

## STUDY OVERVIEW

The Kansas Department of Transportation (KDOT) has identified a future need to replace the functionally obsolete Centennial Bridge over the Missouri River connecting Leavenworth County, Kansas and Platte County, Missouri. Through data collection, cost analysis, and public input, the Route 92 Centennial Bridge Study will examine the options for constructing a four-lane bridge replacement.

The bridge is located on K-92 in Kansas and Route 92 in Missouri, which connects much of northeast Kansas including the cities of Leavenworth and Lansing with the northern part of the Kansas City region, including Platte City and the Kansas City International Airport. The bridge is jointly owned by the Kansas and Missouri Departments of Transportation.



## STUDY SCHEDULE

The study includes four tasks. Three public meetings will be held to engage the public, stakeholders, and the community throughout the study. The study is anticipated to conclude in Spring 2016.

ADVANCED PRELIMINARY ENGINEERING	2014		2015				2016	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Assess Existing Conditions	[Progress Bar]		★					
Evaluate Alternatives			[Progress Bar]					
Conduct Tolling & Revenue (T&R) Study (Level 2)	[Progress Bar]							
Develop Recommendations	★ Public Meetings						[Progress Bar] ★	

Next steps could include a Level 3 Tolling & Revenue (T&R) study and the appropriate level of environmental documentation. Then, design plans with right-of-way acquisition and construction could eventually occur. This tentative schedule forms the basis for revenue assumptions. Currently, there is no funding dedicated for construction.

TENTATIVE FUTURE SCHEDULE	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Concept Study with Level 1 T&R Study	[Progress Bar]										
Advanced Preliminary Engineering with Level 2 T&R Study			CURRENT PHASE								
Environmental Documentation with Level 3 T&R Study						TENTATIVE					
Design and Right-of-Way Acquisition							TENTATIVE				
Construction						NOT FUNDED				TENTATIVE	

## STUDY PURPOSE

The Route 92 Centennial Bridge Study will assess existing conditions, evaluate alternatives, conduct a Tolling & Revenue Study, and develop a recommendation. The study will determine:

- ✓ Bridge location
- ✓ Bridge type
- ✓ Probable costs
- ✓ Potential funding mechanisms
- ✓ Preliminary assessment of the potential environmental impact

## STAY INFORMED

Thank you for your interest in the Route 92 Centennial Bridge Study. To find out more information about the study, visit the KC Metro Area website at:

[www.ksdot.org/kcmetro](http://www.ksdot.org/kcmetro)

Find us on Twitter: [#Rt92centennialbridge](https://twitter.com/Rt92centennialbridge)



# TRAFFIC CHARACTERISTICS

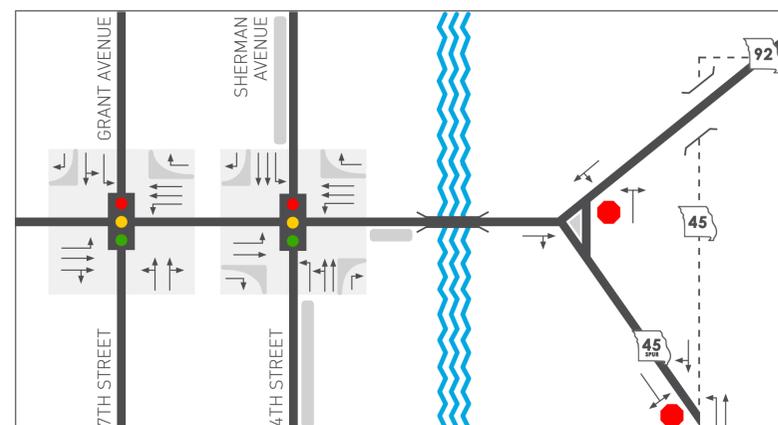
## TRAFFIC OPERATIONS

In Leavenworth, Kansas, Metropolitan Avenue is an urban arterial at 35 mph speed with curb and gutter and sidewalk. In Platte County, Missouri, the character of Route 92 changes to a rural highway at 55 mph speed with shoulders and an open ditch. The intersection analysis included both signalized and unsignalized intersections. Capacity is expressed as a Level of Service (LOS) from free flow (LOS A) to unstable flow (LOS F).

