

# The Merchants Bridge Rehabilitation Program



Project Type: Freight Rail

Project Location: St. Louis, MO to Venice, IL

Funds Requested: \$73.1M/\$50M

Project Applicant: Missouri Department of Transportation



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<b><u>The Merchants Bridge Rehabilitation Program</u></b>	
Was an INFRA application for this project submitted previously?	Yes, under FASTLANE
If yes, what was the name of the project in the previous application?	The Merchants Bridge Rehabilitation Program
Previously Incurred Project Cost	\$5.0 Million
Future Eligible Project Cost	\$213.9 Million/\$204.3 Million
Total Project Cost	\$218.9 Million/\$209.3 Million
INFRA Request	\$ 73.1 Million/\$50.0 Million Alternate
Total Federal Funding (including INFRA)	\$171.1 Million/\$163.4 Million Alternate
Are matching funds restricted to a specific project component? If so, which one?	No
Is the project or portion of the project currently located on National Highway Freight Network?	No
Is the project or a portion of the project located on the NHS? <input type="checkbox"/> Does the project add capacity to the Interstate system? <input type="checkbox"/> Is the project in a national scenic area?	No
Do the project components include a railway-highway grade crossing or grade separation project?	Yes
Do the project components include an intermodal or freight rail project, or freight project within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?	Yes
If answered yes to either of the two component questions above, how much of requested INFRA funds will be spent on each of these projects components?	\$73.1 Million/\$50 Million Alternate -- All on freight rail project

State(s) in which project is located	Missouri/Illinois
Small or large project	Large
Urbanized Area in which project is located, if applicable	St. Louis, MO—IL
Population of Urbanized Area	2,150,706
Is the project currently programmed in the: <input type="checkbox"/> TIP <input type="checkbox"/> STIP <input type="checkbox"/> MPO/State Long Range Transportation Plan <input type="checkbox"/> State Freight Plan?	Yes, Missouri State Freight Plan and Rail Plan. MPO indicates once grant funding received, project will be added to the TIP
If selected, would you be interested in participating in a new environmental review and permitting approach?	Yes



Figure 1 -- View of Merchants Bridge and America's Central Port from North

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**Figure 2-- Merchants Bridge Construction December 9, 1889**

Project Website -- [www.inframerchantsbridgeapp.com/merchantsbridge](http://www.inframerchantsbridgeapp.com/merchantsbridge)  
User Name -- INFRA  
Password -- Cardinals

## Executive Summary

The Missouri Department of Transportation, the Bi-State Development Agency and the Terminal Railroad Association of St. Louis are reconstructing the 127-year-old Merchants Bridge over the Mississippi River connecting St. Louis, Missouri to Venice, Illinois, providing a vital regional and national connection for eastern and western rail freight. INFRA grant funds are requested for 33% (\$73.1M) of the \$213.9M project. ***Under the No-Build scenario, this critical Bridge will go out of service in less than 10 years, forcing extensive reroutes, delays, lost productivity and result in negative public impacts.***



### Meets Key INFRA Objectives

- ✓ **SUPPORTS ECONOMIC VITALITY AT NATIONAL/INTERNATIONAL LEVEL**
  - St. Louis area is the second largest rail terminal by interchange and third largest terminal by volume in the United States
  - Busiest geographic crossing of the Mississippi River, open to all railroads
  - Critical for connecting America's rural farm output to global markets
- ✓ **LEVERAGES FEDERAL FUNDS**
  - PPP leveraging 66% of private investment funds with RRIF and INFRA federal funds to further federal initiative to rebuild aging critical infrastructure.
  - BCA of 1.86
- ✓ **USE INNOVATIVE APPROACHES TO IMPROVE SAFETY AND EXPEDITE PROJECT DELIVERY**
  - Constructed by utilizing an innovative superstructure float-out/float-in allowing for safer construction and expedited project delivery that minimizes river and freight rail traffic interruptions
- ✓ **PERFORMANCE AND ACCOUNTABILITY**
  - Categorical Exclusion approved, design engineering 100% complete, construction procurement underway, project scheduled to be awarded 3<sup>rd</sup> Quarter 2018

## *i. Project Summary -- The Merchants Bridge*

The Merchants Bridge (Bridge) is a double-track railroad bridge that spans the Mississippi River between St. Louis, Missouri and Venice, Illinois. The Bridge was originally constructed in 1890 and consists of three steel Pennsylvania through-truss spans of 518'. The river piers are constructed of a timber caisson<sup>1</sup> set into bedrock and topped by granite and limestone.

The Bridge is owned by the Terminal Railroad Association of St. Louis (TRRA) with rail connections to Amtrak's St. Louis Station, six Class I freight railroads (BNSF Railway Company (BNSF), CSX Transportation, Inc. (CSX), Illinois Central Railroad Company (CN), Kansas City Southern Railway Co., Norfolk Southern Railway Co. (NS), and Union Pacific Railroad Co.(UP)) and five short line carriers. The Merchants Bridge is unique in that it is a true joint, open-access facility that may be used by any railroad. The strategic role of TRRA, to its owners, the railroad industry as a whole, shippers, and the public, is to promote efficiency, connectivity, and reduce environmental impacts. The TRRA bridge infrastructure alleviates the need for individual railroads to construct multiple competing and redundant proprietarily-owned Mississippi River crossings in the St. Louis rail terminal.

The Merchants Bridge is the 6<sup>th</sup> busiest freight rail Mississippi River crossing carrying 40 million gross tons (MGT) per year, and when combined with the MacArthur Bridge, also owned by the TRRA, comprises the busiest geographical crossing of the Mississippi River.

### *A. Current Situation and the Transportation Challenge*

The Merchants Bridge faces a state of good repair limitation that currently causes severe capacity constraints, but an even greater constraint projected by 2026. The bridge is load-restricted due to the age and strength of the 1890-era truss structural steel. The Bridge can only be operated as single-track carrying railcars no heavier than 286,000 lbs. (286K). It is restricted from carrying the 315,000 lbs. (315K) railcars that are increasingly prevalent in standard interchange service, and short axle 286K railcars. This weight restriction imposes significant costs on shippers and inefficiencies in freight transportation manifested in the form of additional cars, reduced freight line capacity, and increased equipment acquisitions. After 127 years of service, the Bridge is well past its expected operational lifespan. In the no-build scenario, engineers project that even with continuously rising maintenance expenditures, the Bridge can, at best, only be preserved at its current limited capacity for less than 10 years before it will have to be taken out of service.

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<sup>1</sup>See Appendix 1 for historic photos of Timber Caissons and other Bridge Construction

The United States Department of Transportation (USDOT) projects a 49% increase in rail tonnage nationwide through 2040<sup>2</sup>. TRRA is an important node in the national freight rail system. TRRA's traffic demand and demand for train slots across the Bridge are a function of national rail freight flows. The current capacity of the Bridge is approximately 38 trains per day. An average of 32 trains per day currently cross the Bridge. By 2026, forecasts project that 34 trains per day<sup>3</sup> will be diverted to other rail routes or interstate trucks if the Merchants Bridge is retired from service.

The Merchants Bridge Rehabilitation Program (Project) addresses the transportation challenge by increasing the national freight rail network capacity and maintaining critical infrastructure in a state of good repair at a strategic Mississippi River crossing in St. Louis.

### **(1) National or Regional Significance of the Merchants Bridge**

The following excerpt taken from the 2014 Missouri State Freight Plan highlights the criticality of Missouri's transportation system to the nation's freight network and why the Bridge is important both regionally and nationally.

*“Missouri is at the freight crossroads of America. As the geographic center and the demographic center of population for the United States, Missouri is well positioned as the country's freight nexus.*

*Missouri does the heavy lifting every day for freight mobility – manufacturing, agriculture, mining, distribution, logistics -- and serves as a “connector” state that holds the region and the nation together. Being a connector state means that the majority of freight moving across the state's transportation networks is truck- and rail-based pass-through traffic.*

*The main commodities are rail-based coal and truck-based secondary traffic (i.e., transportation of goods to additional locations between the point of origin and final destination, such as warehouses or distribution centers). Commodities that are increasing include automotive, agriculture, energy, and bulk products. In 2011, nearly 600 million tons of pass-through freight moved through Missouri, making up nearly 59 percent of the total tonnage of goods moved through the State. It is projected that the pass-through traffic will increase in the future, reinforcing the role of Missouri as a connector state”.*

The State Freight Plan has identified the Bridge as one of the critical freight needs that must be addressed.

