TOLLING & REVENUE

- Level-2 Traffic and Revenue Study
- Preliminary Financial Feasibility Analysis (March 2016)

CENTENNIAL BRIDGE LEVEL-2 TRAFFIC & REVENUE STUDY

August 2016

ROUTE 92
CENTENNIAL BRIDGE STUDY

CDM Smith

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Chapter 1
Introduction

CDM Smith was retained by the Kansas Department of Transportation (KDOT) to conduct an Intermediate Level (Level-2) Traffic and Revenue (T&R) study of the Centennial Bridge over the Missouri River connecting Leavenworth County, Kansas and Platte County, Missouri. This analysis is part of KDOT's ongoing efforts to evaluate the financial feasibility of a toll bridge. As part of this study, CDM Smith updated the previous 2012 Sketch Level (Level-1) Study Traffic and Revenue estimates for the proposed Centennial Bridge replacement under a toll bridge assumption.

This study utilized the available regional travel demand models to reflect the most recent regional transportation plans and socioeconomic datasets developed for the Route 92 corridor. The reconstruction of the existing river crossing between Platte County, Missouri and Leavenworth County, Kansas could support additional growth in the region and improve overall mobility. This report provides long-term (40-year) traffic and revenue estimates of the proposed Centennial Bridge replacement under a toll bridge assumption and will be useful to support the financial feasibility analysis of the bridge.

This chapter is organized into the following sections:

- Objective and Scope of Study
- Project Description
- Background and Project Need
- Overview of Levels of Traffic and Revenue (T&R) Study
- Report Organization

1.1 Objective and Scope of Study

The objective of this Level-2 traffic and revenue study was to develop the baseline long-range revenue forecasts from 2023 through 2062 for the proposed Centennial Bridge replacement under a toll bridge assumption across the Missouri River connecting Missouri and Kansas. The forecasts reflect the latest socio-economic growth assumptions, updated assumptions on future highway improvements for the immediate Kansas City metropolitan region including planned roadway improvements in the vicinity of the bridge. It also includes assumptions regarding future toll rates and other key variables. The traffic and toll revenue estimates in this study cannot be used directly for project financing. A more detailed comprehensive traffic and revenue study would be needed to support financing should the project move forward as a toll bridge.

This chapter provides background information regarding the location and assumptions related to the proposed bridge crossing and other major river crossings in the study corridor.

1.2 Project Description

The Centennial Bridge replacement is a proposed four-lane tolled Missouri River crossing connecting K-92 in Leavenworth, Kansas and MO 92 in Platte County, Missouri. The bridge will replace the existing two-lane bridge which is functionally obsolete. As Figure 1-1 illustrates, the proposed toll bridge will connect much of northeast Kansas including the cities of Leavenworth and Lansing in Kansas with the northern part of the Kansas City region in Missouri including Platte City, East Leavenworth and the Kansas City International Airport.

The bridge originally opened to traffic as a toll bridge in 1955, with the tolls being discontinued in 1977. The existing bridge is a narrow, two-lane structure without adequate shoulders. Due to the width of the roadway, lack of shoulders and other factors, the two-lane bridge has been deemed functionally obsolete. It is currently the only Missouri River crossing in Leavenworth County.

The forecasts developed for this study reflect the latest socio-economic growth assumptions, updated assumptions on future highway improvements for the Kansas metropolitan region including planned highway, arterial and toll road improvements. It also includes assumptions regarding future toll rates and other key variables. This analysis evaluates the proposed construction of a new tolled bridge to replace the existing bridge and the traffic and revenue it can be expected to generate.

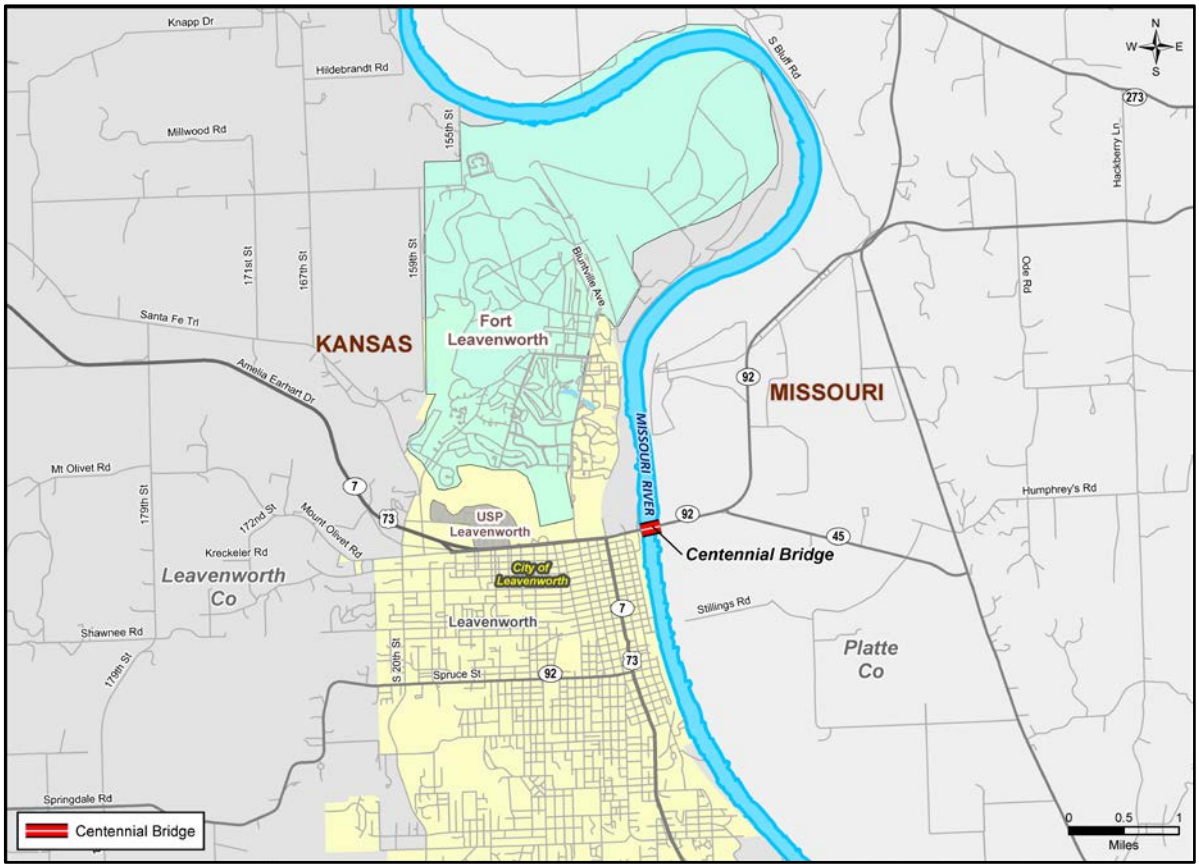

Figure 1-1. Project Location

1.3 Background and Project Need

The state of Kansas was one of the early states to implement toll roads, with the Kansas Turnpike running through a large portion of the state, extending 236 miles from Kansas City, Kansas to the Oklahoma border in the south. According to the Kansas Turnpike Authority, though the Kansas Turnpike spans a large portion of the state, short distance commuters also make up a considerable percentage of Turnpike customers, particularly in the urban corridor stretching through Topeka, Lawrence, and Kansas City.

In Missouri, there is a toll bridge at the Lake of the Ozarks. In recent years, Missouri has also been considering tolling options for Interstate 70 for a 200-mile section between Wentzville and Independence, connecting the two major metropolitan areas of St. Louis and Kansas City respectively.

Three of the counties in the Kansas City area, namely Johnson County, Wyandotte County and Leavenworth County, have been among the top ten most populated counties in Kansas. Leavenworth County in Kansas, to the west of the Centennial Bridge, experienced an average population growth of about 0.8 percent per year over the three decades from 1990 to 2010. The population of the county has grown more than 18 percent from about 64,400 residents in 1990 to over 76,200 residents in 2010. Similarly, Platte County, Missouri, to the east of the Centennial Bridge increased in population by more than 50 percent from 58,300 to about 89,300 residents over the same 20-year time period.

With respect to long-term future growth, Leavenworth County, Kansas and Platte County, Missouri are anticipated to continue to grow at an annual rate of 0.9 percent and 1.5 percent respectively from 2010 to 2040. This growth has resulted in increasing the demand for river crossings in the region. The Centennial Bridge provides improved connections between the growing communities of Leavenworth and Lansing, Kansas, and major destinations like the Kansas City International Airport and major league sporting franchises like the Kansas City Royals and the Kansas City Chiefs on the Missouri side.

With the Kansas Turnpike serving various communities in the metropolitan Kansas City region, there is acceptance of toll roads by the local population, and high ownership of transponders especially K-TAGs based on the data provided by Kansas Turnpike Authority. A review of the historical performance of the various Missouri river crossings also illustrates the need for an improved river crossing. Almost all of the bridges in the region experienced an increase in traffic of more than four percent per year from 1990 to 2000. This significant growth of river crossing traffic was driven by steady socio-economic growth in the region. From 2000 to 2013, the growth was more modest, with the Centennial Bridge experiencing minimal growth and the I-435 Bridge having a growth rate of about 2.8 percent annually.

1.4 Overview of Levels of Traffic and Revenue Study

CDM Smith has been involved with several different types of T&R studies. Based on the level of detail, time and resources required for the study and the purpose of the study (e.g., whether or not the T&R forecasts are intended to be used directly for financing), most T&R studies can be grouped into the following broad categories (as illustrated in Figure 1-2):

1. Sketch-Level (Level-1) involves using generic input assumptions, high-level analysis tools and is reliant on limited data collection to develop high-level T&R estimates.

2. Intermediate (Preliminary or Level-2) involves some data collection, use of validated travel demand modeling tools, refined T&R and other assumptions, updated socio-economic data and limited corridor origin-destination data.

3. Comprehensive (Investment Grade or Level-3) involves extensive data collection efforts including a detailed traffic count program, detailed assumptions related to project configuration, origin-destination data, corridor specific value of time data, independent socioeconomic reviews and calibrated travel demand models.

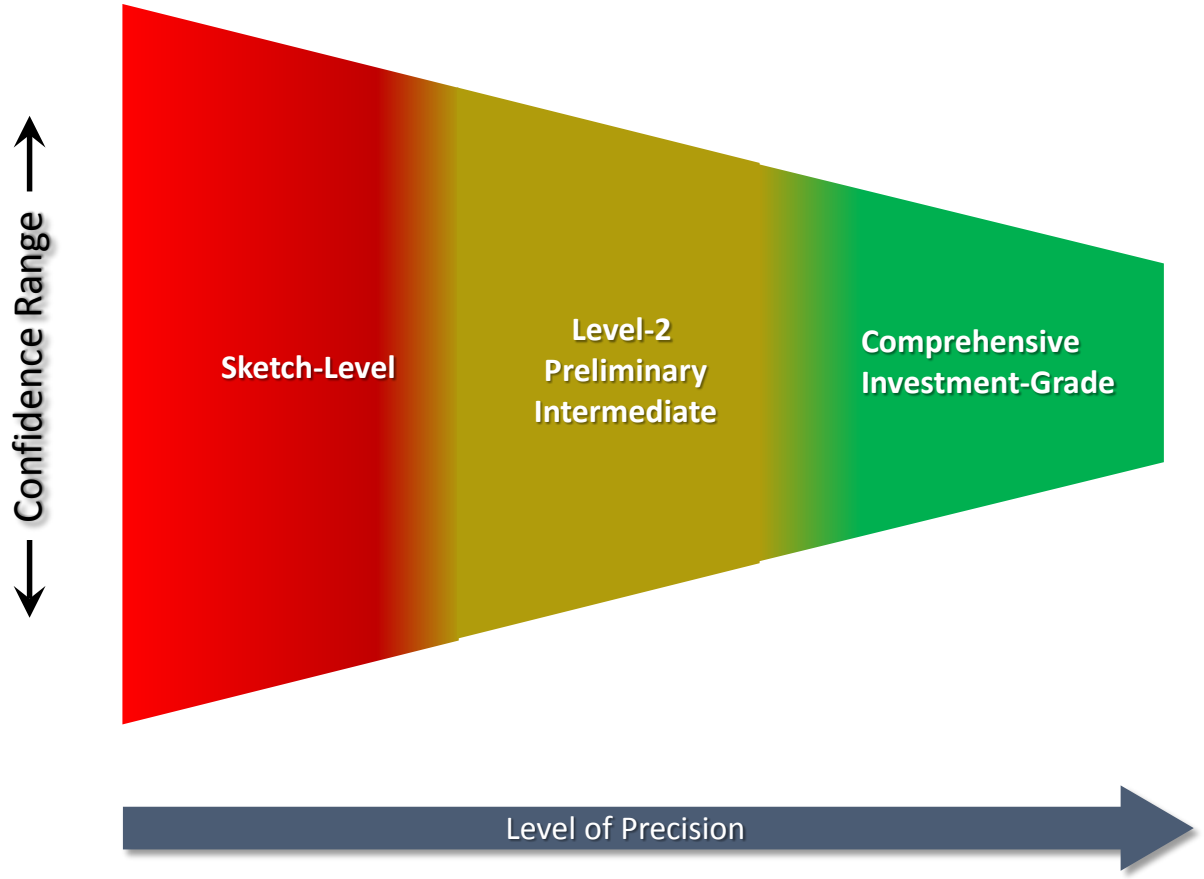

Figure 1-2. Levels of Traffic and Revenue Studies

As Figure 1-2 indicates, the level of precision improves with each level of study and the confidence range narrows moving from a sketch-level study to a comprehensive level T&R study.

This study in intended to evaluate the toll revenue potential of the Centennial Bridge including traffic and revenue estimates that are consistent with an intermediate level (Level-2) T&R analysis. This summary describes the data collection efforts within the corridor and along the adjacent competing and feeder routes, the methodology used to modify and develop the models used to estimate future year traffic forecasts, and the 40-year intermediate level T&R forecasts for the facility.

1.5 Report Organization

The remainder of this report is organized into the following chapters:

1.5.1 Chapter 2 Existing Conditions and Data Collection

A series of data collection exercises were conducted in 2015 within the study area, and included collection of traffic counts, origin-destination (O-D) data from AirSage and stated preference surveys.

1.5.2 Chapter 3 Socio-Economic Review

As part of this study, a review of historical trends of the region's economic indicators, including population and employment, was performed to assess growth patterns in the study area. In addition to historical population and employment growth, the projected socio-economic growth from 2020 to 2040 was reviewed.

1.5.3 Chapter 4 Traffic and Revenue Estimates

This chapter includes the travel demand model calibration measures including comparisons of various model data to observed data such as traffic counts, observed travel times, and base year O-D information received from AirSage. Chapter 4 also details traffic and toll revenue assumptions including background future network assumptions, values of time, toll rates, annual traffic and revenue estimates and toll sensitivity curves.

1.5.4 Chapter 5 Sensitivity Analyses

This chapter describes the various sensitivity analyses that were conducted to evaluate how key variables influence the revenue potential of the proposed Centennial Bridge replacement under a toll bridge assumption. A summary of the financial feasibility conducted by RBC is also provided.

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Chapter 2

Existing Conditions and Data Collection

Chapter 2 provides an overview of the existing roadway conditions in the immediate vicinity of the Centennial Bridge project. The information in this section provides an overview of the historical traffic trends on the various existing bridge crossings in the area across the Missouri River.

In order to better understand current traffic conditions and traffic patterns near the Route 92 study corridor and the roadway system within the surrounding study area, extensive data collection efforts were undertaken. A series of data collection exercises were conducted in 2015 within the study area, and included collection of traffic counts and travel time studies. In addition, this study utilized the results of origin-destination (O-D) and stated preference surveys also undertaken as part of this study. These traffic counts and observed speed and delay data are used in the calibration process for the travel demand model, as described in Chapter 4.

This chapter is organized into the following sections:

- Existing Roadway System
- Historical Traffic Trends for Missouri River Crossings
- Traffic Count Program
- Travel Time Data
- Origin-Destination data from AirSage and Intercept Surveys
- Stated Preference Surveys
- Value of Time (VOT)

2.1 Existing Roadway System

This section provides a summary of the characteristics of various existing bridges and roadways in the vicinity of the Centennial Bridge. Figure 2-1 illustrates the various Missouri river crossings in the immediate study area, namely, the existing Centennial Bridge, the I-435 Bridge, the I-635 Bridge and the US 69 Bridge.

The existing Centennial Bridge is an undivided two-lane bridge with no shoulders with a speed limit of 45 mph. It was built in 1955 and carries an average of about 12,000 vehicles daily.

The Amelia Earhart Bridge (US 59) in the vicinity of Atchison (Kansas) and De Kalb (Missouri) to Centennial Bridge is about 26 miles from the Centennial Bridge, and is a four-lane facility.

The I-435 Bridge is a six-lane facility located approximately 16 miles south of the Centennial Bridge. It was built in 1986 and carries about 30,000 vehicles daily with a posted speed limit of 70 mph.

The I-635 Bridge is a four-lane bridge with a posted speed limit of 65 mph. It was built in 1976 and carries about 50,000 vehicles daily.

The US 69 Bridge is a four-lane bridge with a posted speed limit of 45 mph. It was built in 1957, currently under replacement and carries about 13,000 vehicles daily.

Other major roadways in the study corridor include Metropolitan Avenue with a posted speed limit of 35 mph, US-73 (also called Kansas 7) with posted speed limit of 35 mph and MO 92 with a speed limit of approximately 55 mph.

These roadways serve some of the major trip generators in the area including Fort Leavenworth and the prison at Leavenworth on the Kansas side and the Kansas City International (KCI) airport on the Missouri side.

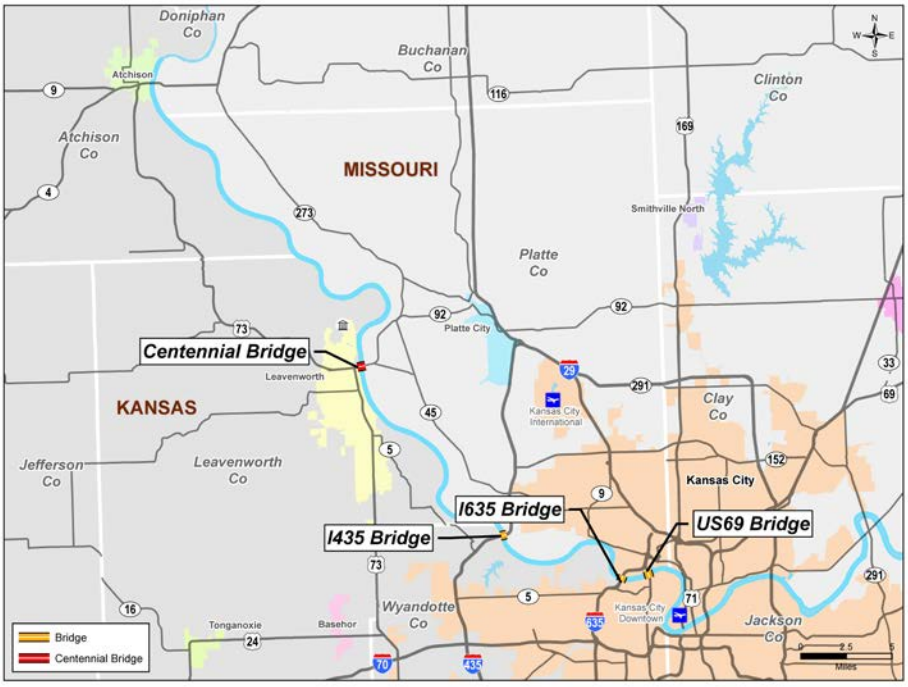


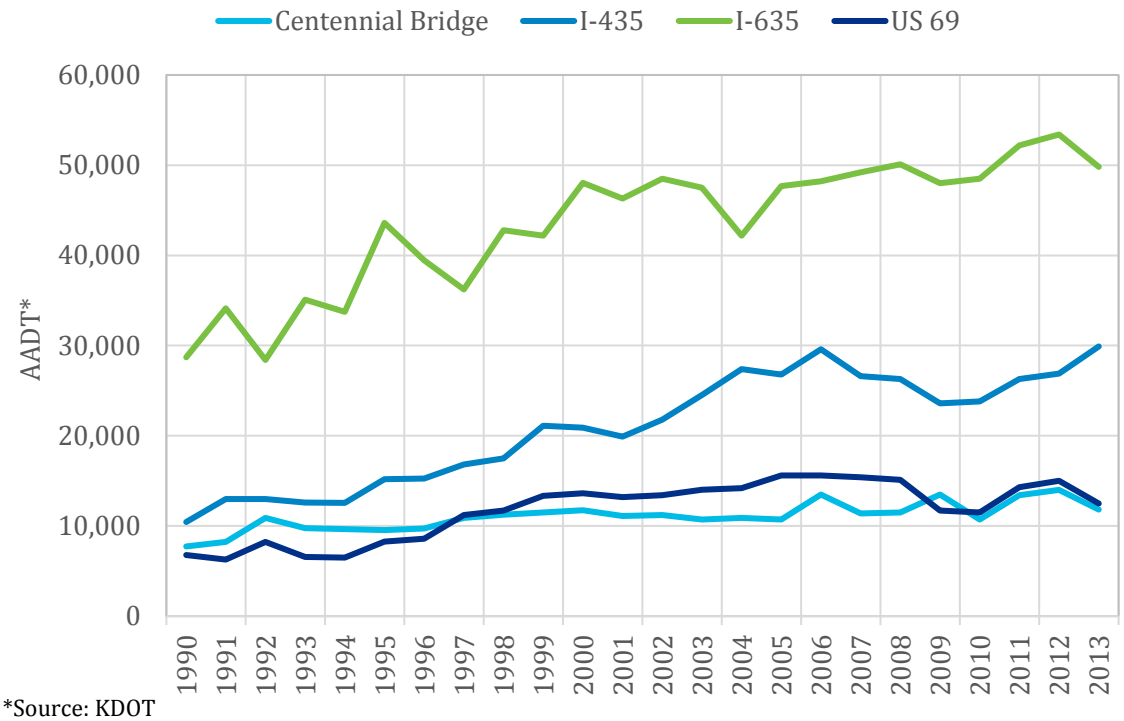
Figure 2-1. Missouri River Crossings in the Immediate Study Area

2.2 Historical Traffic Trends for Missouri River Crossings

This section presents the historical traffic on the existing Centennial Bridge and the other competing bridges across the Missouri River including the I-435, I-635 and US 69 bridges.

Historical counts from the KDOT and Missouri Department of Transportation (MoDOT) were also reviewed. Traffic on Centennial Bridge, I-435, I-635 and US 69 increased at average annual growth rates of 4.3, 7.2, 5.3, and 7.2 percent respectively during the period between 1990 and 2000. As illustrated in Figure 2-2, the growth was relatively modest for the period between 2000

and 2013 (with the exception of I-435). Centennial Bridge showed minimal growth between 2000 and 2013 compared to an annual growth of 2.8 percent on I-435 (the nearest Missouri River crossing located to the south of the Centennial Bridge).



*Source: KDOT

Figure 2-2. Historical Traffic on the Missouri River Crossings

2.3 Traffic Count Program

2.3.1 Traffic Count Data Collection

TranSystems collected traffic count data at multiple locations across the project study area. The traffic count data were used to analyze the total corridor traffic trends and to ensure that the travel demand model outputs used in the traffic forecasting process reflected current traffic characteristics within the project area. The traffic counts at the three screen lines shown in Figure 2-3 were collected for use as part of the base year model calibration process. Traffic counts were collected along the following screen lines:

- Screen line 1 (SL1) Missouri river crossing bridges. This is a natural screen line for traffic crossing the river in the model.
- Screen line 2 (SL2) the external stations of the model north of the study area.
- Screen line 3(SL3) Roadways south of Metropolitan Avenue.

Screen line traffic counts were primarily collected for 48-hour periods in March 2015 and October 2015. Additionally, a few vehicle classification counts were collected in the vicinity of the study area. These classification counts indicated that only about two percent of vehicles on the Centennial Bridge had three or more axles.

In addition to the screen line locations, the following other locations were also counted at spot count locations such as the Kansas City International Airport and Fort Leavenworth.

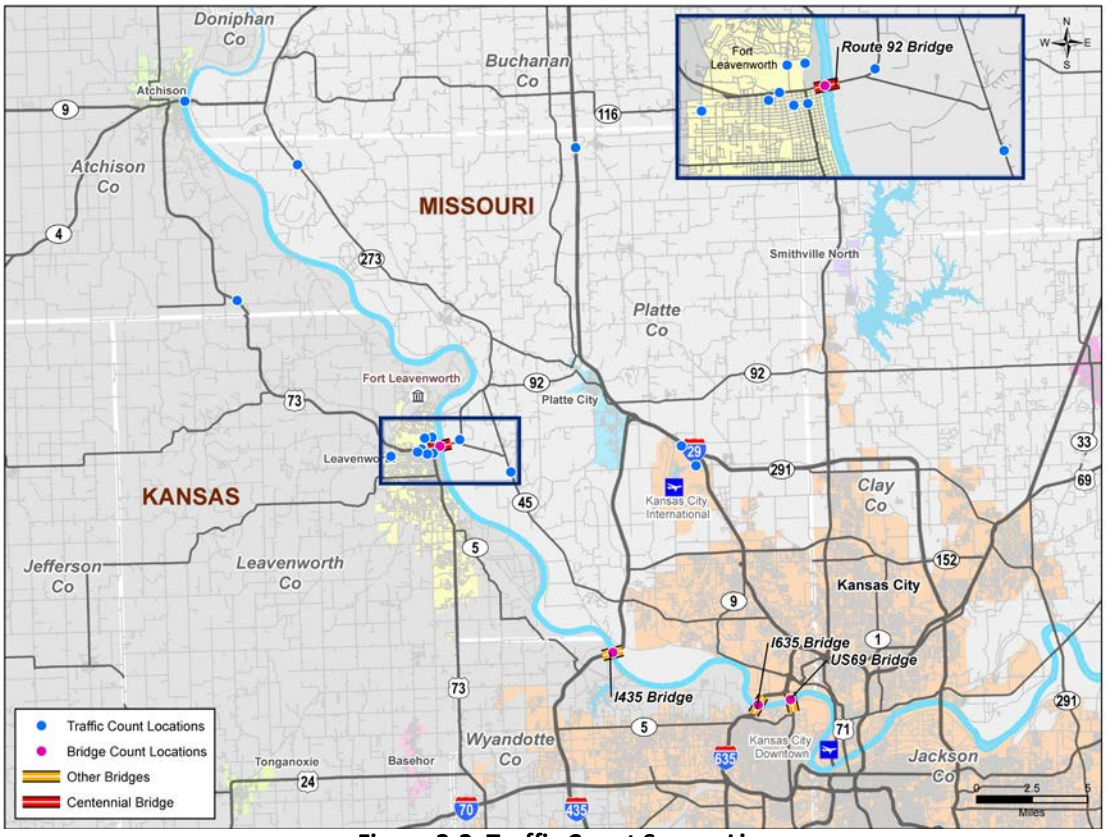


Figure 2-3. Traffic Count Screen Lines

2.3.2 Hourly Traffic Distribution

Figure 2-4 depicts the hourly traffic distribution on Centennial Bridge. A typical commuting pattern is evident with a prominent AM peak traffic pattern in the westbound direction and PM peak in the eastbound direction.

The AM peak hour is observed between 7 AM and 8 AM, while the PM peak hour occurs between 4 PM and 5 PM.

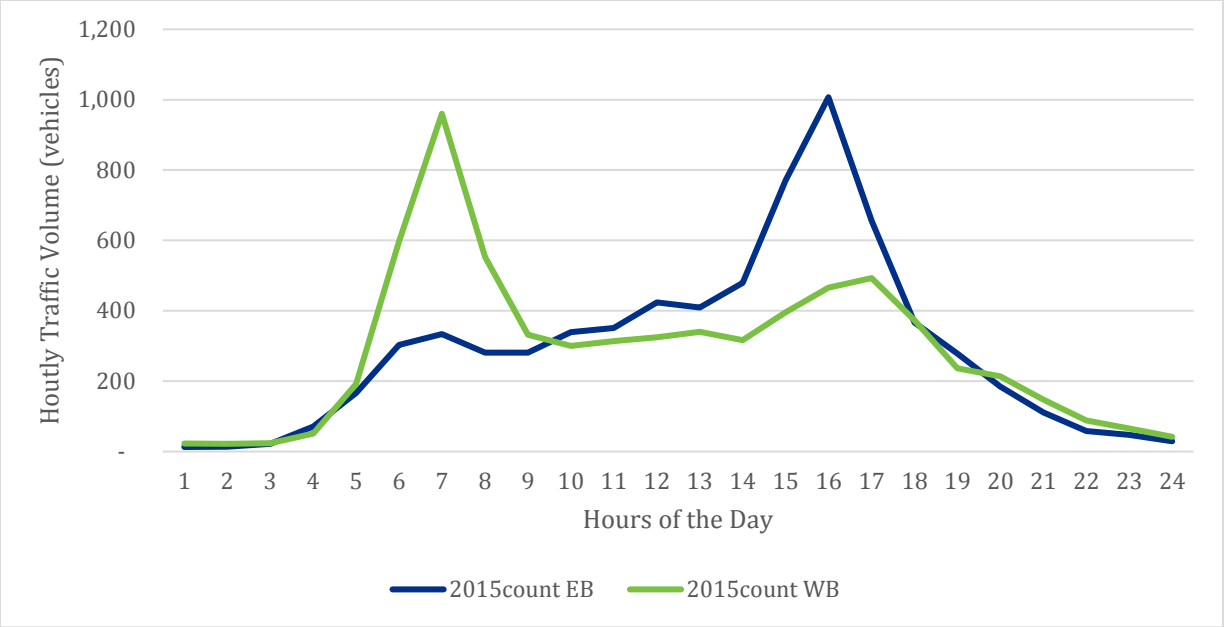


Figure 2-4. Hourly Traffic Distribution on Centennial Bridge

2.3.3 Day of the Week Traffic Distribution

Figure 2-5 illustrates the distribution of Centennial Bridge traffic for different days of the week. Traffic is higher on weekdays than weekends, representing a fairly typical commuter pattern. Eastbound traffic on the bridge is slightly higher than westbound traffic.

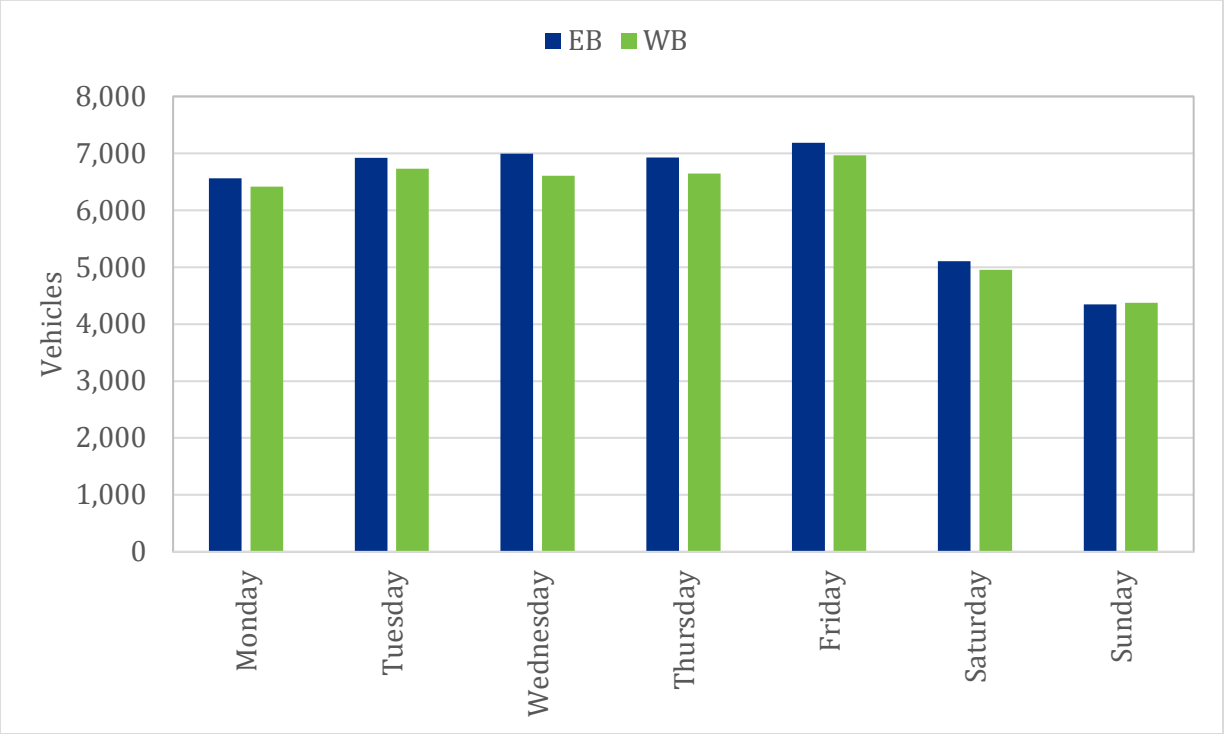


Figure 2-5. Traffic Distribution on Centennial Bridge for Different Days of the Week

2.3.4 Classification Counts

A series of vehicle classifications counts were collected on the Centennial Bridge and on the I-435 Bridge. Figure 2-6 shows the vehicle classification counts on the Centennial Bridge. Two-axle vehicles account for 97.3 percent of the total traffic on the bridge while three or more axle vehicles account for the remaining two percent.