### Level of Service

Intersection	AM Peak Hour	PM Peak Hour
Metropolitan Avenue and 7th Street	C	D
Metropolitan Avenue and 4th Street	C	D
Route 92 and Spur 45	F	E
WB Left	A	A
Segment	AM Peak Hour	PM Peak Hour
East of Bridge	E	E
Between Spur 45 and Route 45	D	D
Between Route 45 and Route 92	A	B

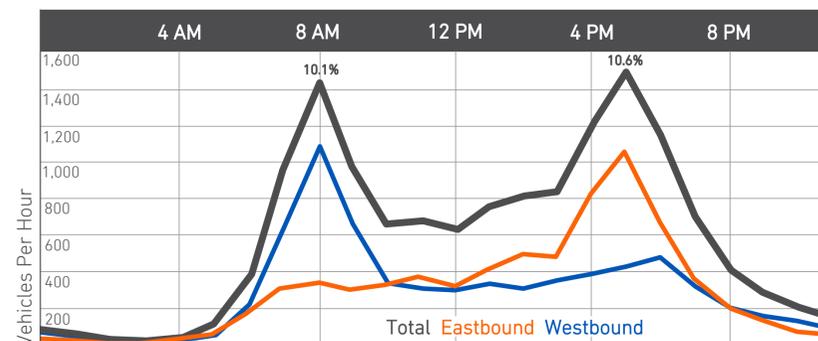
### Intersection Control and Lane Configurations



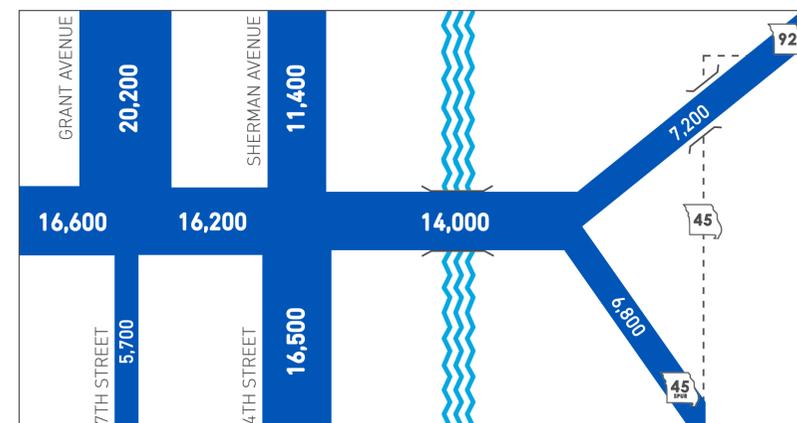
## TRAFFIC VOLUMES

The chart below illustrates the change in traffic volumes by hour on Route 92 east of the bridge. Average daily traffic is 13,989. The chart shows a 10 percent peak during both the AM and PM periods. The directional volume displays 70 percent or more traffic in one direction.