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<sup>2</sup>[https://www.transportation.gov/sites/dot.gov/files/docs/DRAFT\\_NFSP\\_for\\_Public\\_Comment\\_508\\_10%2015%2015%20v1.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/DRAFT_NFSP_for_Public_Comment_508_10%2015%2015%20v1.pdf)

<sup>3</sup> TRRA's RRIF application assumes a much lower future demand in accord with conservative cash flow forecasting.



*“The Merchants Bridge and the MacArthur Bridge were built in 1890 and 1912, respectively. While there is redundancy in the rail system, the condition of these bridges is a concern. In addition, **these are both National Freight Corridors, so their impact on the transportation system stretches beyond Missouri**”.*<sup>4</sup>[emphasis added]

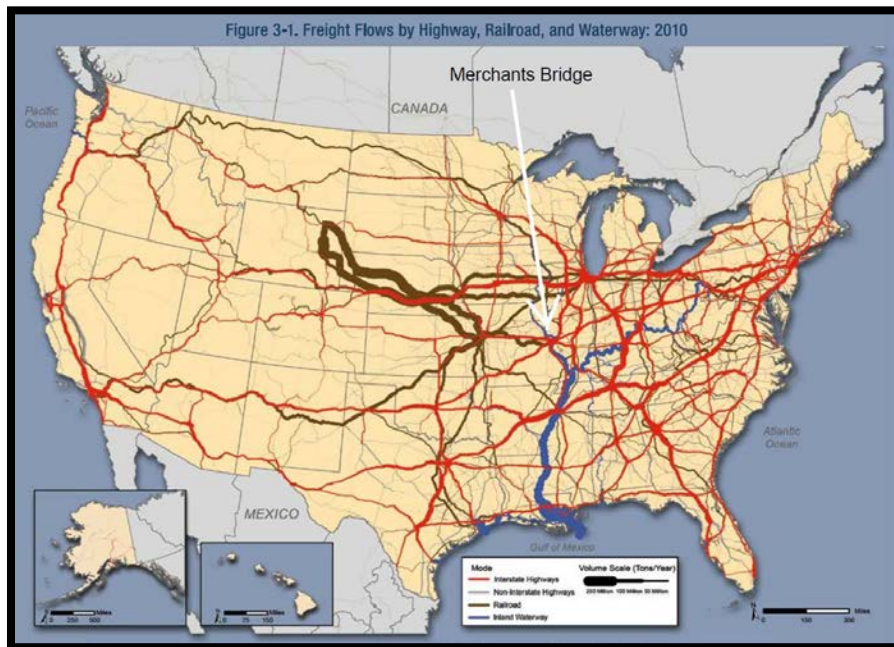


Figure 3 -- USDOT Freight Flow Map

## (2) St. Louis Region's Transportation Role

St. Louis is the second largest freight rail car interchange location in the U.S. and third largest by tonnage. Based on train counts, the two Mississippi River bridges owned by TRRA, the Merchants Bridge and the MacArthur Bridge, account for the busiest geographic Mississippi River crossing. Besides crossings in Baton Rouge and New Orleans, Louisiana, TRRA's bridges are the only Mississippi River bridges that are not owned, operated and controlled by a single railroad.

St. Louis has historically been an important multimodal freight center, is served by six Class 1 Railroads, and is the northern-most year-round ice-free Mississippi River port location. St. Louis has navigable river access to the Gulf of Mexico via the Mississippi River, the Great Lakes via the Illinois River to Lake Michigan, and to the Ohio and Missouri Rivers.

<sup>4</sup><http://www.modot.org/othertransportation/freight/FreightPlan.htm> Appendix C, Page 4

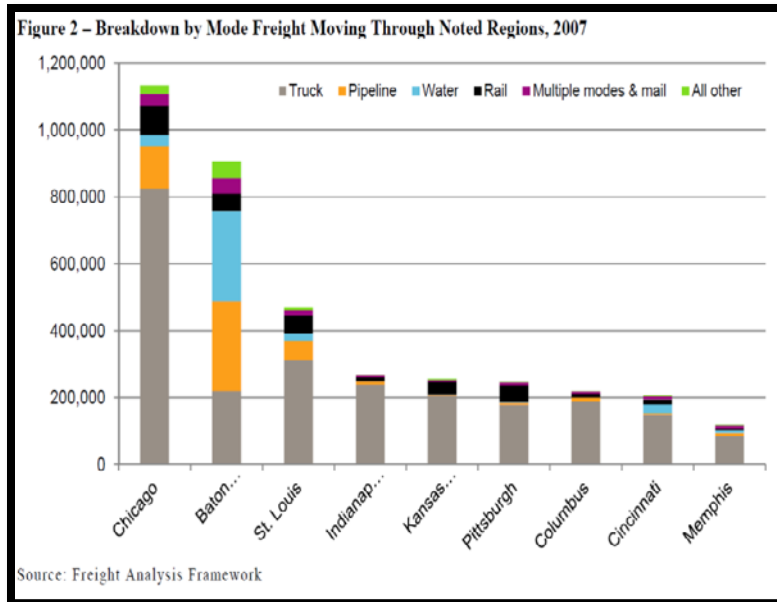


Figure 4: St. Louis Regional Freight Study -- Page 4-24 <sup>5</sup>

St. Louis is a major manufacturing and distribution hub serving national and international commerce. St. Louis is also an important East-West gateway for special dimensional loads including military equipment, transformers, wind turbines and pressure vessels.

St. Louis is home to the world’s 2<sup>nd</sup> largest defense contractor, Boeing Defense, Space & Security, and is part of the Department of Defense’s Strategic Rail Corridor Network (STRACNET) for the movement of military assets.

2014 Train Count - Mississippi River Bridges					
Rank	Bridge	States	Count	Average TPD	Source
1	Ft Madison BNSF	IL-MO	23152	63.4	AEI 178 179
2	Thebes UP	IL-MO	16699	45.8	AEI 625
3	Clinton UP	IL-IA	15644	42.9	AEI 475 476
4	MacArthur Bridge-TRRA	IL-MO	14790	40.5	AEI 68 69
5	Memphis BNSF	TN-AR	12023	32.9	AEI 137
6	Merchants Bridge-TRRA	IL-MO	11798	32.3	AEI 1150 1151
7	Hastings CP	MN		20.0	Estimate
8	La Crosse CP	WI-MN		20.0	Estimate
9	Burlington BNSF	IL-IA		20.0	Estimate
10	Huey P Long Bridge NOPB	LA	6907	18.9	AEI 473/474
11	Vicksburg KCS	MS-LA	6309	17.3	AEI 1121
12	Camden Place (Minneapolis) CP	MN		16.0	Estimate
13	Hoffman UP	MN	5562	15.2	AEI 418
14	Memphis UP	TN-AR	4954	13.6	AEI 235 236
15	Hannibal NS	IL-MO		11.0	Estimate
16	East Minneapolis BNSF	MN		10.0	BNSF TPD map
17	Rock Island IAIS	IL-IA		10.0	Estimate
18	Sabula CP	IL-IA		8.0	Estimate
19	Quincy BNSF	IL-MO		8.0	Estimate
20	Roberts Street UP	MN		7.0	Estimate
21	Baton Rouge	LA		7.0	Estimate
22	Louisiana KCS	IL-MO		5.0	Estimate
23	Bridge 15 UP	MN		4.0	UP Volume map