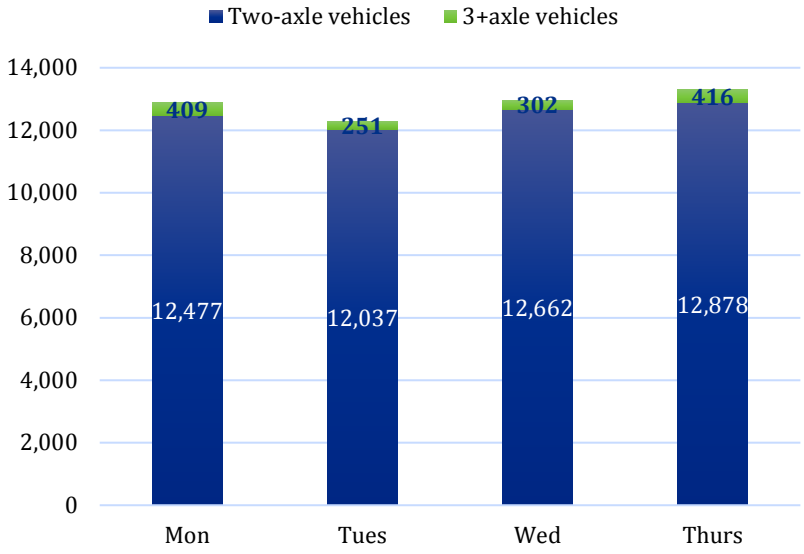


Figure 2-6. Vehicle Classification Counts on the Centennial Bridge

2.4 Travel Time Data

INRIX, Inc., a traffic data company based in Washington State, maintains an archive of travel speed data for thousands of roadways across the United States that is accumulated from GPS-enabled devices along the highway network. INRIX is a Data-as-a-Service (DaaS) company that monitors traffic flow along approximately 260,000 miles of major freeways, highways, urban and rural arterials, and side streets in the United States. This data provides historical as well as real-time traffic data seven days a week, 24 hours a day in as little as 5 minute increments for all metro areas with a population of more than one million. The INRIX travel time data was provided by KDOT for this project.

The observed congested speeds for the peak periods were illustrated using a speed profile index. A speed profile index is defined as the ratio of the congested speed and posted speed. Figure 2-7 illustrates the speed profile index graphically for the AM peak period (7:00AM-9:00AM). The green links represent roadways where the observed speeds were 80 percent of the posted speed, yellow links represent roadways where the observed speeds were 65 percent of the posted speed, orange links represent roadways with observed speeds that are 50 to 65 percent of the posted speed and the red links are links where the observed speeds were less than 50 percent of the posted speed.

In the AM peak, the congestion on the bridge is moderate and speeds range from 30 to 36 mph, as depicted in Figure 2-7.

Figure 2-8 provides an overview of the speed characteristics in the PM peak period (4:00PM-6:00 PM). In the PM peak period, the congestion on the bridge is moderate and the speeds range from 30 to 36 mph.

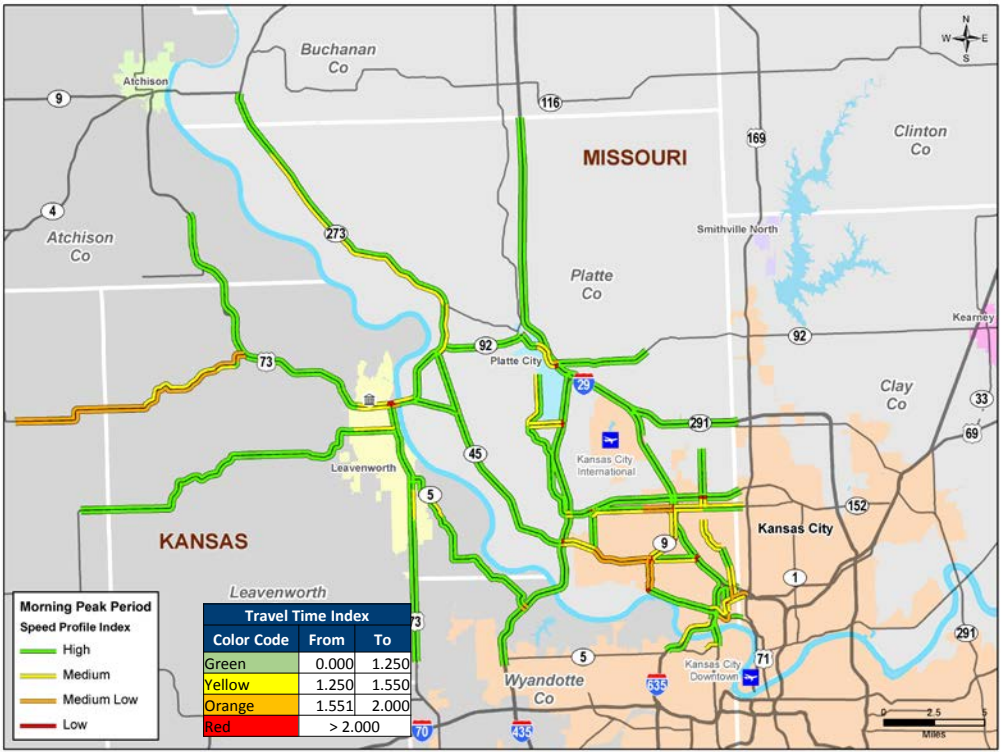


Figure 2-7. Speed Profile Index: Morning Peak Period (7:00AM-9:00AM)

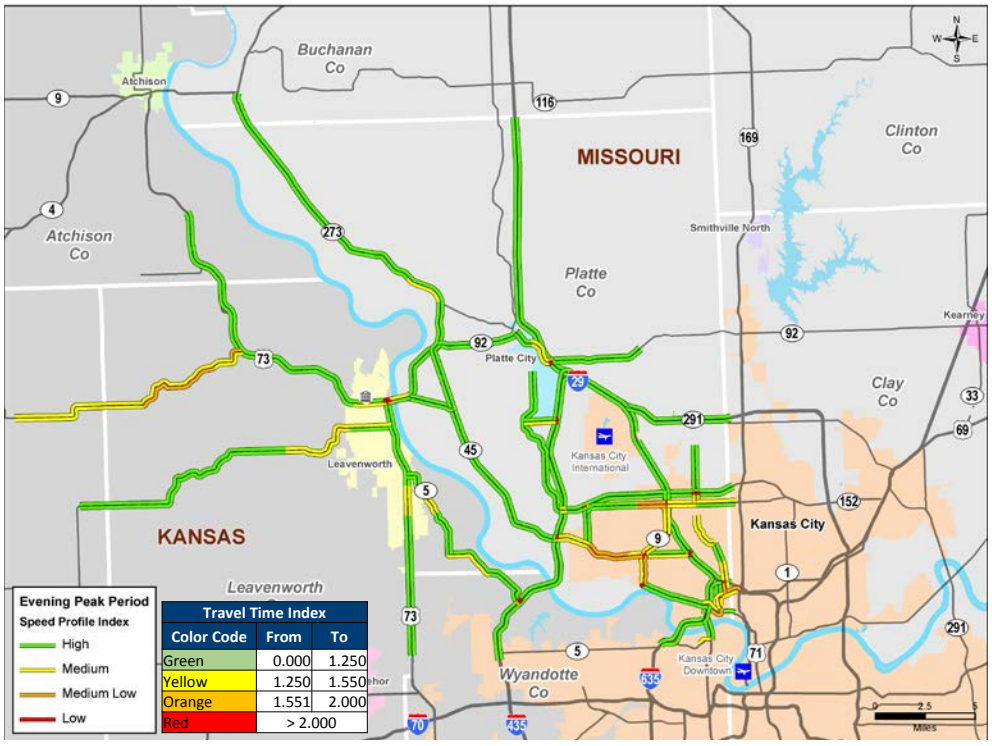


Figure 2-8. Speed Profile Index: Evening Peak Period (4:00PM-6:00PM)

2.5 Origin-Destination Data

Detailed origin-destination (OD) trip data is generally collected to validate trip-making patterns within a study corridor. The OD efforts implemented as part of this study are described in the following sections including the use of AirSage OD data obtained for the region. AirSage uses cellular-signal data to identify temporal travel patterns. This data was also complemented with intercept survey OD data that was collected.

2.5.1 AirSage Data

CDM Smith obtained OD data derived using population movement data and patented technology that monitors cellular telephone signal data from AirSage. AirSage has partnerships with several nationwide wireless phone carriers to access data from more than 100 million mobile devices to obtain general OD patterns while still maintaining the anonymity of any unique movements. AirSage analyzed the available data from the study area to provide OD trip data for the zones identified in the model area.

The data was divided into three trip purposes, home based work trips (HBW), home based other trips (HBO) and non-home based trips (NHB) based on the observed characteristics. The trip data was aggregated by day for the average weekday (Tuesday through Thursday) and the average weekend (Saturday and Sunday). AirSage utilizes aggregated wireless carrier network signaling data in a manner that protects the individual customer information. The sample data is expanded to the full population in the region using specific algorithms developed using census population data. The expansion factors are based on the home location of the devices and the population data.

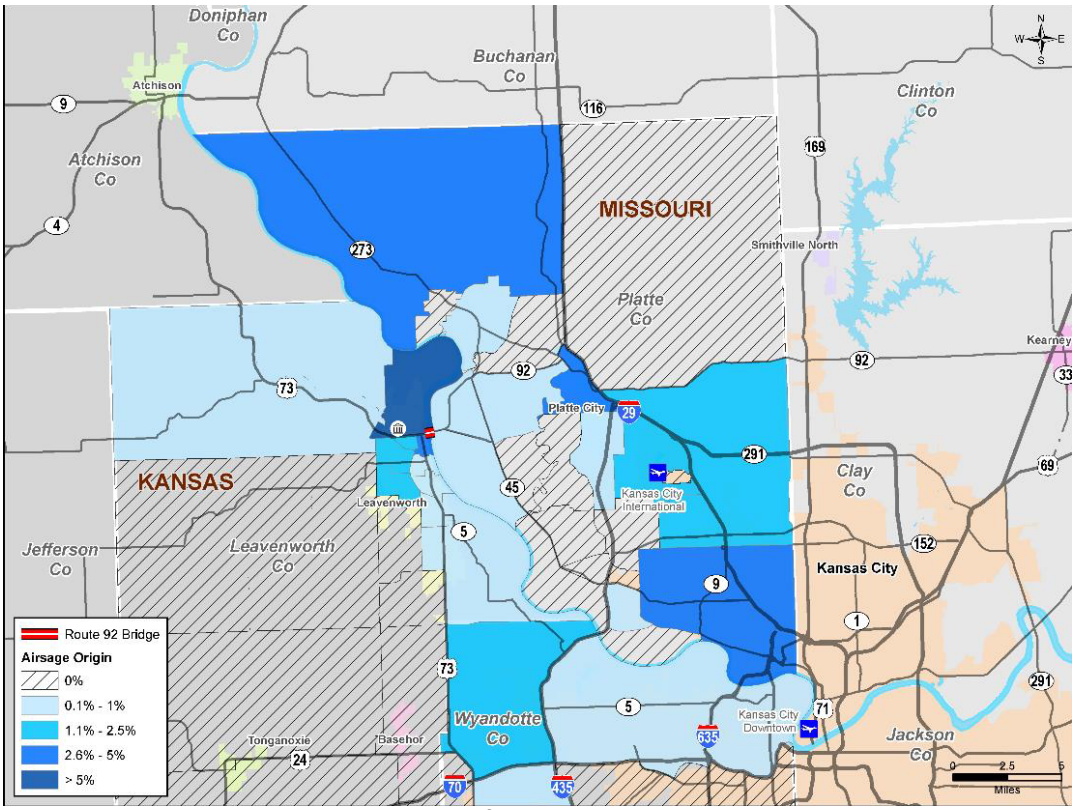


Figure 2-9. Percentage of AirSage Trips Originating by Zone

Although AirSage has visibility of approximately one-third of the population nationwide, the sample size of the usable devices after data cleansing is about 18 percent of the population. The sample size can vary across geographies. AirSage data was purchased at the zonal level within the study area. Additionally, the data corresponding to only traffic that used the Centennial Bridge and the I-435 Bridge routes (select link origin-destination zone pairs for the two bridges) were also acquired. Figure 2-9 illustrates the percentage of trip origins from each zone in the study area. As the figure indicates, the top five origins include Fort Leavenworth, Snow Creek Ski Area, Weston, Kansas Leavenworth, and Platte City. AirSage data is included Data Collection Appendix of the report.

2.5.2 Intercept Surveys

Another source of origin-destination data was the OD intercept survey that was conducted for motorists that used the existing Centennial Bridge. The survey was designed to gather information from all vehicles about the location where the trip began, the location where the trip ended, the purpose of trip, the type of vehicle, the number of occupants, the state where the vehicle was registered, the time of day the vehicle crossed the bridge, the exact route from origin to destination, and whether an exact trip in the opposite direction will be made, on which route, and at what time.

The survey administration process for the two intercept locations involved stopping a random sequence of vehicles crossing the Centennial Bridge in the eastbound direction. The percentage of vehicles surveyed at each location was based on the number of completed surveys required to achieve statistically valid results given the average daily traffic volumes on each highway that was included in the sample. The goal was to obtain data with a precision of at least +/- five percent at the 95 percent level of confidence from each station.

The overall results for the entire survey, which includes data from more than 900 vehicles, have a precision of at least +/- three percent at the 95 percent level of confidence. The actual number of completed surveys exceeded the goals that were established for each station. Figure 2-10 depicts the OD intercept survey trip destinations by zip code in the eastbound direction.

Some of the key results of the intercept survey included:

- A majority of the vehicles crossing the bridge in the eastbound direction were from Kansas (47 percent) or Missouri (38 percent).
- About 73 percent of eastbound vehicles surveyed were single-occupancy vehicles. The mean vehicle occupancy for personal vehicles was 1.57.
- A majority of the trips crossing the bridge in the eastbound direction originated from Leavenworth (91 percent), with a small percentage of trips originating in Atchison and Lansing. About 22 percent of trips captured had an origin in and around Fort Leavenworth.
- The top five reasons that travelers were crossing the bridge included: Work to Home (23 percent), Personal Business (20 percent), Home to Work (15 percent), Business Delivery (14 percent) and Shopping (10 percent).

- About 88 percent of trips crossing eastbound were local trips with an end point in Platte, Clay, counties in Missouri and Jackson, Wyandotte, and Johnson counties in Kansas.
- About 57 percent of vehicles surveyed made the trip more than once a week.

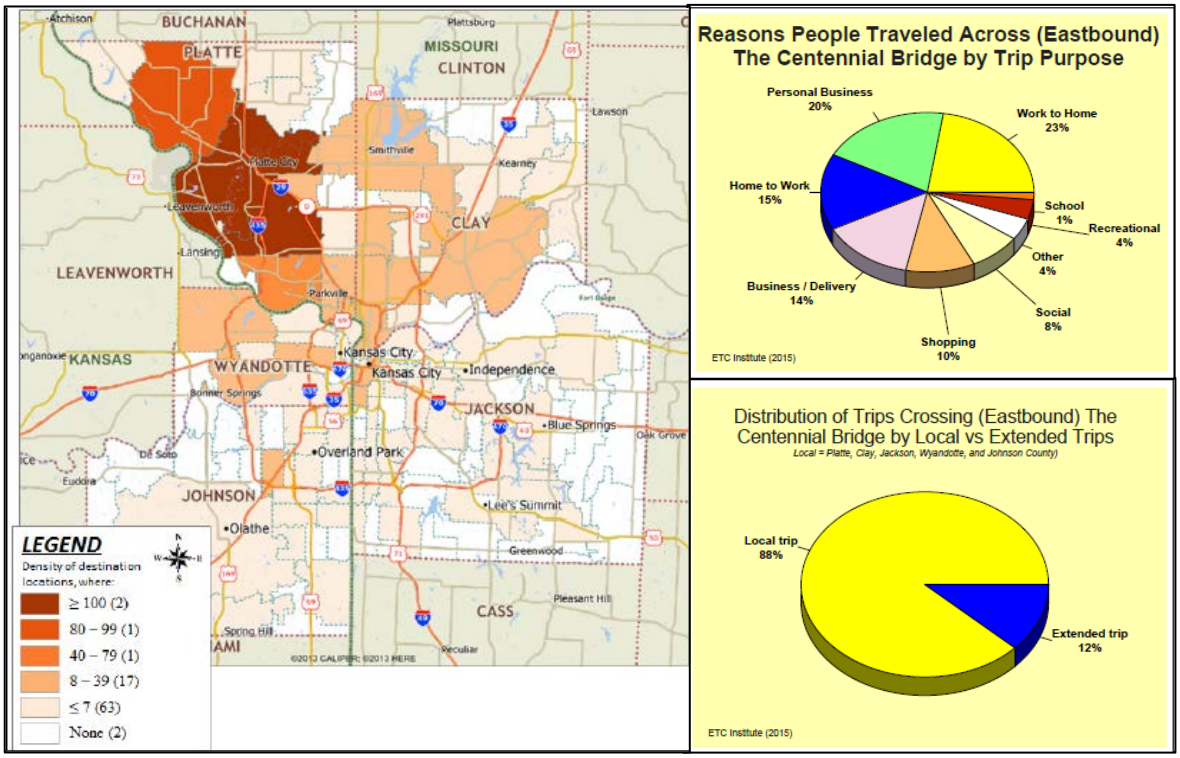


Figure 2-10. Density of Destination Trips by Zip Codes

2.6 Stated Preference Surveys

One major component of this study was the stated preference (SP) surveys to help estimate travelers' values of time, a key factor in determining patrons' willingness to pay tolls. CDM Smith designed the SP survey instrument and ETC Institute, a local firm in Kansas City, was tasked with collecting OD and SP survey data. ETC Institute administered the survey by phone and on the web.

This section details the design of sampling plan, survey instrument, and stated preference survey results.

2.6.1 Sampling Plan

CDM Smith designed a stratified random sampling plan. The sampling plan identified locations to survey and the minimum number of people to survey at each location. The survey was administered to a stratified random sample of 933 residents who made a 10 minute or longer trip that crossed the Centennial Bridge or the I-435 bridge crossing (over the Missouri River) during the past three months. The sample was stratified by geography to ensure that at least 300 surveys were completed by residents of each of the following three areas: Leavenworth, residents of Leavenworth County who live outside of Leavenworth, and Northwest Platte County. This

sampling plan ensured that overall results have a precision of at least +/- three percent at the 95 percent level of confidence.

2.6.2 Survey Administration

Surveys were administered using two different methods. The first method was randomly calling households and asking for participation over the phone via a trained interviewer (CATI System). The second method employed a mailed cover letter to households where only limited access to phone numbers were available. The cover letter explained the purpose of the survey and included a web address that directed the respondent to the self-administered version of the survey. The bulk of these cover letters were sent to– Northwest Platte County – and to a lesser extent– the City of Leavenworth.

Figure 2-11 shows the number of completed surveys in each of the three sample areas. All three geographic areas had a response rate that was large enough to make the sample statistically significant, with Leavenworth County (outside Leavenworth City limits) making up about 35 percent of the total completed surveys.

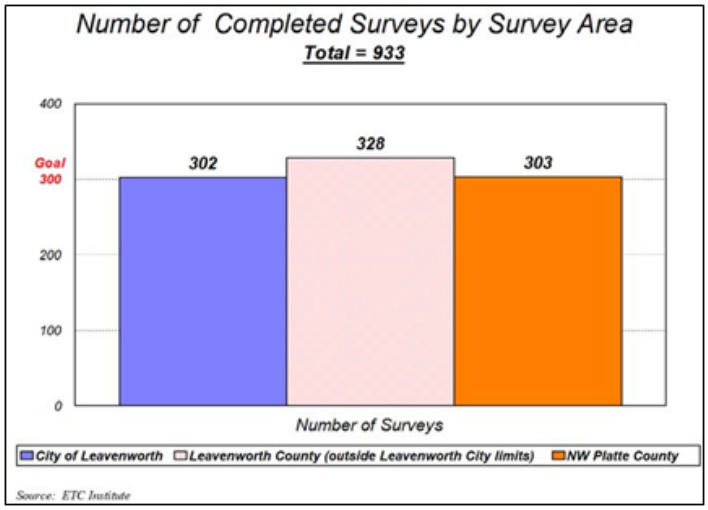


Figure 2-11. Completed Surveys by Geography
ETC Institute Administered the Survey during the Summer of 2015

2.6.3 SP Survey Analysis

CDM Smith used the SP data to develop travelers' values of time (VOT). This study assumed the Centennial Bridge would be tolled starting in year 2020, at which time the bridge may have different levels of congestion from the current levels. To estimate existing congestion levels at the bridge, the bridge users were surveyed about the amount of time they had to wait at the bridge and whether they experienced any delays due to waiting at the bridge. As shown in Figure 2-12, 68 percent of respondents used the Bridge. Of the 68 percent who used the bridge, 15 percent waited to cross the bridge (Figure 2-13), while 23 percent experienced delays at some point during the trip in which they used the bridge (Figure 2-14). The 23 percent who experienced delay, 65 percent experienced that delay on the bridge.

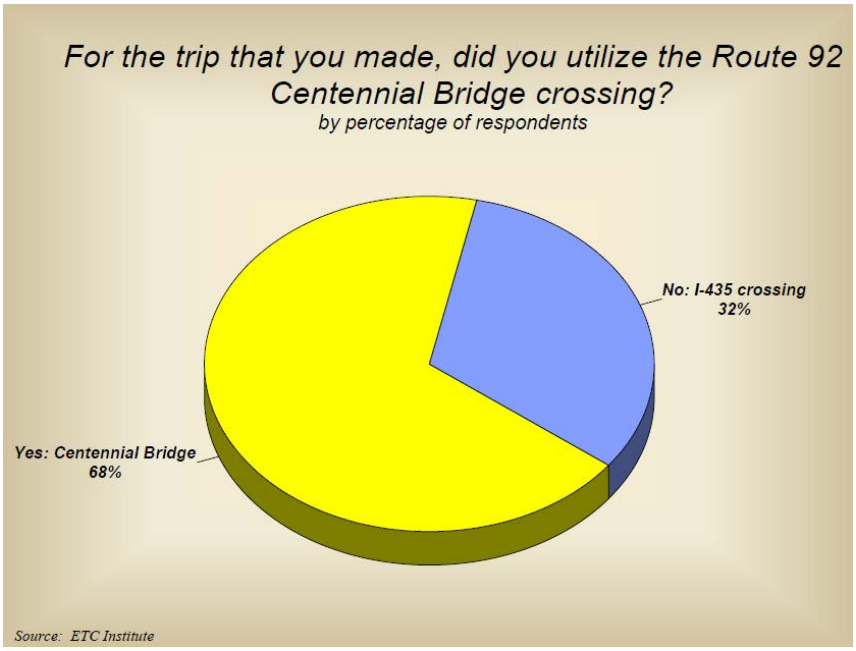


Figure 2-12. Centennial Bridge Usage (Source: ETC Institute)

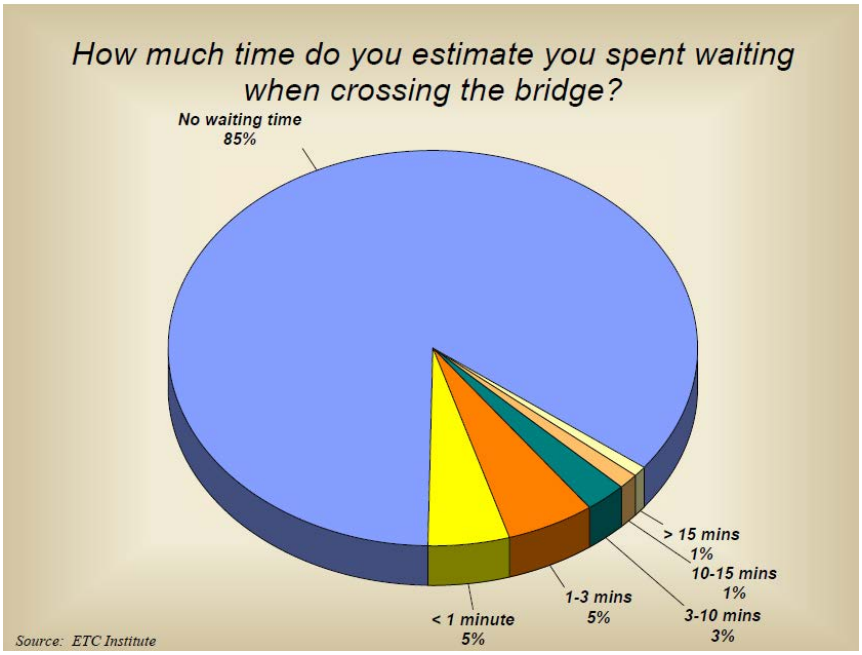


Figure 2-13. Time Spent Waiting to use the Centennial Bridge (Source: ETC Institute)

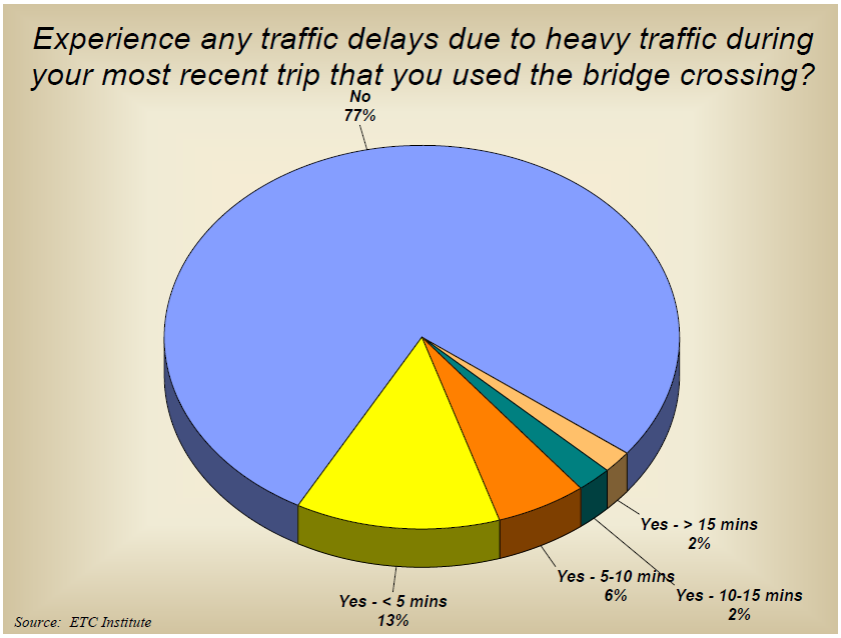


Figure 2-14. Congestion for the Trip using Centennial Bridge (Source: ETC Institute)

2.7 Value of Time

Based on the results of the SP surveys, CDM Smith developed 24 multinomial logit (MNL) models. Nine models were related to trip purpose – (peak, off-peak, average) for three trip purposes, and nine models for geography – (peak, off-peak, average) for three major areas, and six models for the full sample – peak, off-peak, and average of peak and off-peak.

Additionally, two models were developed, one with and another without the toll dummy to account for respondent policy response bias. The final model that was used has a toll dummy and includes log transformation of the income.

Coefficients of the time and cost from the MNL were used to derive VOT. The trip was said to be in a peak period if it was undertaken on a weekday between the hours of 6:00AM-9:00AM (morning peak), or between 3:00PM-7:00PM (evening peak). All other trips on weekdays were defined to fall in off-peak times. Trips on the weekends were defined to be off-peak trips. Table 2-1 shows VOT by income for the peak, off-peak, and sample average.

Table 2-1. VOT for Income Levels

HH Income	Off-peak	Peak	Average
Less than $25,000	$7.55	$9.84	$8.14
$25,000-$50,000	$10.84	$14.13	$11.68
$51000	$11.76	$15.32	$12.67
$50,000-$100,000	$12.91	$16.83	$13.91
$100,000-$150,000	$14.44	$18.82	$15.56
Greater than $200,000	$16.20	$21.11	$17.45

Table 2-2 lists VOT by location for each of the geographies in the survey region. The relative values of VOTs by location make sense since the VOT in each of the locations—the City of Leavenworth, and the two counties—follow the relative median income levels in each of the geographies. However, the VOT values are not derived by plugging in income levels of each of the geographies in a global equation. Separate utility equations were developed for each of the geographies.

Table 2-2. VOT by Location

Location	Off-Peak	Peak	Full Sample
City of Leavenworth1	--	--	$12.40
Leavenworth County2	$14.23	--	$15.24
Platte County	$8.63	$12.92	$10.41

Note:

[1] Sample size low for off-peak, peak

[2] Sample size low for peak

A breakdown of the responses by trip purpose is provided in Figure 2-15. The seven trip purposes were aggregated into three trip purpose categories in Table 2-3, which shows VOT by trip purpose.

The Go To or From Work, Work-related Business, and Go To or From School trip purposes were combined into the Home to Work/Business category in Table 2-3. Social or Recreational, Shopping, and Other Personal Business trip purposes were combined into the Home to Personal Errand category. If respondents indicated that their most recent trip was to the airport, then the trip was classified as an Airport trip, regardless of whether it began or ended at home.

As displayed in Table 2-3, the VOT values are reasonable in relation to each other. For instance, the travel time savings would be valued higher for a trip to the airport than for a commute trip or a personal errand trip. As expected, the lowest VOT was estimated for non-essential personal errand trips.

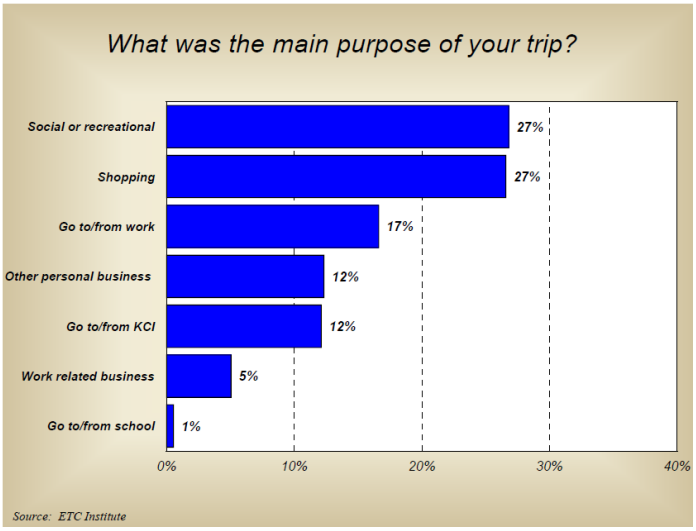


Figure 2-15. Trip Purpose (Source: ETC Institute)

Table 2-3 VOT by Trip Purpose

Trip Purpose	Off-Peak	Peak	Total
Home to Work/Business[1]	--	$13.78	$11.65
Home to Personal Errand	$10.80	--	$12.14
Home to Airport[2]	--	--	$14.83
Note: [1] Sample size low for off-peak [2] Sample size low for off-peak, peak			

The VOT estimates from this study were compared to VOT estimates from two other studies in the Kansas City region. The first was conducted in 1996 by KDOT and the second study was from the Texas Transportation Institute (TTI). Table 2-4 shows the VOT estimates from these other studies.

For the first study, the VOT was about $11.89 per hour in 1996 dollars for two-axle vehicles. If the 1996 VOT was inflated at two percent annually, the two-axle vehicle VOT will be just over $17.00 per hour in 2015 dollars, which is $4.33 per hour higher than the mean VOT ($12.67 per hour) from this study. The VOT was also compared against a second source, the Annual TTI Mobility Report, which captures congestion across the nation. The TTI report offered an estimate of 18 dollars per hour for the Kansas City area. This is $5.33 dollars higher than the mean VOT for this study.

Table 2-4. VOT from Other Studies, 1996

	Car & 4-Tire Truck	6-Tire Truck	3-4 Single Axle Unit	4-Axle Combo	5+ Axle
VOT from KDOT (1996$)[1]	$11.89	$13.48	$25.32	$32.17	$32.35
VOT from KDOT (Inflated to 2015$)[2]	$17.32	$19.64	$36.89	$46.87	$47.13
VOT from TTI	$18.00				
[1]Benefits and Costs of Kansas Comprehensive Highway Program, Department of Transportation Kansas, January 1999 [2]VOT in 2015$ assuming two percent inflation					

Rather than using a global estimate of VOT during the travel demand modeling process, separate utility equations for each individual Traffic Analysis Zone (TAZ) were applied. The utility equations were a function of log transformation of income, which was calculated for each TAZ.

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Chapter 3

Socio-Economic Review

The forecasts developed for this study reflect the latest socio-economic growth assumptions for the Kansas City metropolitan region. These socio-economic inputs are critical to the estimation of the potential T&R expected to be generated by the proposed Centennial Bridge replacement bridge under a toll bridge assumption.

As part of this study, socio-economic review was undertaken to evaluate the validity of the current and anticipated growth of population and employment within the Mid-America Regional Council (MARC) region. A series of checks of the underlying demographic data including reasonableness of growth rates at the zonal and county level, household sizes, and median household income comparisons were conducted to ensure reasonableness of the data across model years. Additional due diligence including a review of historical population and employment growth was conducted.

This chapter is organized into the following sections:

- Historical Population and Employment Trends
- Future Population and Employment Growth by Zone
- Regional Growth Forecasts
- Unemployment Rate
- Median Household Income
- Consumer Price Index
- Major Employers in the Route 92 Corridor

3.1 Historical Population and Employment Trends

A review of historical trends of the region's economic indicators, including population and employment, was performed to assess growth patterns in the study area. The county population of Leavenworth and Platte counties increased by an average annual growth rate of 0.8 percent and 1.5 percent respectively from 1990 to 2010, with the two counties adding about 43,000 new residents over this time period.

Similarly, Table 3-1 and Table 3-2 also indicate that the future population and employment growth in Leavenworth County from 2010 to 2040 will remain at an average of 0.9 percent and 0.3 percent respectively. Platte County is expected to grow at a rate of 1.5 percent in population and 2.7 percent in employment from 2010 to 2040.

Table 3-1. County Population Growth (Historical and Projected)

County	Population			Average Annual Growth	
	1990*	2010*	2040**	1990-2010	2010-2040
Leavenworth	64,371	76,227	99,329	0.8%	0.9%
Platte	58,274	89,322	140,512	2.2%	1.5%

*-Census Data, US Census 1990 and 2010

**-MARC Model Demographic Data

Table 3-2. County Employment Growth (Historical and Projected)

County	Employment			Average Annual Growth	
	2001*	2010*	2040**	2001-2010	2010-2040
Leavenworth	19,989	21,253	23,451	0.7%	0.3%
Platte	34,590	38,809	85,082	1.3%	2.7%

*- Bureau of Labor Statistics data

** - MARC model demographic data

3.2 Future Population and Employment Growth by Zone

Figure 3-1 and Figure 3-2 illustrate the anticipated growth in population by traffic analysis zone (TAZ) from 2010 to 2020 and from 2020 to 2040 respectively. As the map in Figure 3.1 indicates, there is very modest population growth projected in Leavenworth County while zones in Platte City and Platte County show some growth in population.

Figure 3-3 and Figure 3-4 illustrate the anticipated growth in employment by TAZ from 2010 to 2020 and from 2020 to 2040 respectively. The employment projections in zones in the Leavenworth area and in the general study area around the bridge do not showing significant growth in this period.

