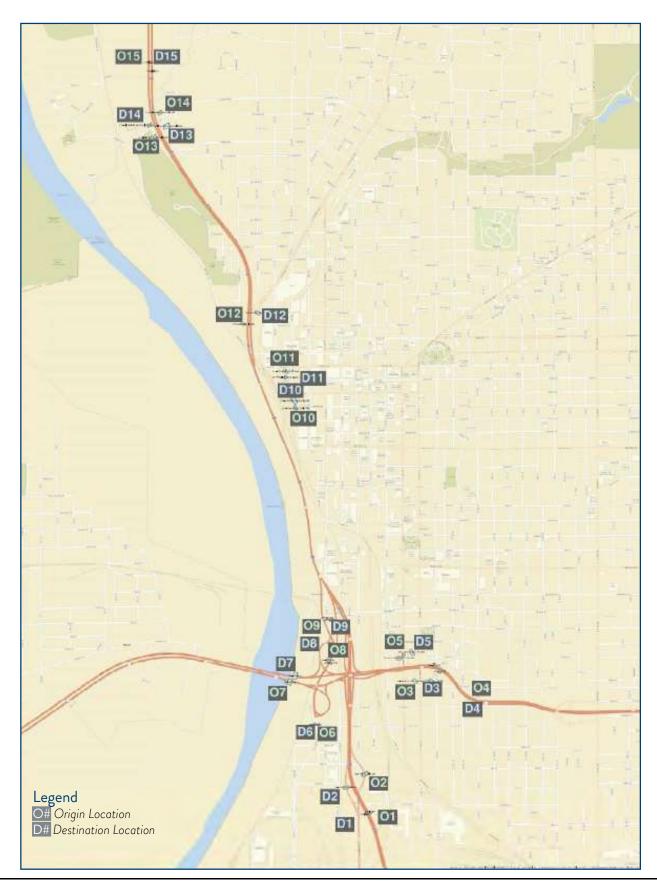
that the extra confidence gained by post processing was applied.

The methodology for developing the VISSIM inputs followed these steps:

- Initial O/D Matrix. Created the initial AADT O/D matrix from SLD's information. The SLD data allowed the creation of a matrix of the AADT between each O/D pair illustrated in Figure 1.
- 2. Balance with Traffic Counts. Generated the traffic count balanced AADT O/D matrix. The MoDOT/ MPO counts were then applied to each O/D and the ratio used to calibrate the initial AADT matrix in step 1 by:
  - Multiplying each column in the matrix by the ratio of the MoDOT/MPO count at the destination to the SLD traffic volume at the destination.
  - Repeating the process for the origin volumes.
- 3. Final O/D Matrix. Manually calibrated to develop a final calibrated AADT O/D matrix. After the counts were balanced at the O/D locations in step 2, counts were reviewed for internal links that would be part of the route for multiple O/D pairs. Some small routing adjustments were made to ensure that the model volumes aligned with these internal count locations as well. More information on the count locations used can be found in the existing model calibration section.
- 4. Peak Hour Traffic. Generated Peak Hour traffic volume inputs for cars and trucks. Based on the data from the MoDOT/MPO counts (as seen in the example images in Figure 2) the AM peak hour and PM peak hour volumes were used to determine the K-factor for each period and a single truck percentage for all time periods was determined for



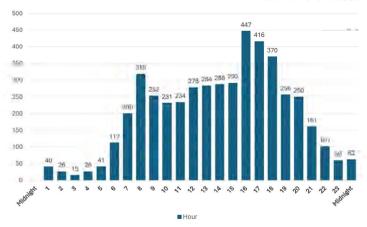
Figure 1
Origin and Destination Pairs



# Example of MoDOT Traffic Data



US 59 N	Quantity
AADT	4762
AAWDT	4967
Motorcycle Volume	8
Passenger Car Volume	3229
PU/Panel Truck Volume	1120
Bus Volume	13
Single Unit Truck Volume	163
Comb Semi Trailer Volume	227



each origin. In the context of this project "truck" is used to mean all heavy vehicles reported by Mo-DOT: panel trucks, buses, single unit trucks and combined semi-truck/trailers. These factors were multiplied by the daily AADT O/D matrix to determine the total origin volumes for cars and trucks during the AM and PM peak.

- 5. Route Traffic. Determined specific routing for AM and PM cars and trucks. Once the origin volumes for each time-period vehicle combination were determined, the SLD data was re-used to pull the specific routing for trucks and cars in the AM and the PM periods. Those routing percentages were then used to determine the O/D routing for the cars and trucks during the AM and PM peak.
- 6. Clean the Data. The SLD data, either through error or by capturing unorthodox driving decisions, recorded a small percentage of O/D pairs that were not possible on the modeled roadway network. These O/D pairs were zeroed out.

# 2.0 Future Traffic Projections

The future traffic projections are based on two primary components: the expected growth rate of traffic between existing year traffic (2018) and design year traffic (2040) and the change in traffic routing due to the different route options available in each Reasonable Alternative. Background traffic growth was based on the provided MoDOT/MPO traffic data while the route diversion was based on the regional travel demand model which was run in TransCAD by AECOM. The travel demand model was run for daily volumes without any time-of-day or vehicle-type information, so the

K factors and truck percentages were held constant to existing conditions.

The three volume forecasts developed were:

- 2040 No-Build. This only included the base traffic growth from MoDOT of 11.6% overall growth. All the roadway connections and traffic routing stayed the same and the origin volumes were all increased by 11.6%
- 2040 Build (Reasonable Alternatives A-D). This
  forecast was used for all four Reasonable Alternatives. In this scenario, additional traffic was added
  from the I-229 closure to 10th Street and 4th
  Street and the appropriate intermediary roadways
  accordingly.

# 3.0 Existing VISSIM Traffic Model (2019)

The existing VISSIM traffic model was created using the calibrated volumes from the origin-destination matrix produced by Burns & McDonnell using several data sources. Model calibration was achieved using the GEH (Geoffrey E. Havers) calculation for the expected roadway volumes to the VISSIM output volumes at the origin locations. Queue data from typical traffic in the area available from Google maps was matched to the VISSIM visual queuing. Google maps travel times were pulled to compare to the VISSIM travel times for specific routes of interest.

The GEH Equation (Figure 3) is used to compare traffic counts and model volumes outputs. Based on FHWA Traffic Modeling Calibration, paragraph 5.3.2, the objective is to satisfy the GEH < 5.0 for > 85% of cases.



#### 3.1 Volume Comparison

To assist in understanding locations noted throughout the remainder of this document, reference numbers have been added to each location (i.e, 43: Eastbound Hwy 36 represents a point on eastbound US Route 36 referenced with the number 43), to assist in understanding the exact location. Figure 4 lists all of the numeric locations referenced in this report.

A comparison of volumes from the O/D matrix and VISSIM output was performed for each peak hour. Table 1 shows the volume comparison for the AM and PM existing peak. The GEH statistic was used to determine calibration of the VISSIM volume outputs to the O/D matrix. The GEH statistic was below 10.0 at all locations. A GEH statistic above 5.0 suggests investigation may be required while a GEH above 10.0 suggests improper model calibration.

#### 3.2 Speed Comparisons

VISSIM average vehicle speed outputs were recorded to ensure accurate portrayal of vehicle speeds through the I-229 corridor. Table 2 shows vehicular speeds recorded through the AM and PM peak hours.

# 3.3 Traffic Signal Performance

VISSIM vehicular queue and delay outputs were recorded to ensure accurate portrayal of traffic signal performance. Traffic signal performance metrics were recorded via nodal and queue analysis points within VISSIM. Table 3 shows movement queue and delay results for each signalized intersection and Table 4 shows queue locations of interest results.

#### 3.4 Travel Times

VISSIM travel times were evaluated using the travel time metric to pull travel times from the routes of interest below noted in **Tables 5** and **6**. The travel times were compared to the Google maps expected times for the same peak hours. The Google times are estimated to the nearest minute. The travel time comparisons are within expected ranges.

# 3.5 Visual Queuing

Existing queuing locations below were evaluated from the Google maps speed slow down locations for a typical day for the AM and PM peaks. This method provides an idea of where queuing issues arise to calibrate the Existing VISSIM model. Figure 5 shows the comparison for the AM and PM peaks between the Google maps and the VISSIM visual outputs.

# 3.6 Existing Conditions Conclusion

The I-229 existing conditions roadways were analyzed to determine areas of concern on the roadway network in terms of queuing and congestion for the AM and PM peak hours. Through VISSIM analysis, the existing roadway shows no significant queuing or delay at any signal location.

#### 4.0 2040 No-Build VISSIM Traffic Model

The No-Build model was created using the calibrated volumes from the O/D matrix produced by Burns & McDonnell. In this analysis the No-Build alternative looks at the I-229 double-decker bridge remaining operational as a basis for comparison for future alternatives. Several data sources were used with an applied background growth. Model calibration was achieved using the GEH calculation for the expected roadway volumes to the VISSIM output volumes at the origin locations. Google Maps travel times were pulled to compare to the VISSIM travel times for specific routes of interest.

# 4.1 Traffic Volume Comparison

A comparison of volumes from the O/D matrix and VISSIM output was performed for each peak hour. Table 7 shows the volume comparison for the AM and PM 2040 No-Build peak. The GEH statistic was used to determine calibration of the VISSIM volume outputs to the O/D matrix. The GEH statistic was below 10.0 at all locations. A GEH statistic above 5.0 suggests investigation may be required while a GEH above 10.0

Figure 3 **GEH Equation** 

$$GEH = \sqrt{\frac{2(M-C)^2}{M+C}}$$

Where: M = Model output volume

C = Real traffic count



Figure 4

Data Collection Locations

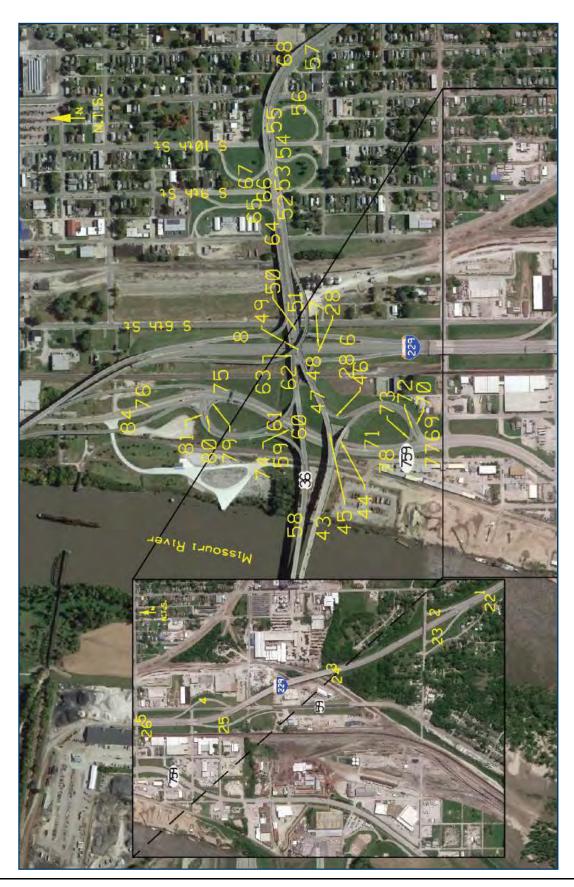


Table 1

Existing Conditions Volume Calibration - GEH



	AM Peak			PM Peak		
	Volu	lumes		Volumes		CELL
Location	Forecast	VISSIM	GEH	Forecast	VISSIM	GEH
1: NB I-229	201	201	0	121	122	0.09
4: NB I-229 on-ramp 6th St	338	336	0.11	441	441	0
14: NB I-229 on-ramp from 2nd St	22	23	0.21	74	73	0.12
20: NB I-229 on-ramp at Highland Ave	11	11	0	30	29	0.18
33: SB I-229 on-ramp from 3rd St	87	86	0.11	198	198	0
37: SB I-229 on-ramp from Hwy 59	375	379	0.21	329	331	0.11
39: SB I-229 off-ramp from Highland Ave	79	82	0.33	87	89	0.21
42: SB I-229	223	219	0.27	172	169	0.23
43: EB Hwy 36	528	531	0.13	768	766	0.07
54: EB Hwy 36 on-ramp from 9th St	50	48	0.29	66	64	0.25
65: WB Hwy 36 on-ramp from 9th St	86	87	0.11	108	110	0.19
68: WB Hwy 36	528	528	0	1015	1012	0.09
69: NB Hwy 759	304	304	0	580	578	0.08
84: SB Hwy 759	35	33	0.34	37	36	0.17

suggests improper model calibration.

# 4.2 Speed Comparisons

VISSIM average vehicle speed outputs were recorded to ensure accurate portrayal of vehicle speeds through the I-229 corridor. **Table 8** shows vehicular speeds recorded through the AM and PM peak hours.

# 4.3 Traffic Signal Performance

VISSIM vehicular queue and delay outputs were recorded to ensure accurate portrayal of traffic signal performance. Traffic signal performance metrics were recorded via nodal and queue analysis points within VISSIM. Table 9 shows movement queue and delay results for each signalized intersection and Table 10 shows locations of added interest queue results.

#### 4.4 Travel Times

VISSIM travel times were evaluated using the travel time metric to pull travel times from the routes of interest noted in Tables 11 and 12. The travel times were compared to the Google Maps expected times for the same peak hours. The Google times are estimated to

the nearest minute. The travel time comparisons are within expected ranges and showed increased travel time compared to the existing model.

#### 4.5 2040 No-Build Conclusion

The I-229 2040 No-Build conditions roadways were analyzed to determine areas of concern on the roadway network in terms of queuing and congestion for the AM and PM peak hours. Through VISSIM analyses, the No-Build 2040 roadway shows no significant queuing or delay at any signal locations.



Table 2
Existing Conditions VISSIM Results: Speeds

	VISSIM		
	Speed (mph)		
Location	AM	PM	
1: NB I-229	70.56	70.25	
2: NB I-229 off-ramp Lake	0.00	0.00	
3: NB I-229	55.74	55.37	
4: NB I-229 on-ramp 6th St	54.83	54.72	
5: NB I-229 North of Oak St	54.36	54.33	
6: NB I-229 off-ramp to US 36	39.41	38.83	
7: NB I-229 at US 36	55.33	55.18	
8: WB US 36 off-ramp to US 36	N/A	N/A	
9: NB I-229 Upper Level	51.69	49.92	
10: NB I-229 on-ramp from Hwy 759	42.59	42.18	
11: NB I-229 Upper Level	51.17	49.88	
12: NB I-229 off-ramp at 3rd St	44.00	43.92	
13: NB I-229 Upper Level	50.55	49.34	
14: NB I-229 on-ramp from 2nd St	31.14	31.14	
15: NB I-229	48.20	46.14	
16: NB I-229 off-ramp to Hwy 59	47.73	46.52	
17: NB I-229	50.70	50.15	
18: NB I-229 off-ramp at Highland Ave	42.24	42.41	
19: NB I-229 at Highland Ave	50.54	49.93	
20: NB I-229 on-ramp at Highland Ave	45.80	45.75	
21: NB I-229	64.32	63.69	
22: SB I-229	68.82	68.95	
23: SB I-229 on-ramp at Lake Blvd	0.00	0.00	
24: SB I-229 at Railroad	54.95	55.16	
25: SB I-229 off-ramp Atchison St	40.30	39.17	
26: SB I-229 at Oak St	51.67	50.81	
27: SB I-229 on-ramp from Hwy 36	N/A	N/A	
28: SB I-229 at US 36	55.12	55.11	
29: SB I-229 on-ramp Hwy 36	28.13	28.08	
30: SB I-229	54.23	54.15	
31: SB I-229 off-ramp from 759	42.21	42.39	
32: SB I-229	54.42	54.51	

	VISSIM		
	Speed (mph)		
Location	AM	PM	
33: SB I-229 on-ramp from 3rd St	40.60	40.64	
34: SB I-229	54.78	54.87	
35: SB I-229 off-ramp to 2nd St	45.05	45.10	
36: SB I-229	52.12	52.22	
37: SB I-229 on-ramp from Hwy 59	44.79	44.81	
38: SB I-229	55.10	55.20	
39: SB I-229 off-ramp from Highland Ave	45.13	45.16	
40: SB I-229 at Highland Ave	69.74	69.95	
41: SB I-229 off-ramp at Highland Ave	65.92	65.10	
42: SB I-229	70.73	70.91	
43: EB Hwy 36	54.09	53.46	
44: WB Hwy 36 off-ramp to Hwy 759	34.61	34.46	
45: EB Hwy 36	49.20	46.23	
46: EB Hwy 36 on-ramp from Hwy 759	33.25	32.59	
47: EB Hwy 36	31.99	26.70	
48: SB I-229 on-ramp from Hwy 36	17.01	16.60	
49: EB Hwy 36	32.93	33.31	
50: NB I-229 left turn to WB Hwy 36	16.51	16.49	
51: NB I-229 right turn to EB Hwy 36	14.98	15.08	
52: EB Hwy 36	47.54	45.55	
53: EB Hwy 36	49.63	47.26	
54: EB Hwy 36 on-ramp from 9th St	28.66	28.28	
55: EB Hwy 36	48.34	45.58	
56: EB Hwy 36 off-ramp to 10th St	21.03	20.99	
57: EB Hwy 36	52.90	51.66	
58: WB Hwy 36	52.67	52.54	
59: NB Hwy 759 on-ramp to Hwy 36	33.22	33.23	
60: WB Hwy 36	50.17	49.83	
61: WB Hwy 36 off-ramp to Hwy 759	28.98	28.56	
62: WB Hwy 36	40.52	40.25	
63: WB Hwy 36 left turn to SB I-229	12.98	12.80	
64: WB Hwy 36	43.78	42.32	



# Table 2 (Continued)

# Existing Conditions VISSIM Results: Speeds

	VIS	SIM
	Speed	(mph)
Location	AM	PM
65: WB Hwy 36 on-ramp from 9th St	28.60	28.46
66: WB Hwy 36	54.93	54.34
67: WB Hwy 36 off-ramp to 10th St	27.78	27.49
68: WB Hwy 36	55.84	55.01
69: NB Hwy 759	32.27	29.47
70: NB Hwy 759 off-ramp to EB US 36	12.95	12.71
71: NB Hwy 759	34.79	33.59
72: Hwy 36 off-ramp to SB Hwy 759 LT	18.13	17.92
73: Hwy 36 off-ramp to NB Hwy 759 RT	31.32	30.79
74: NB Hwy 759	37.53	36.86
75: NB Hwy 759 off-ramp to WB US 36 Lt	13.51	13.49
76: NB Hwy 759	39.33	39.44
77: SB Hwy 759	31.22	28.80
78: SB Hwy 759	32.45	29.13
79: SB Hwy 759 on-ramp from WB US 36 Rt	12.63	12.52
80: NB Hwy 759 on-ramp from WB US 36 Lt	11.79	11.95
81: SB Hwy 759 off-ramp to WB US 36 Rt	14.25	14.26
82: SB I-229 off-ramp to WB US 36	30.83	30.82
83: SB I-229 off-ramp to SB Hwy 759	15.63	15.55
84: SB Hwy 759	35.63	35.09



Table 3
Existing Conditions VISSIM Results Signal Nodes

			AM	Peak			AM	Peak	
Signalized			Queue	Length	Delay		Queue	Length	Delay
Intersections	Movement	Volume	Max (ft)	Avg (ft)	(sec)	Volume	Max (ft)	Avg (ft)	(sec)
	WBR	0	201	34	0	0	270	55	0
	WBT	93	201	34	22.06	83	270	55	33.6
US 36 & I-229	NBR	154	201	34	23.1	190	270	55	34.41
	EBL	127	121	6	17.97	229	210	13	25.96
NS 3	WBT	271	121	6	6.36	488	210	13	7.93
	EBT	431	226	31	19.08	706	476	84	27.23
	Total	1076	-	-	16.58	1696	-	-	22.62
65	SBT	276	172	9	8.13	346	211	15	9.65
my 75	SBL	0	172	9	0	0	211	15	0
Eastbound US 36 & Hwy 759	NBT	146	127	5	7.49	277	181	11	9.69
JS 36	NBR	158	72	0	0.64	300	125	2	1.81
) pur	WBL	77	184	7	14.51	108	203	11	15.03
Istbou	WBR	98	70	0	0.46	139	134	1	0.71
ıй	Total	755	-	-	6.09	1170	-	-	7.08
	EBR	99	99	0	0.78	177	115	1	1.04
	EBL	6	62	2	36.06	8	96	2	37.99
, 759	SBT	25	82	3	12.82	26	85	3	15.16
¥ I	SBR	8	82	3	15.84	9	85	3	18.08
Westbound US 36 & Hwy 759	NBT	35	116	8	1.02	56	168	15	0.89
SUb	NBL	33	116	8	33.1	64	168	15	31.24
ounoq	Free SBL	90	285	8	4.58	87	270	10	5.1
West	SBT	153	333	28	24.41	147	311	31	28.04
	SBL	0	333	28	0	0	311	31	0
		449	-	-	13.4	574	-	-	13.34



Table 4
Existing Conditions VISSIM Results:
Queues of Interest

	Queue Length				
	А	M	PM		
Location	Max (ft.)	Avg (ft.)	Max (ft.)	Avg (ft.)	
NB Right Turn I-229 to US 36	198	30	267	51	

Table 5

Existing Conditions VISSIM Results: Travel Times AM Peak

	AM Peak						
Location	Travel Time (sec)	Travel Time (min:sec)	Distance	Google			
1: NB I-229 to EB US 36	130	02:10	1.51	3:00			
2: WB US 36 to SB I-229	138	02:18	1.54	3:00			
3: WB US 36 to WB US 36	53	00:53	0.71	2:00			
4: EB US 36 to SB I-229	111	01:51	1.37	2:00			
5: NB I-229 to WB US 36	122	02:02	1.42	3:00			
6: EB US 36 to EB US 36	71	O1:11	0.74	2:00			

Table 6

Existing Conditions VISSIM Results: Travel Times PM Peak

	AM Peak					
Location	Travel Time (sec)	Travel Time (min:sec)	Distance	Google		
1: NB I-229 to EB US 36	142	02:22	1.51	3:00		
2: WB US 36 to SB I-229	142	02:22	1.54	3:00		
3: WB US 36 to WB US 36	56	00:56	0.71	2:00		
4: EB US 36 to SB I-229	117	01:57	1.37	2:00		
5: NB I-229 to WB US 36	134	02:14	1.42	3:00		
6: EB US 36 to EB US 36	81	01:21	0.74	2:00		



Figure 5

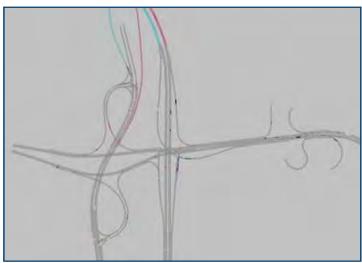
Google Maps vs. VISSIM Output:

Queue Outputs for AM/PM Peaks

AM Peak - Google Maps



AM Peak - VISSIM Queue Output



PM Peak - Google Maps



PM Peak - VISSIM Queue Output

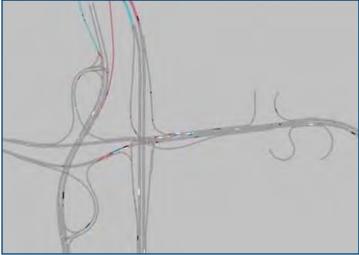




Table 7
No-Build 2040 Volume Analysis - GEH

		AM Peak		PM Peak			
	Vol	umes	CELL	Volu	CELL		
Location	Forecast	VISSIM	GEH	Forecast	VISSIM	GEH	
1: NB I-229	199	200	0.07	119	121	0.18	
4: NB I-229 on-ramp 6th St	352	351	0.05	455	458	0.14	
14: NB I-229 on-ramp from 2nd St	25	25	0	85	84	0.11	
20: NB I-229 on-ramp at Highland Ave	12	12	0	33	32	0.18	
33: SB I-229 on-ramp from 3rd St	99	98	0.1	226	228	0.13	
37: SB I-229 on-ramp from Hwy 59	428	430	0.1	367	379	0.62	
39: SB I-229 off-ramp from Highland Ave	89	91	0.21	99	101	0.2	
42: SB I-229	247	243	0.26	188	188	0	
43: EB Hwy 36	601	600	0.04	858	872	0.48	
54: EB Hwy 36 on-ramp from 9th St	57	55	0.27	76	75	0.12	
65: WB Hwy 36 on-ramp from 9th St	100	101	0.1	125	127	0.18	
68: WB Hwy 36	590	589	0.04	1110	1131	0.63	
69: NB Hwy 759	339	339	0	639	644	0.2	
84: SB Hwy 759	42	41	0.16	44	45	0.15	



Table 8
No-Build 2040 VISSIM Results: Speeds

	VISSIM			
	Speed	(mph)		
Location	AM	PM		
1: NB I-229	70.56	70.23		
2: NB I-229 off-ramp Lake	0.00	0.00		
3: NB I-229	55.70	55.37		
4: NB I-229 on-ramp 6th St	54.77	54.60		
5: NB I-229 North of Oak St	54.23	54.20		
6: NB I-229 off-ramp to US 36	39.03	37.71		
7: NB I-229 at US 36	55.30	55.32		
8: WB US 36 off-ramp to US 36	N/A	N/A		
9: NB I-229 Upper Level	51.49	49.67		
10: NB I-229 on-ramp from Hwy 759	42.60	42.22		
11: NB I-229 Upper Level	50.90	49.57		
12: NB I-229 off-ramp at 3rd St	44.08	43.72		
13: NB I-229 Upper Level	50.14	48.87		
14: NB I-229 on-ramp from 2nd St	31.20	31.06		
15: NB I-229	47.45	45.34		
16: NB I-229 off-ramp to Hwy 59	47.67	46.21		
17: NB I-229	50.00	49.53		
18: NB I-229 off-ramp at Highland Ave	42.37	42.49		
19: NB I-229 at Highland Ave	48.79	48.60		
20: NB I-229 on-ramp at Highland Ave	45.86	45.72		
21: NB I-229	63.38	63.00		
22: SB I-229	68.95	68.90		
23: SB I-229 on-ramp at Lake Blvd	0.00	0.00		
24: SB I-229 at Railroad	55.08	55.12		
25: SB I-229 off-ramp Atchison St	40.14	38.73		
26: SB I-229 at Oak St	51.56	50.84		
27: SB I-229 on-ramp from Hwy 36	N/A	N/A		
28: SB I-229 at US 36	55.13	55.05		
29: SB I-229 on-ramp Hwy 36	28.08	27.88		
30: SB I-229	54.10	54.07		
31: SB I-229 off-ramp from 759	42.23	42.18		
32: SB I-229	54.27	54.33		

	VISSIM			
	Speed	(mph)		
Location	AM	PM		
33: SB I-229 on-ramp from 3rd St	40.61	40.63		
34: SB I-229	54.75	54.85		
35: SB I-229 off-ramp to 2nd St	45.09	45.03		
36: SB I-229	52.05	52.11		
37: SB I-229 on-ramp from Hwy 59	44.72	44.79		
38: SB I-229	55.11	55.20		
39: SB I-229 off-ramp from Highland Ave	45.17	45.17		
40: SB I-229 at Highland Ave	69.68	69.82		
41: SB I-229 off-ramp at Highland Ave	65.86	65.12		
42: SB I-229	70.64	70.68		
43: EB Hwy 36	53.89	52.92		
44: WB Hwy 36 off-ramp to Hwy 759	34.60	34.36		
45: EB Hwy 36	48.64	43.42		
46: EB Hwy 36 on-ramp from Hwy 759	33.25	31.53		
47: EB Hwy 36	31.09	23.66		
48: SB I-229 on-ramp from Hwy 36	17.03	16.39		
49: EB Hwy 36	32.98	33.25		
50: NB I-229 Left Turn to WB Hwy 36	16.50	16.56		
51: NB I-229 Right Turn to EB Hwy 36	15.00	15.08		
52: EB Hwy 36	46.81	44.40		
53: EB Hwy 36	48.79	45.92		
54: EB Hwy 36 on-ramp from 9th St	28.43	28.04		
55: EB Hwy 36	47.49	44.33		
56: EB Hwy 36 off-ramp to 10th St	20.97	20.97		
57: EB Hwy 36	52.55	51.11		
58: WB Hwy 36	52.51	52.25		
59: NB Hwy 759 on-ramp to Hwy 36	33.16	33.27		
60: WB Hwy 36	49.89	49.18		
61: WB Hwy 36 off-ramp to Hwy 759	28.82	28.40		
62: WB Hwy 36	40.37	39.19		
63: WB Hwy 36 Left Turn to SB I-229	12.96	12.74		
64: WB Hwy 36	43.94	41.32		



# Table 8 (Continued)

# No-Build 2040 VISSIM Results: Speeds

	VIS	SIM		
	Speed (mph)			
Location	AM	PM		
65: WB Hwy 36 on-ramp from 9th St	28.64	28.49		
66: WB Hwy 36	54.86	54.16		
67: WB Hwy 36 off-ramp to 10th St	27.75	27.43		
68: WB Hwy 36	55.70	54.84		
69: NB Hwy 759	31.79	28.77		
70: NB Hwy 759 off-ramp to EB US 36	12.94	12.66		
71: NB Hwy 759	34.44	33.25		
72: Hwy 36 off-ramp to SB Hwy 759 LT	18.23	18.09		
73: Hwy 36 off-ramp to NB Hwy 759 RT	31.34	30.27		
74: NB Hwy 759	37.36	36.75		
75: NB Hwy 759 off-ramp to WB US 36 LT	13.54	13.35		
76: NB Hwy 759	38.70	39.44		
77: SB Hwy 759	30.95	28.25		
78: SB Hwy 759	32.26	28.72		
79: SB Hwy 759 on-ramp from WB US 36 RT	12.68	12.42		
80: NB Hwy 759 on-ramp from WB US 36 LT	11.72	11.92		
81: SB Hwy 759 off-ramp to WB US 36 RT	14.24	14.36		
82: SB I-229 off-ramp to WB US 36	30.53	30.35		
83: SB I-229 off-ramp to SB Hwy 759	16.43	16.33		
84: SB Hwy 759	34.33	34.00		



Table 9
No-Build 2040 VISSIM Results - Signal Nodes

			AM	Peak		AM Peak			
Signalized			Queue	Length	Delay		Queue	Length	Delay
Intersections	Movement	Volume	Max (ft)	Avg (ft)	(sec)	Volume	Max (ft)	Avg (ft)	(sec)
	WBR	0	221	41	0	0	310	66	0
	WBT	105	221	41	24.82	94	310	66	38.84
-229	NBR	173	221	41	25.22	215	310	66	37.39
US 36 & I-229	EBL	147	148	7	19.7	262	267	19	29.07
US 3	WBT	313	148	7	6.78	561	267	19	9.47
	EBT	491	287	40	20.63	796	645	135	34.28
	Total	1229	-	-	18	1928	-	-	26.92
Ø.	SBT	324	202	12	8.46	398	218	18	10.33
<sup>∿</sup> y 75	SBL	0	202	12	0	0	218	18	0
⊗ ≾	NBT	161	133	6	8.19	306	208	14	10.24
IS 36	NBR	178	80	0	0.79	338	152	3	2.19
O Pu	WBL	86	152	8	13.96	121	251	13	15.36
Eastbound US 36 & Hwy 759	WBR	108	52	0	0.37	162	128	1	1.01
Ё	Total	857	-	-	6.35	1325	-	-	7.55
	EBR	114	79	1	0.87	203	142	1	1.16
	EBL	8	67	2	38.9	9	66	3	36.3
759	SBT	31	119	4	15.53	33	129	5	17.31
Ž H	SBR	10	119	4	18.04	11	129	5	16.68
Westbound US 36 & Hwy 759	NBT	39	124	10	0.73	66	165	17	1.47
SUL	NBL	37	124	10	33.39	71	165	17	30.97
oo nu	Free SBL	99	315	15	6.86	102	322	16	8.1
Westl	SBT	178	356	37	26.33	165	367	41	30.24
-	SBL	0	356	37	0	0	367	41	0
	Total	516	-	-	14.93	660	-	-	14.29



# Table 10 No-Build 2040 VISSIM Results: Queues of Interest

	Queue Length				
	А	M	PM		
Location	Max (ft.)	Avg (ft.)	Max (ft.)	Avg (ft.)	
NB Right Turn I-229 to US 36	218	38	307	63	

Table 11
No-Build 2040 VISSIM Results: Travel Times AM Peak

	AM Peak						
Location	Travel Time (sec)	Travel Time (min:sec)	Distance	Google			
1: NB I-229 to EB US 36	134	02:14	1.51	3:00			
2: WB US 36 to SB I-229	138	02:18	1.54	3:00			
3: WB US 36 to WB US 36	54	00:54	0.71	2:00			
4: EB US 36 to SB I-229	112	01:52	1.37	2:00			
5: NB I-229 to WB US 36	125	02:05	1.42	3:00			
6: EB US 36 to EB US 36	73	01:13	0.74	2:00			

Table 12
No-Build 2040 VISSIM Results: Travel Times PM Peak

	AM Peak				
Location	Travel Time (sec)	Travel Time (min:sec)	Distance	Google	
1: NB I-229 to EB US 36	146	02:26	1.51	3:00	
2: WB US 36 to SB I-229	150	02:30	1.54	3:00	
3: WB US 36 to WB US 36	58	00:58	0.71	2:00	
4: EB US 36 to SB I-229	125	02:05	1.37	2:00	
5: NB I-229 to WB US 36	140	02:20	1.42	3:00	
6: EB US 36 to EB US 36	90	01:30	0.74	2:00	



#### No-Build O/D 5.0 Matrices

As indicated in previous sections, the origin-destination information obtained through the Streetlight data was used to help calibrate and verify the validity of the VISSIM traffic model. The information was also valuable in helping the study team understand how traffic, especially truck traffic, navigates the study corridor. The information was incorporated into various stakeholder engagement presentations and helped establish the overall project purpose and need. The data was converted into a series of density maps to help tell the story. Several of those maps have been presented here along with short descriptions of how the study team interpreted and presented the data to the public.

double-decker bridge:

Figure 6 I-229 Southbound Traffic (All Movements)

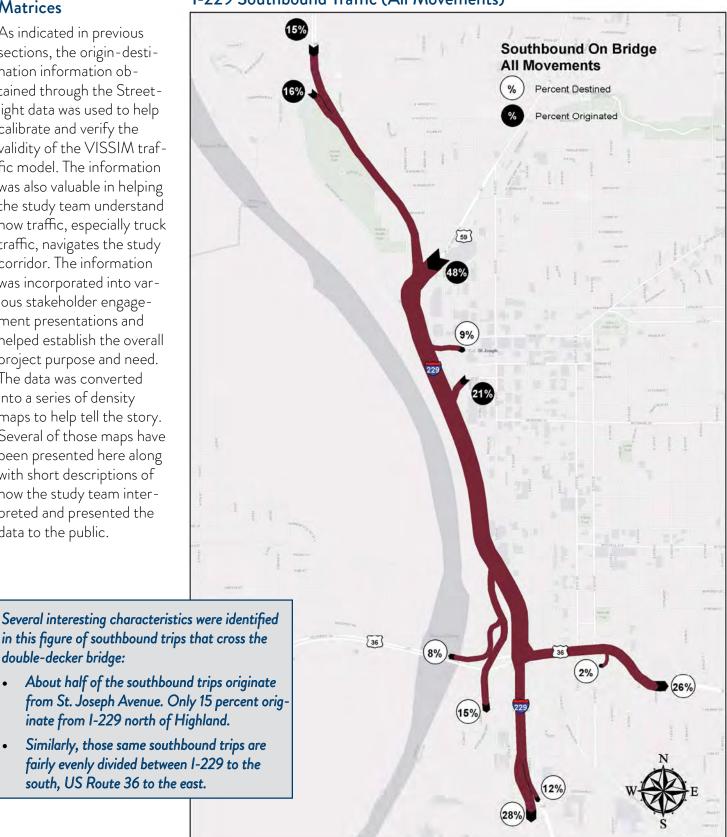




Figure 7

I-229 Northbound Traffic (All Movements)

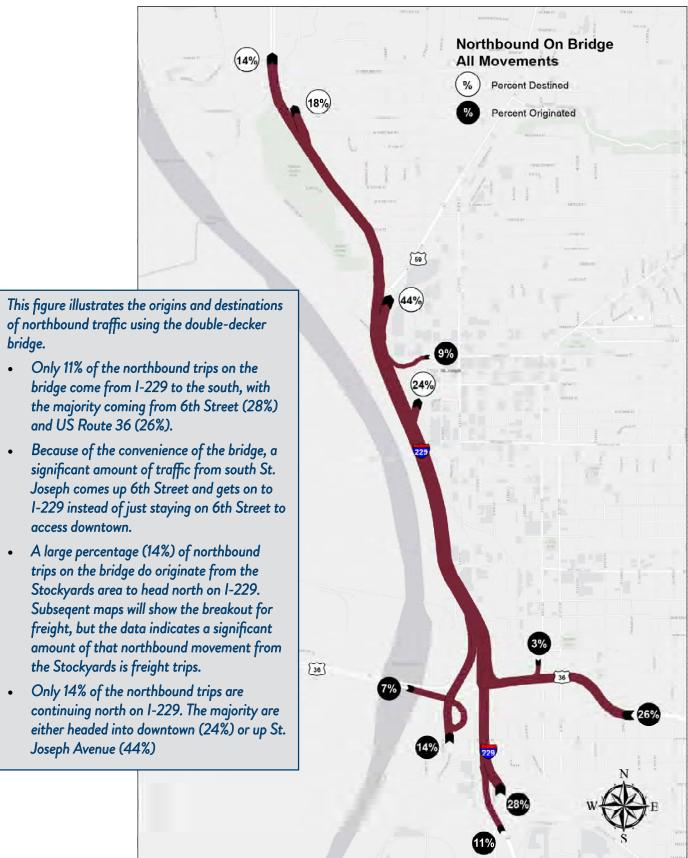




Figure 8

Commercial Movements from Stockyards

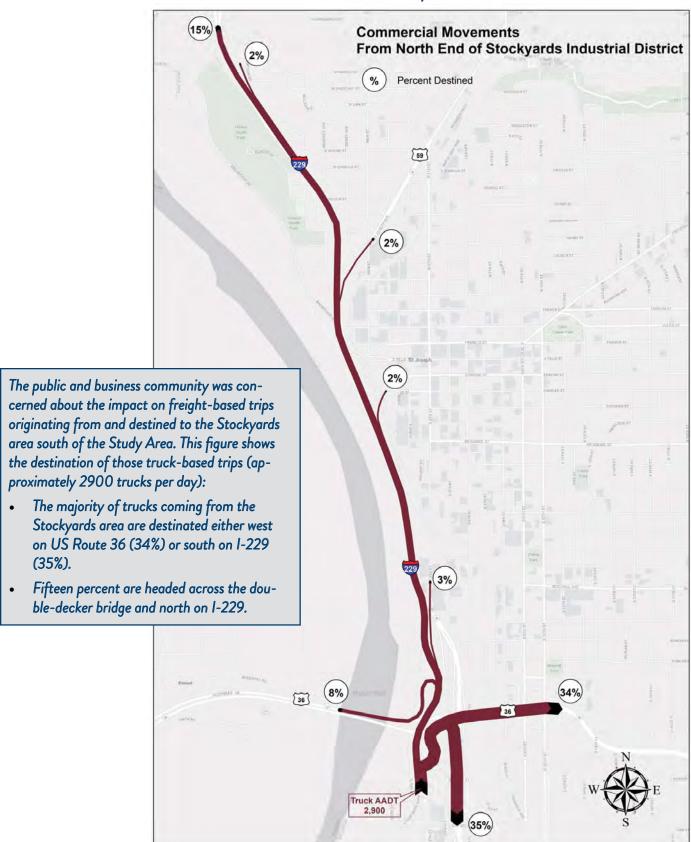
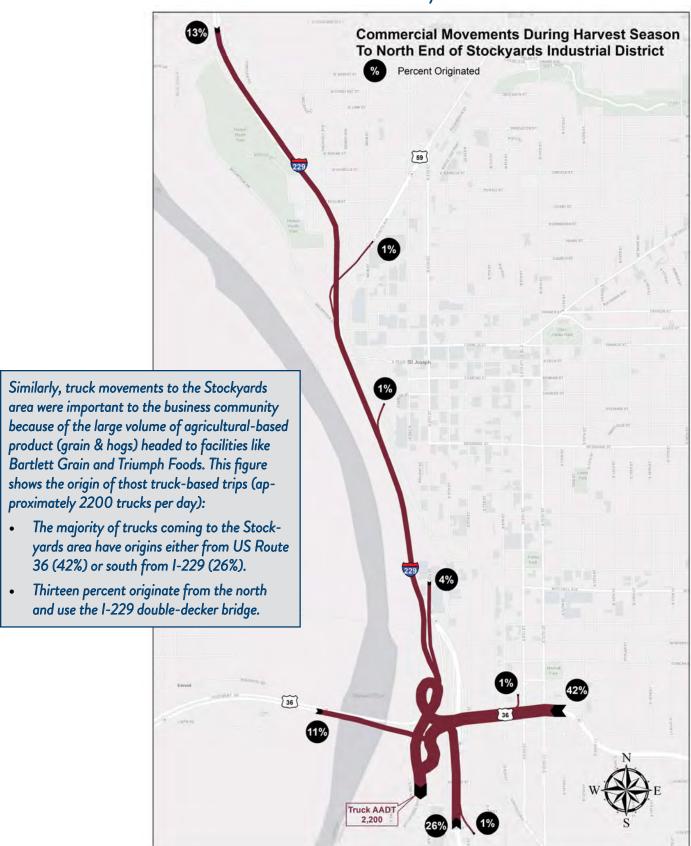




Figure 9

Commercial Movements to the Stockyards





# 6.0 MO-759/US Route 36/I-229 Interchange

Since the MO-759/US Route 36/I-229 interchange will experience the greatest traffic increase of any interchange in St. Joseph due to any of the proposed alternatives, the following analysis is focused on the this interchange. At this interchange there are strong similarities in both the geometry of the interchange as well as the traffic flows and patterns expected through the interchange for each of the Reasonable Alternatives. Therefore, the completed analysis and results are not dependent on the recommended preferred alternative.

The Reasonable Alternative traffic model was created using the calibrated volumes from the O/D matrix produced by Burns & McDonnell. Several data sources were used, with a background growth applied. More detail on the volume data can be found in a previous section. Model calibration was achieved using the GEH calculation for the expected roadway volumes to the VISSIM output volumes at the origin locations. Google Maps travel times were pulled to evaluate the VISSIM travel times for specific routes of interest.

Volume Comparison. A comparison of volumes from the O/D matrix and VISSIM output was performed for each peak hour. Table 13 shows the volume comparison for the AM and PM the Reasonable Alternative 2040 peak. The GEH statistic was used to determine calibration of the VISSIM volume outputs to the O/D matrix. The GEH statistic was below 10.0 at all locations. A GEH statistic above 5.0 suggests investigation may be required while a GEH above 10.0 suggests improper model calibration.

Speed Comparisons. VISSIM average vehicle speed outputs were recorded to ensure accurate portrayal of vehicle speeds through the I-229 corridor. Table 14 shows vehicular speeds recorded through the AM and PM peak hours.

Traffic Signal Performance. VISSIM vehicular queue and delay outputs were recorded to ensure accurate portrayal of traffic signal performance. Traffic signal performance metrics were recorded via nodal and queue analysis points within VISSIM. Table 15 shows movement queue and delay results for each signalized intersection and Table 16 shows locations of added interest queue results. It was observed the weave on US Route 36 and the on-ramp from MO-759 (Figure 6) is nearing capacity in 2040 and is showing occasional backups onto the on-ramp. Therefore, the signal at US Route 36 and I-229 required editing of timings for the eastbound through movement to have more time.

Travel Times. VISSIM travel times were evaluated using the travel time metric to pull travel times from the routes of interest noted in Tables 17 and 18. The travel times were evaluated to the existing Google Maps expected times for the same peak hours. The Google times are evaluated to the nearest minute. The travel time comparisons are within expected ranges and showed similar travel times to the No-Build 2040 metrics.

#### 7.0 Reasonable Alternatives

The I-229 Reasonable Alternatives were analyzed to determine areas of concern on the roadway network in terms of queuing and congestion for the AM and PM peak hours. Through VISSIM analysis, the Reasonable Alternatives 2040 roadway shows no significant queuing or delay at any signalized locations.





Table 13

Reasonable Alternatives:
2040 Volume Analysis - GEH

		AM Peak			PM Peak		
	Volu	Volumes		Volumes		O.E.I.	
Location	Forecast	VISSIM	GEH	Forecast	VISSIM	GEH	
1: NB I-229	221	221	0	133	135	0.17	
4: NB I-229 on-ramp 6th St	455	455	0	593	590	0.12	
43: EB Hwy 36	598	598	0	870	868	0.07	
54: EB Hwy 36 on-ramp from 9th St	74	73	0.12	99	98	0.1	
65: WB Hwy 36 on-ramp from 9th St	220	224	0.27	276	280	0.24	
68: WB Hwy 36	639	636	0.12	1230	1225	0.14	
69: NB Hwy 759	335	334	0.05	639	637	0.08	
84: SB Hwy 759	42	41	0.16	44	44	0	

Figure 6

Reasonable Alternatives: 2040 Queueing





Table 14
Reasonable Alternatives:
2040 VISSIM Results: Speeds

	VIS	SIM
	Speed	(mph)
Location	AM	PM
1: NB I-229	70.49	70.38
2: NB I-229 off-ramp Lake	0.00	0.00
3: NB I-229	55.66	55.50
4: NB I-229 on-ramp 6th St	54.66	54.36
5: NB I-229 North of Oak St	54.15	54.03
6: NB I-229 off-ramp to US 36	38.73	37.77
7: NB I-229 at US 36	55.26	55.16
22: SB I-229	69.09	69.05
23: SB I-229 on-ramp at Lake Blvd	0.00	0.00
24: SB I-229 at Railroad	55.22	55.15
25: SB I-229 off-ramp Atchison St	38.86	37.49
26: SB I-229 at Oak St	51.39	50.54
27: SB I-229 on-ramp from Hwy 36	N/A	N/A
28: SB I-229 at US 36	54.37	54.35
29: SB I-229 on-ramp Hwy 36	27.93	27.73
43: EB Hwy 36	53.91	53.12
44: WB Hwy 36 off-ramp to Hwy 759	34.60	34.35
45: EB Hwy 36	49.27	44.58
46: EB Hwy 36 on-ramp from Hwy 759	33.30	31.96
47: EB Hwy 36	32.52	23.37
48: SB I-229 on-ramp from Hwy 36	16.96	16.32
49: EB Hwy 36	24.38	25.87
50: NB I-229 left turn to WB Hwy 36	16.56	16.57
51: NB I-229 right turn to EB Hwy 36	13.62	13.69
52: EB Hwy 36	44.66	42.27
53: EB Hwy 36	47.74	43.77
54: EB Hwy 36 on-ramp from 9th St	28.13	27.96
55: EB Hwy 36	46.16	41.73
56: EB Hwy 36 off-ramp to 10th St	20.99	20.97
57: EB Hwy 36	52.13	50.13
58: WB Hwy 36	52.88	52.75
59: NB Hwy 759 on-ramp to Hwy 36	33.37	33.48

	VISSIM		
	Speed	(mph)	
Location	AM	PM	
60: WB Hwy 36	50.25	50.08	
61: WB Hwy 36 off-ramp to Hwy 759	28.93	28.46	
62: WB Hwy 36	41.46	41.30	
63: WB Hwy 36 left turn to SB I-229	12.93	12.64	
64: WB Hwy 36	42.53	37.92	
65: WB Hwy 36 on-ramp from 9th St	28.26	28.26	
66: WB Hwy 36	54.57	53.69	
67: WB Hwy 36 off-ramp to 10th St	27.71	27.31	
68: WB Hwy 36	55.59	54.69	
69: NB Hwy 759	31.80	28.84	
70: NB Hwy 759 off-ramp to EB US 36	12.92	12.67	
71: NB Hwy 759	34.60	33.38	
72: Hwy 36 off-ramp to SB Hwy 759 LT	18.34	17.85	
73: Hwy 36 off-ramp to NB Hwy 759 RT	31.48	30.27	
74: NB Hwy 759	42.22	41.92	
75: NB Hwy 759 off-ramp to WB US 36 Lt	13.65	13.37	
76: NB Hwy 759	41.41	40.27	
77: SB Hwy 759	29.03	27.09	
78: SB Hwy 759	28.48	25.79	
79: SB Hwy 759 on-ramp from WB US 36 Rt	12.80	12.56	
80: NB Hwy 759 on-ramp from WB US 36 Lt	11.96	12.08	
81: SB Hwy 759 off-ramp to WB US 36 Rt	13.09	13.18	
82: SB I-229 off-ramp to WB US 36	0.00	0.00	
83: SB I-229 off-ramp to SB Hwy 759	0.00	0.00	
84: SB Hwy 759	36.87	36.01	



Table 15
Reasonable Alternatives
2040 VISSIM Results - Signal Nodes

			AM	Peak			AM	Peak	
Signalized				Length	Delay			Length	Delay
Intersections	Movement	Volume	Max (ft)	Avg (ft)	(sec)	Volume	Max (ft)	Avg (ft)	(sec)
	WBR	0	221	34	0	0	283	63	0
	WBT	104	221	34	29.27	88	283	63	45.36
-229	NBR	0	0	0	0	0	0	0	0
US 36 & I-229	EBL	288	156	13	19.08	463	441	57	33.06
US 3	WBT	345	156	13	5.57	608	441	57	8.64
	EBT	489	298	28	23.63	802	551	116	37.54
	Total	1226	-	-	17.96	1961	-	-	27.87
60	SBT	206	139	8	8.06	303	178	14	10.21
Eastbound US 36 & Hwy 759	SBL	0	139	8	0	0	178	14	0
Ĭ ⊗	NBT	159	137	6	8.24	303	182	13	10.25
15 36	NBR	175	86	0	0.77	334	127	3	1.98
) Pur	WBL	85	174	8	14.57	119	249	13	15.75
stbou	WBR	106	74	0	0.38	158	163	1	0.97
<u>"</u>	Total	731	-	-	6	1217	-	-	7.3
66	EBR	122	73	0	0.4	212	91	0	0.7
w, y, Z,	EBL	9	62	2	26.97	17	116	4	30.87
X	SBT	84	109	5	8.18	91	134	8	11.44
Westbound US 36 & Hwy 759	SBR	69	109	5	7.76	77	134	8	10.03
) pun	NBT	227	141	10	5.35	390	204	19	6.56
estbo	NBL	36	141	10	16.16	70	204	19	17.22
Š	Total	547	-	-	6.05	857	-	-	7.29

Table 16

Reasonable Alternatives - 2040 VISSIM Results: Queues of Interest

	Queue Length					
	AM		P.	M		
Location	Max (ft.)	Avg (ft.)	Max (ft.)	Avg (ft.)		
NBR I-229 to US 36	218	30	280	59		
EBT US 36 @ I-229 Interchange	296	27	549	114		
NB MO-759 into the Roundabout	156	8	261	27		



Table 17

# Reasonable Alternatives -

2040 VISSIM Results: Travel Times AM Peak

	AM Peak				
Location	Travel Time (sec)	Travel Time (min:sec)	Distance	Google	
1: NB I-229 to EB US 36	118	01:58	1.51	3:00	
2: WB US 36 to SB I-229	140	02:20	1.54	3:00	
3: WB US 36 to WB US 36	53	00:53	0.71	2:00	
4: EB US 36 to SB I-229	113	01:53	1.37	2:00	
5: NB I-229 to WB US 36	129	02:09	1.42	3:00	
6: EB US 36 to EB US 36	79	01:19	0.74	2:00	

#### Table 18

# Reasonable Alternatives -

2040 VISSIM Results: Travel Times PM Peak

	AM Peak				
Location	Travel Time (sec)	Travel Time (min:sec)	Distance	Google	
1: NB I-229 to EB US 36	127	02:07	1.51	3:00	
2: WB US 36 to SB I-229	154	02:34	1.54	3:00	
3: WB US 36 to WB US 36	57	00:57	0.71	2:00	
4: EB US 36 to SB I-229	126	02:06	1.37	2:00	
5: NB I-229 to WB US 36	146	02:26	1.42	3:00	
6: EB US 36 to EB US 36	96	01:36	0.74	2:00	



# Technical Memorandum 5

# Traffic Safety Analysis

The purpose of this technical memorandum is to document the safety analysis performed for the I-229 Environmental Assessment (EA) in St. Joseph, MO including an evaluation of the existing crash trends/rates and completing a predictive safety analysis for each of the Reasonable Alternatives.