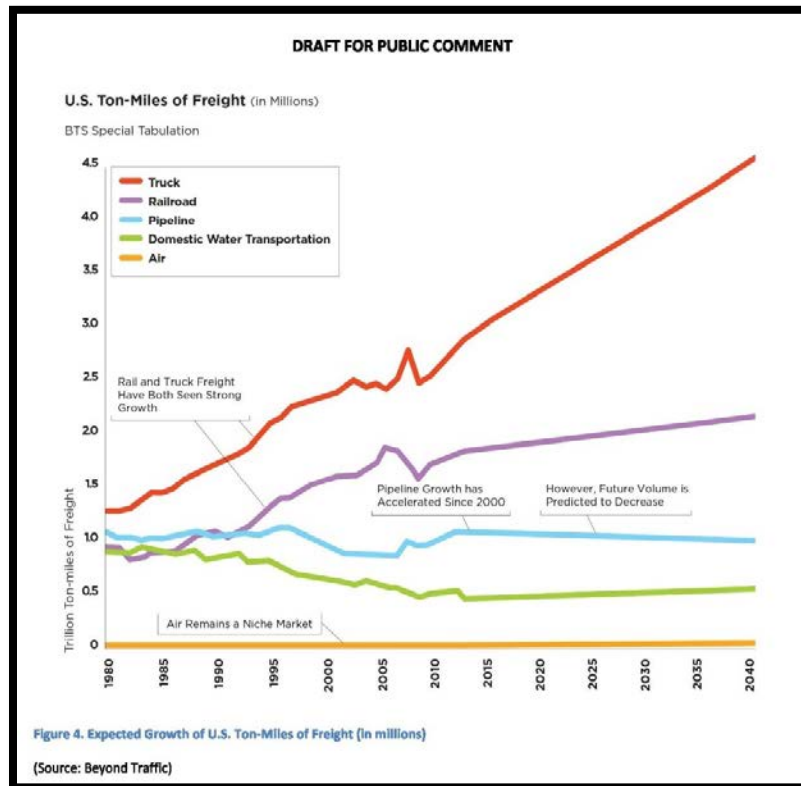
Figure 5: AEI Reader Data 2014

<sup>5</sup><https://www.ewgateway.org/wp-content/uploads/2017/08/FreightStudyFinalRpt.pdf>

## B. Transportation Challenges the Project Aims to Address

The mission of providing safe, reliable, and efficient movement of people and goods throughout the nation's freight network is fundamental to a strong America<sup>6</sup>. MAP-21<sup>7</sup>, section 167, states the policy of the United States is to "improve the condition and performance of the national freight network to ensure that the national freight network provides the foundation for the United States to compete in the global economy and achieve each goal described in subsection (b)", which includes reducing congestion and "to improve the state of good repair of the national freight network."

As shown in Figure 6, Truck and Railroad Ton-Miles is projected to grow significantly through 2040. The Metropolitan Planning Organization (MPO) for the St. Louis region, East-West Gateway Council of Governments (EWG)<sup>8</sup>, has listed its top guiding principle as "Preserve and Maintain the Existing System" in order to ensure the transportation system remains in a state of good repair.



**Figure 6: Growth of U.S. Ton- Miles of Freight**

The Merchants Bridge Rehabilitation Program is exactly the type and size of project prioritized by USDOT and Congress in formulating National Freight Policy. The nation's six busiest

<sup>6</sup> FRA Mission Statement -- <https://www.fra.dot.gov/Page/P0002>

<sup>7</sup> <https://www.gpo.gov/fdsys/pkg/PLAW-112publ141/pdf/PLAW-112publ141.pdf>

<sup>8</sup> [http://www.ewgateway.org/wp-content/uploads/2017/07/Connected2045\\_1.pdf](http://www.ewgateway.org/wp-content/uploads/2017/07/Connected2045_1.pdf)

Mississippi River crossings, carrying an average of 43 trains per day, range between 89 years old and 127 years old. In order to move the next century’s people and goods safely and efficiently, substantial and sustained investment is necessary to improve the Nation’s critical infrastructure.

Rank	Bridge	States	Average Trains Per Day	Truss Year Constructed/Reconstructed	Age in 2017
1	Ft. Madison BNSF	IL-MO	63.4	1928/2013	89/4
2	Thebes UP	IL-MO	45.8	1905	112
3	Clinton UP	IL-IA	42.9	1909	108
4	MacArthur Bridge -- TRRA	IL-MO	40.5	1912	105
5	Memphis BNSF	TN-AR	32.9	1892	125
6	Merchants Bridge -- TRRA	IL-MO	32.3	1890	127

Figure 7 -- Mississippi River Bridges AEI Reader Data 2014

### (1) Throughput Capacity Passenger/Freight Volumes and Congestion

The National Rail Freight Infrastructure Capacity and Investment Study<sup>9</sup> projected bridges over the Mississippi River in St. Louis as Level of Service F, Above Capacity with Unstable Flows and Service Breakdown Conditions, in 2035. The study also projects that the entire Mississippi River bridge network has a lack of capacity to accommodate traffic overflow needed to maintain reliable and timely delivery of passengers and freight. See Figure A.2 on page A-13.

### (2) Maintain Existing Bridge Infrastructure in a State of Good Repair<sup>10</sup>

The years between 1900 and 1935 were known as the “golden age” of railroad truss construction as a result of significant advancements in the structural steel industry which allowed heavier and longer spans to be built that are much more resistant to metal fatigue and section loss than their predecessors built in the late 1800’s. However, the floor systems in these bridges are affected by accumulating fatigue cycles and will likely need replacement within the next 30 years. This period of heavy bridge maintenance will substantially impact national freight rail capacity in the headwinds of increasing freight demand.

<sup>9</sup><http://www.nwk.usace.army.mil/Portals/29/docs/regulatory/bnsf/AAR2007.pdf>

<sup>10</sup> See Appendix 2 Merchants Bridge Evaluation Report



**Figure 8: Merchants Bridge Truss Floor System, Floorbeams, Stringers, Bracing**

Although the Merchants Bridge preceded the era of heavier truss construction, it has been strengthened over time to accommodate heavier rail traffic as car loads increased in weight. The acceptance of 286K cars into standard interchange in the 1990's required the Bridge to be operated as a single track to avoid overstressing the truss. As carriers incorporate more 315K cars or short-axle 286K cars into standard interchange<sup>11</sup>, the Merchants Bridge will not be a viable route going forward without major investment.

The Main Span truss members were built in 1890 and the girders and floor beams range in age between 114 and 127 years old. TRRA conducts bridge inspections of the Main Spans two times per year to monitor structural steel cracking and section loss in the members. TRRA will continue to apply its Bridge Asset Management Plan to inspect and prioritize maintenance of the bridge and track that meets and exceeds federal requirements.



**Figure 9 -- Hands-On SGR Inspections**

<sup>11</sup>[https://www.up.com/aboutup/reference/maps/allowable\\_gross\\_weight/index.htm](https://www.up.com/aboutup/reference/maps/allowable_gross_weight/index.htm)



### **(3) Increase Load Capacity Across the Mississippi River**

The Transportation Research Board investigated increased rail network capacity by incorporating heavier axle loads and evaluated cost increases on bridge and track infrastructure compared to the savings of moving freight.<sup>12</sup> The study found that the benefits of using higher axle loads, 315K and shorter axle 286K cars, reduce total transportation costs, increase freight line capacity, and reduce equipment acquisitions that greatly exceed cost increases in infrastructure maintenance.

### **(4) Provide Network Redundancy**

The capacity of the freight network over the Mississippi River is tested by many factors: periods of heavy volume, flooding of major routes along rivers, potential acts of terrorism, major outages for bridge rehabilitation, vessel collisions with bridges, or a major seismic event.

The unrestricted access to the Merchants Bridge provides system redundancy when individual networks are tested by any of the above factors. The Merchants Bridge was open during the historic Mississippi River Flood of 1993 and routinely serves substantial re-route traffic detouring from various railroads as the Mississippi River floods. The St. Louis Port District has established a 24-hour video surveillance monitoring network along the St. Louis riverfront to detect and prevent potential acts of terrorism. Any adverse impact to the Chicago terminal would be mitigated by access to additional capacity in St. Louis.

As other ageing Mississippi River bridges go through more frequent bridge rehabilitation cycles, additional capacity added to the Merchants Bridge could absorb increased network traffic re-routes of any carrier from Memphis, Tennessee to Clinton, Iowa.