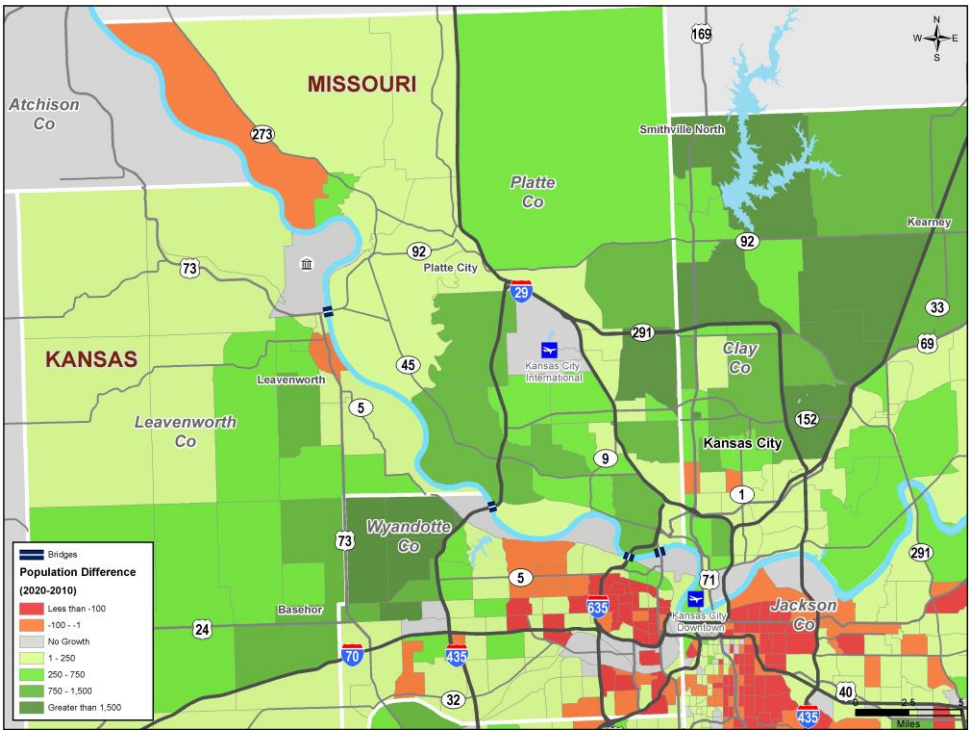

Figure 3-1. Population Change by Zone, 2010-2020

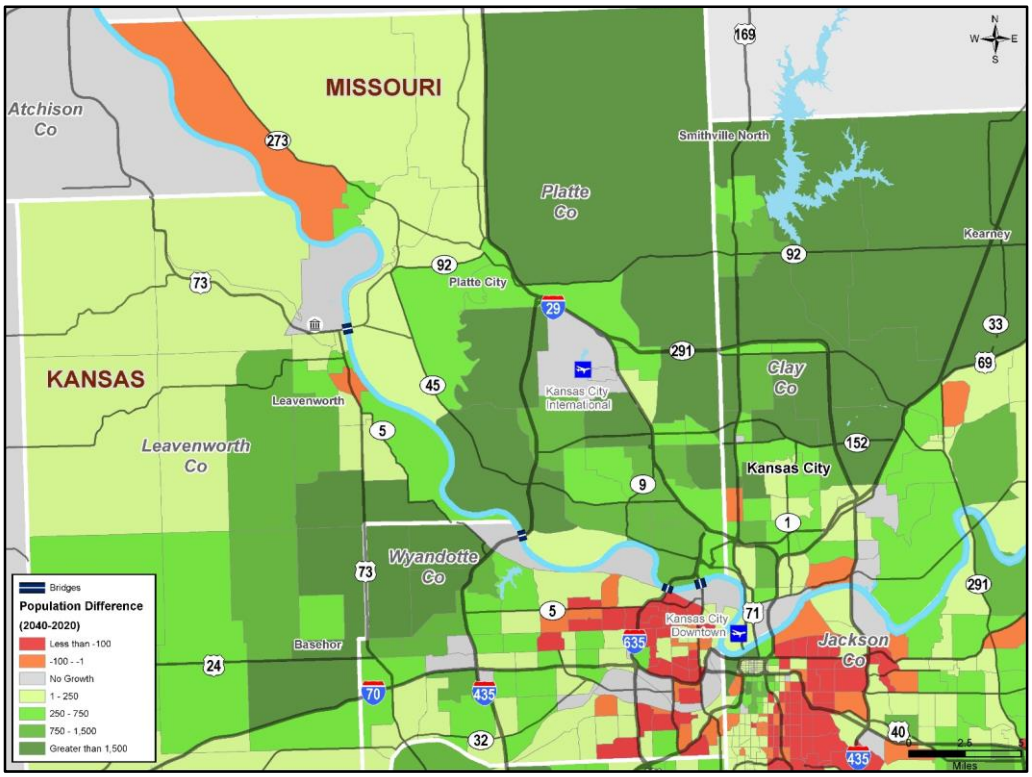

Figure 3-2. Population Change by Zone, 2020-2040

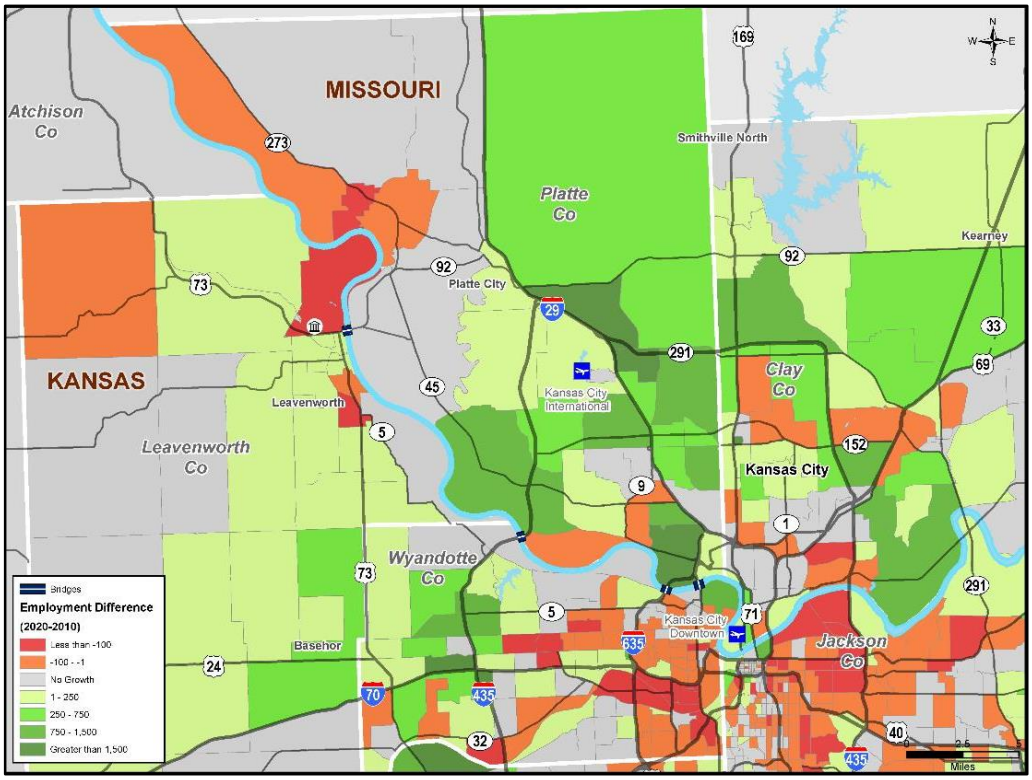

Figure 3-3. Employment Change by Zone, 2010-2020

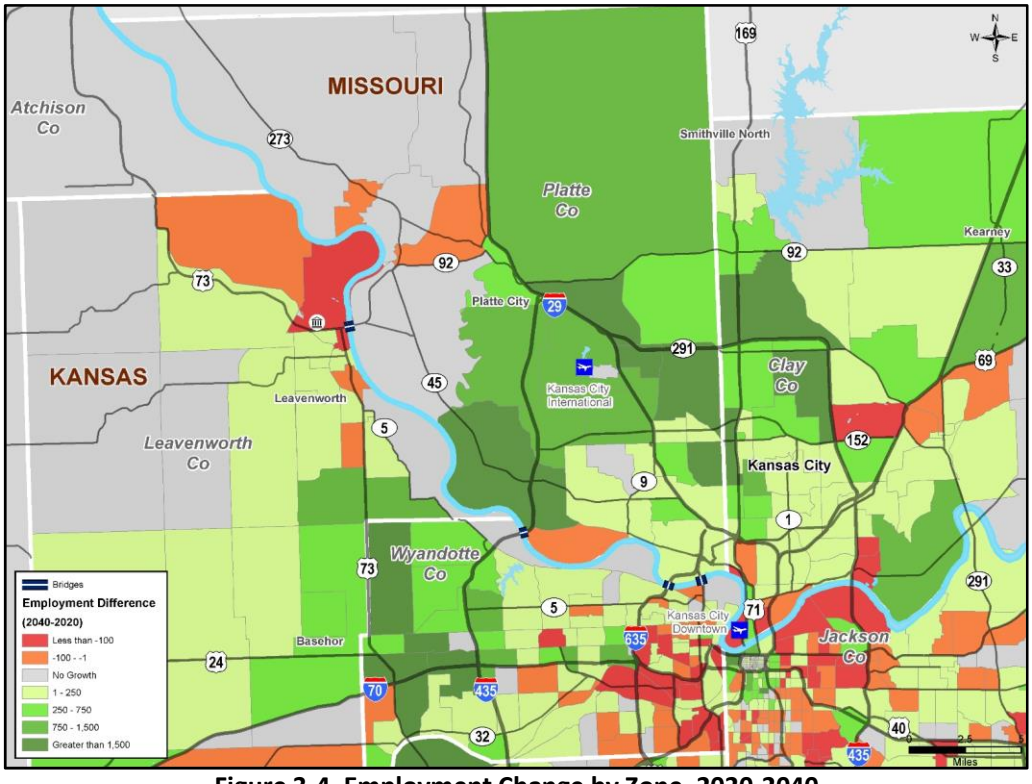

Figure 3-4. Employment Change by Zone, 2020-2040

As part of the socio-economic review of the study corridor, CDM Smith reviewed the population and employment forecasts for Fort Leavenworth, because it is one of the major traffic generators for the proposed Centennial Bridge replacement under a toll bridge assumption. The MARC model showed no growth in the Fort's population between 2010 and 2040. The employment was forecasted to slightly decline by 2030.

The Consultant team met with officials from Fort Leavenworth to discuss the short term and long term growth plan of the area in the vicinity. Based on the Army Stationing and Installation Plan (ASIP), the Fort's population in 2015 was 9,682. Historically, between 2000 and 2015, the Fort's population grew at an average annual growth rate of 2.3 percent. As per the forecasts provided by the Fort, population is projected to decline by year 2020.

3.3 Regional Growth Forecasts

As the Metropolitan Planning Organization (MPO) for the nine-county Kansas City metropolitan region, MARC prepares regional forecasts that are utilized in transportation and other regional planning efforts. Other public and private organizations have also developed population and employment projections for the Kansas City region. These population and employment projections from other sources include:

- The five-county model demographic data
- Woods & Poole Economics, Inc.

Figure 3-5 and Figure 3-6 illustrate the MARC model-based population and employment from 2010 through 2040 (in ten-year increments) for Leavenworth and Platte Counties. Historical population is based on information from the U.S. Census Bureau. Also shown in the population and employment graphics are forecasts from Woods and Poole and the five-county model.

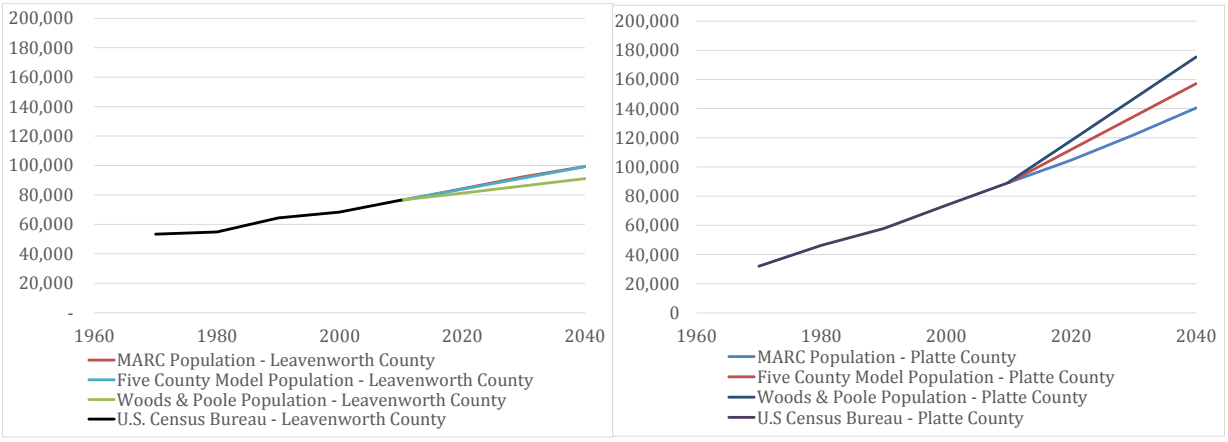

Figure 3-5. Comparison of Population Growth Forecasts - Leavenworth and Platte Counties

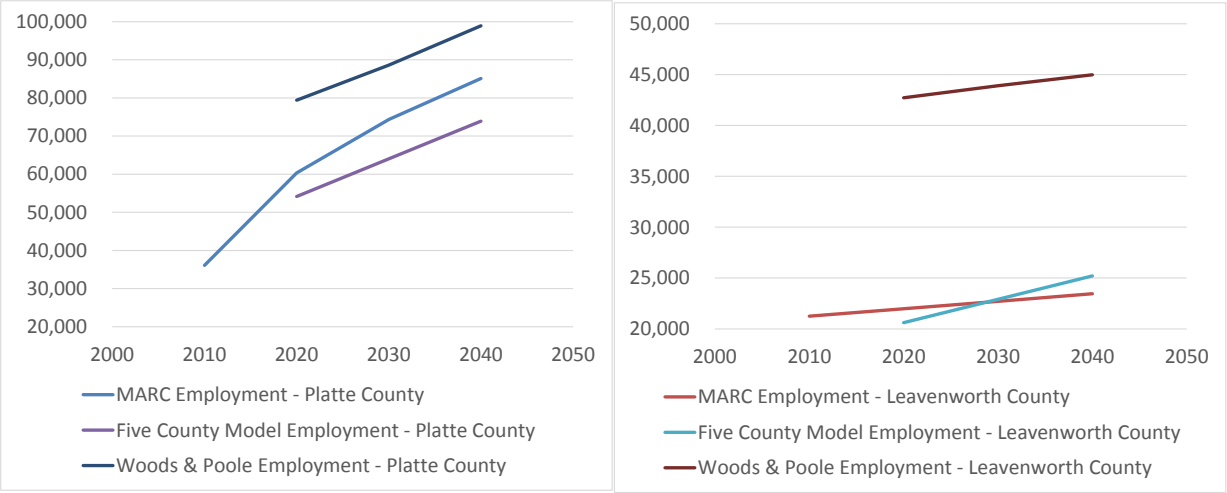

Figure 3-6. Comparison of Employment Growth Forecasts – Platte and Leavenworth Counties

3.4 Unemployment Rate

According to the Bureau of Labor Statistics (BLS), the unemployment rate for Leavenworth County and Platte County was about 4.5 percent and 4.2 percent respectively in 2015, which is lower than national average of 5.3 percent.

Figure 3-7 illustrates the unemployment rate for adjacent Kansas and Missouri counties, according to the BLS. Both Leavenworth and Platte Counties had an unemployment rate around five percent in 2014, compared to a national average of more than six percent.

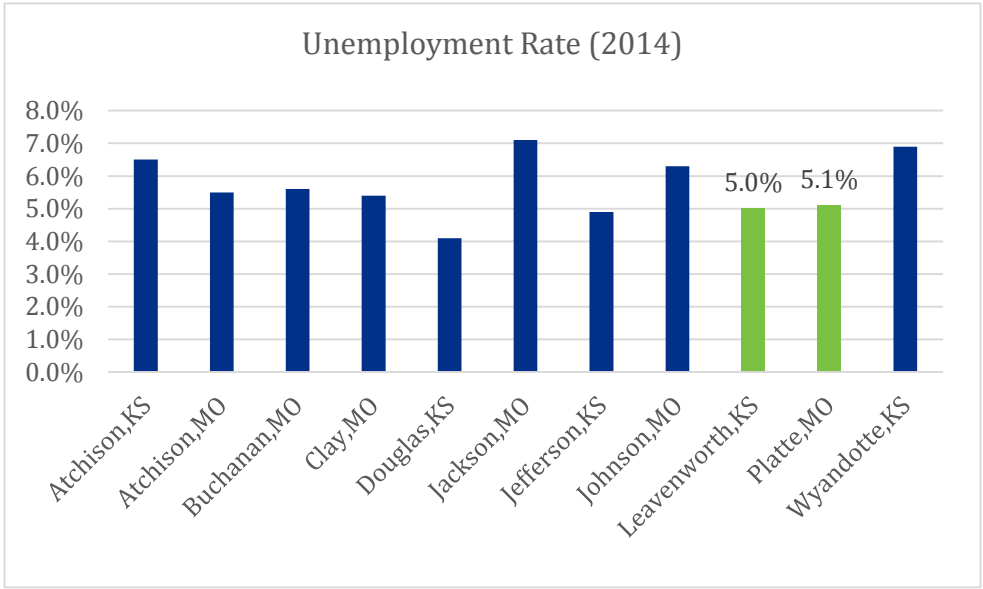

Figure 3-7. Unemployment Rate for Kansas and Missouri Counties in Study Area (Source: Bureau of Labor Statistics)

3.5 Median Household Income

Travel demand in general is sensitive to, among other things, the amount of disposable income available to a household. Regarding demand for toll facilities, a reliable indicator of an individual's propensity to pay tolls instead of free alternatives is income; this is a key input into the assessment of the values-of-time for a motorist as there is typically a relationship between values-of-time, income and motorists' willingness-to-pay tolls. Figure 3-8 illustrates the median household income growth trends from 2005 to 2013.

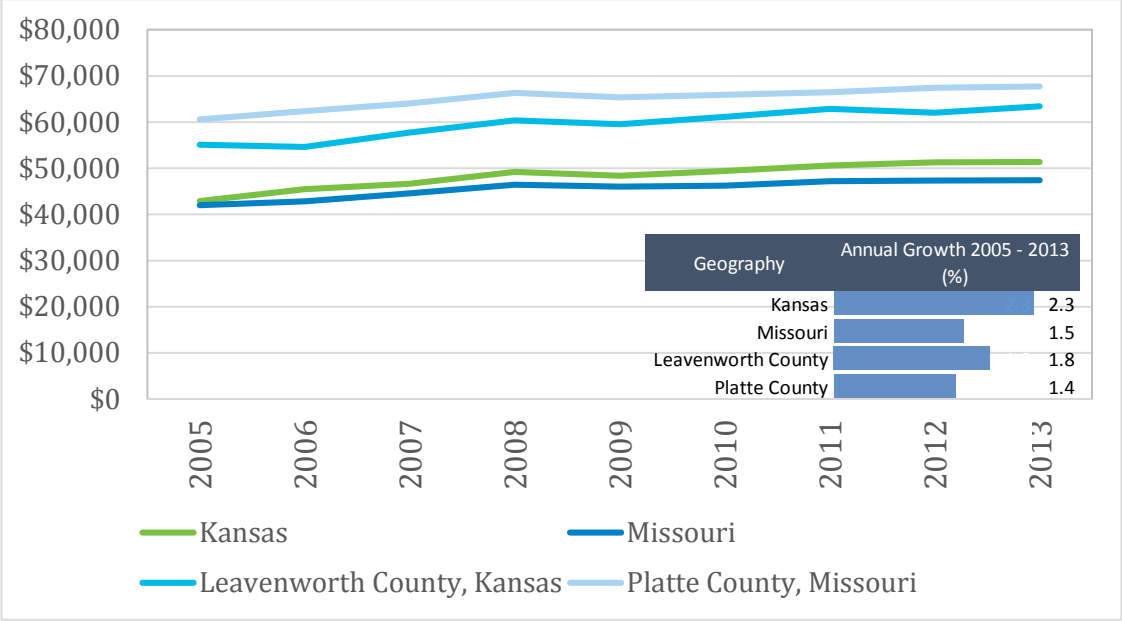

Figure 3-8. Median Income for Counties in Immediate Study Area (Source: U.S. Census Bureau)

In 2014, the median household incomes of Leavenworth County and Platte County were $64,909 and $68,638 respectively according to the U.S. Census Bureau. Between 2005 and 2013, the median household income of Leavenworth County grew at an average annual rate of 1.8 percent and that of Platte County grew at an average annual rate of 1.4 percent.

Both Leavenworth County and Platte County median household incomes are higher than both the Kansas and Missouri median household incomes. The median household income for the City of Leavenworth was $52,022 in 2014, according the U.S. Census, which is higher than the state but lower than the national median household income. In 2014, the median household income for Platte County was $52,022.

3.6 Consumer Price Index

The Consumer Price Index (CPI) is the most widely used measure of inflation and serves as an economic indicator. The CPI determines the aggregate price level of a specific market basket of goods and services that are consumed by typical households. This is done by calculating the average going price of each item in the market basket. The Consumer Price Index program

maintained by BLS produces monthly data on changes in the prices paid by urban consumers for that representative basket of goods and services.

The growth in CPI or the rate of inflation is used to determine the inflation assumption for VOT, toll rates and operating costs.

Figure 3-9 illustrates how the CPI has changed from 1995 to 2015 (in 2005 dollars). The CPI for the Kansas City metropolitan region increased at a rate of 2.5 percent per year from 1995 to 2005 and at 1.8 percent annually from 2005 to 2015. The average inflation over the 20-year period from 1995 to 2015 was approximately 2.1 percent.

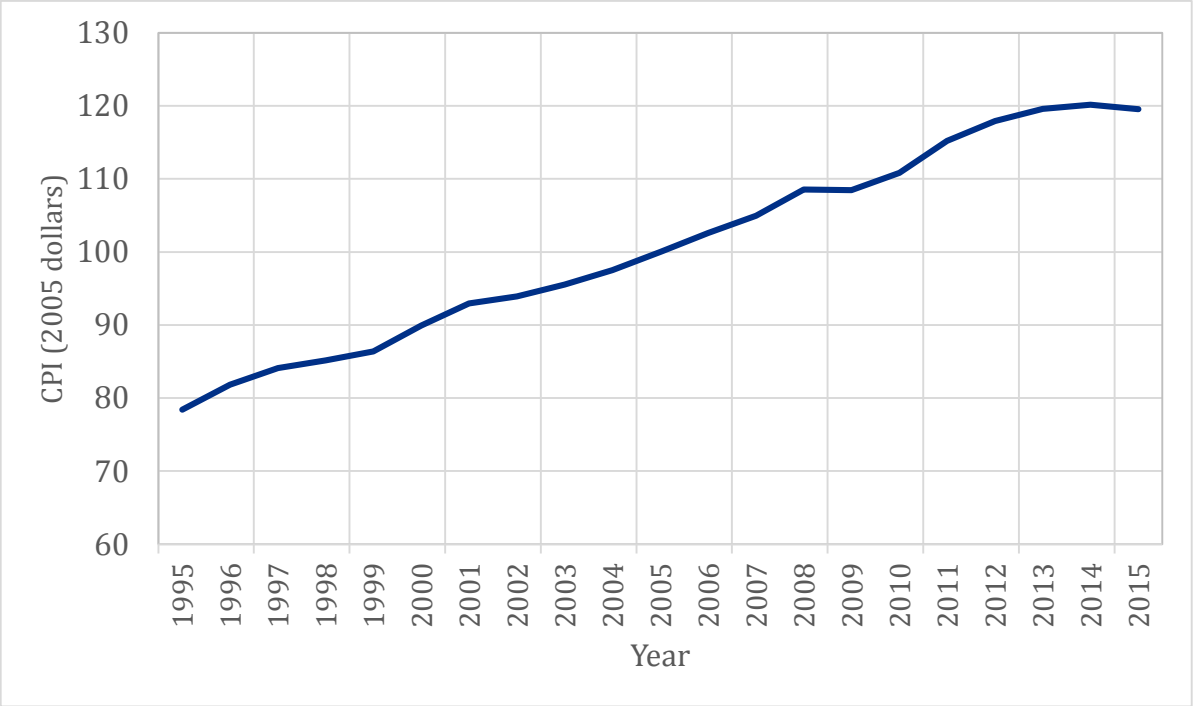

Figure 3-9. Change in CPI, 1995-2015

3.7 Major Employers in the Route 92 Corridor

There are several major employers in the vicinity of Leavenworth and Platte Counties. Table 3-3 lists the major employers in Leavenworth and Platte Counties. Fort Leavenworth is the oldest, continuously active military reservation located in Leavenworth, Kansas and in close vicinity of Centennial Bridge. Fort Leavenworth is the major employer located in the study corridor. Figure 3-10 shows major employers with employees greater than 300 employees located in the study area. Kansas City International Airport (KCI) located in Platte County is also another major employer as well as major traffic generator in the study area. Figure 3-10 shows the location of major employers in the study corridor.

Table 3-3. Major Employers in Leavenworth County and Platte County

Name	Location	Number of Employees
Fort Leavenworth – Military/Civilian	Leavenworth County	4,185
Park University	Platte County	1,016
Saint Luke's Northland Hospital	Platte County	1,000
Lansing Correctional Facility	Leavenworth County	913
Harley-Davidson Motor Co.	Platte County	835
Argosy Casino Hotel & Spa	Platte County	750
Tyco Integrated Security	Platte County	700
VA Eastern Kansas Health Care System	Leavenworth County	700
Northrop Grumman	Leavenworth County	700
Johnson Controls	Platte County	600
Kansas City Aviation Department	Platte County	520
Central Plains Consolidated Patient Account Center (CPAC)	Leavenworth County	400
Cubic Defense Applications Group	Leavenworth County	390
U.S. Penitentiary	Leavenworth County	380
Travelport	Platte County	359
Leavenworth County Government	Leavenworth County	352
Walmart Supercenter	Leavenworth County	350
Smithfield	Platte County	326
Aviation Technical Services	Platte County	297
HMS Host/LJA joint Venture	Platte County	275
Fort Leavenworth Schools USD #207	Leavenworth County	275
Hallmark Cards	Leavenworth County	260
Platte County Government	Platte County	255
VA Consolidated Mail Order Pharmacy (CMOP)	Leavenworth County	250
KCP&L (Iatan plant)	Platte County	246
Southwest Airlines	Platte County	245
Faurecia Riverside	Platte County	235
Leavenworth Detention Center (CCA, Inc.)	Leavenworth County	230
Federal Express	Platte County	207
Heatron, Inc.	Leavenworth County	200
Blount International	Platte County	170
Cushing Memorial Hospital	Leavenworth County	170
Armed Forces Insurance	Leavenworth County	170
Hilton-Kansas City Airport	Platte County	160
Saint John Hospital	Leavenworth County	160
The National Golf Club of Kansas City	Platte County	146
Kansas City Airport Marriott	Platte County	145
Embassy Suites	Platte County	144
University of Saint Mary	Leavenworth County	139
American Roofing, Co.	Leavenworth County	120
Great Western Manufacturing	Leavenworth County	115
Cereal Ingredients	Leavenworth County	110

Source: Leavenworth County Development Corporation; Platte County Economic Development Council

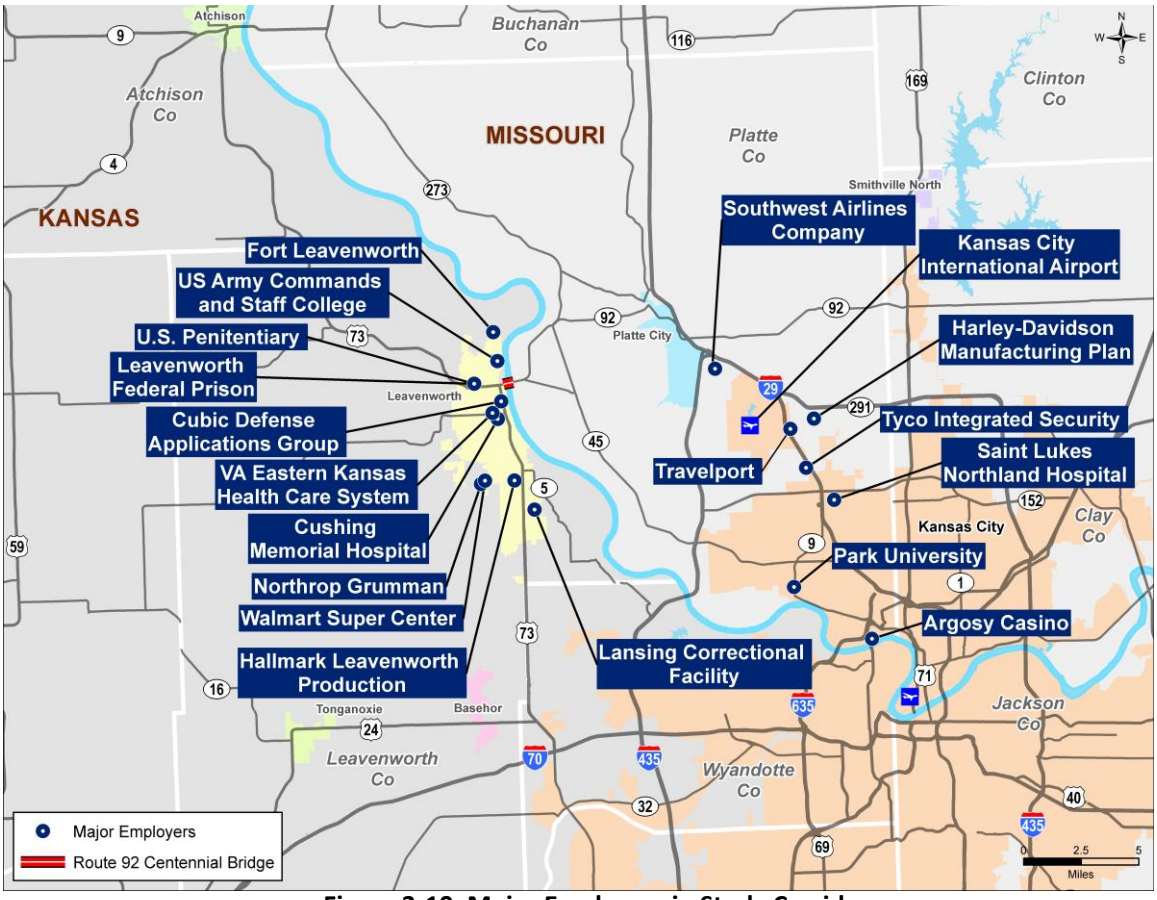

Figure 3-10. Major Employers in Study Corridor

Chapter 4
Traffic and Revenue Estimates

The assessment of the traffic and toll revenue for the Centennial Bridge was accomplished by utilizing a fully updated travel demand model for the Kansas City metropolitan region. This chapter explains the adopted toll analysis methodology for estimating the volume of toll patrons' transactions and toll revenues generated over time by the toll bridge, and also includes the estimated average weekday and the base case annual traffic and toll revenue forecasts. This chapter includes a brief outline of the regional travel demand model update and the refinement process undertaken along with a description of the various inputs and the base year model calibration efforts. The model calibration process included an extensive effort devoted to the refinement and validation of the regional travel demand model.

This chapter is organized into the following sections:

- Travel Demand Model Background
- Travel Demand Model Calibration
- Traffic and Revenue Assumptions
- Comparison of Proposed Toll Rates on Centennial Bridge to Other Bridge Crossings
- Toll Sensitivity Analysis
- Annual Traffic and Toll Revenue Estimates

4.1 Travel Demand Model Background

CDM Smith utilized the latest version of the travel demand model provided by MARC for this study. The MARC regional travel demand model is a four-step model that is implemented using the EMME software platform and uses a detailed zonal structure of 951 TAZs and 30 external stations to represent the Kansas City metropolitan region. Figure 4-1 illustrates the geographic extent of the MARC model (blue shaded area) and the Centennial Bridge study area. The purple area shows the Centennial Bridge study area model. Detailed data collection was conducted in the study area for Centennial Bridge study as described in Chapter 2.

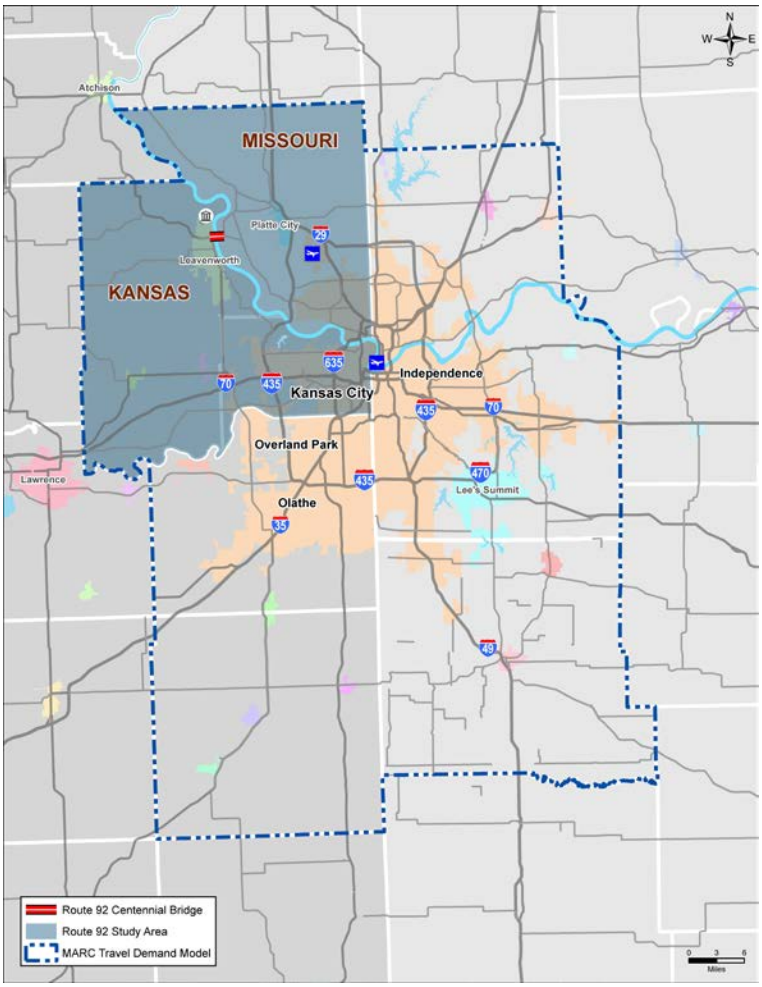

Figure 4-1. MARC Travel Demand Model Region

4.1.1 Travel Demand Modeling and Traffic and Revenue Forecasting Methodology

The MARC regional travel demand model was utilized as a starting point to develop the forecasted traffic and toll revenue estimates for this study. The various steps involved in the forecasting process are depicted in the process flow chart in Figure 4-2.