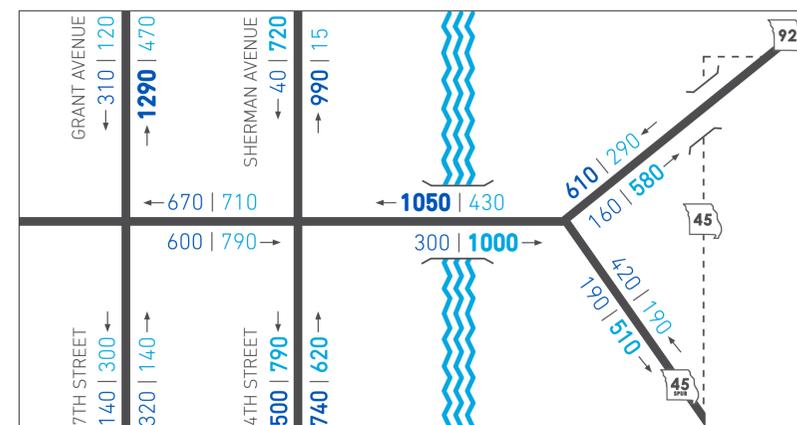
### Traffic Volumes



### Average Daily Traffic



### Peak Hour Directional Traffic



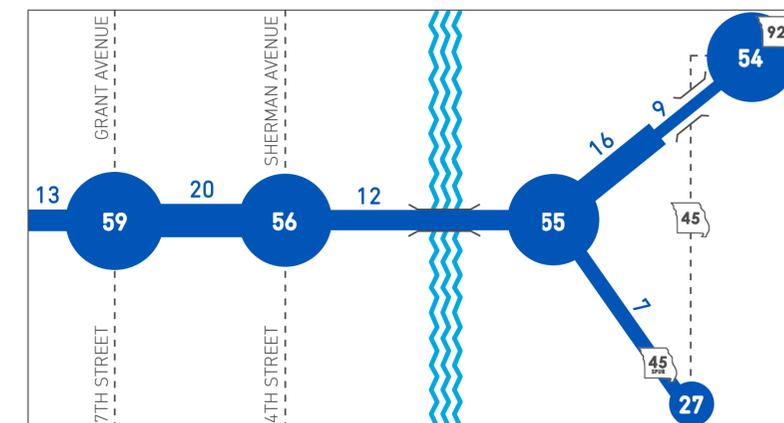
## TRAFFIC SAFETY

The chart below outlines traffic safety characteristics for the study corridor on both sides of the Centennial Bridge. The corridor includes 1.8 miles of Metropolitan Avenue from 16th Avenue to the state line and 3.9 miles of Route 92 from the state line to Route 45.

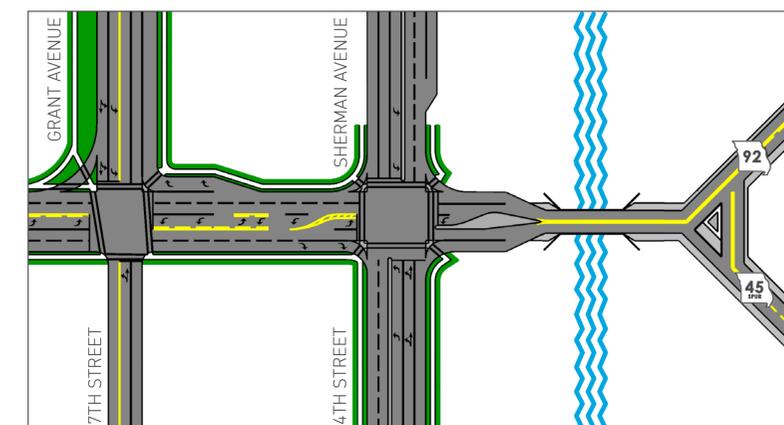
### Traffic Safety

Characteristic	Metropolitan Ave	Route 92
Average Annual Accidents (2009 - 2013)	20 accidents	21 accidents
Intersection and Intersection-Related Accidents	81%	72%
#1 Accident Type	Angle: Side Impact	Rear End
#2 Accident Type	Rear End	Deer
Top 2 Accidents Account for:	70%	55%
Injury Rate	24% Less than state average	21% More than state average