Protection against a major vessel collision is a major factor in performing a major navigable river asset investment determination. Over the course of a century or longer, a major vessel strike is probable. The St. Louis harbor is challenging to navigate due to its curvature and multiple bridge structures, [https://www.youtube.com/watch?v=C\\_WywnZaFek](https://www.youtube.com/watch?v=C_WywnZaFek). The new Main Span piers will be upgraded to withstand a code-level vessel collision, whereas other bridges constructed in the 19<sup>th</sup> and early 20<sup>th</sup> century will remain subject to this risk.

### **(5) Protect against Seismic Hazard in the Central U.S.<sup>13</sup>**

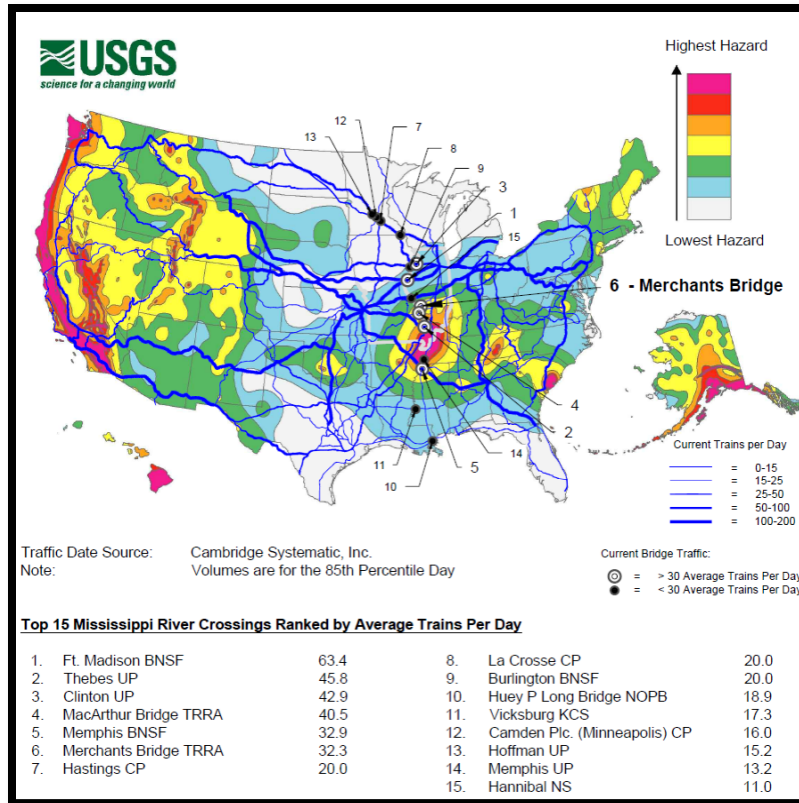
The east-west interchange of freight is vulnerable to a major seismic risk that exists along the New Madrid Fault in the Midwest. Of the Major Freight Corridors cited by FHWA<sup>14</sup>, all bridges between the St. Louis and Memphis portions of the network have this elevated seismic risk. In addition to the Major Freight Corridors listed, several other Mississippi and lower Ohio River bridges that carry substantial rail freight traffic are subject to this risk.

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<sup>12</sup>[https://trforum.org/wp-content/uploads/2017/04/2013v52n2\\_06\\_HeavyAxleLoads.pdf](https://trforum.org/wp-content/uploads/2017/04/2013v52n2_06_HeavyAxleLoads.pdf)

<sup>13</sup><https://earthquake.usgs.gov/hazards/hazmaps/>

<sup>14</sup>[http://ops.fhwa.dot.gov/freight/freight\\_analysis/freight\\_story/major.htm](http://ops.fhwa.dot.gov/freight/freight_analysis/freight_story/major.htm)



**Figure 10: Rail Traffic Volumes Overlaid with Seismic Hazard, 2014**

All other Mississippi River rail bridges were originally constructed prior to the development of seismic design. The impact of a code-level seismic event would be extremely disruptive to the St. Louis-to-Memphis network and would re-route substantial amounts of traffic onto the already congested corridors in Chicago and negatively impact the Nation’s economic competitiveness.

According to the map, approximately 165 out of 409 average trains per day could be affected by a major seismic event. Seismic retrofit and modification of existing river piers would ensure Merchants Bridge could survive a code-level earthquake, providing reliability to this area of geographic importance. A major seismic event would likely put other Mississippi and Ohio River bridges between St. Louis and Memphis out of service for lengthy periods of time. The unrestricted access of the Merchants Bridge would provide all railroads a critical lifeline structure so rail traffic could be restored in a reasonable amount of time after such an event.

## C. Alternates Considered that Do Not Meet the Transportation Challenge

### (1) The No-Build Option

The No-Build scenario consists of maintaining the existing Bridge as currently configured until its load rating drops to where it could no longer reliably carry 286K standard axle railcar traffic. The Bridge would be taken out of service, primarily driven by increasing frequency of structural steel fatigue cracks in the floor system members, the complete fracture of one would cause a

derailment over the Mississippi River. Engineers would continue to perform hands-on inspections of the Main Spans no less than two times each year. Fatigue cracks in the floor beams and stringers would be drilled or plated and monitored until they reach critical length at which time more elaborate member replacement would occur until the major defect frequency dictates the track be taken out of service. Track speed eventually would be reduced from 20 mph (FRA Track Class II) to 10 mph (FRA Track Class I) triggering the need for either additional locomotives or train tonnage limits in order to ascend the 1.5% grade on the 6-degree curves on the Merchants Bridge West Approach in Missouri. These options would lower the amount of impact and dynamic load to the structure. This failure mechanism is anticipated to limit the remaining asset useful life to less than 10 years, or a projected out of service date of 2026, when many of the floor system members will be 136 years old.

The No-Build scenario would remove capacity for 38 daily Mississippi River crossings out of the freight and passenger rail network. Passenger trains (up to 18 daily by 2026) into and out of St. Louis from Chicago would re-route over the adjacent 114-year-old MacArthur Bridge. Local industries concentrated in Central and North St. Louis would see shipping times increase substantially as there is no good alternate connection to the northwest from the MacArthur Bridge<sup>15</sup>. The NS would re-route 136 miles, approximately 1.64 billion ton-miles per year, to serve the St. Louis terminal<sup>16</sup>.



Figure 11 -- Not Feasible to Connect to North-South Route due to Highway Clearances, Grade, and Curvature

<sup>15</sup> See Appendix 3 – No Build Impacts – No NW Connection from MacArthur Bridge

<sup>16</sup> See Appendix 4 – NS Reroute

Currently the MacArthur Bridge carries over 40 trains per day with a maximum capacity of 72 trains per day. The MacArthur Bridge capacity drops to 55 trains per day during maintenance periods and could only absorb 15 of the 32 current trains per day crossing Merchants Bridge. The MacArthur Bridge is the second longest freight rail bridge in the country. Maximum capacity is not available for over 40% of the working days during a 25-year period due to the substantial amount of steel repairs, programmed structure rehabilitations, rail replacements, and tie renewals. Also, as shown in Figure 11, the MacArthur Bridge cannot directly tie into the Merchants subdivision, the north-south route through St. Louis, which would otherwise provide speed and fluidity in the St. Louis Terminal.

The MacArthur Bridge is scheduled for floor system replacement in the Main Spans in 2030, which will eliminate Mississippi River crossings in St. Louis during working hours and limit such crossings to a single-track the remaining 16 hours per day for approximately 2 years.

The No-Build impacts would cripple both freight and passenger on-time performance or cause lengthy re-routes/reductions in scheduled service. There would be a large modal shift from rail to trucking and rerouting of trains through interchanges in already congested Chicago. Local shippers served by TRRA would experience less efficient and costlier rail service under the No-Build Option. Amtrak's regional and high speed intercity services would not have a consistently available route during daytime weekday working hours which could trigger reduced scheduled passenger service or bus bridges between stations.