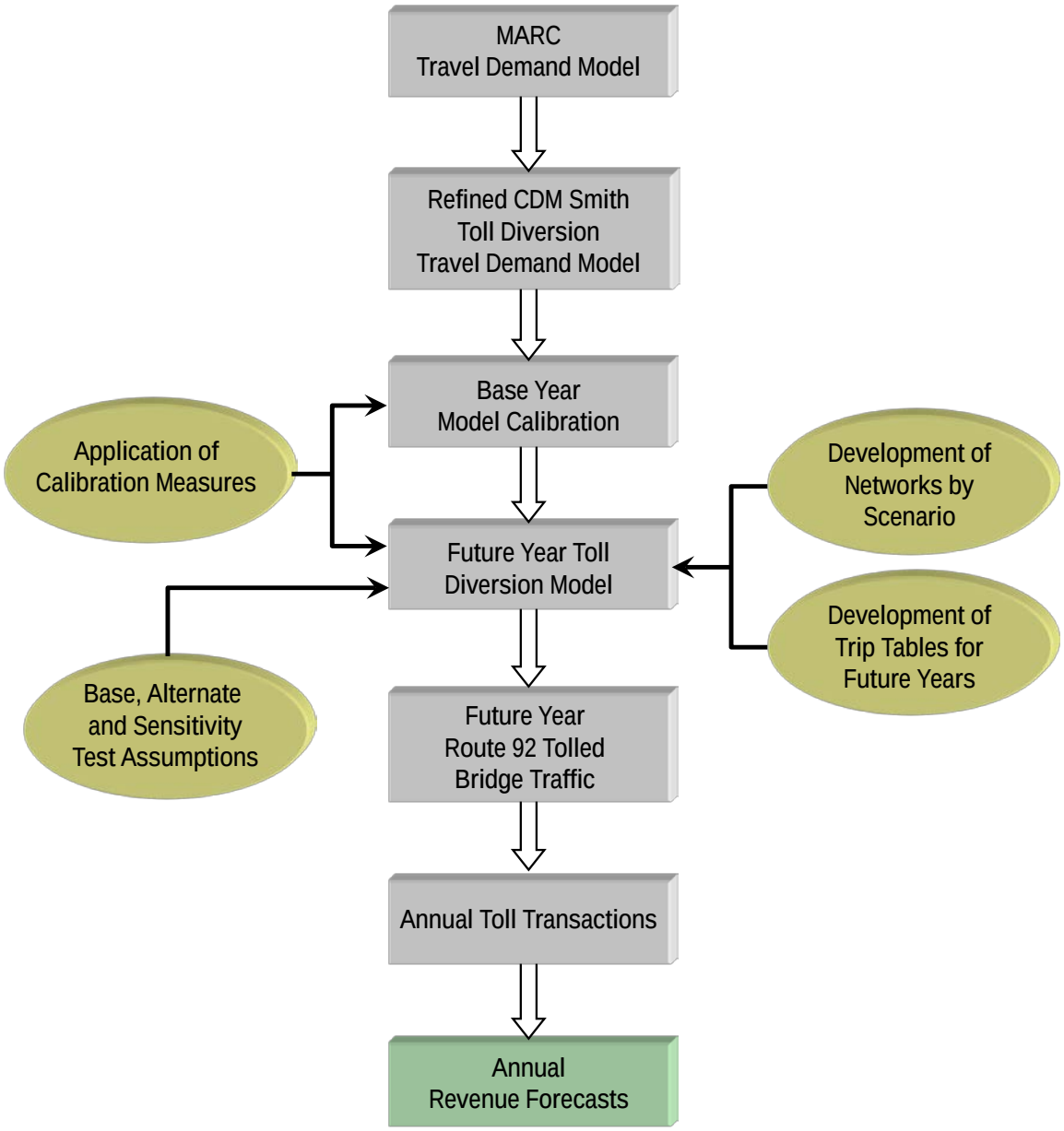

Figure 4-2. Traffic and Toll Revenue Forecasting Process

The MARC model was fine-tuned for base year conditions using the detailed data collection in the study corridor and through an application of appropriate calibration measures which were then applied to the future year networks and trip table model datasets.

4.2 Travel Demand Model Calibration

For the purposes of the study, the MARC model was converted to CDM Smith's standard toll diversion modeling framework. The model was then fine-tuned for base year conditions through an application of appropriate calibration measures which were then applied to the future year model datasets. Future year traffic assignments were conducted and several sensitivity scenarios were undertaken as part of the study. For each scenario, the future year network and trip tables were developed from the calibrated toll diversion model to produce the estimated traffic demand

for the Centennial Bridge for future years. Toll transactions at the tolling location were then extracted from the calibrated model and annual estimates for interim and horizon years, 2022, 2030 and 2040 were developed. Transactions and revenue for the interim years between these model years and forecast years beyond 2040 were interpolated and extrapolated, respectively. Toll revenue estimates were then calculated by applying the appropriate toll rates to the estimated transactions.

The 2015 model network was used as the base year for model validation purposes and the model was calibrated within the immediate study area to represent observed data. To model the travel conditions in the study more accurately, CDM Smith disaggregated few zones, added missing roads, updated free flow speeds, and reviewed network parameters such as the number of lanes, speeds, and centroid connections in the immediate vicinity of the Centennial Bridge. CDM Smith adjusted origin and destination trip distributions for the Centennial Bridge and I-435 river crossing based on AirSage and intercept survey data. External zone and the airport zone trips were adjusted to match observed traffic counts.

The modeled traffic volumes were compared to the traffic counts and actual toll transactions for various roadways to ensure that the screen line modeled volumes match reasonably well with the traffic counts. Figure 4-3 demonstrates that the model volumes at various screen line locations match the traffic counts closely and the base year model calibration is within acceptable limits compared to the maximum desirable deviation specified in the National Cooperative Highway Research Program (NCHRP) 255 manual.

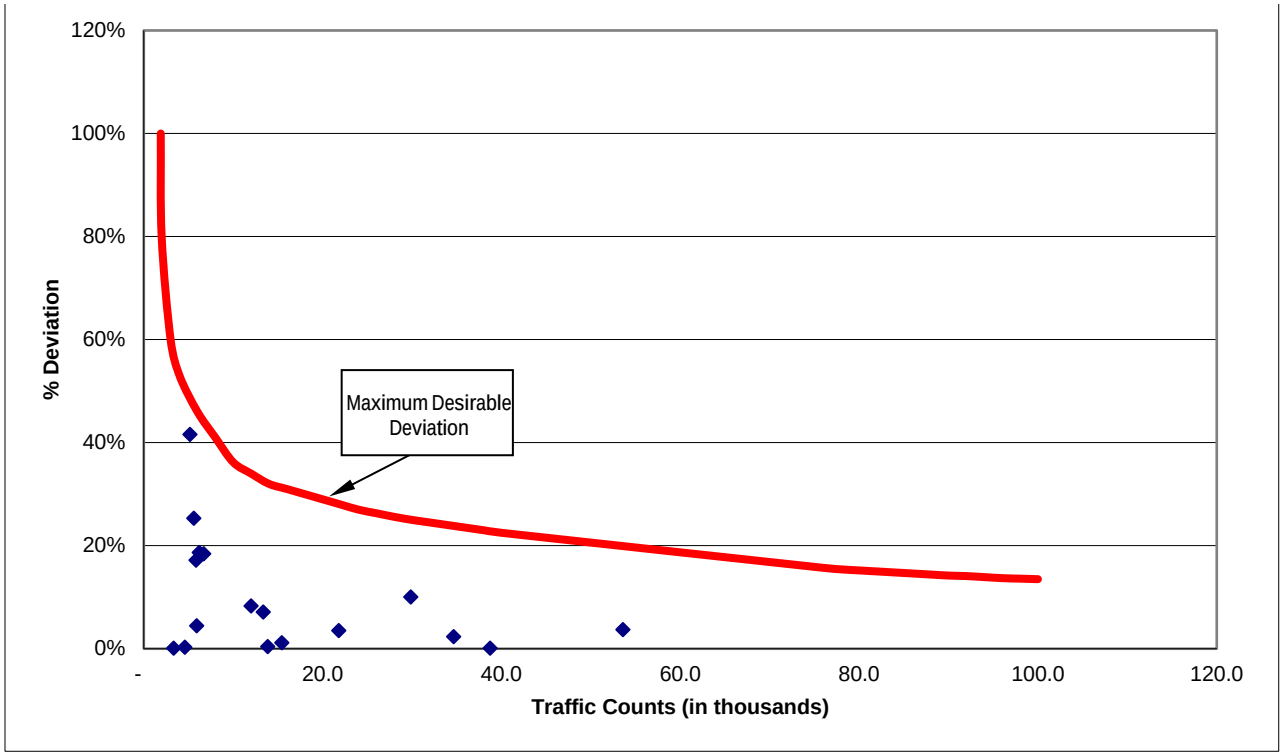

Figure 4-3. Comparison of Model Volumes to Traffic Counts at Screen Lines

The initial model traffic from the MARC model (prior to any modifications and refinements related to calibration by CDM Smith) showed a significantly different peaking pattern than the hourly traffic counts on Centennial Bridge, as indicated in Figure 4-4.

Figure 4-5 illustrates the comparison between the hourly traffic counts and the traffic volumes from the model after CDM Smith base year model calibration. It is observed that the hourly volumes from the calibrated model closely match the traffic volumes.

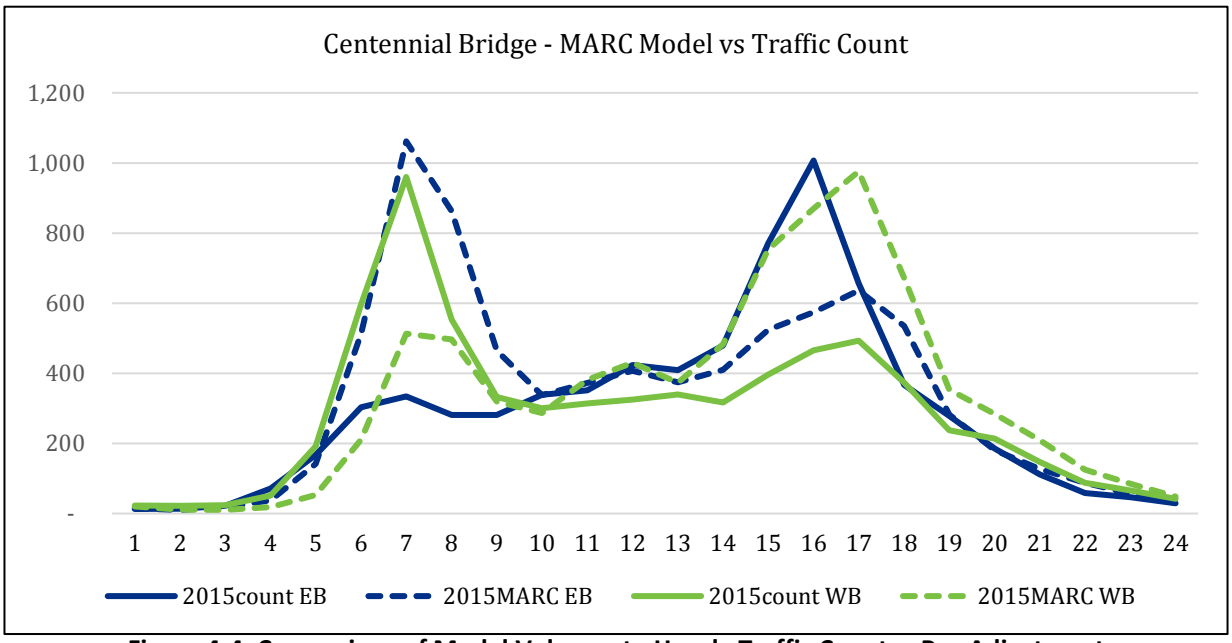

Figure 4-4. Comparison of Model Volumes to Hourly Traffic Counts - Pre-Adjustment

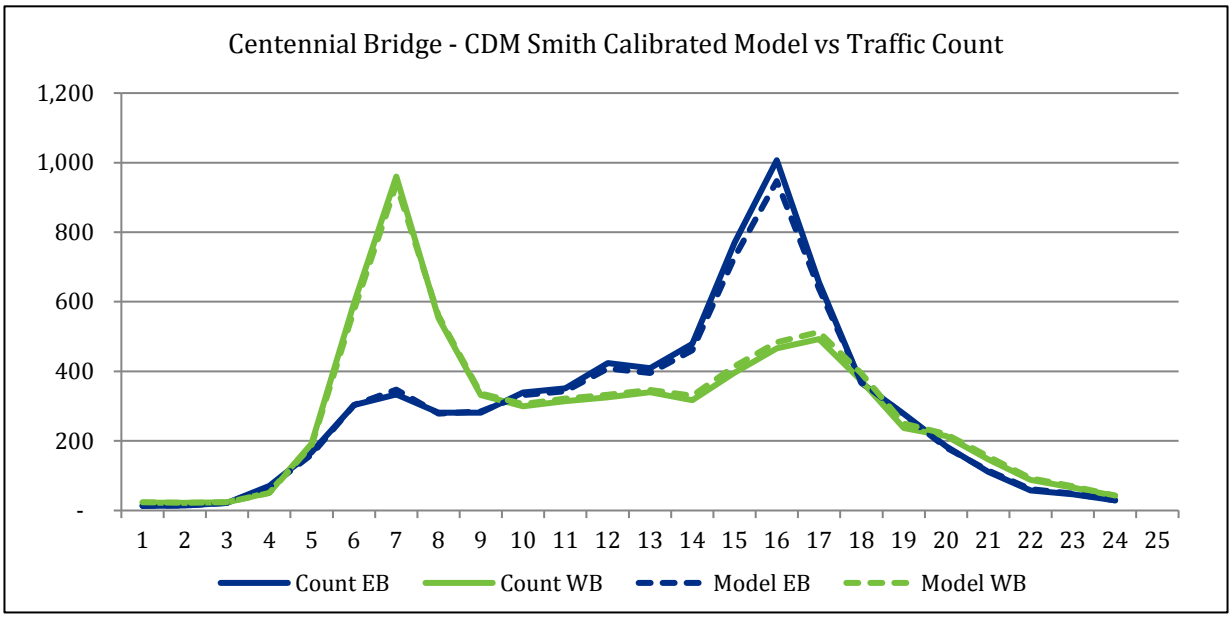

Figure 4-5. Comparison of Model Volumes to Hourly Traffic Counts - Post-Adjustment

Similar to the adjustments made to match the observed Centennial Bridge hourly traffic counts, adjustments were also made to the model so that the model hourly distributions for the other bridges, including I-635, I-435 and US 69, match the observed traffic counts on those facilities.

4.2.1 Travel Time Comparisons

In addition to comparing the model estimated traffic volumes to the observed traffic volumes at the screen lines, the base year model congested speeds were also compared to observed speed data from INRIX and GPS data collection efforts for a few selected routes. The various routes selected for comparison of travel times to INRIX data are listed below:

- Route 1: K-92 east of 207th Street to MO 92 east of I-29
- Route 2: MO 45 from Centennial Bridge to east of I-29
- Route 3: US 73 north of 234th Rd to US 40
- Route 4: K-5 from US 73 to I-435
- Route 5: I-435 north of I-70 to MO 152

Table 4-1 shows the model congested speeds in comparison to the INRIX data for the AM and PM peak periods for the various routes described above. As Table 4-1 indicates, the model output speeds match the INRIX data closely.

Table 4-1. Model Congested Speeds Compared to Observed Speed Data from INRIX

Route	Period	Distance (in Miles)	Average Speed (mph)		Delta
			INRIX	Model	
1	AM	29.4	44	46	1.6
	PM	29.4	44	46	2.4
2	AM	27.7	46	48	2.3
	PM	27.7	46	48	1.9
3	AM	21.3	46	49	2.7
	PM	21.3	44	49	4.9
4	AM	10.2	42	42	-0.3
	PM	10.2	41	42	1.3
5	AM	9.5	67	67	0.4
	PM	9.5	67	67	0.0

4.2.2 Origin-Destination Trips Validation

In addition to comparison to actual observed traffic count and travel time data, the OD trips from the base year model were also validated. Specifically, the model OD trips were compared to available actual OD data from AirSage and Intercept Survey data to ensure a reasonable match.

Validation to trip origins and destinations was performed at two levels – region-wide and for trips that used the Centennial Bridge. To validate the trips that used the Centennial Bridge, a select link analysis was run on the bridge and the share of trips from each origin that traveled to the other destinations was estimated.

The initial MARC model (pre-calibration) origin and destination trip patterns did not match with the trip patterns from the observed OD data from the AirSage and intercept data that was collected. Figure 4-6 illustrates the comparison between the origin and destination trips between the MARC model (pre-calibration results are shown on the left side of Figure 4-6) and the observed OD data.

Various adjustments were made to the origin-destination trip patters to ensure that the model OD patterns at a super zone level matched closely with the trip patterns. Figure 4-6 also illustrates the comparison between the origin and destination trips between the calibrated model (post-calibration results are shown on the right side of Figure 4-6) and the observed OD data. As the charts illustrate, the model origins and destination trips match much more closely to counts post-calibration compared to pre-calibration.

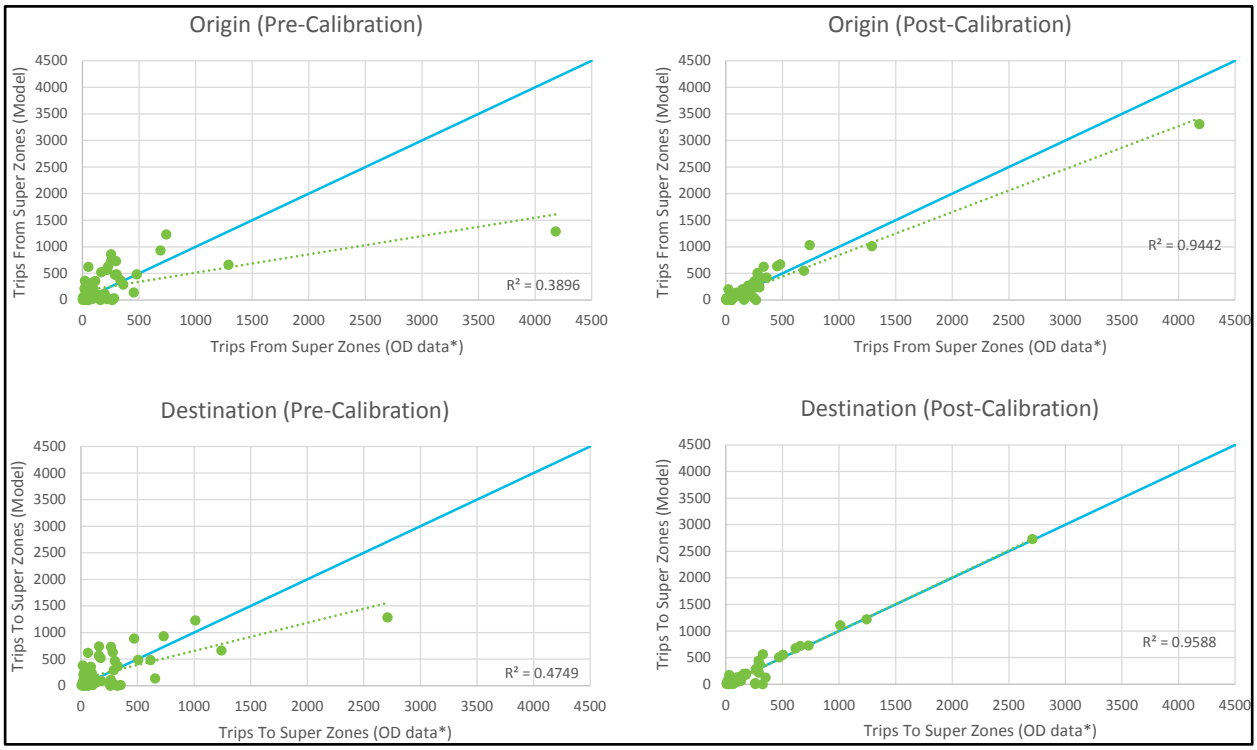

Figure 4-6. Comparison of Origin and Destination Trips to Observed Data

4.2.3 Future Transportation Improvements

All relevant planned transportation improvements included in the MARC models were incorporated into the future year models. These improvements were further refined after a detailed review of the MARC Transportation Outlook 2040 and consultation with Kansas Department of Transportation to ensure that major planned transportation improvements were reflected correctly in the future model networks. Figure 4-7 illustrates the major roadway improvements and the future year that they get included in the CDM Smith model runs.

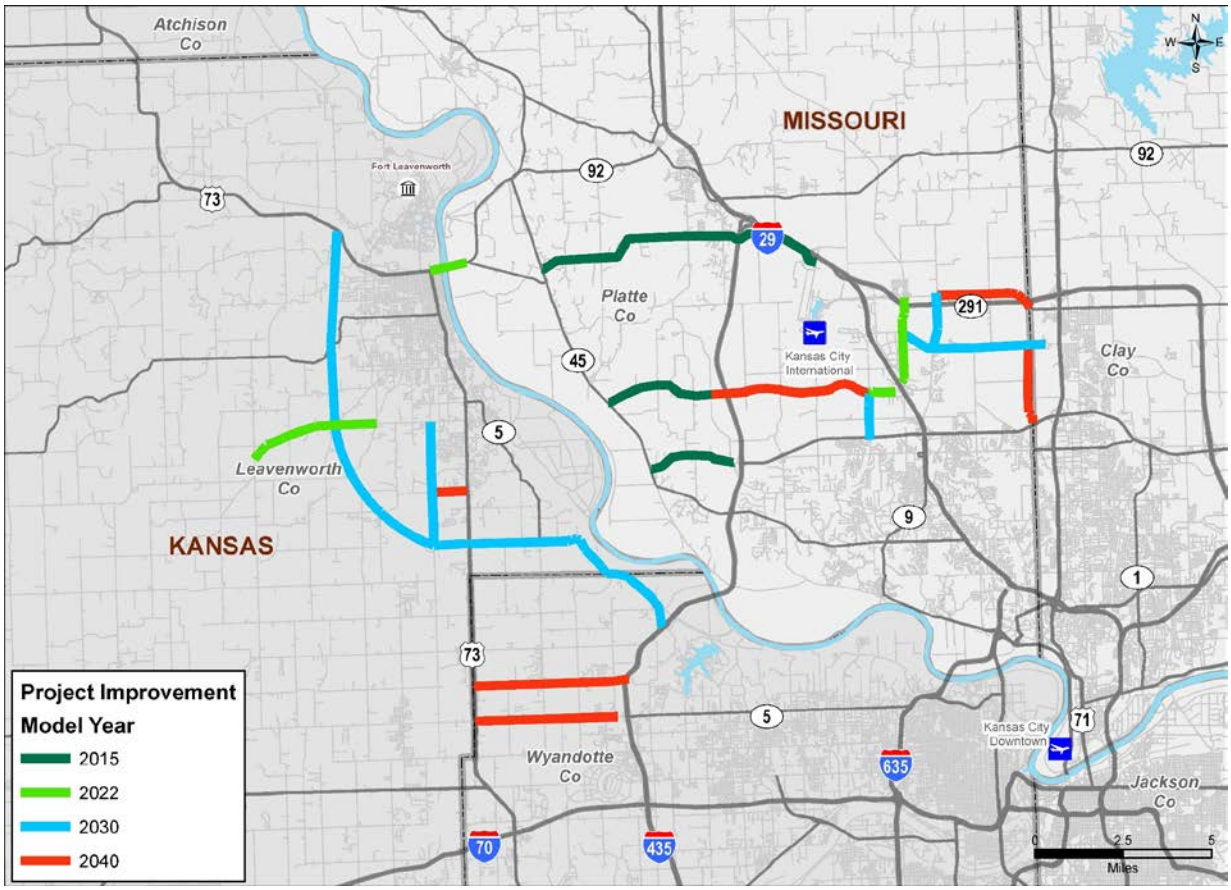

Figure 4-7. Planned Major Roadway Improvements

4.3 Traffic and Revenue Assumptions

The annual traffic and toll revenue estimates for the base case of the Centennial Toll Bridge over the Missouri River connecting Leavenworth County, Kansas and Platte County, Missouri line were developed using the following assumptions:

- The Centennial Bridge replacement was assumed to open to traffic in July 2022 with tolling beginning on the bridged starting July 1, 2022.
- The Centennial Toll Bridge will be operational 24 hours a day and 365 days a year.
- The tolls will be collected using transponder-based automatic vehicle identification (AVI) and video tolling for vehicles without toll transponders, and there will be no provision for cash tolls.
- Toll rates are assumed to increase by five percent every three years.
- Tolling operations are assumed to be actively monitored and strictly enforced to minimize the potential revenue loss due to toll evasion.
- Toll leakage applied to the annual revenue estimates was zero percent for AVI and 50 percent for the video tolling transactions. The video toll surcharge is assumed to be 100 percent of the AVI toll charge.

- The estimates of annual toll revenue included in this report have been adjusted to reflect "ramp-up" during the first three years of operation. The ramp-up used as part of this study was 70 percent in the opening year, 80 percent in the following year, 90 percent by the third year, and 100 percent for fourth and all subsequent years.
- The Centennial Bridge will be well maintained, efficiently operated, and effectively signed and promoted to encourage maximum usage.
- The VOT was estimated based on an analysis of the data from the stated-preference (SP) survey efforts. The average VOT for 2015 was approximately $13.38 per hour. The VOT was escalated at an estimated average rate of 2.0 percent per year over the duration of the forecast horizon based on the economic assessment of the region and thus reflects no real anticipated growth in the regional VOT.
- The starting AVI share was assumed to be 50 percent in the opening year (2022), increasing to 75 percent by 2047 and beyond.
- The vehicle operating costs were assumed to be 17.3 cents per mile (in 2015 dollars) based on AAA Report titled, "Your Driving Costs- 2015 Edition".
- Economic growth in the study corridors is based upon projections and growth patterns as described in Chapter 3.
- No capacity expansion is assumed through the extent of the study period (year 2061) on I-435, I-635 and US 69 bridges.
- Motor fuel and any other source of power for operating the motor vehicles will remain in adequate supply and increases in price will not substantially exceed overall inflation over the long-term.
- No local, regional, or national emergency will arise that may abnormally restrict the use of motor vehicles.
- No change will occur in vehicle technology that will significantly affect the vehicle carrying capacity or vehicle operating speeds.
- Any significant departure from the above basic assumptions could materially affect the estimated T&R for the proposed Centennial Toll Bridge.

4.4 Comparison of Proposed Toll Rates on Centennial Bridge to Other Bridge Crossings

The toll rate for the Centennial Bridge project base scenario was assumed to be $2.00 in 2015 dollars. Figure 4-8 shows a comparison of electronic toll rates in 2015 dollars for similar bridge crossings in the United States. The toll of $2.00 is lower than the average toll ($2.14) of all the bridges. The base case toll rate selected for the Centennial Bridge is shown to reflect a reasonable assumption based on the location of the project and surrounding regional income characteristics.

Several bridges with higher toll rates are located in regions with unique characteristics such as high year-round tourism or prominent affluence.

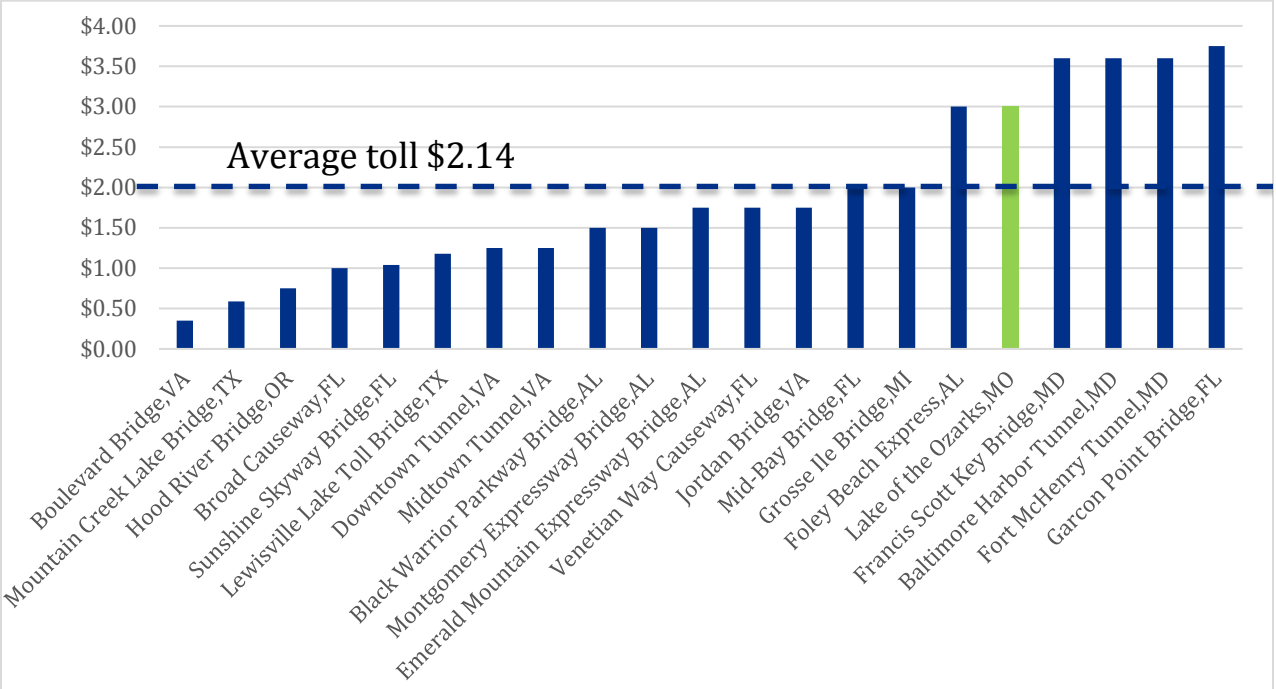

Figure 4-8. Comparison of Electronic Passenger Car Toll Rates (2015$) for Bridge Crossings

4.5 Toll Sensitivity

Toll sensitivity analysis involves testing a series of toll rates to determine how price affects traffic demand on the toll facility taking into account future characteristics of the transportation network and future willingness-to-pay tolls.

In general, a toll sensitivity curve suggests that when toll rates increase, a portion of travelers will divert from the toll facility in favor of other routes and thus decreasing the captured toll transactions. The initial increases from a low toll rate level typically result in increased toll revenues until an optimal point where the maximum revenue is generated. Increases beyond this optimal toll rate level yields diminished revenues as the magnitude of diverted traffic exceeds the net return generated by the toll rate increase.

CDM Smith evaluated T&R potential under a range of alternative toll rates. Figure 4-9 illustrates the weekday revenue toll sensitivity curves for the proposed Centennial Bridge toll bridge for average weekday revenue before applying ramp-up for 2022. Several toll rates that were higher and lower than the assumed programmed toll rate were analyzed. The toll sensitivity analysis results indicate that the projected toll rates on the proposed tolled bridge are below the estimated theoretical revenue maximization points. This demonstrates that overall, there is potential for revenue enhancement through toll increases above current toll rate levels and the assumed escalated rates used for forecasting purposes, if warranted.

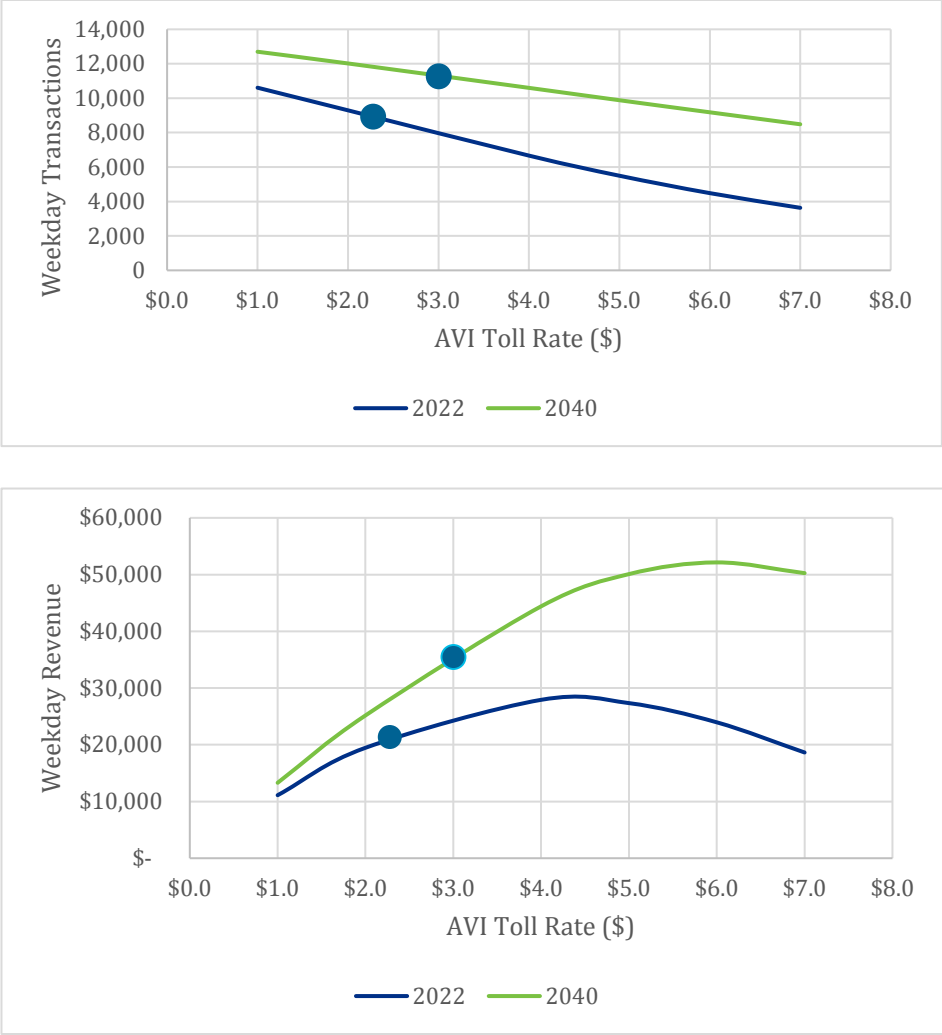

Figure 4-9. Toll Sensitivity Curves

4.6 Annual Traffic and Toll Revenue Estimates

The annual fiscal year (FY) T&R estimates for the proposed Centennial Bridge project base case scenarios are shown in Table 4-2, including a breakdown by toll collection from AVI and video tolling. The toll bridge is anticipated to generate $5.3 million in revenue in 2023, its first full year of operation. It is expected to then grow to $11.3 million by 2040. Between 2023 and 2062, the toll bridge is anticipated to generate a total of $512.1 million in annual toll revenue. The average annual revenue growth between 2023 and 2030 was about 7.3 percent (includes ramp-up from 2023 to 2025), decreasing to 2.7 percent between 2030 and 2040.