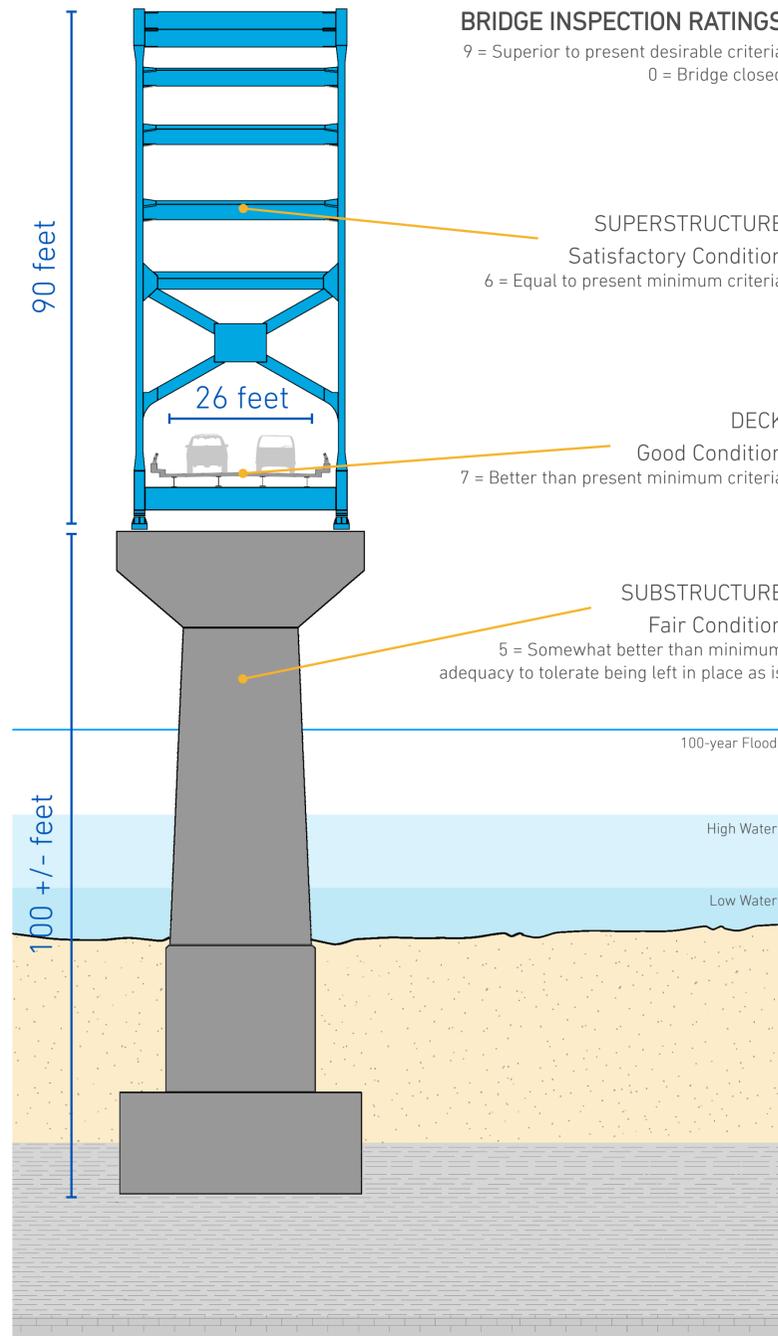
### Accident Locations



### Road Characteristics



# BRIDGE CONDITIONS



CENTENNIAL BRIDGE CROSS SECTION

## BRIDGE OVERVIEW

The existing bridge was constructed in 1955 as a toll facility to accommodate transportation needs over the Missouri River. The bridge is a narrow, two-lane structure without adequate shoulders. The Centennial Bridge underwent a rehabilitation project in 2011. Repairs were made to piers, bearings, expansion joints, drainage, and other structural components in order to extend the life of the bridge while a plan for replacing the bridge is developed.

The main spans of the through steel arch bridge over the Missouri River are a total of 840 feet. The superstructures for the east and west approaches are comprised of