Figure 12 -- MacArthur Bridge looking Northwest

## **(2) The Rehabilitate Merchants Bridge as a Single-Track Option**

TRRA has considered an option that would address the structural steel fatigue by replacing the floor system supporting the track, performing truss rehabilitation, and re-purposing the bridge as a single track only. This option would preserve the existing 38 trains per day capacity of the



bridge further into the future and would allow routine 315K or short-axle 286K railcars and improve horizontal, but not vertical clearances for dimensional loads. This \$40M option would extend the useful life of the bridge for approximately 30 years until approximately 2050.

The funding for this option would displace funds needed to build a new bridge with a 100-year lifecycle as a capital bulge would descend upon TRRA with competing capital demands of the then 138-year old MacArthur Bridge increase. Pursuing this option would “kick the can down the road” but would likely be fatal to keeping two freight rail bridges in operation in St. Louis past 2050 as overlapping borrowing for two major Mississippi River crossings during the same payback time frame could force TRRA to choose between which rail bridge to keep in service. TRRA has determined that paying off the complete rebuild of the Merchants Bridge provides a better use of capital than the single-track option. This project does not meet the Transportation Challenge as the capacity preserved is not sufficient to accommodate freight growth capacity needs into the future.

#### D. Preferred Alternates Carried Forward into Design

TRRA brought two Alternates for the Merchants Bridge into design that would provide an asset useful life of 100 years or more and meet the Transportation Challenge of increasing network freight rail capacity and maintaining critical infrastructure in a state of good repair at a strategic Mississippi River crossing. These options replace the existing trusses, strengthen the existing river piers, and encase the existing East Approach bents in a wider cellular concrete fill.

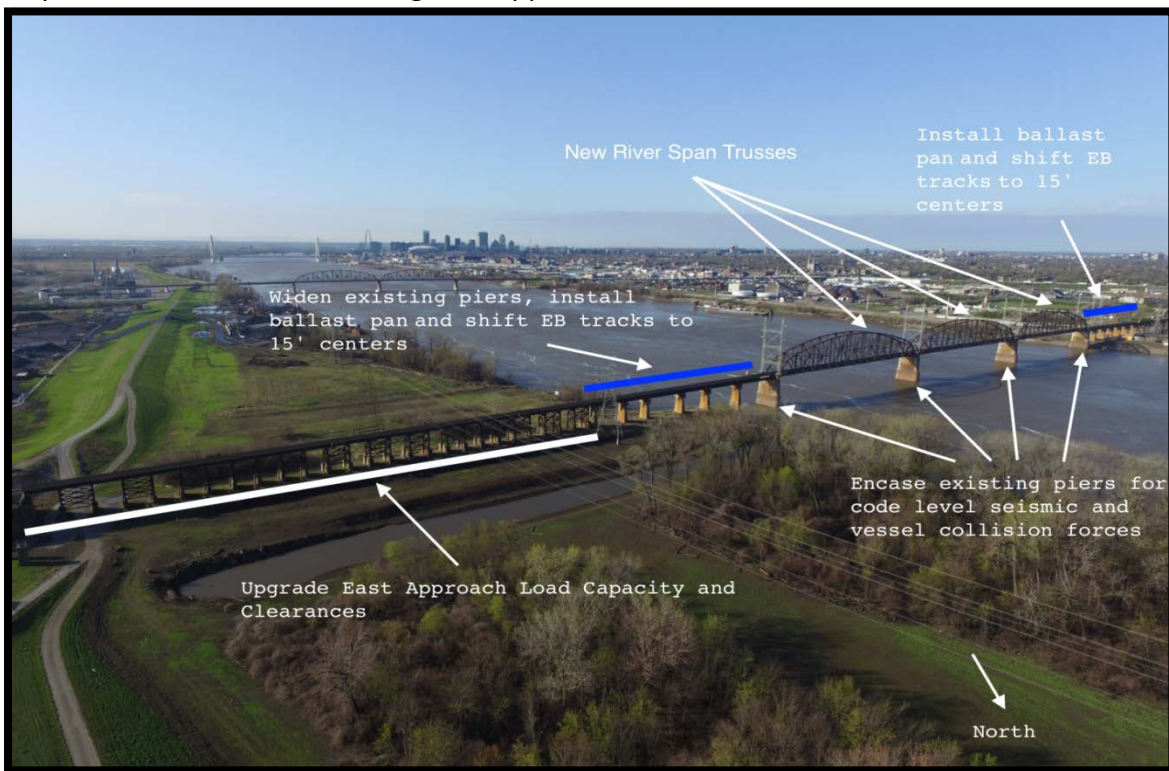


Figure 13: Rehabilitation of the Merchants Bridge Project Elements

The base bid package, estimated to cost \$204.3M includes the following:



- i. Double track capacity for E-80 Loading and AAR bridge clearances.
- ii. Encasing the existing masonry piers to meet AREMA Seismic Performance Level II.
- iii. A Float Out/In of new River Trusses.
- iv. The encasement of the existing load restricted East Approach structure.
- v. Five-minute travel time reduction for Amtrak on Merchants Subdivision.
  - a) TRRA will improve existing switches and surface at five control points along the Merchants subdivision and re-align an existing speed restricting 10-degree curve and spirals with additional super-elevation at MP 2.5<sup>17</sup>. TRRA will also increase grade crossing approach warning times along the route. These investments will allow Amtrak to increase their speeds resulting in a 5-minute travel savings. In addition, there will be four mainline in-service tracks across the Mississippi River versus three currently. When a bridge or track is undergoing maintenance, other routes are available to assure reliable service into the St. Louis Terminal.

TRRA is soliciting bids as an add alternate, estimated to cost \$213.9M, the following elements:

- Pier Modifications to withstand the maximum credible earthquake at this location meeting AREMA Seismic Performance Level III, and maximum vessel collision force.

## **E. Completing Merchants Bridge Meets the Transportation Challenge**

Rebuilding the Merchants Bridge meets the Transportation Challenge by addressing future passenger/freight volumes and congestion, maintaining existing bridge infrastructure in a state of good repair, increasing the load capacity across the Mississippi River, providing network redundancy, and protecting the freight network against disruptions.

The added capacity, speed, and more efficient routing will absorb a significant portion of the projected 49% increase in the nation's rail traffic over the Mississippi River. The Bridge will be able to carry the heavier carloads and locomotive power necessary for an efficient network. Community benefits will include reduced grade crossing delays for motorists and emergency vehicles, cleaner air in a federal non-attainment area<sup>18</sup> and a better quality of life by connecting disadvantaged populations to job centers between St. Louis and Chicago.

## **F. Why Should Federal Funds Support this Project?**

In the late 19th century, rail freight flows serving the nation's westward expansion were impacted by challenging topography in the St. Louis region, a critical transportation route. The engineering challenge of the time was to cross the Mississippi River at a reasonable elevation so as not to interfere with river navigation while landing in the river valley short of the hilly terrain of St. Louis to maintain grades suitable for railroads. This created complex competing interests of the many railroads for a limited rail corridor in this critical freight hub. The Federal Government helped

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<sup>17</sup> See Appendix 5 – Travel Time Reductions Merchants Sub.

<sup>18</sup> [https://www.fhwa.dot.gov/environment/air\\_quality/conformity/maps/pm25\\_1997/moil\\_stlouis.cfm](https://www.fhwa.dot.gov/environment/air_quality/conformity/maps/pm25_1997/moil_stlouis.cfm)

remedy this classic market failure, through action by the Supreme Court. In a 1912<sup>19</sup> decision pursuant to the Sherman Anti-Trust Act, the TRRA was established as a true joint facility, open to any railroad serving St. Louis, on equal terms with all other railroads. The benefits of this structure today accrue to many stakeholders including TRRA's shareholders, other rail service providers, local shippers, transcontinental shippers, passenger rail users, residents, and transportation providers in general. The benefits are not concentrated in one entity and TRRA's role is truly national.

*The Merchants Bridge—the oldest Mississippi River railroad bridge—is on the front end of a substantial capital bubble facing the freight railroad industry... critical to the nation's global competitiveness.*

The St. Louis area is uniquely positioned to provide multimodal solutions to the nation's increasing freight mobility challenges. According to the Beyond Traffic draft, nearly 30,000 miles of the nation's busiest highways will be congested daily costing the U.S. economy \$27 billion per year. Working with multimodal partners in the St. Louis region, TRRA is positioned to tackle these challenges and mitigate the impacts.