Table 4-2. Traffic and Toll Revenue Forecasts – Base Scenario

Fiscal Year	Annual Transactions			Annual Revenue		
	AVI	VIDEO	TOTAL	AVI	VIDEO	TOTAL
2023	1,122,800	1,098,900	2,221,700	$2,680,800	$2,623,700	$5,304,500
2024	1,320,000	1,241,500	2,561,500	$3,151,700	$2,964,100	$6,115,800
2025	1,529,900	1,382,500	2,912,400	$3,652,900	$3,300,900	$6,953,800
2026	1,668,000	1,449,500	3,117,500	$4,192,300	$3,643,100	$7,835,400
2027	1,728,700	1,443,000	3,171,700	$4,344,800	$3,626,700	$7,971,500
2028	1,791,100	1,435,800	3,226,900	$4,501,400	$3,608,600	$8,110,000
2029	1,855,000	1,427,900	3,282,900	$4,895,300	$3,768,300	$8,663,600
2030	1,891,800	1,398,500	3,290,300	$4,992,500	$3,690,600	$8,683,100
2031	1,924,700	1,365,200	3,289,900	$5,079,300	$3,602,800	$8,682,100
2032	1,982,200	1,349,100	3,331,300	$5,500,900	$3,743,800	$9,244,700
2033	2,040,900	1,332,300	3,373,200	$5,663,600	$3,697,300	$9,360,900
2034	2,100,700	1,314,900	3,415,600	$5,829,600	$3,649,000	$9,478,600
2035	2,161,700	1,296,800	3,458,500	$6,315,800	$3,789,000	$10,104,800
2036	2,223,900	1,278,100	3,502,000	$6,497,500	$3,734,300	$10,231,800
2037	2,287,300	1,258,700	3,546,000	$6,682,800	$3,677,600	$10,360,400
2038	2,352,000	1,238,600	3,590,600	$7,216,500	$3,800,500	$11,017,000
2039	2,417,900	1,217,900	3,635,800	$7,418,800	$3,736,800	$11,155,600
2040	2,485,100	1,196,400	3,681,500	$7,625,000	$3,670,800	$11,295,800
2041	2,553,600	1,174,100	3,727,700	$8,236,300	$3,787,000	$12,023,300
2042	2,623,400	1,151,100	3,774,500	$8,461,600	$3,712,800	$12,174,400
2043	2,694,600	1,127,400	3,822,000	$8,691,200	$3,636,200	$12,327,400
2044	2,767,200	1,102,800	3,870,000	$9,389,000	$3,741,900	$13,130,900
2045	2,841,200	1,077,500	3,918,700	$9,639,900	$3,656,000	$13,295,900
2046	2,916,600	1,051,400	3,968,000	$9,895,700	$3,567,300	$13,463,000
2047	2,993,400	1,024,400	4,017,800	$10,689,300	$3,658,200	$14,347,500
2048	3,051,300	1,017,100	4,068,400	$10,895,900	$3,632,000	$14,527,900
2049	3,089,600	1,029,900	4,119,500	$11,032,900	$3,677,600	$14,710,500
2050	3,128,400	1,042,800	4,171,200	$11,761,200	$3,920,400	$15,681,600
2051	3,157,900	1,052,600	4,210,500	$11,871,900	$3,957,300	$15,829,200
2052	3,177,700	1,059,200	4,236,900	$11,946,500	$3,982,200	$15,928,700
2053	3,197,700	1,065,900	4,263,600	$12,624,300	$4,208,100	$16,832,400
2054	3,217,800	1,072,600	4,290,400	$12,703,700	$4,234,600	$16,938,300
2055	3,238,000	1,079,300	4,317,300	$12,783,500	$4,261,200	$17,044,700
2056	3,258,400	1,086,100	4,344,500	$13,512,200	$4,504,100	$18,016,300
2057	3,278,800	1,092,900	4,371,700	$13,597,100	$4,532,400	$18,129,500
2058	3,299,500	1,099,800	4,399,300	$13,682,600	$4,560,900	$18,243,500
2059	3,320,200	1,106,700	4,426,900	$14,463,900	$4,821,300	$19,285,200
2060	3,341,100	1,113,700	4,454,800	$14,554,800	$4,851,600	$19,406,400
2061	3,362,100	1,120,700	4,482,800	$14,646,300	$4,882,100	$19,528,400
2062	3,383,200	1,127,700	4,510,900	$15,482,400	$5,160,800	$20,643,200
Total	**102,775,400**	**47,601,300**	**150,376,700**	**$356,803,700**	**$155,273,900**	**$512,077,600**

Chapter 5

Sensitivity Analyses and Alternative Traffic and Revenue Scenarios

Chapter 5 provides an overview of the various sensitivity tests that were performed as part of this traffic and revenue study. The purpose of the sensitivity analysis is to evaluate the range within which the toll revenue generation potential of the proposed toll facilities may fall based on varying assumptions regarding key variables influencing the revenue potential of the Centennial Toll Bridge. While a full account of the overall sensitivity associated with forecasting into the future is difficult, the analyses undertaken as part of this study identified the impact of some of the key variables on the toll revenue potential of the corridor. These sensitivity tests are useful to identify the major factors and parameters with the greatest potential to influence the forecasted baseline traffic and revenue. These sensitivity tests were performed at selected future years only and are intended to be for illustrative purposes and do not reflect the entire forecast horizon.

In addition to the various sensitivity tests, this chapter includes an overview of the financial feasibility of the Centennial Bridge analyzed by RBC Capital Markets, LLC.

This chapter is organized into the following sections:

- Alternative Traffic and Revenue Scenarios
- Listing of Sensitivity Tests
- Results of Sensitivity Tests
- Financial Feasibility

5.1 Alternative Traffic and Revenue Scenarios

Two alternative traffic and revenue scenarios were developed to assess the traffic and revenue impacts under a different set of assumptions than the base case T&R scenario. The two alternative traffic and revenue scenarios included:

- High Case
- Delayed Opening of the Centennial Bridge replacement

For both these scenarios, traffic and revenue estimates were developed for a 40-year forecast period.

5.1.1 High Case Traffic and Revenue Scenario

In this scenario, the underlying demographics including population and employment for future years was assumed to be higher than the base case scenario. Table 5-1 includes the annual transactions and revenue for this scenario from 2023 to 2062.

The overall revenue over the 40-year forecast period was about $692 million, higher than the Base Case by about 35 percent.

5.1.2 Delayed Opening of the Centennial Bridge Replacement

In this scenario, the Centennial Bridge is assumed to open to open to traffic ten years (by 2033) after the assumed opening date of the Base Case scenario. Table 5-2 includes the annual transactions and revenue for this scenario from 2033 to 2072.

The overall revenue over the 40-year forecast period was higher than the base case by about 29 percent due to the fact that the forecast extends ten years further into the future than the base case.

5.2 Listing of Sensitivity Tests

In addition to the Base Case and alternative T&R scenarios presented previously, the following sensitivity tests were performed for select future model years:

- Impact of lower VOT
- Impact of higher VOT
- Impact of higher traffic demand due to higher socio-economic growth assumptions
- Impact of lower traffic demand due to reduced socio-economic growth assumptions
- Impact of higher truck percentage assumptions
- Impact of background projects such as the Leavenworth Bypass
- Impact of lower revenue days
- Impact of higher video violation

The sensitivity tests are what if scenarios and the purpose of this analysis was to evaluate the range within the toll revenues of Centennial Bridge may fall based on changes to discrete variables.

Table 5-1. High Case Traffic and Revenue Scenario

Fiscal Year	Annual Transactions			Annual Toll Revenue		
	AVI	VIDEO	TOTAL	AVI	VIDEO	TOTAL
2023	1,218,700	1,192,700	2,411,400	$3,106,500	$3,040,200	$6,146,700
2024	1,439,600	1,353,800	2,793,400	$3,669,600	$3,451,000	$7,120,600
2025	1,676,500	1,514,900	3,191,400	$4,273,300	$3,861,400	$8,134,700
2026	1,836,300	1,595,700	3,432,000	$4,927,200	$4,281,600	$9,208,800
2027	1,912,200	1,596,100	3,508,300	$5,130,900	$4,282,700	$9,413,600
2028	1,990,700	1,595,800	3,586,500	$5,341,300	$4,281,700	$9,623,000
2029	2,071,600	1,594,600	3,666,200	$5,836,400	$4,492,500	$10,328,900
2030	2,120,300	1,567,300	3,687,600	$5,973,500	$4,415,700	$10,389,200
2031	2,168,600	1,538,100	3,706,700	$6,109,800	$4,333,400	$10,443,200
2032	2,251,500	1,532,200	3,783,700	$6,670,500	$4,539,400	$11,209,900
2033	2,336,900	1,525,400	3,862,300	$6,923,400	$4,519,300	$11,442,700
2034	2,424,800	1,517,600	3,942,400	$7,184,000	$4,496,300	$11,680,300
2035	2,515,400	1,508,900	4,024,300	$7,846,100	$4,706,600	$12,552,700
2036	2,608,700	1,499,200	4,107,900	$8,137,100	$4,676,200	$12,813,300
2037	2,704,800	1,488,300	4,193,100	$8,436,800	$4,642,500	$13,079,300
2038	2,803,800	1,476,400	4,280,200	$9,184,400	$4,836,500	$14,020,900
2039	2,905,700	1,463,400	4,369,100	$9,518,200	$4,793,800	$14,312,000
2040	3,010,600	1,449,200	4,459,800	$9,861,900	$4,747,200	$14,609,100
2041	3,118,600	1,433,800	4,552,400	$10,738,800	$4,937,100	$15,675,900
2042	3,229,800	1,417,100	4,646,900	$11,121,800	$4,879,600	$16,001,400
2043	3,344,300	1,399,100	4,743,400	$11,516,000	$4,817,600	$16,333,600
2044	3,462,200	1,379,700	4,841,900	$12,541,200	$4,997,700	$17,538,900
2045	3,583,500	1,358,900	4,942,400	$12,980,600	$4,922,400	$17,903,000
2046	3,708,400	1,336,700	5,045,100	$13,432,800	$4,841,900	$18,274,700
2047	3,836,800	1,312,900	5,149,700	$14,627,500	$5,005,400	$19,632,900
2048	3,942,500	1,314,200	5,256,700	$15,030,400	$5,010,100	$20,040,500
2049	4,024,400	1,341,500	5,365,900	$15,342,500	$5,114,200	$20,456,700
2050	4,107,900	1,369,300	5,477,200	$16,487,700	$5,495,900	$21,983,600
2051	4,171,700	1,390,600	5,562,300	$16,743,600	$5,581,200	$22,324,800
2052	4,215,000	1,405,000	5,620,000	$16,917,400	$5,639,100	$22,556,500
2053	4,258,800	1,419,600	5,678,400	$17,950,100	$5,983,400	$23,933,500
2054	4,303,000	1,434,300	5,737,300	$18,136,400	$6,045,500	$24,181,900
2055	4,347,600	1,449,200	5,796,800	$18,324,700	$6,108,200	$24,432,900
2056	4,392,800	1,464,300	5,857,100	$19,448,000	$6,482,700	$25,930,700
2057	4,438,400	1,479,500	5,917,900	$19,649,900	$6,550,000	$26,199,900
2058	4,484,500	1,494,800	5,979,300	$19,853,900	$6,618,000	$26,471,900
2059	4,531,000	1,510,300	6,041,300	$21,073,200	$7,024,400	$28,097,600
2060	4,578,000	1,526,000	6,104,000	$21,292,000	$7,097,300	$28,389,300
2061	4,625,600	1,541,900	6,167,500	$21,513,000	$7,171,000	$28,684,000
2062	4,673,600	1,557,900	6,231,500	$22,833,600	$7,611,200	$30,444,800
Total	**129,375,100**	**58,346,200**	**187,721,300**	**$485,686,000**	**$206,331,900**	**$692,017,900**

Table 5-2. Delayed Opening Scenario

Fiscal Year	Annual Transactions			Annual Toll Revenue		
	AVI	VIDEO	TOTAL	AVI	VIDEO	TOTAL
2033	1,279,100	1,251,900	2,531,000	$3,549,500	$3,474,100	$7,023,600
2034	1,496,700	1,407,700	2,904,400	$4,153,400	$3,906,400	$8,059,800
2035	1,726,500	1,560,200	3,286,700	$5,044,200	$4,558,500	$9,602,700
2036	1,873,700	1,628,300	3,502,000	$5,474,300	$4,757,500	$10,231,800
2037	1,932,700	1,613,300	3,546,000	$5,646,700	$4,713,700	$10,360,400
2038	1,992,900	1,597,700	3,590,600	$6,114,800	$4,902,200	$11,017,000
2039	2,054,300	1,581,500	3,635,800	$6,303,200	$4,852,400	$11,155,600
2040	2,116,900	1,564,600	3,681,500	$6,495,400	$4,800,400	$11,295,800
2041	2,180,800	1,546,900	3,727,700	$7,034,000	$4,989,300	$12,023,300
2042	2,246,000	1,528,500	3,774,500	$7,244,200	$4,930,200	$12,174,400
2043	2,312,400	1,509,600	3,822,000	$7,458,500	$4,868,900	$12,327,400
2044	2,380,200	1,489,800	3,870,000	$8,075,900	$5,055,000	$13,130,900
2045	2,449,300	1,469,400	3,918,700	$8,310,300	$4,985,600	$13,295,900
2046	2,519,800	1,448,200	3,968,000	$8,549,400	$4,913,600	$13,463,000
2047	2,591,600	1,426,200	4,017,800	$9,254,600	$5,092,900	$14,347,500
2048	2,664,900	1,403,500	4,068,400	$9,516,200	$5,011,700	$14,527,900
2049	2,739,600	1,379,900	4,119,500	$9,782,900	$4,927,600	$14,710,500
2050	2,815,700	1,355,500	4,171,200	$10,585,600	$5,096,000	$15,681,600
2051	2,884,300	1,326,200	4,210,500	$10,843,200	$4,986,000	$15,829,200
2052	2,944,800	1,292,100	4,236,900	$11,070,700	$4,858,000	$15,928,700
2053	3,005,900	1,257,700	4,263,600	$11,867,100	$4,965,300	$16,832,400
2054	3,067,700	1,222,700	4,290,400	$12,111,100	$4,827,200	$16,938,300
2055	3,130,200	1,187,100	4,317,300	$12,357,700	$4,687,000	$17,044,700
2056	3,193,300	1,151,200	4,344,500	$13,242,200	$4,774,100	$18,016,300
2057	3,257,100	1,114,600	4,371,700	$13,506,700	$4,622,800	$18,129,500
2058	3,299,500	1,099,800	4,399,300	$13,682,600	$4,560,900	$18,243,500
2059	3,320,200	1,106,700	4,426,900	$14,463,900	$4,821,300	$19,285,200
2060	3,341,100	1,113,700	4,454,800	$14,554,800	$4,851,600	$19,406,400
2061	3,362,100	1,120,700	4,482,800	$14,646,300	$4,882,100	$19,528,400
2062	3,383,200	1,127,700	4,510,900	$15,482,400	$5,160,800	$20,643,200
2063	3,404,500	1,134,800	4,539,300	$15,579,700	$5,193,200	$20,772,900
2064	3,425,800	1,141,900	4,567,700	$15,677,600	$5,225,900	$20,903,500
2065	3,447,400	1,149,100	4,596,500	$16,570,300	$5,523,400	$22,093,700
2066	3,469,000	1,156,300	4,625,300	$16,674,500	$5,558,200	$22,232,700
2067	3,490,800	1,163,600	4,654,400	$16,779,300	$5,593,100	$22,372,400
2068	3,512,800	1,170,900	4,683,700	$17,730,800	$5,910,300	$23,641,100
2069	3,534,900	1,178,300	4,713,200	$17,842,200	$5,947,400	$23,789,600
2070	3,557,100	1,185,700	4,742,800	$17,954,400	$5,984,800	$23,939,200
2071	3,579,400	1,193,100	4,772,500	$19,004,300	$6,334,800	$25,339,100
2072	3,601,900	1,200,600	4,802,500	$19,123,800	$6,374,600	$25,498,400
Total	**112,586,100**	**52,557,200**	**165,143,300**	**459,358,700**	**201,478,800**	**$660,837,500**

5.3 Results of Sensitivity Tests

Figure 5-1 provides a comparison of the revenue impact of each sensitivity test compared to the base case scenario.

The results of sensitivity analyses demonstrate that the higher growth in assumed socio-economic growth in the region was the most influential parameter to the revenue potential for the Centennial Bridge project. The higher socioeconomic growth assumption (20 percent higher than base case) yielded a 20 percent increase in total revenue in 2023 and 2040 in comparison to the base case. Conversely, a reduction in traffic demand (50 percent lower traffic demand compared to base case) due to lower underlying socioeconomic growth will result in revenue reduction of nearly 50 percent.

A 20 percent lower VOT and a 20 percent higher VOT resulted in a 4.1 percent decrease and 3.1 percent increase in toll revenue respectively for the Centennial Bridge compared to the base case in 2023. A similar decrease or increase in VOT in 2040 resulted in a 1.7 percent decrease and 1.3 percent increase in toll revenue for the tolled bridge.

Additional tests included removal of background projects such as the Leavenworth Bypass and increased assumed truck percentage. If the Leavenworth Bypass project was not assumed in the roadway network, the revenue on the bridge increased by 3.2 percent in 2040. An assumption of a higher truck percentage (five percent trucks) resulted in a revenue increase of about 6.8 percent compared to the base case.

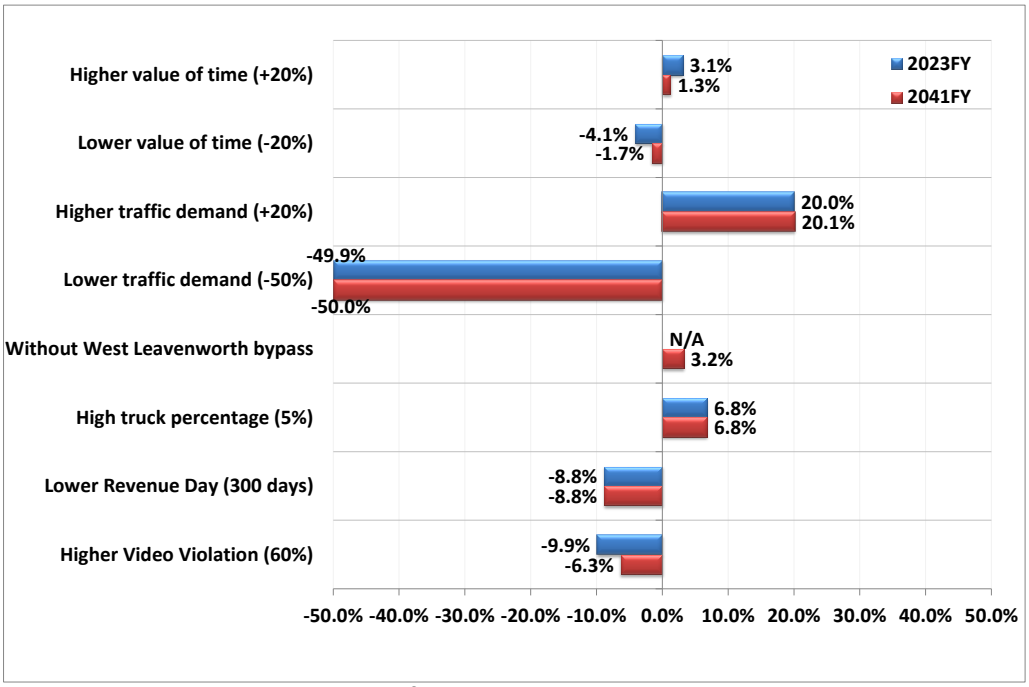

Figure 5-1. Sensitivity Analysis of Annual Gross Revenue Compared to Base Scenario

5.4 Financial Feasibility

RBC Capital Markets, LLC was engaged to conduct toll feasibility of the project. Level-2 toll feasibility is indicative and illustrative and useful in supporting a decision regarding whether a project has tolling potential. A detailed description of the various assumptions and results is included in the Preliminary Financial Feasibility Analysis section of the report, this section provides a broad overview of the financial feasibility analysis.

One key part of the financial analysis was to estimate what portion of the project cost would be covered by revenue generated from tolls. Based on state enabling legislation, only the construction cost of the Centennial Bridge crossing the Missouri River and the roadway approach in Kansas are eligible to be covered by tolling revenue.

Financial feasibility was performed for three cases, and the results of the feasibility analysis for the three cases are described below. Figure 5-2 through Figure 5-5 illustrates the financial feasibility of each case.

1. Standard tax-exempt toll revenue bond: Using a standard municipal toll road revenue bond finance approach with the base revenue case projections and associated cost projections, the project is only 80 percent feasible with a financing gap of approximately $15 million.

2. Additional debt leverage: With the incremental debt capacity gained by using a federal loan, e.g. Transportation Infrastructure Finance and Innovation Act (TIFIA), the project is fully feasible.

3. Delayed projections/timing: With a ten-year delay of both construction and the project's opening, the financial feasibility increases to 93 percent with a financing gap of approximately $6 million.

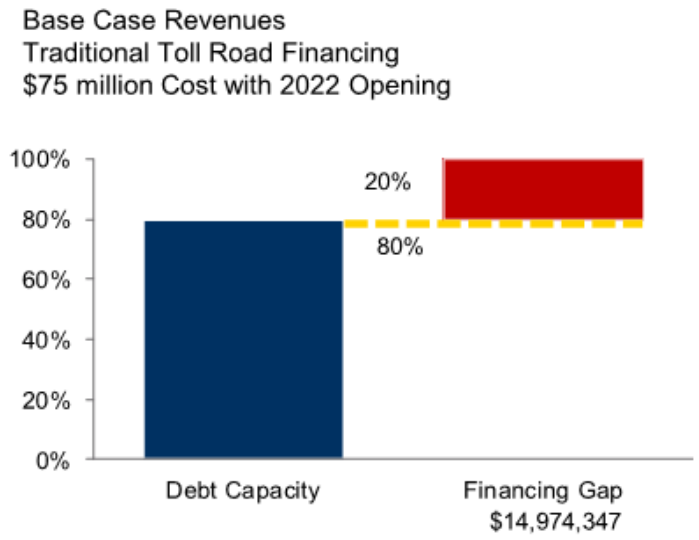

Figure 5-2. Centennial Bridge Financial Feasibility
Case 1 Traditional Toll Road Financing with Opening Year 2022

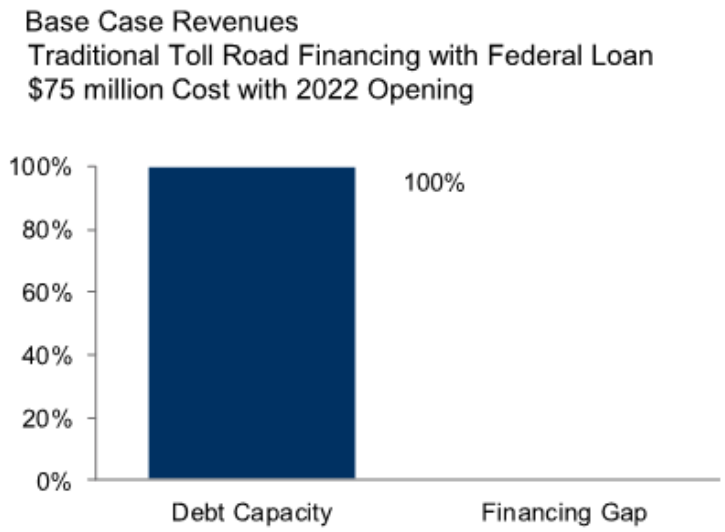

Figure 5-3. Centennial Bridge Financial Feasibility
Case 2 Traditional Toll Road Financing with Federal Load and Opening Year 2022

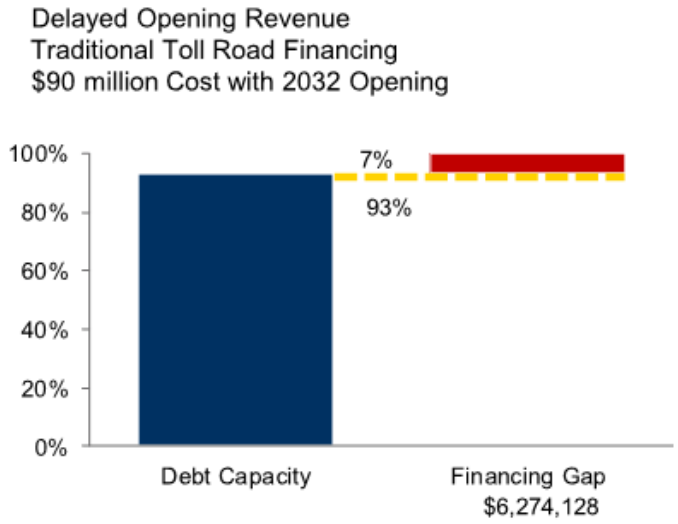

Figure 5-4. Centennial Bridge Financial Feasibility
Case 3 Traditional Toll Road Financing with and Delayed Opening Year 2032

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Route 92 Centennial Bridge Project Preliminary Financial Feasibility Analysis

Prepared for CDM Smith

MARCH 11, 2016

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RBC Capital Markets

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Appendix A: Case 1 Model Output

Appendix B: Case 2 Model Output

Appendix C: Case 3 Model Output

Appendix D: Case 4 Model Output

1. Executive Summary

CDM Smith Inc ("**CDM Smith**") has entered into a contract dated September 2014 with TransSystems Corporation for the purpose of performing professional services in connection with the K-92 Centennial Bridge (the "**Project**"). CDM Smith has engaged RBC Capital Markets, LLC ("**RBCCM**") through a sub-contract to perform a preliminary financial feasibility analysis (the "**Analysis**") for the Project.

Project Overview

The Kansas Department of Transportation ("**KDOT**") has identified a future need to replace the Centennial Bridge over the Missouri River connecting Leavenworth County, Kansas and Platte County, Missouri. 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. Two opening dates for the four-lane bridge replacement are being considered: July 1, 2022 ("**Base Case Date**") and July 1, 2032 ("**Delayed Case Date**").

Overview of Annual Revenue and Costs Utilized in the Analysis

On January 19, 2016, CDM Smith provided RBCCM with three sets of annual revenue inputs to use in the Analysis, as follows:

- **Base Revenue Case**: A base level of traffic that begins with the Project opening in 2022;
- **Delayed Revenue Case**: A base level of traffic that begins with the Project opening in 2032; and
- **High Revenue Case**: A high level of traffic that begins with the Project opening in 2022 using the same toll rates as the Base Case.

On January 25, 2016 projected annual operations and maintenance ("**O&M**") costs and major maintenance ("**MM**") costs were provided as well for each revenue case described above. Each set of O&M and MM costs included costs associated with the bridge, the Kansas roadway approach, and all tolling equipment.

Preliminary Financial Feasibility Analysis Overview

The Analysis was performed using the structure of a stand-alone non-recourse toll road financing using municipal tax-exempt toll revenue bonds. A TIFIA loan offered through a federal loan program administered by the U.S. Department of Transportation is another debt instrument available for municipal toll road financing, and as such, the Analysis also includes use of such a loan for one of the scenarios. Each scenario analyzed assumes that the senior toll road revenue bonds receive at least two investment grade ratings, which are ratings of at least Baa3 / BBB- / BBB- from two of either Moody's, S&P, or Fitch, respectively.

Summary of Preliminary Financial Feasibility Analysis Cases

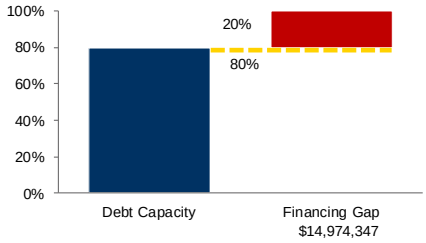
- **Case 1**: This case uses the Base Revenue Case projections and associated annual cost projections and tax-exempt toll revenue bonds only.
- **Case 2**: Similar to Case 1, Case 2 has been developed with the Base Revenue Case projections and associated annual cost projections, tax-exempt toll revenue bonds but also includes additional debt leverage with the use of a TIFIA Loan.
- **Case 3**: Instead of Base Revenue Case projections, Case 3 uses the Delayed Revenue Case projections/timing and the associated Project cost and annual cost projections using tax-exempt toll revenue bonds only.
- **Case 4**: RBCCM was also asked to analyze the debt capacity applying the High Revenue Case and associated annual cost projections provided by CDM Smith. While we performed this analysis, we note that, given our understanding of the aggressive traffic assumptions of this revenue case, we do not believe it can achieve investment grade rating levels and sold to public bond investors at the same cost and leverage assumptions assumed in the Analysis. As such, this scenario is not included in the summary below nor do we compare it to Cases 1-3.

Summary of Preliminary Financial Feasibility Analysis Results

Case 1 is only 80% feasible with a financing gap of approximately $14.97 million. Case 2, with the incremental debt capacity gained by the use a TIFIA loan, the Project is fully feasible and Case 3, with a 10-year delay of both construction and the Project's opening, the financial feasibility increases to 93% with a financing gap of approximately $6.27 million. Below we summarize these results.

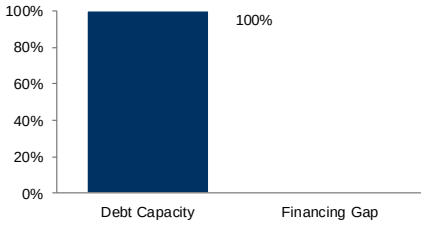
Case 1

Base Case Revenues
Traditional Toll Road Financing
$75 million Cost with 2022 Opening



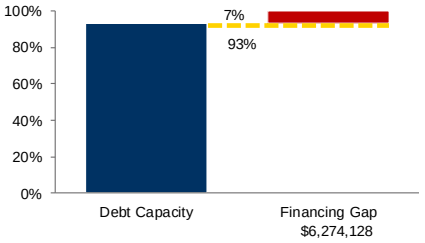
Case 2

Base Case Revenues
Traditional Toll Road Financing with Federal Loan
$75 million Cost with 2022 Opening



Case 3

Delayed Opening Revenue
Traditional Toll Road Financing
$90 million Cost with 2032 Opening



2. Overview of Preliminary Financial Feasibility Analysis Methodology

The basic debt instrument used in the U.S. to finance a public highway, bridge, or tunnel projects that drivers pay a toll to use is a toll revenue bond. U.S. toll revenue bonds are most commonly issued in the municipal tax-exempt debt market. When issued, public agencies are effectively borrowing money from investors to finance the costs of the toll asset and pay back the bonds, both principal and interest, over time, from net revenues (as further described below). U.S. municipal bond financing can be supplemented with a TIFIA loan (as defined below) from the U.S. Department of Transportation. Using standard practice municipal project finance assumptions, the Analysis seeks to maximize municipal bond financing, with a TIFIA Loan supplement as appropriate, for funding of the Project. The following discussion provides an overview of the various debt instruments considered in the analysis as well as the cash flow and structural features that drive the Analysis.

Types of U.S. Municipal Bonds

Described below are the three main types of debt products for long-term municipal bonds.

- Current Interest Bond ("**CIB**"): A CIB pays interest periodically, typically semi-annually.
- Capital Appreciation Bond ("**CAB**"): A CAB is a bond with no periodic interest payments. The investor receives one payment at maturity equal to the principal price paid for the bonds plus interest compounded semi-annually to maturity. CABs are typically more expensive than CIBs for the issuer.
- Convertible Capital Appreciation Bond ("**CCAB**"): A CCAB has features of both CIBs and CABs – interest accrues similar to a CAB to a certain date (the "**Conversion Date**") and then the bonds pay interest periodically, similar to a CIB, on the total amount that has accreted from financial close to the Conversion Date. CCABs are typically more expensive than CIBs but less expensive than CABs for the issuer.

TIFIA Loan

The Transportation Infrastructure Finance and Innovation Act ("**TIFIA**") program provides Federal credit assistance in the form of direct loans to finance surface transportation projects of national and regional significance. TIFIA credit assistance provides flexible repayment terms, and typically more favorable interest rates than in the traditional municipal bond market. Any type of project that is eligible for Federal assistance through existing surface transportation programs (highway and transit capital projects) is eligible for the TIFIA credit program. Major requirements include a capital cost of at least $50 million (or 33.3% of a State's annual apportionment of Federal-aid funds, whichever is less), $15 million in the case of intelligence transportation systems or $25 million for rural projects. It is our understanding that the Project would be categorized as a rural project. TIFIA credit assistance is limited by statute to a maximum of 49% of the total eligible project costs, but the policy and practice has been a limit of 33% of a project's total eligible cost.