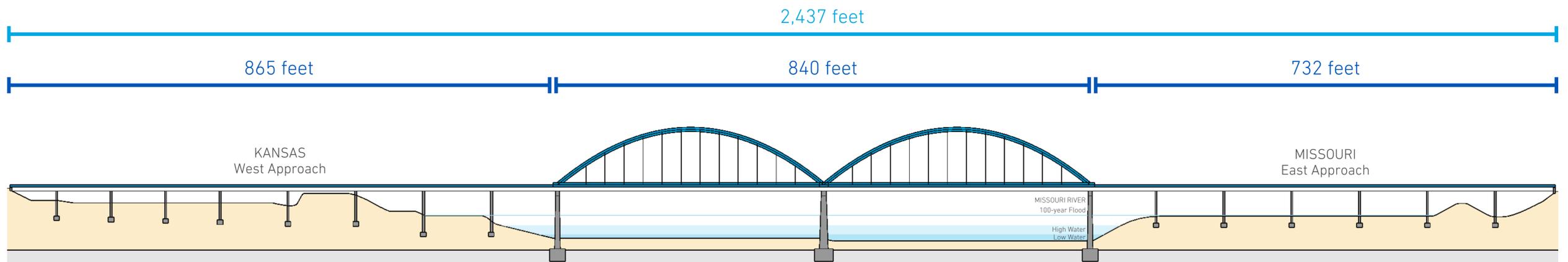
a concrete deck supported by steel plate girders, stringers, and floor beams. The 26-foot wide roadway carries two lanes of traffic, one in each direction, with a 2.5-foot wide curb and 1-foot wide barrier. The overhead vertical clearance of the arch is 18.5 feet.

Due to the width of the roadway, lack of shoulders, and other factors, the existing bridge has been deemed functionally obsolete. According to the Federal Highway Administration, a bridge is considered functionally obsolete when it does not meet current design standards either because the volume of traffic exceeds the level anticipated when the bridge was constructed and/or the relevant design standards have been revised.

## DESIGN ELEMENTS

Independent of the river crossing location, the bridge design requires coordination with several other modes of transportation as well as natural and manmade physical elements:

- ✓ Streets that pass underneath the bridge
- ✓ Railroad along the west bank of the Missouri River
- ✓ Freight navigational clearance for traffic on the Missouri River
- ✓ Aviation approach path to Sherman Army Airfield
- ✓ Utilities on and adjacent to the bridge
- ✓ Levee along east bank of the Missouri River
- ✓ Geotechnical abandoned mine shafts west of the Missouri River



CENTENNIAL BRIDGE ELEVATION

# TOLLING & REVENUE STUDY

## TOLLING OVERVIEW

Like many states, the Kansas Department of Transportation has more transportation needs than revenue, leaving a funding gap for the construction, maintenance, and operation of Kansas highways. One way to attempt to close the gap is to implement new funding sources, such as tolls. A Tolling & Revenue (T&R) study determines how much funding can be generated by tolling.

Tolling & Revenue studies are conducted at three different levels of intensity:

- 1 A "sketch-level" study to determine if a project has enough merit to perform an in-depth study
- 2 A mid-level, more refined study that includes location, type and cost analysis, and funding mechanisms
- 3 An investment-grade level that develops a forecasting model necessary for lending institutions to fund a project

### TOLLING & REVENUE STUDY PROCESS

#### LEVEL 1: Sketch or Feasibility Study

The Level 1 study explored three structural types of bridges that range in cost from \$45 to \$100 million. The study determined it was suitable to advance into the next phase to improve estimates.

#### LEVEL 2: Preliminary Study

The study is currently at the Level 2 phase. Efforts at this level generally include detailed traffic modeling and collection of socio-economic data. The final output is a series of analyses that provide a range of traffic and revenue projections.

**CURRENT  
PHASE**

#### LEVEL 3: Investment-Grade Study

If the study moves beyond Level 2, this phase requires extensive work in developing a sophisticated traffic revenue and forecasting model and analyzing several economic factors. Potential toll revenues are one of several factors that the financial community and bond rating agencies use to assess the project.

## TOLLING FACTS

In 2013, KDOT conducted a Level 1 Tolling & Revenue study and determined that tolling could be a viable funding option for the replacement of the Centennial Bridge and should be further studied. The next step is to continue refinement with the Level 2 Tolling & Revenue component as part of this study.