TRRA and the Merchants Bridge allow railroads to connect east/west and north/south. Through the ports in the St. Louis area, TRRA also links freight between modes which increases access to multimodal alternatives. In the future, this will allow shippers and haulers to have choices that will help freight to avoid bottlenecks, ensure more reliable movements and reduce stress on the National Highway Freight Network.

The burden of maintaining the Mississippi River crossings in St. Louis falls upon the TRRA and its shareholders, each beneficiaries of the asset, but none a sole beneficiary of the asset. As such, it is difficult to raise capital for a joint facility that otherwise competes for capital expenditures with each shareholder's extensive and proprietarily owned assets whose sole return on investment is captured by each shareholder. Each of TRRA's shareholders has substantial demand for scarce capital dollars to maintain extensive railroad networks primarily constructed over 100 years ago. The Merchants Bridge, the oldest Mississippi River railroad bridge in the country, is on the front end of a substantial capital bubble facing the freight railroad industry in maintaining these vast networks critical to the nation's global competitiveness. In addition to the massive state of good repair needs of the shareholders, implementing Positive Train Control technologies to automatically stop a train before accidents caused by human error, a revolutionary transformation of technology, increases pressures on capital expenditures an estimated \$10B with yearly recurring costs of hundreds of millions.

TRRA is seeking a Federal equity share contribution to the Project commensurate with the public benefits in a true public-private partnership that will provide substantial returns on investment for the over 100-year projected life of the new structure.

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<sup>19</sup><https://supreme.justia.com/cases/federal/us/224/383/>

## ii. Project Location

The Merchants Bridge spans the Mississippi River between St. Louis, Missouri and Venice, Illinois at Upper Mississippi River mile 183.2. The bridge is situated just south of the confluence of the Missouri and Illinois rivers and is south of the Mississippi River lock and dam system. The geospatial location of the bridge is 38°40'28.31"N, 90°11'11.85"W.

The Bridge has rail connections to all six Class I railroads serving St. Louis. TRRA connects to Amtrak's St. Louis Station. TRRA interchanges with multiple trucking facilities in the St. Louis area. TRRA interchanges with major Mississippi River Ports on the St. Louis Area Riverfront including: America's Central Port, SCF Lewis and Clark, Bunge, and the St. Louis Port Authority. The Merchants Bridge is in very close proximity to major freight corridors via interstates, I-70, I-55, I-44, and I-64. See Appendix 7 – Connections to Existing Transportation Infrastructure for a detailed map of connections.

The Merchants Bridge will be constructed in the STL, MO-IL Urbanized Area, with a 2010 population of 2,150,706.

## iii. Project Parties

The Missouri Department of Transportation<sup>20</sup> (MODOT) will be the grantee for the Merchants Bridge Project. Bi-State Development<sup>21</sup> is co-sponsoring the application.

Bi-State Development is a Congressionally-approved interstate compact between Illinois and Missouri which was granted economic development powers for the St. Louis region. Bi-State Development created the St. Louis Regional Freightway ("Freightway"), a public-private partnership whose mission is to optimize the region's freight transportation network. The Freightway meets with representatives from all modes of freight transportation -- shippers, haulers, industry and government entities. The Freightway has designated the Bridge as the top regional priority.

TRRA<sup>22</sup> will be the sub-recipient for the Project. TRRA is a 127-year-old intermediate switching carrier that provides rail service to approximately 80 industries in the St. Louis Metropolitan area. TRRA is jointly owned by five Class I freight railroads: Union Pacific Railroad, CSX Transportation, Illinois Central Railroad Company (a wholly owned subsidiary of Canadian National Railway), Norfolk Southern Railway, and the BNSF Railway.

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<sup>20</sup><http://www.modot.org/>

<sup>21</sup><http://www.bistatedev.org/>

<sup>22</sup><http://www.terminalrailroad.com/>

The U.S. Supreme Court<sup>23</sup> declared that TRRA must act as an “impartial agent of every railway, stockholder or not”. As such, TRRA has an ideal private corporate structure for receiving Federal Funds as the benefits are widely distributed throughout the freight and passenger industry and not concentrated towards any one private carrier. All revenues received by TRRA are used to support operations and capital expenditures and do not pass through to shareholders.

TRRA has a successful track record of public-private partnerships in order to accomplish projects with significant public benefits. Projects of note include:

- MODOT/TRRA -- Construction of a new third mainline track in downtown St. Louis to eliminate a significant passenger and freight rail bottleneck;
- DHS-FEMA/TRRA -- Removing the out of service road deck of the MacArthur Bridge to improve security using a Transportation Security Administration grant;
- MODOT/TRRA -- Replaced the existing West Approach of the Merchants Bridge using ARRA funds;
- MODOT and IDOT are partnering with TRRA to implement Positive Train Control in St. Louis;
- The Freightway<sup>24</sup> is partnering with TRRA to implement air pollution control technology to TRRA’s locomotive fleet through CMAQ funds.
- MODOT and the Illinois Department of Transportation (IDOT) partner with TRRA on grade crossing removals and replacements.

#### **iv. Grant Funds, Sources and Uses of Project Funds**

The Project will be funded by a combination of INFRA Grant funds, Railroad Rehabilitation and Improvement Financing (RRIF)<sup>25</sup>, and TRRA funding as shown in Appendix 8 – Grant Funds, Sources, and Uses of Project Funds. A summary tab and detailed breakdown tab is provided. TRRA’s repayment of the RRIF loan is backed by TRRA’s five Class 1 shareholders. Any grant funds awarded to the contract will reduce the amount of the RRIF loan balance.

Regarding the Notice of Funding Opportunity (NOFO) Section D.2.b.iv.(D), documentation of non-Federal funding commitments, TRRA will provide \$42.8M of private commercial financing<sup>26</sup> (\$40.9M if TRRA contracts to Level II seismic protection) in conjunction with RRIF financing. TRRA is in process of negotiating the terms and priority of the private financing in relation to the RRIF terms and conditions with USDOT’s Build America Bureau.

Regarding NOFO Section D.2.b.iv.(G), contingency, TRRA has used recent similar construction projects to estimate costs and has engaged with steel fabricators and industry for estimating structural steel erection unit pricing. The Project cost estimate includes a 15% contingency for unanticipated cost increases, consistent with other major structural rehabilitation projects. In

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<sup>23</sup>224U.S. 383, 32 S. Ct. 507, 56 L.ED. 810 (1912), <https://supreme.justia.com/cases/federal/us/224/383/case.html>

<sup>24</sup><http://www.thefreightway.com/>

<sup>25</sup><https://www.transportation.gov/buildamerica/programs-services/rrif>

<sup>26</sup> Appendix 8 – Existing Bank of America Line of Credit and Supplemental Financing from Stifel

addition, TRRA has access to additional resources should bid prices exceed estimates, which are being discussed with the Build America Bureau.

Regarding NOFO Section D.2.b.iv.(H), INFRA \$500M cap on freight rail, water, and other freight intermodal funds, all \$73.1M (or \$50M) of INFRA grant funds awarded to the Project would count towards this constraint.

<b>Financing Component</b>	<b>Amount/Alternate</b>	<b>% of Project</b>
TRRA Non-Federal Match-Private Financing	\$ 42.8M/\$ 40.9M	20%/20%
RRIF Financing	\$ 98.0M/\$113.4M	46%/56%
INFRA Grant	\$ 73.1M/\$ 50.0M	34%/24%
Totals	\$213.9M/\$204.3M	100%/100%

## **v. Merit Criteria**

### **A. Support for National or Regional Economic Vitality**

#### **(1) Achieves a significant reduction in traffic fatalities and serious injuries on the surface transportation system**

Moving freight via a closed system rail network minimizes opportunities for traffic fatalities and serious injuries, allowing funds to be concentrated to the intersection points of grade crossings. According to the Insurance Institute for Highway Safety, in 2014, 3,660 people died in the United States because of collisions between large trucks and passenger vehicles, pedestrians, or cyclists. An estimated 138,000 truckloads are projected to be diverted from highways to rail attributed to this project which will have a significant positive impact on highway safety. The Project promotes removing freight from the highway system and directing it to the rail network thereby absorbing future freight demand, preserving highway capacity and promoting traffic safety.