Bond Ratings

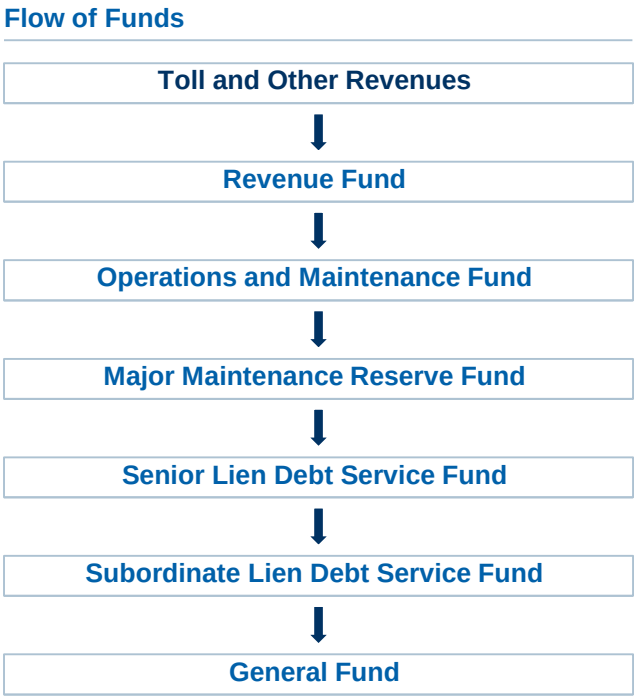
Bond ratings are alpha and/or numeric symbols used to give indications of relative credit quality. Moody's Investor Services ("**Moody's**"), Standard and Poor's ("**S&P**") and Fitch Ratings ("**Fitch**") are the three predominant rating agencies servicing the U.S. municipal finance market. Rating categories for long term obligations range from Aaa/AAA (highest ratings, lowest risk) to C/D (lowest ratings, highest risk), as shown below.

Ratings Chart

	Moody's	S&P	Fitch
Investment Grade	Aaa	AAA	AAA
	Aa1	Aa+	AA+
	Aa2	AA	AA
	Aa3	AA-	AA-
	A1	A+	A+
	A2	A	A
	A3	A-	A-
	Baa1	BBB+	BBB+
	Baa2	BBB	BBB
	Baa3	BBB-	BBB-
	Ba1 - C	BB+ - D	BB+ - D

Flow of Funds

For the issuance of municipal debt, legal documents, which are typically referred to as bond indentures or bond resolutions will detail the mechanics of the bond issue, flow of funds, security features, covenants, events of default, and other key features of the legal structure of the bonds. The flow of funds set forth the order in which funds generated by the asset will be allocated for various purposes. Below we provide a typical flow of funds for toll revenue bonds. In general, toll revenues are first applied to pay for O&M costs, followed by MM costs. Toll roads need to be operated and maintained to certain standards for vehicles to travel on the road so revenue can be collected; if revenues are not collected, then debt service cannot be paid. As such, these expenses are typically paid prior to the payment of debt service. This type of structure is referred to as a net revenue pledge – revenues available for debt service are "net" of certain expenses – in this case O&M and MM costs. O&M costs are typically annual costs to operate the road as well as ordinary maintenance performed to maintain assets in operating condition. MM costs are lifecycle costs. MM repairs occur less frequently and often require large amounts of money. MM expenses are often "lumpy" and for cash flow and feasibility calculation purposes, these costs are typically "smoothed out" in some fashion and annual amounts are deposited in a reserve fund – here referred to as a MM reserve fund.



Debt Service Reserve Fund

This fund is a set aside reserve that protects bondholders against a temporary interruption or delay on the receipt of toll revenues or for traffic underperformance resulting in insufficient net revenue to fully pay debt service. Investors and rating agencies will require a debt service reserve fund. It is typically funded by bond proceeds.

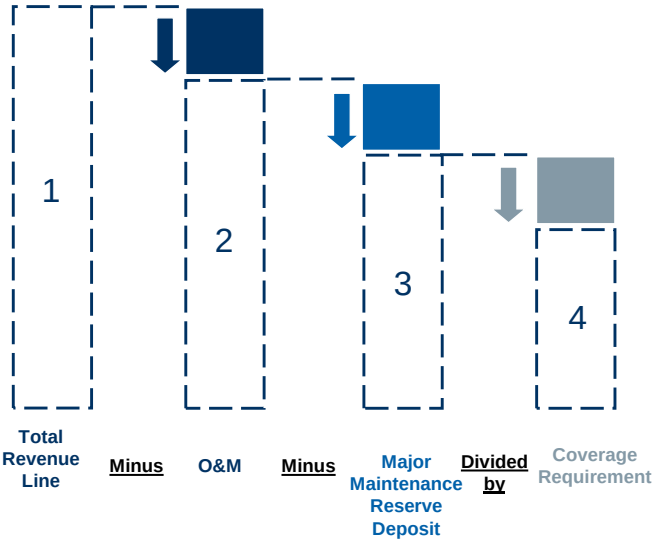
Capitalized Interest

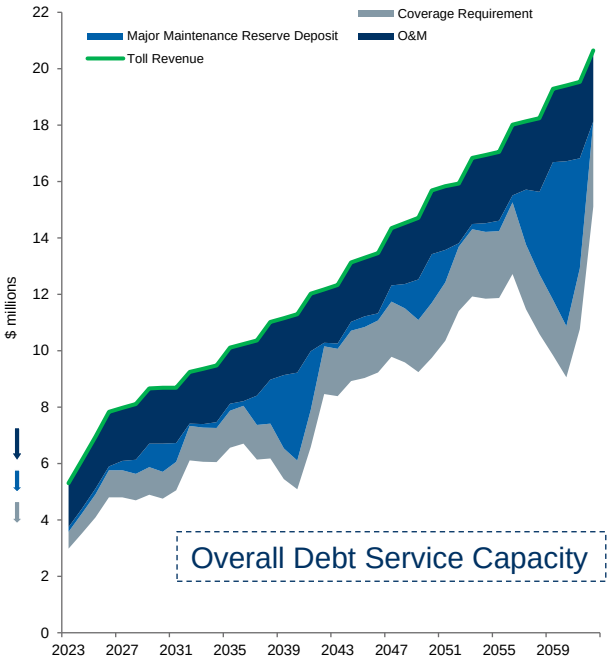
Capitalized Interest ("**CapI**") is funded with bond proceeds and used to pay current interest on the bonds during the construction period as the asset does not generate revenue to pay interest. IRS regulations allow for CapI to be funded with tax-exempt bond proceeds for up to one-year following substantial completion of a project.

Debt Service Coverage

Debt service coverage is the ratio of net revenues to debt service expense. Annual toll revenues must be sufficient to not only cover annual O&M, deposits to the MM reserve fund and annual debt service, but also contain a "cushion" to protect against actual revenues collected being lower than projections or actual annual costs being higher than projections. Below we provide a graphic representation of revenue application and debt capacity.

Use of Revenue Prior to Debt Service Drives Debt Capacity

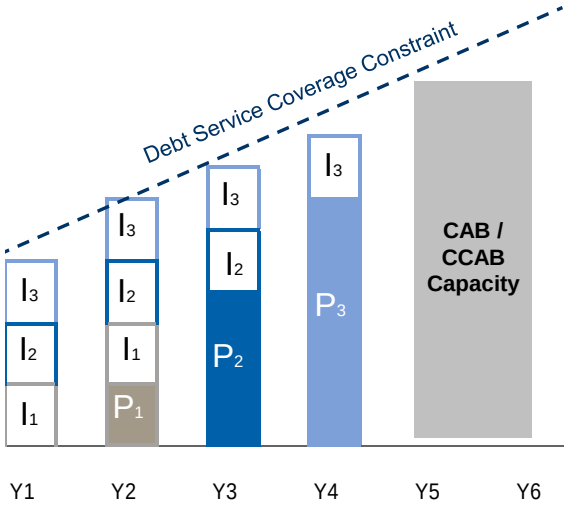




Debt Capacity

The amount of interest that can be supported by net revenues will drive the maximum amount of CIBs that can be issued to finance a project. Interest expense associated with CIBs must be covered by net revenue (with a coverage cushion, as previously discussed). As illustrated below, for a project with net revenue that grows annually, the first year is usually the "pinch-point" year. There is usually no principal amortization in that year, only interest payments. For each successive year after the "pinch-point" year, as long as net revenues are growing, an increasing amount of principal payments can be accommodated. For example, in year four (Y4), net revenues, less a coverage cushion, need to support the interest component I_3 associated with P_3 while each prior year needs to take into account the interest payments for all maturities that follow it. As illustrated, the maximum amount of CIBs that can be issued is driven by how much interest can be paid in the first year, the "pinch point" year. Additional leverage can be obtained by the use of deferred interest products such as CABs and CCABs, as well as the use of subordinate liens with a lower debt service coverage ratio requirement and the use of a TIFIA Loan, which typically provides more flexible terms than publicly issued bonds.

Basic Methodology of Structuring for Maximum Debt Capacity



RBC Capital Markets

3. Preliminary Financial Feasibility Analysis Assumptions and Inputs

Construction Cost

Construction costs have been provided for two scenarios, one for the bridge inclusive of the Kansas roadway approach or another for the bridge only and for these, they are shown in 2016, 2021 and 2031 dollars. RBCCM's Analysis, which includes 2021 and 2031 openings, assumes construction of the bridge with the Kansas roadway approach.

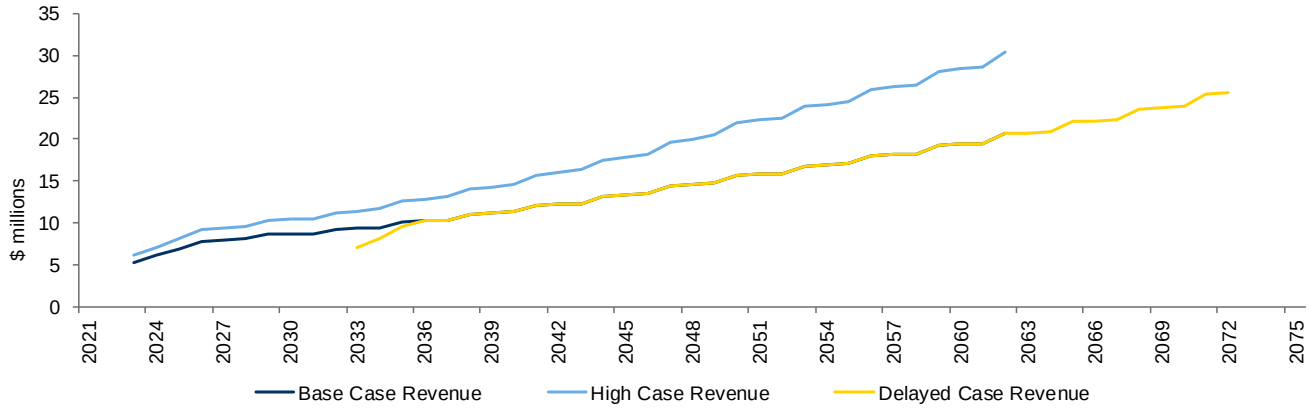
Description	2016	2021	2031
Bridge with Kansas Roadway Approach	$65mm	**$75mm**	**$90mm**
Bridge Only	$60mm	$65mm	$80mm

Revenues

CDM Smith provided annual revenues for three cases: a Base Case, a Delayed Case and a High Case.

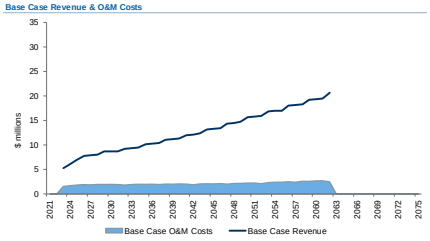
- **Base Revenue Case**: A base level of traffic that begins with the Project opening in 2022;
- **Delayed Revenue Case**: A base level of traffic that begins with the Project opening in 2032; and
- **High Revenue Case**: A high level of traffic that begins with the Project opening in 2022 using the same toll rates as the Base Case.

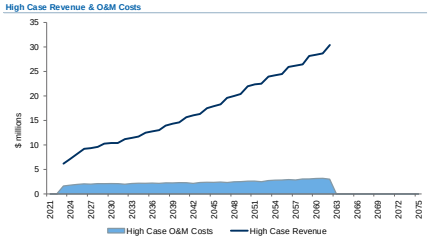
Annual Toll Revenue

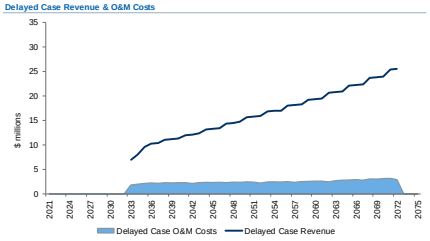


Operation and Maintenance ("O&M") Costs

O&M costs were provided for each of the three revenue cases described above. Below, we provide graphical representations showing revenue versus O&M costs.

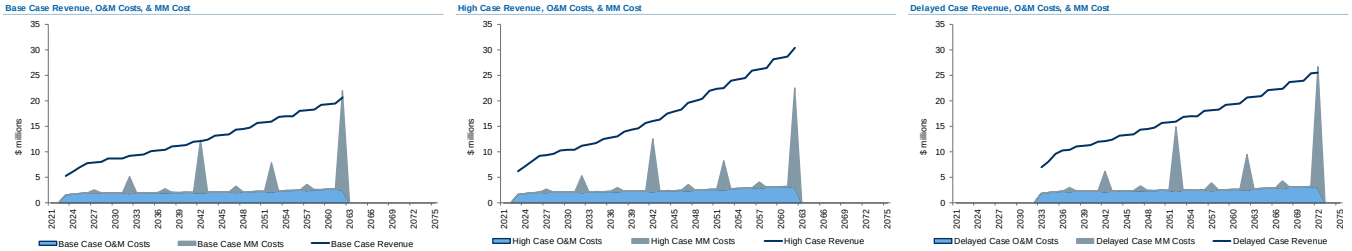






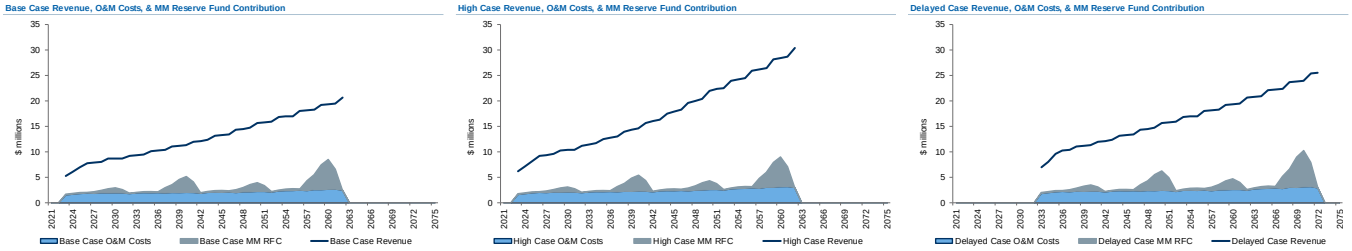
Major Maintenance ("MM") Costs

MM expenses were provided for each of the three revenue cases. Below, we provide graphical representations showing revenue versus O&M and major maintenance costs.



Major Maintenance Reserve Fund

As illustrated in the graphs above and as described earlier, MM costs do not typically occur annually, and when they do occur, are usually significant and lumpy. As such, to smooth out these expenditures, it is typical to use a major maintenance reserve fund. Funds are deposited from cash flow into this reserve fund on an annual basis in advance of major maintenance costs and are drawn from the fund at the time such costs are incurred. For this analysis, we have assumed a major maintenance reserve fund requirement equal to the sum of (a) 100% of the following year's major maintenance costs, (b) 80% of the major maintenance costs in two years, (c) 50% of the major maintenance costs in three years, (d) 25% of the major maintenance costs in four years, and (e) 10% of the major maintenance costs in five years. As can be seen graphically below, this methodology provides for less variability in annual cash flow.



Interest Rates

As provided below, the Analysis utilizes current market rates provided by RBCCM's Municipal Underwriting desk as of January, 22, 2016. These rates are based on the assumption that the bonds are rated Baa3/BBB- (investment grade) and we include an additional 100 basis points cushion to be conservative as the bonds are expected to be issued a few years from the date of this analysis. Applying an interest rate cushion is standard practice for a financial feasibility analysis of a project that will be financed in the future. CIBs assume a standard 10-year par call option provision for the issuer. CABs assume no call option. CCABs assume a 10-year conversion date and a subsequent 10-year par call option for the issuer following the conversion date.

Indicative Yields* (as of January 22, 2016)

Maturity	Current Interest Bonds	Capital Appreciation Bonds	Convertible Capital Appreciation Bonds
7/1/2024	2.84%	3.84%	3.64%
7/1/2025	3.05%	4.05%	3.85%
7/1/2026	3.23%	4.23%	4.03%
7/1/2027	3.44%	4.44%	4.24%
7/1/2028	3.65%	4.65%	4.45%
7/1/2029	3.84%	4.84%	4.64%
7/1/2030	4.00%	5.00%	4.80%
7/1/2031	4.15%	5.15%	4.95%
7/1/2032	4.28%	5.28%	5.08%
7/1/2033	4.37%	5.37%	5.17%
7/1/2034	4.46%	5.46%	5.26%
7/1/2035	4.54%	5.54%	5.34%
7/1/2036	4.61%	5.61%	5.41%
7/1/2037	4.66%	5.66%	5.46%
7/1/2038	4.71%	5.71%	5.51%
7/1/2039	4.76%	5.76%	5.56%
7/1/2040	4.81%	5.81%	5.61%
7/1/2045**	5.04%	6.04%	5.84%
7/1/2050**	5.10%	6.10%	5.90%
7/1/2060**	5.30%	6.30%	6.10%

**Inclusive of 100 basis point cushion.*

***Denotes term bonds.*

As of January 22, 2016, the 30-year TIFIA Loan rate for a standard project was 2.78%. As the Project would likely be categorized as rural project, the TIFIA Loan rate as of that date was 1.39%. The rural rate, plus 100 basis points, was assumed for this analysis.

Key Dates

Below we provide the summary of assumed dates for each scenario.

Dates

	Case 1	Case 2	Case 3	Case 4
Financial Close	July 1, 2020	July 1, 2020	July 1, 2030	July 1, 2020
End of Construction	June 30, 2022	June 30, 2022	June 30, 2032	June 30, 2022
End of Capitalized Interest	July 1, 2023	July 1, 2023	July 1, 2033	July 1, 2023
First TIFIA Interest Payment	n/a	July 1, 2027	n/a	n/a
First TIFIA Principal Payment	n/a	July 1, 2032	n/a	n/a

Capitalized Interest

The Analysis assumes three years of capitalized interest from the financial closing date. This covers the assumed period of construction plus one year following the end of construction.

Debt Service Reserve Fund

The Analysis assumes a Debt Service Reserve Fund totaling the maximum annual debt service amount for the toll revenue bonds issued. This assumption is in line with other comparable toll revenue bond projects.

Financing Costs

The Analysis assumes $1 million of financing costs. These are typically legal fees, rating agency fees, financial advisory fees, underwriting fees and other issuance-related costs. This is an estimate only; actual costs may differ from this amount.

TIFIA Eligible Costs

The standard policy of 33% of eligible costs, which include the cost of construction, capitalized interest, the debt service reserve fund, and financing costs, is used for this analysis.

4. Preliminary Financial Feasibility Analysis - Overview of Each Case

Case 1

Case 1 uses the Base Revenue Case projections and associated annual cost projections and tax-exempt toll revenue bonds only (no TIFIA) with a Financial Close on 7/1/2020. The cost of construction is $75 million in 2021 dollars and construction ends on 6/30/2022. CIBs and CCABs after the conversion date pay interest semi-annually on 1/1 and 7/1 and principal on 7/1. CABs amortize on 7/1. Debt service coverage on a net revenue basis must be at least 1.40x annually.

Summary of Results

Based on the minimum annual debt service coverage target of 1.40x, Case 1 results in a Project shortfall of $14.974 million. The Project is 80.03% feasible. The Senior Lien All-in TIC (cost of borrowing) is 5.42%. Total bond proceeds generated are $77.64 million with the issuance of $60.435 million of CIBs, $11.22 million of CABs and $22.45 million of CCABs. Bond proceeds are less than the total par amount of bonds as the CIBs are issued at a discount given the 100 basis point interest rate cushion.

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	77,640,321
TIFIA Loan		-
Total Sources	**$**	**77,640,321**
Uses		
Construction	$	75,000,000
Debt Service Reserve Fund		7,549,418
Capitalized Interest Fund		9,065,250
Financing Costs		1,000,000
Total Uses	**$**	**92,614,668**
Shortfall	**$**	**14,974,347**
Feasibility		**80.03%**

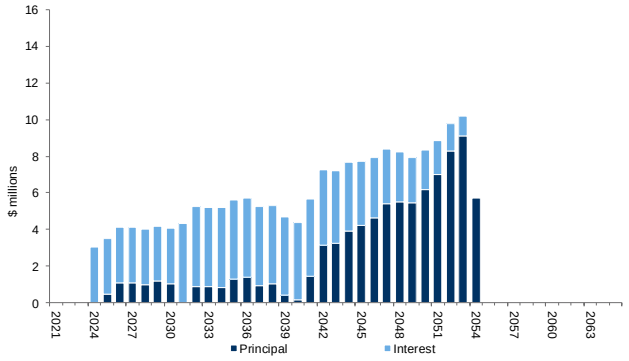
Debt Summary

		Par Amount	Final Maturity	Principal Amortization
Current Interest Bonds	$	60,435,000	7/1/2054	2046 - 2054
Capital Appreciation Bonds	$	11,220,000	7/1/2036	2025 - 2029, 2032 - 2036
Convertible Capital Appreciation Bonds	$	22,450,000	7/1/2046	2037 - 2046
TIFIA Loan	$	-	-	-
Total Debt Issued	**$**	**94,105,000**	**-**	**-**

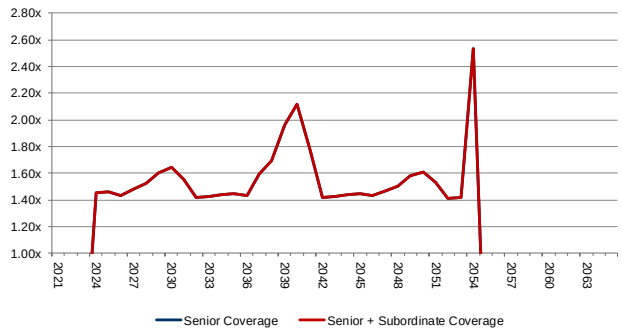
Statistics

Senior Lien All-in TIC	5.42%
TIFIA Loan Rate	n/a

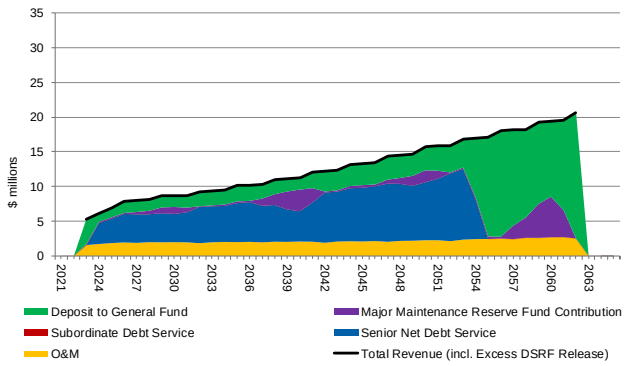
Senior Net Debt Service



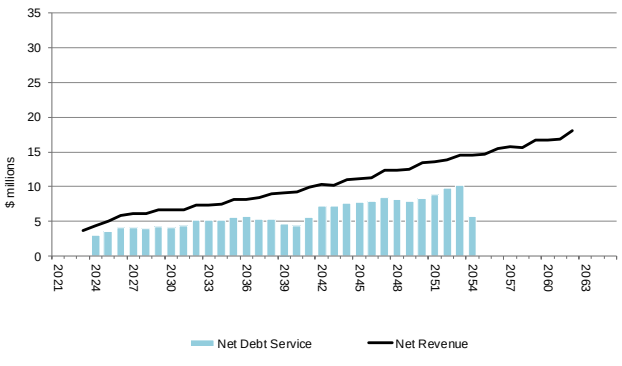
Debt Service Coverage Ratios



Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Case 2

Case 2 uses the Base Revenue Case projections and associated annual cost projections, tax-exempt toll revenue bonds and additional debt leverage with the use of a TIFIA loan. Financial Close is on 7/1/2020. The cost of construction is $75 million in 2021 dollars and construction ends on 6/30/2022. CIBs and the TIFIA loan pay interest semi-annually on 1/1 and 7/1 and principal on 7/1. Debt service coverage on a net revenue basis for the senior lien toll revenue bonds must be at least 1.40x annually and for all debt (including the TIFIA loan) must be at least 1.20x annually.

Summary of Results

Based on the minimum annual debt service coverage target of 1.20x, Case 2 results in a fully feasible Project. The Senior Lien All-in TIC (cost of borrowing) is 5.07% and the TIFIA loan rate is 2.39%. Total bond proceeds generated are $90.48 million with the issuance of $60.624 million of CIBs and TIFIA loan proceeds of $29.859 million. Case 2 does not need to use any deferred interest bonds.

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	60,624,268
TIFIA Loan		29,859,431
Total Sources	**$**	**90,483,699**
Uses		
Construction	$	75,000,000
Debt Service Reserve Fund		5,453,125
Capitalized Interest Fund		9,030,000
Financing Costs		1,000,574
Total Uses	**$**	**90,483,699**
Shortfall	**$**	**-**
Feasibility		**100.00%**

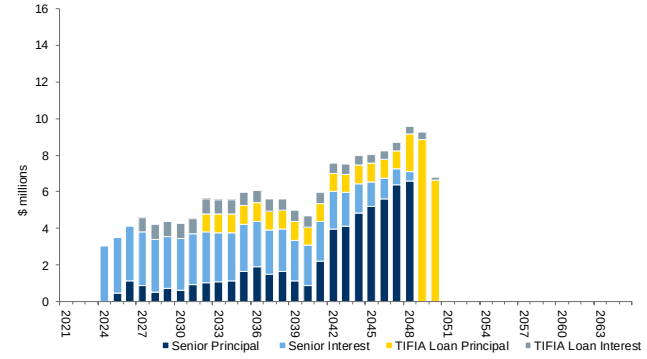
Debt Summary

		Par Amount	Final Maturity	Principal Amortization
Current Interest Bonds	$	60,200,000	7/1/2049	2024 - 2049
Capital Appreciation Bonds	$	-	-	-
Convertible Capital Appreciation Bonds	$	-	-	-
TIFIA Loan	$	29,859,431	7/1/2050	-
Total Debt Issued	**$**	**90,059,431**	**-**	**-**

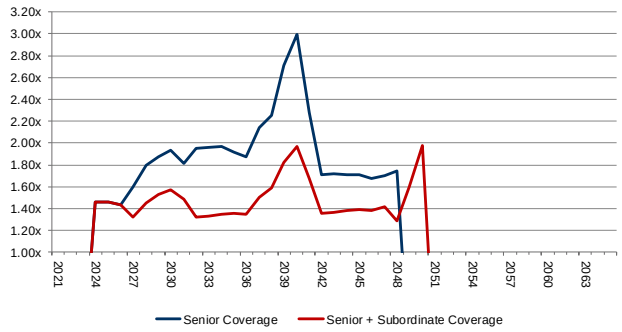
Statistics

Senior Lien All-in TIC	5.07%
TIFIA Loan Rate	2.39%

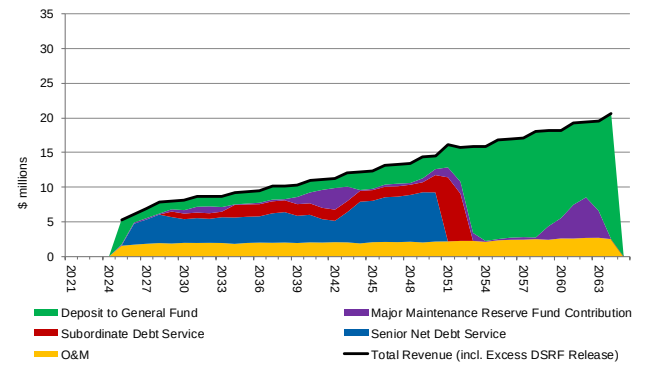
Senior and Subordinate Net Debt Service



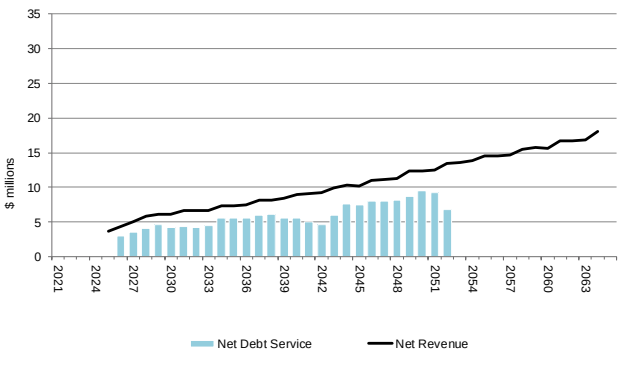
Debt Service Coverage Ratios



Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Case 3

Case 3 uses the Delayed Revenue Case projections and associated annual cost projections and tax-exempt toll revenue bonds only (no TIFIA) with a Financial Close on 7/1/2030. The cost of construction is $90 million in 2031 dollars and construction ends on 6/30/2032. CIBs and CCABs (after the conversion date) pay interest semi-annually on 1/1 and 7/1 and principal on 7/1. CABs amortize on 7/1. Debt service coverage on a net revenue basis must be at least 1.40x annually.

Summary of Results

Based on the minimum annual debt service coverage target of 1.40x, Case 1 results in a Project shortfall of $6.274 million. The Project is 90.03% feasible. The Senior Lien All-in TIC (cost of borrowing) is 5.40%. Total bond proceeds generated are $107.453 million with the issuance of $83.27 million of CIBs, $8.18 million of CABs and $37.62 million of CCABs. Bond proceeds are less than the total par amount of bonds as the CIBs are issued at a discount given the 100 basis point interest rate cushion.

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	107,453,560
TIFIA Loan		-
Total Sources	**$**	**107,453,560**
Uses		
Construction	$	90,000,000
Debt Service Reserve Fund		10,237,188
Capitalized Interest Fund		12,490,500
Financing Costs		1,000,000
Total Uses	**$**	**113,727,688**
Shortfall	**$**	**6,274,128**
Feasibility		**93.03%**

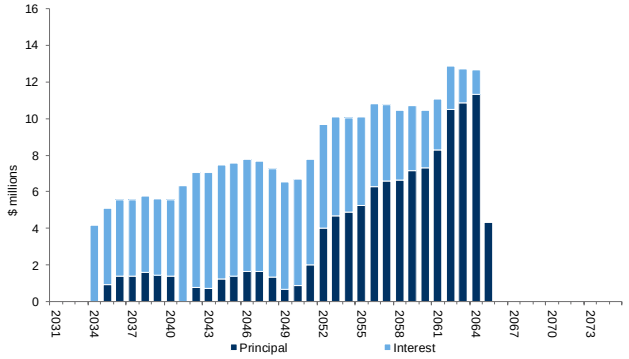
Debt Summary

		Par Amount	Final Maturity	Principal Amortization
Current Interest Bonds	$	83,270,000	7/1/2065	2057 - 2065
Capital Appreciation Bonds	$	8,180,000	7/1/2040	2035 - 2040
Convertible Capital Appreciation Bonds	$	37,620,000	7/1/2056	2041 - 2056
TIFIA Loan	$	-	-	-
Total Debt Issued	**$**	**129,070,000**	**-**	**-**

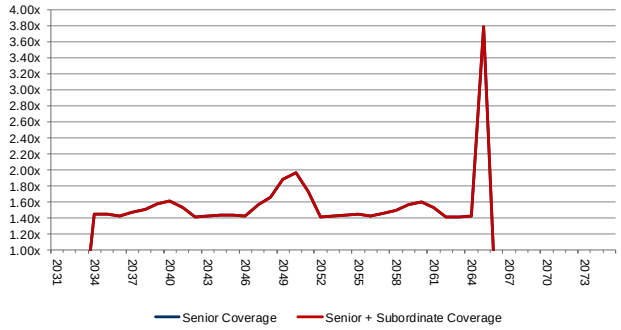
Statistics

Senior Lien All-in TIC	5.40%
TIFIA Loan Rate	n/a

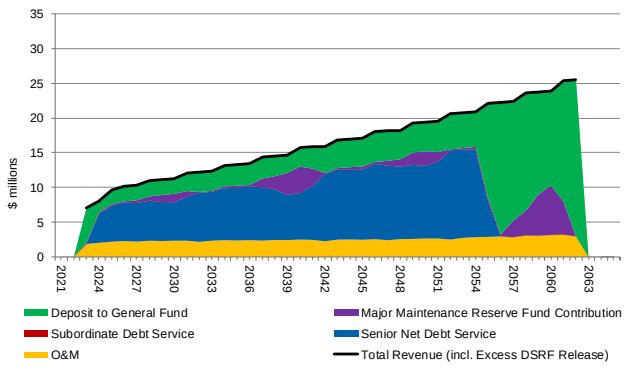
Senior Net Debt Service



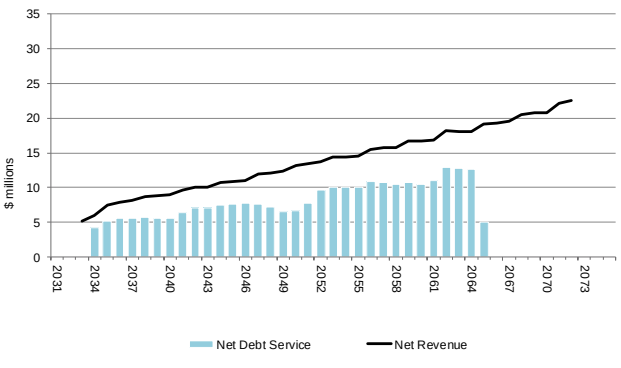
Debt Service Coverage Ratios



Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Case 4

Case 4 analyzes the debt capacity applying the High Revenue Case and associated annual cost projections provided by CDM Smith. While we performed this analysis, we note that, given our understanding of the aggressive traffic assumptions of this revenue case, we do not believe it can achieve investment grade rating levels and sold to public bond investors at the same cost and leverage assumptions assumed in the Analysis.

Case 4 uses tax-exempt toll revenue bonds only (no TIFIA) with a Financial Close on 7/1/2020. The cost of construction is $75 million in 2021 dollars and construction ends on 6/30/2022. CIBs and CCABs after the conversion date pay interest semi-annually on 1/1 and 7/1 and principal on 7/1. CABs amortize on 7/1. Debt service coverage on a net revenue basis must be at least 1.40x annually.

Summary of Results

Based on the minimum annual debt service coverage target of 1.40x, Case 4 results in in a fully feasible Project. The Senior Lien All-in TIC (cost of borrowing) is 5.33%. Total bond proceeds generated are $96.286 million with the issuance of $73.26 million of CIBs, $9.775 million of CABs and $31.665 million of CCABs. Bond proceeds are less than the total par amount of bonds as the CIBs are issued at a discount given the 100 basis point interest rate cushion.