When the crash data was obtained for this project, MoDOT only had crash records through 2021 in the MoDOT Transportation Management System (TMS). Crash data for 2022 was not complete at the time of analysis. For this reason, the most recent crash data used was 2021.

# 1.0 Existing Crash Rates

To help better understand each Reasonable Alternative's impact on traffic safety, existing crash rates for the I-229 corridor were analyzed. To obtain the 5-year crash rate per 100 million vehicle miles traveled (HM-VMT), MoDOT's TMS system was used. This system allows for a rate to be obtained for specific routes as well as rates for similar facility types (i.e., interstates) by county, district, and state. Table 1 shows the comparison of the I-229 5-year crash rate with similar facilities.

As the numbers indicate, I-229 southbound (SB) has a higher crash rate than similar facilities in Missouri while northbound (NB) is at or slightly below the averages. It should be noted, the average annual daily traffic (AADT) on I-229 in both directions is low which, although there are few crashes, translates to a higher than expected crash rate.

# 2.0 Existing Crash Trends

To gain an understanding of the existing crash trends, crash information was obtained from TMS for 2017-2021 for the interstate and local connector routes within the Study Area.

### 2.1 I-229 Existing Crash Data

To determine if there were any concentrations of crashes along I-229, a heat map was created using the MoDOT TMS system. The heat map only portrays concentrations of crashes with no regard to AADT. The results have been graphically depicted in **Figure 1** and show concentrations of crashes near the ramps.

I-229 crash data by severity and year is shown in **Table** 2. Approximately 27% or more of the crashes involve injuries, which is higher than the statewide interstate injury average, at 22%.

In addition to analysis by severity type, an analysis of the types of crashes occurring on the interstate was performed. Table 3 shows the crash types present on the interstate during the five-year period analyzed.

Table 1
Existing Crash Rate Comparisons

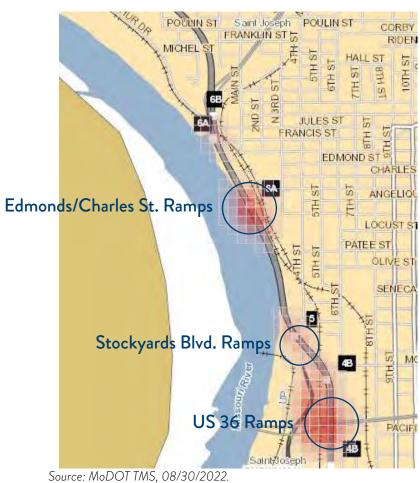
Facility Type	5-Year Rate (per HMVMT*)
Statewide Interstate	119
District Wide Interstate	67
County Wide Interstate	105
I-229 SB	163
I-229 NB	77

\*Note: HMVMT - Crashes per Hundred Million Vehicle Miles of Travel

Source: MoDOT TMS, 08/30/2022.



Figure 1
High Concentrations of Traffic Crashes on I-229



Source: MoDOT TMS, 08/30/2022. Data Date Range: 2017 - 2021.

Table 2
Number of Existing Crashes by Severity on I-229 (US 59 to US 36)

Year	Fatal	Serious Injury	Minor Injury	Property Damage Only	Total
2017	0	0	5	23	28
2018	0	1	6	22	29
2019	1	0	6	20	27
2020	0	2	11	21	34
2021	1	2	3	14	19
Total	1	5	31	100	137

Source: MoDOT TMS, 08/30/2022.



Table 3
Crashes by Type on I-229 (US 59 to US 36)

Crash Type	Total Crashes
Animal Not Deer / Dog / Farm Animal	0
Avoiding	0
Changing Lane	6
Deer	0
Dog	0
Fixed Object	1
Head On	1
Jackknife	0
Other	8
Out of Control	53
Parking or Parked Car	0
Passing	24
Pedestrian	0
Rear End	43
Sideswipe	0
U-Turn	0
Total	136

Source: MoDOT TMS, 08/30/2022. Data Date Range: 2017 - 2021.

The highest crash type is 'out of control' and it makes up approximately 39% of the crashes on the interstate. This is a higher proportion of the crashes than on other interstates within Missouri.

# 2.2 Local Road Existing Crash Data

To gain an understanding of the crashes existing on the local roadway system, TMS heat maps were obtained for downtown St. Joseph, MO within the I-229 Study Area (Figure 2). The heat maps show concentrations of crashes along US Route 36 and along 9th and 10th Streets. Limited to no clustering of crashes are found on other arterial streets, such as 4th and 6th Streets.

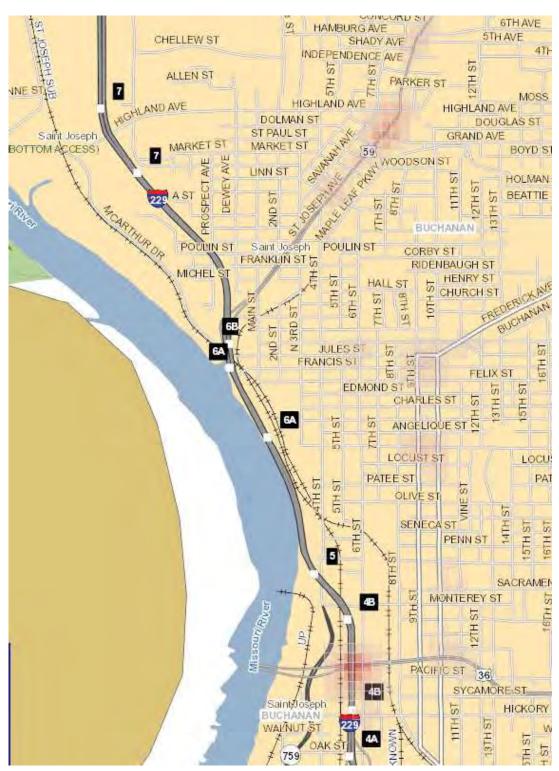
Figure 3 presents that same information in a slightly different manner. This figure shows crash location and severity for all the arterials in the Study Area. Green represents property damage only crashes, yellow are injury crashes and red are fatal crashes.

It should be noted that this is from the MoDOT crash database and may not include all crashes on the local roadways.

In addition, the crash severities (Table 4) and types (Table 5) were summarized for the Study Area. The top types of crashes are consistent with what the statewide local roadway types experience. There is a difference in the distribution of these crashes, with a higher percentage of the crashes occurring within the following areas: right angle, rear end, out of control, passing, left turn right angle collision, and parking or parked car.



Figure 2
High Concentrations of Traffic Crashes off of I-229



Source: MoDOT TMS, 08/30/2022. Data Date Range: 2017 - 2021.



Figure 3
Location and Severity of Traffic Crashes
on Local Streets in I-229 Study Area



Legend Fatal Crash Minor Injury

Serious Injury PDO



Table 4

Number of Existing Crashes by Severity on Local Roads in I-229 Study Area

Year	Fatal	Disabling Injury	Minor Injury	Property Damage Only	Total
2017	0	2	13	50	65
2018	0	1	22	50	73
2019	0	1	24	71	96
2020	0	1	19	41	61
2021	0	1	14	39	54
Total	0	6	92	251	349

Source: MoDOT TMS, 08/30/2022.

Table 5
Number of Crashes by Type on Local Roads in I-229 Study Area

Crash Type	Total Crashes
Backing	0
Changing Lane	2
Dual Lefts Collide	1
Fixed Object	2
Head On	6
Left Turn	21
Left Turn Right Angle Collision	37
Other	3
Out of Control	63
Parking or Parked Car	32
Passing	31
Pedalcycle	2
Pedestrian	0
Rear End	64
Right Angle	75
Right Turn	4
Right Turn Right Angle Collision	5
Sideswipe	1
U-Turn	0
Total	349

Source: MoDOT TMS, 08/30/2022. Data Date Range: 2017 - 2021.



## 3.0 Future Predictive Crash Analysis

Utilizing IHSDM-HSM Predictive Method 2018 Release version 14.1.0 and applying the February 2018 Missouri Specific HSM Calibration factors, future crashes were established for the following Reasonable Alternatives:

- No-Build
- A Main Street Corridor
- B 2nd Street Corridor
- C Railroad Tracks East Corridor
- D Existing Corridor

Future traffic volumes applied to the models were obtained from traffic counts collected as part of this study, existing data found in the MoDOT count map, and assumptions based upon surrounding data. Roadway input data was gathered from the MoDOT ARAN (MoDOT's automatic road analyzer) data, Google Earth, as-built plans, and from the Reasonable Alternatives developed. Using IHSDM allows for analysis of one-way streets and roundabouts, which are not currently in the Highway Safety Manual.

To allow for equal comparison of each of the alternatives, any roadway that was altered in an alternative was included in its existing condition roadway. Roadside characteristics remain consistent with existing conditions with the future growth volume for all other alternatives. All table outputs from the IHSDM models can be provided upon request.

Table 6 shows a comparison of the total expected crashes for No-Build and each of the four build alternatives. The table shows that there is relatively minor differences in predicted crashes between the No-Build alternative and each of the Reasonable Alternatives. As the spread of data is this close, these measures should be used with caution when determining a preferred alternative. In other words, even though the analysis shows some alternatives faring slightly better than others, all four Reasonable Alternatives are relatively the same and not distinct from the No-Build alternative.

#### 3.1 No-Build Alternative

The No-Build analysis required volumes on I-229 to exit from the interstate facility going southbound at Highland Drive and going northbound at US Route 36 and taking the 9th/10th Street exit. Volumes and volume distributions are shown in the traffic technical memorandum (Tech Memorandum 4). Results indicate with volume growth, increase in volumes on local roadways, and MoDOT-applied calibration factors that 233 crashes can be expected for the entire analyzed area per year.

#### 3.2 Alt A - Main Street Corridor

The Alternative A analysis included new traffic signals at Stockyards Boulevard/4th Street, Charles Street and Francis Street. In addition, I-229 traffic would be diverted down existing Main Street from Francis Street to US 59. Results indicate with volume growth, increase in volumes on local roadways, and MoDOT-applied calibration factors that 232 crashes (0.43% reduction from the No-Build) can be expected for the entire analyzed area per year.

#### 3.3 Alt B - 2nd Street Corridor

Alternative B places signalized intersections at the Stockyards Boulevard/4th Street and the 2nd Street/Felix Street intersections. No additional city streets would be used for this alternative. Results indicate with volume growth, increase in volumes on local roadways, and MoDOT-applied calibration factors that 232 crashes (0.43% reduction from the No-Build) can be expected for the entire analyzed area per year.

#### 3.4 Alt C - Railraod Tracks East Corridor

Alternative C places signalized intersections at the Stockyards Boulevard/4th Street and Charles Street/ Edmonds Street Street intersections. No additional city streets would be used for this alternative. Results indicate with volume growth, increase in volumes on local roadways, and MoDOT-applied calibration factors that 235 crashes (0.86% increase from the No-Build) can be expected for the entire analyzed area per year.

Table 6

# Number of Estimated Annual Crashes for each Reasonable Alternative



Reasonable Alternative	Total Annual Estimated Crashes	Percent Change from No-Build
No-Build	233	
Alt A: Main Street Corridor	232	(.43%)
Alt B: 2nd Street Corridor	232	(.43%)
Alt C: Railroad Tracks East Corridor	235	0.86%
Alt D: Existing Corridor	234	0.43%

Source: IHSDM Analysis by Burns & McDonald

### 3.5 Alt D - Existing Corridor

Alternative D places one signalized intersections at the Stockyards Boulevard/4th Street intersection. No additional city streets would be used for this alternative. Results indicate with volume growth, increase in volumes on local roadways, and MoDOT-applied calibration factors that 234 crashes (0.43% increase from the No-Build) can be expected for the entire analyzed area per year.

# 4.0 Supplementary Analysis

In addition to analyzing existing I-229 and the local arterials in the Study Area, two additional crash analyses were performed to better understand the possible traffic safety implications of the Reasonable Alternatives.

## 4.1 Segment of I-29

In addition to performing the IHSDM, an analysis was performed on a segment of I-29 north of US Route 36 with the added total volume of traffic assumed to divert from I-229. Under the assumption that some of the Reasonable Alternatives will result in shifting traffic from I-229 to the US Route 36/I-29 corridor, it was important to understand if that shift would result in a significant increase in crashes along the US Route 36/I-29 corridor. Under this scenario, the results (Table 7) indicate an additional 0.4 crashes per year, or one additional crash every two years.

# 4.2 I-29 / I-229 / US 71 Interchange

The interchange located north of St. Joseph, MO has left on-ramps and the shifting from I-229 to I-29 raised a concern that this could create an additional crash risk based on the existing geometrics of this interchange. The increase in volume was noted as a concern

for MoDOT. To evaluate the safety change due to the increased volumes, the left on-ramp was evaluated with existing traffic and then with existing plus the traffic destined for I-229 northbound that was assumed to transition off of I-229 onto I-29. **Table 8** shows that the increase in traffic from the volume headed to I-229 results in an additional 0.1 crashes per year or, more correctly, one additional crash every 10 years. **Table 9** shows an additional 1.4 crashes per year on US Route 36/I-29.

#### 5.0 Conclusions

Overall, the existing safety of the I-229 corridor in the Study Area has a high crash rate due to a low total volume of vehicles relative to the number of crashes. Each of the Reasonable Alternatives evaluated would result in a negligible change in the overall number of crashes in the Study Area. Changing travel patterns away from I-229 to US Route 36 and I-29 also does not result in a significant change in the crash rates for those facilities.



Table 7

Number of Estimated Crash Impacts of Diverting I-229 Traffic to I-29

Scenario	Fatal & Injury*	PDO	TOTAL
No-Build: With I-229 Connection	0.4	0.7	1.1
Remove I-229 Connection	0.6	0.9	1.5
Net Annual Change	0.2	0.2	0.4

\*Note: Data represents the total additional crashes per year due to the diversion to 1-29.

Source: IHSDM Analysis by Burns & McDonald

Table 8

Number of Estimated Crash Impacts of Diverting I-229 Traffic on I-29/I-229/US 71 Interchange

Scenario	Fatal & Injury*	PDO	TOTAL
Existing Ramp Traffic	0.7	1.4	2.1
Existing Ramp Traffic + I-229 Traffic	0.8	1.4	2.2
Net Annual Change	0.1	0.0	0.1

\*Note: Data represents the total additional crashes per year due to the diversion to 1-29.

Source: IHSDM Analysis by Burns & McDonald

Table 9

# Number of Estimated Crash Impacts of Diverting I-229 Traffic on I-29/US 36 Interchange

Scenario	Fatal & Injury*	PDO	TOTAL
Existing Ramp Traffic	3.8	8.3	12.1
Existing Ramp Traffic + I-229 Traffic	4.2	9.3	13.5
Net Annual Change	0.4	1.0	1.4

\*Note: Data represents the total additional crashes per year due to the diversion to 1-29.

Source: IHSDM Analysis by Burns & McDonald



# Technical Memorandum 6

# Interstate De-designation

### 1.0 Background

The Missouri Department of Transportation (MoDOT) is interested in removing the interstate designation for I-229 in St. Joseph, MO from the I-29/I-229 interchange on the north to the I-29/I-229 interchange to the south (see Figure 1). The interstate is 15 miles in length and travels through downtown St. Joseph. It is a bypass of I-29 and is largely duplicative of I-29.

MoDOT is currently conducting an Environmental Assessment (NEPA) for 1.1 miles of I-229 in downtown St. Joseph that is comprised almost entirely by a double-decker interstate bridge. The bridge needs a major rehabilitation estimated to cost approximately \$50 million. Before making that investment, MoDOT is using the NEPA decision-making process to make sure a rehabilitation is the best use of taxpayer dollars or, if not, is there a better improvement strategy that meets the needs of the project.

The final NEPA decision's recommended preferred alternative includes the removal of the double-decker structure and replacing the bridge with a non-interstate principal arterial. The rest of I-229 north and south of the double-decker segment would remain as a 4-lane divided limited access freeway. With that final decision, MoDOT will need to request the de-designation of at least the northern portion of I-229 from US Route 36 to I-29. However, MoDOT's preference would be to request de-designating I-229 in its entirety.

#### 2.0 Justifications

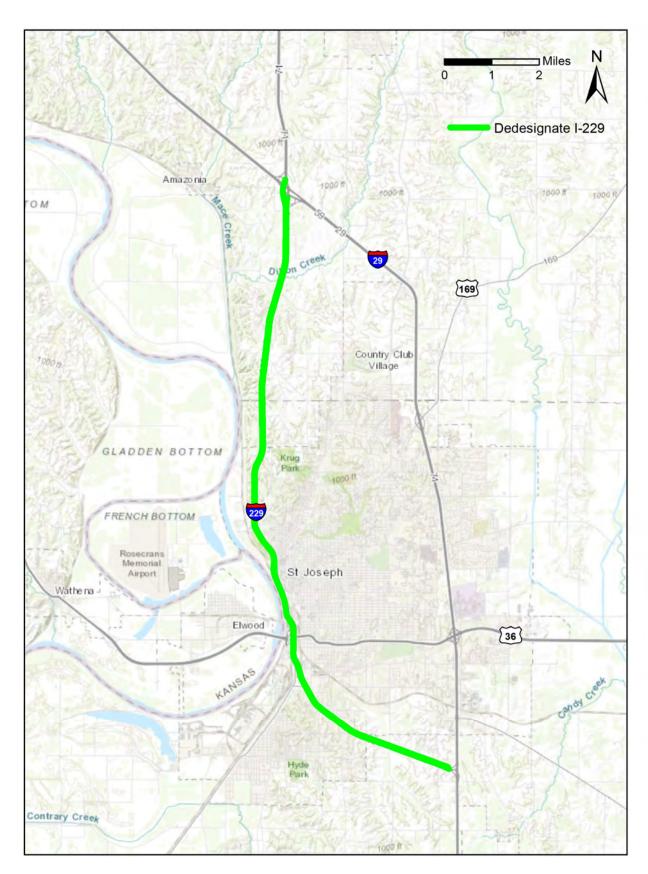
The following justifications for the de-designation of I-229 include:

• Traffic Volumes. I-229 is the least traveled interstate in Missouri, serving 3,000 – 19,000 vehicles per day as of 2020. The bulk of the interstate

- serves traffic toward the lower end of that spectrum. ADTs approaching 19,000 only occur on or near the double-decker bridge through downtown St. Joseph. I-229, especially the segment through downtown, primarily serves local traffic movements with limited regional traffic movements.
- Major Traffic Generator. I-229 does not serve a "major highway traffic generator" such as an urbanized area with a population over 100,000 or a similar major concentrated land use activity that produces and attracts long-distance Interstate and statewide travel of persons and goods. I-229 does provide connectivity to the Stockyards Industrial District, including several hundred truck trips per day, which is located on the south side of the downtown area. Conversations with the owners of several of those businesses have indicated that an interstate is not required for their business operations as long as they can still access I-29 from either the north or south or along US Route 36 to the east.
- construction of I-229, which was built in the late 1970s and early 1980s, was to revive St. Joseph's downtown which had been seeing its businesses migrate to sites along the Belt Highway about two miles east of downtown near I-29. I-29 initially had been designed to bypass developed areas of St. Joseph, but its construction spurred development near the interstate on the city's east side. The thought being that if traffic could more quickly access the downtown, the outward flow of residences and businesses would be slowed, blighted neighborhoods could be replaced by the interstate, and the downtown could regain its former prominence. The



Figure 1
Proposed De-Designation of I-229





success of I-229 achieving this is dubious and as with many urban interstates across the nation it has been viewed as a villain to the downtown as much as, if not more than, a lifeline to the downtown.

## 3.0 Anticipated Impacts

It is expected that if the double-decker is replaced with a new 4-lane non-interstate arterial most passenger vehicles that use the existing facility will continue to use the new facility resulting in minimal impacts to the Interstate System. However, it is expected that some of the freight movements will move to the US Route 36 corridor between I-229 and I-29 and to the I-29 corridor between US Route 36 and I-229 north of St. Joseph. The increased freight volumes along those corridors are estimated to be 1500 vehicles per day in 2040. Impacts to capacity and safety due to the increased freight volumes along I-29 have been determined to be minimal. Along the US Route 36 corridor, impacts have been determined to be minimal with the exception of an operational concern just east of the Kansas State Line at the weave on US Route 36 and the on-ramp from Stockyards Expressway (MO 759). This area is nearing capacity and the model shows occasional backups onto the on-ramp.

### 3.1 Impacts to the National Network

Besides changes to route marking detailed below and potential minor adjustments to the route alignment through downtown St. Joseph there are no anticipated impacts to the National Network. All of the Reasonable Alternatives envision at least a principal arterial throughout the corridor. Should a portion of the route be reclassified to a minor arterial or less, by rule, the segment will be removed from the National Network.

# 3.2 Funding Impacts

In terms of federal matching dollars, interstate maintenance is matched at 90% vs 80% for non-interstate. De-designation of this piece of interstate will not impact the amount of money MoDOT receives from the federal government. However, MoDOT will have to match more money in order to receive its share of federal funds which has been a concern from some of the local stakeholders. MoDOT will realize a savings if they no longer have to support the high costs of maintaining the double-decker bridge.

#### 3.3 Repayment/Relinquishment Impacts

If the double-decker structure is removed the existing interstate right-of-way no longer needed for roadway use by MoDOT or the City will be "disposed" in accordance with applicable procedures in 23 CFR 620.203. The Federal share of the proceeds from the sale of the property will be used for other projects within the State eligible for funding under Title 23 of the U.S. Code. (See 23 CFR 710.403(e)). For those sections of I-229 beyond the double-decker, since MoDOT will continue to use it as a highway and does not plan to change the access or right-of-way there are no repayment/relinquishment impacts.

#### 3.4 Human, Natural, Environmental Impacts

Since de-designating an interstate requires a "Fed-eral Action" the potential environmental impacts of that action must be incorporated into the NEPA decision-making process. Chapter 5 of the Environmental Assessment details the potential environmental impacts and benefits of de-designating I-229. Besides the environmental impacts associated with replacing the existing double-decker bridge with one of the reaonable alternatives, the act of de-designating I-229 alone does not create any adverse human, natural or other environmental impacts.

#### 3.5 Proposed Route Numbering

De-designation will require a change in route marking and coordination with the American Association of State Highway and Transportation Official's (AASHTO's) Special Committee on Route Numbering on the proposed route numbering that would result from the de-designation. AASHTO requires as part of the submittal the approval of the FHWA Administrator in Washington, DC. The AASHTO Special Committee on Route Numbering meets twice a year, typically once around October and once around April/May and applications need to be sent is at least a month in advance.

It is proposed the route numbering of I-229 should become US Route 71 and the route numbering of US Route 71 along I-29 from I-229 north of St. Joseph to I-229 south of St. Joseph should be removed. A US route designation is appropriate for this type of facility given the expected ADT volumes, its importance as



a direct connection to downtown St. Joseph and the Stockyards Industrial District, and because it meets the design standards for inclusion in the US numbered system. In order to use a US route designation the route should form continuity between two or more states therefore a US route located wholly in one State is not allowed. This necessitates the use of an existing US facility in the area if it is desired that I-229 carry that designation. Other US facilities in the area include US Route 59 and US Route 169. However, these routes are problematic because they do not directly connect at either end of I-229 where as US Route 71 does. In addition, US Route 59 and US Route 169 are important connections in their own right whereas US Route 71 simply runs congruent with I-29 through St. Joseph. In other words, it makes sense to move the US 71 off of I-29 to I-229.

Alternative route numbering to a US route designation include state route designations of which there are many available numbers. MO-229 is one such available state route number which provides continuity with the previous designation of I-229. This is primarily a north-south route so it is suggested the route be labeled with an odd number. In addition, it is a circumferential route of I-29 and US Route 71 which suggests the route be labeled with a suffix of either 29 or 71. According to interstate route numbering guidelines circumferential routes should have a prefix of 2, 4, or 6, which could be applied here. Prefixes of 1, 3 and 5 are reserved for spur routes according to interstate route numbering guidelines, however, no mention is made of a prefix with 7, which is

# A Simplified Step-by-Step Description of the Process for Removing Segments from the Interstate Highway System

#### Interstate Withdrawal Procedures

- 1. The State Department of Transportation(s) (State DOT) evaluates the merits of the proposed withdrawal based on the Federal Highway Administration's Q&A guidance, http://www.fhwa.dot.gov/planning/national\_highway\_system/interstate\_highway\_system/withdrawalqa.cfm.
- 2. The State DOT then submits a withdrawal proposal documenting the merits of the removal, based on the requirements found in the 23 CFR 470 and the Q&A guidance to their FHWA Federal-Aid Division Office. The submission should include:
- a. The proposed revision (e.g., limits and location).
- b. An assessment describing the anticipated effect on the Interstate System, the planned use of the segment after withdrawal, any associated repayment/relinquishment implications, and documentation of coordination with the Metropolitan Planning Organization (MPO) and affected local entities.
- c. A withdrawal constitutes a Federal action which requires a National Environmental Policy Act (NEPA) assessment.
- d. A withdrawal may lead to the deletion of the segment from the National Network (23 CFR 658.11) and will need to be published in the Federal Register as a Notice of Proposed Rulemaking (NPRM).
- The FHWA Division Office submits the proposal along with their recommendation to FHWA Office of Planning, Environment, and Realty (HEP).
- 4. FHWA HEP, reviews and processes the proposal. FHWA responds to the State DOT with a formal decision from the Administrator.

# Interstate Numbering Procedures

- 1. The State DOT coordinates with the American Association of State Highway and Transportation Official's (AASHTO's) Special Committee on Route Numbering on the proposed route numbering that would result from the withdrawal.
- 2. AASHTO makes a recommendation on the feasibility of the proposed numbering and coordinates with FHWA on the proposed numbering.
- 3. The FHWA Administrator approves all route numbering changes. Upon completion of the withdrawal action, the FHWA Administrator will notify AASHTO of his/her decision.



commonly used around the state including on circumferential routes and so may be an option here as well.

Additional information about changes to route numbering can be found in Category 943 of MoDOT's Engineering Policy Guide.

#### Public Outreach

Public outreach and stakeholder meetings were not only used to inform, but more importantly to solicit input from the public and stakeholders on what they wanted the future of St. Joseph and the Study Area to look like. As part

of that outreach, the project team frequently asked the participants how important maintaining the existing facility as an interstate was to them. Most responses were that the interstate designation was not important to either personal or commercial travel.

Specific resources and discussions were also included at the three in-person public meetings and on the project website. Just one example is provided in the call-out box to the right. At the Location Public Hearing a station specifically dealing with interstate de-designation will be provided. The Location Public Hearing will be held following publication of this Environmental Assessment.

For more information regarding public outreach activities refer to Technical Memoranda 15 - Public Meetings and 16-Stakeholder Engagement.

# Coordination with Affected Governmental Entities

MoDOT has already coordinated with several local governmental entities including the City of St. Joseph, the

St. Joseph Mayor's Office, the St. Joseph City Council, and the St. Joseph Area Transportation Study Organization (SJATSO). Additional coordination and letters of support, as required, will be solicited as MoDOT formally submits the request for de-designation to FHWA. The study team does not currently know about any formalized opposition to the de-designation process and expects support from the affected governmental entities.

# **Public Input**

The public, including community stakehoders, were informed about the potential for de-designating I-229 and encouraged to provide feedback. The graphic below depicts just one flyer developed to ensure the public knew about the potential decision.

### De-Designation of I-229

Except for the No-Build and Rehabilitate Existing alternatives, all other Reasonable Alternatives would require the removal of the Interstate designation on I-229. Based on conversations with FHWA, it is not practical nor allowable to just de-designate the portion of I-229 between US 36 and US 59. Therefore, depending on which Reasonable Alternative is selected as the recommended preferred, MoDOT will be required to initiate the interstate de-designation process. We want your feedback on this proposed action.

**Environmental or Social Impacts** - The impacts of de-designating I-229 as an interstate have been reviewed and have been determined to be minimal with minor pluses and minuses to de-designation. Since no actual changes to the facility will occur either north or south of the downtown area there will not be any adverse social or environmental impacts.

**Economic Impacts** - In discussions with freight interests, businesses, and others, the consensus has been that removal of the interstate designation will not have a negative impact on either existing businesses or the ability to attract new businesses in the future.

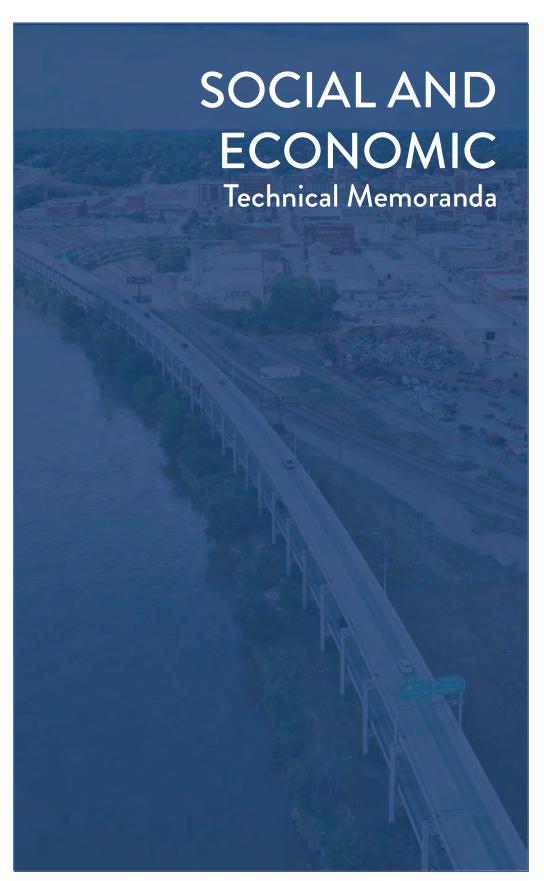
Accessibility Benefits – Removal of the interstate designation removes restrictions to providing additional access points typical of most interstate facilities. This has the potential of opening opportunities to add additional access points (interchanges, at-grade intersections, etc.) currently being discussed by the community.

**Funding Impacts** - The impact to federal and state funding of the facility is minimal. Federal match requirements will change for any additional work done on I-229 but removal of the interstate designation will not change the total amount of funding received from the federal government.

New Highway Designation - If I-229 is de-designated, one requirement is that the facility would need to be renumbered. Two options have been discussed: moving the US-71 designation that is currently along I-29 to the existing facility or renaming it as a Missouri Highway 229 (MO 229). Either designation would be acceptable to MoDOT and FHWA.









# Technical Memorandum 7

# **Business Inventory**

#### 1.0 Introduction

This technical memorandum provides an inventory of the businesses located within the I-229 Study Area that may be affected by decisions regarding the future of the double-decker bridge. The Study Area extends from US Route 36 to the south, US Route 59 to the north, the Missouri River to the west, and approximately 10th Street to the east. This discussion begins with an overview of the St. Joseph region's economy, followed by a description of the region's diverse and innovative range of business clusters, which play a crucial role in the area's economic success. The section concludes by identifying the major businesses located within the Study Area.

# 2.0 The St. Joseph Economy

According to the U.S. Census Bureau, St. Joseph, Missouri's population was 72,473 in 2020, falling six percent from 76,780 in 2010. The city ranks as the eighth-largest city in Missouri in terms of population.<sup>1</sup> St. Joseph has a healthy and growing economy with a thriving business climate, which has resulted in the city receiving national accolades and awards in recent years. For example, the city was named the seventh fastest-growing economy in the nation in 2013, as reported by the Conference of Mayors. In 2014, St. Joseph was ranked as one of the top U.S. cities in Area Development magazine, being named one of its "Leading Locations," "Leading Small Cities," and "Leading Midwest Cities." Forbes magazine ranked St. Joseph fourth on its list of America's Strongest Farming and Agribusiness Regions in 2015. NewGeography.com recently listed St. Joseph as one of the "Best Cities for Job Growth."<sup>2</sup>

Data released in January 2019 by the Missouri Department of Economic Development illustrate the St. Joseph region's economic vitality. The Missouri Department of Economic Development's November 2018 job report showed that St. Joseph's civilian labor force and total employment grew 1.6 percent and 2.1 percent, respectively, from November 2017, which were higher increases than the U.S. and all other Missouri cities. St. Joseph's unemployment rate in the November 2018 report was 2.7 percent, which is lower than the U.S. rate (3.7 percent), the Missouri rate (3.1 percent), and several cities in Missouri, including St. Louis (3.3 percent), Kansas City (3.2 percent), and Cape Girardeau (2.9 percent). The November report also showed that St. Joseph's average hourly wage of \$22.20 only fell behind St. Louis and Kansas City. Cities in Missouri with average hourly wages less than St. Joseph were Cape Girardeau (\$21.93), Springfield (\$21.76), Jefferson City (\$21.25), Columbia (\$20.86), and Joplin (\$19.74).3

Several factors account for the strength of St. Joseph's economy. One factor is the region's diversified employment base. As shown in Figure 1, four industries employ more than 10 percent of the workforce in St. Joseph. These industries include education & healthcare (23.1 percent), manufacturing (20.7 percent), retail trade (11.1 percent), and arts & entertainment (10.2 percent). Table 1 identifies the largest employers in St. Joseph, several of which provide products or services within the largest industries. With a diversified employment base, the St. Joseph region is better able to withstand economic downturns.

<sup>1.</sup> U.S. Dicennial Census, "Census of Population and Housing," 2010 & 2020. 2. http://www.newgeography.com/content/005244-small-cities-rankings-2016-best-cities-job-growth

<sup>3.</sup> https://www.missourieconomy.org/pdfs/industry\_nov18.pdf



A second factor is St. Joseph's prime location in the Midwest, which puts businesses within 500 miles of 44 percent of total U.S. manufacturing establishments.<sup>1</sup> The city is a 35-minute drive from Kansas City International Airport and a 50-minute drive from downtown Kansas City. St. Joseph boasts convenient access to major interstates and highways, with Interstate 29, a major north-south interstate, and U.S. Highway 36, northern Missouri's primary east-west thoroughfare, running through the city. Interstates 435, 35, and 70 are located within 30 to 45 minutes of St. Joseph and provide connections to other interstates and major cities such as San Antonio, Dallas, Kansas City, Minneapolis, Denver, St. Louis, Indianapolis, and Columbus. The city also offers a multi-modal port with both rail and barge access, giving businesses in the area additional transport options. St. Joseph's central location and multi-dimensional transportation resources have contributed to the city's ranking as the third largest exporter in Missouri, behind St. Louis and Kansas City. Lastly, the St. Joseph economy benefits from a skilled and educated workforce. According to the St. Joseph

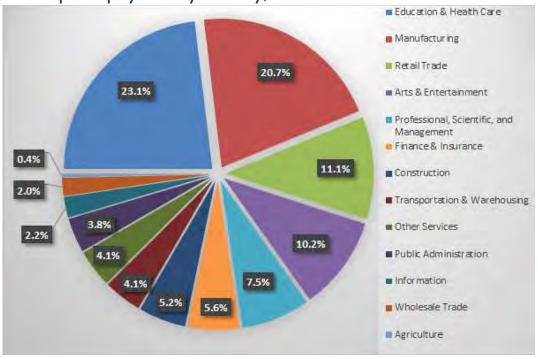
Economic Development Partnership, 88 percent of adults in the St. Joseph area have a high school education or have continued with further educational training. Additionally, the city's high school graduation rate is 88.6 percent, which is higher than the Missouri high school graduation rate of 85.7 percent.<sup>2</sup>

Contributing to the quality workforce in St. Joseph are initiatives such as Profit in Education and the Workforce Development Alliance. Profit in Education is a program of the United Way of Greater St. Joseph that brings local business leaders and St. Joseph's educational system together to create a prepared workforce and train future leaders. The program, which began in 1989, also seeks to improve the percentage of adults who attain their General Equivalency Diplomas (GEDs), encourage life-long learning, and provide an educated workforce.<sup>3</sup> The Workforce Development Alliance is comprised of the St. Joseph Chamber of Commerce, St. Joseph Public School District, Hillyard Technical Center, Missouri Western State University, the United Way of Greater St. Joseph, and local busi-

Figure 1

St. Joseph Employment by Industry, 2017

1. http://choosesaintjoseph.com/business-clusters/logistics-warehousing/



Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates



<sup>2.</sup> http://choosesaintjoseph.com/site-selection/data/education/

<sup>3.</sup> http://choosesaintjoseph.com/site-selection/data/education/

Table 1
Largest Employers in St. Joseph



Employer	Product/Service	Employment
Mosaic Life Care	Health Care	4,072
Triumph Foods	Food Processing	2,900
St. Joseph School District	Education	1,853
Boehringer Ingelheim	Animal Pharmaceuticals	1,191
139th Airlift Wing, Missouri Air National Guard	Government	1,070
American Family Insurance	Insurance	793
Missouri Western State University	Education	757
Wal-Mart	Retail	740
City of St. Joseph	Government	698
Tyson Foods	Food Processing	670

Source: St. Joseph Economic Development Partnership

nesses. Focusing on the needs of St. Joseph employers, the Workforce Development Alliance's purpose is to coordinate local training and educational initiatives to support a prepared and engaged workforce.<sup>1</sup>

St. Joseph is also fortunate to have a strong network of colleges, universities, and technical schools located in the immediate area, such as Missouri Western State University and Hillyard Technical Center, and within a short drive, such as Benedictine College in Atchison, Kansas (20 miles southwest of St. Joseph), Northwest Missouri State University in Maryville, Missouri (45 miles north of St. Joseph), and the University of Missouri – Kansas City (60 miles south of St. Joseph). These schools provide students and workers with the education and technologically-advanced skills they need to compete in today's global economy.

# 3.0 St. Joseph Business Clusters

Business clusters are defined as geographic concentrations of interconnected companies, suppliers, and service providers in a particular industry. Through their proximity to one another, businesses are able to take advantage of linkages such as demand, supply, skills, and technology. St. Joseph has multiple business clusters that play a vital role in the region's economy. For a city of its size, St. Joseph is unique with respect to the scope and diversity of its business clusters, a characteristic that has earned the city national and

global attention. These business clusters are primarily located in areas south, east, and north of the I-229 Study Area. Although the business clusters are located largely outside the Study Area, it is important to include discussion of them because they include some of the city's largest employers and freight carriers. The business clusters found in St. Joseph include the following:

Agricultural Sciences – St. Joseph has a rich agricultural history that the city has built upon to create a strong agricultural sciences industry. Out of 324 metropolitan areas in the U.S., St. Joseph has been ranked fourth by location quotient for the agricultural sciences industry.3 St. Joseph ranks among the top 10 areas in the country in terms of the concentration of agricultural science and life science employment.<sup>4</sup> The city also dominates the four-state region of Missouri, Kansas, Iowa, and Nebraska in terms of agricultural sciences resources and businesses.<sup>5</sup> Contributing to the strength of the agricultural sciences industry in St. Joseph is the city's location at the center of the Midwest's globally-recognized Agricultural Research Triangle. This triangle is formed by Kansas State University to the west, the University of Missouri to the east, and the University of Nebraska to the north. The Agricultural Research Triangle brings together academic, government, and local business partners engaged in knowledge sharing and collaborations to create an economic engine cen-

 $<sup>1.\</sup> http://choosesaintjoseph.com/site-selection/data/workforce/$ 

<sup>2.</sup> https://www.mo-kan.org/about/certified-economic-development-strategy/

<sup>3.</sup> http://choosesaintjoseph.com/business-clusters/agricultural-sciences/

<sup>4.</sup> http://choosesaintjoseph.com/business-clusters/agricultural-sciences/

<sup>5.</sup> http://choosesaintjoseph.com/business-clusters/agricultural-sciences/



tered around advancements in agricultural science. Top agricultural sciences employers in St. Joseph include BASF; Omnium; Albaugh, LLC; Boehringer Ingelheim Vetmedica, Inc.; HPI Products, Inc.; and Ag Processing, Inc.

Animal Health and Nutrition - In addition to contributing to St. Joseph's strong agricultural sciences industry, the city's location at the center of the Midwest's Agricultural Research Triangle has helped to create a business cluster comprised of companies in the animal health and nutrition industry. Animal health and nutrition is a \$19 billion industry, with nearly half of the 10 largest global animal health companies located in the renowned KC Animal Health Corridor. The KC Animal Health Corridor stretches from Columbia, Missouri, to Manhattan, Kansas, with St. Joseph at the center. Two of these largest animal health companies, Nestle Purina Petcare Co. and Boehringer Ingelheim Vetmedica, Inc., have research headquarters in St. Joseph. The city's important role in the KC Animal Health Corridor is demonstrated by the Kit Bond Science and Technology Incubator located at Missouri Western State University in St. Joseph. This incubator is a partnership of public and private enterprise that provides facilities and assistance for bioscience start-up companies. Other leaders in St. Joseph's animal health and nutrition industry include Land O'Lakes/Purina Mills, Inc.; Star Labs; BioZyme, Inc.; Wilbur-Ellis Feed, LLC; Vedco; Clipper Distributing Company; and Protein, Inc.

Back Office – St. Joseph's dynamic back office business cluster is supported by cutting-edge information technology and telecommunications infrastructure. Further helping this cluster flourish are St. Joseph's competitive electrical utility rates and the city's ideal Midwest location where a balanced mix of wind power, coal, natural gas, and hydroelectric power results in energy reduction and reliability.<sup>2</sup> Back office industry leaders in St. Joseph include The Results Company and System Services Technologies, Inc.

Bioscience – The bioscience industry encompasses advancements in animal health and nutrition, animal pharmaceutical development, and agricultural-based research and development. St. Joseph's bioscience

1. http://choosesaintjoseph.com/business-clusters/animal-health-nutrition/2. http://choosesaintjoseph.com/business-clusters/back-office/

business cluster is closely aligned with the agricultural sciences and animal health and nutrition clusters. Like those clusters, the bioscience cluster thrives in St. Joseph due to the city's location at the center of the Agricultural Research Triangle and KC Animal Health Corridor. Supporting bioscience companies in the region are at least 20 universities, which offer undergraduate, graduate, and post-doctorate degree programs related to bioscience; the University of Kansas, located one hour from St. Joseph, which offers the nation's only MBA program for Animal Health; four top veterinary schools and three veterinary technology programs located within the KC Animal Health Corridor; and the Kit Bond Science and Technology Incubator located at Missouri Western State University.<sup>3</sup> Major employers in the bioscience business cluster in St. Joseph overlap with top employers in the agricultural sciences and animal health and nutrition clusters. They include Wilbur-Ellis Feed, LLC; BioZyme, Inc.; Boehringer Ingelheim Vetmedica, Inc.; Nestle Purina Petcare Co.; Land O'Lakes/Purina Mills, Inc.; Star Labs; and Vedco.

Food Processing – St. Joseph has long been a home for food processors due to the city's ideal Midwest location, excellent transportation network, below average cost of utilities, and skilled workforce. Food processors are supported by access to raw products in St. Joseph as well as infrastructure such as the Southside Sewer District Pre-Treatment Facility and Nor-Am Cold Storage, which is a full service, refrigerated warehouse, blast freezer, and packaged ice company. Food processing companies in St. Joseph include Triumph Foods, which maintains its headquarters in the city; Tyson Foods, Inc.; LifeLine Foods; Ventura Foods, LLC; Ag Processing, Inc.; Chase Candy Company; and Daily's Premium Meats.

Health Care – St. Joseph's nationally-honored health system is a significant factor for businesses that choose to locate or expand in the city. Mosaic Life Care is the city's largest employer and consistently wins national awards for its quality of care and use of technology. In 2009, Mosaic Life Care was named a Malcolm Baldridge National Quality Award winner, which is the nation's highest presidential honor awarded to organizations for quality and organizational performance.<sup>4</sup>

<sup>3.</sup> http://choosesaintjoseph.com/business-clusters/bioscience/

<sup>4.</sup> http://choosesaintjoseph.com/business-clusters/health-care/



Northwest Health Services is an additional provider of quality health care in the St. Joseph region, with 16 locations in Northwest Missouri and Northeast Kansas.

Insurance – Because of St. Joseph's broad spectrum of major employers, the insurance business cluster plays a critical role in the city's economy. Major insurance providers such as American Family Insurance and Blue Cross/Blue Shield of Kansas City support the city's business community by offering competitive benefits packages for their employees, which helps with employee recruitment and retention. St. Joseph is home to American Family Insurance's regional headquarters.

Logistics and Warehousing – As previously explained, St. Joseph is fortunate to be centrally located in the Midwest with access to an outstanding transportation network consisting of major interstates, a major international airport, and rail and barge transport options. This prime location supports a robust business cluster in St. Joseph consisting of logistics, warehousing, and distribution companies who are able to save time and costs on transportation. Leaders in logistics and warehousing in St. Joseph include BMS Logistics, Inc.; Brown Transfer and Storage Co.; Pony Express Warehousing LLC; and Nor-Am Cold Storage. Large companies with distribution centers and networks in St. Joseph include Silgan Containers LLC; Altec Industries, Inc.; Johnson Controls; and Boehringer Ingelheim Vetmedica, Inc.

Skilled Manufacturing – St. Joseph has become recognized as one of the Midwest's leaders in regional and global manufacturing. Specialized equipment, animal health pharmaceuticals, and batteries are just a few of the products manufactured by global firms with a presence in the city. Like the businesses in the logistics and warehousing business cluster, St. Joseph's manufacturers benefit from the city's premier location and multi-dimensional transportation resources. Major manufacturers that have chosen to locate in the St. Joseph region include Altec Industries, Inc.; Gray Manufacturing; Hillyard, Inc.; Johnson Controls; Nestle Purina Petcare Co.; Tyson Foods, Inc.; Ag Processing, Inc.; Albaugh, LLC; BioZyme, Inc.; Boehringer Ingelheim Vetmedica, Inc.; Bradken; Sealed Air Corporation; DuPont; International Paper; Land O'Lakes/Purina Mills, Inc.; National Beef; Omnium; Perka Building

Frames; Schutz Container Systems, Inc.; Silgan Containers LLC; Snorkel; Triumph Foods; Varco Pruden Buildings; Ventura Foods, LLC; and Vektek.

Table 2 presents the major companies within each of the business clusters in St. Joseph, along with their estimated employment. As shown in Table 2, these companies employ more than 15,300 workers, with Mosaic Life Care (4,072 employees), Triumph Foods (2,900 employees), and Boehringer Ingelheim Vetmedica, Inc. (1,191 employees) being the largest employers.

# 4.0 Businesses Within the I-229 Study Area

St. Joseph's business clusters are clearly economic engines, but the businesses within the I-229 Study Area also make important contributions to the region's strong economy. The Study Area contains a wide variety of hundreds of businesses, including approximately 200 businesses within St. Joseph's Downtown Community Improvement District (CID) alone. The Downtown CID is the cultural center of St. Joseph and is approximately bounded by Robidoux Street to the north, I-229 to the west, Charles Street to the south, and 10th Street to the east. The CID falls entirely within the Study Area. Many of the businesses within the Study Area include local service providers, such as gas stations, convenience stores, vintage clothing stores, coffee shops, and restaurants. Examples of just a few of these businesses include The Lucky Tiger, a vintage clothing store on Francis Street; Boudreaux's Louisiana Seafood & Steaks, a popular eatery on North 4th Street; Imperial Super Gas, a gas station on South 6th Street; and Brioche Café, a French bakery on North 7th Street. Due to the constraints of this study, an analysis of local service providers such as these and other smaller businesses within the Study Area was not possible. The focus instead was on the Study Area's major employers, which are found in industries such as manufacturing, construction, transportation and warehousing, and wholesale trade.1

To identify the major employers within the Study Area, a street-by-street search using the Buchanan County Geographic Information Systems (GIS) website was conducted. The focus of this search was on the larger parcels of land. Google Maps provided additional detail

<sup>1.</sup> Major employers were considered businesses with 20 or more employees.