#### **(2) Improves interactions between roadway users, reducing the likelihood of derailments or high consequence events**

Keeping freight rail moving at reasonable speeds will limit train occupancy of grade crossings, improving roadway traffic flow and grade crossing safety. Queuing for bridges blocks grade crossings throughout the region, impairing emergency response and promoting aggressive driving behavior. Additional bridge capacity will alleviate a substantial portion of this queuing.

#### **(3) Eliminates bottlenecks in the freight supply chain**

Refer to section i.B.(1) Throughput Capacity Passenger/Freight Volumes and Congestion above.



**(4) Ensure or restore the good condition of infrastructure that supports commerce and economic growth**

Refer to section i.B.(2) Maintain Existing Bridge Infrastructure in a State of Good Repair above.

**(5) Sustain or advance national or regional economic development in areas of need, including projects that provide or improve connections to the Nation’s transportation network to support the movement of freight and people**

The Project complements federal investments in the Chicago to St. Louis high-speed intercity passenger rail corridor and completes a critical component needed to reduce travel times.

The Project also complements federal investments in America’s Central Port<sup>27</sup>, served by TRRA, and the new Mississippi River Bridge<sup>28</sup> accommodating large freight flows through St. Louis. The Project is the number one freight infrastructure improvement priority in the St. Louis region.

**(6) Reduce barriers separating workers from employment centers, including projects that are primarily oriented toward reducing traffic congestion and corridor projects that reduce transportation network gaps to connect peripheral regions to urban centers or job opportunities.**

As part of the high-speed intercity passenger rail corridor, Merchants Bridge connects disadvantaged populations to job centers between St. Louis and Chicago.

**(7) Benefit Cost Analysis Summary<sup>29</sup>**

The Project will complete the Merchants Bridge Rehabilitation Program, deliver the listed benefits and a BCA ratio of 1.86 over a 25-year period:

<i>Benefits</i>	<i>Present Value at 7%</i>
<b>1. OPERATING COST SAVINGS</b>	
a. Reduction in Delays for Freight Rail Shipping	\$ 36,719,000
b. Reduction of Delays from Freight Rail Rerouting	\$ 276,742,000
c. Reduction in Operations and Maintenance Costs	\$ 57,000
<b>2. EMISSION REDUCTION BENEFITS</b>	
a. Reduction in Emissions from Idling Locomotives	\$ 558,000
b. Reduction in Emissions from Freight Rail Rerouting	\$ 54,231,000
<b>3. VALUE OF TRAVEL TIME SAVINGS</b>	
a. Reduction in Amtrak Passenger Times	\$ 10,898,000
<b>4. RESIDUAL VALUE OF RECONSTRUCTED BRIDGE</b>	
a. Value of Merchants Bridge Beyond Analysis Period	\$ 18,651,000
<b>TOTAL BENEFITS</b>	<b>\$ 397,856,000</b>
<b>TOTAL COSTS</b>	<b>\$ 213,900,000</b>
<b>BCA RATIO</b>	<b>1.86</b>

<sup>27</sup><http://www.americascentralport.com/>

<sup>28</sup>[https://en.wikipedia.org/wiki/Stan\\_Musial\\_Veterans\\_Memorial\\_Bridge](https://en.wikipedia.org/wiki/Stan_Musial_Veterans_Memorial_Bridge)

<sup>29</sup> Reference Appendix 6 -- Benefit Cost Analysis

## **(8) Cost Effectiveness**

Incorporating additional capacity into an existing railroad alignment is congruent with national transportation policy<sup>30</sup> and is cost effective. The entire program is projected to cost \$258.4M, a much lower cost for increasing capacity for High-Speed Rail than initial cost estimates approaching \$700M<sup>31</sup> towards a new bridge structure in St. Louis.

### **B. Leveraging of Federal Funding**

This project leverages \$73.1M of INFRA Funds with \$140.8M of funds paid by the private sector (TRRA private financing of \$42.8M and RRIF \$98M). TRRA is working with the Build America Bureau of the USDOT to finance 100% of future eligible costs (between \$204.3M and \$213.9M). TRRA is looking to partner with the Federal Government as an equity stakeholder in addition to providing the RRIF financing. An INFRA grant would lower the private funding required, freeing TRRA's owners to re-invest in their own rail networks, including Positive Train Control and rehabilitation of infrastructure created in the late 1800's and early 1900's.

The BCA shows that the Project's return on investment substantially outweighs costs. There are no anticipated constraints on the non-Federal contributions that conflict with Federal Grant or RRIF terms and conditions. TRRA has provided a financial model to the Build America Bureau that shows how TRRA will maintain its entire infrastructure in a state of good repair through 2053 (i.e., the term of the RRIF loan), including the MacArthur Bridge, which will undergo major rehabilitation projects. Since the projected life-cycle of the new Merchants Bridge exceeds 100 years, a full life cycle cost model was not performed.

### **C. Potential for Innovation**

TRRA will not apply for innovation in environmental review and permitting as the NEPA clearance was obtained through a Categorical Exclusion in September 2017 and the Project is scheduled to have all necessary permits prior to the beginning of construction and INFRA grant award. The Project will not require innovation in project delivery as it is 100% designed and out for bid.

The Merchants Bridge Main Spans will be constructed by utilizing an innovative, but proven, superstructure float-out/float-in procedure on a very large scale. This procedure was recently used successfully on the Paducah and Louisville Bridge over the Tennessee River, a single-track 500-foot truss. [https://www.youtube.com/watch?v=uHXk4d7s2\\_I](https://www.youtube.com/watch?v=uHXk4d7s2_I) .

The East Approach work will consist of placing a lightweight cellular concrete fill to encase the existing columns and structural steel floor system. The existing girders will be cut off to elevation providing a traditional freight track cross section for sub-ballast and ballast. This method saves cost in demolishing the existing structure and strengthens it in place to serve as a fill. Also, this

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<sup>30</sup>[https://www.transportation.gov/sites/dot.gov/files/docs/2014-2018-strategic-plan\\_0.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/2014-2018-strategic-plan_0.pdf) page 5

<sup>31</sup><https://www.fra.dot.gov/eLib/Details/L03962> page 3-62

method substantially reduces the amount of track outages needed as it replaces a lot of crane work with concrete pumps, which do not foul the in-service tracks.

## **D. Performance and Accountability**

The Project is ready to go. Design engineering is complete, a NEPA Categorical Exclusion has been issued, and the Project is out for bids with all terms and conditions required of Federal grants. The Build America Bureau has requested that construction bids be received prior to closing on the RRIF loan. The contract is scheduled to be awarded in summer 2018. TRRA would agree to condition Federal grant funding on milestones for contract award in calendar year 2018 and project completion no later than 2022 that can be written into the grant award document, if consistent with RRIF terms and conditions. TRRA would also seek pre-award authority starting at construction notice to proceed if the potential grant award would occur after that milestone.

There are no local administrative barriers to a public-private partnership for this project. TRRA is able to implement any procurement or project delivery innovations in conjunction with Federal terms and conditions, but has not requested any. Traditional Design-Bid-Build procurement, consistent with existing Federal regulations, was selected as the most efficient delivery for this type of project based upon financing considerations and timing.

## **vi. Project Readiness**

### **A. Technical Feasibility**

Final Design is complete, and the Project is out for construction bids. The design has been peer reviewed by TRRA's Class I railroad engineering group and provided to the Build America Bureau. The cost estimates<sup>32</sup> have been developed by experienced railroad structural engineers benchmarking off similar projects with major cost elements being reviewed with industry suppliers. The approved NEPA Categorical Exclusion is included in Appendix 9 – NEPA CATEX.