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	96,286,380
TIFIA Loan		-
Total Sources	**$**	**96,286,380**
Uses		
Construction	$	75,000,000
Debt Service Reserve Fund		9,293,468
Capitalized Interest Fund		10,989,000
Financing Costs		1,003,912
Total Uses	**$**	**96,286,380**
Shortfall	**$**	**-**
Feasibility		**100.00%**

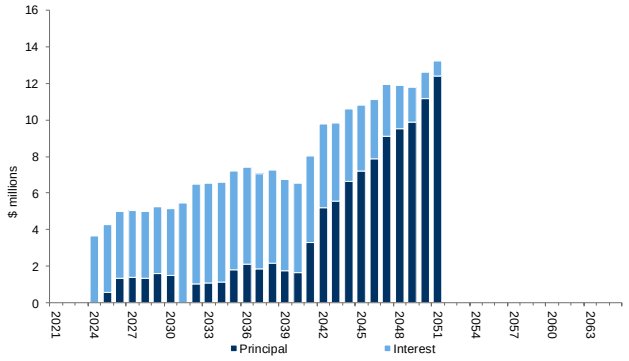
Debt Summary

		Par Amount	Final Maturity	Principal Amortization
Current Interest Bonds	$	73,260,000	7/1/2052	2044 - 2052
Capital Appreciation Bonds	$	9,775,758	7/1/2033	2025 - 2030, 2032, 2033
Convertible Capital Appreciation Bonds	$	31,665,000	7/1/2044	2033 - 2044
TIFIA Loan	$	-	-	-
Total Debt Issued	**$**	**114,700,758**	**-**	**-**

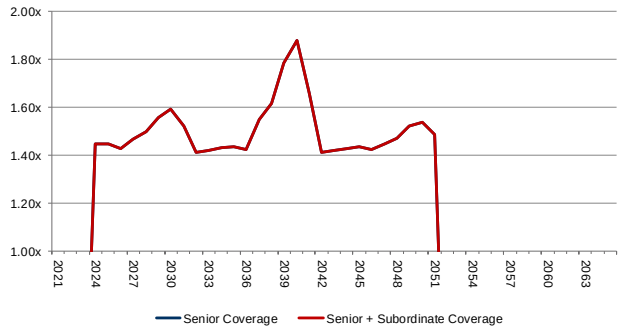
Statistics

Senior Lien All-in TIC	5.33%
TIFIA Loan Rate	n/a

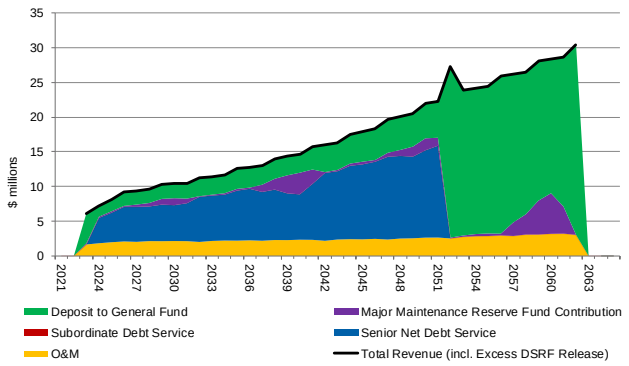
Senior Net Debt Service



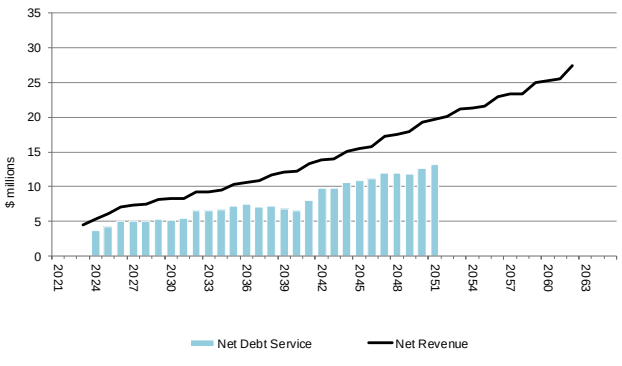
Debt Service Coverage Ratios



Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



5. Conclusions

Case 2, which incorporates the use of a TIFIA loan, results in a fully feasible Project. Both Cases 1 and 3 result in a Project shortfall. Below we compare the Sources and Uses of funds for each of the three cases as well as the related financial shortfall and feasibility percentage.

	Case 1	Case 2	Case 3
Revenue:	**Base Case**	**Base Case**	**Delayed Opening**
Financing:	**Traditional Municipal Toll Road Revenue Bonds**	**Traditional Municipal Toll Road Revenue Bonds with Federal Loan**	**Traditional Municipal Toll Road Revenue Bonds**
Opening:	**2022**	**2022**	**2032**
Sources			
Senior Lien Bond Proceeds	$ 77,640,321	$ 60,624,268	$ 107,453,560
Federal Loan	-	29,859,431	-
Total	**$ 77,640,321**	**$ 90,483,699**	**$ 107,453,560**
Uses			
Construction	$ 75,000,000	$ 75,000,000	$ 90,000,000
Debt Service Reserve Fund	7,549,418	5,453,125	10,237,188
Capitalized Interest Fund	9,065,250	9,030,000	12,490,500
Financing Costs	1,000,000	1,000,574	1,000,000
Total	**$ 92,614,668**	**$ 90,483,699**	**$ 113,727,688**
Shortfall	**$ 14,974,347**	**$ -**	**$ 6,274,128**
Feasibility	**80.03%**	**100.00%**	**93.03%**

Appendix A: Case 1 Model Output

RBC Capital Markets

Kansas Department of Transportation
K92 Bridge Financing

Case: 1
Description: Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Version: 1.01
Date: 2/4/2016

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6	TIFIA Loan Calculations (Monthly)	Calculation
7	Revenue and Cost Calculations	Calculation
8	Annual Date Calculations	Calculation
9	Monthly Date Calculations	Calculation
10	Debt Inputs	Input
11	Revenue and Cost	Input
12	Scenario Controls and Static Inputs	Input

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Kansas Department of Transportation
K92 Bridge Financing
Case: 1
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Summary
USD$

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	77,640,321
TIFIA Loan		-
Total Sources	**$**	**77,640,321**
Uses		
Construction	$	75,000,000
Debt Service Reserve Fund		7,549,418
Capitalized Interest Fund		9,065,250
Financing Costs		1,000,000
Total Uses	**$**	**92,614,668**
Shortfall	**$**	**14,974,347**
Feasibility		**80.03%**

Key Dates

Financial Close	7/1/2020
Construction End	6/30/2022
Capitalized Interest End	7/1/2023
First TIFIA Interest Payment	6/30/2027
First TIFIA Principal Payment	6/30/2032

Debt Summary

		Par Amount	**Final Maturity**
Current Interest Bonds	$	60,435,000	7/1/2054
Capital Appreciation Bonds	$	11,220,000	7/1/2036
Convertible Capital Appreciation Bonds	$	22,450,000	7/1/2046
TIFIA Loan	$	-	-
Total Debt Issued	**$**	**94,105,000**	
Statistics			
Senior Lien All-in TIC		5.42%	
TIFIA Loan Rate			

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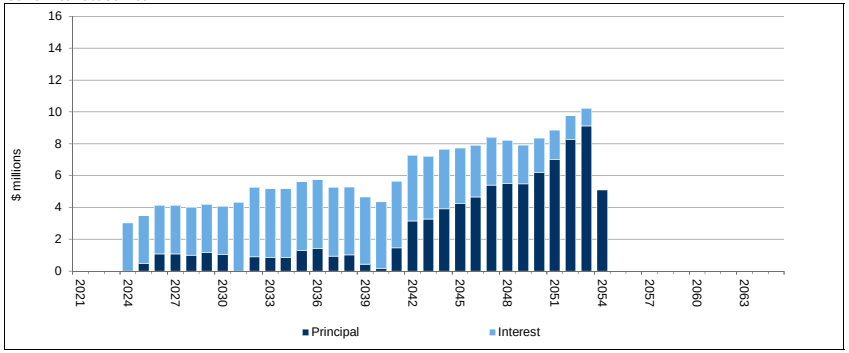
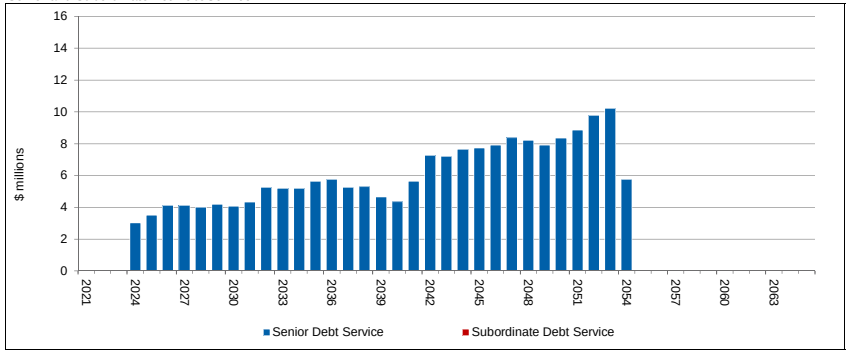
Kansas Department of Transportation
K92 Bridge Financing
Case: 1
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Graphs
USD$

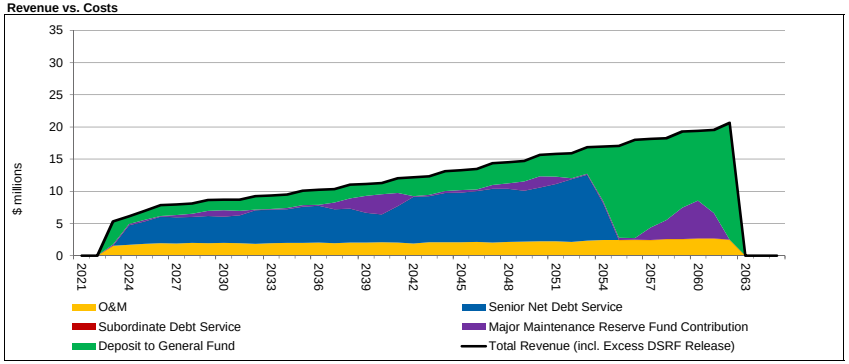
Senior Net Debt Service



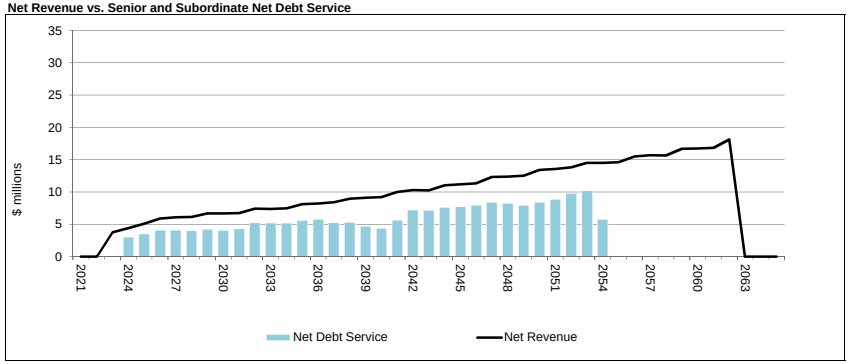
Senior and Subordinate Net Debt Service



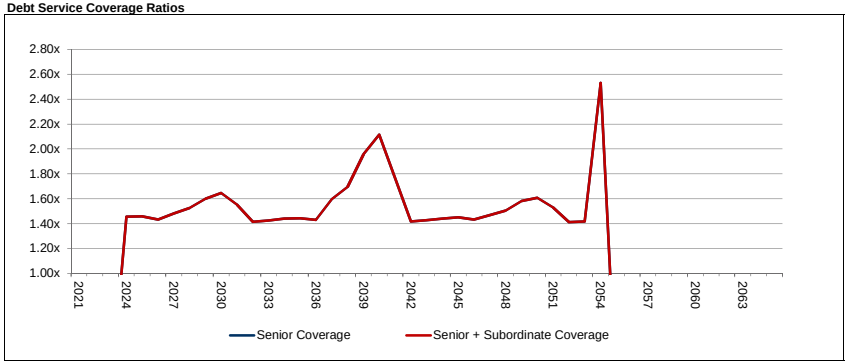
Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Debt Service Coverage Ratios



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Kansas Department of Transportation
K92 Bridge Financing
Case: 1
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		1	2	3	4	5	6	7	8	9	10	11	12
Start Date		1-Jul-20	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31
End Date		30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-31	30-Jun-32
Bond Year		1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31	1-Jul-32
Waterfall													
Toll Revenue	512,077,600	-	-	5,304,500	6,115,800	6,953,800	7,835,400	7,971,500	8,110,000	8,663,600	8,683,100	8,682,100	9,244,700
Operations and Maintenance Costs	(85,327,284)	-	-	(1,558,055)	(1,714,606)	(1,844,388)	(1,939,843)	(1,878,960)	(1,977,287)	(1,959,831)	(1,978,802)	(1,956,326)	(1,830,163)
Net Revenue	426,750,316	-	-	3,746,445	4,401,194	5,109,412	5,895,557	6,092,540	6,132,713	6,703,769	6,704,298	6,725,774	7,414,537
Senior Debt Service													
Principal	(94,105,000)	-	-	-	-	(480,000)	(1,090,000)	(1,090,000)	(1,000,000)	(1,170,000)	(1,050,000)	-	(910,000)
Interest	(111,239,160)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(4,326,615)	(4,326,615)
Gross Senior Debt Service	(205,344,160)	(3,021,750)	(3,021,750)	(3,021,750)	(3,021,750)	(3,501,750)	(4,111,750)	(4,111,750)	(4,021,750)	(4,191,750)	(4,071,750)	(4,326,615)	(5,236,615)
Capitalized Interest	9,065,250	3,021,750	3,021,750	3,021,750	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	7,549,418	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(188,729,492)	-	-	-	(3,021,750)	(3,501,750)	(4,111,750)	(4,111,750)	(4,021,750)	(4,191,750)	(4,071,750)	(4,326,615)	(5,236,615)
Revenue Avaliable after Senior Debt Service	238,020,824	-	-	3,746,445	1,379,444	1,607,662	1,783,807	1,980,790	2,110,963	2,512,019	2,632,548	2,399,159	2,177,922
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	238,020,824	-	-	3,746,445	1,379,444	1,607,662	1,783,807	1,980,790	2,110,963	2,512,019	2,632,548	2,399,159	2,177,922
Major Maintenance Costs	(42,958,764)	-	-	-	-	-	-	(677,761)	-	-	-	-	(3,329,678)
Major Maintenance Reserve Fund Release	42,958,764	-	-	-	-	-	-	677,761	-	-	-	-	3,329,678
Major Maintenance Reserve Fund Deposit	(42,958,764)	-	-	(169,440)	(169,440)	(203,328)	(135,552)	(332,968)	(499,452)	(832,420)	(998,903)	(665,936)	(82,619)
Revenue Avaliable for General Fund Deposit		-	-	3,577,005	1,210,004	1,404,334	1,648,255	1,647,822	1,611,512	1,679,600	1,633,645	1,733,223	2,095,303
General Fund													
General Fund Opening Balance		-	-	-	3,577,005	4,787,009	6,191,343	7,839,597	9,487,420	11,098,931	12,778,531	14,412,176	16,145,399
Deposit/(Draw)		-	-	3,577,005	1,210,004	1,404,334	1,648,255	1,647,822	1,611,512	1,679,600	1,633,645	1,733,223	2,095,303
Closing Balance		-	-	3,577,005	4,787,009	6,191,343	7,839,597	9,487,420	11,098,931	12,778,531	14,412,176	16,145,399	18,240,702
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x				1.46x	1.46x	1.43x	1.48x	1.52x	1.60x	1.65x	1.55x	1.42x
Senior and Subordinate	1.41x				1.46x	1.46x	1.43x	1.48x	1.52x	1.60x	1.65x	1.55x	1.42x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x				1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x
Senior and Subordinate	1.40x				1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 1
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		13	14	15	16	17	18	19	20	21	22	23	24
Start Date		1-Jul-32	1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42	1-Jul-43
End Date		30-Jun-33	30-Jun-34	30-Jun-35	30-Jun-36	30-Jun-37	30-Jun-38	30-Jun-39	30-Jun-40	30-Jun-41	30-Jun-42	30-Jun-43	30-Jun-44
Bond Year		1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42	1-Jul-43	1-Jul-44
Waterfall													
Toll Revenue	512,077,600	9,360,900	9,478,600	10,104,800	10,231,800	10,360,400	11,017,000	11,155,600	11,295,800	12,023,300	12,174,400	12,327,400	13,130,900
Operations and Maintenance Costs	(85,327,284)	(1,964,246)	(2,012,450)	(1,986,023)	(2,021,370)	(1,953,792)	(2,044,601)	(2,020,515)	(2,073,929)	(2,043,575)	(1,893,844)	(2,072,564)	(2,108,080)
Net Revenue	426,750,316	7,396,654	7,466,150	8,118,777	8,210,430	8,406,608	8,972,399	9,135,085	9,221,871	9,979,725	10,280,556	10,254,836	11,022,820
Senior Debt Service													
Principal	(94,105,000)	(865,000)	(855,000)	(1,295,000)	(1,415,000)	(935,000)	(1,015,000)	(445,000)	(165,000)	(1,455,000)	(3,150,000)	(3,270,000)	(3,920,000)
Interest	(111,239,160)	(4,326,615)	(4,326,615)	(4,326,615)	(4,326,615)	(4,326,615)	(4,275,564)	(4,219,638)	(4,194,896)	(4,185,639)	(4,100,667)	(3,916,707)	(3,725,739)
Gross Senior Debt Service	(205,344,160)	(5,191,615)	(5,181,615)	(5,621,615)	(5,741,615)	(5,261,615)	(5,290,564)	(4,664,638)	(4,359,896)	(5,640,639)	(7,250,667)	(7,186,707)	(7,645,739)
Capitalized Interest	9,065,250	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	7,549,418	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(188,729,492)	(5,191,615)	(5,181,615)	(5,621,615)	(5,741,615)	(5,261,615)	(5,290,564)	(4,664,638)	(4,359,896)	(5,640,639)	(7,250,667)	(7,186,707)	(7,645,739)
Revenue Avaliable after Senior Debt Service	238,020,824	2,205,039	2,284,535	2,497,162	2,468,815	3,144,993	3,681,835	4,470,448	4,861,975	4,339,086	3,029,889	3,068,129	3,377,081
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	238,020,824	2,205,039	2,284,535	2,497,162	2,468,815	3,144,993	3,681,835	4,470,448	4,861,975	4,339,086	3,029,889	3,068,129	3,377,081
Major Maintenance Costs	(42,958,764)	-	-	-	-	(826,187)	-	-	-	-	(10,392,583)	-	-
Major Maintenance Reserve Fund Release	42,958,764	-	-	-	-	826,187	-	-	-	-	10,392,583	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(123,928)	(206,547)	(247,856)	(165,237)	(1,039,258)	(1,558,887)	(2,598,146)	(3,117,775)	(2,078,517)	(126,071)	(189,106)	(315,177)
Revenue Avaliable for General Fund Deposit		2,081,111	2,077,989	2,249,306	2,303,577	2,105,735	2,122,948	1,872,302	1,744,201	2,260,570	2,903,818	2,879,022	3,061,904
General Fund													
General Fund Opening Balance		18,240,702	20,321,814	22,399,802	24,649,108	26,952,685	29,058,420	31,181,368	33,053,670	34,797,871	37,058,441	39,962,259	42,841,281
Deposit/(Draw)		2,081,111	2,077,989	2,249,306	2,303,577	2,105,735	2,122,948	1,872,302	1,744,201	2,260,570	2,903,818	2,879,022	3,061,904
Closing Balance		20,321,814	22,399,802	24,649,108	26,952,685	29,058,420	31,181,368	33,053,670	34,797,871	37,058,441	39,962,259	42,841,281	45,903,185
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x	1.42x	1.44x	1.44x	1.43x	1.60x	1.70x	1.96x	2.12x	1.77x	1.42x	1.43x	1.44x
Senior and Subordinate	1.41x	1.42x	1.44x	1.44x	1.43x	1.60x	1.70x	1.96x	2.12x	1.77x	1.42x	1.43x	1.44x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x
Senior and Subordinate	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 1
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		25	26	27	28	29	30	31	32	33	34	35	36
Start Date		1-Jul-44	1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54	1-Jul-55
End Date		30-Jun-45	30-Jun-46	30-Jun-47	30-Jun-48	30-Jun-49	30-Jun-50	30-Jun-51	30-Jun-52	30-Jun-53	30-Jun-54	30-Jun-55	30-Jun-56
Bond Year		1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54	1-Jul-55	1-Jul-56
Waterfall													
Toll Revenue	512,077,600	13,295,900	13,463,000	14,347,500	14,527,900	14,710,500	15,681,600	15,829,200	15,928,700	16,832,400	16,938,300	17,044,700	18,016,300
Operations and Maintenance Costs	(85,327,284)	(2,080,107)	(2,139,510)	(2,033,183)	(2,164,922)	(2,185,614)	(2,259,447)	(2,257,967)	(2,122,161)	(2,342,165)	(2,419,544)	(2,435,618)	(2,511,119)
Net Revenue	426,750,316	11,215,793	11,323,490	12,314,317	12,362,978	12,524,886	13,422,153	13,571,233	13,806,539	14,490,235	14,518,756	14,609,082	15,505,181
Senior Debt Service													
Principal	(94,105,000)	(4,240,000)	(4,655,000)	(5,400,000)	(5,500,000)	(5,480,000)	(6,190,000)	(7,015,000)	(8,270,000)	(9,125,000)	(12,655,000)	-	-
Interest	(111,239,160)	(3,496,811)	(3,249,195)	(2,981,750)	(2,711,750)	(2,436,750)	(2,162,750)	(1,853,250)	(1,502,500)	(1,089,000)	(632,750)	-	-
Gross Senior Debt Service	(205,344,160)	(7,736,811)	(7,904,195)	(8,381,750)	(8,211,750)	(7,916,750)	(8,352,750)	(8,868,250)	(9,772,500)	(10,214,000)	(13,287,750)	-	-
Capitalized Interest	9,065,250	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	7,549,418	-	-	-	-	-	-	-	-	-	7,549,418	-	-
Net Debt Service	(188,729,492)	(7,736,811)	(7,904,195)	(8,381,750)	(8,211,750)	(7,916,750)	(8,352,750)	(8,868,250)	(9,772,500)	(10,214,000)	(5,738,332)	-	-
Revenue Avaliable after Senior Debt Service	238,020,824	3,478,982	3,419,295	3,932,567	4,151,228	4,608,136	5,069,403	4,702,983	4,034,039	4,276,235	8,780,423	14,609,082	15,505,181
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	238,020,824	3,478,982	3,419,295	3,932,567	4,151,228	4,608,136	5,069,403	4,702,983	4,034,039	4,276,235	8,780,423	14,609,082	15,505,181
Major Maintenance Costs	(42,958,764)	-	-	(1,260,708)	-	-	-	-	(5,747,683)	-	-	-	-
Major Maintenance Reserve Fund Release	42,958,764	-	-	1,260,708	-	-	-	-	5,747,683	-	-	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(378,212)	(252,142)	(574,768)	(862,152)	(1,436,921)	(1,724,305)	(1,149,537)	(122,767)	(184,151)	(306,918)	(368,301)	(245,534)
Revenue Avaliable for General Fund Deposit		3,100,770	3,167,154	3,357,799	3,289,075	3,171,215	3,345,098	3,553,446	3,911,272	4,092,085	8,473,506	14,240,781	15,259,647
General Fund													
General Fund Opening Balance		45,903,185	49,003,955	52,171,109	55,528,908	58,817,983	61,989,198	65,334,296	68,887,743	72,799,015	76,891,100	85,364,606	99,605,387
Deposit/(Draw)		3,100,770	3,167,154	3,357,799	3,289,075	3,171,215	3,345,098	3,553,446	3,911,272	4,092,085	8,473,506	14,240,781	15,259,647
Closing Balance		49,003,955	52,171,109	55,528,908	58,817,983	61,989,198	65,334,296	68,887,743	72,799,015	76,891,100	85,364,606	99,605,387	114,865,034
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x	1.45x	1.43x	1.47x	1.51x	1.58x	1.61x	1.53x	1.41x	1.42x	2.53x		
Senior and Subordinate	1.41x	1.45x	1.43x	1.47x	1.51x	1.58x	1.61x	1.53x	1.41x	1.42x	2.53x		
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	2.48x		
Senior and Subordinate	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	2.48x		

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 1
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		37	38	39	40	41	42	43	44	45
Start Date		1-Jul-56	1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64
End Date		30-Jun-57	30-Jun-58	30-Jun-59	30-Jun-60	30-Jun-61	30-Jun-62	30-Jun-63	30-Jun-64	30-Jun-65
Bond Year		1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64	1-Jul-65
Waterfall										
Toll Revenue	512,077,600	18,129,500	18,243,500	19,285,200	19,406,400	19,528,400	20,643,200	-	-	-
Operations and Maintenance Costs	(85,327,284)	(2,417,601)	(2,612,422)	(2,601,895)	(2,689,442)	(2,707,971)	(2,513,347)	-	-	-
Net Revenue	426,750,316	15,711,899	15,631,078	16,683,305	16,716,958	16,820,429	18,129,853	-	-	-
Senior Debt Service										
Principal	(94,105,000)	-	-	-	-	-	-	-	-	-
Interest	(111,239,160)	-	-	-	-	-	-	-	-	-
Gross Senior Debt Service	(205,344,160)	-	-	-	-	-	-	-	-	-
Capitalized Interest	9,065,250	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	7,549,418	-	-	-	-	-	-	-	-	-
Net Debt Service	(188,729,492)	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Senior Debt Service	238,020,824	15,711,899	15,631,078	16,683,305	16,716,958	16,820,429	18,129,853	-	-	-
Subordinate Debt Service										
Principal	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	238,020,824	15,711,899	15,631,078	16,683,305	16,716,958	16,820,429	18,129,853	-	-	-
Major Maintenance Costs	(42,958,764)	(1,227,670)	-	-	-	-	(19,496,495)	-	-	-
Major Maintenance Reserve Fund Release	42,958,764	1,227,670	-	-	-	-	19,496,495	-	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(1,949,650)	(2,924,474)	(4,874,124)	(5,848,949)	(3,899,299)	-	-	-	-
Revenue Avaliable for General Fund Deposit		13,762,250	12,706,603	11,809,181	10,868,010	12,921,130	18,129,853	-	-	-
General Fund										
General Fund Opening Balance		114,865,034	128,627,284	141,333,887	153,143,068	164,011,077	176,932,207	195,062,060	195,062,060	195,062,060
Deposit/(Draw)		13,762,250	12,706,603	11,809,181	10,868,010	12,921,130	18,129,853	-	-	-
Closing Balance		128,627,284	141,333,887	153,143,068	164,011,077	176,932,207	195,062,060	195,062,060	195,062,060	195,062,060

Debt Service Coverage Ratio by Net Revenue

Senior	1.41x
Senior and Subordinate	1.41x

Debt Service Coverage Ratio by Net Revenue less MMRF Retention

Senior	1.40x
Senior and Subordinate	1.40x

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Appendix B: Case 2 Model Output

RBC Capital Markets

Kansas Department of Transportation
K92 Bridge Financing

Case: 2
Description: Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Version: 1.01
Date: 2/4/2016

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5	Annual Calculations	Calculation
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8	Annual Date Calculations	Calculation
9	Monthly Date Calculations	Calculation
10	Debt Inputs	Input
11	Revenue and Cost	Input
12	Scenario Controls and Static Inputs	Input

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Kansas Department of Transportation
K92 Bridge Financing
Case: 2
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Summary
USD$

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	60,624,268
TIFIA Loan		29,859,431
Total Sources	**$**	**90,483,699**
Uses		
Construction	$	75,000,000
Debt Service Reserve Fund		5,453,125
Capitalized Interest Fund		9,030,000
Financing Costs		1,000,574
Total Uses	**$**	**90,483,699**
Shortfall	**$**	-
Feasibility		**100.00%**

Key Dates

Financial Close	7/1/2020
Construction End	6/30/2022
Capitalized Interest End	7/1/2023
First TIFIA Interest Payment	6/30/2027
First TIFIA Principal Payment	6/30/2032

Debt Summary

		Par Amount	**Final Maturity**
Current Interest Bonds	$	60,200,000	7/1/2049
Capital Appreciation Bonds	$	-	-
Convertible Capital Appreciation Bonds	$	-	-
TIFIA Loan	$	29,859,431	7/1/2050
Total Debt Issued	**$**	**90,059,431**	
Statistics			
Senior Lien All-in TIC		5.07%	
TIFIA Loan Rate		2.39%	

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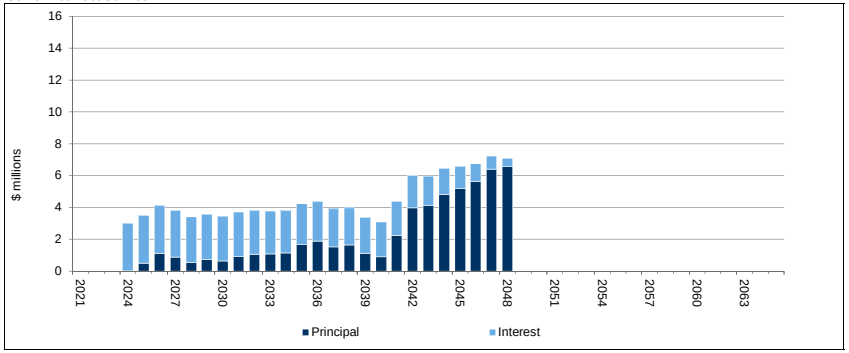
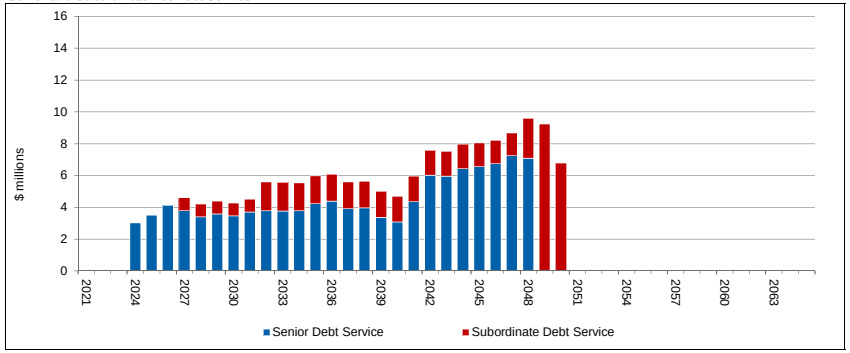
Kansas Department of Transportation
K92 Bridge Financing
Case: 2
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Graphs
USD$

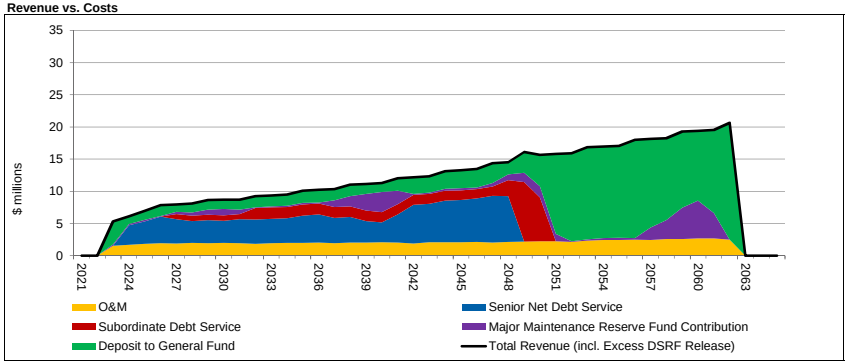
Senior Net Debt Service



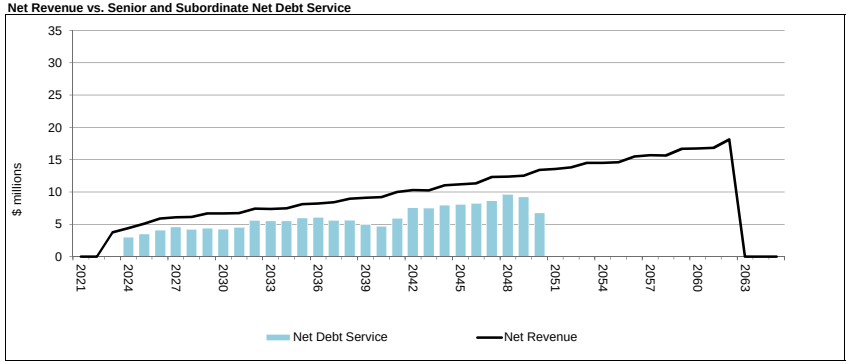
Senior and Subordinate Net Debt Service



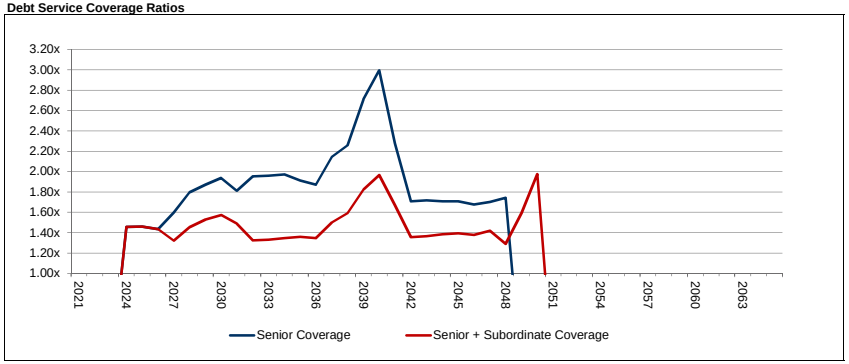
Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Debt Service Coverage Ratios



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Kansas Department of Transportation
K92 Bridge Financing
Case: 2
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Cash Flow Waterfall
USD$