Table 2

Major Employers in St. Joseph's Business
Clusters

Employer	Business Cluster/Service	Employment (Est.)
Ag Processing, Inc.*	Agricultural Sciences; Food Processing; Skilled Manufacturing	180
Albaugh, LLC*	Agricultural Sciences; Skilled Manufacturing	120
Altec Industries, Inc.*	Logistics and Warehousing; Skilled Manufacturing	260
American Family Insurance	Insurance	793
BASF	Agricultural Sciences	35
BioZyme, Inc.*	Animal Health and Nutrition; Bioscience; Skilled Manufacturing	20
Blue Cross/Blue Shield of Kansas City	Insurance	13
BMS Logistics, Inc.	Logistics and Warehousing	330
Boehringer Ingelheim Vetmedica, Inc.	Agricultural Sciences; Animal Health & Nutrition; Bioscience; Logistics and Warehousing; Skilled Manufacturing	1,191
Bradken	Skilled Manufacturing	160
Brown Transfer & Storage Co.	Logistics and Warehousing	35
Chase Candy Company	Food Processing	10
Clipper Distributing Company	Animal Health and Nutrition	20
Daily's Premium Meats*	Food Processing	200
DuPont	Skilled Manufacturing	100
Gray Manufacturing	Skilled Manufacturing	200
Hillyard, Inc.	Skilled Manufacturing	190
HPI Products, Inc.	Agricultural Sciences	60
International Paper	Skilled Manufacturing	125
Johnson Controls*	Logistics and Warehousing; Skilled Manufacturing	700
Land O'Lakes/Purina Mills, Inc.	Animal Health and Nutrition; Bioscience; Skilled Manufacturing	50
LifeLine Foods	Food Processing	145
Mosaic Life Care	Health Care	4,072
National Beef*	Skilled Manufacturing	200
Nestle Purina Pet Care Co.*	Animal Health and Nutrition; Bioscience; Skilled Manufacturing	250
Nor-Am Cold Storage*	Food Processing; Logistics and Warehousing	65
Northwest Health Services	Health Care	250
Omnium*	Agricultural Sciences; Skilled Manufacturing	28
Perka Building Frames*	Skilled Manufacturing	18
Pony Express Warehousing LLC*	Logistics and Warehousing	50
Protein, Inc.*	Animal Health and Nutrition	70
Schutz Container Systems, Inc.	Skilled Manufacturing	50
Sealed Air Corporation*	Skilled Manufacturing	60
Silgan Containers LLC*	Logistics and Warehousing; Skilled Manufacturing	150
Snorkel*	Skilled Manufacturing	400
Star Labs	Animal Health and Nutrition; Bioscience	12

Sources: St. Joseph Economic Development Partnership; Manta; D&B Hoovers; St. Joseph News-Press; Missouri Partnership

<sup>\*</sup>Employees adjacent to the Study Area



#### Table 2 (Continued)

# Major Employers in St. Joseph's Business Clusters

Employer	Business Cluster/Service	Employment (Est.)
System Services Technologies, Inc.	Back Office	300
The Results Company	Back Office	470
Triumph Foods*	Food Processing; Skilled Manufacturing	2,900
Tyson Foods Inc.	Food Processing; Skilled Manufacturing	670
Varco Pruden Buildings*	Skilled Manufacturing	175
Vedco	Animal Health and Nutrition; Bioscience	48
Vektek	Skilled Manufacturing	35
Ventura Foods, LLC*	Food Processing; Skilled Manufacturing	130
Wilbur-Ellis Feed, LLC	Animal Health and Nutrition; Bioscience	40
Total		15,367

Sources: St. Joseph Economic Development Partnership; Manta; D&B Hoovers; St. Joseph News-Press; Missouri Partnership \*Employees adjacent to the Study Area

Figure 2
Industrial Areas Near the I-229
Study Area





on parcels and allowed for verification of businesses. Employment information was obtained from a variety of sources, including the St. Joseph Economic Development Partnership's website; Manta and D&B Hoovers, which are online business information databases; the St. Joseph News-Press; and an interview of St. Joseph Chamber of Commerce staff. Historical sales data for these businesses was not available from the St. Joseph Chamber of Commerce. Estimated annual sales data for these businesses was therefore obtained from Manta and D&B Hoovers during the employment information collection process.

Through this methodology, a list of more than 20 employers in the Study Area with 20 or more employees was generated, as shown in Table 3. Table 3 identifies each business, their estimated employment, and their estimated annual sales. Combined, these businesses employ more than 1,300 employees and generate estimated annual sales ranging from \$130 million to \$310 million. The largest businesses in the Study Area in terms of employment include Hillyard, Inc. (190 employees); IHP Industrial, Inc. (112 employees); News Press and Gazette Co. (250 employees); and RS Electric Corporation (100 employees). According to the St. Joseph Chamber of Commerce, there has been very little turnover with these businesses in the Study Area. For example, Hillyard, Inc. has been located in the Study Area since its founding in 1907. Similarly, the News Press and Gazette Co., which owns the St. Joseph News-Press, has also been located in the Study Area since the early 1900s. The opposite is true of the local service providers in the Study Area, where there has been significant turnover observed in the last ten years as many new businesses have moved in due to an increasing residential population in the CID.<sup>2</sup>

# 5.0 Industrial Areas Near the I-229 Study Area

There are many transportation dependent businesses identified in Section 3.0 located adjacent to the I-229 Study Area. These industrial areas use I-229 for freight traffic to/from the north of St. Joseph. There are two industrial areas including the Stockyards Industrial Park which is the industrial hub of St. Joseph located imme-

diately south of the I-229/US Route 36 interchange stretching three miles south along Stockyards Expressway and then extending another mile west along Alabama Street. The Stockyards Industrial Park is home to several of the largest industrial based employers in St. Joseph, including Triumph Foods, which uses I-229 to transport hogs to its facility that processes approximately 20,000 hogs per day.<sup>3</sup>

The second industrial area encompasses approximately a one-mile area between US Route 36 and Vermont Street in Elwood, Kansas, and provides access to Rosecrans Memorial Airport and the 139th Airlift Wing of the Missouri Air National Guard. The two industrial areas are shown on Figure 2 (previous page).

The business cluster employers with an asterisk in **Table 2** are in these industrial areas adjacent to the I-229 Study Area. A few of these businesses such as Pony Express Warehousing, LLC and Nor-Am Cold Storage have multiple locations both in the Study Area and in the industrial areas adjacent to the Study Area.

# 6.0 Impacts to the Economy

Each of the Reasonable Alternatives will affect the economy of St. Joseph through full and partial parcel removal from the tax base, short-term construction impacts, and long-term impacts.

## 6.1 Tax Based Impacts

Each of the Reasonable Alternatives will affect the tax base of St. Joseph and other entities that receive tax dollar support as a result of removing land from the tax rolls that is needed to construct the Reasonable Alternatives. There are two types of impacts – full and partial parcel impacts. Full impacts require the entire parcel to be purchased and partial impacts only require a small portion of the property to be purchased and does not impact the activities on the property. As such, the value of parcels partially impacted only includes the land value and not the value of any buildings on the property. It is important to remember that only a portion of the partially impacted parcels will be affected. The assessed values of the impacted parcels are shown in Table 4.

<sup>1.</sup> Ranges of annual business sales are used due to the sensitive nature of this type of information.

<sup>2.</sup> Interview of Brad Lau, Vice President of Economic Development with the St. Joseph Chamber of Commerce, on February 7, 2019.

<sup>3.</sup> Interview of Brad Lau, Vice President of Economic Development with the St. Joseph Chamber of Commerce, on February 7, 2019.



Table 3

Major Employers in the I-229 Study Area

Company	NAICS Industry	Employment (Est. No.)	Estimated Annual Sales Range
1st Street Graphics	Manufacturing	40	<\$10 million
Action Electric	Construction	25	<\$10 million
Advantage Metals Recycling LLC	Wholesale Trade	44	Not Available
Brooner & Associates Construction, Inc.	Construction	55	Not Available
Harshman Machine and Tool Co.	Other Services (except Public Administration)	21	<\$10 million
Hillyard, Inc.	Manufacturing	190	\$30-\$39.9 million
HPI Products, Inc.	Manufacturing	60	\$10 - \$19.9 million
I&M Machine and Fabrication Corporation	Manufacturing	45	\$10 - \$19.9 million
IHP Industrial, Inc.	Construction	112	\$20-\$29.9 million
Lawhon Construction Co.	Construction	35	\$10 - \$19.9 million
Missouri Doctors Mutual Insurance Co.	Finance and Insurance	20	<\$10 million
News Press and Gazette Co.	Information	250	Not Available
Nor-Am Cold Storage	Transportation and Warehousing	65	<\$10 million
Pony Express Warehousing LLC	Transportation and Warehousing	50	<\$10 million
RS Electric Corporation	Construction	100	\$10 - \$19.9 million
Scot Young Research, Inc.	Manufacturing	40	\$10-\$19.9 million
Seaman & Schuske Metal Works and Roofing	Other Services (except Public Administration)	60	\$10-\$19.9 million
Shamrad Metal Fabricators, Inc.	Manufacturing	36	<\$10 million
Sunshine Electronic Display Corporation	Manufacturing	40	\$20-\$29.9 million
System Builders, Inc.	Construction	20	<\$10 million
Wilbur-Ellis Feed, LLC	Manufacturing	40	<\$10 million
Total		1,348	\$130-\$310 million

Sources: St. Joseph Economic Development Partnership; Manta; D&B Hoovers; St. Joseph News-Press; St. Joseph Chamber of Commerce

Table 4
Assessed Value of Impacted Parcels

	Number of Parcels Fully Impacted	Total Assessed Value of Parcels Fully Impacted	Number of Parcels Partially Impacted	Total Assessed Land Value of Parcels Partially Impacted
No-Build Alternative	0	N/A	0	N/A
Alt A: Main Street Corridor	2	\$7,500	14	\$42,000
Alt B: 2nd Street Corridor	0	\$0	9	\$12,200
Alt C: Railroad Tracks East Corridor	5	\$316,900	7	\$54,700
Alt D: Existing Corridor	0	0	6	\$48,300

Source: Buchanan County Tax Data



Reasonable Alternatives A, B and D have a relative-ly low impact on assessed value and, therefore, tax based impacts, because each of these alterantives have limited impact to full or partial property parcels and no takings of existing businesses. Reasonable Alternative C has a higher average assessed land value for impacted parcels as a result of impacts to the Advantage Metals and HPI properties.

#### 6.2 Construction Impacts

Construction of any of the Reasonable Alternatives will result in short-term impacts associated with construction activities. These short-term construction impacts can impact the local businesses and economy through noise, dust/air quality, traffic detours, or vehicle emissions. These impacts have the potential to temporarily reduce economic activity near the construction area.

Noise - Noise from heavy construction equipment and haul trucks is a short-range but nonetheless disturbing impact upon the area near the construction site. To minimize the adverse effects of the construction period, contractors will be required to equip and maintain trucks and machinery to limit noise emissions. Contract specifications will also restrict especially noisy construction activity to the daytime hours to reduce conflict with noise-sensitive nighttime activities.

Air Quality - Air quality will also be subjected to shortterm construction impacts. Demolition, grading, and the transportation of materials, such as earth and aggregates, could result in the release of dust into the air. Emissions from construction machinery will add to the motor vehicle air pollution. During construction, the contractor will be responsible for adequate dust-control measures to avoid causing detriment to the safety, health, welfare, or comfort of the neighboring population or to avoid causing damage to any property, residence, or business. Contractors involved with the construction will be required to comply with MoDOT's Engineering Policy Guide. Specifically, adherence to the sections concerning fugitive dust, visible emissions, and permits will be required in the construction contracts to minimize the short-range effects upon air quality within the Study Area. The above guidance includes the following:

 Fugitive Dust – Reasonable precautions will be taken to prevent the discharge of fugitive dust including the use of such materials as water, chemicals, asphalt, or oil on surfaces which cause fugitive dust. Installation and use of containment or control equipment to enclose or otherwise limit the emissions resulting from the handling and transfer of dusty materials will be required. The covering of open-bodied construction vehicles transporting materials likely to give rise to airborne dust will also be required while in motion.

 Visible Emissions – Exhausts from construction equipment, and asphalt plants are required to comply with emission standards. Open burning will not be allowed during construction.

Traffic Circulation - Traffic patterns and existing access points near the construction activities will be affected. A Maintenance of Traffic (MOT) plan will be produced and onstruction schedules will be coordinated in advance to minimize the effects of such disruption. Suitable detours will be required to maintain traffic circulation, and areas under construction during any time period would be controlled to limit the extent of disruption to traffic flow. Contractors will be required to maintain access within a specified distance of residential areas to assure continued fire protection and emergency services.

#### 6.3 Long-Term Impacts

Over time the Study Area, downtown, and the entire city is expected to continue to prosper and grow. Travelers will likely experiment with different routes until they discover what works best for them including commuters, business travelers, shoppers, and freight haulers. The annual loss in tax-base from the required property acquisitions will be felt every year although the overall impact is anticipated to be a small percent of the City's overall tax revenue. Each Reasonable Alternative will provide some additional developable land either near the existing ramps into downtown or near the US Route 59/I-229 interchange.

# 7.0 Alternatives Impact Summary

The Reasonable Alternatives will have economic impacts related to tax base impacts, short-term construction impacts, and long-term impacts as described below.



#### 7.1 No-Build Alternative

Under the No-Build alternative, the existing double-decker bridge would be left in place. Only routine maintenance and repair of the existing bridge would occur. There would be no widening of the bridge, no improvement of roadway or bridge profiles, no major rehabilitation, and no replacement of the existing bridge. Due to its deteriorated condition, the I-229 double-decker bridge would fall into a significant state of disrepair causing the bridge to eventually be load posted and ultimately closed - potentially within the next few years.

There are no anticipated property impacts. Impacts to the local businesses and economy will be the results of traffic pattern changes and associated vehicle emissions. The existing I-229 users will change their routes when I-229 eventually deteriorates to the point of closure. The daily commuters will likely use the local street network to commute to and from work. The existing Study Area through traffic will use the local street network through downtown or travel to I-29 to continue their route.

#### 7.2 Alt A: Main Street Corridor

Alternative A would require two full displacement impacts and will require partial displacement impacts from 14 properties that have an average assessed value of nearly \$3,000. The two parcels fully impacted include an outdoor storage area for Hillyard and an undeveloped residential parcel and have an assessed value of \$7,500. All property purchased as a full or partial impacted parcel for this alternative will be removed from the City's tax base. Construction impacts to the local businesses and economy will include noise, dust/air quality, traffic detours, or vehicle emissions. These impacts have the potential to temporarily reduce economic activity near the construction area.

Business benefits from pass-by traffic are not anticipated with this alternative as the alignment is within a more industrial setting that typically does not have walk-in, off-the-street business patronage.

#### 7.3 Alt B: 2nd Street Corridor

Alternative B would not require any full displacement impacts but would require partial displacement impacts from nine properties with an average assessed value of \$12,200. All property purchased as a partially impacted parcel for this alternative would be removed from the city's tax base. Construction impacts to the local businesses and economy will include noise, dust/air quality, traffic detours, and/or vehicle emissions. These impacts have the potential to temporarily reduce economic activity near the construction area.

Business benefits from pass-by traffic are not anticipated with this alternative as the alignment is within a more industrial setting that typically does not have walk-in, off-the-street business patronage.

#### 7.4 Alt C: Railroad Tracks East Corridor

Alternative C would require five full displacement impacts and will require partial displacement impacts from seven additional properties that have an total assessed value of \$54,700. Two of the largest of the five parcels fully impacted include HPI Products and Advantage Metals. The total value of the five properties fully impacted is \$316,900. All property purchased as a full or partial impacted parcel for this alternative would be removed from the city's tax base. Construction impacts to the local businesses and economy will include noise, dust/air quality, traffic detours, and/or vehicle emissions. These impacts have the potential to temporarily reduce economic activity near the construction area.

Business benefits from pass-by traffic are not anticipated with this alternative as the alignment is within a more industrial setting that typically does not have walk-in, off-the-street business patronage.

# 7.5 Alt D: Existing Corridor

Alternative D would not require any full displacement impacts but would require partial displacement impacts from nine properties with an average assessed value of \$48,300. All property purchased as a partially impacted parcel for this alternative would be removed from the city's tax base. Construction impacts to the local businesses and economy will include noise, dust/air quality, traffic detours, and/or vehicle emissions. These impacts have the potential to temporarily reduce economic activity near the construction area.

Business benefits from pass-by traffic are not anticipated with this alternative as the alignment is within a more industrial setting that typically does not have walk-in, off-the-street business patronage.



# 8.0 Summary

This technical memorandum provided an inventory of the businesses that could be impacted by decisions regarding the future of the double-decker bridge that runs through downtown St. Joseph. As previously discussed, St. Joseph has a robust economy that is fueled by a variety of factors, including a diversified employment base, a superb Midwest location boasting convenient access to multi-dimensional transportation resources, a quality workforce, and a diverse range of business clusters that is unique to a city of St. Joseph's size. The city's largest employers include Mosaic Life Care, Triumph Foods, St. Joseph School District, the 139th Airlift Wing of the Missouri Air National Guard, Boehringer Ingelheim Vetmedica, American Family Insurance, Missouri Western State University, Wal-Mart, City of St. Joseph, and Tyson Foods, some of which are found within St. Joseph's business clusters. These business clusters are predominantly located outside of the Study Area, but discussion of them was included in this section since they are major employers in St. Joseph. It was found during analysis of these business clusters that total employment of the largest businesses within them exceeds an estimated 15,000 workers who help drive the regional economy.

Within the I-229 Study Area itself are hundreds of businesses that also support St. Joseph's economy. The focus of the analysis was on the major employers within the Study Area, which are found in industries such as manufacturing, construction, transportation and warehousing, and wholesale trade. A few of the largest employers in the Study Area include News Press and Gazette Co; Hillyard, Inc.; IHP Industrial, Inc.; and RS Electric Corporation. Total employment of these and other major employers in the Study Area is estimated at more than 1,300 workers, with total annual sales estimated between \$130 million and \$310 million.

The No-Build alternative would not impact the overall tax base, however there will be some limited traffic diversion impacts, and no anticipated long-term impacts. Reasonable Alternatives A, B and D would have minor economic impacts resulting from a loss of some tax base property, short-term construction impacts, and long-term impacts. Alternative C would have significantly more impacts than the other Reasonable Alternatives because of the full property takings, especially the Advantage Metals and HPI sites.





# Technical Memorandum 8

# **Economics and Freight**

#### 1.0 Introduction

This technical memorandum assesses freight-oriented economic effects of the proposed I-229 double-decker bridge alternatives. Factors include local freight dependency on the I-229 corridor and potential economic redevelopment impacts. The short-term (single year) construction impacts are quantified, and the long-term effects on local shippers/receivers is qualitatively assessed via surveys and quantitatively through freight data.

#### 2.0 Evaluation Methods

Transportation supports the people, capital, and technology that drive regional demand, supply, and goods distribution. Various tools help determine whether proposed transportation investments facilitate its support role. Quantitative and qualitative approaches are applied to these tools to evaluate the freight and economic implications of the Reasonable Alternatives.

#### 2.1 Evaluation Tools

Quantitative and qualitative economic evaluation tools offer opportunities and constraints. Qualitative models require little data and are easily managed but are subjective and potentially influenced by bias and opinion. Quantitative models are more (but not completely) objective, but require much more data input/collection, and require greater processing effort. Some of the standard analysis tools available include:

Basic Sufficiency Ratings – A simple measure, including road characteristics (e.g., length, width, strength), safety, and activity (e.g., vehicle miles traveled (VMT), etc.). Method subjectivity enables easy use of basic economic factors, but its simplicity also limits it. For example, "Do nearby businesses use the road? Yes/No."

- Economic Feasibility Often referred to as benefit/cost analysis (BCA), this quantitative approach compares monetary values using metrics such as Net Present Value (NPV), Benefit/Cost Ratios (BCR), and Internal Rates of Return (IRR). Federal funding agencies (e.g., FHWA, FAA, TIGER Grants, etc.) increasingly require BCA for capacity project evaluations. BCA requires input data and assumptions that are time consuming to compile and evaluate.
- Economic Impact Impacts comprise various measures (jobs, income, output, etc.), types (direct, indirect, induced, etc.), and components (efficiency, transfers, construction). While job impact measures are widely understood, they can mislead. Preferably, impacts should reflect monetized travel-efficiency benefits input into an economic impact model. A less rigorous, more subjective, and misleading approach is to simply use employment estimates associated with new development, which typically include transfers from existing regional businesses that relocate to the newly developed land.
- Cost Effectiveness A ratio of an investment's effectiveness to its cost (e.g., increased average annual daily traffic (AADT) or reduced travel time saved per investment cost, etc.). Projects can also be evaluated by benefits (travel and time savings, accidents, user costs, maintenance costs, etc.) per number of users, lane-miles, etc.
- Weighted Factors A detailed approach that multiplies factors by a relative weight. The total score is highly dependent on the component weights, which are often arbitrarily assigned. Results from other approaches often provide input into a weighted



- factors approach, which enables incorporation of both quantitative and qualitative analyses.
- Others Other screening/prioritization approaches vary between high subjectivity/low data requirements to low subjectivity/high data requirements.
   Of these, the Delphi Method uses group discussion to decide action or generate subjective criteria.
   For example, a Delphi Method could be used by a group of researchers (or DOT officials) to decide on which factors to use and how to assign weights in a weighted factors approach.

#### 2.2 I-229 Approach

The various approaches to assess the freight and economic effects associated with the proposed I-229 Reasonable Alternatives incorporate previous data and findings, which include shipper/receiver surveys, TRANSEARCH truck freight, AADT, alternative construction costs, the IMPLAN® economic model, etc. The quantitative and qualitative tools include:

- Construction Impacts short-term impacts based on alternatives' construction costs.
- Truck user benefits although insufficient to conduct a standard BCA, existing AADT and qualitative data is used to generate sketch-level truck user (dis)benefit estimates, which are then compared between alternatives.
- Shipper/receiver impacts truck-user benefits are compared with shipper/receiver and socioeconomic data to comment on the relative effect of truck diversions.

Regional development – while the truck diversions may negatively affect shippers/receivers, the effects may be offset by regional redevelopment initiatives associated with the replacement alternatives.

# 3.0 Business Users (Shippers & Receivers)

The St. Joseph economy includes numerous areas with large concentrations of businesses or clusters. Twenty firms from some of these clusters located in close proximity to I-229 and identified as I-229 users were surveyed/interviewed; nine are in the Stockyards Industrial area, one is in the Elwood Industrial Area, five are in the Study Area limits, and three are south of the Study Area, as shown in Figure 1. Two other surveyed firms with locations in St. Joseph were completed at their business management offices located in the Greater Kansas City area.

## 3.1 Trading Partners and Highway Use

Freight survey responses highlight long-distance trucking, with 43 percent of suppliers and 66 percent of customers located beyond the Missouri/Kansas region (Table 1). Only 17 percent of the surveyed firm's suppliers are co-located within Buchanan County, and only 10 percent of customers. Combined, the surveyed firms depend on I-229; 34 percent use I-229 for inbound shipments and 22 percent for outbound shipments (Table 2). When asked to rank I-229 importance on a 1-5 scale (low to high, respectively), responses averaged a 4.0 (i.e. "important").

Table 1

Location of Surveyed Firms' Trading Partners

Location	Suppliers	Customers
St. Joseph	15%	9%
Rest of County	2%	1%
NW Missouri	14%	3%
Rest of Missouri	12%	13%
KS	15%	8%
Other	43%	66%
Total	100%	100%

Source: CDM Smith

Table 2

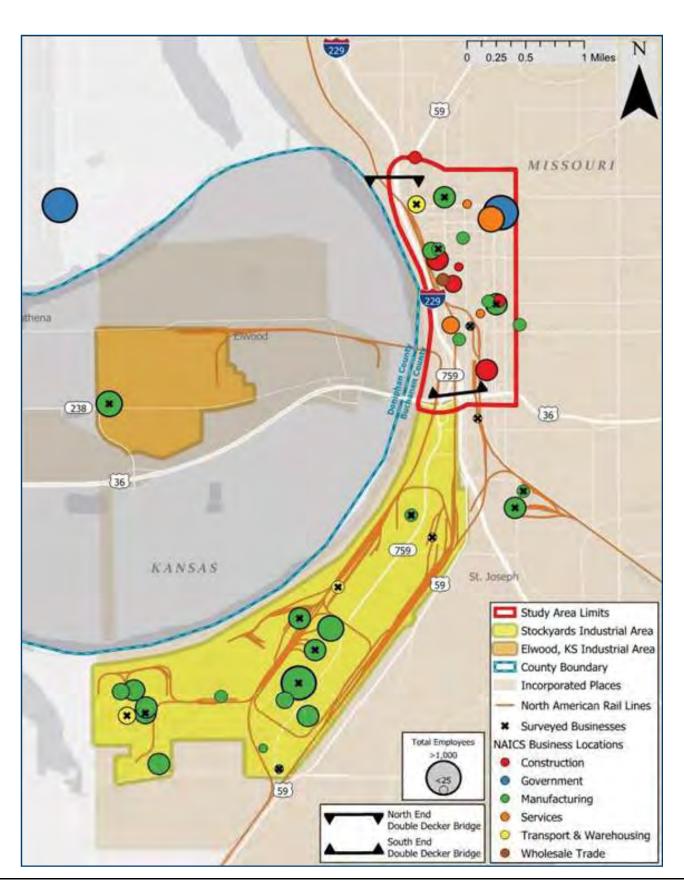
Surveyed Firms' Highway Usage

	Inbound	Outbound
I-229N	34%	22%
I-229E	22%	37%
US36-W	12%	9%
US36-E	22%	22%
Other	10%	10%
Total	100%	100%

Source: CDM Smith



Figure 1
I-229 Area Businesses and Surveyed Firms





#### 3.2 User Perceptions

Surveyed businesses north of US Route 36 and agricultural-related businesses depend on I-229 for inbound and outbound freight. Agribusinesses (grain, livestock, fertilizers, and chemicals) use I-229 for inbound supplier products from northwest Missouri, lowa, and Nebraska. Surveyed businesses southeast of the Study Area tend to depend on I-229 less since most of their freight moves to/from the south according to their survey responses.

Surveyed businesses responded that I-229 provides convenient access to downtown and the stockyards from the north although the bridge has been referred to as an eyesore. The I-229 interstate designation is less important to these businesses than having a reliable, safe, four-lane roadway. Respondents generally preferred a four-lane, truck-friendly facility unconstrained by local dimensional or weight permitting requirements. Two-lane roadway alternatives could change driver route behavior, result in longer travel and supply lead times, and create congestion/safety issues on alternate routes.

# 4.0 Truck Freight

TRANSEARCH truck data indicates most truck volumes as through movements. The data was also used to identify locally significant commodity movements, midterm growth through year 2030, and the importance of I-229 relative to other regional freight highways.

# 4.1 Freight Data

Freight data are characterized by geography/facility, volume, direction, time frame, and mode. Volume is measured by weight and/or monetary value in aggregate, or by commodity detail. Different sources encapsulate various dimensions, each with limitations and nuances. IHS Markit's TRANSEARCH, a for-hire freight

database, is more-comprehensive and detailed than other sources (e.g., FHWA Freight Analysis Framework (FAF)), and was made available for MoDOT's Statewide Freight Plan (2014). Such data were used to identify truck movements relating to I-229 in Buchanan County, Missouri along the following dimensions:

- Geography/Facility Data are presented relative to Buchanan County as the smallest level of geographic resolution available; and, some basic route/ segment-specific information.
- Direction Freight is delineated by four major movements relative to the geography/facility: outbound, inbound, intra, and through; such directions are sub-categorized relative to Missouri.
- Time Freight data are in annual terms, with a
  historical base year (i.e., 2011) and forecast year(s)
  (i.e., 2030); data presented are for year 2017,
  based on interpolating detailed direction-commodity data between 2011 and 2030.
- Measured Value Freight is measured by weight (i.e., tons), truck units, and monetary value.
- Commodity Freight comprises all goods movements, typically entailing a mix of commodities, both intermediary and final products. A two-digit Standard Transportation Commodity Code (STCC) level of data are presented.

Although the original TRANSEARCH database for the MoDOT Statewide Freight Plan is a bit dated (2011 base year), the data is still more-robust and applicable to sub-state analyses than the freely-available FHWA FAF data. Note that the data presented may include minor rounding-error differences between the detail and (sub)totals, accounting for differences due to interpolation, etc.





# 4.2 Buchanan County Freight

Current freight volumes (tons, units, value) are viewed from three primary perspectives: direction, commodity, and origin-destination pairing. Supporting data are in Tables 3 to Table 5.

Directional Summary – Year 2017 truck volumes for Buchanan County totaled 49.8 million tons in 3.5 million semi-trailer units, valued at \$80 billion. Value-perton averaged \$1,638, and averaged 14 tons per unit. As typical of a small urban county along an interstate, most truck freight is through, neither originating nor terminating in Buchanan County; 85.3 percent of tons, 79.4 percent of units, and 88.8 percent of value, per Figure 2. Additionally, a majority of those through movements pass through Missouri entirely.

Of the Buchanan-relevant truck movements, inbound tonnage exceeds outbound (9.2 percent versus 5.0 percent of total, respectively). However, outbound value exceeds inbound (6.0 percent versus 5.2 percent, respectively). This reflects the higher value-per-ton of outbound goods relative to inbound, illustrating the supply-chain effect of importing intermediary goods, adding value through manufacturing and other economic activity, and then exporting higher-value goods. Intra-county movements are a fraction of the total.

Commodity Summary – Food and kindred products and farm products comprise over half of the tonnage traversing Buchanan County's highways. Aside from through volumes, Buchanan-relevant commodities are

mostly inbound farm products and nonmetallic minerals, and outbound food and kindred products, secondary traffic, and chemicals or allied products. Figure 3 presents the top ten two-digit STCC commodities (digits reflect STCC codes) by ton for Buchanan County. Figure 4 provides commodity values, which shows shifts and dispersion between leading commodities (i.e., a larger share of Remaining Commodities).

Origins-Destinations – As noted, most semi-trailer truck movement on Buchanan County's roadways is through traffic that does not pertain to the County or the State. Buchanan County serves as a bridge region for longer-distance truck movements:

- Pairings Through traffic origins and destinations are myriad, with 515 unique state-to-state pairings between Canada, Mexico, and the United States.
- Notable through Pairings Missouri-Nebraska and Kansas-Nebraska comprise 10.8 percent and 6.2 percent of the through tonnage, respectively. All other pairings individually represent less than 5 percent of through traffic, most just a fraction of a percent.
- Buchanan County In contrast to the wide dispersion of through volumes, Buchanan County inbound and outbound movements are mostly to/from Midwestern states. Over half of the outbound tonnage from Buchanan County is destined for Missouri, Kansas, Nebraska, and Iowa, and over half of the inbound are from just Missouri and Kansas.

Figure 2

Directional Truck Summary (2017)

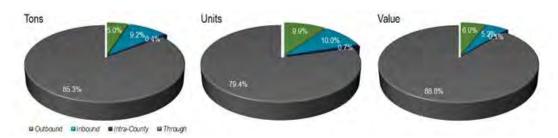




Table 3

Directional Truck Summary (2017)

Discorting	Tor	ıs	Un	its	Value (in	millions)	Average	Average
Direction	Amount	Percent	Amount	Percent	Amount	Percent	Value/Ton	Tons/Unit
Outbound	2,464,197	5.0%	347,001	9.9%	\$4,779	6.0%	\$1,939	7.1
Outbound to MO	556,575	1.1%	105,466	3.0%	\$752	0.9%	\$1,351	5.3
Outbound to non-MO	1,907,622	3.9%	241,536	6.9%	\$4,028	5.0%	\$2,111	7.9
Inbound	4,504,715	9.2%	351,105	10.0%	\$4,124	5.2%	\$915	12.8
Inbound from MO	1,580,497	3.2%	126,304	3.6%	\$942	1.2%	\$596	12.5
Inbound from no-MO	2,924,218	6.0%	224,801	6.4%	\$3,182	4.0%	\$1,088	13.0
Intra-County	217,411	0.4%	23,487	0.7%	\$67	0.1%	\$308	9.3
Through	41,640,571	85.3%	2,775,005	79.4%	\$70,993	88.8%	\$1,705	15.0
Through MO to MO	731,679	1.5%	80,152	2.3%	\$617	0.8%	\$844	9.1
Through non-MO to MO	5,647,472	11.6%	435,575	12.5%	\$7,074	8.8%	\$1,253	13.0
Through MO to non-MO	5,416,974	11.1%	517,752	14.8%	\$7,610	9.5%	\$1,405	10.5
Through non-MO to non-MO	29,844,447	61.1%	1,741,526	49.8%	\$55,691	69.6%	\$1,866	17.1
Total	48,826,894	100.0%	3,496,598	100.0%	\$79,963	100.0%	\$1,638	14.0

Table 4

Buchanan County Freight Growth, by Directional Volume (2017-2030)

D'andia	201	7	203	30	%Change	CAGR
Direction	Amount	Percent	Amount	Percent	('17-'30)	('17-'30)
Tons	48,826,894	100.0%	62,718,835	100.0%	28.5%	1.9%
Outbound	2,464,197	5.0%	2,965,481	4.7%	20.3%	1.4%
Inbound	4,504,715	9.2%	5,737,777	9.1%	27.4%	1.9%
Intra-County	217,411	0.4%	999,890	1.6%	359.9%	12.5%
Through	41,640,571	85.3%	53,015,686	84.5%	27.3%	1.9%
Units	3,496,598	100.0%	4,472,526	100.0%	27.9%	1.9%
Outbound	347,001	9.9%	428,777	9.6%	23.6%	1.6%
Inbound	351,105	10.0%	456,629	10.2%	30.1%	2.0%
Intra-County	23,487	0.7%	62,486	1.4%	166.0%	7.8%
Through	2,775,005	79.4%	3,524,633	78.8%	27.0%	1.9%
Value, in millions	\$79,963	100.0%	\$108,689	100.0%	35.9%	2.4%
Outbound	\$4,779	6.0%	\$5,884	5.4%	23.1%	1.6%
Inbound	\$4,124	5.2%	\$5,756	5.3%	39.6%	2.6%
Intra-County	\$67	0.1%	\$83	0.1%	23.8%	1.7%
Through	\$70,993	88.8%	\$96,967	89.2%	36.6%	2.4%



Table 5
Commodity Growth, 2017-2030 Tons

STCC	Constitution	20	17	20:	30	Change	
STCC Commodity		Amount	Percent	Amount	Percent	Tons	CAGR
20	Food or Kindred Products	13,607,172	27.9%	17,089,019	27.2%	3,481,847	1.8%
50	Secondary Traffic	6,273,714	12.8%	9,551,412	15.2%	3,277,698	3.3%
14	Nonmetallic Minerals	2,558,885	5.2%	4,337,514	6.9%	1,778,629	4.1%
01	Farm Products	12,722,954	26.1%	13,730,379	21.9%	1,007,425	0.6%
32	Clay, Concrete, Glass, or Stone	1,570,169	3.2%	2,449,667	3.9%	879,499	3.5%
28	Chemicals or Allied Products	2,291,780	4.7%	2,872,890	4.6%	581,110	1.8%
29	Petroleum or Coal Products	2,239,771	4.6%	2,694,447	4.3%	454,677	1.4%
36	Electrical Equipment	360,128	0.7%	738,884	1.2%	378,756	5.7%
24	Lumber or Wood Products	1,377,269	2.8%	1,723,130	2.7%	345,861	1.7%
30	Rubber or Misc. Plastics	552,516	1.1%	755,206	1.2%	202,691	2.4%
	Remaining Commodities	5,272,535	10.8%	6,776,286	10.8%	1,503,751	1.9%
	Total	48,826,894	100.0%	62,718,835	100.0%	13,891,941	1.9%

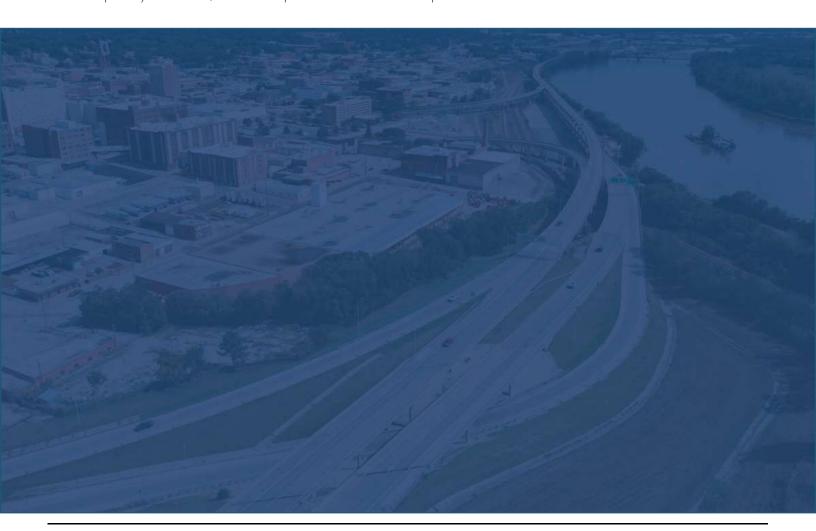




Figure 3

Commodity Tons (2017)

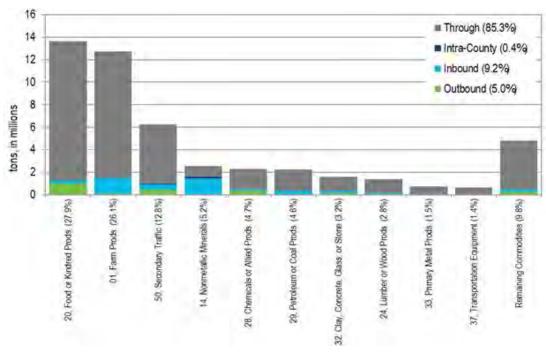
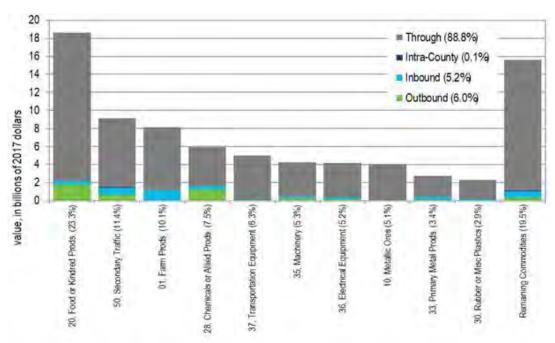


Figure 4

Commodity Value (2017)





Midterm Growth – Tons, value, and unit growth between 2017 and 2030 as described below:

- Directional Growth Year 2030 Buchanan County freight volume of 62.7 million tons, carried in 4.5 million truck units, is valued at \$108.7 billion (see Table 5). This reflects a compound average growth rate (CAGR) of 1.9 percent, 1.9 percent, and 2.4 percent, respectively, from 2017. Intra-county tonnages grow at a fast pace (albeit, it is low-value Nonmetallic Minerals, or aggregate). Despite slight differences in directional growth, the overall year 2030 composition is like 2017, with a significant majority (85 percent) of through volumes.
- Commodity Growth Food and kindred products and secondary traffic growth account for almost half of tonnage growth. Commodity growth detail is shown in Table 5.

#### 4.3 I-229 Freight Movements & Economic Importance

TRANSEARCH assigns truck movements to 36 roadway segments in Buchanan County. Eight pertain to I-229 segments, the remainder pertain to I-29 and other US and state roads. The 2017 roadway density data indicates freight value peaked at \$73.6 billion on an I-29 segment, which was dominated by through movements, see Figure 5. In comparison, the highest-value segment of I-229 (\$2.5 billion) is only 3.4 percent of the I-29 segment volume. However, 83 percent of the I-229 value pertains to Buchanan County. Bottom-line, traffic volumes on I-229 study segments are much less than those on I-29 but accommodate a greater share of locally relevant traffic (e.g., non-through).

Table 6 **Buchanan County Economy (2017)** 

Variable	Goods^	Other	Total	Goods %
Employment	11,423	51,034	62,457	18.3%
Labor Income*	\$0.8	\$2.3	\$3.10	24.8%
Value Added*	\$1.6	\$3.4	\$5.00	32.6%
Output*	\$6.7	\$5.9	\$12.60	52.9%

Source: Source: IMPLAN; \*in billions of dollars; ^includes agriculture, mining, manufacturing, etc.

Economic Importance - Of the \$2.5 billion trucked along I-229 study segments, \$2.0 billion (80 percent) are inbound-to or outbound-from Buchanan County. Comparison of these values to county economic totals provides perspective. According to IMPLAN® (see Section 6.1), Buchanan County's economy employed 62,500 people in 2017, earning \$3.1 billion in labor income, producing \$5.0 billion in value-added (or, gross regional product), with a final sales output of \$12.6 billion, as shown in Table 6. Goods-related industries (e.g., agriculture, mining, manufacturing, etc.) account for 52.9 percent of the regional sales output (\$6.7 billion). As such, the \$2.0 billion worth of Buchanan County-produced/consumed goods carried on I-229 study segments account for about 30 percent of the Buchanan County's goods-related output value in 2017.

#### 5.0 Economic Assessment

The following economic assessment includes construction impacts, trucking (dis)benefits, and potential redevelopment.

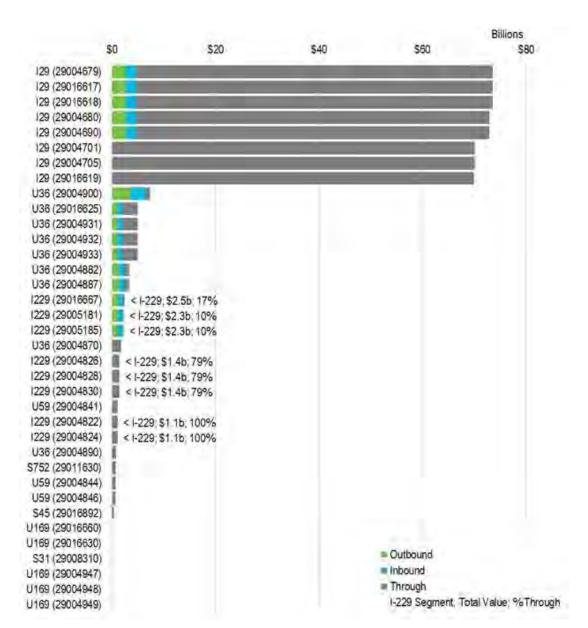
#### 5.1 Construction Impacts

IMPLAN® was used to estimate the short-term construction impacts of replacing or rehabilitating the I-229 double-decker bridge.

IMPLAN® – Is an input-output (I/O), social account matrix software used for estimating regional annual economic impacts from assumed industry or commodity changes, reflecting economic interrelationships between industries, commodities, households, and governments, measured by impact multipliers and other economic characteristics. Multipliers are developed from regional purchase coefficients, production functions, and socioeconomic data for each geographically specific variable. IMPLAN® is commonly used for quantifying economic interactions along various metrics and dimensions and can be evaluated in a myriad of ways for a variety of purposes.



Figure 5
Freight Value by Roadway Segment in Buchanan Co., MO (2017)





Alternative Construction Costs – The inputs into the model are based on the relative construction cost of each of the Reasonable Alternatives. The No-Build alternative assumes the existing double-decker bridge is barricaded and permanently closed with no replacement. The four Reasonable Alternatives costs range from \$48 to \$72 million (Table 7).

**Impact Measures** – Five annual impact measures are used to assess the construction effects.

- Employment (Jobs) Measured in terms of full-time-equivalent (FTE) job-years.
- Output Total sales value associated with all levels of economic activity (comprises intermediate inputs and value added, combined).
- Value-Added Net additional economic activity beyond intermediate inputs in the production of goods and services, synonymous with gross regional product (GRP); includes labor income, other property income types, and taxes.
- Labor Income Includes both employee compensation, which is the wage/salary earnings paid to employment, and proprietor income.
- Taxes Various taxes on production and imports (sales, property, excise, etc.), fines, fees, licenses, permits, etc. resulting from business economic activity; this includes all federal, state, and local tax revenues

Impact Types – An industry or commodity change applied to the IMPLAN® model yields three types of impacts that aggregate into a total impact for each of the above-mentioned measures.

Table 7

Construction Cost by Alternative

Alternative Description	Cost (\$M)
No-Build	N/A
Alt A: Main Street Corridor	\$49.1
Alt B: 2nd Street Corridor	\$51.4
Alt C: Railroad Tracks East Corridor	\$71.5
Alt D: Existing Corridor	\$48.3

Source: I-229 EA

- Direct Impacts attributable to the changed industry or commodity.
- Indirect Impacts associated with the suppliers that provide intermediate goods and services to the directly impacted industries; this is a supply-chain effect.
- Induced Impacts associated with the re-spending of earned income from both the direct and indirect industries in the study region; this is a net regional gain/loss income effect.
- Total Summation of direct, indirect, and induced types.

Impact Findings – Construction costs represent the direct change in regional output, which range from \$48 to \$72 million (Table 7). Resultant annual impacts, inclusive of the direct, indirect, and induced effects would total between 429 to 635 jobs, as summarized in Table 8. These reflect single-year impacts that would cease after the new facility is built. Employment income impacts range from \$26.0 to \$37.8 million. The other value-added, output, and tax impacts are also shown. Since there are no costs associated with the No-Build, no impacts are estimated.

## 5.2 Freight Benefits

Order of magnitude (dis)benefits associated with the four Reasonable Alternatives were developed to provide a sketch-level economic perspective. The general findings lack the quantitative rigor associated with travel demand modeling (TDM) of each alternative under a base year and forecast year. Rather, existing AADT, TRANSEARCH derived truck units, shipper/receiver responses, and USDOT Benefit-Cost Analysis (BCA) guidelines were used to broadly estimate the annual truck-user (dis)benefits – exclusive of passenger vehicles, traffic growth, and other BCA factors. The purpose was to understand the (dis)benefits associated with existing bridge closure to the shippers/receivers, as well as how such (dis)benefits compare with alternative construction costs and regional economic activity.

General Assumptions – Truck diversion estimates reflect survey responses, TRANSEARCH I-229 volumes, MoDOT AADT, and consultant experience. While it is hard to estimate diversions based on any given Reasonable Alternative it was assumed based



on experience that Alternative A and B, with additional signals, would result in more diversions than Alternatives C or D with fewer signals. Survey responses suggest fewer traffic signals would result in less diversion. All the alternatives are expected to divert the routes of some drivers (e.g., I-29 to/from US Route 36), which increases drive times, distances, and potentially congestion on alternative routes (especially I-29). Additionally, these alternatives facilitate better connectivity to/from the Stockyards Expressway and the expressway north of the decommissioned bridge.

An average diverted truck-trip distance of five miles is assumed (e.g., using US Route 36 and I-229). AADT are annualized assuming 300 days/year. Average diverted speed is estimated at 50 mph. Truck operating costs are estimated at \$0.92/mile and \$29.25/hour, per USDOT BCA Guidance. Daily truck volume estimates of 2,700/day reflect similar data across TRANSEARCH, the surveyed volumes, and MoDOT traffic counts.

Diversion Costs and Benefits – Two perspectives: first, closing the existing I-229 bridge (No-Build Alternative) will result in (dis)benefits, since trucks (and other users) will drive further at lower speeds on other network roads. Second, comparison of the Reasonable Alternatives (dis) benefits to the No-Build alternative generates net benefits (i.e., (dis)benefit reduction).

**Truck Diversion Costs** – Under the four Reasonable Alternatives, truck diversion estimates range from 5 percent (Alt D) to 20 percent (Alt B). A 100 percent diversion is assumed under the No-Build Alternative, since the bridge would be closed without a new alternative rout. Resultant diversion costs and benefits shown in

#### Table 9 suggest:

- Annual diverted truck (dis)benefits of decommissioning without a replacement total \$6.1 million (No-Build).
- Comparatively, the Reasonable Alternatives would reduce annual truck (dis)benefits to between \$0.3 million (Alt D) and \$1.2 million (Alt B).

Annual Benefits – Compared to the (dis)benefits of the No-Build Alternative, the Reasonable Alternatives yield notable truck benefits (\$4.9 million to \$5.8 million). Of these net benefits, it is estimated that 60 percent pertain to local shippers/receivers; the other 40 percent accrue to non-local through truck movements.

Summary – From a freight-user feasibility perspective, the relative annual (dis)benefits associated with each of the Reasonable Alternatives range from one to two percent of their construction costs. A detailed BCA would yield more substantiated conclusions.

Under the No-Build Alternative local diverted truck (dis) benefits of \$3.7 million reflect a very small share of the overall annual regional goods economy (\$6.7 billion, see Table 6). Of the four Reasonable Alternatives, Alternative D appears to facilitate the greatest truck traffic flow, and hence be the least disruptive to local businesses. These findings also appear to support the general perspectives gleaned from the surveys.

#### 5.3 Economic Development

The long-term economic impacts and benefits associated with decommissioning the bridge go beyond construction and freight users. The alternatives reorganize

Table 8

Construction Impacts by Alternative, Measure, and Type

		Alt A	Alt B	Alt C	Alt D
Measure	No-Build	Main Street Corridor	2nd Street Corridor	Railroad Tracks East Corridor	Existing Corridor
Employment (No. of Jobs)	NA	436	457	635	429
Income (\$M)	NA	\$26.0	\$27.2	\$37.8	\$25.5
Value-Added (GRP in \$M)	NA	\$33.4	\$35.0	\$48.7	\$32.9
Output (\$M)	NA	\$70.4	\$73.7	\$102.6	\$69.3
Taxes (\$M)	NA	\$1.3	\$1.3	\$1.8	\$1.2

Source: CDM Smith use of IMPLAN



local shipper/receiver freight traffic on St. Joseph's roads, which could also facilitate downtown redevelopment if paired appropriately with other revitalization initiatives. Quantification of such redevelopment is difficult and often controversial since it comprises varying economies, land-use and zoning, transport volume and capacity, etc. While quantification goes beyond this study purpose and objectives, general observations and experience provide perspective.