TRRA has implemented robust risk mitigation measures<sup>33</sup>. TRRA employs experienced licensed professional engineering managers who have successfully managed large, complex bridge projects funded with federal grants. TRRA conducted a qualifications-based engineering design procurement that attracted firms from across the nation to propose on the Project and selected a highly experienced and skilled design team, TransSystems Corporation<sup>34</sup> and Burns & McDonnell<sup>35</sup>, for railroad bridge design and construction management. TRRA is managing the project process utilizing the principles of the USDOT Federal Transit Administration Project and Construction Management Guidelines<sup>36</sup>.

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<sup>32</sup> Project Budget and Cost Estimate is included in Appendix 8

<sup>33</sup> Reference Appendix 11 for a Risk Probability Mitigation Matrix

<sup>34</sup><http://www.transystems.com/>

<sup>35</sup><http://www.burnsmcd.com/>

<sup>36</sup>[https://www.fta.dot.gov/sites/fta.dot.gov/files/docs/FTA\\_Project\\_and\\_Construction\\_Mgmt\\_Guidelines\\_2016.pdf](https://www.fta.dot.gov/sites/fta.dot.gov/files/docs/FTA_Project_and_Construction_Mgmt_Guidelines_2016.pdf)

The Project does not require additional right-of-way. The design team has identified potential staging areas where the contractor may build the three river trusses. TRRA is pre-qualifying construction contractors who have built major river trusses using a span float-in or roll-in process.

All major utilities and the river bottom, have been identified and mapped, so contractors can properly bid and plan their cofferdam designs for pier improvements. TRRA has coordinated the replacement of electric transmission lines on the Bridge with electric utility Ameren, Inc.<sup>37</sup> TRRA’s agreement with Ameren assures that the relocation will not impact construction.

A detailed scope of work, consisting of Issue for Bid plans and specifications, is included in Appendix 10 – Scope of Work.

## B. Project Schedule

A detailed project schedule is included in Appendix 10. The following is a project milestone schedule for major activities.

<b>Merchants Bridge Schedule</b>	<b>Milestone</b>	
<b>Activity</b>	<b>Start</b>	<b>End</b>
NEPA Environmental Clearance		20-Sep-17
Final Design Complete		16-Oct-17
RRIF Approval Process through Closing	8-Mar-16	15-Aug-18
INFRA Grant Award through Obligation		12-Nov-18
Construction Procurement	29-Sep-17	25-Jan-18
Construction	16-Aug-18	2-April-21
Project Completion	2-April-21	

The Project does not require right of way acquisition or agreements with other railroads or require State and local approvals other than environmental permits. St. Louis MPO, EWG, is familiar with the Project. EWG Officials have indicated that since the TIP is required to be fiscally constrained, the Project will be added to the TIP if grant funds are awarded.

INFRA funds can be obligated quickly for this project. Grant funds will be spent expeditiously once construction starts as the major cost items of structural steel material procurements and

<sup>37</sup><https://www.ameren.com/>

pier modifications will occur in the first year of construction. Notice to Proceed is projected for 3<sup>rd</sup> Quarter of 2018.

## C. Required Approvals

### (1) Environmental Permits and Reviews

The NEPA Categorical Exclusion Document<sup>38</sup> has been received. TRRA's environmental consultants are completing the process for the remainder of the permitting, which is scheduled to be received prior to construction notice to proceed and shown in the program schedule<sup>39</sup>.

Environmental studies and documentation have been submitted to regulatory agencies. The Area of Potential Effect (APE) has concurrence from USCG, FRA, and MoSHPO. The Section 106 Memorandum of Agreement has been executed as of August 10, 2017. TRRA's environmental consultants have coordinated with FRA, USCG and permitting agencies throughout the NEPA and permitting process.

### (2) State and Local Approvals.

State and local approvals needed for the replacement of the Bridge are limited to environmental permitting. The permitting processes are expected to be complete prior to contract award.

### (3) Federal Transportation Requirements Affecting State and Local Planning.

St. Louis MPO, EWG, officials have indicated that the Project will be added to the TIP if grant funds are awarded.

The Project is listed on the Missouri State Freight Plan recognizing that the condition of the Bridge is a challenge that needs to be addressed.

*"The Merchants Bridge and the MacArthur Bridge were built in 1890 and 1912, respectively. While there is redundancy in the rail system, the condition of these bridges is a concern. In addition, **these are both National Freight Corridors, so their impact on the transportation system stretches beyond Missouri**".<sup>40</sup>[emphasis added]*

Because of the significance of the Bridge and its condition, it has been listed as a high priority project in the Missouri State Freight Plan<sup>41</sup>. MODOT is establishing Freight Advisory Councils (FAC) in each of its Districts. The St. Louis Regional Freightway<sup>42</sup> is the FAC for the St. Louis

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<sup>38</sup> See Appendix 9 NEPA CATEX

<sup>39</sup> See Appendix 10 Scope of Work

<sup>40</sup> <http://www.modot.org/othertransportation/freight/documents/Missouri-Freight-Plan-Appendices-Small-FINAL2.pdf> Appendix C, Page 4

<sup>41</sup> <http://www.modot.org/othertransportation/freight/documents/Missouri-Freight-Plan-Appendices-Small-FINAL2.pdf> -- Appendix G, Page 28

<sup>42</sup> <http://www.thefreightway.com/>



District, and has listed the replacement of the Bridge as its number one freight priority project – see Appendix 12 Letter of Support from Executive Director, Mary Lamie.

### D. Assessment of Project Risks and Mitigation Strategies

A risk probability mitigation matrix is included in Appendix 11.

### vii. Large/Small Project Requirements

<p>1. Does the project generate national or regional economic, mobility, safety benefits?</p>	<p>Yes, refer to section i.B, Transportation Challenges the Project Aims to Address and v.A, Support for National or Regional Economic Vitality. Project:</p> <ol style="list-style-type: none"> <li>1. increases in freight capacity by adding back the capacity of a 2<sup>nd</sup> track,</li> <li>2. maintains existing bridge infrastructure in a state of good repair by reconstruction,</li> <li>3. decreases traffic fatalities by keeping freight on the closed rail network and off highway trucks, and</li> <li>4. improves Nation’s transportation network to support movement of freight and people by adding capacity.</li> </ol>
<p>2. Is the project cost effective?</p>	<p>Yes, the BCA shows a ratio of 1.86 with 7% discount rate.</p>
<p>3. Does the project contribute to one or more of the Goals listed under 23 U.S.C. 150?</p>	<p>The project:</p> <ol style="list-style-type: none"> <li>1. reduces roadway fatalities by keeping freight on the closed rail network and off highway trucks;</li> <li>2. maintains highway infrastructure in a state of good repair by keeping freight on the closed rail network and off highway trucks;</li> <li>3. reduces congestion on NHS by keeping freight on the closed rail network and off highway trucks;</li> <li>4. improves efficiency of surface transportation system by adding capacity to freight network and eliminating bottlenecks;</li> </ol>

	<p>5. improves national freight network by lowering costs and increasing throughput</p> <p>6. protects the environment by rebuilding on an existing alignment and lowering emissions by efficient movement of freight; and</p> <p>7. accelerated project delivery as the project is out for bid.</p>
4. Is the project based on the results of preliminary engineering?	Project is 100% designed and out for bid. Plans have been uploaded to Build America Bureau as part of the loan underwriting process.
5a. With respect to non-Federal financial commitments, does the project have one or more stable and dependable funding or financing sources to construct, maintain, and operate the project?	Yes. TRRA has the backing of five Class 1 railroads and a funding agreement supporting the RRIF loan and non-federal match. This information has been provided to the Build America Bureau as part of the loan underwriting process.
5b. Are contingency amounts available to cover unanticipated cost increases?	Yes, the project budget shows a contingency of 15% on Future Eligible Expenses.
6. Is it the case that the project cannot be easily and efficiently completed without other Federal funding or financial assistance available to the project sponsor?	See section i.F. Favorable RRIF financing and grant availability will help TRRA and its five Class 1 shareholders maintain their network infrastructure in the face of a capital bubble facing the industry.
7. Is the project reasonably expected to begin construction not later than 18 months after the date of obligation of funds for the project?	Yes, the current project schedule has notice to proceed being issued in the 3 <sup>rd</sup> Quarter of 2018.

End of Application

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