- ✓ A toll is a way of charging only drivers who use a particular facility in direct relation to their frequency of use.
- ✓ Tolls back revenue bonds which can be issued, accelerating construction funding.
- ✓ The ongoing income from tolls provides dedicated revenue to fund maintenance and operation of the facility for years to come.
- ✓ Tolls are the oldest means of funding roads with the first toll road in the U.S. dating back to the 1700s.
- ✓ Currently, 31 states (including Kansas and Missouri) have or are considering toll roads.

## FREQUENTLY ASKED QUESTIONS

### Why investigate tolling?

Traditional funding methods are not keeping up with the costs to construct and maintain roads. Tolling is one option to provide revenue to cover a portion of the cost.

### How is the cost shared for bridges across state lines?

KDOT and the Missouri Department of Transportation share the cost of operating and maintaining the bridges. They alternate the lead agency role on every other bridge. Roadways approaching the bridge are the responsibility of each state.

### How could tolls be collected?

An open road toll collection is envisioned that does not require motorists to stop at a booth but uses an electronic toll collection similar to a K-TAG transponder. Motorists without a transponder could be detected through video monitoring and sent a bill.

### How much will a toll cost?

The study will evaluate a range of potential revenue. Tolls for passenger cars may be \$1.50 to \$2.00 each way with trucks paying more. A definitive cost would not be set until analysis is conducted in Level 3.

### Who would administer collection?

The institutional framework of a bi-state authority between Kansas and Missouri requires coordination. If tolling advances, this study would outline the process to collect tolls across the border.

### How does MoDOT's review of tolling along Interstate 70 relate to the Route 92 Centennial Bridge Study?

Interstate 70 is one of Missouri's most pressing infrastructure needs and tolling may be an option for rebuilding at a cost of \$2 to \$4 billion across the state. While the two projects are significantly different, the reality for any highway project is that funding from the gas tax has flattened as vehicles have become more fuel efficient. Tolling is an alternative way of paying for roads.

## ASSESS AND DEVELOP FUTURE CONDITIONS

### Forecast Traffic Volumes

Forecast traffic volumes to design year of 2040 and conduct capacity analyses. The **K-92 TRAFFIC FORECAST** expects volumes to increase from its current volume up to as much as 20,000 average daily traffic.

### Conduct Capacity Analyses

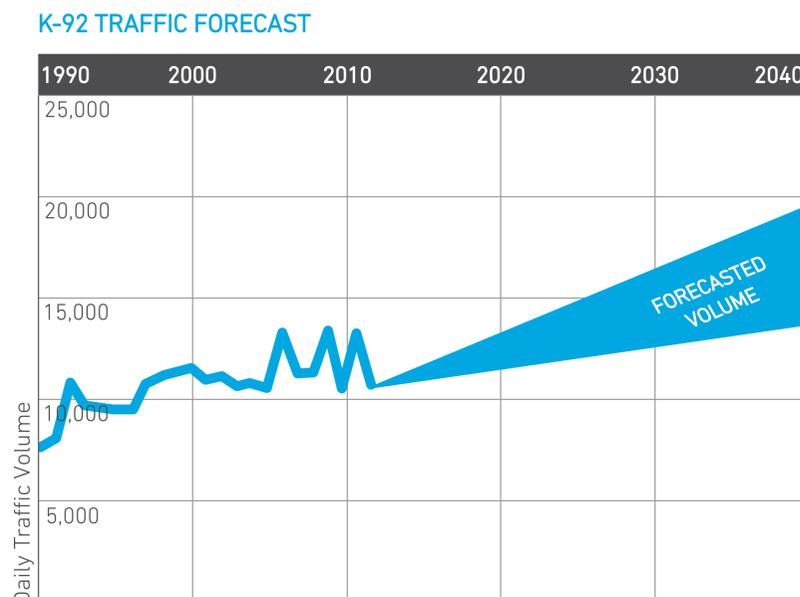
Develop and review roadway and intersection improvements to address congestion issues, including lane balancing for determining the distance the four lanes should extend from the bridge into Missouri.