The Strategic Highway Research Program 2 (SHRP2) studied 100 before and after highway case studies of economic and land development impacts, created a national database, and developed a web-based tool to evaluate the potential impacts given project and analysis area metrics. Project types included intercity highways, urban beltways, bypasses, local access roads, bridges, highway interchanges, and intermodal road/rail terminals. Regions included both urban and rural

settings, spanning a range of economic distress levels. Data was categorized in five ways:

- **Project characteristics** Facility, construction date, cost, distance, region, traffic volume, etc.
- Project objectives Congestion reduction, enhanced access, economic growth, etc.
- Impact metrics Change in employment, income, business output, land values, building development, and tax revenues.
- Quantitative explanatory data Location (region, metropolitan/rural), topography, and economic distress level.
- Qualitative explanatory data Local interview findings on land use plans and policies, business climate and support programs, other factors affecting outcomes.

Table 9

Truck Diversion (dis)Benefits by Alternative

Alternative Description	No-Build	Alt A	Alt B	Alt C	Alt D
		Main Street Corridor	2nd Street Corridor	Railroad Tracks East Corridor	Existing Corridor
Diversions					
Percent diverted <sup>a.</sup>	100%	15%	20%	10%	5%
Daily Trucks	2,700	405	540	270	135
Annual <sup>b.</sup>					
Truck miles (VMT) <sup>c.</sup>	4,050,000	607,500	810,000	405,000	202,500
Truck hours (VHT) <sup>d.</sup>	81,000	12,150	16,200	8,100	4,050
Annual Truck Disbenefits (\$M)					
Vehicle Operating <sup>e.</sup>	\$3.7	\$0.6	\$0.7	\$0.4	\$0.2
Time <sup>f.</sup>	\$2.4	\$0.4	\$0.5	\$0.2	\$0.1
Total	\$6.1	\$1.0	\$1.2	\$0.6	\$0.3
Local User Disbenefits <sup>g.</sup>	\$3.7	\$0.5	\$0.7	\$0.4	\$0.2
Annual Net Benefits (\$M)					
Benefits (vs. No-Build)		\$5.1	\$4.9	\$5.5	\$5.8

a. CDM Smith

b. 300 hundred days per year

c. five diverted miles per truck trip

d. 50 mph average trip speed

e. \$0.92 VOC/mile (FHWA BCA Guidance 2018)

f. \$29.25 time-cost/hour (FHWA BCA Guidance 2018)

q. 60% local trucks; comparison of MoDOT AADT, Transearch, and shipper/receiver surveys



Key Findings – Statistical analysis of empirical data and identification of common themes from the qualitative interview reports yielded the following:

- Impact measures Transportation projects facilitate economic development in varying forms of employment, income, land use, property values, or building construction depending on project type and setting no "one-size-fits-all."
- Impact horizon Impacts vary over time, which requires multiple impact measures and temporal observations to understand economic development impacts.
- Impact variance Eighty-five percent of the projects yielded positive economic impacts, while the rest show either no net impact or a small negative impact. However, impacts varied widely given the variance in project characteristics.
- Region Larger job impacts are generated in metropolitan settings than in rural settings. Rural projects tend to have lower costs and take less time to build than those in metropolitan settings. Job growth in rural areas lags metropolitan areas.
- Regional economy Projects in economically vibrant areas with complementary infrastructure and zoning regulations tend to generate more jobs than projects in areas with a weak/faltering economy, lacking infrastructure support, and unsupportive zoning.
- Regional coordination Projects with a coordinated economic development effort (involving complementary policies) generally facilitate more long-term job growth than projects lacking local supporting policies.

Project Details Affect Outcomes – The seven common themes affecting economic impact comprise two general categories:

- · Land use policies and conditions
- Consistency with land use policies;
- Zoning and site preparation; and
- Real estate market conditions.

#### Proactive government actions

- Promotion of a shared vision among stakeholders;
- Inter-agency coordination and consensus building;
- Integration with other public investment and development efforts; and
- Complementary targeting of economic development efforts.

Prior study findings indicate that a rising demand for goods and services is required for a region to realize economic development impacts from a highway infrastructure project. This requires appropriate land use policies/conditions and government support. It confirms that transportation investment can facilitate but not solely create economic activity. Rather, other complementary and supporting initiatives are required in conjunction with transportation improvements.

#### 5.4 Conclusions

The construction costs associated with the four Reasonable Alternatives are of the same magnitude but reflect single year events with no long-term impact. Local shippers/receivers indicate I-229 to be a significant roadway. While bridge decommissioning would affect freight users over the long-term, alternative roadways are available, albeit more (dis)benefits in transport terms (i.e., further and/or longer).

Order-of-magnitude truck (dis)benefits of decommissioning without replacement are \$6.1 million annually, which could be reduced with a bridge replacement; nonetheless annual (dis)benefits still rise (\$0.9 to \$2.4 million). A more accurate and encompassing analysis of transport benefits for shippers/receivers and passenger-vehicle users requires a travel demand model.

Beyond the transport efficiency and construction impacts, the larger issue at hand may be the potential economic redevelopment impacts of removing the bridge in a manner that facilitates downtown St. Joseph redevelopment. Such redevelopment goes beyond a freight-economic analysis to incorporate various land use policies and proactive government actions.



# Technical Memorandum 9

# Riverfront Development

#### 1.0 Introduction

The purpose of this technical memorandum is to outline potential impacts to the proposed improvements described in the recently completed St. Joseph Riverfront Master Plan (SWT Design, et al 2019), due to each of the I-229 Reasonable Alternatives.

The proposed reconfigurations of I-229 are generally limited to the area between U.S. Route 36 and U.S. Route 59. Therefore, potential impacts are for the most part limited to the southernmost area of the proposed Riverfront improvements – referred to as Robidoux Landing in the Master Plan document (Figure 1). The proposed Robidoux Landing improvements (Segment E) include a riverwalk trail, pedestrian bridge across the Missouri River, trail center, public plaza, urban beach, splash plaza, destination playground, and pedestrian bridge rail crossing (Figure 2).

#### 2.0 Role in Alternatives Selection

The study team has been working closely with the community and staff from the City of St. Joseph to assess the importance and the role the proposed Riverfront plan should have in the development and selection of a final recommended preferred alternative. The recommendations in the final plan, supported by members of the community and city staff, prioritized Riverfront improvements north of the Study Area, near the casino and the Remington Nature Preserve. Improvements in the Study Area (Segment E - Roubidoux Landing) have been given the lowest priority because of the limited land available for development, accessibility and safety issues with the current at-grade railroad crossing, lack of funding, and limited ability to connect with downtown improvements.

The proposed improvements in Segment E - Roubidoux Landing do have some support from various

stakeholders in the community and there is a desire to make some of the proposed improvements. However, others in the community believe the at-grade rail crossing will be a permanent impediment to those plans and are hesitant to value impacts to that plan higher than other community goals related to downtown revitalization and the efficient movement of freight. To formalize that belief, the study team asked the Mayor and City Council to write a letter to that affect (Figure 3). Based on this letter and other discussions with the community, the decision was made to continue to use the potential impacts to the Riverfront Master Plan as one of the study's evaluation criteria, but at the same level as the other criteria, and not as high as others that were determined to be more important to the community - downtown revitalization and freight accessibility.

#### 3.0 Effects of Alternatives Considered

The following section evaluates the potential for direct or indirect impacts on the proposed Riverfront improvements outlined in the St. Joseph Riverfront Master Plan by the Reasonable Alternatives, including the No-Build Alternative. It also describes how each alternative would impact bicycle and pedestrian access to the Riverfront.

#### 2.1 No-Build Alternative

Currently, I-229 passes through the Riverfront Master Plan area as a double-decker elevated interstate highway. I-229's on- and off-ramps connect to downtown via Charles Street, Edmond Street, Felix Street, and Francis Street. The I-229 double-decker bridge portion of the interstate is situated between the Riverfront and the existing BNSF railroad tracks; it passes directly over a parking lot, proposed destination playground, and public space shown in the proposed Robidoux Landing improvements (**Figure 2**). The Master Plan proposes



Figure 1

Proposed Riverfront Master Plan



The Riverfront Master Plan has been divided into five different segments. Segment E, the Robidoux Landing, is the only segment that overlaps with the I-229 Study Area.

Source: SWT Design, et al 2019

# Legend A North Riverfront B Riverfront Core C The Bluff D Eco-Line E Robidoux Landing



Figure 2

Proposed Riverfront Master Plan Improvements in the Area of Robidoux Landing



Source: SWT Design, et al 2019

Figure 3

Letter from Mayor of St. Joseph, MO

# City of Saint Joseph

1100 Frederick Avenue • City Hall, Room 309



# Office of the Mayor

St. Joseph, MO 64501-2346 • Phone: 816.271.4640

December 27, 2022

Mr. Martin Liles, PE
District Engineer
Missouri Department of Transportation
Northwest District
3602 North Belt Hwy.
St. Joseph, MO 64506-1399

Subject: St. Joseph Riverfront Master Plan

Re:

I-229 Double-Decker Bridge Project - US 36 to US 59

MoDOT Project No. J1I3053

Dear Mr. Liles:

As you have explained, MoDOT is conducting an Environmental Assessment (EA) on the I-229 Double-Decker Bridge for the following reasons:

- The bridge is nearing the end of its expected life: the expected lifespan of the bridge is 50 years.
   The bridge is currently 40 years old.
- The bridge is rated in poor condition: despite ongoing maintenance, the bridge continues to deteriorate and is rated in poor condition - the equivalent to a C- grade.
- Current structural problems on the bridge will be difficult and costly to repair: if the bridge was
  rehabilitated, it would either need a second rehabilitation or a complete replacement in
  approximately 25 years with an estimated cost around \$200 million.

Therefore, removing the existing double-decker bridge and replacing it with a comparable alternative has become a community priority. Several alternatives have been analyzed and when I took office, I made it a priority to arrive at a solution that both the City of St. Joseph and MoDOT could support. I believe an alternative (Alternative D – Existing Corridor) that follows the existing alignment at-grade as much as possible is that solution.

We also understand that this alternative would impact the southern portion of the Riverfront Master Plan, referred to in that plan as Segment E – Robidoux Landing. While some members of our community would support the improvements noted in this segment of the Riverfront Master Plan, past discussion of the topic by the City Council indicates the City Council does not prioritize those potential improvements over the effectiveness "Alternative D – Existing Corridor" offers in enabling the north-south flow of traffic, based on the following:



Figure 3

Letter from Mayor of St. Joseph, MO (Page 2)

- The recommendations in the final plan, supported by members of the community and city staff, prioritized riverfront improvements north of the I-229 Study Area, near St. Jo Frontier Casino and Remington Nature Center, over those proposed improvements within the Robidoux Landing area
- Improvements at Robidoux Landing have been given the lowest priority because of the limited land available for development, accessibility and safety issues with the current at-grade railroad crossing, lack of funding, and limited ability to connect with downtown improvements.
- As previously referenced, the proposed improvements in Segment E Robidoux Landing do have some support from various stakeholders in the community and there is a desire to move forward with some of these improvements. However, others in the community, including myself and, based on public discussion, a supermajority of City Council members, believe the at-grade rail crossing will be a permanent impediment to those plans. Placing a higher value on the potential negative impact on Segment E improvements over other community goals related to downtown revitalization and the efficient movement of freight would not align with our goals.

In the interest of keeping the I-229 project moving forward, the intent of this letter is to confirm previous conversations that place Segment E of the Riverfront Master Plan as a lower priority for the City in comparison to transportation improvements that will be served by Alternative D – Existing Corridor. If you have any questions and/or concerns, please feel free to contact me at jjosendale@stjosephmo.gov or at (816) 271-4640.

Respectfully,

John Josend Mayor



re-imagining the currently underutilized space beneath the interstate as an urban "canvas" for local artists, with murals lending new energy and life to the area. The authors of the Riverfront Master Plan document did not consider the presence of the I-229 bridge to be an impediment to the proposed Riverfront improvements, stating that "Robidoux Landing has been programmed/ designed in such a way that the key elements are capable of existing with or without the elevated highway." However, there would be obvious drawbacks should the double-decker bridge remain. The current configuration of I-229, with its tangle of bridges and ramps, complicates bicycle and pedestrian access to the proposed Robidoux Landing - an area that is already nearly unnavigable on foot, even when considering the presence of the BNSF railroad. Vehicular access will remain limited to the existing at-grade railroad crossing at Francis Street. However, pedestrian access could still be expanded via the proposed riverwalk trail and pedestrian bridges shown in the Riverfront Master Plan.

#### 2.2 Alt A - Main Street Corridor

Alternative A proposes partial removal of I-229 between Felix Street and US Route 59, with a realigned roadway connecting into Main Street (Figure 4). The connection to Main Street transitions to an at-grade arterial roadway north of Sylvanie Street. Alternative A also reconnects the grid along 2nd Street, at the intersections of Sylvanie Street, Charles Street, and Edmond Street. The relocation of the roadway will ease constructability of the proposed Robidoux Landing elements. While this alignment eliminates a large portion of the elevated highway, the alternative maintains an elevated highway between Robidoux Landing and downtown St. Joseph. There would likely be some reductions in traffic around Robidoux Landing as a result of the re-aligned roadway. The removal of the existing on-ramp and off-ramp connecting to Felix Street and Francis Street could expand opportunities to improve connectivity to the north of Robidoux Landing, including simplifying the implementation of the proposed pedestrian bridge rail crossing.

#### 2.3 Alt B - 2nd Street Corridor

Alternative B proposes I-229 be re-aligned, with a handful of on-ramps and off-ramps replaced with two intersections - one located southwest of 4th Street

and Mitchell Street and the other at Felix Street and 2nd Street (**Figure 5**). The interstate would effectively be eliminated in the area of Robidoux Landing, including the on-ramp and off-ramp that currently connect to Charles Street and Edmond Street, respectively. As with Alternative A, the resultant space left by the removal of the interstate would ease constructability of the Landing. However, the re-aligned roadway, which would be at-grade or slightly elevated north of Sylvanie Street, could present a significant barrier for bicyclists and pedestrians – despite proposed pedestrian facilities alongside the roadway. The intersections, unlike the roundabouts originally proposed as part of this alternative, will be friendlier to pedestrians. Traffic lights and crossing signals will provide safer access to the landing and the slower traffic speeds will be more welcoming for on-street bicyclists.

#### 2.4 Alt C - Railraod Tracks East Corridor

Alternative C proposes I-229 be realigned between US Route 59 and US Route 36 and moved to the east side of the BNSF railroad (**Figure 6**). A bridge would be provided on the north just east of the railroad to provide a connection to I-229 to the north. The interstate would effectively be eliminated in the area of Robidoux Landing. As with Alternatives A and B, the resultant space left by the removal of the interstate would ease constructability of the Landing. A signalized intersection would be provided at Felix however significant barriers would be present along the majority of the corridor with BNSF and the proposed boulevard running parallel. The best opportunity for pedestrians and bicyclists to access the landing would likely be at Francis Street under the new bridge structure.

With the shift to the east side of the railroad, this alternative also opens up the possibility of providing a trail connection into the Riverfront from the south that the other alternatives would preclude.

# 2.5 Alt D - Existing Corridor

Alternative D proposes I-229 be reconstructed along its existing corridor at ground level where feasible. A bridge would be provided on the north just east of the railroad to provide a connection to I-229 to the north (**Figure 7**). Unlike Alternatives A, B and C, the resultant space left by the removal of the double-decker



Figure 4

Alternative A - Main Street Corridor
Riverfront Rendering



Figure 5

Alternative B - 2nd Street Corridor
Riverfront Rendering





Figure 6

Alternative C - Railroad Tracks East Corridor
Riverfront Rendering



Figure 7

Alternative D - Existing Corridor Riverfront Rendering





bridge would not provide adequate space for the proposed construction of the Landing. The best opportunity for pedestrians and bicyclists to access the landing would likely be at Francis Street under the new bridge structure.

#### 3.0 Conclusion

The I-229 double-decker bridge - as it stands today - is largely a psychological and visual barrier to the River-front from Downtown. Although access to the River-front is currently limited to the at-grade railroad crossing on Francis Street, there is no additional, significant physical barrier presented by the I-229 bridge structure itself. Access to the Riverfront - for bicyclists, pedestrians, and motorists alike - will not greatly improve unless additional connections are made. Additionally, a southern connection could greatly improve access to the Riverfront. Alternative C provides the land and ability to ease connectivity to the south.

Among the four alternatives that propose some level of modification to the existing I-229 bridge and/or ramps, Alternative A seems to offer the most promise in terms of improving the relationship between downtown St. Joseph and the Riverfront – at least in the area of Robidoux Landing. Alternatives B and C provide the additional right-of-way needed for the improvements but both introduce a new bridge structure in the vicinity of the proposed improvements. If any of the alternatives were paired with robust pedestrian and bicycle facilities to provide new, direct multi-modal access to the Riverfront, the net benefit could be even greater. Table 1 below provides a summary of the impacts outlined in this section.

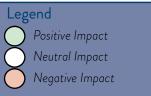


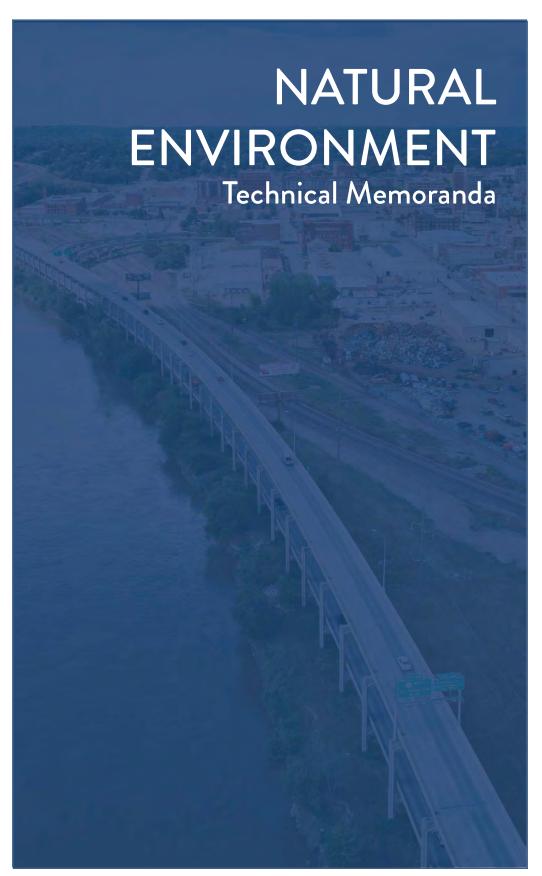
Table 1

Reasonable Alternatives Effect on the Proposed Robidoux Landing Improvements

	No-Build	Alt A Main St. Corridor	Alt B 2nd Street Corridor	Alt C Railroad Tracks East Corridor	Alt D Existing
Bicycle/Pedestrian Access to the Riverfront	No change to existing bike/ped access. Francis St. remains the only crossing point.	Removal of I-229 bridge eliminates a visual and psychological barrier but does not change access. New traffic light at Francis St could make crossing safer.	No change to existing bike/ped access. Francis St. remains the only crossing point.	New bike/ped access points to the south would improve con- nectivity.	No change to existing bike/ped access. Francis St. remains the only crossing point.
Ability to Provide Southern Riverfront Access	Southern access not possible.	Southern access not possible.	Southern access not possible.	Southern access possible.	Southern access not possible.
Vehicular Access to the Riverfront	No change to existing vehicular access.	No new vehicular access points to the Riverfront.	No new vehicular access points to the Riverfront.	Southern access could be accomodated.	No new vehicular access points to the Riverfront.
New Development Opportunities	No new developable land.	Removal of large portions of I-229 and re-connection of grid results in new, poten- tially developable land.	Removal of ramps at Edmonds/Charles opens up developable land but new bridge at Felix/Francis limits opportunities.	Removal of existing businesses and bridge structure on the north would be an impediment to new development. Some additional land available along Riverfront.	Removal of ramps at Edmonds/Charles and at Felix/France opens up developable land. No additional land available along Riverfront.
Views to the River from Downtown	Views remain un- changed.	Removal of I-229 bridge eliminates a visual barrier.	New bridge structures could negate potential benefit of I-229 bridge removal.	New bridge structures could negate potential benefit of I-229 bridge removal.	New bridge structures could negate potential benefit of I-229 bridge removal.









# **Technical Memorandum 10**

# Visual Assessment

#### 1.0 Introduction

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

The visual assessment process consists of four components. These include:

- Determining the area of visual effect
- Analyzing the landscape character and experience
- Predicting baseline impacts
- Identifying mitigation options

The visual assessment process provides an analysis of the landscape character for the Study Area. It is also used to determine the type and degree of visual impact for various viewers, such as the interstate user, the recreational tourist, and the local resident.

# 2.0 Project Description

The Missouri Department of Transportation (MoDOT) is currently evaluating the future of a portion of Interstate 229 (I-229) in the St. Joseph, Missouri region. I-229 is a major corridor through downtown St. Joseph carrying traffic through the heart of the city along the Missouri River. Through the downtown area, I-229 consists of a mile-long, double-decker bridge that has served industry and daily travelers since it was built in 1976. This key piece of infrastructure is aging and will soon need significant repairs to keep it in good driving condition. Before proceeding with costly repairs, Mo-DOT has decided to consider the future of the I-229 bridge.

## 3.0 Analysis Process

This visual assessment provides information for the FHWA National Environmental Policy Act (NEPA) process. This visual assessment is based on the FHWA Guidelines for the Visual Impact Assessment of Highway Projects (January 2015) methodology for assessing potential visual impacts.

This visual analysis assesses the visual character and visual quality of the landscape, and then considers how typical viewers may respond to what they see around them. This assessment uses a professional observational approach that involves using projections about the visual preferences of viewers from certain locations. These assumptions are listed when the affected population is described within the landscape units identified and discussed in the section below.

Visual quality addresses aesthetics, which is the study of perceptual experiences that are pleasing to people. Visual quality is, therefore, the experience of having pleasing visual perceptions. Although background and former experiences make each individual's experience of visual quality unique, human perception of what constitutes a pleasing landscape is remarkably consistent, not only within a society but across cultures.

A viewer observing an existing scene has a range of available responses that are inherent to all human beings. The FHWA Visual Impact Assessment Guidelines recognize three types of visual perception, corresponding to the three types of visual resources:

- Natural environment This includes air, land, water, vegetation, and animal life.
- Cultural environment This consists of buildings, structures, transportation infrastructure, and other built features, including art.

#### Figure 1

# **Example Landscape Units**





Downtown Landscape Unit



Missouri River Landscape Unit

• Project environment - This includes the alignment, profile, type, size, pavement type, signs, enhancements, other elements of the bridge and roadway.

The project impacts were identified by considering these elements. This visual assessment memorandum describes the existing conditions and the impacts of the alternatives in the foreground view within approximately 0.25 miles and the middle ground view (3 to 5 miles). The background views are generally blocked by the existing built environment.

#### 4.0 Affected Environment

The project site is the existing I-229 double-decker bridge between US Route 36 and US Route 59. The BNSF tracks and the I-229 structure are between downtown and the Missouri River. Downtown St. Joseph is characterized by a traditional main street with several local streets. In addition to commercial, industrial, and residential uses, it includes a transit center and civic buildings. There are a variety of building types and ages, as well as varied building heights and densities, throughout downtown.

#### 4.1 Area of Visual Effect

The area of project visibility is referred to as the Area of Visual Effect (AVE). It is determined by the physical constraints of the environment and the physiological limits of human sight. For this project, the AVE includes the foreground and middle ground views, generally bound by US Route 59 to the north, South 11th Street on the east, US Route 36 to the south, and views beyond the Missouri River to the west. The AVE

focuses on foreground views within 0.25 miles and the middle ground views within 3 to 5 miles because views of the site beyond the middle ground are largely obscured by existing development. Existing buildings may also obscure views from locations within the AVE.

A landscape unit can be conceived of as a spatially defined landscape with a particular visual identity—a distinctive "outdoor room." The two landscape units (Figure 1) defined for this project are:

- Downtown East of I-229
- Missouri River West of I-229

# 4.2 Visual Character, Quality, and Viewer Population

An area's buildings, infrastructure, structures, art, and landscaping create the character of the cultural visual environment. The Study Area is located in downtown St. Joseph, which has a varied visual character and quality blended into a defined downtown area, including a mix of residential, commercial, industrial, and public uses

In the context of the urban downtown setting, elements of the natural environment are a minor feature of the visual setting because this is a highly developed area with the built environment providing much of the landscape.

The viewing population in the AVE includes residents, employees and customers/visitors at area businesses and institutions, commuters, and people passing through the area. Viewer preferences identified below are based on the viewer categories and visual preferences identified in the FHWA Visual Impact Assess-



ment Guidelines. Residents tend towards a desire to maintain the existing landscape as it is and are often interested in visual order and a natural harmony, the existing mix of uses and visual elements in the area detract from visual harmony. Merchants tend to be more permanent and prefer heightened visibility, free of competing visual intrusions. Shoppers prefer visual clarity to guide them to their destination; once at their destination, they prefer to concentrate on the shopping experience with few distractions. Commercial/industrial workers who manufacture goods and services or transport goods and services may benefit from good order and project coherence, but do not depend on those visual attributes.

#### 4.3 Downtown East of I-229

Downtown is the cultural center of the city and is approximately bounded by Robidoux Street to the north, I-229 to the west, Charles Street to the south, and 10th Street to the east. The buildings are of varying heights with primary materials including brick or concrete. Many of the businesses within the Study Area include local service providers, such as gas stations, convenience stores, vintage clothing stores, coffee shops, and restaurants. Examples of just a few of these businesses include The Lucky Tiger, a vintage clothing store on Francis Street; Boudreaux's Louisiana Seafood & Steaks, a popular eatery on North 4th Street; Imperial Super Gas, a gas station on South 6th Street; and Brioche Café, a French bakery on North 7th Street.

- Natural environment The downtown built environment is of the composition that is generally inharmonious to the natural environment. The downtown area does have a few small parks and green spaces.
- Cultural environment The downtown built environment provides a sense of cultural order typical of a downtown area.
- Project environment Alternatives where the main traffic flow travels through the downtown area will enrich the viewers experience of the downtown cultural environment as they pass industrial, commercial, and governmental buildings and activities. However, these alternatives will have limited views of the natural features of the Missouri River.

#### 4.4 Missouri River West of I-229

The Missouri River meanders on the west side of I-229 preserving natural features of the area with forested areas and open space undeveloped by humankind. This untouched natural fabric is seen in Figure 1.

- Natural environment The Missouri River landscape is the predominant natural environment feature but also includes riparian vegetation and agricultural fields west of the river. The meandering Missouri River and green banks are complemented by the unbuilt views beyond the river's western banks.
- Cultural environment The Missouri River area west of I-229 is generally without cultural influences within the viewshed.
- Project environment Alternatives where the main traffic flow travels, partially along the Riverfront, will maintain the viewers experience of the downtown cultural environment to the east and views of the natural features of the Missouri River towards the west.

# 5.0 Potential Impacts

Visual impacts are changes to the environment (measured by the change in the compatibility of the impact to the surrounding area) or to viewers (measured by sensitivity to the impacts). Together, the compatibility of the impact and the sensitivity of the viewers yield the degree of the impact to visual quality. Potential impacts of the alternatives result from the most prominent element which is the roadway. These impacts are defined below:

- Compatability Compatibility of the change is defined as the ability of the environment to absorb the project with the surrounding environment by having compatible visual character. The alternative can be considered compatible or incompatible.
- Sensitivity Sensitivity to the change is defined by the ability of viewers to see and be affected (either negatively or positively) by the changed setting. The sensitivity to impact is based on viewer sensitivity to changes in the visual character of visual resources. Viewers are either sensitive or insensitive to impacts. By itself, the sensitivity of the impact should



- not be confused or conflated with the value of the impact.
- Degree Degree of the impact is defined as either a beneficial, adverse, or neutral change to visual quality. An alternative may benefit visual quality by either enhancing visual resources or by creating better views of those resources and improving the experience of visual quality by viewers. Similarly, it may adversely affect visual quality by degrading visual resources or obstructing or altering desired views.

Pictures of various views within the Study Area have been provided in Figure 2. In addition, renderings of each of the Reasonable Alternatives (RA) have been provided in Figure 3.

#### 5.1 No-Build Alternative

Under the No-Build alternative, the existing double-decker bridge would be left in place. Only routine maintenance and repair of the existing bridge would occur. There would be no widening of the bridge, no improvement of roadway or bridge profiles, no major rehabilitation, and no replacement of the existing bridge. Due to its deteriorated condition, the I-229 double-decker bridge would fall into a significant state of disrepair causing the bridge to eventually be load posted and ultimately closed - potentially within the next few years.

- Compatibility Although the double-decker bridge would remain, it would fall into a state of disrepair.
   In this deteriorated state, it would become unsightly and thus viewers would be sensitive to this decrepit structure.
- Sensitivity The viewers will not experience a changed setting. Thus, the viewers are insensitive to impacts.
- Degree The visual quality will decline over time resulting in an adverse effect.

#### 5.2 Alt A - Main Street Corridor

Under this alternative, I-229 would be partially or fully de-designated as an interstate, the double-decker bridge removed, and a four-lane arterial constructed. The arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and storm-

water drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River with the exception of the section between US Route 59 and Messanie Street. The new arterial would cross over the railroad at 2nd Street and would tie into Main Street on the west side of the electrical substation. A bridge would be required to bring the new arterial over the BNSF tracks. On the south end of the project, the bridge configuration would remain largely as-is with the exception of a new at-grade intersection with Stockyards Boulevard.

- Compatibility The existing built environment has
  the ability to absorb the changes to the surrounding
  environment as a result of Alt A while maintaining
  a compatible visual character. Alt A is considered
  compatible with the surrounding environment.
- Sensitivity The viewers will not experience a changed setting across most of Alt A. Some viewers could have a negative sensitivity to their immersion into the downtown area with the absence of the iconic brick street as well as and being sensitive to the lost viewshed of the Missouri River on the northern portion of the alignment. Open views of the river will be a positive feature of this alternative, especially with the new bridge on the south end. Therefore, Alt A is considered a neutral impact to sensitivity.
- Degree of Impact Most of this alternative will maintain the existing views which are positive impacts. However, the northern portion of the alignment will lose the view of the Missouri River's natural features. Alt A is considered to have a neutral change to visual quality.

#### 5.3 Alt B - 2nd Street Corridor

Under this alternative, I-229 would require full or partial de-designation, the double-decker bridge removed, and a four-lane arterial constructed. The new arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing I-229 double-decker bridge between the BNSF tracks and the Missouri River, with the exception of a section between Messanie Street and Francis Street. On the north, the arterial would cross over the BNSF tracks



## Figure 2 Representative Views









Figure 3
Renderings of Reasonable Alternatives







## Figure 3 (Continued)

## Renderings of Reasonable Alternatives







at 2nd Street, which would connect to the Interstate and downtown, with newly constructed access utilizing a four-way signalized intersection at 2nd and Felix Streets. On the south, the two-lane principal arterial would connect the Stockyards Expressway, 4th Street, and I-229 with a four-way signalized intersection. Two new bridges, one toward the south end of the project and one toward the north end, are proposed to get over the BNSF Railroad.

- Compatibility The existing built environment has
  the ability to absorb the changes to the surrounding
  environment as a result of Alt B while maintaining
  a compatible visual character. Alt B is considered
  compatible with the surrounding environment.
- Sensitivity Viewers would generally be insensitive to view changes as Alt B maintains views of both the downtown and the Missouri River. This would be a neutral change to sensitivity.
- Degree of Impact The intermittent views through the tree lined river transitions to an elevated view as the viewer crosses the railroad lines are positive impacts. The northern portion of the alignment will lose the view of the Missouri River's natural features and result in negative impacts. As a result, Alt B is considered to have a neutral change to visual quality.

#### 5.4 Alt C - Railroad Tracks East Corridor

Under this alternative the double-decker bridge would be removed, and a 4-lane boulevard constructed. The 4-lane boulevard would be constructed generally atgrade and primarily on the east side of the BNSF tracks between 2nd and 4th Streets. The new boulevard would have three bridges over the BNSF with one on the north end of the study corridor and two on the south end. On the south, a signalized intersection is proposed connecting the Stockyards Expressway and I-229 south of the study corridor to the new boulevard.

 Compatibility – The existing built environment can absorb the changes to the surrounding environment as a result of Alt C while maintaining a compatible visual character. Alt C is considered compatible with the surrounding environment.

- Sensitivity Viewers will experience a changed setting across most of Alt C. Some viewers could have a negative sensitivity to their immersion into the downtown area and be sensitive to the lost elevated viewshed of the Missouri River along this alignment. This would be a negative change to sensitivity.
- Degree This alignment will lose the view of the Missouri River's natural features and lacks the open views of the Riverfront in other alternatives. Alt C is considered to have a negative change to visual quality.

#### 5.5 Alt D - Existing Corridor

Under this alternative the double-decker bridge would be removed, and a 4-lane arterial constructed. The new arterial would be constructed generally at-grade and primarily on the west side of the BNSF tracks between tracks and the river - generally located along the existing alignment. The new arterial would have two bridges over the BNSF with one on the north end of the study corridor and one on the south end. On the south, a signalized intersection is proposed connecting the Stockyards Expressway and I-229 south of the study corridor to the new arterial.

- Compatibility The existing built environment has
  the ability to absorb the changes to the surrounding
  environment as a result of Alt D while maintaining
  a compatible visual character. Alt D is considered
  compatible with the surrounding environment.
- Sensitivity The viewers will not experience a changed setting across most of Alt D. Open views of the river will be a positive feature of this alternative, especially with the new bridge on the south end. Therefore, Alt D is considered a neutral impact to sensitivity.
- Degree of Impact Most of this alternative will maintain the existing views which are positive impacts. Alt D is considered to have a neutral change to visual quality.



#### 5.6 Construction Impacts

Construction impacts, although temporary, could last for a couple of years and would involve the fastest degree of visual change for any alternative. Site clearing would involve removal of existing asphalt and landscaping. Other sources of visual effects could include construction staging areas, detours or temporary roadways, lighting, signage, heavy equipment, trailers, fences, scaffolding, cranes, and material storage. This construction work would result in visual clutter and little visual unity for viewer groups given the variety of construction activities, equipment, and stored materials that would change throughout the temporary con-

struction period. The construction and staging areas would lack visual cohesion and have low visual quality compared with the existing conditions or the expected visual character after construction.

#### 6.0 Conclusions

The overall visual assessments are shown in **Table 1**. Alt D maintains more of the existing views of both the downtown landscape unit viewshed and the Missouri River landscape unit viewshed compared to the other alternatives.

Table 1
Visual Assessments

Reasonable Alternative	Compatibility	Sensitivity	Visual Quality
No-Build	Negative	Neutral	Negative
Alt A - Main Street Corridor	Positive	Neutral	Neutral
Alt B - 2nd Street Corridor	Positive	Neutral	Neutral
Alt C - Railroad Tracks East Corridor	Positive	Negative	Negative
Alt D - Existing Corridor	Positive	Neutral	Neutral





### **Technical Memorandum 11**

# Hazardous Materials

#### 1.0 Introduction

The Study Area for the hazardous materials analysis included the I-229 double-decker bridge and adjacent properties. A review of historical aerial photographs and historical Sanborn Fire Insurance maps, a field reconnaissance, and a database search of potentially hazardous waste sites was performed to evaluate the likelihood of soil and/or groundwater contamination within the Study Area. The purpose of the evaluation was to identify sites that may require remediation that would result in additional costs and time for completion of the selected alternative. The scope of this evaluation was limited to database searches for recorded site information, review of historical aerial photographs/Sanborn maps, followed by a "windshield" field reconnaissance survey of selected potentially hazardous waste sites. Electronic databases were used that queried federal and state agency databases. This evaluation did not include a complete site assessment per ASTM Standard E 1527, nor does it constitute a hazardous waste remedial investigation.

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

#### 2.0 Survey Methodology

There is no single comprehensive source of information available that identifies all known or potential sources of environmental contamination within the Study Area. Therefore, to identify and evaluate sites that may potentially contain hazardous materials, petroleum products, or other sources of contamination, a federal and state government database search was conducted by Environmental Data Resources, Inc. (EDR), dated September 5, 2018. The database search included over 100 different environmental databases including sites identified or evaluated as federal or state Superfund sites; facilities that generate, store, treat or dispose of hazardous wastes; solid waste landfills; facilities that have active, closed, or leaking aboveground storage tanks (ASTs) or underground storage tanks (USTs); sites actively undergoing cleanup; spills involving potentially hazardous materials; and a number of other activities that might be an indicator of a hazardous condition.

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

In addition to the government database searches, historical aerial photographs and Sanborn Fire Insurance maps were obtained from EDR and the Archaeological Research Center (ARC). These photographs and maps were reviewed for evidence of activity or features that might suggest the potential for waste disposal. Historical aerial photographs from the years 1900, 1977, 1986, 1991, 1997, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2012, 2014 and 2017 were reviewed. Historical Sanborn maps from the years 1883, 1888, 1897, 1911, 1949 and 1950 were reviewed.



A meeting was held with the MDNR, MoDOT and Hg Consult on April 23, 2019 to discuss the status of several sites with known contamination (Moderate-to-High) issues in order to obtain additional documentation and clarification. The following is a summary of those sites:

- WireCo The WireCo site is a Voluntary Cleanup Program (VCP) site that has minor contamination associated with petroleum hydrocarbons from a service station formerly on the northeast corner of the property and an old heating oil tank. The site is still under investigation.
- Advantage Metals The Advantage Metals Recycling, Inc. site has a small portion of the property with a soil cap covering an area where elevated arsenic and lead levels were detected. The site has an environmental covenant plan and is a VCP site where they are almost finished addressing all of the identified issues. The capped area would be the only real area of concern and would appear to be a low to medium priority for avoidance.
- Artesian Ice & Cold Storage Plant The Artesian Ice & Cold Storage Plant site has an area under the existing parking lot with slightly elevated levels of lead and arsenic. The parking lot serves as a cap. If the site were disturbed, a soil management plan would have to be submitted to the MDNR.
- HPI Several HPI properties/sites are being managed by the US Environmental Protection Agency (EPA) because of an on-going criminal investigation. MDNR's understanding was that most of the drums and chemicals once stored at these facilities have been removed. As of July 8, 2022, the Western District Court of Missouri ordered HPI to continue operating under a receivership. That receivership has recommended shutting down the business. The purpose of the receiver is to assess HPI's financial ability to complete environmental compliance requirements set forth by the USE-PA and determine if the company can resume operations independently. Anecdotal information suggests that the HPI operations will be shut down in November 2022. While a number of drums and other hazardous materials have been removed from HPI facilities, investigations to determine the na-

- ture and extent of contamination in the soils and/or groundwater at these facilities has not yet begun.
- Farmland Industries The Farmland Industries Old Insecticide Pit site has an 18-inch clay cap and any alternatives that put soil on top of the cap or even the use of surface piles might be acceptable as long as none of the soils underlying the cap are brought to the surface. Once soils are brought to the surface they are automatically considered hazardous waste and must be disposed of in accordance with hazardous waste regulation at a hazardous waste landfill. The contamination appears to be concentrated in certain areas of the property. MoDOT, depending on the alternative chosen, would have to agree to an environmental covenant that they would maintain the cap. In addition, MoDOT would need to coordinate with USEPA project manager Laura Price. There are no monitoring wells. The site will soon require only annual monitoring.

An electronic copy of all information obtained from EDR, MDNR, Google and other sources has been provided with this document as an attachment due to the file size and amount of information and is available upon request. These sources are also listed in the References section at the end of this memorandum.

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

#### 3.0 Potential Sites

The results of the database searches, historical reviews, and field reconnaissance were prioritized as to the likelihood of soil and/or groundwater contamination present in or near the Study Area. The priority assigned was either "None-to-Low", "Low-to-Moderate", or "Moderate-to-High," in accordance with the following definitions:



- "None-to-Low" After a review of available database information, there is no indication that the proposed project would impact the site. It is possible that potential contaminants could have been generated or handled on the site, however, all information indicates potential impact to a proposed alternative would be minimal. These sites include things such as Resource Conservation and Recovery Act (RCRA) small quantity generators or UST sites for which releases of hazardous constituents have not been documented.
- "Low-to-Moderate" These sites include any former or current operations identified as large quantity hazardous waste generators. Also included in the category are locations where releases of hazardous materials or petroleum products have been reported, and remediation has been completed. These sites include leaking UST sites that have been listed in the database as closed following completion of remediation.
- "Moderate-to-High" A review of available information indicates that known soil and/or groundwater contamination is present and that the site is either undergoing remediation or continued groundwater monitoring. Additional sites may include unmappable sites in proximity of the Study Area listed in the database search. Further assessment would be required if a "Moderate-to-High" priority site is affected by the selected alternative to determine the actual presence and/or levels of contamination, the contaminated medium and the need for mitigation/remediation. Actual physical assessment would not begin until the final selected alternative is defined.

Well over 200 different sites were identified within the Study Area and used as one of the factors which the Initial Alternatives and later the Reasonable Alternatives were screened. As a result, a total of 31 sites were identified during the government database searches as being potentially impacted by the Reasonable Alternatives, except for the No-Build alternative, as depicted in Table 1.

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

#### 4.0 Potential Impacts

Hazardous waste sites located within the Study Area were inventoried and reviewed based on the results of a search of federal and state environmental databases, review of historical aerial photographs/Sanborn maps, and field reconnaissance. The inventory discussed in Section 3.0 includes a ranking of the sites to determine those with a "None-to-Low", a "Low-to-Moderate", or a "Moderate-to-High" potential for impact. This discussion provides an assessment of the "Moderate-to-High" ranked sites potentially impacted by the Reasonable Alternatives (Table 2).

Minor variation of alignments during final design could avoid some of these sites; however many of them could require further investigation to evaluate potential contamination of soils or groundwater. In addition, the possibility exists that additional sites with contamination may be encountered during actual construction, particularly given the large number and long history of industrial facilities in and near the Study Area.

It should also be noted that a large amount of unknown fill has been placed along the banks of the Missouri River over a long period of time. In the event contamination is encountered, MoDOT would develop an appropriate course of action and coordinate with the MDNR.

#### 4.1 No-Build Alternative

Under the No-Build alternative, the existing double-decker bridge would be left in place. Only routine maintenance and repair of the existing bridge would occur. There would be no widening of the bridge, no improvement of roadway or bridge profiles, no major rehabilitation, and no replacement of the existing bridge. The No-Build Alternative would not affect potentially hazardous waste sites.



# Table 1

# Hazmat Database Sites Potentially Impacted By Reasonable Alternatives (RA)

Site No.	Name	Address	Status/Federal or State Program List	Priority*	Alt A	Alt B	Alt C	Alt D	
MDN	MDNR E-Start Sites and Other								
1/ E12	WireCo/Hillyard Industries	609 N. 2nd Street	Active Hazardous Substance Investigation & Cleanup Site; Former UST NFA Letter Issued Prior to 2004	1	Indirect				
2/E7	City of St. Joe - Faraon St. Lagoon	Faraon Street	Former UST NFA Letter Issued Prior to 2004	2	Indirect				
3	Wyeth Company	101 Jules	Former UST NFA Letter Issued Prior to 2004	2	Indirect				
E9	Blacksnake Creek CSO Outfall	103 Francis St	NPDES	3	Indirect				
4/ E10	Artesian Ice & Cold Storage Plant A	202-204 Main Street	Long-Term Stewardship/Activity & Use Limitation Area	1	Indirect	Indirect	Indirect	Indirect	
E11		77 Francis Street	SPILLS	3	Direct	Indirect			
E22	Family Guidance Center	200 Corby Bldg., 422 Felix St	ECHO	2		Indirect			
E23	St. Joseph Light & Power	112 S Second St	ICIS	3		Indirect			
E24	Edmond Street Substation	106 South 2nd St	ЕСНО	3		Indirect			
5/ E25	Southern Star Central Gas Pipeline Inc Northern Area Site: St. Joseph Power Plant (Edmond Street)	151 S. 2nd Street	Completed hazardous materials investigation w/ no mercury issues identified	3	Indirect	Direct	Indirect		
E26		102 South 3rd Street	ERNS	3		Indirect			
E6	Lawhon Construction Co	519 Main Street	RCRA NonGen/NLR	3	Indirect				
7/ E29	Downtown Fur- niture Emporium (NRHP)	302 S. 3rd Street	Completed hazardous materials investigation w/ no petroleum issues identified; SPILLS	3	Indirect		Indirect		
E8		101 Jewell St. & Missouri RV	SPILLS	3	Indirect				
E34	Site ID 290210001	Southwestern Bell Telephone Building	FINDS	3				Direct	
E48		I-229 and Route K	SPILLS	3			Indirect		
E49		I-229 North of High- way 3 (3/4 mi north)	SPILLS	3	Direct	Direct		Direct	
E60		Wastewater Treatment Plant on Alabama St	SPILLS	3	Direct	Direct		Direct	
E61	Main	Unknown	FINDS	3	Indirect	Indirect	Indirect	Indirect	
10/ E51	Advantage Metals Recycling, LLC	750 S. 4th Street	Active Hazardous Substance Investigation & Cleanup Site	1			Direct		
E66		Missouri River Flood- ing	SPILLS	3	Direct	Direct			
11/ E67	Farmland Industries Old Insecticide Pit	4th and Seneca Streets	Long-Term Stewardship	1	Indirect	Indirect	Direct	Indirect	

<sup>\*</sup>Note: 1 = Moderate to High Probability of Contamination; 2 = Low to Moderate Probability of Contamination; 3 = None to Low Probability of Contamination Details of Priority 1 sites (shaded in red) are provided in Table 2



#### Table 1 (Continued)

#### Hazmat Database Sites Potentially Impacted By Reasonable Alternatives

Site No.	Name	Address	Status/Federal or State Program List	Priority*	Alt A	Alt B	Alt C	Alt D	
MDN	MDNR E-Start Sites and Others (Cont'd)								
12/ E71/ E73	Gray Automotive Products	1313 S. 4th Street	Former UST NFA Letter Issued Prior to 2004; SPILLS	2	Indirect	Indirect	Indirect	Indirect	
13/ E70	Seaman & Schuske Metal Works Co.	1215 S. 4th Street	Former UST NFA Letter Issued	3	Indirect	Indirect			
E80	Bulk Plant	310 Sacramento	RGA LUST	2	Direct	Direct	Direct	Direct	
E81	Missiouri Chemical Co.	4th & Monterrey St.	SEMS-Archive	2	Indirect	Indirect	Indirect	Indirect	
14	Union Pacific Rail- road Easement	Near 4th & Montarey Streets	Former UST NFA Letter Issued Prior to 2004	2	Direct	Direct	Indirect	Indirect	
E84		County Rd 18098 Private Drive 3482	SPILLS	3	Indirect	Indirect	Indirect	Indirect	
15/ E86	US Army Corps of Engineers	1602 S. 4th Street	Former UST NFA Letter Issued Prior to 2004	2	Direct	Direct	Direct	Direct	
E43	LESCO, Inc. (aka HPI)	222B Sylvanie	RCRA NonGen/NLR	1			Direct	_	
19	Undocumented Landfill	Riverfront near north bank of Blacksnake Creek	Undocumented Landfill	1	Indirect	Indirect	Indirect	Indirect	

<sup>\*</sup>Note: 1 = Moderate to High Probability of Contamination; 2 = Low to Moderate Probability of Contamination; 3 = None to Low Probability of Contamination Details of Priority 1 sites (shaded in red) are provided in Table 2



Table 2
"Moderate-to-High" Ranked Potentially Hazardous Waste Site Descriptions

Site No.	Name	Address	Status/Federal or State Program List	Comments	Alt's Potentially Impacted
1/E12	WireCo	609 N. 2nd Street	Long-Term Steward- ship, no drilling or use of grandwater; Former UST NFA Letter Issued Prior to 2004; BROWNFIELDS	This 30-acre Brownfield site was formerly owned by Wire-Co World and is the subject of an active hazardous waste investigation and remediation. In addition, Underground Storage Tanks were removed from the property prior to 2004 and the adoption of MDNR's Risk Based Corrective Action Guidance for Petroleum Storage Tanks.	А
4/E10	Artesian Ice & Cold Storage Plant A	202-204 Main Street	Long-Term Steward- ship/Activity & Use Limitation Area; VCP	This Voluntary Cleanup Program site is also a Long-Term Stewardship site with a long history of industrial use. Site investigations indicated fill/soil concentrations of arsenic and lead above non-residential risk based target levels. A Soil Management Plan has been developed to properly manage affected soils if encountered during future on-site activities.	A, B, C, D
10/E51	Advantage Met- als Recycling, LLC	750 S. 4th Street	Brownfield Assessment; RCRA-CESQG	This active hazardous waste investigation site, a portion of which is also a Long-Term Stewardship site with a long history of metal yard operations. Environmental site assessments revealed metals, polycyclic aromatic hydrocarbon (PAH) and polychlorinated biphenyl (PCB) contamination in soil and arsenic and PAHs in groundwater. Only a portion of this site has been designated for Long-Term Stewardship. Reasonable Alternative C would directly impact this facility. Phase I ESA conducted in 2021 with RECs identified.	С
11/E67/ E68/E90	Farmland Industries Old Insecticide Pit	4th and Seneca Streets	Long-Term Steward- ship; ECHO; SEMS; US BROWNFIELDS	This is a Long-Term Stewardship site with a long history of former pesticide formulation. The site is owned by the BNSF Railroad and the land was leased to several companies throughout its history. Between 1950 and 1980, several companies occupied the site while formulating organochlorine pesticides. Buildings and associated facilities were removed in 1979-80 with a Capping Plan approved by the USEPA in 1989. BNSF submits an annual report based on a 1989 Consent Order. This site is listed on the MDNR's Registry of Confirmed Abandoned and Uncontrolled Hazardous Waste Sites in Missouri (i.e., the State's equivalent of Superfund). The use of property listed on the Registry may not change substantially without the written approval of the MDNR. Of all the "Moderate to High" sites identified in the course of this study this site above all should be avoided. Reasonable Alternative C would directly impact this facility.	A, B, C, D
19	Undocumented Landfill	Riverfront near north bank of Blacksnake Creek	Undocumented landfill	City officials report that during construction of Riverwalk trail a large amount of landfilled debris was encountered.	A, B, C, D
E43	Lesco, Inc. (AKA HPI Products, Inc.)	222B Sylvanie	RCRA NONGEN/ NLR; Brownfield As- sessment	This site is owned by HPI Products, Inc which has a long history of illegally storing and disposing of hazardous wastes. This particular site is the location of HPI's main manufacturing operations and was used for the illegal storage and disposal of hazardous wastes. Over the last several years this site has been the subject of USEPA investigations and Consent Decree. On June 15, 2021, the USDOJ, USEPA state of Missouri, Missouri Attorney General and MDNR filed a motion to hold HPI and its owner in contempt for their ongoing failure to comply with a 2011 settlement. Reasonable Alternative C would directly impact this facility.	С



#### 4.2 Alt A - Main Street Corridor

Under this alternative, I-229 would be partially or fully de-designated as an interstate, the double-decker bridge removed, and a four-lane arterial constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the BNSF tracks and the Missouri River with the exception of the section between US Route 59 and Messanie Street. The new arterial would cross over the railroad at 2nd Street and would tie into Main Street on the west side of the electrical substation. A bridge would be required to bring the new arterial over the BNSF tracks. On the south end of the project, the bridge configuration would remain largely as-is with the exception of a new at-grade intersection with Stockyards Boulevard.

The potential impact to identified hazardous materials sites has been mapped in Figure 1 and include:

- Total Sites In terms of total numbers of all sites combined (i.e., "Moderate-to-High", "Low-to-Moderate", and "None-to-Low" probability of contamination) Alt A would potentially impact 23 sites.
- "Moderate to High Sites" Alt A would potentially indirectly impact four sites, including the Wireco, Artesian Ice, Farmland Industries Old Insecticide Pit, and undocumented landfilling along the banks of the Missouri River.

#### 4.3 Alt B - 2nd Street Corridor

Under this alternative, I-229 would require full or partial de-designation, the double-decker bridge removed, and a four-lane arterial constructed. The new arterial would be constructed at-grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing I-229 double-decker bridge between the BNSF tracks and the Missouri River, with the exception of a section between Messanie Street and Francis Street. On the north, the arterial would cross over the BNSF tracks at 2nd Street, which would connect to the Interstate and downtown, with newly constructed access utilizing a four-way signalized intersection at 2nd and Felix

Streets. On the south, the two-lane principal arterial would connect the Stockyards Expressway, 4th Street, and I-229 with a four-way signalized intersection. Two new bridges one toward the south end of the project and one toward the north end are proposed to get over the BNSF railroad.

The potential impact to identified hazardous materials sites has been mapped in Figure 1 and include:

- Total Sites In terms of total numbers of all sites combined (i.e., "Moderate-to-High", "Low-to-Moderate", and "None-to-Low" probability of contamination) Alt B would potentially impact 20 sites.
- "Moderate to High Sites" Alt B would potentially indirectly impact three sites, including the Artesian Ice, Farmland Industries Old Insecticide Pit, and undocumented landfilling along the banks of the Missouri River.

#### 4.4 Alt C - Railroad Tracks East Corridor

Under this alternative the double-decker bridge would be removed, and a four-lane boulevard constructed. The four-lane boulevard would be constructed generally at-grade and primarily on the east side of the BNSF tracks between 2nd and 4th Streets. The new boulevard would have three bridges over the BNSF with one on the north end of the study corridor and two on the south end. On the south, a signalized intersection is proposed connecting the Stockyards Expressway and I-229 south of the study corridor to the new boulevard.

The potential impact to identified hazardous materials sites has been mapped in Figure 1 and include:

- Total Sites In terms of total numbers of all sites combined (i.e., "Moderate-to-High", "Low-to-Moderate", and "None-to-Low" probability of contamination) Alt C would potentially impact 13 sites.
- "Moderate to High Sites" Alt C would potentially indirectly impact two sites (i.e., Artesian Ice and undocumented landfilling along the banks of the Missouri River). More importantly Alt C would directly impact three sites, including Advantage Metals Recycling, Farmland Industries Old Insecticide Pit, and LESCO, Inc. aka HPI.



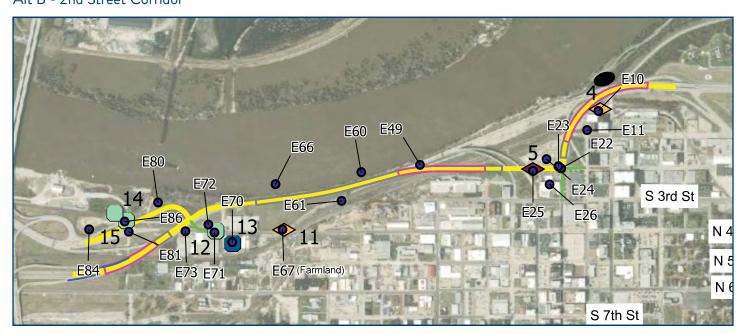
Figure 1

Hazardous Waste Sites by Reasonable
Alternatives

Alt A - Main Street Corridor



Alt B - 2nd Street Corridor



#### Legend

- Operating UST Facilities with No Known Release
- No Further Action Letter Issued Without Restriction
- No Further Action Letter Issued Prior to 2004 Tanks RBCA
- Landfill
- EDR Database Site
- ▲ Hazardous Waste Site (Active)
- Hazardous Waste Site (Complete)
- Hazardous Waste Site (Long-Term Stewardship)



#### Figure 1 (Continued)

# Hazardous Waste Sites by Reasonable Alternatives

#### Alt C - Railroad Tracks East Corridor



Alt D - Existing Corridor



#### Legend

- Operating UST Facilities with No Known Release
- No Further Action Letter Issued Without Restriction
  - No Further Action Letter Issued Prior to 2004 Tanks RBCA
- Landfill
- EDR Database Site
- ▲ Hazardous Waste Site (Active)
- Hazardous Waste Site (Complete)
- Hazardous Waste Site (Long-Term Stewardship)



#### 4.5 Alt D - Existing Corridor

Under this alternative the double-decker bridge would be removed, and a four-lane arterial constructed. The new arterial would be constructed generally at-grade and primarily on the west side of the BNSF tracks between tracks and the river - generally located along the existing alignment. The new arterial would have two bridges over the BNSF with one on the north end of the study corridor and one on the south end. On the south, a signalized intersection is proposed connecting the Stockyards Expressway and I-229 south of the study corridor to the new arterial.

The potential impact to identified hazardous materials sites has been mapped in Figure 1 and include:

- Total Sites In terms of total numbers of all sites combined (i.e., "Moderate-to-High", "Low-to-Moderate", and "None-to-Low" probability of contamination) Alt D would potentially impact 13 sites.
- "Moderate to High Sites" Alt D would potentially indirectly impact three sites (i.e., Farmland Industries Old Insecticide Pit, Artesian Ice & Cold Storage Plant, and undocumented landfilling along the banks of the Missouri River).

#### 5.0 Conclusions

Regarding "Moderate-to-High" hazardous waste sites:

- Alts C would potentially indirectly impact two sites, Alt B and D would indirectly impact three sites, and Alt A would potentially indirectly impact four sites.
- Alt C would directly impact three sites in addition to indirectly impact two sites.
- Alts A, B and D would all potentially indirectly impact the Farmland Industries Old Insecticide Pit State Superfund site.
- Alt C would directly impact the Farmland Industries
   Old Insecticide Pit State Superfund site.
- Alt C would also directly impact the LESCO, Inc. (aka HPI) and Advantage Metals Recycling sites.

In terms of total numbers of all sites combined (i.e., "Moderate-to-High", "Low-to-Moderate", and "None-to-Low" probability of contamination) Alt A would po-

tentially impact 23 sites, Alt B would potentially impact 20 sites, and Alt C as well as Alt D would potentially impact 13 sites.

Alt B or D would be the preferred alternative in terms of the least amount of impacts upon "Moderate-to-High" hazardous waste sites.

#### 6.0 Mitigation

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

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#### **Technical Memorandum 12**

# Ecological Assessment

#### 1.0 Introduction and Methodology

The purpose of this technical memorandum is to outline existing conditions as they relate to wetlands and Waters of the US, biotic (terrestrial and aquatic) communities, and threatened and endangered species within the Interstate 229 (I-229) Study Area. This technical memorandum also compares the impacts of the Reasonable Alternatives upon these resources. The Study Area is located in the downtown area of the city of St. Joseph, Missouri (Figure 1). This is an urbanized area that has been developed for more than a century.

#### 1.1 Wetlands and Waters of the US

Existing information was evaluated for the Study Area prior to conducting the initial site visit. Mapping information included National Wetland Inventory (NWI) maps (US Fish and Wildlife Service [USFWS] – Wetland Mapper), and soils maps (Natural Resource Conservation Service [NRCS] Web Soil Survey).

Review of USFWS NWI mapping of the Study Area (Figure 2) indicates the potential presence of a riverine wetland (R2UBH), the Missouri River, and a forested/shrub wetland (PF01A). The Missouri River flows north to south along the western edge of the Study Area. The forested/shrub wetland is located in the northwestern corner of the Study Area with a small finger of the wetland located adjacent to the southern end of McArthur Drive, west of I-229.

The NRCS Web Soil Survey (Figure 3) was reviewed to determine the potential existence of hydric soils. Soils within the Study Area include Knox, Marshall, Haynie, and Urban land. The hydrologic soil group rating for the Knox, Marshall and Haynie soils is Group B, which are soils having a moderate infiltration rate when thoroughly wet. The Urban Land soils do not have a group rating due to the level of disturbance within urban/highly developed

areas. Hydric ratings for soils are provided on a scale of O (not hydric) to 100 (hydric). The hydric rating for the Knox, Marshall, and Urban Land soils is "O", indicating they are not hydric. The hydric rating for the Haynie soils, which make up less than 5 percent of the soils and are only found in the northwestern corner of the Study Area, is "9".

The Soil Survey also provides information on vegetative classes that provide a general ecological description (vegetation, soils, and hydrology) of sites. Vegetative classes are illustrated in Figure 4, with most of the Study Area being "Not Rated" or "Not Available", and the northern area consisting of "Mixed/Transitional" vegetation.

A site visit was conducted on June 13, 2019, to assess existing conditions and the potential presence of wetlands and Waters of the US within the Study Area. The 2019 spring was unusually wet and resulted in an extended period of flooding along the Missouri River and other major tributaries that feed into the river. Flooding along with construction of the Blacksnake Creek tunnel precluded staff from gaining access to the area along McArthur Drive where the NWI indicates the potential existence of a forested/shrub wetland. The Missouri River was the only Waters of the US directly observed within the Study Area at that time. Blacksnake Creek is predominantly a piped stream channel within the Study area and is called the Blacksnake Creek Tunnel. The outfall for the tunnel is located within the Study Area north of the railroad crossing on Francis St. at the northwestern end of the downtown. The outfall channel is not mapped as a wetland or stream in the NWI. Flow within this remnant stream channel west of the tunnel is a result of water discharge from the tunnel and/or backwater from the Missouri River during high flow events.



Figure 1
I-229 Study Area used for Ecological Studies

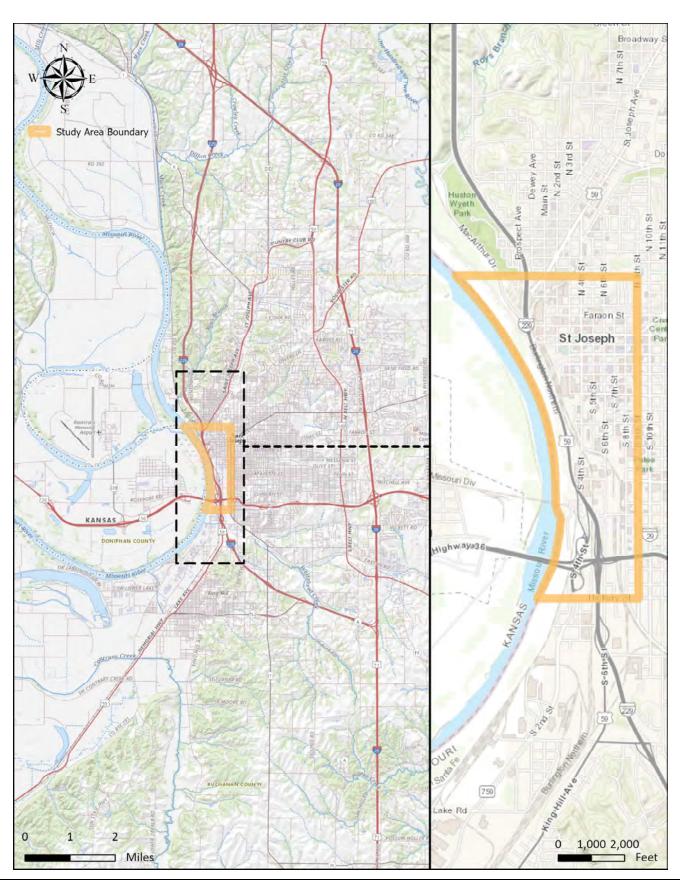
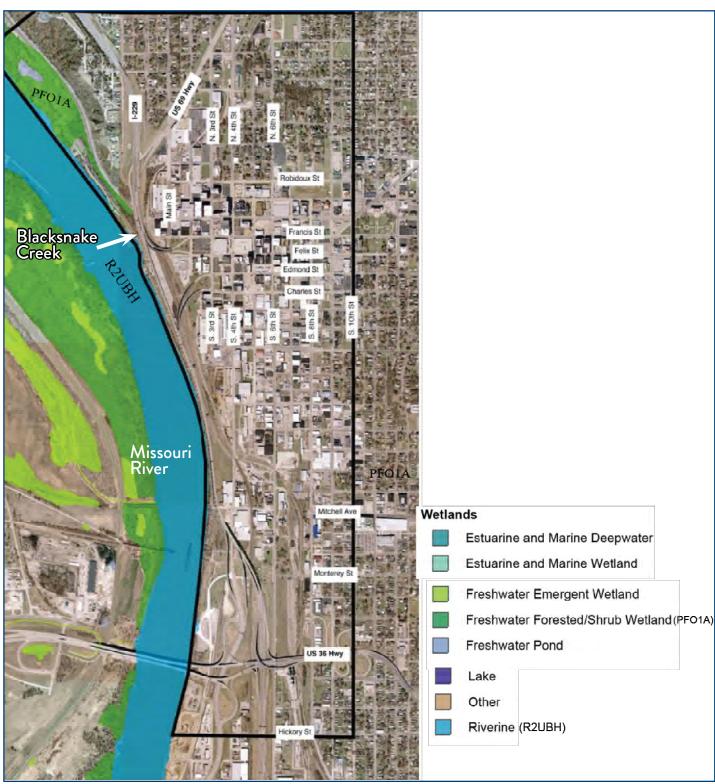




Figure 2

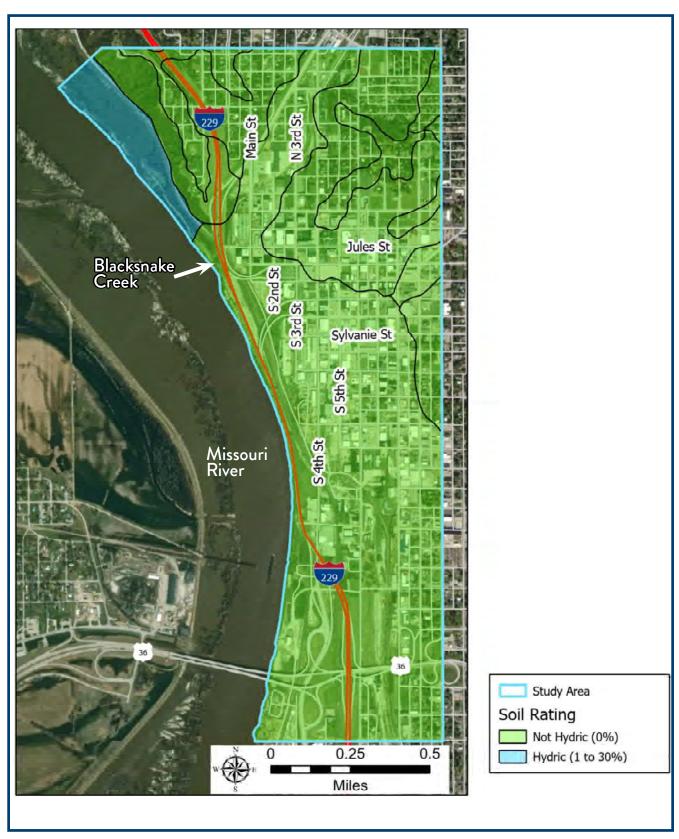
National Wetland Inventory



Source: USFWS, National Wetland Inventory, 2019



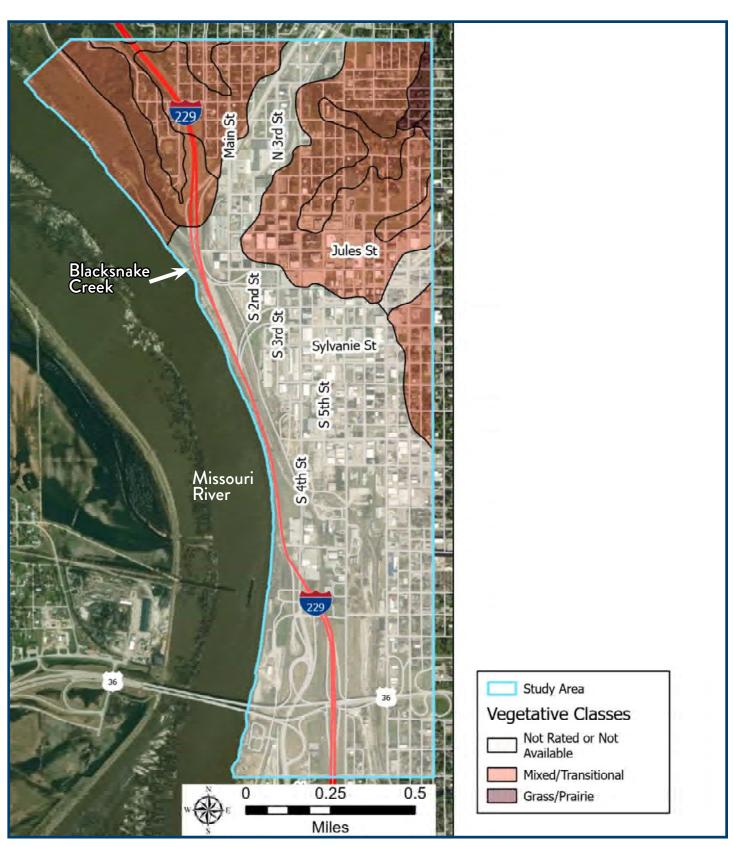
Figure 3
Soils



Source: NRCS, Web Soil Survey, 2019.



Figure 4
Vegetative Classes



NRCS, Web Soil Survey, 2019.



A follow up site visit was conducted on October 21, 2022, to assess the area previously inaccessible due to Missouri River flooding and to document any changes within the Study Area that may have occurred after the 2019 site visit. The NWI mapped area is a long finger that runs along the southern side of the dual line of Burlington Northern Santa Fe Railroad tracks. This mapped area is a ditch likely created by the railroad to assist with drainage along the railroad tracks. The ditch is relatively shallow with no vegetation present in the bottom. Vegetation adjacent to the ditch is dominated by shrub honeysuckle (Lonicera maackii), Siberian elm (Ulmus pumila), and red mulberry (Morus rubra). Much of the area is blanketed by raccoon grape (Ampelopsis cordata), which is also inhibiting vegetative growth in the understory. (see photo P5 in Figure 5). The vegetative species present are all upland species. Soils within the area are Urban land, which have a hydric rating of O. While it is evident that the ditch does carry water as indicated by the absence of vegetation and drainage patterns in the dirt bottom, no water was present at the time of the site visit. When present, water in the ditch would be conveyed to the northwest away from the roadway and the Missouri River. Based on the absence of two (soils and vegetation) out of three of the required wetland indicators, the ditch is not a wetland.

# 1.2 Biotic Communities and Threatened and Endangered Species

Database information was gathered from the Missouri Department of Conservation (MDC) Natural Heritage Review and the USFWS Information for Planning and Consultation (IPAC) in January 2024. The reports for this database search were updated in July 2023 and January 2024, to ensure current species and habitat information. The information from the January 2024 report is included here. The IPaC report has been provided in Appendix 12-1 and the MDC Natural Heritage Review has been provided in Appendix 12-2. Both appendices can be located at the end of this technical memorandum.

The Natural Heritage Review included the Study Area boundary and a 1-mile project boundary buffer. The review indicated that there are records for species listed under the Federal Endangered Species Act, and possibly records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Con-

servation Concern within or near the defined project area. The Heritage database provides a list of species of Conservation Concern for Buchanan County. The report also noted that the proposed project occurs on or near public land: the DuPree (Arthur) Memorial Conservation Area, and the St. Joseph-French Bottom Access. Both of these public lands are located outside of the Study Area to the northwest (they are within the project boundary buffer). Copies of the MDC Level Three Report and the Heritage Database are available in Appendices 12-1 and 12-2.

Indiana bats (Myotis sodalis, federal- and state-listed endangered) and northern long-eared bats (Myotis septentrionalis, federal-listed threatened) are both species noted in the Heritage Review that may occur near the Study Area. The Heritage Review noted that the Study Area is within the geographic range of nesting bald eagles (Haliaeetus leucocephalus) in Missouri. It also noted that the Study Area is adjacent to the Missouri River, which has the federal- and state-listed endangered pallid sturgeon (Scaphirhynchus albus).

The January 2024 USFWS IPAC report (Project Code 2023-010552) provides an official species list for the Study Area that includes a total of five threatened, endangered, or candidate species. These include the Indiana bat, Northern long-eared bat, Tricolored bat, the pallid sturgeon, and the Monarch butterfly (candidate). The Tricolored bat is currently listed as "Proposed Endangered". The IPAC report (Appendix 12-1 at the end of this technical memorandum) also notes that there are no critical habitats within the Study Area under the jurisdiction of the USFWS, and that there are no refuge lands or fish hatcheries within the Study Area.

Indiana and Northern long-eared bats roost in caves and mines in the winter and roost in forest and woodland habitat the rest of the year (April 1 through October 31). Suitable roost trees include trees greater than 3 inch diameter breast height (dbh) that have exfoliating bark, cracks, crevices, and/or hollows. Tree species include but are not limited to shagbark and shellbark hickory, white oak, cottonwood, and maple. The IPAC report notes that unsuitable habitat for these species includes:

 Individual trees that are greater than 1,000 feet from forested or wooded areas; and



Figure 5 **Site Photos** 



P1: Northern end of I-229 bridge at Blacksnake Creek tunnel.



P2: Mid-section of I-229 bridge along pedestrian trail & MO River.



P3: Mid-section of I-229 bridge, southern end of pedestrian trail.



P4: Southern end of study area looking north at I-229/Hwy 36.



P5: Upland vegetation over ditch on southern side of railroad.



P6: Cliff swallows and nests on underside of I-229 bridge decks.

I-229 EA

Figure 5: Site Photos St. Joseph, Missouri

T 57N R 35W S 8, 17, 20

Date of Photos: June 13, 2019 Photographer Laurie Brown

Date: June 27, 2019







• Trees found in highly-developed urban areas (e.g., street trees, downtown areas).

Most of the study area lies within the developed core of the city where there are limited trees. While there are a few larger trees present within the study area, most do not provide habitat for these species due to the lack of desirable characteristics noted above.

Habitat requirements for Tricolored bats are much broader than those of Indiana and Northern long-eared bat species. This bat species can be found inhabiting open hardwood woodland and forest habitats with trees as small as 3 inches in diameter in the spring, summer, and fall. While they prefer mature deciduous hardwood forests, which provide greater structural diversity for roosting sites, smaller trees present within the study area may potentially provide suitable habitat for this species.

During the June 13, 2019 site visit noted above, staff evaluated vegetated areas throughout the Study Area (see photos in Figure 5 on previous page) to determine the presence or absence of wildlife species, especially bats. There is a narrow band of trees and shrubs along the edge of the Missouri River throughout most of the Study Area. No bald eagles or nests were noted within this vegetated area. Additionally, no bats nor evidence of the presence of bats (guano deposits or stains) were noted in or around the double-decker bridge structure. Staff did find cliff swallows (Petrochelidon pyrrhonota) nesting along the undersides of both decks of the I-229 bridge, especially along the west-central portion facing the Missouri River. These birds are protected under the Migratory Bird Treaty Act (MBTA).

No changes in ecological condition were noted within the Study Area during the 2022 site visit.

#### 2.0 Effects of Alternatives Considered

The following section evaluates the potential for direct or indirect effects on wetlands and water resources, biotic communities, and threatened and endangered species by the Reasonable Alternatives, including the No-Build alternative.

#### 2.1 No-Build Alternative

Currently, I-229 passes through the western portion of the downtown as a double-decker elevated interstate. I-229's ramps connect to downtown via Charles Street, Edmond Street, Felix Street, and Francis Street. Each Reasonable Alternative would result in the demolition of the existing double-decker bridge. Mitigation measures related to that demolition have been incorporated into the project commitments and include:

- Protection measures will be employed during bridge demolition to avoid impacts to the Missouri River, including the narrow tree line along the edge of the river bank.
- Appropriate measures for migratory birds addressed in NJSP-16-06A: Migratory Bird Restrictions, will be implemented for cliff swallow nests present on the existing bridge.

Under the No-Build alternative, the existing double-decker bridge would be left in place. Only routine maintenance and repair of the existing bridge would occur. There would be no widening of the bridge, no improvement of roadway or bridge profiles, no major rehabilitation, and no replacement of the existing bridge. Due to its deteriorated condition, the I-229 double-decker bridge would fall into a significant state of disrepair causing the bridge to eventually be load posted and ultimately closed - potentially within the next few years.

The No-Build alternative would have no direct or indirect effects on wetlands, Waters of the US, or federal- or state-listed wildlife species, and this is not likely to change due to ongoing maintenance of the bridge structure.

#### 2.2 Alt A - Main Street Corridor

In this alternative, the double-decker bridge is removed. A two- to four-lane arterial road would be constructed at grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in generally the same location as the existing double-decker bridge between the railroad tracks and the Missouri River, except for the section between US Route 59 and Messanie Street.

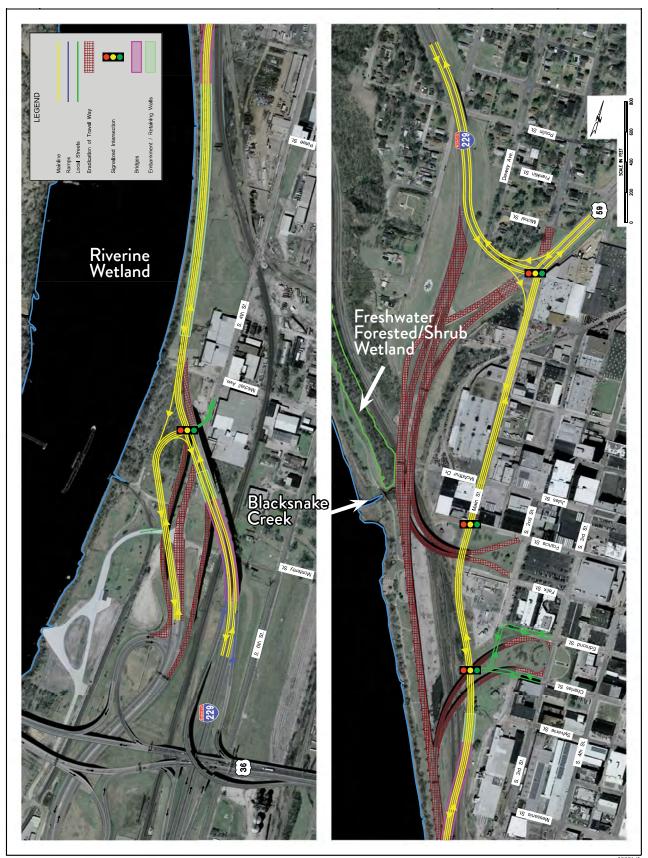
The Main Street Corridor (Figure 6) is not likely to have direct or indirect effects on wetlands, Waters of the US, or federal- or state-listed wildlife species. This alternative would be constructed within the existing roadway



Figure 6

Ecological Sites

Alternative A - Main Street Corridor





footprint and would modify existing road structures on the northern end of the roadway corridor. Additionally, the narrow band of trees along the river bank, which may provide some suitable habitat for the Tricolored bat, will not be removed for construction of the project.

#### 2.3 Alt B - 2nd Street Corridor

In this alternative, the double-decker bridge is removed and a two- to four-lane arterial constructed. The arterial would be constructed at grade (elevated as necessary for compliance with floodplain and stormwater drainage requirements) in the same location as the existing double-decker bridge between the railroad tracks and the Missouri River, except for a section between Messanie Street and Francis Street.

The 2nd Street Corridor (Figure 7) is not likely to have direct or indirect effects on wetlands, Waters of the US, or federal- or state-listed wildlife species. This alternative would be constructed within the existing roadway footprint and would modify existing road structures on the northern end of the roadway corridor. Additionally, the narrow band of trees along the river bank, which may provide some suitable habitat for the Tricolored bat, will not be removed for construction of the project.

#### 2.4 Alt C - Railroad Tracks East Corridor

In this alternative, the double-decker bridge is removed and is replaced with a new four-lane boulevard constructed at-grade (elevated as necessary for compliance with floodplain and storm requirements) east of the railroad tracks. The new structure would connect I-229 with downtown St. Joseph via a signalized intersection at Charles and Edmond streets and ramps at St. Joseph Avenue.

The Railroad Tracks East Street Corridor (Figure 8) is not likely to have direct or indirect effects on wetlands, Waters of the US, or federal- or state-listed wildlife species. This alternative would be constructed within the existing roadway footprint along the south end, would shift east of the Missouri River through the middle section and would tie in on the north end to the original alignment on the northern end of the roadway corridor. The narrow band of trees along the river bank, which may provide some suitable habitat for the Tricolored bat, will not be cleared for construction of this project. Being on structure through this area it is not anticipated to impact the wetland.

#### 2.6 Alt D - Existing Corridor

In this alternative the double-decker bridge is removed and replaced with a new four-lane arterial road constructed at-grade (elevated as necessary for compliance with floodplain and stormwater requirements) in generally the same location as the existing double-decker bridge between the railroad tracks and the Missouri River.

The Existing Corridor (Figure 9) is not likely to have direct or indirect effects on wetlands, Waters of the US, or federal- or state-listed wildlife species. This alternative would be constructed within the existing roadway footprint throughout the corridor and would tie in to the original alignment on the north. The narrow band of trees along the river bank, which may provide some suitable habitat for the Tricolored bat, will not be removed for construction of the project.

#### 3.0 Conclusions

Given the long-term urbanized character of the I-229 Study Area, and the likelihood that none of the Reasonable Alternatives will have direct or indirect effects on wetlands, Waters of the US, or federal- or state-listed wildlife species, this evaluation does not provide an obvious preferred alternative. Therefore, from an ecological perspective, all of the alternatives are equal with no preference for one alternative over another.

#### References

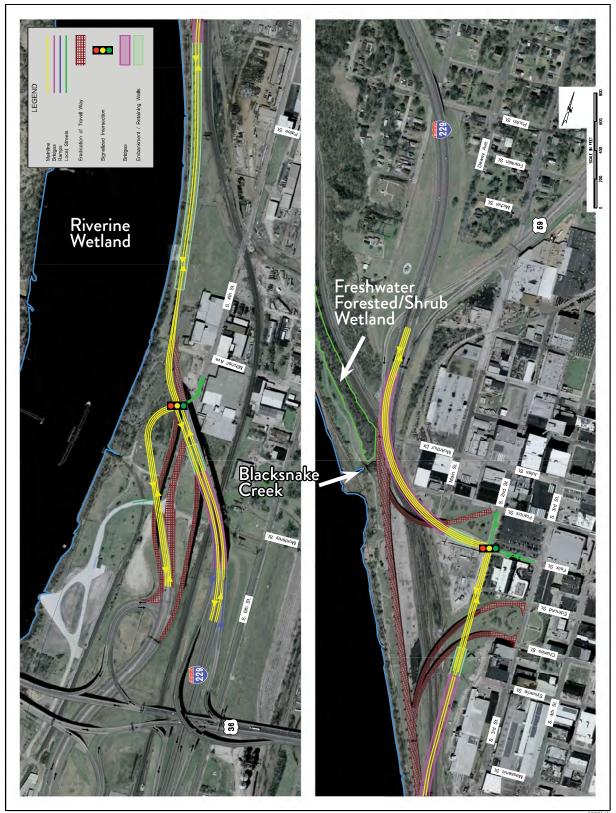
- Missouri Department of Conservation Natural Heritage Review. Available at: https://naturalheritagereview.mdc. mo.gov/. Accessed November 2017, April 2019, July 2023 and January 2024.
- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed April 4, 2019.
- US Fish and Wildlife Service Information for Planning and Consultation. Available at: https://ecos.fws.gov/ipac. Accessed October 2018, April 2019, July 2023 and January 2024.
- US Fish and Wildlife Service Wetland Mapper. Available at: http://www.fws.gov/wetlands/Data/Mapper.html. Accessed October 2018, April 2019 and October 2022.



Figure 7

Ecological Sites

Alternative B - 2nd Street Corridor



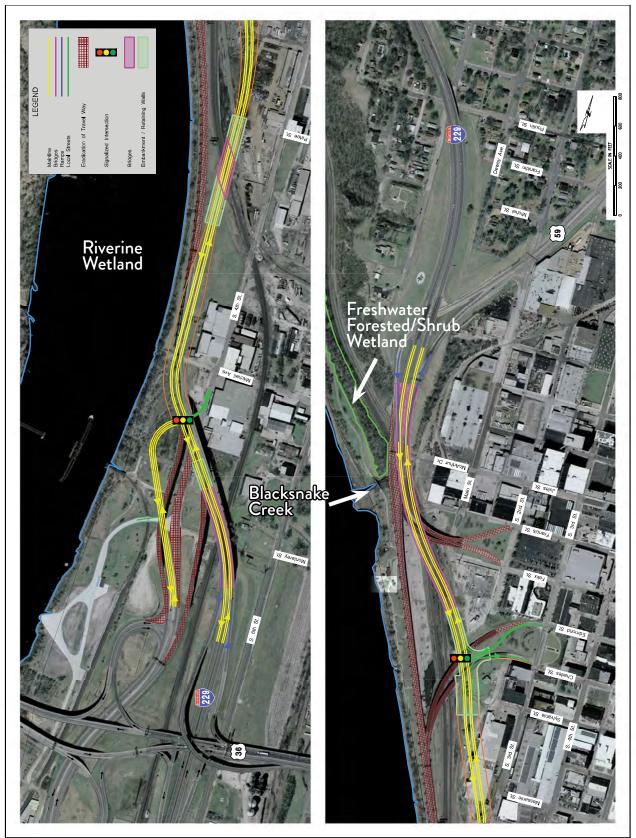
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Figure 8

Ecological Sites

Alternative C - Railroad Tracks East Corridor



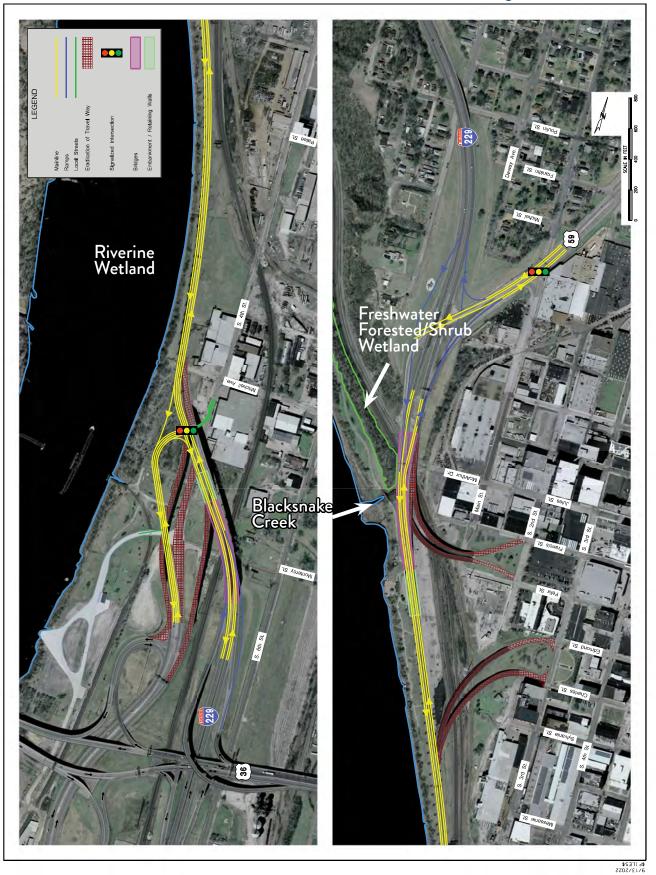
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Figure 9

Ecological Sites

Alternative D - Existing Corridor





Appendix 12-1

IPaC Official Species List

April 29, 2024



## United States Department of the Interior



#### FISH AND WILDLIFE SERVICE

Missouri Ecological Services Field Office 101 Park Deville Drive Suite A Columbia, MO 65203-0057

Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To: 04/29/2024 18:59:05 UTC

Project Code: 2023-0105552

Project Name: I-229 Environmental Assessment US 36 to US 59, St. Joseph, MO

Subject: List of threatened and endangered species that may occur in your proposed project

location or may be affected by your proposed project

#### To Whom It May Concern:

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

#### **Threatened and Endangered Species**

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

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

#### **Consultation Technical Assistance**

Refer to the Midwest Region <u>S7 Technical Assistance</u> website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects:



projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

#### **Federally Listed Bat Species**

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

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

Examples of unsuitable habitat include:

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

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

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



- 2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project other than bats (see #3 below) then project proponents can conclude the proposed activities may affect those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain <u>Life History Information for Listed and Candidate Species</u> through the Species website.
- 3. If IPac returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:
  - a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
  - b. Any activity in or near the entrance to a cave or mine;
  - c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
  - d. Construction of one or more wind turbines; or
  - e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

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

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

#### Other Trust Resources and Activities

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

*Migratory Birds* - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA



to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

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

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

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

#### **Next Steps**

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

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

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

John Weber

#### Attachment(s):

Official Species List

A of C



#### OFFICIAL SPECIES LIST

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

This species list is provided by:

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



#### PROJECT SUMMARY

Project Code: 2023-0105552

Project Name: I-229 Environmental Assessment US 36 to US 59, St. Joseph, MO

Project Type: Bridge - Replacement

Project Description: The project is an environmental assessment (Study) of the 1.6 mile I-229

Corridor from US 36 to to US 59, in the City of St. Joseph, Missouri. The Study Area is approximately 580 acres, extending from just south of US 36 on the southern end, to US 59 on the north, the Missouri River to the west, and 11th Street to the east. The Study is proposed to be completed in

spring of 2020.

#### Project Location:

The approximate location of the project can be viewed in Google Maps: <a href="https://www.google.com/maps/@39.75974287796866">https://www.google.com/maps/@39.75974287796866</a>, 94.85235722127291,14z



Counties: Buchanan County, Missouri



Project code: 2023-0105552 04/29/2024 18:59:05 UTC

### **ENDANGERED SPECIES ACT SPECIES**

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

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

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

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



Project code: 2023-0105552 04/29/2024 18:59:05 UTC

MAMMALS

NAME

Indiana Bat Myotis sodalis

Endangered

There is final critical habitat for this species. Your location does not overlap the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/5949

General project design guidelines:

https://ipac.ecosphere.fws.gov/project/BPGZTF76GBCJNLSHQN5KPJUKZQ/documents/generated/6868.pdf

Northern Long-eared Bat Myotis septentrionalis

Endangered

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

This species only needs to be considered if the project includes wind turbine operations.

Species profile: https://ecos.fws.gov/ecp/species/9045

General project design guidelines:

https://ipac.ecosphere.fws.gov/project/BPGZTF76GBCJNLSHQN5KPJUKZQ/documents/generated/6868.pdf

Tricolored Bat Perimyotis subflavus

Proposed

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a> Endangered

**FISHES** 

NAME STATUS

Pallid Sturgeon Scaphirhynchus albus

Endangered

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/7162">https://ecos.fws.gov/ecp/species/7162</a>

INSECTS

NAME STATUS

Monarch Butterfly Danaus plexippus

Candidate

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>

### **CRITICAL HABITATS**

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

8 of 9



Project code: 2023-0105552 04/29/2024 18:59:05 UTC

### **IPAC USER CONTACT INFORMATION**

Agency: Private Entity Name: Laurie Brown

Address: 414 Oak St., Suite 101

City: Kansas City

State: MO Zip: 64106

Email laurie@bevireo.com

Phone: 8167773006

### LEAD AGENCY CONTACT INFORMATION

Lead Agency: Missouri Department of Transportation



# Appendix 12-2 MDC Natural Heritage Review April 29, 2024



### Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

### Natural Heritage Review <u>Level Three Report: Species Listed Under the Federal Endangered</u> <u>Species Act</u>

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. <u>Please contact</u> the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

**Foreword:** Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this report is to provide information to federal, state and local agencies, organizations, municipalities, corporations, and consultants regarding sensitive fish, wildlife, plants, natural communities, and habitats to assist in planning, designing, and permitting stages of projects.

#### PROJECT INFORMATION

Project Name and ID Number: I-229 EA #5888

User Project Number: 113053

Project Description: T57N,R35W,S8,17,20

Project Type: Transportation, Structures and Bridges, Other

Contact Person: Laurie Brown

Contact Information: laurie@bevireo.com or 816.777.3006



**Disclaimer:** This NATURAL HERITAGE REVIEW REPORT identifies if a species or natural community tracked by the Natural Heritage Program is known to occur within or near the project area submitted, and shares recommendations to avoid or minimize project impacts to sensitive species or natural habitats. Incorporating information from the Natural Heritage Program into project plans is an important step in reducing impacts to Missouri's sensitive natural resources. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information.

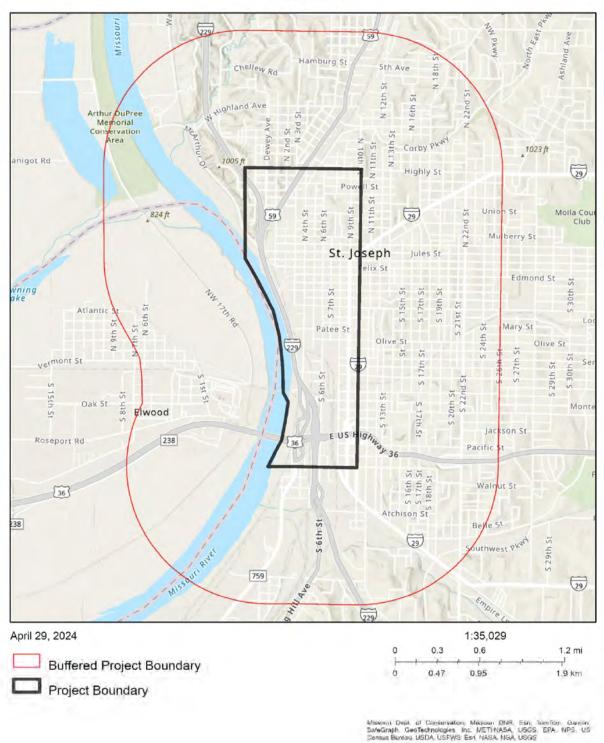
This Natural Heritage Review Report is not a site clearance letter for the project. Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If project plans or location change, this report may no longer be valid. Because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, reports include information about records near but not necessarily on the project site. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. This report does not fulfill Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit <a href="IPAC: Home (fws.gov)">IPAC: Home (fws.gov)</a> to initiate USFWS Information for Planning and Conservation (IPaC) consultation. Contact the Columbia Missouri Ecological Field Services Office (573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203) for more information.

**Transportation Projects:** If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit <a href="Home Page | Missouri Department of Transportation (modot.org">Missouri Department of Transportation (modot.org</a>) for additional information on recommendations.



### I-229 EA



Densus Bureau USDA, USFWS Esri NASA, NGA, USGS



### Species or Communities of Conservation Concern within the Area:

There are records of species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

Email (preferred): NaturalHeritageReview@mdc.mo.gov

MDC Natural Heritage Review

Science Branch P.O. Box 180 Jefferson City, MO 65102-0180

Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service Ecological Service 101 Park Deville Drive Suite A Columbia, MO 65203-0007

Phone: 573-234-2132

#### Other Special Search Results:

The project occurs on or near public land, DuPree (Arthur) Mem CA, St Joseph (French Bottom Access), please contact MDC.

#### Project Type Recommendations:

Transportation -Structures and Bridges: Other Streams in the area should be protected from soil erosion, water pollution and in-stream activities that modify or diminish aquatic habitats. Please see <u>Best Management Protects for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).</u>

- Avoid disturbance to stream banks and riparian areas. Channel modification, flow interruption or bank modification should occur only in compliance with conditions established in permits required under the federal Clean Water Act.
- Grade and seed disturbed areas as soon as possible to minimize erosion. Native grasses and wildflowers are
  recommended for plantings compatible with the local native landscape and wildlife needs. Annuals like ryegrass may
  be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch
  and sericea lespedeza.
- All temporary in-channel fills that could impound water should be culverted. Culverts should (a) maintain at least six inches of water and (b) not create water velocities in excess of two feet per second during average annual discharges. A drop between the downstream end of the culverts and the downstream water surface should not occur at any time. Conditions provided within the USACE Clean Water Act Section 404 permit, if required ((http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/moregoffices.pdf), should help minimize impacts to the aquatic organisms within the area.
- Avoid work in the channel from March 15 until June 15, a time when many fish are spawning and eggs need minimal disturbance.

#### **Project Location and/or Species Recommendations:**



Endangered Species Act Coordination - If this project has the potential to alter habitat (e.g. tree removal, projects in karst habitat) or cause direct mortality of bats, please coordinate directly with U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 Ext. 100 for Ecological Services) for further coordination under the Endangered Species Act. Indiana bats (Myotis sodalis, federal- and state-listed endangered) and Northern long-eared bats (Myotis septentrionalis, federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April.

Bald Eagle: The project location submitted and evaluated is within the geographic range of nesting Bald Eagles in Missouri. Bald Eagles (Haliaeetus leucocephalus) may nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. Adults begin nesting activity in late December and January and young birds leave the nest in late spring to early summer. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: Do I need an eagle take permit? J.U.S. Fish & Wildlife Service (fws.gov) if eagle nests are seen.

Pallid Sturgeon: The project location submitted and evaluated is located within or adjacent to the Mississippi or Missouri rivers. Pallid Sturgeons (*Scaphirhynchus albus*, federal- and state-listed endangered) are big river fish that range widely in the Mississippi and Missouri River system (including parts of some major tributaries). Any project that modifies big river habitat or impacts water quality should consider the possible impact to pallid sturgeon populations. See <u>Pallid Sturgeon Best Management Practices (mo.gov)</u> for Best Management Practices. Additional coordination with the U.S. Fish and Wildlife Service under the Endangered Species Act may be necessary (U.S. Fish and Wildlife Service, Ecological Services, 101 Park DeVille Drive, Suite A, Columbia, Missouri 65203-0007; phone 573-234-2132.)



Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See Managing Invasive Species in Your Community | Missouri Department of Conservation (mo.gov) for more information.

- · Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (Kansas City District Regulatory Branch (army.mil)) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification | Missouri Department of Natural Resources (mo.gov), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit Wastewater Permits | Missouri Department of Natural Resources (mo.gov) for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov MDC Natural Heritage Review Science Branch P.O. Box 180 Jefferson City, MO 65102-0180

Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service Ecological Service 101 Park Deville Drive Suite A Columbia, MO 65203-0007 Phone: 573-234-2132



#### **Miscellaneous Information**

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See <u>Missouri Species and Communities of Conservation Concern Checklist (mo.gov)</u> for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at <u>Mofwis Search Results</u>. Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

## Appendix 12-3 Migratory Bird Restrictions (NJSP-16-06A)

#### Restrictions for Migratory Birds NJSP-16-06A

- **1.0 Description.** Swallows or other bird species protected by the Migratory Bird Treaty Act may be nesting under the bridge or bridges that will be repaired under this contract.
- **2.0 Restrictions.** To comply with the Migratory Bird Treaty Act, nests of protected species cannot be disturbed when active (eggs or young are present). Generally, nests are active between April 1 and July 31, but active nests can be present outside of these dates.