### Develop New Bridge Alignments

Review alignment options, including locating the bridge on the north or south side of the existing bridge. New alignment locations may be bracketed by previous bridge crossings. Potential impacts related to the Union Pacific Railroad, navigation channel of the Missouri River, and the U.S. Corps of Engineers and local Levee District will be addressed.

### Assess Bicycle and Pedestrian Accommodations

Develop bicycle and pedestrian accommodations to create a Complete Streets vision that balances different modes along Metropolitan Avenue and Route 92.



### Develop Associated Costs

Develop costs along the bridge as well as approach roadways that may need improvements.

### Assess Alternate Routes

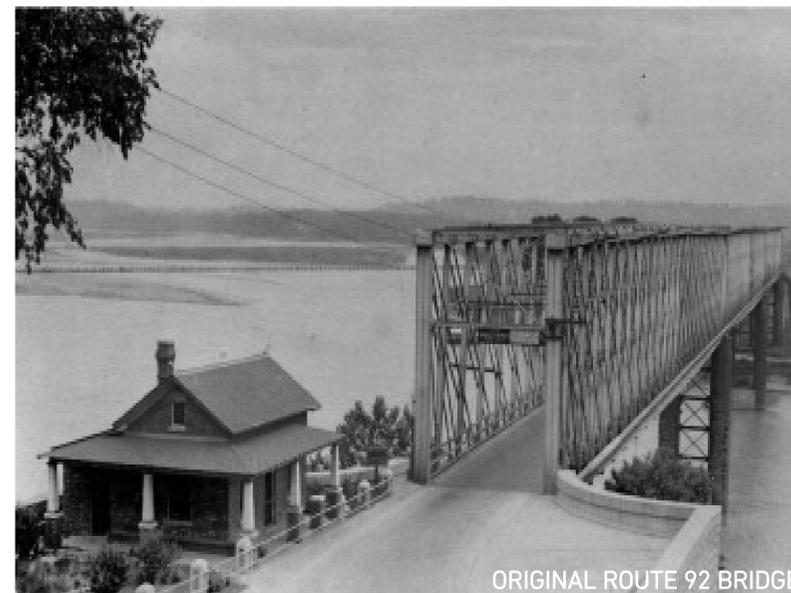
Assess alternate routes for diversion. The nearest Missouri River bridge crossings are located 20 miles north in Atchison, Kansas along U.S. 59 and 12 miles south in Wyandotte County, Kansas and Platte County, Missouri along Interstate 435.

### Advance Tolling & Revenue Analysis

Progress through various steps including conducting an origin-destination survey. The survey will better define trip patterns, trip purposes, and specific routes for motorists using the bridge.

### Reuse of the Bridge

While the existing bridge remains structurally sound and could continue as such with maintenance, the lateral and vertical obstructions of the bridge design type make the existing bridge functionally obsolete. Reuse of the bridge for vehicular traffic is significantly constrained and the replacement bridge alternatives under consideration do not include keeping the existing bridge.



## DID YOU KNOW?

In 2002, the Missouri Department of Transportation explored the option of tolling various projects including a series of major existing Missouri River bridges. The report concluded that tolling for the major bridges warranted further study. The bridges reviewed in the study included:

- ✓ Route 47 near Washington, Missouri
- ✓ Route 19 near Hermann, Missouri
- ✓ U.S. 59 near Atchison, Kansas
- ✓ U.S. 159 near Rulo, Nebraska
- ✓ U.S. 136 near Phelps City, Missouri
- ✓ Interstate 29 in Kansas City, Missouri

The Centennial Bridge was originally a toll road from its opening until 1977.

The Centennial Bridge's name is associated with the construction of the bridge in 1955, a century after the founding of the City of Leavenworth in 1855.

Missouri River crossings in the City of Leavenworth previously included the **ORIGINAL ROUTE 92 BRIDGE** (1.4 miles north of the Centennial Bridge) into Fort Leavenworth as well as the **SWING RAIL BRIDGE** (0.9 miles south of the Centennial Bridge) into Choctaw Street.