### [DRAFTERS NOTE: Section 2.1 is deleted if MoDOT staff is not maintaining the structure free of nests prior to the Notice to Proceed]

- **2.1 MoDOT to Maintain Prior to the Notice to Proceed.** The bridge, or bridges, associated with the work for this contract have been evaluated and any inactive nests found have been removed by MoDOT staff. MoDOT staff will maintain the structures to be free of nests until the Notice to Proceed date. At the notice to proceed, the contractor shall be responsible to maintain the structures to be free of nests until the work on the applicable bridge, or bridges, is complete.
- **3.0 Avoidance Measures.** The contractor shall not disturb active nests or destroy adults, eggs or young birds. In an effort to comply with the Migratory Bird Treaty Act, the contractor operations will be limited to the options established in the following sections.
- **3.1 Inactive or Partially Constructed Nests.** If nests are present and MoDOT determines that the nests are inactive or partially constructed, the contractor may remove the nests provided that the colony's inactive or partially constructed nests are completely removed by March 15 and the contractor maintains a nest free condition until the bridge work is complete. Dry removal methods shall be used when practicable. If dry removal is not practicable, hydro cleaning may be used if approved by the Engineer and only if water is free of blasting grit, chemicals, or detergents, and applied using pressure less than 5,000 PSI. Clean water such as that from municipal water treatment plants or wells shall be used. Use of source water from Waters of the State (i.e., streams or lakes), is allowable, if the appropriate methods to prevent the possible spread of invasive aquatic species are implemented.
- **3.2 Water and Equipment Used for Hydro cleaning.** Aquatic invasives such as zebra mussels and some algae species have infested several bodies of water in the United States and can be transported by vessels (barges, boats, tugs, tankers, etc.) and equipment (tanks, tubing, pumps, etc.) that have been used in areas that contain these invasive species. If equipment is not properly inspected and treated to prevent the spread of invasives, these species can be introduced into areas not currently known to have a population. These invasive species are detrimental to existing ecosystems and can outcompete native species. To assist in preventing the introduction and spread of aquatic invasive species through MoDOT projects in Missouri streams and lakes, the following precautions shall be followed.
- **3.2.1 Use of Water from Streams, Lakes or Ponds.** Contractors shall not use water for nest removal from streams, lakes or ponds, unless they have implemented appropriate methods to prevent the possible spread of invasive aquatic species. Water sources from municipal water treatment plants or wells may be used without following these measures provided the equipment to be used has not previously contained waters from streams, lakes or ponds. If the equipment has previously contained waters from other streams or lakes, the following measures must be implemented prior to use.



- **3.2.1.1 Equipment Washing.** Prior to the use or re-use of equipment following any use with water from streams, lakes or ponds, all equipment shall be washed and rinsed thoroughly with hard spray (power wash) and hot (minimum 120° F) water, for at least one minute.
- **3.2.1.2 Equipment Treating or Drying.** Equipment shall be treated or dried in one of the following manners.
- **3.2.1.2.1** Equipment interior and/or other surfaces shall be treated with a 10% bleach solution to kill any aquatic nuisance species. This solution must also be run through all intake lines and hoses, to sterilize interior components. When chlorine treatment is used, all chlorine runoff from equipment washing must be collected and properly treated and/or disposed of in accordance with Sec 806.
- **3.2.1.2.2** Equipment interior and/or other surfaces shall be treated with 140° F water for a minimum of 10 seconds contact on all surfaces. 140 ° F water must also be run through all intake lines and hoses, to purge any standing water.
- **3.2.1.2.3** Equipment shall be flushed of all non-municipal water, and dried thoroughly, in the sun before using in or transporting between streams and lakes. Dry times will depend on the season the equipment is being used. Equipment must dry a minimum of 7 days for June-September, 18 days for March-May; 18 days for October-November, and 30 days for December-February. The drying method should be reserved as a last resort option.
- **3.2.2** Prior to use of equipment, contractors shall provide the MoDOT inspector written documentation of the equipment's geographic origin (including the water body it was last used in), as well as defining the specified treatment method used to adequately ensure protection against invasive species. The written documentation will include a statement indicating the contractor is aware of these provisions and will also treat the equipment appropriately after completion of the project.
- **3.3 Active Nests.** The contractor may work on the bridge if active nests are present, as long as the work does not impact or disturb the birds and/or nests. At a minimum, work shall not be performed within 10 feet of an active nest; however, the contractor is responsible for ensuring their activities do not impact the nests, eggs, or young.
- **4.0 Additional Responsibilities.** If active bird nests remain after all reasonable avoidance measures have been taken, or if bird nests are observed during project construction, the contractor shall notify the Resident Engineer and contact the MoDOT Environmental Section (573-526-4778) to determine if there are other allowable options.



## Appendix 12-4 Tree Clearing Restrictions (JSP)

### XX. TREE CLEARING RESTRICTION

- 1.0 Description. The project is within the known range of federally endangered bats. These bats are known to roost in trees when not in winter hibernation. To avoid potential negative impacts to protected bats, removal of trees will only be allowed between November 1 and March 31.
- **2.0 Basis of Payment.** No direct pay shall be provided for any labor, equipment, time, or materials necessary to complete this work.



### **Technical Memorandum 13**

## Section 4(f)/6(f)

There are three parks within the maintained parks system of St. Joseph that are located within the Study Area (Figure 1). These three parks include Huston Wyeth Park, Coleman Hawkins Park/Felix Street Square, and Riverfront Park.

- Huston Wyeth Park Huston Wyeth Park is located at the northwest edge of the Study Area along McArthur Drive. The portion of the park that borders the Study Area does not contain any facilities. This park should not be impacted by the Build Alternative but could potentially be impacted by one of the potential enhancement options. See Chapter 2 Section 2.4 of the Environmental Assessment for additional details
- Coleman Hawkins Park/Felix Street Square This
  park occupies three corners of the block along Felix
  Street between 7th and 8th Streets. The park contains a gazebo and is utilized for local concerts and
  community festivals. This park will not be affected by
  the Build Alternative.
- Riverfront Park While not currently a maintained park, the 2022 "St. Joseph Comprehensive Plan" and the "St. Joseph Riverfront Master Plan" both show a future park along the riverfront from the Nature Center to the parking area and old riverboat landing area adjacent to I-229. That proposed park, referred to as Riverfront Park, currently includes the Riverwalk Trail, the trailhead shelter at the southern end of the Riverwalk Trail, as well as unmaintained segments associated with the old riverboat landing, including the landing area, interpretive signing, lighting (removed), park benches, and remnants of the walking path. The Riverfront Masterplan identifies a plan to improve this section as detailed in Tech Memo 11 | Riverfront Development. This proposed park would be impacted by the Build Alternative.

### 1.0 Section 4(f) Resources

Section 4(f) of the USDOT Act of 1966 was designed to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. A Section 4(f) eligible property must be publicly owned, except for historic sites, which could be either public or privately owned. Federally funded DOT actions cannot impact Section 4(f) properties unless there is no feasible and prudent alternative. Both the Huston Wyeth Park and the proposed Riverfront Park would be considered Section 4(f) resources and, therefore, any impacts to those parks require a Section 4(f) Statement unless determined to be "de minimis".

### 1.1 Section 4(f) Impacts of Reasonable Alternatives

The No-Build and Build Alternative would have the following impacts to Section 4(f) resources:

- No-Build Alternative The No-Build Alternative would not affect any Section 4(f) resources.
- Alt A Main Street Corridor The Main Street Corridor Alternative would not affect any Section 4(f) resources.
- Alt B 2nd Street Corridor The 2nd Street Corridor Alternative would not affect any Section 4(f) resources.
- Alt C Railroad Tracks East Corridor The Railroad Tracks East Corridor Alternative would not affect any Section 4(f) resources.
- Alt D Existing Corridor The Existing Corridor is expected to require the acquisition/use of the proposed Riverfront Park (Figure 2) and could potentially result in impacting the southern end of Huston Wyeth Park (Figure 3).



Figure 1

Existing and Proposed Parks

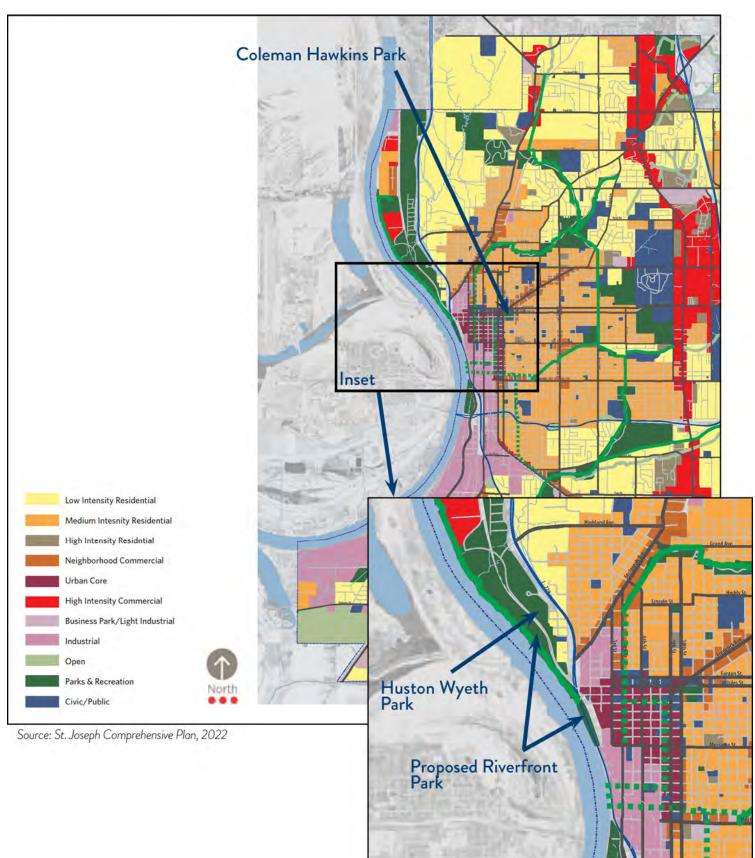




Figure 2

Riverfront Park

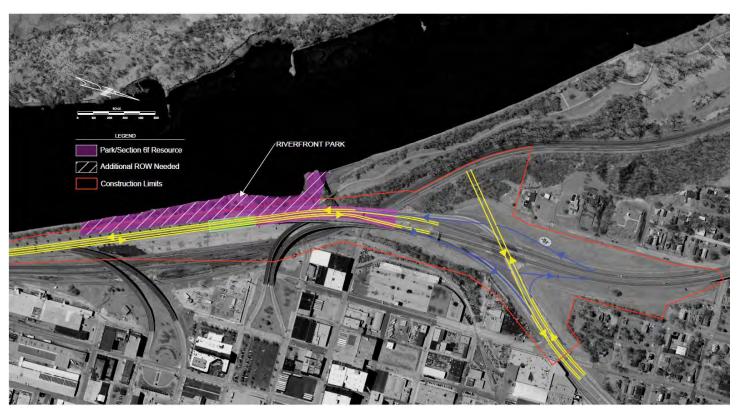


Figure 3 **Huston Wyeth Park** 





### 1.2 Section 4(f) De Minimis Use

Under Section 4(f), the Riverfront Park and Huston Wyeth Park are Section 4(f) resources and will be impacted by the project. Approximately 3.4 acres of new right-of-way is needed in the narrow strip of Riverfront Park and 2.4 acres of new right-of-way is needed at the very southern tip of Huston Wyeth Park. A "Determination of Section 4(f) De Minimis Use" document has been developed justifying the De Minimis recommendation and will be provided upon request. The justification for a de minimis determination includes:

- Riverside Park has not functioned as a park since the Riverboat Casino moved upstream. Most of the park amenities (benches, lighting, rest room, etc.) have fallen into a state of disrepair or have been removed. In addition the southern portion of Huston Wyeth Park does not currently function as a park and does not contain any recreational activities.
- The City of St. Joseph, the official with jurisdiction, has determined that impacts to these facilities are de minimis in that the proposed construction and completed project will not adversely impact the activities, features, and attributes that qualify it for protection under Section 4(f). Two letters to that affect have been provided from John Josendale, the mayor of St. Joseph, MO (Figures 4 & 5).
- Mitigation will occur in the form of replacement park property of +/- 7.85 acres at Karnes Road. The plans for this new park would include recreational activites and function like a park. This property is discussed further in Section 2.3.
- The remainder of both Riverside Park and Huston Wyeth Park (totally over 700 acres) remain intact and will continue to function as a park, especially with planned riverfront improvements be completed by the city.

### 2.0 Section 6(f)

Section 6(f) is part of the Land and Water Conservation (LWCF) Act designed to provide restrictions for public recreation facilities funded with LWCF money. The LWCF Act provides funds for the acquisition and development of public outdoor recreation facilities that include community, county, and state parks, trails,

fairgrounds, conservation areas, boat ramps, shooting ranges, etc. LWCF-assisted facilities must be maintained for outdoor recreation in perpetuity, and therefore require mitigation that includes replacement land of at least equal value and recreation utility.

### 2.1 Section 6(f) Impacts of Reasonable Alternatives

In 1987, the City of St. Joseph received LWCF for the development of +/- 5 acres of land located in the central portion of the city at Roubidoux Landing in the amount of \$51,200. The development was to include a trail, restroom, park benches, and utilities. In 1989, the City of St. Joseph received additional funding for the same project going from \$51,200 to \$54,000. The project boundary map from the Section 6(f) agreement has been provided in Figure 6.

The current status of the park is that the utilities have all been disconnected due to disrepair, theft, and vandalism. The restroom building has been demolished. The trail and park benches are still in place in some areas but are also in a state of disrepair or have been the subject of theft or vandalism.

The No-Build and Build Alternative would have the following impacts to Section 6(f) resources:

- No-Build Alternative The No-Build Alternative would not affect any Section 6(f) resources.
- Alt A Main Street Corridor The Main Street Corridor Alternative would not affect any Section 6(f) resources.
- Alt B 2nd Street Corridor The 2nd Street Corridor Alternative would not affect any Section 6(f) resources.
- Alt C Railroad Tracks East Corridor The Railroad Tracks East Corridor Alternative would not affect any Section 6(f) resources.
- Alt D Existing Corridor The Existing Corridor
  is expected to require the acquisition/use of the
  proposed Riverfront Park. The project will remove
  3.4 acres of park property from public outdoor use
  constituting a Section 6(f) conversion.

#### 2.2 Coordination with the National Park Service

MoDOT and the City of St. Joseph are currently working with the Missouri Department of Natural Resources



### Figure 4

## Letter from City of St. Joseph in Support of Impacts to City Park Property - January 2024

### City of Saint Joseph

1100 Frederick Avenue • City Hall, Room 309



### Office of the Mayor

St. Joseph, MO 64501-2346 • Phone: 816.271,4640

January 25, 2024

Mr. Marty Liles, P.E. Missouri Department of Transportation – NW District 3602 N. Belt Hwy. St. Joseph, MO 64506

Subject: St. Joseph Riverfront Master Plan and Robidoux Landing

Re: I-229 Double-Decker Bridge Project – US 36 to US 59

MoDOT Project No. J1I3053

Dear Mr. Liles:

As you are aware, we support removing the existing I-229 double-decker bridge and replacing it with a comparable alternative. This is a community priority. We are in support of Alternative D, which follows the existing alignment at-grade, as the best option.

We acknowledge that a portion of the riverfront area depicted in our updated Master Plan as parkland, the southern portion of Wyeth Hill Park, and the southern portion of the Riverfront Master Plan would all be impacted as depicted in the attached figures.

These impacts raise several issues, the first of which is the City's priorities in terms of the Riverfront Master Plan. The recommendations in the final plan, supported by members of the community and city staff, prioritized riverfront improvements north of the I-229 Study Area, near the casino and Remington Nature Preserve.

The proposed improvements in Segment E - Robidoux Landing do have some support from stakeholders in the community and there is a desire to move forward with some of the improvements where they can be incorporated. However, many in the community recognize that the at-grade rail crossing will be a permanent obstacle to the completion of the full scope of the proposed elements. While recognizing that the full scope cannot be completed, the City will continue to remain committed to the elements spelled out for Segment E (i.e. Trail Center, Urban Plaza, Spray Plaza, Destination Playground, Urban Beach, Renovated Parking, Pedestrian Bridge Over Rail, Pedestrian Bridge Across River) to determine whether any can still be incorporated or potentially shifted to other segments. As such, the City will continue to collaborate with MoDOT and seek to have input through the design-build process with the goal of ensuring the final design accommodates the future development of those elements to the extent reasonably possible.

The riverfront is not being utilized as a common park since the relocation of the casino to its current location. The current status of the park is that the utilities have all been disconnected due to disrepair, theft, and vandalism. A former restroom building has been demolished. The trail and park benches are still in place in some areas, but some are aged, and some have been the subject of theft or vandalism.

Based on the information discussed above, the improvements in the Study Area (Segment E – Roubidoux Landing) have been deemphasized from the list of priorities for the Riverfront Master Plan and the community will suffer no detriment if this property is no longer identified as park/parkway in future land use plans.



### Figure 4 (Continued)

### Letter from City of St. Joseph in Support of Impacts to City Park Property - January 2024

We understand that due to the use of federal funds, the proposed transportation project is subject to the requirements of Section 4(f) of the Department of Transportation Act of 1966, which affords protection to publicly owned parks, recreation areas, and wildlife and waterfowl refuges. As a result, another purpose of this correspondence is to document that the Official with Jurisdiction concurs with the listed measures to minimize harm and the assessment of impacts.

The following measures to minimize harm will be incorporated into the plans as plan notes and as environmental commitments in the environmental document:

- Approximately 7.85 acres of land near the intersections of Karnes Road/Northwest Parkway and St. Joseph Avenue will be dedicated for park use. The land is currently owned by the City, but it was purchased to accommodate a stormwater project and has never been dedicated as parks land or opened to the public for use as a park; however, the property is adjacent to existing recreational facilities and will enhance the City's parks system upon dedication.
- Access to the riverfront will be maintained by MoDOT during operating hours during construction activities.
- Temporary construction fencing will be installed by MoDOT along the construction limits prior to the start of construction activities to protect the existing 4(f) property and the public.
- Appropriate signage will be installed by MoDOT to alert users of short-term access restrictions or closures and to direct users to secondary access points.
- Except as necessary to facilitate construction activities, the staging and/or storage of construction
  equipment will not be allowed by MoDOT to take place outside the proposed construction limits
  that are within the defined boundaries of the 4(f) property.
- MoDOT's contractor will be required to closely coordinate the construction schedule with MoDOT and the City.

In accordance with 23 CFR 774, I believe the proposed project will have a de minimis impact upon the Riverfront and Wyeth Hill Park, based upon the following assessment:

- All possible planning to minimize harm has been incorporated into project development.
- The nature and magnitude of changes to the riverfront and Wyeth Hill Park by the I-229 project will not adversely affect the recreational activities, features, or attributes that qualified the property for 4(f) protection.
- Proposed measures to minimize harm and resulting mitigation regarding protecting the 4(f) property and maintaining access and safety, are considered to be reasonable and acceptable.

Based on the scope of the proposed project and type of work, there will be no adverse effects to the protected recreational activities, features or attributes associated with the riverfront or Wyeth Hill Park.

Respectfully,

John Josendale



Figure 5

Letter from City of St. Joseph in Support of Impacts to City Park Property - December 2023

### City of Saint Joseph

1100 Frederick Avenue • City Hall, Room 309



### Office of the Mayor

St. Joseph, MO 64501-2346 • Phone: 816.271.4640

December 27, 2022

Mr. Martin Liles, PE
District Engineer
Missouri Department of Transportation
Northwest District
3602 North Belt Hwy.
St. Joseph, MO 64506-1399

Subject: St. Joseph Riverfront Master Plan

Re: I-229 Double-Decker Bridge Project - US 36 to US 59

MoDOT Project No. J1I3053

Dear Mr. Liles:

As you have explained, MoDOT is conducting an Environmental Assessment (EA) on the I-229 Double-Decker Bridge for the following reasons:

- The bridge is nearing the end of its expected life: the expected lifespan of the bridge is 50 years.
   The bridge is currently 40 years old.
- The bridge is rated in poor condition: despite ongoing maintenance, the bridge continues to deteriorate and is rated in poor condition - the equivalent to a C- grade.
- Current structural problems on the bridge will be difficult and costly to repair: if the bridge was
  rehabilitated, it would either need a second rehabilitation or a complete replacement in
  approximately 25 years with an estimated cost around \$200 million.

Therefore, removing the existing double-decker bridge and replacing it with a comparable alternative has become a community priority. Several alternatives have been analyzed and when I took office, I made it a priority to arrive at a solution that both the City of St. Joseph and MoDOT could support. I believe an alternative (Alternative D – Existing Corridor) that follows the existing alignment at-grade as much as possible is that solution.

We also understand that this alternative would impact the southern portion of the Riverfront Master Plan, referred to in that plan as Segment E – Robidoux Landing. While some members of our community would support the improvements noted in this segment of the Riverfront Master Plan, past discussion of the topic by the City Council indicates the City Council does not prioritize those potential improvements over the effectiveness "Alternative D – Existing Corridor" offers in enabling the north-south flow of traffic, based on the following:

Letter from City of St. Joseph in Support of Impacts to City Park Property - December 2023

- The recommendations in the final plan, supported by members of the community and city staff, prioritized riverfront improvements north of the I-229 Study Area, near St. Jo Frontier Casino and Remington Nature Center, over those proposed improvements within the Robidoux Landing area
- Improvements at Robidoux Landing have been given the lowest priority because of the limited land available for development, accessibility and safety issues with the current at-grade railroad crossing, lack of funding, and limited ability to connect with downtown improvements.
- As previously referenced, the proposed improvements in Segment E Robidoux Landing do
  have some support from various stakeholders in the community and there is a desire to move
  forward with some of these improvements. However, others in the community, including myself
  and, based on public discussion, a supermajority of City Council members, believe the at-grade
  rail crossing will be a permanent impediment to those plans. Placing a higher value on the
  potential negative impact on Segment E improvements over other community goals related to
  downtown revitalization and the efficient movement of freight would not align with our goals.

In the interest of keeping the I-229 project moving forward, the intent of this letter is to confirm previous conversations that place Segment E of the Riverfront Master Plan as a lower priority for the City in comparison to transportation improvements that will be served by Alternative D – Existing Corridor. If you have any questions and/or concerns, please feel free to contact me at jjosendale@stjosephmo.gov or at (816) 271-4640.

Respectfully,

John Josemale

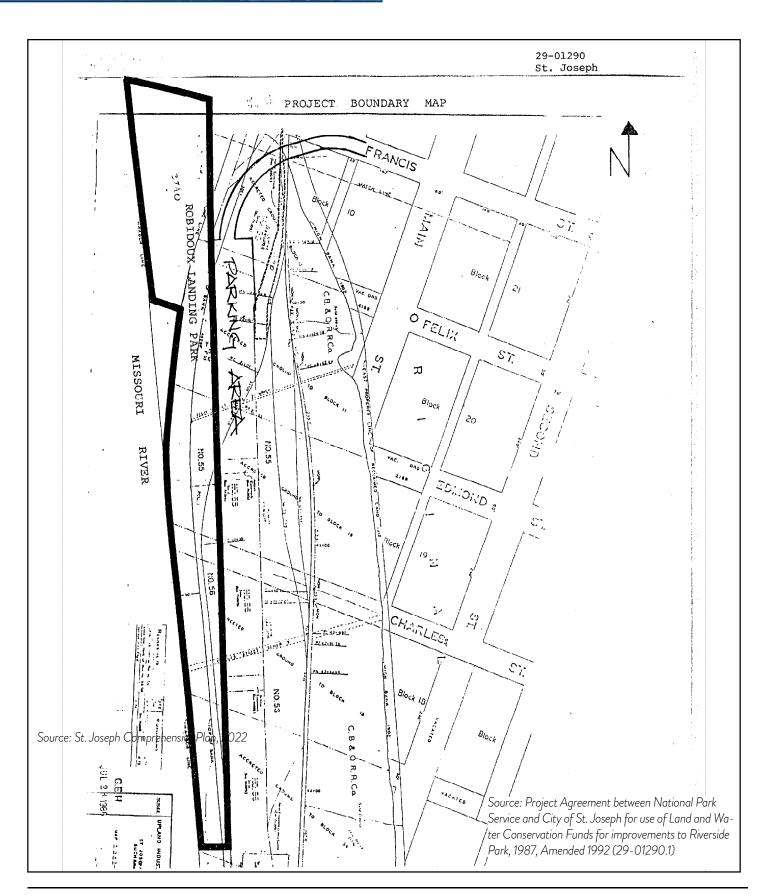
Mayor



Figure 6

Project Boundary Map from Section 6(f)

Agreement with National Park Service





(MDNR), Division of State Parks to complete the Section 6(f) process. As the Section 6(f) process is not yet complete at the time of this EA submittal, Dawn Scott, Director for the Grants, Recreation, and Interpretation Program, issued a letter (Figure 7) to accompany the EA, as assurance that St. Joseph and MoDOT are currently coordinating with State Parks in the Section 6(f) process.

#### 2.3 MoDOT Commitment

MoDOT will enter into an agreement with the National Park Service to mitigate the impacts to this Section 6(f) resource. Per that agreement, MoDOT, in coordination with the City of St. Joseph, has agreed to unencumber the existing Riverside Park and to encumber a new proposed park at the corner of St. Joseph Avenue and Northwest Parkway in northern St. Joseph across from Krug Park. Additional details of that agreement include:

- MoDOT has paid for and received the required appraisal, per National Park Service requirements, of the existing Riverfront Park (appraisal available upon request).
- The City of St. Joseph has agreed to transfer the "encumbrance" from Riverfront Park to the proposed new park (Figure 8). The proposed replacement property is located at Karnes Road near the intersection of St. Joseph Avenue and Northwest Parkway. The property is adjacent to the Northside Recreational Complex, which includes a playground,

water feature, basketball courts, one baseball/softball field, two bantam football fields, two horseshoe courts, a handball court, and a shelter house. Krug Park is located across St. Joseph Avenue. The proposed replacement property is +/- 7.85 acres and is anticipated to include disc golf.

- MoDOT has agreed, sometime prior to construction, to complete the required appraisal, per National Park Service requirements, for the new replacement park.
- MoDOT has also agreed to ensure that the new park has a "recreational value" per Section 6(f) requirements.
- The City of St. Joseph and MoDOT will ensure that all steps outlined in the attached Section 6(f) Conversion process list (Figure 9) are complete prior to seeking federal authorization and will submit all related documentation to FHWA.
- MoDOT also agrees to comply with any additional requirements, not specifically mentioned here, spelled out in the agreement with National Park Service.
- MoDOT has received a letter from the Missouri Department of Natural Resources indicating agreement with the proposed plan of action.

There are no other Section 6(f) resources in the vicinity of the project area.



# Figure 7 Letter from Missouri Department of Natural Resources



November 8, 2023

Matthew Burcham Senior Environmental Specialist Missouri Department of Transportation PO Box 270 Jefferson City, MO 65102

RE: St. Joseph I-229 Double-Decker Bridge Environmental Assessment

Dear Mr. Burcham,

On behalf of the Missouri Department of Natural Resources, Division of State Parks, I am writing concerning the proposal to replace the St. Joseph I-229 double-decker bridge with an atgrade road. The proposal would have an impact on Robidoux Landing Park, encompassing the entire footprint of the roughly 3-acre park. Because Robidoux Landing Park (LWCF project #29-01290) is protected under Section 6(f)(3) of the Land and Water Conservation Fund Act (LWCF), removal of the park property from public outdoor recreation will require a conversion of use.

The Missouri Department of Transportation and the St. Joseph Parks and Recreation Department have been in discussions with the division's Grants Management Section (GMS) staff about the conversion process. Additionally, GMS staff has engaged in preliminary consultation with the National Park Service (NPS) on behalf of the City of St. Joseph, and will submit the final conversion packet to the NPS upon completion. It is our understanding that St. Joseph Parks and Recreation Department has identified a potential replacement parcel owned by another City department and is in the process of determining acquisition feasibility.

As indicated in email correspondence, this letter will be submitted to the Federal Highway Administration as part of the EA documentation required for the NEPA review. Please don't hesitate to contact me if you need additional information. I can be reached at 573-522-0571 or dawn.scott@dnr.mo.gov.

Sincerely,
MISSOURI STATE PARKS

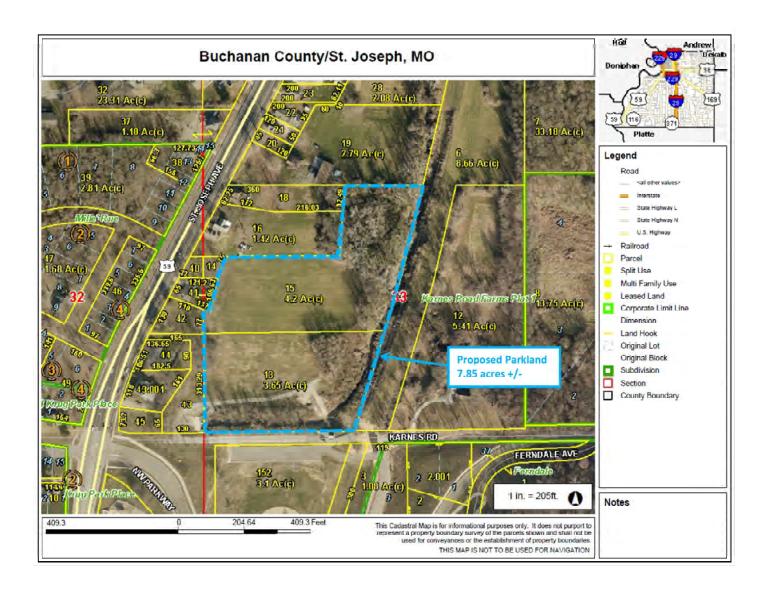
Dun Sout

Dawn Scott, Program Director Grants, Recreation & Interpretation Program



Figure 8

Section 6(f) Proposed Parkland Replacement Property





## Figure 9 Section 6(f) Conversion Process

A portion of Roubidoux Landing, in the city of St. Joseph, is protected under Section 6(f)(3) of the Land and Water Conservation Fund Act (LWCF) (Project #29-01290.1) and will be impacted by the I-229 Double Decker Bridge. The project will require a conversion of the LWCF assisted property. As a result of the conversion, replacement property must be acquired. The City of St. Joseph, Missouri and the Missouri Department of Transportation (MoDOT) are coordinating with Missouri Parks and Recreation Department to acquire replacement property for conversion of the Section 6(f) resource.

Following are the steps required in the Section 6(f) conversion process for this project.

- Step 1 Step 3 regard the process for obtaining National Park Service (NPS) concurrence on the acceptability of the proposed replacement property:
  - 1. The City of St. Joseph, MoDOT, DNR State Parks (serving as the State liaison), and National Park Service (NPS) must agree on the existing 6(f)(3) property boundary and the amount of property that will be impacted. A critical first step is for the State and NPS to agree on the size of the Section 6(f) park land impacted by any non-recreation, non-public use, especially prior to any appraisal activity. Any previous LWCF project agreements and actions must be identified and understood to determine the actual Section 6(f) boundary.
    - a. St. Joseph must provide a current boundary map of the entire Riverfront Park area protected under Section 6(f).
    - b. St. Joseph must provide a site-specific map showing the extent of the proposed conversion in acres.
    - c. St. Joseph must provide a description of impacts that the converted portion of the property will have on the remaining 6(f)(3) property.
    - d. DNR State Parks will conduct preliminary consultation with NPS, informing them of the conversion request and sharing the maps provided by St. Joseph. NPS will review its files to confirm whether St. Joseph's boundary of the 6(f) property is accurate and to determine whether it concurs with St. Joseph's definition of the extent of impacts to the property.
  - 2. St. Joseph and MoDOT must obtain concurrence from NPS on the proposed replacement property prior to conducting any appraisals on this property. The acceptability of the proposed replacement parkland must be explored prior to State/local sponsor expenditure of resources on appraisals and on the required environmental review process to be undertaken in accordance with NEPA.
    - a. St. Joseph must provide a map of the proposed replacement property and a justification as to why the property/area is being proposed as the replacement property.
    - b. NPS will use the following criteria to complete a preliminary evaluation of the proposed replacement property:
      - i. The property proposed for replacement is of reasonably equivalent usefulness and location as that being converted. This is determined by evaluating the proposed conversion in order to determine what recreation needs are being fulfilled by the facilities which exist and the types of outdoor recreation resources and opportunities available. The property being proposed for substitution is then evaluated in a similar manner to determine if it will meet recreation needs that are at least like in magnitude and impact to the user community as the converted site.
      - ii. The replacement property must constitute, or be part of, or have the potential to be a viable recreation area.



## Figure 8 (Continued) Section 6(f) Conversion Process

- 3. Once NPS issues its concurrence on the acceptability of the proposed replacement property, an appraisal and review appraisal may be conducted on both the 6(f)(3) property and the proposed replacement property to determine the fair market value of each.
- Step 4 Step 8 regard obtaining NPS approval of the conversion of the 6(f)(3) property:
- 4. In addition to the documentation generated from the above processes, St. Joseph must complete the Proposal Description and Environmental Screening Form (PD/ESF), and submit this formal request to DNR State Parks.
- 5. DNR State Parks will then submit the proposal to NPS for review and approval of the conversion of the 6(f)(3) property.
- 6. Once NPS has issued approval of the conversion, DNR will notify St. Joseph who will then notify MoDOT and FHWA.
- 7. St. Joseph will immediately acquire the replacement property and develop the property according to the replacement proposal timetable that will be established.
- 8. Should development of the replacement property be delayed beyond three years from the date of the NPS conversion approval, then a request for delayed development beyond three years with a justification for the delay will be made to the NPS.
- 9. As it becomes available, all documentation related to the conversion of the LWCF assisted property and the acquisition of the replacement property will be submitted to FHWA and MoDOT.
- 10. All commitments regarding 6(f) property must be completed prior to seeking federal authorization.



### **Technical Memorandum 14**

### Noise

The purpose of this technical memorandum is to outline existing conditions as they relate to noise within the I-229 Study Area. This technical memorandum also compares the noise impacts to the recommended preferred alternative.

### 1.0 Criteria for Determining Impacts

The Study Area is predominantly commercial or industrial, with a sparse residential area and parkland (parkland is located between I-229 and the Missouri River) near the northern terminus. To be considered for noise abatement, a receiver must be categorized under Federal Highway Administration (FHWA) Noise Abatement Criteria (NAC) activity categories A-E, shown in Table 1.

The following is a list of Traffic Noise Terminology:

- A-Weighted Sound Level (dBA): The sound level in decibels that correlates to the inverted Fletcher & Munson 40-phon curve measuring loudness. The A-scale tends to suppress lower frequencies (e.g. below 1,000 Hertz) and best approximates the sound as heard by the human ear.
- Alternative Noise Abatement Measures: Any method of noise abatement other than a noise wall, such as an earth berm.
- Benefited Receptor: The recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 7 dB(A).
- Decibel (dB): A measure used to express the relative level of a sound in comparison with a standard reference level. For traffic noise purposes, the A-weighted scale, which closely approximates the frequency response of the human ear to typical environmental sound levels, is used. The A-weighted sound level in decibels has the unit dBA.

- Feasibility: Consideration of engineering factors and other constraints as they relate to construction of noise abatement.
- First-row Receptor: Receptors directly adjacent to the highway, at nearly the same elevation, with no intervening developed lands. Receptors with intervening parcels separating the receptor parcel from abutting the roadway right-of-way are generally considered second row or greater. In the case of multi-story buildings, only ground level receptors are considered to be first row.
- Impacted Receptor: Any receptor that has an average hourly noise level at the loudest traffic noise hour approaching (within 1 dB) or exceeding the Noise Abatement Criteria Table for the corresponding land use category or exceeding existing noise levels by 15 dBA.
- Insertion Loss: The difference between an evaluated receptor's Leqs with and without the barrier (barrier level minus no barrier level).
- Noise Sensitive Area (NSA): A collection of areas where frequent human use can take place. This can include exterior sitting or eating areas, playgrounds, pools, homes, businesses, or other similar locations where people may gather
- Reasonableness: The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure. Viewpoints of owners and residents of the benefited receptors will be obtained. Noise abatement measures shall not exceed 1,300 square feet per benefited receptor, in the case of noise walls. Where noise walls are not options, other noise abatement techniques may be considered, but cannot exceed \$46,000 per benefited receptor.



## Table 1 FHWA Noise Abatement Criteria (Hourly A-Weighted Sound Level - Decibels)

Activity Category	Activity Criteria Leq(h)*	Evaluation Location	Activity Descriptions
А	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
В	67	Exterior	Residential
С	67	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools and television studios.
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F			Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical) and warehousing.
G			Undeveloped lands that are not permitted.

<sup>\*</sup>Approaching NAC is defined by MoDOT as being 1 dBA less than the NAC for Activity Categories A-E

 Receiver/Receptor: A discrete or representative location of a noise sensitive area(s), for any of the land uses listed in the Noise Abatement Criteria Table.

### 2.0 Identification of Noise Sensitive Land Uses and Noise Study Areas

Since the project has a small number of receptors and is located in a mostly urban land use only one NSA was identified which encompasses the entire Study Area. The land uses associated with NAC Activity Categories within the NSA include B and C. Only receivers within 500 feet of the proposed roadway were included, as sufficient evidence indicates the Traffic Noise Model (TNM) software is not reliable beyond this distance.

### 3.0 Determination of Existing Sound Levels

Three existing noise model validation points were chosen near noise sensitive receptors. Existing sound levels were recorded the hour before peak traffic volume: The sound levels were recorded in the afternoon from 1500 to 1645 hours on July 27th, 2022. An Extech SDL600 Datalogging Sound Level Meter and Extech 407744 Calibration Unit were used during the field visit. Readings were taken in 15-minute intervals. If line of sight to the highway was available traffic volumes were counted

and categorized by light vehicles (cars), medium trucks, heavy trucks, buses, and motorcycles. These 15-minute traffic volumes were adjusted to hourly volumes to use in the traffic models. If line of sight was not available, traffic volumes were gathered from the MoDOT traffic volumes map website (https://www.modot.org/traffic-volume-maps). The volumes used are shown in Table 2, photos are shown in Figure 1.

The FHWA Traffic Noise Model, TNM 2.5, was used to model all relevant roadways, receivers, terrain lines, barriers, building rows, and ground zones in the project area for the existing condition. After coordination with MoDOT, it was determined that the model would be rendered as a flat model (straight-line) with no elevation data. This represents a worst-case scenario where there are no hills or ditches to alter the path of the noise to the receptor. Receptors at single-family homes were modeled on the side of the house closest to the noise origin.

The field measurements and their corresponding traffic counts validated the model by ensuring less than a 3 dBA difference between the measured noise levels and the modeled noise levels at each location, as shown in Table 3.



Figure 1

Photo Log of Validation Points

Picture 1:

Validation Point 1, looking north at Prospect Ave (foreground) and I-229 (back ground).



Picture 2:

Validation Point 2, looking northeast at raised I-229.



Picture 3:

Validation Point 3, looking southeast at raised I-229.



Source: Hg Consult





Validation Point ID	Date	Peak Hour	Field Event Hour	Field Visit Duration	Road	Light Vehicles	Medium Trucks	Heavy Trucks	Buses	Motorcycles
Validation Point 1	7/27/2022	1600	1500	15 minutes	NB 229	56	7	8	0	0
					SB 229	59	9	7	0	0
					Prospect	NA	1	0	0	0
Validation Point 2	7/27/2022	1600	1530	15 minutes	No Line of Sight for Traffic Volume Count					
Validation Point 3	7/27/2022	1600	1615	15 minutes	No Line of Sight for Traffic Volume Count					

Source: Hg Consult supplemented by MoDOT traffic counts

Table 3

Validation

Validation Point ID	Date	Time Period	Field Measured Noise Levels (dBA) Leq	FHWA TNM Leq (h) Noise Levels dBA	Measured Minus Modeled Noise Levels dB
Validation Point 1	7/27/2022	1500-1515	56.6	59.3	2.7
Validation Point 2	7/27/2022	1530-1545	59	60.6	1.6
Validation Point 3	7/27/2022	1600-1645	59.6	62.1	2.5

Leq = Equivalent Noise Level; dB = Decibel; dBA = A-weighted Sound Level; Leq(h) = Hourly Leq

### 4.0 Future Sound Levels and Impacts

Using the TNM 2.5 software, the recommended preferred alternative lane centerlines were modeled. The previously modeled receivers, terrain lines, barriers, building rows, and ground zones were included along with any necessary adjustments for the future roadway. For consistency with the validation model, the design year model was also rendered as a flat model (straight-line) model with no elevation data. The line work for the model is shown in Figure 2. Design year traffic volumes for I-229 and I-229 ramps were provided by Hg Consult traffic engineers. Traffic volumes for lesser roadways were gathered from the MoDOT traffic volumes map

website (https://www.modot.org/traffic-volume-maps) and adjusted as needed (**Table 4**). **Table 5** details the TNM 2.5 calculated sound levels.

Where traffic noise impacts were identified, noise abatement measures were then evaluated for feasibility and reasonableness. To be considered impacted, a receptor must have an Leq at the loudest traffic noise hour approaching (within 1 dBA) or exceeding the NAC for the corresponding land use category, or exceeding existing noise levels by 15 dBA. NAC Activity Categories B and C are present in the NSA. A sound level impact for these categories would be a calculated LAeq1h of 66dBA or above. There were two impacted receptors.



Figure 2
Noise Sensitive Areas (NSAs) & Validation Points

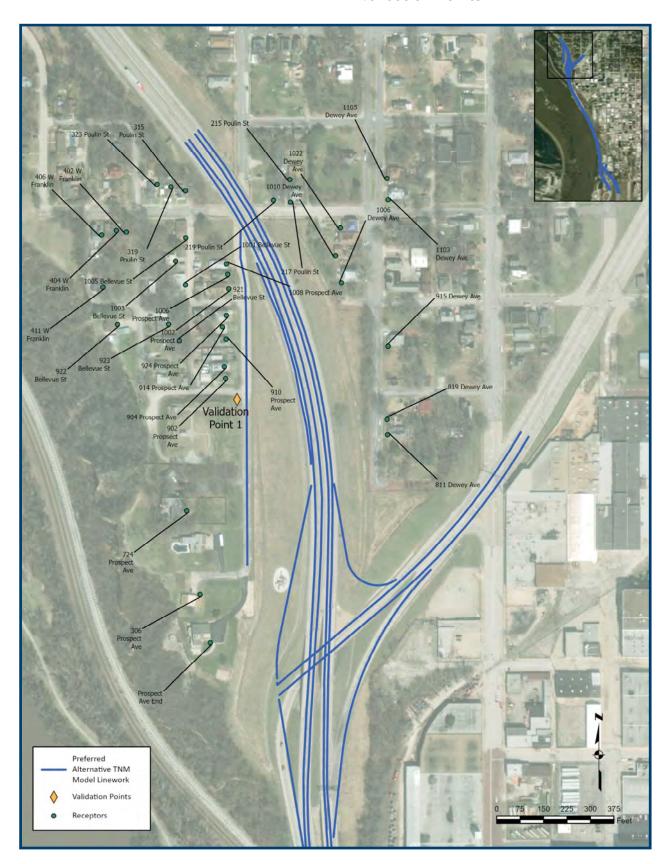




Figure 2 (Cont'd)

Noise Sensitive Areas (NSAs) &

Validation Points





Figure 2 (Cont'd)

Noise Sensitive Areas (NSAs) &

Validation Points







Road	Peak Hour Light Vehicles	Peak Hour Medium Trucks	Peak Hour Heavy Trucks
I-299 NB	286		72
I-229 SB	286		72
Prospect Ave	4		0
59 EB	255	12	4
59 WB	213	70	3
59 EB to I-229 NB	180		6
59 to I-229 SB	190		6
I-229 SB to 59	94		3
I-229 NB to 59 EB	180		6
4th St NB	30	2	1
4th St SB	30	2	1
New 4th St NB	30	2	1
New 4th St SB	265	10	47
I-229 SB to 4th St	265	8	46

Table 5

Design Year Sound Levels

Receiver Name	Number of Dwelling Units	Existing LAeq1h from Validation Model (dBA)	Design Year Calculated LAeq1h (dBA)	Increase Over Existing (dB)	Impact Type
Validation 1 Ft. Smith Historical Society	1	56.6	61.4	4.8	
Validation 2 St. Joseph Riverwalk	1	59	63.3	4.3	
Validation 3 South Open Space	1	59.6	63.6	4	
Prospect Ave End	1	57.2	60.2	3	
306 Prospect Ave	1	56.1	59.1	3	
724 Prospect Ave	1	55.2	57.6	2.4	
902 Prospect Ave	1	58.6	60.7	2.1	
904 Prospect Ave	1	58.7	60.8	2.1	
924 Prospect Ave	1	60.8	62.7	1.9	
914 Prospect Ave	1	59.8	61.8	2	
910 Prospect Ave	1	59.8	61.8	2	
1002 Prospect Ave	1	62.4	64.2	1.8	
1006 Prospect Ave	1	63.1	64.9	1.8	
1008 Prospect Ave	1	63.5	65.3	1.8	
921 Bellevue St	1	56	58.3	2.3	
923 Bellevue St	1	55.7	57.9	2.2	
1001 Bellevue St	1	58	60.1	2.1	
1003 Bellevue St	1	57.9	60	2.1	
1005 Bellevue St	1	59.9	61.9	2	

### Design Year Sound Levels



Receiver Name	Number of Dwelling Units	Existing LAeq1h from Validation Model (dBA)	Design Year Calculated LAeq1h (dBA)	Increase Over Existing (dB)	Impact Type
402 W Franklin	1	54.7	56.9	2.2	
315 Poulin St	1	63	64.8	1.8	
319 Poulin St	1	61.1	63	1.9	
323 Poulin St	1	59.1	61.1	2	
219 Poulin St	1	65.5	67.2	1.7	Snd Lvl
215 Poulin St	1	61.1	63.1	2	
217 Poulin St	1	62.8	64.6	1.8	
1006 Dewey Ave	1	61.3	63.2	1.9	
1010 Dewey Ave	1	60.6	62.6	2	
915 Dewey Ave	1	58.1	60.4	2.3	
1022 Dewey Ave	1	58.4	60.6	2.2	
1103 Dewey Ave	1	53.9	56.3	2.4	
1105 Dewey Ave	1	53.2	55.6	2.4	
811 Dewey Ave	1	60.1	62.5	2.4	
819 Dewey Ave	1	59.9	62.2	2.3	
Riverboat Landing 1	1	62.9	65.3	2.4	
Riverboat Landing 2	1	65	68.2	3.2	Snd Lvl

Notes: Snd Lvl = Design Year Calculated LAeq1h 66dBA or above

### 5.0 Noise Abatement Evaluation Methodology

### 5.1 Noise Barrier Feasibility

For noise abatement measures to be considered feasible, MoDOT requires at least a 5 dBA insertion loss for a minimum of two first-row, impacted receptors. Feasibility also refers to the engineering limitations, including the physical constraints and other constructability constraint limits such as maintenance, drainage, safety, etc.

#### 5.2 Noise Barrier Reasonableness

If a noise barrier is considered feasible, it is then checked for three mandatory reasonableness factors, all of which must be met. First, noise abatement measures cannot exceed 1,300 square foot of noise wall or \$46,000 of alternative noise abatement measures, per benefited receptor. A benefited receptor is defined as a receptor that receives at least a 7 dBA reduction in noise level after the addition of noise abatement measures. Secondly, noise abatement must provide a 7 dBA reduction for 100 percent of first-row benefited receptors.

### 5.3 Ballot Results of Benefited Property Owners and Residents

First-row benefited owners and residents would be notified of potential noise abatement measures and their viewpoints would be sought via ballot. The viewpoints of non-owner residents would be evaluated as a portion of an aggregate of 25 percent of the total. The viewpoints of owners would be evaluated as a portion of an aggregate of 75 percent of that total. Over 50 percent of the aggregate response must be in favor of abatement.

#### 6.0 Noise Abatement Evaluation

There was one NSA that encompassed the entire Study Area. There were 38 receivers within it (including the three validation points). The receivers were evaluated for noise impacts along the corridor. Two receivers had sound level impacts. No receivers were found to have an increase of 15 dBA over existing noise levels.

Noise abatement was not considered feasible because, per MoDOT noise policy, at least a 5 dBA insertion loss



for a minimum of two first-row impacted receivers is required for noise abatement to be considered feasible. The two impacted receptors are separated by the highway and are not in the same residential cluster. Therefore, since the two receptors are separated they would not meet MoDOT noise policy to assess for a barrier.

7.0 Construction Noise

As required by 23 CFR 772.19, the temporary increase in noise levels due to construction was also considered. These noise impacts will take place in the immediate vicinity of the construction activities and generally be limited to working hours. MoDOT construction specifications require all construction equipment to be in good working order. Mufflers are required to help reduce and

address construction noise impacts. Interference with speech communication for those passing by, working, or living near the construction sites is to be expected. Because of the distance of the construction areas to the NSA and the hours of equipment use, noise impacts due to construction are expected to be minor and to occur infrequently.



### **Technical Memorandum 15**

### **Cultural Resources**

The archaeological and historic resource studies followed a three-step process. The first step of the process included an archival review of documented archaeological sites, sites/structures documented as potentially eligible for the National Register of Historic Places (NRHP), and sites/structures/districts/ buildings/objects documented as being on the NRHP. For the records review and literature search effort, the approximately 689.5-acre Study Area and one mile around, was assessed at the MDNR's, State Historic Preservation Office (SHPO) in Jefferson City, Missouri in late 2018. The search identified recorded archaeological sites, previously conducted cultural resources surveys for archaeological and architectural resources, NRHP properties and districts, and shipwrecks.

Additionally, the Study Area was evaluated for the potential to contain archaeological cultural resources. It has been determined that the Study Area has a high probability of intact archaeological cultural resources. Pre-Columbian sites could occur anywhere within the Study Area. Very early habitation sites would generally occur on ridge tops overlooking major waterways and on the high terrace at the foot of the bluff slopes. More permanent communities would have been established in the Late Archaic to Mississippian Periods. The floodplain would have been ideal for farming. The Missouri River would have also provided opportunities for travel, trade and communications. A site associated with the Kansas occupation of northwestern Missouri was identified less than two miles from the Study Area. Other Kansas or Osage villages could be within the Study Area.

The second step of the process involved a pedestrian survey for the Area of Potential Effect (APE) defined

as 50 feet outside the footprint of all the Reasonable Alternatives to verify the presence/absence/condition of documented NRHP sites or districts and to identify additional properties potentially eligible for the NRHP. The results of this investigation were presented to the consulting parties and final determinations of eligibility for the NRHP made by the Missouri SHPO. The preliminary findings of this investigation were used in screening the Reasonable Alternatives and arrive at the Recommended Preferred Alternative (Note: Due to the sensitive nature of the location of archaeological sites the Archival Review and Architectural Survey of Cultural Resources Report has not been included in this report but is available upon request).

The third step in the process included an assessment of the direct and indirect impacts that the Recommended Preferred Alternative may have upon archaeological or historic resources and whether those impacts would constitute an adverse impact. While a preliminary assessment of potential impacts for the initially preferred alternative is presented in the Environmental Assessment, the process is ongoing and coordination with the consulting parties will continue and be finalized at the time a preferred alternative is selected.

A Phase II archaeological survey of the preferred alternative will also be conducted upon selection of the preferred alternative. Excavations associated with the proposed I-229 improvements could impact archaeological remains associated with the Pre-Contact cultures or the early historical use of the City of St. Joseph. These remains cannot be found by a standard archaeological survey but must be found as part of Phase II testing of the preferred alignment by excavating trenches using a backhoe.



MoDOT in consultation with FHWA and SHPO developed a project specific PA to guide further archaeological survey work, including identifying parcels requiring future survey and testing, and mitigation measures if sites cannot be avoided during the project. Efforts to avoid, minimize, or mitigate adverse effects were addressed through consultation for the development of the Programmatic Agreement (PA), which includes continuing consultation to ensure stipulations in the PA are accomplished. The PA will guide the Phase II testing, and address data recovery for sites determined as eligible for listing in the NRHP. For projects using the Design-Build process, the effects of the project on historic properties are re-evaluated as the project design is developed through consistent communication between the Design-Build contractor and MoDOT Historic Preservation staff.

On November 25, 2019, FHWA notified the Advisory Council on Historic Preservation (ACHP), inviting the ACHP to consult on the development of the PA. The ACHP has chosen not to participate in consultation (December 6, 2019).

MoDOT submitted a draft PA to the SHPO for legal review and to FHWA for approval. MoDOT distributed the PA to the Missouri Highways and Transportation Commission, the SHPO, and FHWA for signatures. MoDOT will adhere to all stipulations of the executed Section 106 PA for the I-229 Moving Forward project.

A letter dated February 28, 2023, SHPO concurred "that the undertaking will have no adverse effect on historic properties and have no objection to the initiation of project activities." The SHPO letter is included as Figure 1 on the next page.

The draft PA is included as **Figure 2** located immediately after Figure 1. A copy of the PA, including all the attachments, can be requested. A final PA will be provided after final approval prior to the release of the FONSI.



Figure 1

#### Letter from State Historic Preservation Officer, February 28, 2023



Michael L. Parson Governor

> Dru Buntin Director

February 28, 2023

Mike Meinkoth Missouri Department of Transportation P.O. Box 270 Jefferson City, MO 65109

Re: SHPO Project Number: 002-BN-19 – I-229 Improvements between U.S. 59 and U.S. 36, St. Joseph, Buchanan County, MO 64501 (FHWA)

Dear Mike Meinkoth:

Thank you for submitting information to the State Historic Preservation Office (SHPO) regarding the above-referenced project for review pursuant to Section 106 of the National Historic Preservation Act, P.L. 89-665, as amended (NHPA), and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which require identification and evaluation of historic properties.

We have reviewed the information regarding the above-referenced project and have included our comments on the following page(s). Please retain this documentation as evidence of consultation with the Missouri SHPO under Section 106 of the NHPA. SHPO concurrence does not complete the Section 106 process as federal agencies will need to conduct consultation with all interested parties. Please be advised that, if the current project area or scope of work changes, such as a borrow area being added, or cultural materials are encountered during construction, appropriate information must be provided to this office for further review and comment.

If you have questions please contact the SHPO at (573) 751-7858 or call/email Kevin McHugh, (573) 522-4641, kevin.mchugh@dnr.mo.gov. If additional information is required please submit the information via email to <a href="MOSection106@dnr.mo.gov">MOSection106@dnr.mo.gov</a>.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Joni m. Drawl

Toni M. Prawl, PhD Director and Deputy State Historic Preservation Officer

c: Michael Meyer, MoDOT Taylor Peters, FHWA

PO Box 176, Jefferson City, MO 65102-0176 • dnr.mo.gov





#### Figure 1

### Letter from State Historic Preservation Officer, February 23, 2023 (Cont'd)

February 28, 2023 Mike Meinkoth Page 2 of 2

SHPO Project Number: 002-BN-19 – I-229 Improvements between U.S. 59 and U.S. 36, St. Joseph, Buchanan County, MO 64501 (FHWA)

#### COMMENTS:

We have reviewed the cultural resources survey report entitled *Archival Review and Architectural Survey of Cultural Resources Associated with the Proposed Interstate 229 Improvements between U.S. 59 and U.S. 36 in the City of St. Joseph, Buchanan County, Missouri* by Robin Jorcke and Joe Harl of Archaeological Research Center of St. Louis, Inc. Based on this review it is evident that an adequate survey has been conducted of the project area. We concur that Architectural Properties H148 at 302 South Third Street and H152 at 222 Sylvanie Street are contributing elements of the National Register of Historic Places (NRHP)-listed South Fourth Street Historic District, and that current construction plans should avoid H152 at 222 Sylvanie Street. We also concur that Properties H083 at 333 Main Street, H085 at 202 Main Street, H087 at 101 Francis Street, and H088 at 117 Francis Street are contributing elements of the NRHP-listed Central/North Commercial Historic District.

We further concur that Architectural Resources H084 at 101 Jules Street and H089, with Buildings 1 and 2 at 201 North Second Street are non-contributing elements to the **NRHP-listed** Central/North Commercial Historic District. We also concur that the remaining 78 evaluated properties, including 19 architectural properties constructed before 1979 located within current NRHP historic districts and 31 resources on 20 properties constructed before 1979 not within current NRHP districts are **not eligible** for the NRHP. Finally, we concur that the undertaking will have **no adverse effect on historic properties** and have no objection to the initiation of project activities.

SHPO Reviewer: Kevin McHugh, (573) 522-4641, kevin.mchugh@dnr.mo.gov



#### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER,
THE MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION,
AND THE

CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

**UNDERTAKING:** I-229 Moving Forward: Replacement of the Interstate 229 (I-229) bridge (A2225) in St. Joseph, Buchanan County, Missouri and connections to the local street system;

Missouri Department of Transportation Job Number J1I3053 (see attachment A).

STATE: Missouri

**AGENCY:** Federal Highway Administration

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

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

WHEREAS, the Missouri Highways and Transportation Commission (MHTC) is the board that governs the Missouri Department of Transportation (MoDOT), appoints the Director and authorizes the Statewide Transportation Improvement Program, and acting by and through MoDOT, has participated in the consultation and has been invited to be a signatory to this Agreement; and

WHEREAS, FHWA and MoDOT are studying alternatives for the rehabilitation or replacement the Interstate 229 (I-229) double-decker bridge (A2225) in St. Joseph, Buchanan County, Missouri, and is anticipating an Environmental Assessment (EA) under the National Environmental Policy Act of 1969 (NEPA) (PL 91-190); and

WHEREAS, the MoDOT, acting on behalf of the FHWA, has determined that the undertaking's area of potential effects (APE) for consideration of direct effects was the footprint of the build alternatives being carried through the study, including any necessary right of way, permanent easements and temporary easements. The APE includes the combined footprint of all the build alternatives and includes an offset of 50 feet for the consideration of direct effects (see attachment B for further description). Moving forward the APE will be restricted to the footprint of the preferred alternative; and



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

WHEREAS, a Preferred Alternative has been identified that would build on the existing alignment of the I-229 Bridge alignment; and

WHEREAS, the built environment survey has been conducted and FHWA and MoDOT have determined that the preferred alternative would have no adverse effect on historic properties and has provided the SHPO the opportunity to review the finding and the SHPO has concurred (February 28, 2023); and

WHEREAS, archaeological investigations have yet to be conducted for the preferred alternative; and

WHEREAS, the FHWA notified the Advisory Council on Historic Preservation (Council) of the potential to have adverse effects on a large number of historic properties and intention to develop a programmatic agreement (PA) (November 25, 2019) and the Council has chosen not to participate in consultation (December 6, 2019); and

WHEREAS, the FHWA recognizes that the Iowa Tribe of Kansas and Nebraska, Iowa Tribe of Oklahoma, Kaw Indian Nation of Oklahoma, Omaha Tribe of Nebraska and Iowa, Osage Nation, Otoe-Missouria Tribe of Indians, Pawnee Nation of Oklahoma, Ponca Tribe of Nebraska, Ponca Tribe of Oklahoma, Sac and Fox Nation of the Missouri in Kansas and Nebraska, Sac and Fox Tribe of the Mississippi in Iowa, and the Sac and Fox Nation of Oklahoma have an interest in the undertaking area, and notified them of the project and invited them to participate in the I-229 Moving Forward Study on October 5, 2018 and again consulted with them on a government-to-government basis on August 30, 2021; and,

WHEREAS, the Iowa Tribe of Kansas and Nebraska had contacted FHWA and MoDOT and asked to participate in consultation about I-229 Moving Forward and asked to sign the PA; and

WHEREAS, the Pawnee Nation responded on October 4, 2021, that they have concern about cultural landscapes in the project area of concern to the Pawnee Nation, and that the Robidoux Trading Post could be affected. In addition, they noted that many tribe members are descendants of Joseph or Antoine Robidoux, and that alternatives that avoid the Trading Post are preferred by them. If any previously undiscovered properties are identified by the project, they request that work stop immediately, and they be notified; and

WHEREAS, Buchanan County Commission, the City of St. Joseph, the Missouri-Kansas Regional Council, St. Joseph Convention and Visitor's Bureau, St. Joseph Regional Port Authority & Tourism Commission, the National Park Service/National Trails Office, Oregon-California Trails Association, Gateway Chapter/Oregon-California Trails Association, The National Pony Express Association, Historic St. Joseph Foundation, Restoration Church, Felix Street Gourmet, Skrye, Ernie "Lee" Clark, Mary Conrad, Sarah Elder, Allison & Kelly Horn, Joseph K. Houts, Jr., Jim Lehr, Kenneth Reeder, Bob Simpson, Janet Storts, Gary Westcott, Shelley White, have been notified of undertaking and have been invited to participate in



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

consultation (July 8, 2019) or requested and were granted consulting party status (see attachment C for consultation status); and

**WHEREAS**, the City of St. Joseph and the National Park Service/National Historic Trails Program have been invited to sign this PA as concurring parties; and

**WHEREAS**, public involvement for this undertaking has been handled in accordance with the MoDOT *Engineering Policy Guide*, Chapter 129: Public Involvement; and

WHEREAS, virtual and in-person public meetings were held on I-229 Moving Forward (October 9, 2018, April 4, 2019, and September 1, 2022), and information about the undertaking, historic properties and the undertaking effects on historic properties has been available to the public (see attachment D for a summary of consultation and public involvement to date); and

WHEREAS, no comments from the public have been received about historic properties; and

WHEREAS, to the best of the FHWA's knowledge and belief, no human remains, associated or unassociated funerary objects or sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001), are expected to be encountered; and

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

#### **STIPULATIONS**

FHWA, with the assistance of MoDOT, shall ensure that the following measures are carried out by, or under the direction of, a professional who meets the Professional Qualification Standards set forth in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716):

#### I. CONSULTATION AND PUBLIC INVOLVEMENT

- A. The FHWA, assisted by MoDOT, shall consult with federally recognized Tribal Nations with ancestral, historic, and ceded land connections to Missouri and that may attach religious and/or cultural significance to historic properties in the county (counties) with the project and invite them to participate in Section 106 consultation per 36 CFR Part 800.2(c)(2).
- B. The FHWA and MoDOT, in consultation with the SHPO, shall work to identify other consulting parties to notify of the project and invite to participate in

<sup>1</sup> https://www.modot.org/stjoe229



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

consultation per 36 CFR Part 800.2(c)(3) and 800.2(c)(5). These parties shall include, at a minimum:

- 1. The local elected official(s) with jurisdiction over the project area.
- If communities in the project area have been designated Certified Local Governments (CLG) under the program jointly administered by the National Park Service and SHPO, the CLG point of contact.<sup>2</sup>
- 3. Local historical societies serving the project area.<sup>3</sup>
- 4. Local preservation organizations.
- 5. Bridge preservation groups.
- 6. Communities participating in the Main Street Program in the project area.<sup>4</sup>
- C. Consultation shall occur at major milestones in the Section 106 process and shall also be timed to allow the consulting parties the opportunity to have input into the project through timing of the National Environmental Policy Act (NEPA) documentation. Consultation shall occur at:
  - 1. Project Kickoff—project notification and invitation to consult
  - Development of Purpose and Need and Initial Range of Alternatives/Development of Area of Potential Effects and discussion of field methods to be employed
  - Narrowing of Range of Alternative—Results of Background (Archival)
     Survey; preliminary discussion of results of built environment results
  - 4. Selection of Preferred Alternative
    - a. effects of the preferred alternative on built environment resources
    - b. preliminary archaeological results
    - c. Resolution of adverse effects including appropriate mitigation measures for adversely affected properties
- D. The public shall be kept informed of the status of the Section 106 process and informed of how to request consulting party status through the project website (if

<sup>&</sup>lt;sup>2</sup> Missouri Certified Local Government Program, List of Missouri CLG: https://mostateparks.com/sites/mostateparks/files/CLG PrimaryContactList.pdf

<sup>&</sup>lt;sup>3</sup> State Historical Society of Missouri, Society Directory: https://shsmo.org/local-societies/directory

<sup>&</sup>lt;sup>4</sup> Missouri Main Street Connection, Participating Communities: https://www.momainstreet.org/participating-communities/



Figure 2
Section 106 Programmatic Agreement (Draft)
(Cont'd)

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one is developed for the project), project publications, and through public meetings held for the project, which will include displays on the Section 106 process and handouts explaining the Section 106 process and how to request consulting party status for the project.

- Any substantive comments about historic properties or Section 106
  concerns received from the public will be shared with the consulting
  parties and will be addressed in the Section 106 consultation process and
  the resolution discussed in the project documentation for the National
  Environmental Policy Act (NEPA).
- Consulting parties will be informed of substantive comments received from the public concerning Section 106 and historic properties and how they will be addressed.
- E. Any requests for consulting party status that are received shall be considered by FHWA, MoDOT, and the SHPO.

#### II. QUALIFICATION STANDARDS

A. MoDOT shall ensure that actions prescribed by this Agreement that involve the identification, evaluation, recording, treatment, monitoring, or disposition of historic properties, or that involve the reporting or documentation of such actions in the form of reports, forms, or other records, shall be carried out by or under the direct supervision of a person or persons who meets the Secretary of the Interior's Professional Qualifications Standards (SOI) (published in 48 FR 44738-44739) for the resource being considered.

#### III. AREA OF POTENTIAL EFFECTS

- A. FHWA and MoDOT shall consult with SHPO, Tribal Nations and consulting parties to determine the APE for the project, with the understanding that the APE will be three dimensions (i.e., having height and depth as well as length and width), encompass the full range of alternatives and will be refined as alternatives are added and eliminated throughout the study. The APE shall consider:
  - Direct effects from construction-related activities including ground disturbance, demolition of resources, visual, auditory, vibration and atmospheric effects;
  - Proposed construction impacts, ground-disturbing and non-grounddisturbing, to justify the types and level of investigative effort to identify historic properties.
  - The APE may contract over time as alternatives are eliminated. Tribal Nations and other consulting parties will be consulted as this occurs.



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- Indirect effects, as clarified by the D. C. Circuit Court in *National Parks Conservation Assoc. v. Semonite* and the Council, as those effects "caused by the undertaking that are later in time or farther removed in distance but still reasonably foreseeable"<sup>5</sup>; and
- B. The APE may be supplemented if the Design-Build Process is utilized. If the Design-Build consultant proposes an alternative(s) that meets Purpose & Need that falls outside the original APE, FHWA and MoDOT shall consult per Stipulation III.A.

#### IV. IDENTIFICATION OF RESOURCES

- A. MoDOT shall ensure that the Built Environment investigations are conducted in a manner consistent with MoDOT's Built Environment Methods.
- B. MoDOT shall ensure that the archaeological investigations are conducted in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and SHPO's Guidelines for Phase I Archaeological Surveys and Reports.

#### C. Reporting

- 1. The results of the Built Environment and Archaeological surveys shall be reported in a single, comprehensive report. The report shall include:
  - a. Background Research Results including previous surveys, NRHP listed and determined eligible properties, previously reported sites, appropriate historic context, and historic mapping to understand the APE
  - b. Field Survey Results will be reported on the MoDOT Section 106 Survey Memo, which meets the standards set by the Missouri SHPO for surveys done in Missouri. Any properties where access was denied or where survey was not possible for any reason shall be clearly identified on mapping and in the report text; and
  - c. Determinations made through consultation between MoDOT, FHWA, SHPO, the Tribal Nations and other consulting and interested parties shall be included in the Report.

<sup>&</sup>lt;sup>5</sup> NPCA v. Semonite, No. 18-5179 (D. C. Cir 2019); ACHP, Court Ruling on Definitions Informs Agencies on Determining Effects, 2019: https://www.achp.gov/news/court-rules-definitions-informs-agencies-determining-effects.



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- d. The report shall be shared with FHWA, SHPO and consulting parties. SHPO and the consulting parties shall have thirty (30) days to comment on the results and findings of the report. The results and findings shall be the topics of meetings between MoDOT, FHWA, SHPO and the consulting parties as needed.
- D. Properties that could not be accessed for survey during the Phase I investigations shall be surveyed, in accordance with Stipulations IV.4-A-C or an Archaeological Research Design developed for the project (and located in Attachment E), as design proceeds and property is acquired.
- E. If the APE is supplemented during the Design-Build process, the processes in Stipulation IV shall be followed for the identification of resources within that APE.

#### V. NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY EVALUATION

- A. MoDOT, in consultation with FHWA, SHPO, Tribal Nations, and other consulting and interested parties, shall apply the NRHP criteria (36 CFR Part 63), and applicable guidance issued by the Keeper of the National Register, to each property identified in the field survey or through consultation to determine if the property is eligible for listing in the NRHP (a historic property).
- B. MoDOT will seek the concurrence of SHPO, Tribal Nations and other consulting parties, on eligibility for each resource identified as eligible for listing in the NRHP.
- C. Properties that are eligible for listing in the NRHP shall have the following addressed in the report: the NRHP criteria the property is eligible for listing under; area(s) of significance, characteristics that qualify the property for inclusion in the NRHP, contributing and non-contributing elements, period(s) of significance and boundary of the historic property.
- D. If the APE expands during the Design-Build process, the processes in Stipulation V shall be utilized to evaluate and consult about eligibility of resources.

#### VI. ASSESSMENT OF EFFECTS

A. MoDOT, on behalf of FHWA, shall apply the criteria of adverse effects (36 CFR Part 800.5) to each property listed in or eligible for listing in the NRHP, for each alternative under consideration. FHWA and MoDOT shall consult with the SHPO, Tribal Nations and other consulting parties about the effects of the various alternatives on historic properties.



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- B. If FHWA and MoDOT find that project activities have adverse effects on properties eligible for the NRHP, they shall consult with SHPO, Tribal Nations and other consulting parties to resolve the adverse effects, consistent with guidance provided in 36 CFR Part 800.6. This consultation shall include efforts to develop and evaluate alternatives or modifications to the undertaking that could avoid or minimize the adverse effects on said historic properties.
- C. For projects utilizing the Design-Build process, the effects of the project on historic properties will be re-evaluated as the project design is developed through consistent communication between the Design-Build and MoDOT Historic Preservation staffs:
  - If there is an adverse effect finding, MoDOT shall provide FHWA with information to notify the Council of the adverse effect.
  - FHWA and MoDOT shall consult with Tribal Nations, SHPO and the other consulting parties to resolve the adverse effect, per Stipulation VII to inform them of the resource, the change in effect and what is causing the change:
    - a. SHPO and the consulting parties will have thirty (30) days to review the information and provide comments.
    - b. If there is disagreement about the finding, FHWA and MoDOT will consult with the parties to resolve the disagreement.
    - c. If the disagreement cannot be resolved, procedures for resolution in 36 CFR 800.5(c)(2) shall be implemented.
  - FHWA and MoDOT shall consult with the SHPO, Tribal Nations and consulting parties to resolve any adverse effects using the processes in Stipulation VII: Resolution of Adverse Effects.

#### VII. RESOLUTION OF ADVERSE EFFECTS

A. If FHWA and MoDOT find project activities have adverse effects on historic properties, they will consult with SHPO, Tribal Nations and other interested parties to resolve the adverse effects, consistent with guidance provided in 36 CFR Part 800.6, through the implementation of a Mitigation Plan for Built Environment Resources or an Archaeological Data Recovery Plan(s) developed in accordance with the Council's Recommended Approach for Consultation on the Recovery of Significant Information from Archaeological Sites and the Secretary of the Interior's Standards for Archaeological Documentation.



Figure 2
Section 106 Programmatic Agreement (Draft)
(Cont'd)

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- B. Mitigation measures that benefit and engage the public shall be developed to the extent practical. Public benefit mitigation measures may be used as a substitute for traditional mitigation measures in some cases.
- C. All mitigation measures shall be memorialized in a Mitigation Plan, which shall be developed and will contain all agreed upon mitigation measures.
- D. The Mitigation Plan or Archaeological Data Recovery Plan will be negotiated among the signatories and consulting parties and will become effective only upon written concurrence by representatives for all signatories and invited signatories.
- E. If adverse effects are avoided during the Design-Build process, the Mitigation Plan or Archaeological Data Recovery Plan can be amended by the signatories and consulting parties.

#### VIII. TREATMENT OF HUMAN REMAINS

- A. The FHWA recognizes that any human remains (other than from a crime scene or covered under Missouri's Cemeteries Law, §§ 214. RSMo) that may be discovered during project activities and are located on non-federal land are subject to the immediate jurisdiction of the SHPO, albeit FHWA or its delegate is responsible to have a professional archaeologist analyze the remains and advise SHPO of the physical location and cultural and biological characteristics, and if SHPO determines, as per the consultation conducted under Section 106, excavation is warranted such remains will be handled pursuant to the Missouri Unmarked Human Burial Sites Act, §§ 194.400 194.410, RSMo. All discoveries of human remains shall be treated as sensitive information and shall not be made available to the public.
- B. Native American skeletal remains, associated or unassociated funerary objects, sacred objects, and objects of cultural patrimony that may be discovered during the archaeological survey, testing, or data recovery excavations on federal land are the responsibility of the federal agency that manages that property. The involved Federal land-managing agency will notify any Tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification. The Federal Agency shall take into account Tribal recommendations regarding treatment of the remains and proposed actions, and then direct MoDOT to carry-out the appropriate actions.
- C. The USDOT is a signatory to the Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Indigenous Sacred Sites to affirm their commitment to improve the protection of, and access to, Indigenous sacred sites through enhanced and improved interdepartmental coordination, collaboration, and action and to demonstrate their commitment



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through the early consideration of the protection and access to Indigenous sacred sites in agency decision-making and regulatory processes.

#### D. If human remains are encountered during archaeological investigations:

- The archaeologists shall immediately stop all work within a fifty (50)meter (approximately 165-foot) radius of the remains and shall not resume
  without specific authorization from either the SHPO or the local law
  enforcement officer, or if on federal land the land management agency,
  whichever party has jurisdiction over and responsibility for such remains.
- 2. MoDOT HP staff will notify the local law enforcement (to ensure that it is not a crime scene) and the SHPO as per the Missouri Unmarked Human Burial Sites Act and contact FHWA and Tribes that have expressed interest in Section 106 undertakings in the County the remains were found in, within twenty-four (24) hours of the discovery.
- 3. FHWA will notify any tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification.
- FHWA shall, to the maximum extent possible, seek consensus and incorporate identifications, recommendations, and Native American traditional knowledge regarding treatment of the remains and proposed actions.
- MoDOT shall monitor the archaeological data recovery and handling of any such human remains and associated or unassociated funerary objects, sacred objects or objects of cultural patrimony, to assure itself that these are handled, excavated or processed in accordance with the Missouri Unmarked Human Burials Sites Act.
- 6. Should, through consultation with Tribes, excavation be determined necessary, MoDOT will provide notification within twenty-four (24) hours to affiliated Tribes when physically transferring possession of ancestors or cultural items to SHPO for continued consultation on reinternment.

#### E. If human remains are encountered during construction:

 The contractor shall immediately stop all work within a fifty (50)-meter (approximately 165-foot) radius of the remains and shall not resume without specific authorization from either the SHPO or the local law enforcement officer, or if on federal land the land management agency, whichever party has jurisdiction over and responsibility for such remains.



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- The contractor shall notify the MoDOT Construction Inspector and/or Resident Engineer who will contact the MoDOT HP section within twenty-four (24) hours of the discovery.
- MoDOT HP staff will immediately notify the local law enforcement, or if
  on federal land the land management agency, (to ensure that it is not a
  crime scene) and the SHPO as per the Missouri Unmarked Human Burial
  Sites Act or to notify SHPO what has occurred and that it is covered by
  Missouri's Cemeteries Law, §§ 214. RSMo.
- 4. MoDOT HP staff will notify FHWA that human remains have been encountered within twenty-four (24) hours of being notified of the find.
- If, within twenty-four (24) hours, the contractor is unable to contact
  appropriate MoDOT staff, the contractor shall initiate the involvement by
  local law enforcement, or if on federal land the land management agency,
  and the SHPO. A description of the contractor's actions will be promptly
  made to MoDOT.
- FHWA will notify any tribe that might attach cultural affiliation to the identified remains as soon as possible after their identification.
- FHWA shall, to the maximum extent possible, seek consensus and incorporate identifications, recommendations, and Native American traditional knowledge regarding treatment of the remains and proposed actions.
- MoDOT, under FHWA oversight, shall monitor the handling of any such human remains and associated funerary objects, sacred object or objects of cultural patrimony in accordance with the Missouri Unmarked Human Burial Sites Act.
- Should, through consultation with Tribes, excavation be determined necessary, MoDOT will provide notification within twenty-four (24) hours to affiliated Tribes when physically transferring possession of ancestors or cultural items to SHPO for continued consultation on reinternment.

#### IX. POST-REVIEW DISCOVERIES

A. Planning for Subsequent Discoveries

MoDOT shall include in any environmental document, contract, and specifications a plan for post-review discovery of historic properties.



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Implementation of the plan as originally proposed or modified as necessary owing to the nature and extent of the properties discovered, will be in accordance with 36 CFR Part 800.4-6.

- B. If cultural resources are encountered during construction:
  - The contractor shall immediately stop all work within a fifty (50)-meter (approximately 165 foot) radius around the limits of the resource and shall not resume work without specific authorization from a MoDOT Historic Preservation Specialist.
  - 2. The contractor shall notify the MoDOT Resident Engineer or Construction Inspector, who shall contact the MoDOT Historic Preservation (HP) section within twenty-four (24) hours of the discovery.
  - MoDOT HP shall contact FHWA, Tribes and SHPO within forty-eight (48) hours of learning of the discovery to report the discovery after a preliminary evaluation of the resource and reasonable efforts to see if it can be avoided.
  - FHWA shall make an eligibility and effects determination based upon the preliminary evaluation and consult with MoDOT, Tribes and SHPO to minimize or mitigate any adverse effect.
  - FHWA shall take into account Tribal recommendations regarding the eligibility of the property and proposed actions, and direct MoDOT to carry out the appropriate actions. The Council does not need to be notified if the SHPO, Tribes, and other parties agree to treatment plan.
  - 6. MoDOT shall provide FHWA and SHPO with a report of the actions when they are completed.
  - 7. Upon receipt, FHWA shall provide this report to the Tribes.
  - 8. MoDOT, in coordination with FHWA, will make this report available to the public and other consulting parties, if it is not limited by the requirements for confidentiality, as identified in Stipulation X.
- C. If the discovery is not limited by the confidentiality requirements of Section 304 of the NHPA and Stipulation X of this Agreement, the public shall be notified of the late discovery in the following manner:
  - 1. Information on the discovery shall be posted to the MoDOT website associated with the project, if one exists. This information will include the



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nature of the discovery, how it is being treated, and the evaluation of it. The website will include information on how to contact the project manager or the MoDOT HP Section with comments or concerns about the discovery.

MoDOT will issue a press release about the discovery. The press release
will include the nature of the discovery, how it is being treated and the
evaluation. The press release will include a way for the public to contact
the project manager or the MoDOT HP Section if they have comments or
concerns about the discovery.

#### X. CONFIDENTIALITY

All parties to this Agreement acknowledge that information about historic properties or potential historic properties are or may be subject to the provisions of Section 304 of NHPA. Section 304 allows FHWA to withhold from disclosure to the public, information about the location, character, or ownership of a historic resource if the signatories and invited signatories determine that disclosure may: 1) cause a significant invasion of privacy; 2) risk harm to the historic resource; or 3) impede the use of a traditional religious site by practitioners. Having so acknowledged, all parties to this Agreement will ensure that all actions and documentation prescribed by this Agreement are, where necessary, consistent with the requirements of Section 304 of the NHPA.

#### XI. DURATION

This Agreement shall remain in effect for a period of ten (10) years after the date it takes effect, unless it is terminated prior to that time. No later than six (6) months prior to the conclusion of the ten (10)-year period, MoDOT will notify all parties in writing if an extension is needed. The Agreement may be extended for an additional term, the length of which will be agreed to by the signatories and invited signatories. The extension will be codified through an amendment of the Agreement in accordance with Stipulation XIV. If any party objects to extending the Agreement, or proposes amendments, MoDOT will consult with the parties to consider amendments or other actions to avoid termination.

#### XII. REPORTING

MoDOT, acting on behalf of FHWA, shall, at the end of each calendar year following the execution of this PA, provide to all signatories a written report regarding the actions taken to fulfill the terms of the agreement, and shall file a copy with the Council per 36 CFR Part 800.6(b)(iv). The report shall include the following information:

- A. Any stipulations completed during the calendar year;
- B. Work done toward completion of any stipulations during the calendar year;



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- C. Any consultation done regarding any of the stipulations during the calendar year, the subject of the consultation and parties consulted with; and
- D. The status of the project, including tasks that remain outstanding.

#### XIII. DISPUTE RESOLUTION

Any party to this Agreement may terminate it by providing thirty (30) calendar daysnotice in writing to the other parties explaining the reason for termination, provided that the parties will consult during the period prior to termination to seek agreement on amendments and other actions that would avoid termination. In the event of termination, FHWA shall ensure that undertakings shall be reviewed individually in accordance with 36 CFR Part 800.3-800.6 that were previously covered by this Agreement.

At any time during implementation of this Agreement, should any member of the public raise an objection in writing pertaining to such implementation to any signatory or invited signatory to this Agreement, that signatory or invited signatory shall immediately notify FHWA. FHWA shall immediately notify the other signatories and invited signatories in writing of the objection. Any signatory or invited signatory may choose to comment on the objection to FHWA. FHWA shall establish a reasonable time frame for this comment period. FHWA shall consider the objection, and in reaching its decision, FHWA will take all comments from the other parties into account. Within fifteen (15) days following closure of the comment period, FHWA will render a decision regarding the objection and respond to the objecting party. FHWA will promptly notify the other parties of its decision in writing, including a copy of the response to the objecting party. FHWA's decision regarding resolution of the objection will be final. Following the issuance of its final decision, FHWA may authorize the action subject to dispute hereunder to proceed in accordance with the terms of that decision.

#### XIV. AMENDMENTS

Any signatory or invited signatory to this Agreement may at any time propose amendments, whereupon all signatories and invited signatories shall consult to consider such amendment. This Agreement may be amended only upon written concurrence of all signatories and invited signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the Council.

#### XV. TERMINATION

Any party to this Agreement may terminate it by providing thirty (30) calendar daysnotice in writing to the other parties explaining the reason for termination, provided that the parties will consult during the period prior to termination to seek agreement on amendments and other actions that would avoid termination. In the event of termination,



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FHWA shall ensure that undertakings shall be reviewed individually in accordance with 36 CFR Part 800.3-800.6 that were previously covered by this Agreement.

#### XVI. EXECUTION

Execution of this PA by the FHWA, the SHPO and the MHTC and the implementation of its terms evidence that FHWA has taken into account the effects of this undertaking on historic properties and afforded the Council an opportunity to comment. A copy of the executed PA shall be provided by FHWA to the Council for their records.

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FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER,
THE MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION,
AND THE

CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

**UNDERTAKING:** I-229 Moving Forward: Replacement of the Interstate 229 (I-229) bridge (A2225) in St. Joseph, Buchanan County, Missouri and connections to the local street system;

Missouri Department of Transportation Job Number J1I3053.

STATE: Missouri

AGENCY: Federal Highway Administration

SIGNED:

FEDERAL HIGHWAY ADMINISTRATION:

By:	Date:	
Title:		



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER,
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AND THE

CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

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Missouri Department of Transportation Job Number J1I3053.

**STATE:** Missouri

AGENCY: Federal Highway Administration

SIGNED:

THE MISSOURI STATE HISTORIC PRESERVATION OFFICER:

By: \_\_\_\_\_ Date: \_\_\_\_\_

**Title: Deputy State Historic Preservation Officer** 



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER,
THE MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION,
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CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

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Missouri Department of Transportation Job Number J1I3053.

STATE: Missouri

AGENCY: Federal Highway Administration

SIGNED:

#### MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION:

Ву:	Date:	
Title:		
Attest:	Approved as to form:	
Commission Secretary	<b>Commission Counsel</b>	



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
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AND THE

CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

**UNDERTAKING:** I-229 Moving Forward: Replacement of the Interstate 229 (I-229) bridge (A2225) in St. Joseph, Buchanan County, Missouri and connections to the local street system;

Missouri Department of Transportation Job Number J1I3053.

STATE: Missouri

AGENCY: Federal Highway Administration

**CONCUR:** 

IOWA TRIBE OF KANSAS AND NEBRASKA:

By:	Date:	
Title:		



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER,
THE MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION,
AND THE

CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

**UNDERTAKING:** I-229 Moving Forward: Replacement of the Interstate 229 (I-229) bridge (A2225) in St. Joseph, Buchanan County, Missouri and connections to the local street system;

Missouri Department of Transportation Job Number J1I3053.

STATE: Missouri

AGENCY: Federal Highway Administration

**CONCUR:** 

#### NATIONAL PARK SERVICE/NATIONAL TRAILS OFFICE:

By:	Date:
Title:	



FHWA Missouri, Buchanan County I-229 Moving Forward, MoDOT Job No. J1I3053

### PROGRAMMATIC AGREEMENT AMONG

THE FEDERAL HIGHWAY ADMINISTRATION,
THE MISSOURI STATE HISTORIC PRESERVATION OFFICER,
THE MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION,
AND THE

CITY OF ST. JOSEPH, MISSOURI REGARDING I-229 MOVING FORWARD (THE REPLACEMENT OF THE I-229 BRIDGE (A2225)) BUCHANAN COUNTY, MISSOURI

**UNDERTAKING:** I-229 Moving Forward: Replacement of the Interstate 229 (I-229) bridge (A2225) in St. Joseph, Buchanan County, Missouri and connections to the local street system;

Missouri Department of Transportation Job Number J1I3053.

STATE: Missouri

AGENCY: Federal Highway Administration

**CONCUR:** 

**CITY OF ST. JOSEPH, MISSOURI:** 

By:	Date:	
-		
Title:		



#### Technical Memorandum 16

### Flooplains

### 23CFR Section 650 Subpart A Technical Memorandum

23 CFR Section 650.111 (c) Location studies shall include discussion of the following items, commensurate with the significance of the risk or environmental impact, for all alternatives containing encroachments and for those actions which would support base floodplain development.

1. The risks associated with implementation of the action are as follows:

The limits of the I-229 EA extend along I-229 in downtown St. Joseph, MO from US-36 on the south to US-59/St. Joseph Avenue on the north. The western limit of the study is the Missouri River while the eastern limit is approximately 8th Street. The Selected Alternative (Alternative D) for this proposed project would tear down the double-decker I-229 Bridge and build an at-grade four lane facility along the Missouri River. The project was shared with the local floodplain administrator. The regulatory floodway is to be avoided. Fill will be placed in the floodway fringe to elevate the roadway above the 100-year water surface elevation (WSE). At a minimum a Floodplain Development Permit through the Missouri State Emergency Management Association will be required for this action. Depending on a determination from the local floodplain administrator additional actions/permits may be required. Approximately 3.9 acres of 100-year floodplain and 0 acres of regulatory floodway would be impacted by the Selected Alternative D. See the corresponding Alternative D Study Area Map (Figure 1), which provides the location of the proposed alternative alignment, floodways and floodplains, and the encroachment areas.

2. Impacts on natural and beneficial floodplain values:

Natural and beneficial floodplain values include, but are not limited to, fish, wildlife, plants, open space, natural

beauty, scientific study, outdoor recreation, agriculture, forestry, natural moderation of floods, water quality maintenance, and groundwater.

Floodplain - Alternative D is expected to have minimal impact on the existing floodplain and regulatory floodways. The measurement used to evaluate the potential impacts were "acres" of disturbed floodplain. Alternative D would affect 3.9 acres of 100-year floodplain and 0.0 acres of floodway. It is assumed three-to-five feet of fill would be placed throughout the entire affected area to elevate the roadway above the base flood elevation.

- MoDOT Commitment: MoDOT will restrict development within the regulatory floodway and "demonstrate through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge". If MoDOT is unable to avoid the regulatory floodway with the final alignments, MoDOT would conduct a hydraulic analysis during final design to document that the new improvements would result in "no rise" in the flow within the regulatory floodway.
- MoDOT Commitment: MoDOT will conduct an engineering analysis for the Recommended Preferred Alternative prior to submission of the floodplain development permit application to SEMA. The contractor shall obtain a floodplain development permit and "no-rise" certification.
- MoDOT Commitment: MoDOT will minimize the size and duration of temporary obstructions within the floodplains and regulatory floodway during construction by effective construction sequencing and construction methodology.



 MoDOT Commitment: MoDOT will employ sediment and erosion control management best practices during construction and re-seed disturbed areas following construction.

Fish and Wildlife - The Selected Alternative is not likely to have direct or indirect effects on federal - or state-listed wildlife species other than Tricolored bats. This alternative would generally be constructed within the existing roadway footprint.

• MoDOT Commitment: MoDOT shall conduct surveys of bridges prior to the start of construction to identify any active bird nests on the structures. If the use of avoidance measures is not possible, options include removal of inactive nests by MoDOT staff with on-going maintenance until project Notice to Proceed, or removal of inactive or partially constructed nests by March 15 (outside of the general nesting season of April 1 to July 31) by the project contractor. A nest free condition must be maintained by the contractor until bridge work is complete.

Recreation – Alternative D, as proposed, would potentially impact the segment of trail south of the trailhead shelter, past the old riverboat landing to the chain link fence. It also could potentially impact the existing trailhead shelter. The trail from the trailhead shelter north across Blacksnake Creek toward the Nature Center would not be impacted. In addition, future plans to extend the existing trail south would likely not be an option because of the limited land available between the river, bridge and railroad tracks.

- MoDOT Commitment: MoDOT shall replace the existing Riverwalk Trail trailhead shelter with at least a compatible, if not improved structure during construction.
- MoDOT Commitment: MoDOT shall improve the pedestrian connection between Francis Street, across the BNSF tracts, to the southern trailhead during construction.
- MoDOT Commitment: MoDOT shall provide opportunities for parking in proximity to the trailhead during the project design process and construction.
- MoDOT Commitment: MoDOT shall investigate options for upgrading the Riverwalk Trail south of the

existing trailhead to potentially connect south of its current termini during the project design process.

Water Quality – Construction related impacts to water quality would be primarily the result of stormwater runoff. Water quality impacts resulting from construction of the new project and removal of the existing bridges would be relatively short-term due to the nature of the construction process. However, Alternative D would essentially result in the same amount of stormwater runoff after construction as under the current conditions. No groundwater impacts are anticipated because of construction activities.

MoDOT Commitment: MoDOT shall ensure that
in accordance with the requirements of the NPDES
program, the contractor will be required to develop
a project-specific SWPPP to describe the BMPs to
be implemented during construction. The SWPPP
would include MDNR approved components to
reduce suspended solids, turbidity, and downstream
sedimentation that may degrade water quality and
adversely impact aquatic life.

Wetlands – Alternative D will, for the most part, be constructed within the existing roadway footprint and would modify existing road structures on the northern end close to the potential forested/shrub wetland. Based on the October 2022 field visit, the area of the potential wetland that could be impacted by the proposed improvement is not a wetland and, therefore, Alternative D would not have a direct or indirect effect on wetlands or Waters of the US.

**Agriculture** - Because no farmland is present, review of the project under the Farmland Protection Policy Act is not required.

 Support of probable incompatible floodplain development:

As defined by the FHWA, the support of incompatible base floodplain development encourages, allows, serves, or otherwise facilitates incompatible base floodplain development, such as commercial development or urban growth.

MoDOT will ensure local and regional access to existing rural and urban areas and facilities are maintained during construction. This highway improvement project would not support incompatible floodplain development.



### 4. Measures to minimize floodplain impacts associated with the action:

MoDOT will avoid modification to the functions of the natural floodplain environment or will maintain it as closely as practicable in its natural state. MoDOT will ensure the floodplain analysis and certifications comply with floodplain regulations and demonstrate minimal impacts to the floodplains within the project limits. MoDOT will obtain floodplain development permits from SEMA prior to FHWA authorization for construction.

MoDOT will ensure sediment and erosion control best management practices are implemented during construction and disturbed areas are seeded following construction for restoring and preserving natural and beneficial floodplain values.

#### Measures to restore and preserve the natural and beneficial floodplain values impacted by the action.

There would be limited impacts to the natural and beneficial floodplain values of the floodplains from this project. Because there would be temporary soil disturbance during construction activities, MoDOT will ensure sediment and erosion control best management practices are implemented during construction and disturbed areas seeded following construction.

 23 CFR Section 650.111 (d) Location studies shall include evaluation and discussion of the practicability of alternatives to any significant encroachments or any support of incompatible floodplain development

As defined in 23 CFR 650.105, a significant encroachment involves a significant potential for interruption or termination of a transportation facility, which is needed for emergency vehicles or provides a community's only evacuation route, a significant risk meaning potential for loss of life or property, or a significant adverse impact on natural and beneficial floodplain values.

This project would not result in a significant potential for interruption or termination of this transportation facility,

which is needed for emergency vehicles or a community's only evacuation route. It would also not result in a significant risk or potential for loss of life or property. This project would not result in a substantial adverse impact on natural and beneficial floodplain values. This highway improvement project would maintain local and regional access to existing rural and agricultural areas and would not support any incompatible floodplain development.

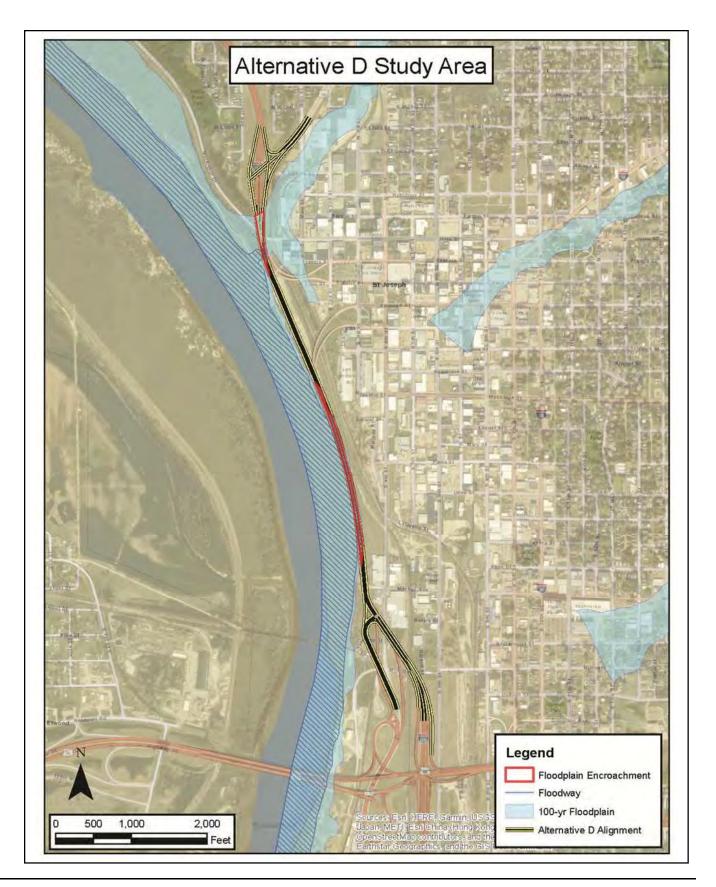
There would be no significant encroachments from this project, and it would not support incompatible floodplain development.

This project is not expected to cause a greater risk within a floodplain that potentially impacts an adjacent structure



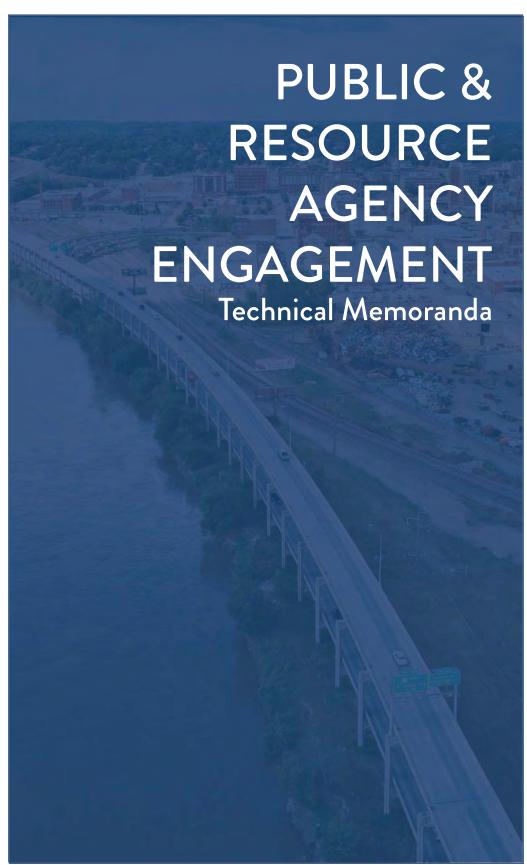
Figure 1

Recommended Preferred Alternative Floodplain & Floodway Encroachment











#### **Technical Memorandum 17**

### Public Meetings

The Study Team completed three public meetings during the course of the I-229 Environmental Assessment. Summaries of each of those meetings, along with public comments, are provided on the following pages. The formal public meetings included:

- Visioning Workshop. An initial workshop was held in-person on October 9, 2018 to ask the community about the importance of the bridge and to explore future visions for downtown I-229.
- Initial Alternatives Public Meeting. An in-person Open House, along with a concurrent virtual web-based meeting, was held on April 19, 2019 to present the Initial Alternatives and to get feedback on the relative merits of each.
- Reasonable Alternatives Public Meeting. A second in-person Open House, along with a similar virtual al web-based meeting, was held on September 1, 2022 to present the Reasonable Alternatives and to get feedback on their relative merits.
- Public Hearing. A final Public Hearing is planned for the Fall of 2023 following review and approval of the Environmental Assessment. The Finding of No Significant Impact will include the Hearing details and public comments from that meeting.

#### 1.0 Visioning Workshop

A packed house of local elected officials, business owners, community leaders and members of the public participated in hearty discussions about the vision of St. Joseph for the next 60 years and the role the Interstate 229 double-decker bridge will have in the future.

Approximately 105 St. Joseph citizens participated in an initial Visioning Workshop to discuss the future of I-229 and the St. Joseph community.

The I-229 bridge facility is getting to the point that major decisions with significant price tags attached will be required in the near term. Those decisions and the funding associated with whatever happens next will have long term affects. And so, MoDOT asked residents to look into the future and describe what they saw for their community.

To that end, participants were walked through a series of table-top discussions and survey questions answered in the room. The portion of I-229 that goes through downtown St. Joseph is one of only a handful like it in the United States. The bridge runs a little over a mile and is nearly 40 years old. MoDOT is evaluating potential next steps for the structure. Currently, the bridge carries about 17,000 vehicles a day, less than a quarter of the traffic a typical four lane interstate can carry safely.

#### 1.1 Community Vision

One of the questions asked of the assembled participants was, can we connect even better? Often, com-





#### When asked, what participants envisioned downtown St. Joseph to be like in 60 years, they responded:



munities get stuck in what has been built and miss an opportunity to think about what could be. The workshop focused on defining the future the community wants and then deciding on what infrastructure is required to create that future.

#### 1.2 Role of Technology

As part of small group facilitated discussions in the room, residents were asked how they believed technology would affect the project. Among the notes taken at each table were:

- With automated vehicles people will be more patient about getting somewhere fast as they will be able to do other things while traveling
- Flying vehicles might happen within 60 years
- Technology will result in more leisure time/time for recreational activities
- Might have dedicated cargo lanes/facilities
- More people are working from home and the trend will continue in the future
- Automation will result in fewer workers
- Service industry employment will continue to grow
- More trips from non-commuter types, such as recreational, healthcare, etc., that require face-to-face interactions
- The amount of grain being transported will grow as technology continues to increase yields

- More people working from home less need for personal trips
- Commercial vehicle trips likely will remain about the same
- Highways will need to accommodate driverless vehicles
- Charging strips may someday be placed on the road to charge vehicles as they drive
- More access points may be necessary
- Automated vehicles will change the landscape
- Trend to avoid driving transit, walk, Uber
- Messaging along infrastructure will change (i.e. not billboards but in dash information)
- People will work remotely, live downtown, and walk
- Sharing cars like the scooter system now
- Food, supplies needed will be delivered

#### 1.3 Role of Freight

The nearly 15-mile I-229, which includes the double-decker bridge, provides major north and south connections along the river and to US Route 36 which crosses the state line. In addition to its downtown connection, I-229 connects through a major industrial area to the south which uses the interstate to move goods.

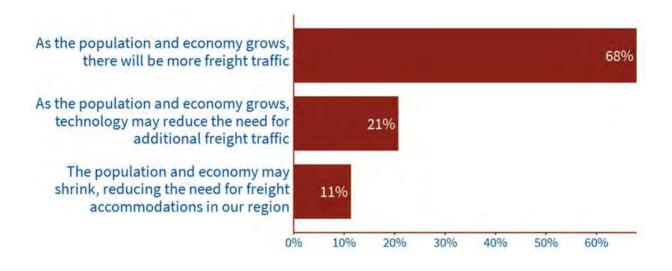
The group was asked a series of questions related to the importance of freight movement to the community. The response to two of those questions are below.



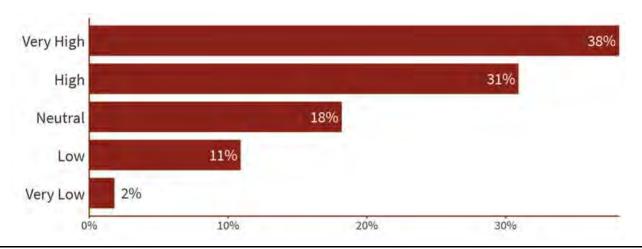
Additionally, the consultant team facilitated a tabletop discussion about the freight issues affecting the corridor. Members of the public expressed support for the corridor to continue to enable goods to move through the city and region. Additional thoughts collected at the tables included:

- Value of livestock will go down as diet/foods change
- Conversely may be heavier emphasis on things like farm to table sourced foods
- Grain will always be a staple even if converting to some other protein and will need to be produced and transported
- Will be short term issues with increased delivery times
- The new port will soon be open and will result in additional truck deliveries
- There is a belief that some trucks use I-229 to avoid congestion on I-29. Removing I-229 would result

The group was asked to rate the three freight elements as depicted by the results below.



The assembled group was asked to rate the needs to improve commuting and the movement of goods and services through the study area. While rating the needs fairly high, the results indicate an understanding that the corridor currently operates fairly well with few delays or traffic issues.





in shifting those trucks back to I-29 and increasing congestion

- Increasing freight traffic on US Route 36 not preferred because of its current condition
- Shifting trucks to downtown streets also not desirable
- South side will always have an industrial element
- In order to build up the downtown you need to be able to get construction equipment into the area.
   Right now, I-229 provides good access into the downtown for construction equipment
- Industrial/ manufacturing so moving freight is important
- Bridge used heavily to get to Lower Lake Rd.
- How else do you connect to the north?
- Option for expressway for truck, harder for trucks but great for city
- Eliminate Highland to 36 to get Riverfront back
- Re-route freight to other side of the river by adding a 2-lane bridge
- Helps to get to Air Guard
- Remove upper level of current structure and use the lower one as a high-line type of park to get river back

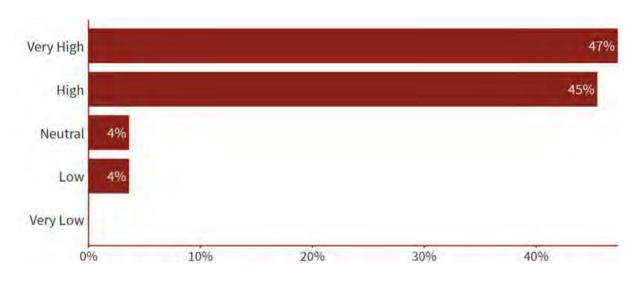
#### 1.4 Economic Forces

The crowd was also asked critical questions about the project's economic development potential. The public placed a high value on the potential for investments in I-229 to spur other economic development benefits.

#### 1.5 Meeting Conclusions

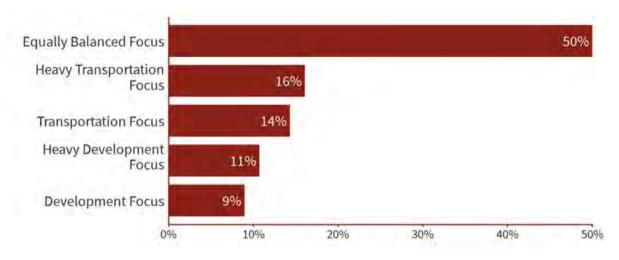
While the public clearly acknowledged the economic development potential of the project, when asked about what the public most wanted the planning team to focus on for the bridge and corridor, it was clear that transportation needs should remain a key focus of the study. Half of all participants said that transportation and economic needs should be equally balanced, and an additional 30 percent wanted a focus soley on transportation needs. The bridge clearly has a transportation need, but there seemed to be a genuine acknowledgment by the public that there could be economic development opportunities associated with investments in the bridge and corridor.

#### Nearly all participants, 92 percent, rated the economic development potential as "Very High" or "High."





The majority of participants wanted the study team to take a balance approach focusing equally on both transportation and economic development.



Before concluding the evening's meeting, the public was asked to suggest what would make the project a success for the region. Below is a word cloud indicating which words the public used the most to describe success. Standing out are the words: maintain, freight, economic, downtown, growth, Riverfront access, better, traffic, development and transportation.





### 2.0 Initial Alternatives Public Meeting

MoDOT and its local partners sought input from residents on a series of Initial Alternatives to the I-229 double-decker bridge in downtown St. Joseph. Because any alternative, including repairing the existing bridge, will require significant tax-dollars, MoDOT had been reaching out to stakeholders for months to collect ideas and suggestions. The initial set of potential alternatives ranged from rehabilitating the current structure to removing the highway and replacing it with alternative routes.

### 2.1 In-Person and Virtual Options

MoDOT invited the public to participate in an interactive open house style meeting to review and rate potential alternatives. In parallel to the public meeting, an online survey was launched that walked visitors through the same materials shown at the in-person meeting. Nearly 100 residents participated in the open house and 487 completed the online alternatives assessment.

### 2.2 Feedback on Initial Alternatives

Attendees had an opportunity to study each alternative in depth, ask questions of the project team, and assess 20 different Initial Alternatives grouped into eight different categories. Each potential alternative was visually mapped. The project team also identified the "pros" and "cons" of each. The potential alternatives were assessed in relation to the project's purpose, need and overarching goals. Finally, each alternative was assessed a relative cost score compared to the other alternatives.

There was very little variation between the results gathered at the open house and the results gathered online. This consistency adds to the veracity of the results.

Over 100 community members attended the Initial Alternatives Public Meeting in April 2019.

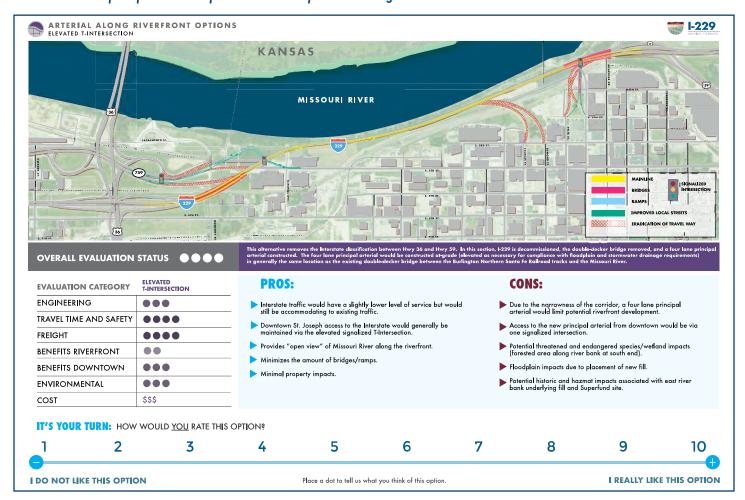


The twenty Initial Alternatives were divided into eight different categories and presented to the public for feedback.





Boards were developed for each Initial Alternative that contained a map of the alternative, the overall evaluation scoring, and a list of potential pros and cons of each option. This board is an illustrative example of the boards presented at the public meeting.



Community members were given several "dots" and asked to rank each alternative from 1 "I do not like this option" to 10 "I really like this option". Those results were captured as illustrated in the example board here.





Overall, the feedback was mixed. Some generalizations based on the "dot" exercise and the feedback (oral and written) that was received include:

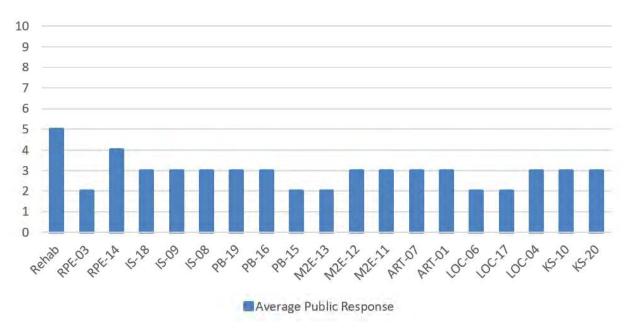
- Rehabilitate the Existing This alternative seemed to fair better than the others primarily related to convenience it provides in getting to downtown, the ability for trucks to use it to get to the Stockyards area, and that it has "served the community relatively well". However, there were contrary opinions related to how it inhibits economic development, is an eyesore, disrupts the view of the Missouri River, etc. Overall, it received an average of 5 on the 1 to 10 scale.
- Kansas Alternatives There was a desire from some in the community to look at alternatives that crossed the Missouri River north of downtown to provide improved access to Rosecrans Memorial Airport and the Air National Guard facility there. These options

- evoked extreme reactions on either side. Almost all of the "dots" for these alternatives were either a 1 or a 10 with little in between. Overall these options scored a 3 in the 1 to 10 scale.
- Other Options While there was some variations on the other Initial Alternatives they were all relatively the same ranging from a 2 to 4 in the 1 to 10 scale.

### 2.3 Meeting Conclusions

While the comments were mixed, the general takeaway was that the public, because of their general support to rehabilitate the existing facility, was interested in options that maintained or minimized impacts to the ease of accessibility into the downtown and continued to support the freight movements to and from the Stockyards. However, based on the comments received, none of the options stood above the others from a public opinion standpoint.

Using the "dot" exercise, the public was asked to rank each alternative from 1 "I do not like this option" to 10 "I really like this option". The results show a slight favoring of the Rehabilitate the Existing alternative with little variation between any of the alternatives.





### 3.0 Reasonable Alternatives Public Meeting

MoDOT held its third public meeting on September 1, 2022 to present the Reasonable Alternatives and solicit feedback on each. As discussed below, there was a lot of work between the Initial Alternatives Public Meeting and this public meeting as the screening process was completed, final field work was conducted, and the study team coordinated with the Technical Advisory Committee and the project stakeholders. The discussions led to a series of decisions that eventually led to presenting the four remaining Reasonable Alternatives to the public at this meeting.

### 3.1 Pre-Meeting Discussions

Prior to the third public meeting, the study team had been working with the project stakeholders, city staff, the Mayor, City Council and the MPO to come to a consensus on what the Reasonable Alternatives could be and that discussion took time to iron out. In the Fall of 2021, the study team had presented an initial slate of Reasonable Alternatives to the Technical Advisory Committee and were making progress toward a consensus when several members of that group asked the team to take a step back and re-evaluate those recommendations. A short summary of that effort included:

- New MPO Alternative Members of the MPO presented the study team with a new alternative that stayed on the east side of the BNSF railroad tracks. The study team evaluated that alternative, completed the same initial screening process as all the other Initial Alternatives, and then worked with the MPO to refine this alternative. This refined alternative eventually became Reasonable Alternative C Railroad Tracks East Corridor and was presented to the public at this public meeting.
- Modified Mayor's Alternative In addition, when the new Mayor and a majority of the City Council came into office in the Spring of 2022 there were discussions about modifications to any earlier alternative that they wanted the study team to consider. The al-

ternative included improved connections from I-229 to Stockyards Boulevard and generally followed the existing alignment to north of downtown. That refined alternative became Reasonable Alternative D - Existing Corridor.

- Removed Reasonable Alternatives There were two initial Reasonable Alternatives, one connected to the existing street network (Arterials East) and one developed a boulevard through the Riverfront (McArthur Drive Extension), that received a significant amount of negative feedback from both the Technical Advisory Committee and from the stakeholders the team was beginning to update about the alternatives. The primary concern was the impact on the local street network. Based on that feedback, these initial Reasonable Alternatives were eliminated from further consideration.
- Remaining Reasonable Alternatives The two remaining Reasonable Alternatives did have general support and became Reasonable Alternative A -Main Street Corridor and Alternative B - 2nd Street Corridor.

The new alternatives were all modifications of alternatives developed and screened during the initial screening phase and all alternatives, old and new, were subject to the same scrutiny regardless of how it was developed or modified. Once the Reasonable Alternatives were finalized, each went through a more detailed screening process and that information was presented to the public at the Reasonable Alternatives Public Meeting in September of 2022.



Approximately 85 community members attended the Reasonable Alternatives Public Meeting in September 2022.



### 3.2 In-Person and Virtual Options

MoDOT invited the public to participate in an interactive open house style meeting to review and rate potential alternatives. In parallel to the public meeting, an online public website was launched that walked visitors through the same materials shown at the in-person meeting. Nearly 75 residents participated in the open house and over 800 attended (880 views/313 clicks) the online public meeting.

### 3.3 Feedback on Reasonable Alternatives

Attendees had an opportunity to study each alternative in depth, ask questions of the project team, and assess the four Reasonable Alternatives. Each potential alternative was visually mapped. The project team also identified the "pros" and "cons" of each. The potential alternatives were assessed in relation to the project's purpose, need and overarching goals. Finally, each alternative was assessed a relative cost score compared to the other alternatives.

Overall, the feedback was most favorable to Alternative D - Existing Corridor. More specifically, comments received by alternative included:

- Alt A Main Street Corridor Feedback on this alternative was mixed with several favorable comments related to its ability to provide access to downtown and open the Riverfront for development. However, there was strong opposition to using Main Street, especially north of Felix Street, because of the industrial nature of the area, its potential impact to Hillyard's operation, and the removal of the existing brick pavers.
- Alt B 2nd Street Corridor There was limited to no support for this alternative because of the intersection at 2nd Street and Felix Street and the requirement for I-229 traffic to turn left and use a new bridge with a significant grade. Specific concerns were with trucks trying to climb the bridge headed north and trucks trying to stop during the winter heading south.
- Alt C Railroad Tracks East Corridor There was some limited support for using this alternative as a mechanism to do some urban renewal for a couple of blighted properties but overall this alternative did not receive support from the majority of the participants. There was concern about taking existing businesses

# A sampling of the comments received during the Reasonable Alternatives Public Meeting

"Why not just take down the double bridge and build a single bridge and make it 4 lanes so we don't have to stop at lights and a train that way we can keep it as a interstate highway?"

"Direct access to downtown is very important to me. It is where I work and recreate. Eliminating access would be detrimental to the growth and prosperity of our historic center."

"The new alternate (Alt D) is the best so far. My main concern is the access to downtown. There must be significant upgrades to 4th or Main Street in order for this plan to be feasible."

"The I-229 bridge is too important to eliminate. It should be refurbished and keep the interstate designation. This is an artery carrying commercial traffic and it should remain as it is, in spite of the cost. All of the proposals are expensive and a poor substitute for I-229."

"I favor A or D. I'm opposed to C because of the possible impacts on hazardous sites."

"The last plan, one on the end (Alt D) makes the most sense especially if our access to downtown can be created. If not it is still the best."

"Leave the bridge. Fix it and forget it."

"I feel it is essential to incorporate pedestrian and biking traffic in any design. I may have missed this, but I'm not seeing this. I feel we need to have as much access to the Riverfront as possible from downtown."

"I support Alternative C as it preserves the downtown Riverfront area. It also eliminates three hazardous waste areas."

"I'm very concerned about access to both downtown and Riverfront Park. I believe abandoning that historic assett would be a major mistake. I also feel no direct artery to downtown will significately affect traffic, conveninece and progress to the revitalization already taking place. Thanks for inviting input."

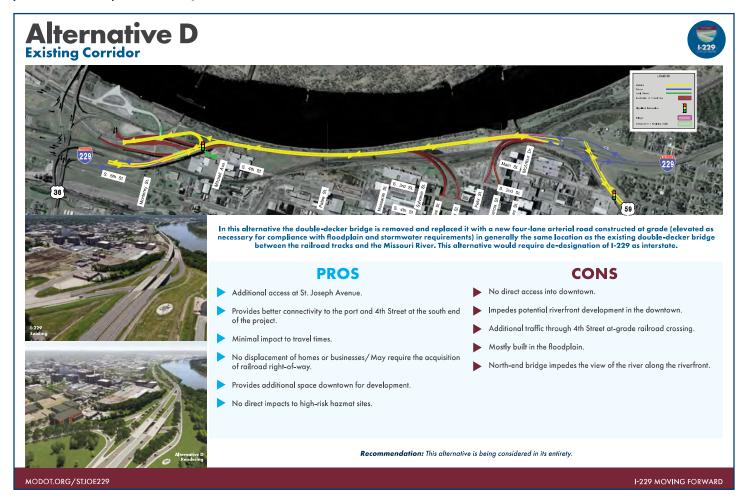
# All of the comments received both in-person at the public meeting and virtually during the online public meeting were compiled by topic.



Topic	Comments	#Comments
D 1 1 1 1 1 1	Keep this current bridge and repair it.	10
Rehabilitation Alternative	Fixing the bridge is fiscally irresponsible.	1
, weeth daive	Keep double decker but go with Alternative D (rehab)	1
	Prefer Alternative A	6
Alternative A - Main Street Corridor	Alternative A is my second choice.	1
ource: Corridor	The Main Street option is ridiculous.	1
Alternative B - 2nd Street Corridor		
	Prefer Alternative C.	7
	Refined Alternative RA-5 Boulevard East of Tracks is the only option that will ensure traffic has access to downtown.	1
	Making a decision without testing the soil for contamination on Alternative C is irresponsible.	1
Alternative C - Railroad Tracks East Corridor	Alternative C allows for construction of most of the roadway prior to tearing the bridge down which reduces down time.	1
	Opposed to Alternative C because of possible impacts on hazardous sites.	1
	Do the remediation on HPI & Advantage.	2
	As a business that spends 8-10 hours a day delivering and picking up product, RA-5 is best.	1
	The new alternate is the best/preferred.	10
	The only option I would oppose is Alternate D.	2
Alternative D - Existing Corridor	Direct access to downtown is important.	32
Corridor	Discussions on the discussions of 6th Street should be a part of this conversation.	1
	With the new alternative significant upgrades to 4th or Main Street are needed to make this option feasible.	1
	Just pick an alternate and get the work done.	1
General Alternative	The alternatives suck.	1
Related	Take down existing bridge and build a single, 4-lane bridge to eliminate stop lights and train issues.	3
	Some of the alternatives would hurt the farmers and manufacturing on the south side of the city.	1
1 220 14 : .	I-229 should not have gotten into a state of disrepair.	3
I-229 Maintenance	Maintain new bridges better than I-229	2
Interstate De- commission	Maintain interstate designation.	7
	Maintain access to the Riverfront.	5
Riverfront/Bike Access	Incorporate pedestrian and biking traffic.	2
	Spent a lot of money on bike trails, which need to have access to downtown.	4
	Other routes will cause more traffic on I-29 and more congestions between 36 and North Shopps.	1
Traffic/Congestion	Avoid trucks taking Highland Avenue which can't handle the traffic.	1
	We don't want heavy trucks and equipment going through town, destroying city streets.	1
	Why put it on the ground in a floodplain.	1
	Designs should keep the homeless out.	3
Design & Construction	Where does the material from I-229 go after it is torn down?	1
Related	Questions on maintaining traffic, length of construction, and timing of construction.	1
	Use concrete box structures for trains and street access which will save them from winter.	1
Property Concerns	Would this impact my property?	1
Funding	Let voters decide if they would consider a small tax to keep the historic bridge.	3



Similar to the previous public meeting, boards were developed for each Reasonable Alternative that contained a map of the alternative, renderings of what the improvement could look like, and a list of potential pros and cons of each option. This board is an illustrative example of the boards presented at the public meeting.



and the potential job loss associated with that action as well as the potential cost and liabilities of MoDOT having to clean up the hazardous materials sites.

• Alt D - Existing Corridor - As indicated, the majority of the community favored this alternative compared to the other Reasonable Alternatives. There was some concern about losing the interstate designation and potential traffic access changes required to access downtown. The supporters mentioned the ease of trucks from the Stockyards heading north, the ability to open up some developable property on the east side of the railroad tracks, and the limited amount of new right-of-way that would be required.

### 3.4 Meeting Conclusions

While the comments were mixed, the general takeaway was that the public were supportive of Alternative D - Existing Corridor for the reasons mentioned. The community encouraged the study team to think through how traffic would access downtown and to make sure that truck traffic, both from the Stockyards and Downtown, were able to efficiently access the new facility.

# 4.0 Final Public Hearing

A final public hearing is planned for the summer of 2024 and information from that meeting will be added to the FONSI after its completion.



### Technical Memorandum 18

# Stakeholder Engagement

In addition to the in-person and virtual public meetings that were open to everyone, the study team coordinated with additional smaller groups either through the Technical Advisory Committee (TAC) or through face-to-face meetings with dozens of community stakeholder groups.

## 1.0 Technical Advisory Committee

During the project initiation, a TAC was formed to help advise the study team, to help brainstorm options, review study materials, and to help make the final decision on a recommended preferred alternative. The TAC met a total of three times during the study, typically at key milestones.

#### 1.1 TAC Members

The TAC was comprised of the members of the following organizations:

- Bartlett Grain
- BNSF Railway
- Buchanan County Commission
- Downtown First
- Felix Street Gourmet/Room 108 Event Space
- Hillyard
- Mo-Kan Regional Planning Council
- Nor-Am Ice & Cold Storage
- Seaboard Foods
- St. Joseph Chamber of Commerce

Representatives from various stakeholder groups comprising interested businesses, economic development organizations, city staff, etc. participated in the TAC to discuss the relative merits of the I-229 alternatives at each stage of development.

- St. Joseph City Council
- St. Joseph Downtown Partnership
- St. Joseph Area Transportation Study Organization
- St. Joseph Planning & Community Development
- St. Joseph Public Works & Transportation
- Downtown Association
- Triumph Foods
- U.S. Army Corps of Engineers
- United Way

### 1.2 Initial Alternatives Discussion

The first TAC meeting was conducted on January 28, 2019 to discuss the relative merits of the Initial Alternatives. After a brief presentation about the project, the attendees divided into four groups. Five tables were set up with three to five alternatives per table. The four groups took turns at each table discussing the alternatives. The groups spent approximately 1 hour and 15 minutes at the tables. A summary of table notes for





each of the alternatives was developed and assisted in guiding the evaluation of each of the inital alternatives.

### 1.3 Reasonable Alternatives Discussion

The second TAC meeting focused on the development of the Reasonable Alternatives. After introductions, a project status update, and an overview of the Reasonable Alternatives, the attendees divided into four groups. Four tables were setup with one Reasonable Alternative per table excluding the rehabilitation alternative (it was assumed everyone understood the rehabilitation alternative). The four groups took turns at each table discussing the alternatives. The groups spent approximately 1 hour and 15 minutes at the tables. After the small group discussions, the entire group reconvened and the study team summarized the table discussions. At the end of the meeting, attendees were asked to take three dot stickers (green, yellow, and red) and rate the alternatives with green being the most preferred, yellow the second preferred, and red the least preferred. An image of the dot ratings is provided below.

Note: A couple of weeks after this meeting, members of SJATSO approached the study team with concerns about the recommendations from this TAC meeting which led to the development of several new alternatives and a change of direction in the study. More details of this process have been provided in Section 3.1 of the Public Meetings Tech Memo.

### 1.4 Preferred Alternative Discussion

A final TAC meeting is scheduled for the end of 2022 to discuss and confirm their recommendation for a preferred alternative. This section will be updated once that meeting is completed.

## 2.0 Community Stakeholder Meetings

Throughout the life of the study, the study team met with dozens of stakeholder groups (see figure on next page), individual businesses and potentially impacted property owners. In fact, the study team met over 100 times to discuss the project.

During the TAC meeting discussing the Reasonable Alternatives, each member was asked to vote on their favorite and least favorite Reasonable Alternative.

Every meeting was similar in format. The study team would provide a project update depending on which phase the project was in (Project Initiation, Initial Alternatives or Reasonable Alternatives) and then discussed the specific topics of concern, answered any questions and brainstormed different ideas.

Each conversation was different depending on the specific interests of the group but, in general, most of the discussions focused on five general areas of interest.

- Interstate Designation There was always general interest in whether the facility would remain an interstate and, even if the group didn't raise the issue, the study team was interested and always asked. Almost universally, the various groups were concerned that the new facility functions as an interstate, but they generally didn't care whether it was signed as an interstate. Can trucks get to where they are going? Will it remain a four-lane facility? How many signals will be added? Therefore, the study team focused on options that maintained similar accessibility as if it would remain an interstate, but explored options that would require the interstate designation to be removed.
- Accessibility The groups were also interested in maintaining good accessibility both to downtown and the Stockyards area to the south.
- Economic Development Several groups were interested in options that opened up new development land either where the ramps into downtown are now



# Community Stakeholder Meetings Completed

	Date	Organization
	6/14/2018	Regional Freight Summit
	6/25/2018	Chamber of Commerce
	6/25/2018	SJATSO (MPO) Staff
	6/29/2018	BNSF Railroad
	7/12/2018	MPO Technical Cmt.
	7/12/2018	City Planning & Community Dev.
	7/12/2018	Frontier Casino
	7/19/2018	Hillyard
	7/19/2018	Downtown Partnership
	7/26/2018	Downtown CID
ра	7/26/2018	MPO Coordinating Cmt.
Ne	7/30/2018	City Council Working Session
e Se	7/30/2018	Public Works
rpos	8/7/2018	Downtown Association
Pul	8/29/2018	Mo-Kan Regional Council
ion	9/11/2018	St. Joseph Riverfront Master Plan
Project Initiation   Purpose & Need	9/24/2018	Riverfront Development Consultant
t In	10/11/2018	UP Railroad
ojec	10/24/2018	Partnership for Success
P.	11/1/2018	Lions Club
	11/8/2018	Downtown Strategic Planning Cmt
	11/8/2018	Chamber Manufacturers Mtg.
	11/28/2018	East Side Rotary Club
	12/6/2018	MPO Freight Committee
	12/10/2018	United Way
	12/19/2018	St. Joseph Riverfront Master Plan
	1/15/2019	Downtown Rotary
	2/13/2019	MPO Freight Committee
	3/6/2019	St. Joseph Riverfront Master Plan
	6/20/2019	South Side Rotary
	11/7/2019	Regional Freight Summit
	11/25/2019	Convention Visitors Bureau
	12/11/2019	Hillyard
Initial Alternatives	12/13/2019	Chamber Meeting
rna	12/17/2019	Triumph
Alte	1/6/2020	City Staff and Business Community
tial	1/13/2020	City Council Working Session
<u>-i</u>	2/6/2020	WireCo
	2/14/2020	NorAm
	2/14/2020	NorAm
	3/5/2020	Chamber Meeting
	8/5/2020	St. Joseph Ec. Dev. Partnership
	9/1/2020	Albaugh LLC and Jeff Gates
	9/3/2020	AGP, Sky Real Estate, Affinity
	9/8/2020	Lifeline Foods

	11/12/2020	MPO Technical Committee		
	12/15/2020	FHWA		
	1/8/2021	City of St. Joseph Public Works		
	2/23/2021	Advisory Group		
	3/11/2021	Scot Young Research (SYR)		
	3/15/2021	Advantage Metals		
	3/18/2021	Brooner Construction		
	3/24/2021	HPI		
	3/24/2021	RS Electric		
	4/8/2021	Royal Packaging		
	4/19/2021	Dusty Gippando		
	4/19/2021	Fender Trucking (Jim Fender)		
	4/23/2021	Cindy Meers and Rebecca Schwamp		
	5/6/2021	Terry Ellis		
	6/3/2021	MPO		
	6/22/2021	Section 106 Consultation		
	7/7/2021	Royal Packaging		
	7/13/2021	Royal Packaging		
	8/24/2021	Hillyard		
S	8/26/2021	Downtown CID		
tive	8/26/2021	1&M		
erna	9/1/2021	FHWA		
Alte	9/2/2021	City/MPO		
Reasonable Alternatives	9/8/2021	Downtown Association		
son	9/9/2021	Main Street St. Joseph		
Rea	9/13/2021	KDOT Planning		
	9/22/2021	Port Authority		
	9/28/2021	Chamber Board of Directors		
	10/1/2021	Pioneer Material		
	10/18/2021	South St. Joseph Industry Group		
	10/26/2021	Community Alliance		
	11/11/2021	Manufacturers' Council		
	3/16/2022	Section 106 Consultation		
	4/15/2022	City Council Members		
	6/1/2022	City and MPO Staff		
	7/5/2022	I&M		
	7/19/2022	City Council Working Session		
	7/21/2022	MPO Joint Meeting		
	7/26/2022	City Star Gas Station		
	8/5/2022	Pony Express Warehouse		
	8/11/2022	Manufacturers' Council		
	8/11/2022	Main Street St. Joseph		
	8/25/2022	Downtown CID		
	9/7/2022	Downtown Association		
	9/7/2022	South St. Joseph Development Corp.		
	9/27/2022	Chamber Board of Directors		

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The study team met with dozens of community stakeholders throughout the NEPA process beginning with Projection Initiation, during the development of the Initial Alternatives, and through the screening of the Reasonable Alternatives, and selection of the recommended preferred alternative. The feedback provided to the study team was invaluable in helping determine the appropriate solution.



or along the Riverfront. The economic development discussion also centered around limiting truck traffic on city streets while increasing the traffic that would drive by existing businesses.

- Maintaining Key Industry St. Joseph relies on several key industries to provide jobs and economic activity in and around the downtown, especially businesses like Hillyards, Triumph Foods, etc. Several groups were interested in how each of these businesses could potentially be affected and were concerned about creating hardships that could limit future growth or even encourage them to relocate. The study team, therefore, made sure to be aware of how each alternative might change how these businesses get and distribute their product, how commuters get to work, and how product is moved around the facility.
- Agricultural Transportation Transporting agricultural product, primarily hogs and grain, is important especially during harvest season. A lot of trucks move back and forth between St. Joseph and northwest Missouri, southeast Iowa and Omaha. News-Press News Sports Obituaries Marketplace Local Links Creating additional delays in those movements was of concern and the study team conducted several evaluations of out-of-dis-

The conversations with the various stakeholder groups was invaluable in understanding the community, the potential issues of concern, and in helping frame the evaluation of each alternative.

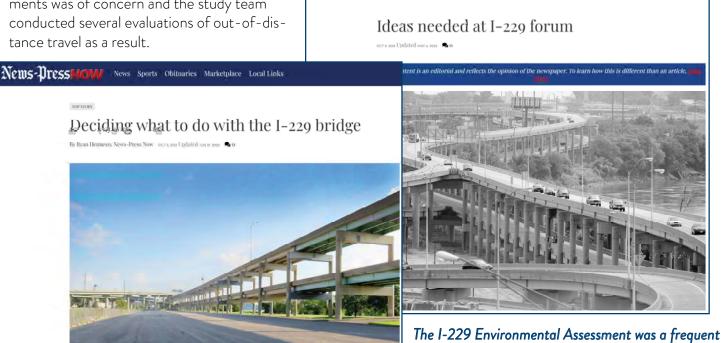
Additional meetings are anticipated between now and when the final NEPA documents are complete and this section will be updated after those meetings occur.

#### 3.0 Social Media

In addition to in-person outreach, the study team provided several social media options for the community to engage in. The website has previously been discussed and provided a project overview, timely project updates, and an opportunity to provide feedback. The web page was also used for the virtual public meeting that happened in coordination with the Reasonable Alternatives Public Meeting that was held in-person.

The study team also maintained a project Facebook page and a Twitter account and posted to both frequently during the study.

> topic on the nightly news and in the local newspapers. Over twenty-five different stories were featured in the local press since the project began.





# **Technical Memorandum 19**

# Resource Agency Coordination

The I-229 Environmental Assessment included extensive coordination with FHWA and the various state and federal resource agencies with responsibility over the different environmental resources. The study began with an Agency Scoping meeting in November of 2018 and included extensive coordination throughout.

## 1.0 Agency Coordination Plan

The Coordination Plan meets one of several requirements under Section 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU) of 2005. All Environmental Impact Statements (EIS) for which the Notice of Intent (NOI) was published in the Federal Register after August 10, 2005, must follow SAFETEA-LU's requirements. Section 6002 of SAFETEA-LU requires preparation of a Coordination Plan for projects requiring an EIS as defined by the National Environmental Policy Act (NEPA).

While not required for an Environmental Assessment (EA), it is advantageous to use a coordination plan for an EA in case the EA may need to be elevated to an EIS. This Coordination Plan establishes an approach for coordinating agency (i.e., Federal Lead, Joint Lead, Cooperating, and Participating) and public participation including comment during the environmental review process. This Coordination Plan defines the process by which the Study Team communicated information about the I-229 EA project to the Federal Lead, Cooperating, Participating and other interested agencies and to the public. The study team consists of an assigned Project Manager from the MoDOT District Office, a

Approximately 20 representatives of the various resource agencies attended an initial scoping meeting for the I-229 Environmental Assessment.

MoDOT Headquarters Environmental Manager, the consultant, and the Program Development Team Leader from the Federal Highway Administration (FHWA) Missouri Division assigned to the project. The plan also identified how input from agencies and the public was solicited and considered.

### 1.1 Initial Coordination

Various agencies played a role in the I-229 Environmental Assessment in various capacities, including:

- Lead and Joint Lead Agencies The FHWA is expected to provide funding for this project; therefore, FHWA served as the Lead Agency. MoDOT, as the direct recipient of federal funds for the project, was a Joint Lead Agency.
- Cooperating Agencies Cooperating agencies are those federal agencies that the lead agency specifically requests to participate in the environmental evaluation process for the project. FHWA's NEPA regulations (23 CFR 771.111(d)) require that federal agencies with jurisdiction by law (such as permitting





or land transfer authority) be invited to be cooperating agencies for an EA. A distinguishing feature of a cooperating agency is that the CEQ regulations (40 CFR Section 1501.6) permit a cooperating agency to "assume on request of the lead agency responsibility for developing information and preparing environmental analyses including portions of the environmental impact statement concerning which the cooperating agency has special expertise." An additional distinction is that, pursuant to 40 CFR 1506.3, "a cooperating agency may adopt without recirculation of the environmental impact statement of a lead agency when, after an independent review of the statement, the cooperating agency concludes that its comments and suggestions have been satisfied." This provision is particularly important to permitting agencies, such as the U.S. Army Corps of Engineers, who, as a cooperating agency, routinely adopts USDOT environmental documents. In accordance with the I-229 Agency Coordination Plan no Cooperating agencies were identified.

- Participating Agencies SAFETEA-LU (Section 6002) created a new category of involvement in the environmental review process for NEPA documents, known as Participating Agencies. These are federal and non-federal governmental agencies that may have an interest in the project because of their jurisdictional authority, special expertise and/or statewide interest in the project. There are four federal and state agencies that have agreed to be Participating Agencies for this project including the US Army Corps of Engineers, the National Park Service, the Missouri Department of Natural Resources and the State Historic Preservation Office.
- Local Agencies and Organizations Other agencies and organizations were identified as having an interest in the project through the public involvement process or for permit, approval, certification, or concurrence purposes. For example, an agency may have information on a particular resource within the project area that would be useful to the study team. Meetings with these agencies and organizations occurred to discuss topical information, but their overall role was minimal.

Non-Participating Agencies and Organizations Several agencies were invited to be Participating
Agencies, but for various reasons declined. These
agencies were still involved with the NEPA process
by being on the project mailing list, were points of
contact for data required for the NEPA document,
and will be furnished copies, or portions of, the final
NEPA document for review and comment as determined appropriate by the study team.

### 1.2 Environmental Collaboration Points (CP)

To reduce delay in the environmental review process, the following collaboration points were completed as part of the Resource Agency coordination plan.

- CP1 Agency Scoping Meeting
- CP 2 Draft NEPA Document
- CP 3 Final NEPA Document

The process for coordination associated with each collaboration point is summarized in Section 2.0 and 3.0 below. The collaboration points are provided as milestones and are not meant to take the place of other necessary NEPA and permitting requirements.

### 1.3 Other Opportunities for Agency Involvement

Beyond the collaboration points outlined herein, the I-229 NEPA document also includes other strategies for encouraging agency input and involvement.

- Project Website The study team maintained and updated a project website. In addition to containing project information, this site allowed stakeholders to sign-up to receive project update information.
- Project Information Meetings Agencies and stakeholders were invited to all public project meetings.

## 2.0 CP1 - Agency Scoping Meeting

The purpose of this collaboration point was to ensure that Participating Agencies had a meaningful opportunity to provide input on the study. Participating Agencies, Local Agencies, and Non-Participating Agencies were all invited to attend an agency scoping meeting on November 1, 2018, at 10:30am at the Remington Nature Center, 1502 MacArthur Drive, St. Joseph, MO. At the meeting, the study team provided an overview of the study process and key issues. There was time for the



The Project Scoping Meeting brought in experts from the various federal and state resource agencies, as well as members of various tribes, to discuss the project and solicit feedback on potential environmental resources of concern. An initial presentation (example slide below) was conducted and then comments received from the participants. Copies of the presentation and meeting minutes were then transmitted to all those in attendance and to those who were not there.

# Threatened and Endangered Species

Scientific Name	Common Name	Federal Listing	State Listing
Mammals			
Myotis septentrionalis	Northern Long-eared Bat	Т	SE
Myotis sodalis	Indiana Bat	Е	SE
Fish			
Scaphirhynchus albus	Pallid Sturgeon	Е	SE

T – Threatened; E – Endangered; SE – State Endangered



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agencies to provide input on key concerns regarding potential environmental or socioeconomic impacts. Following the meeting materials and notes were sent to agency representatives who are unable to attend. Alternatively, if Participating Agency members were unable to attend in person, they were able to attend via teleconference.

### 2.1 Resource Agencies

The following agencies were invited to coordinate on the I-229 EA with opportunities to provide comments throughout:

- City of St. Joseph, Missouri
- St. Joseph Area Transportation Study Organization (SJATSO)
- Federal Aviation Administration Central Region (FAA)
- Missouri Department of Conservation (MDC)
- Missouri Department of Natural Resources (MDNR)

- Missouri State Emergency Management Agency (SEMA)
- Missouri State Historic Preservation Office (SHPO)
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Homeland Security Federal Emergency Management Agency Region VII (FEMA)
- U.S. Coast Guard
- U.S. Department of Interior National Park Service (NPS)
- U.S. Fish and Wildlife Service (USFWS)

### 2.2 Agency Scoping Meeting Feedback

Specific feedback received during this meeting included:

 Hazardous Materials - Extensive discussion of known and/or potential hazardous materials locations.
 Specific properties of concern mentioned included the Sunshine Electronic Display Company on 5th



- Street, the Seaman & Schuske Site, the Farmland Pesticide Site and the Advantage Metals Site.
- National Parks Discussion related to the Pony Express display under the bridge (potentially stolen), and the NPS Charrette related to improving connections with the Pony Express, railroad depot, the downtown, and the Riverfront.
- Cultural Resources Two archaeological sites (Pony Express stables and the ferry crossing/trading post) were discussed and inquiries made about potential interpretive signing.
- Missouri River Discussion of flooding along the Missouri River, 404 Regulations (river, tributaries, floodways, adjacent wetlands), Section 10 of the Rivers and Harbors Act, and 408 permitting requirements.

Agency attendees and detailed agency coordination meeting minutes are available in the Project Record.

### 3.0 FHWA Coordination

The Federal Highway Administration was an active participant in the I-229 Environmental Assessment and provided critical guidance throughout. In fact, representatives from FHWA participated in both the Technical Advisory Committee and sat-in, as schedules dictated, on the study team's bi-weekly check-in calls. Several additional meetings with FHWA are documented below.

### 3.1 Purpose and Need

In March of 2019, FHWA was provided a copy of the Purpose & Need (draft) and afforded the opportunity to comment. FHWA provided 21 comments on the document and then the study team followed with a teleconference to discuss their comments. Following that meeting, FHWA's comments were incorporated and the Purpose & Need was updated accordingly.

### 3.2 De-Designation of I-229

An initial meeting to discuss the process of de-designating an interstate highway was conducted on September 1, 2021. Several subsequent meetings also took place that provided further clarification. The discussion focused on the specific steps that must occur for the de-designation to occur, including:

- NEPA Requirements Since de-designation requires a Federal Action, the I-229 Environmental
  Assessment will require a discussion of the environmental impacts associated with the de-designation.
- Access Justification Report (AJR) Requirements

   Assuming MoDOT de-designates the entirety
   of I-229, then an AJR would not be required to be included with the Environmental Assessment.
- Logistics and Timing MoDOT needs to coordinate with FHWA on the specific timing of the de-designation request. The assumption is that a formal request would occur following the approval of the NEPA document.

### 3.3 Reasonable Alternatives

During the Reasonable Alternatives phase, the study team was having issues coming to terms with the City of St. Joseph and SJATSO on the results of the screening of Reasonable Alternatives and the plan for moving toward a recommended preferred alternative. A series of meetings were held with FHWA to discuss several related topics, including:

- Reasonable Screening Results A meeting was conducted on May 20, 2021 to present the Reasonable Alternative screening results and get feedback. Several comments related to safety at the 4th Street rail crossing, how the team displayed construction cost estimates, and how potential Section 4(f) impacts were received and incorporated into the screening process.
- SJATSO Buy-In Issues A second meeting with FHWA on the Reasonable Alternatives was conducted on December 17, 2021 specifically focused on SJATSO's recommendation for the preferred alternative that went through several hazardous waste properties. FHWA indicated that an agreement with SJATSO would be required to meet the fiscal requirements of getting the project on the TIP/STIP, that FHWA would be reluctant to take on the liability of those hazardous materials sites, that moving forward with the SJATSO alternative may trigger an EIS, and encouraged the team to continue to work with SJATSO on a compromise option.



Compromise Alternative - A final meeting on this topic was completed on May 12, 2022 where the study team presented FHWA with a compromise alternative, what eventually became Alternative D - Existing Corridor, presented to the team by the Mayor and members of the City Council. FHWA agreed with the direction to move forward with this compromise alternative, to make sure that the alternative underwent the same scrutiny as all the other alternatives, and to be sure to provide the public with the opportunity to comment. If those conditions were met then FHWA would be supportive of including the new compromise alternative as a Reasonable Alternative.

### 4.0 Other Related Coordination

In addition to the initial Scoping Meeting, the study team participated in several other related coordination activities.

### 4.1 Tribal Coordination

The following tribes were asked if they would like to participate and consult in the study process.

- Iowa Tribe of Kansas and Nebraska
- Iowa Tribe of Oklahoma
- Kaw Indian Nation of Oklahoma
- Miami Tribe of Oklahoma
- Omaha Tribe of Nebraska and Iowa
- Osage Nation
- Otoe-Missouri Tribe of Indians in Oklahoma
- Pawnee Nation of Oklahoma
- Ponca Tribe of Nebraska
- Ponca Tribe of Oklahoma
- Sac and Fox Nation of Missouri in Kansas and Nebraska
- Sac and Fox Nation of Oklahoma
- Sac and Fox Nation of the Mississippi in Iowa

None of the tribes agreed to formally participate, but Lance Foster, Vice Chair at the Iowa Tribe of Kansas and Nebraska, indicated that they should be informed if any ancestral artifacts are discovered during construction. In addition Mr. Foster attended a number Section 106 coordination meetings (Refer to Section 4.3).

### 4.2 MDNR Hazardous Materials Meeting

On April 23, 2019, the study team met with members of MDNR to discuss the potential impacts to several hazardous materials properties within the Study Area. Staff from MDNR provided the following information:

- WireCo The WireCo site is a Voluntary Cleanup Program (VCP) site that is not that contaminated with petroleum hydrocarbons from a service station formerly on the northeast corner of the property and an old heating oil tank. The site is still under investigation.
- Advantage Metals The Advantage Metals Recycling, Inc. site has a small portion of the property with a soil cap covering an area where elevated arsenic and lead levels were detected; the site has an environmental covenant plan, is a VCP site where they are almost finished addressing all of the identified issues; the capped area would be the only real area of concern and would appear to be a low to medium priority for avoidance.
- Artesian Ice & Cold Storage Plant The Artesian Ice & Cold Storage Plant site has an area under the existing parking lot with slightly elevated levels of lead and arsenic. The parking lot serves as a cap. If the site were disturbed a soil management plan would have to be submitted to the MDNR.
- St. Joseph FMGP #3 The St. Joseph FMGP #3
   site has a restrictive covenant, and if excavation were
   conducted on the site tar, and other semi-volatile
   tar-like compounds would likely be encountered.
   MDNR recommended the site should be avoided.
- HPI The three HPI sites are being managed by the USEPA because the hazardous material concerns at the properties are under criminal investigation. MDNR's understanding is that most of the drums and chemicals once stored at these facilities have been removed.
- Farmland Industries The Farmland Industries Old Insecticide Pit site has an 18-inch clay cap and any alternatives that put soil on top of the cap or even



the use of surface piles might be acceptable as long as none of the soils underlying the cap are brought to the surface. Once soils are brought to the surface they are automatically considered hazardous waste and must be disposed of in accordance with hazardous waste regulations at a hazardous waste landfill. The contamination appears to be more concentrated in certain areas of the property. MoDOT under the right engineering scenario would have to agree to an environmental covenant that they would maintain the cap. In addition, MoDOT would need to coordinate with USEPA project manager Laura Price. There are no monitoring wells. The site will soon require only annual monitoring.

- Underground Tanks MDNR staff stated that all
  of the underground petroleum storage tanks within
  the Study Area have been closed, but there may
  be some unknown sites that could be encountered
  during construction. The MDNR does not have tank
  closure reports but they can be obtained through the
  Sunshine Law.
- MoDOT Commitments MoDOT explained that one of the environmental commitments that will be in the NEPA document is that if regulated solid or hazardous wastes are found during construction activities, the construction inspector shall direct the contractor to cease work at the suspect site. The construction inspector shall contact the appropriate MoDOT environmental specialist to discuss options for remediation. The MoDOT environmental specialist, the construction office, and the contractor shall develop a plan for sampling, remediation, and continuation of project construction. Independent consulting, analytical, and remediation services shall be contracted, if necessary. The MDNR and USEPA shall be contacted for coordination and approval of required activities.

### 4.3 Section 106 Coordination

Detailed results of the cultural resources investigations, including summaries of the Section 106 Consultation, have been provided in separate cultural resource reports. A short summary of those meetings has been provided here.

- Trails Committee of St. Joseph The study team met with the Trails Committee on July 18, 2019 to update the committee on the I-229 Environmental Assessment and to solicit feedback that would be beneficial to the cultural resources investigation. The team discussed the Section 106 consultation process and encouraged the group to participate.
- Consultation Meeting #1 An initial consultation meeting was held on October 9, 2019. The intent of this meeting was to discuss the I-229 project and the role the group would have related to the Section 106 process. The discussion focused on the National Parks Service Plans for some historical improvements related to the Pony Express, potential impacts to historic trails, and the potential for significant archaeological sites along the Riverfront.
- Consultation Meeting #2 A second consultation meeting was held on December 3, 2019. The discussion focused on the Area of Potential Effect and the preliminary results of the architectural survey. Discussion from the group focused on potential removal of the existing brick pavers on Main Street, the desire to assess the air and noise pollution impacts on historic properties, and the historic district on the north side of the Study Area.
- Consultation Meeting #3 A third consultation meeting was held on June 22, 2021 to brainstorm ideas for potential mitigation depending on the recommended preferred alternative. Ideas were discussed and priorities established.
- Consultation Meeting #4 A final consultation meeting is planned for late 2022 or early 2023 to discuss the results of the Section 106 process and to finalize the development of the Programmatic Agreement. This section will be updated following the conclusion of that meeting.

The next two concurrence points, CP 2 and CP 3 have not occurred yet and these sections will be updated following the completion of the NEPA document.

### 5.0 CP 2 - NEPA Document

Upon completion of the NEPA document, the study team will determine which agencies, if any, will be given the opportunity to review and comment. Those agen-



cies not provided with an official copy of the document may be provided a status meeting. The status meeting can serve as a check-in with the agencies to explain the status of the document and to address issues specific to their areas of interest and responsibility. Alternatively, agencies may be provided with sections of documents, technical reports, or modeling results to review and provide comments. It is at the discretion of the study team to decide what and how information is disseminated for review and comment.

The study team, and the appropriate Participating Agencies, if any, will be given a 30-day period from receipt of the NEPA document to review and provide a response. At the end of the 30-day review period, Mo-DOT will receive comments from the Lead Agency with a statement of support or statement of non-support. If determined appropriate by the study team, comments may also be provided from the Participating Agencies. MoDOT assumes that those agencies from whom it has not heard from at the end of the 30-day period have no comments that need further consideration.

The output of CP 2 will be concurrence from the study team and Participating Agencies on:

- The adequacy of the NEPA document
- Specification as to whether additional information is needed to fulfill other applicable environmental reviews or consultation requirements.
- Specification on any additional information needed to comment adequately on the NEPA document analysis of site-specific effects associated with the granting or approving by the agency of necessary permits, licenses, or entitlements.

Based on FHWA's approval of the NEPA document for circulation, a public hearing will be conducted during the 45-day review in accordance with NEPA requirements and requirements in the MoDOT's EPG.

### 6.0 CP 3 - Final NEPA Document

Based on the output of CP 2 and the comments received from the public hearing on the NEPA document, the study team will prepare a Final NEPA document. This document will be circulated to the Participating Agencies for their review and comment. Based on Lead Agency's approval, the Final NEPA document will be made available for public and agency review for a minimum of 30 days. This period is the last period during which comments on the environmental evaluation process will be received from the public and agencies. Upon addressing the comments received in the comment period, the Final NEPA document will be forwarded by the study team to the Lead Agency with a request for a decision document.