Year		1	2	3	4	5	6	7	8	9	10	11	12
Start Date		1-Jul-20	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31
End Date		30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-31	30-Jun-32
Bond Year		1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31	1-Jul-32
Waterfall													
Toll Revenue	512,077,600	-	-	5,304,500	6,115,800	6,953,800	7,835,400	7,971,500	8,110,000	8,663,600	8,683,100	8,682,100	9,244,700
Operations and Maintenance Costs	(85,327,284)	-	-	(1,558,055)	(1,714,606)	(1,844,388)	(1,939,843)	(1,878,960)	(1,977,287)	(1,959,831)	(1,978,802)	(1,956,326)	(1,830,163)
Net Revenue	426,750,316	-	-	3,746,445	4,401,194	5,109,412	5,895,557	6,092,540	6,132,713	6,703,769	6,704,298	6,725,774	7,414,537
Senior Debt Service													
Principal	(60,200,000)	-	-	-	(10,000)	(490,000)	(1,125,000)	(880,000)	(530,000)	(725,000)	(640,000)	(925,000)	(1,055,000)
Interest	(66,312,500)	(3,010,000)	(3,010,000)	(3,010,000)	(3,010,000)	(3,009,500)	(2,985,000)	(2,928,750)	(2,884,750)	(2,858,250)	(2,822,000)	(2,790,000)	(2,743,750)
Gross Senior Debt Service	(126,512,500)	(3,010,000)	(3,010,000)	(3,010,000)	(3,020,000)	(3,499,500)	(4,110,000)	(3,808,750)	(3,414,750)	(3,583,250)	(3,462,000)	(3,715,000)	(3,798,750)
Capitalized Interest	9,030,000	3,010,000	3,010,000	3,010,000	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	5,453,125	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(112,029,375)	-	-	-	(3,020,000)	(3,499,500)	(4,110,000)	(3,808,750)	(3,414,750)	(3,583,250)	(3,462,000)	(3,715,000)	(3,798,750)
Revenue Avaliable after Senior Debt Service	314,720,941	-	-	3,746,445	1,381,194	1,609,912	1,785,557	2,283,790	2,717,963	3,120,519	3,242,298	3,010,774	3,615,787
Subordinate Debt Service													
Principal	(33,579,055)	-	-	-	-	-	-	-	-	-	-	-	(1,000,000)
Interest	(14,934,744)	-	-	-	-	-	-	(802,539)	(802,539)	(802,539)	(802,539)	(802,539)	(802,539)
Subordinate Debt Service	(48,513,799)	-	-	-	-	-	-	(802,539)	(802,539)	(802,539)	(802,539)	(802,539)	(1,802,539)
Revenue Avaliable after Subordinate Debt Service	266,207,142	-	-	3,746,445	1,381,194	1,609,912	1,785,557	1,481,251	1,915,424	2,317,980	2,439,759	2,208,235	1,813,247
Major Maintenance Costs	(42,958,764)	-	-	-	-	-	-	(677,761)	-	-	-	-	(3,329,678)
Major Maintenance Reserve Fund Release	42,958,764	-	-	-	-	-	-	677,761	-	-	-	-	3,329,678
Major Maintenance Reserve Fund Deposit	(42,958,764)	-	-	(169,440)	(169,440)	(203,328)	(135,552)	(332,968)	(499,452)	(832,420)	(998,903)	(665,936)	(82,619)
Revenue Avaliable for General Fund Deposit		-	-	3,577,005	1,211,754	1,406,584	1,650,005	1,148,283	1,415,972	1,485,560	1,440,855	1,542,299	1,730,629
General Fund													
General Fund Opening Balance		-	-	-	3,577,005	4,788,759	6,195,343	7,845,347	8,993,630	10,409,602	11,895,163	13,336,018	14,878,317
Deposit/(Draw)		-	-	3,577,005	1,211,754	1,406,584	1,650,005	1,148,283	1,415,972	1,485,560	1,440,855	1,542,299	1,730,629
Closing Balance		-	-	3,577,005	4,788,759	6,195,343	7,845,347	8,993,630	10,409,602	11,895,163	13,336,018	14,878,317	16,608,946
Debt Service Coverage Ratio by Net Revenue													
Senior	1.43x				1.46x	1.46x	1.43x	1.60x	1.80x	1.87x	1.94x	1.81x	1.95x
Senior and Subordinate	1.29x				1.46x	1.46x	1.43x	1.32x	1.45x	1.53x	1.57x	1.49x	1.32x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x				1.40x	1.40x	1.40x	1.51x	1.65x	1.64x	1.65x	1.63x	1.93x
Senior and Subordinate	1.20x				1.40x	1.40x	1.40x	1.25x	1.34x	1.34x	1.34x	1.34x	1.31x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 2
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Cash Flow Waterfall
USD$

Year		13	14	15	16	17	18	19	20	21	22	23	24
Start Date		1-Jul-32	1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42	1-Jul-43
End Date		30-Jun-33	30-Jun-34	30-Jun-35	30-Jun-36	30-Jun-37	30-Jun-38	30-Jun-39	30-Jun-40	30-Jun-41	30-Jun-42	30-Jun-43	30-Jun-44
Bond Year		1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42	1-Jul-43	1-Jul-44
Waterfall													
Toll Revenue	512,077,600	9,360,900	9,478,600	10,104,800	10,231,800	10,360,400	11,017,000	11,155,600	11,295,800	12,023,300	12,174,400	12,327,400	13,130,900
Operations and Maintenance Costs	(85,327,284)	(1,964,246)	(2,012,450)	(1,986,023)	(2,021,370)	(1,953,792)	(2,044,601)	(2,020,515)	(2,073,929)	(2,043,575)	(1,893,844)	(2,072,564)	(2,108,080)
Net Revenue	426,750,316	7,396,654	7,466,150	8,118,777	8,210,430	8,406,608	8,972,399	9,135,085	9,221,871	9,979,725	10,280,556	10,254,836	11,022,820
Senior Debt Service													
Principal	(60,200,000)	(1,085,000)	(1,150,000)	(1,665,000)	(1,890,000)	(1,520,000)	(1,650,000)	(1,125,000)	(895,000)	(2,240,000)	(3,985,000)	(4,140,000)	(4,825,000)
Interest	(66,312,500)	(2,691,000)	(2,636,750)	(2,579,250)	(2,496,000)	(2,401,500)	(2,325,500)	(2,243,000)	(2,186,750)	(2,142,000)	(2,030,000)	(1,830,750)	(1,623,750)
Gross Senior Debt Service	(126,512,500)	(3,776,000)	(3,786,750)	(4,244,250)	(4,386,000)	(3,921,500)	(3,975,500)	(3,368,000)	(3,081,750)	(4,382,000)	(6,015,000)	(5,970,750)	(6,448,750)
Capitalized Interest	9,030,000	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	5,453,125	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(112,029,375)	(3,776,000)	(3,786,750)	(4,244,250)	(4,386,000)	(3,921,500)	(3,975,500)	(3,368,000)	(3,081,750)	(4,382,000)	(6,015,000)	(5,970,750)	(6,448,750)
Revenue Avaliable after Senior Debt Service	314,720,941	3,620,654	3,679,400	3,874,527	3,824,430	4,485,108	4,996,899	5,767,085	6,140,121	5,597,725	4,265,556	4,284,086	4,574,070
Subordinate Debt Service													
Principal	(33,579,055)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)	(1,000,000)
Interest	(14,934,744)	(778,639)	(754,739)	(730,839)	(706,939)	(683,039)	(659,139)	(635,239)	(611,339)	(587,439)	(563,539)	(539,639)	(515,739)
Subordinate Debt Service	(48,513,799)	(1,778,639)	(1,754,739)	(1,730,839)	(1,706,939)	(1,683,039)	(1,659,139)	(1,635,239)	(1,611,339)	(1,587,439)	(1,563,539)	(1,539,639)	(1,515,739)
Revenue Avaliable after Subordinate Debt Service	266,207,142	1,842,015	1,924,661	2,143,687	2,117,490	2,802,069	3,337,760	4,131,846	4,528,781	4,010,286	2,702,016	2,744,446	3,058,330
Major Maintenance Costs	(42,958,764)	-	-	-	-	(826,187)	-	-	-	-	(10,392,583)	-	-
Major Maintenance Reserve Fund Release	42,958,764	-	-	-	-	826,187	-	-	-	-	10,392,583	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(123,928)	(206,547)	(247,856)	(165,237)	(1,039,258)	(1,558,887)	(2,598,146)	(3,117,775)	(2,078,517)	(126,071)	(189,106)	(315,177)
Revenue Avaliable for General Fund Deposit		1,718,087	1,718,114	1,895,831	1,952,253	1,762,811	1,778,873	1,533,700	1,411,007	1,931,769	2,575,946	2,555,340	2,743,153
General Fund													
General Fund Opening Balance		16,608,946	18,327,033	20,045,147	21,940,978	23,893,231	25,656,042	27,434,914	28,968,615	30,379,621	32,311,391	34,887,336	37,442,676
Deposit/(Draw)		1,718,087	1,718,114	1,895,831	1,952,253	1,762,811	1,778,873	1,533,700	1,411,007	1,931,769	2,575,946	2,555,340	2,743,153
Closing Balance		18,327,033	20,045,147	21,940,978	23,893,231	25,656,042	27,434,914	28,968,615	30,379,621	32,311,391	34,887,336	37,442,676	40,185,829
Debt Service Coverage Ratio by Net Revenue													
Senior	1.43x	1.96x	1.97x	1.91x	1.87x	2.14x	2.26x	2.71x	2.99x	2.28x	1.71x	1.72x	1.71x
Senior and Subordinate	1.29x	1.33x	1.35x	1.36x	1.35x	1.50x	1.59x	1.83x	1.96x	1.67x	1.36x	1.37x	1.38x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.93x	1.92x	1.85x	1.83x	1.88x	1.86x	1.94x	1.98x	1.80x	1.69x	1.69x	1.66x
Senior and Subordinate	1.20x	1.31x	1.31x	1.32x	1.32x	1.31x	1.32x	1.31x	1.30x	1.32x	1.34x	1.34x	1.34x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 2
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Cash Flow Waterfall
USD$

Year		25	26	27	28	29	30	31	32	33	34	35	36
Start Date		1-Jul-44	1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54	1-Jul-55
End Date		30-Jun-45	30-Jun-46	30-Jun-47	30-Jun-48	30-Jun-49	30-Jun-50	30-Jun-51	30-Jun-52	30-Jun-53	30-Jun-54	30-Jun-55	30-Jun-56
Bond Year		1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54	1-Jul-55	1-Jul-56
Waterfall													
Toll Revenue	512,077,600	13,295,900	13,463,000	14,347,500	14,527,900	14,710,500	15,681,600	15,829,200	15,928,700	16,832,400	16,938,300	17,044,700	18,016,300
Operations and Maintenance Costs	(85,327,284)	(2,080,107)	(2,139,510)	(2,033,183)	(2,164,922)	(2,185,614)	(2,259,447)	(2,257,967)	(2,122,161)	(2,342,165)	(2,419,544)	(2,435,618)	(2,511,119)
Net Revenue	426,750,316	11,215,793	11,323,490	12,314,317	12,362,978	12,524,886	13,422,153	13,571,233	13,806,539	14,490,235	14,518,756	14,609,082	15,505,181
Senior Debt Service													
Principal	(60,200,000)	(5,180,000)	(5,625,000)	(6,400,000)	(6,570,000)	(3,875,000)	-	-	-	-	-	-	-
Interest	(66,312,500)	(1,382,500)	(1,123,500)	(842,250)	(522,250)	(193,750)	-	-	-	-	-	-	-
Gross Senior Debt Service	(126,512,500)	(6,562,500)	(6,748,500)	(7,242,250)	(7,092,250)	(4,068,750)	-	-	-	-	-	-	-
Capitalized Interest	9,030,000	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	5,453,125	-	-	-	-	5,453,125	-	-	-	-	-	-	-
Net Debt Service	(112,029,375)	(6,562,500)	(6,748,500)	(7,242,250)	(7,092,250)	1,384,375	-	-	-	-	-	-	-
Revenue Avaliable after Senior Debt Service	314,720,941	4,653,293	4,574,990	5,072,067	5,270,728	13,909,261	13,422,153	13,571,233	13,806,539	14,490,235	14,518,756	14,609,082	15,505,181
Subordinate Debt Service													
Principal	(33,579,055)	(1,000,000)	(1,000,000)	(1,000,000)	(2,071,632)	(8,869,343)	(6,638,079)	-	-	-	-	-	-
Interest	(14,934,744)	(491,839)	(467,939)	(444,039)	(420,139)	(370,627)	(158,650)	-	-	-	-	-	-
Subordinate Debt Service	(48,513,799)	(1,491,839)	(1,467,939)	(1,444,039)	(2,491,771)	(9,239,971)	(6,796,729)	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	266,207,142	3,161,454	3,107,051	3,628,028	2,778,957	4,669,290	6,625,423	13,571,233	13,806,539	14,490,235	14,518,756	14,609,082	15,505,181
Major Maintenance Costs	(42,958,764)	-	-	(1,260,708)	-	-	-	-	(5,747,683)	-	-	-	-
Major Maintenance Reserve Fund Release	42,958,764	-	-	1,260,708	-	-	-	-	5,747,683	-	-	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(378,212)	(252,142)	(574,768)	(862,152)	(1,436,921)	(1,724,305)	(1,149,537)	(122,767)	(184,151)	(306,918)	(368,301)	(245,534)
Revenue Avaliable for General Fund Deposit		2,783,242	2,854,909	3,053,260	1,916,804	3,232,369	4,901,119	12,421,696	13,683,772	14,306,085	14,211,838	14,240,781	15,259,647
General Fund													
General Fund Opening Balance		40,185,829	42,969,071	45,823,981	48,877,240	50,794,045	54,026,414	58,927,532	71,349,229	85,033,001	99,339,086	113,550,924	127,791,705
Deposit/(Draw)		2,783,242	2,854,909	3,053,260	1,916,804	3,232,369	4,901,119	12,421,696	13,683,772	14,306,085	14,211,838	14,240,781	15,259,647
Closing Balance		42,969,071	45,823,981	48,877,240	50,794,045	54,026,414	58,927,532	71,349,229	85,033,001	99,339,086	113,550,924	127,791,705	143,051,352
Debt Service Coverage Ratio by Net Revenue													
Senior	1.43x	1.71x	1.68x	1.70x	1.74x								
Senior and Subordinate	1.29x	1.39x	1.38x	1.42x	1.29x	1.59x	1.97x						
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.65x	1.64x	1.62x	1.62x								
Senior and Subordinate	1.20x	1.35x	1.35x	1.35x	1.20x	1.41x	1.72x						

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 2
Base Case Revenues - Traditional Municipal Toll Road Revenue Bonds with Federal Loan

Cash Flow Waterfall
USD$

Year		37	38	39	40	41	42	43	44	45
Start Date		1-Jul-56	1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64
End Date		30-Jun-57	30-Jun-58	30-Jun-59	30-Jun-60	30-Jun-61	30-Jun-62	30-Jun-63	30-Jun-64	30-Jun-65
Bond Year		1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64	1-Jul-65
Waterfall										
Toll Revenue	512,077,600	18,129,500	18,243,500	19,285,200	19,406,400	19,528,400	20,643,200	-	-	-
Operations and Maintenance Costs	(85,327,284)	(2,417,601)	(2,612,422)	(2,601,895)	(2,689,442)	(2,707,971)	(2,513,347)	-	-	-
Net Revenue	426,750,316	15,711,899	15,631,078	16,683,305	16,716,958	16,820,429	18,129,853	-	-	-
Senior Debt Service										
Principal	(60,200,000)	-	-	-	-	-	-	-	-	-
Interest	(66,312,500)	-	-	-	-	-	-	-	-	-
Gross Senior Debt Service	(126,512,500)	-	-	-	-	-	-	-	-	-
Capitalized Interest	9,030,000	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	5,453,125	-	-	-	-	-	-	-	-	-
Net Debt Service	(112,029,375)	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Senior Debt Service	314,720,941	15,711,899	15,631,078	16,683,305	16,716,958	16,820,429	18,129,853	-	-	-
Subordinate Debt Service										
Principal	(33,579,055)	-	-	-	-	-	-	-	-	-
Interest	(14,934,744)	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	(48,513,799)	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	266,207,142	15,711,899	15,631,078	16,683,305	16,716,958	16,820,429	18,129,853	-	-	-
Major Maintenance Costs	(42,958,764)	(1,227,670)	-	-	-	-	(19,496,495)	-	-	-
Major Maintenance Reserve Fund Release	42,958,764	1,227,670	-	-	-	-	19,496,495	-	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(1,949,650)	(2,924,474)	(4,874,124)	(5,848,949)	(3,899,299)	-	-	-	-
Revenue Avaliable for General Fund Deposit		13,762,250	12,706,603	11,809,181	10,868,010	12,921,130	18,129,853	-	-	-
General Fund										
General Fund Opening Balance		143,051,352	156,813,602	169,520,206	181,329,386	192,197,396	205,118,526	223,248,378	223,248,378	223,248,378
Deposit/(Draw)		13,762,250	12,706,603	11,809,181	10,868,010	12,921,130	18,129,853	-	-	-
Closing Balance		156,813,602	169,520,206	181,329,386	192,197,396	205,118,526	223,248,378	223,248,378	223,248,378	223,248,378

Debt Service Coverage Ratio by Net Revenue

Senior	1.43x
Senior and Subordinate	1.29x

Debt Service Coverage Ratio by Net Revenue less MMRF Retention

Senior	1.40x
Senior and Subordinate	1.20x

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Appendix C: Case 3 Model Output

RBC Capital Markets

Kansas Department of Transportation
K92 Bridge Financing

Case: 3
Description: Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Version: 1.01
Date: 2/4/2016

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12	Scenario Controls and Static Inputs	Input

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Kansas Department of Transportation
K92 Bridge Financing
Case: 3
Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Summary
USD$

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	107,453,560
TIFIA Loan		-
Total Sources	**$**	**107,453,560**
Uses		
Construction	$	90,000,000
Debt Service Reserve Fund		10,237,188
Capitalized Interest Fund		12,490,500
Financing Costs		1,000,000
Total Uses	**$**	**113,727,688**
Shortfall	**$**	**6,274,128**
Feasibility		**93.03%**

Key Dates

Financial Close	7/1/2030
Construction End	6/30/2032
Capitalized Interest End	7/1/2033
First TIFIA Interest Payment	6/30/2037
First TIFIA Principal Payment	6/30/2042

Debt Summary

		Par Amount	**Final Maturity**
Current Interest Bonds	$	83,270,000	7/1/2065
Capital Appreciation Bonds	$	8,180,000	7/1/2040
Convertible Capital Appreciation Bonds	$	37,620,000	7/1/2056
TIFIA Loan	$	-	-
Total Debt Issued	**$**	**129,070,000**	
Statistics			
Senior Lien All-in TIC		5.40%	
TIFIA Loan Rate			

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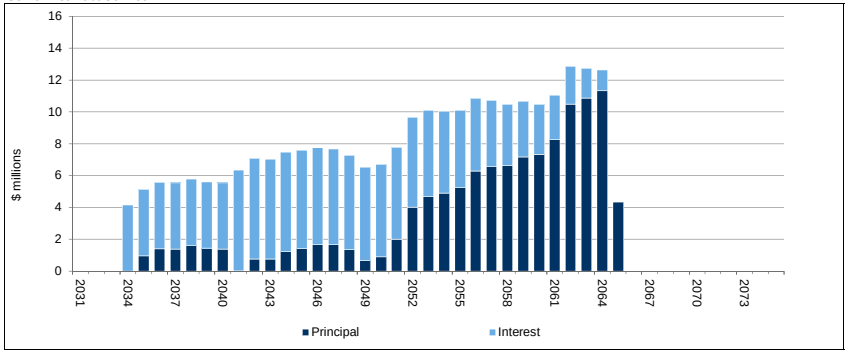
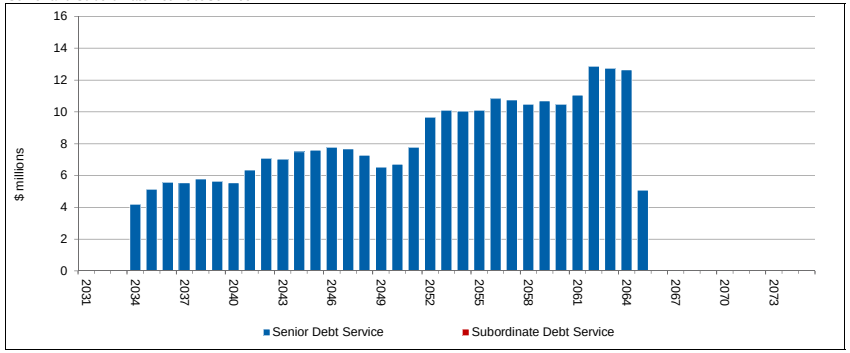
Kansas Department of Transportation
K92 Bridge Financing
Case: 3
Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Graphs
USD$

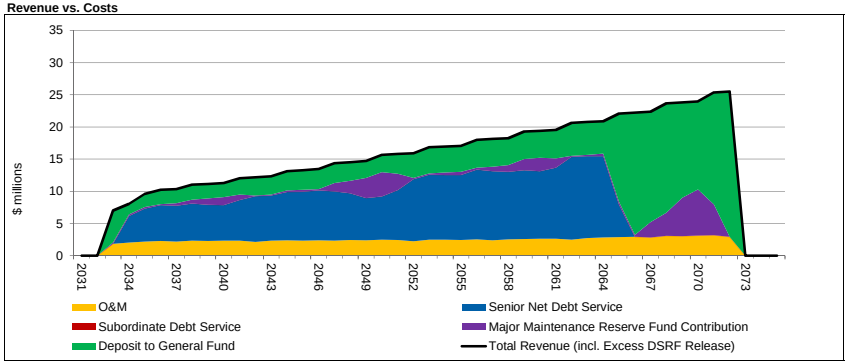
Senior Net Debt Service



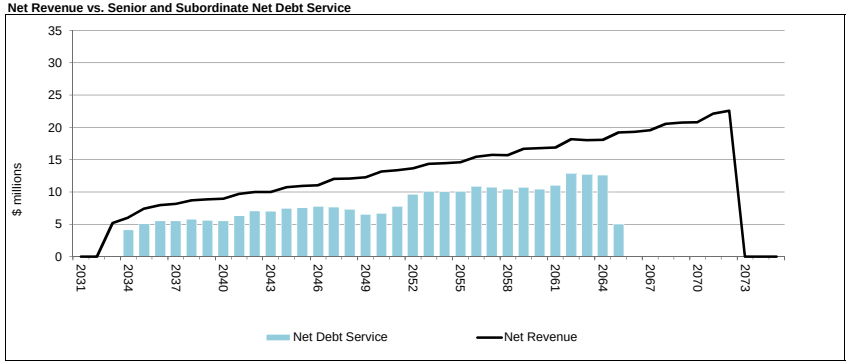
Senior and Subordinate Net Debt Service



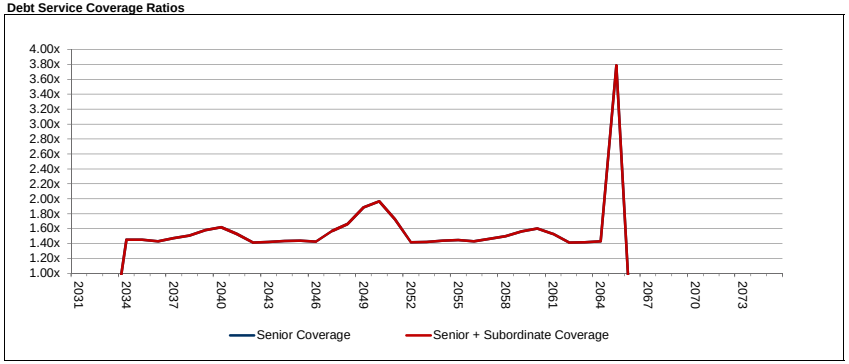
Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Debt Service Coverage Ratios



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Kansas Department of Transportation
K92 Bridge Financing
Case: 3
Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		1	2	3	4	5	6	7	8	9	10	11	12
Start Date		1-Jul-30	1-Jul-31	1-Jul-32	1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41
End Date		30-Jun-31	30-Jun-32	30-Jun-33	30-Jun-34	30-Jun-35	30-Jun-36	30-Jun-37	30-Jun-38	30-Jun-39	30-Jun-40	30-Jun-41	30-Jun-42
Bond Year		1-Jul-31	1-Jul-32	1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42
Waterfall													
Toll Revenue	660,837,500	-	-	7,023,600	8,059,800	9,602,700	10,231,800	10,360,400	11,017,000	11,155,600	11,295,800	12,023,300	12,174,400
Operations and Maintenance Costs	(100,713,601)	-	-	(1,844,737)	(2,022,946)	(2,175,744)	(2,273,254)	(2,192,949)	(2,316,687)	(2,280,342)	(2,320,947)	(2,325,389)	(2,162,501)
Net Revenue	560,123,899	-	-	5,178,863	6,036,854	7,426,956	7,958,546	8,167,451	8,700,313	8,875,258	8,974,853	9,697,911	10,011,899
Senior Debt Service													
Principal	(129,070,000)	-	-	-	-	(960,000)	(1,400,000)	(1,380,000)	(1,615,000)	(1,450,000)	(1,375,000)	(25,000)	(760,000)
Interest	(157,571,262)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(6,317,002)	(6,315,764)
Gross Senior Debt Service	(286,641,262)	(4,163,500)	(4,163,500)	(4,163,500)	(4,163,500)	(5,123,500)	(5,563,500)	(5,543,500)	(5,778,500)	(5,613,500)	(5,538,500)	(6,342,002)	(7,075,764)
Capitalized Interest	12,490,500	4,163,500	4,163,500	4,163,500	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	10,237,188	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(263,913,574)	-	-	-	(4,163,500)	(5,123,500)	(5,563,500)	(5,543,500)	(5,778,500)	(5,613,500)	(5,538,500)	(6,342,002)	(7,075,764)
Revenue Avaliable after Senior Debt Service	296,210,325	-	-	5,178,863	1,873,354	2,303,456	2,395,046	2,623,951	2,921,813	3,261,758	3,436,353	3,355,909	2,936,135
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	296,210,325	-	-	5,178,863	1,873,354	2,303,456	2,395,046	2,623,951	2,921,813	3,261,758	3,436,353	3,355,909	2,936,135
Major Maintenance Costs	(52,366,494)	-	-	-	-	-	-	(826,187)	-	-	-	-	(4,058,859)
Major Maintenance Reserve Fund Release	52,366,494	-	-	-	-	-	-	826,187	-	-	-	-	4,058,859
Major Maintenance Reserve Fund Deposit	(52,366,494)	-	-	(206,547)	(206,547)	(247,856)	(165,237)	(405,886)	(608,829)	(1,014,715)	(1,217,658)	(811,772)	(100,712)
Revenue Avaliable for General Fund Deposit		-	-	4,972,316	1,666,807	2,055,600	2,229,809	2,218,065	2,312,984	2,247,043	2,218,695	2,544,137	2,835,423
General Fund													
General Fund Opening Balance		-	-	-	4,972,316	6,639,124	8,694,724	10,924,533	13,142,598	15,455,581	17,702,625	19,921,320	22,465,457
Deposit/(Draw)		-	-	4,972,316	1,666,807	2,055,600	2,229,809	2,218,065	2,312,984	2,247,043	2,218,695	2,544,137	2,835,423
Closing Balance		-	-	4,972,316	6,639,124	8,694,724	10,924,533	13,142,598	15,455,581	17,702,625	19,921,320	22,465,457	25,300,880
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x				1.45x	1.45x	1.43x	1.47x	1.51x	1.58x	1.62x	1.53x	1.41x
Senior and Subordinate	1.41x				1.45x	1.45x	1.43x	1.47x	1.51x	1.58x	1.62x	1.53x	1.41x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x				1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x
Senior and Subordinate	1.40x				1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 3
Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		13	14	15	16	17	18	19	20	21	22	23	24
Start Date		1-Jul-42	1-Jul-43	1-Jul-44	1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53
End Date		30-Jun-43	30-Jun-44	30-Jun-45	30-Jun-46	30-Jun-47	30-Jun-48	30-Jun-49	30-Jun-50	30-Jun-51	30-Jun-52	30-Jun-53	30-Jun-54
Bond Year		1-Jul-43	1-Jul-44	1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54
Waterfall													
Toll Revenue	660,837,500	12,327,400	13,130,900	13,295,900	13,463,000	14,347,500	14,527,900	14,710,500	15,681,600	15,829,200	15,928,700	16,832,400	16,938,300
Operations and Maintenance Costs	(100,713,601)	(2,327,553)	(2,399,921)	(2,357,987)	(2,402,722)	(2,335,417)	(2,436,108)	(2,408,462)	(2,490,140)	(2,437,777)	(2,249,030)	(2,476,151)	(2,499,357)
Net Revenue	560,123,899	9,999,847	10,730,979	10,937,913	11,060,278	12,012,083	12,091,792	12,302,038	13,191,460	13,391,423	13,679,670	14,356,249	14,438,943
Senior Debt Service													
Principal	(129,070,000)	(755,000)	(1,245,000)	(1,420,000)	(1,655,000)	(1,665,000)	(1,360,000)	(680,000)	(900,000)	(2,000,000)	(4,020,000)	(4,685,000)	(4,910,000)
Interest	(157,571,262)	(6,277,156)	(6,238,123)	(6,172,636)	(6,096,808)	(6,007,272)	(5,916,363)	(5,841,427)	(5,803,619)	(5,753,129)	(5,636,329)	(5,401,561)	(5,127,957)
Gross Senior Debt Service	(286,641,262)	(7,032,156)	(7,483,123)	(7,592,636)	(7,751,808)	(7,672,272)	(7,276,363)	(6,521,427)	(6,703,619)	(7,753,129)	(9,656,329)	(10,086,561)	(10,037,957)
Capitalized Interest	12,490,500	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	10,237,188	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(263,913,574)	(7,032,156)	(7,483,123)	(7,592,636)	(7,751,808)	(7,672,272)	(7,276,363)	(6,521,427)	(6,703,619)	(7,753,129)	(9,656,329)	(10,086,561)	(10,037,957)
Revenue Avaliable after Senior Debt Service	296,210,325	2,967,691	3,247,857	3,345,277	3,308,470	4,339,811	4,815,429	5,780,611	6,487,841	5,638,294	4,023,341	4,269,688	4,400,986
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	296,210,325	2,967,691	3,247,857	3,345,277	3,308,470	4,339,811	4,815,429	5,780,611	6,487,841	5,638,294	4,023,341	4,269,688	4,400,986
Major Maintenance Costs	(52,366,494)	-	-	-	-	(1,007,117)	-	-	-	-	(12,668,500)	-	-
Major Maintenance Reserve Fund Release	52,366,494	-	-	-	-	1,007,117	-	-	-	-	12,668,500	-	-
Major Maintenance Reserve Fund Deposit	(52,366,494)	(151,068)	(251,779)	(302,135)	(201,423)	(1,266,850)	(1,900,275)	(3,167,125)	(3,800,550)	(2,533,700)	(153,680)	(230,519)	(384,199)
Revenue Avaliable for General Fund Deposit		2,816,623	2,996,077	3,043,142	3,107,047	3,072,961	2,915,154	2,613,486	2,687,290	3,104,594	3,869,662	4,039,168	4,016,787
General Fund													
General Fund Opening Balance		25,300,880	28,117,503	31,113,581	34,156,723	37,263,770	40,336,731	43,251,886	45,865,372	48,552,662	51,657,256	55,526,918	59,566,086
Deposit/(Draw)		2,816,623	2,996,077	3,043,142	3,107,047	3,072,961	2,915,154	2,613,486	2,687,290	3,104,594	3,869,662	4,039,168	4,016,787
Closing Balance		28,117,503	31,113,581	34,156,723	37,263,770	40,336,731	43,251,886	45,865,372	48,552,662	51,657,256	55,526,918	59,566,086	63,582,873
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x	1.42x	1.43x	1.44x	1.43x	1.57x	1.66x	1.89x	1.97x	1.73x	1.42x	1.42x	1.44x
Senior and Subordinate	1.41x	1.42x	1.43x	1.44x	1.43x	1.57x	1.66x	1.89x	1.97x	1.73x	1.42x	1.42x	1.44x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x
Senior and Subordinate	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 3
Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		25	26	27	28	29	30	31	32	33	34	35	36
Start Date		1-Jul-54	1-Jul-55	1-Jul-56	1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64	1-Jul-65
End Date		30-Jun-55	30-Jun-56	30-Jun-57	30-Jun-58	30-Jun-59	30-Jun-60	30-Jun-61	30-Jun-62	30-Jun-63	30-Jun-64	30-Jun-65	30-Jun-66
Bond Year		1-Jul-55	1-Jul-56	1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64	1-Jul-65	1-Jul-66
Waterfall													
Toll Revenue	660,837,500	17,044,700	18,016,300	18,129,500	18,243,500	19,285,200	19,406,400	19,528,400	20,643,200	20,772,900	20,903,500	22,093,700	22,232,700
Operations and Maintenance Costs	(100,713,601)	(2,459,937)	(2,543,698)	(2,393,346)	(2,547,524)	(2,581,432)	(2,644,920)	(2,638,436)	(2,490,950)	(2,740,365)	(2,834,130)	(2,873,053)	(2,944,946)
Net Revenue	560,123,899	14,584,763	15,472,602	15,736,154	15,695,976	16,703,768	16,761,480	16,889,964	18,152,250	18,032,535	18,069,370	19,220,647	19,287,754
Senior Debt Service													
Principal	(129,070,000)	(5,245,000)	(6,295,000)	(6,575,000)	(6,625,000)	(7,175,000)	(7,325,000)	(8,280,000)	(10,490,000)	(10,875,000)	(11,340,000)	(14,585,000)	-
Interest	(157,571,262)	(4,841,213)	(4,534,905)	(4,163,500)	(3,834,750)	(3,503,500)	(3,144,750)	(2,778,500)	(2,364,500)	(1,840,000)	(1,296,250)	(729,250)	-
Gross Senior Debt Service	(286,641,262)	(10,086,213)	(10,829,905)	(10,738,500)	(10,459,750)	(10,678,500)	(10,469,750)	(11,058,500)	(12,854,500)	(12,715,000)	(12,636,250)	(15,314,250)	-
Capitalized Interest	12,490,500	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	10,237,188	-	-	-	-	-	-	-	-	-	-	10,237,188	-
Net Debt Service	(263,913,574)	(10,086,213)	(10,829,905)	(10,738,500)	(10,459,750)	(10,678,500)	(10,469,750)	(11,058,500)	(12,854,500)	(12,715,000)	(12,636,250)	(5,077,062)	-
Revenue Avaliable after Senior Debt Service	296,210,325	4,498,550	4,642,697	4,997,654	5,236,226	6,025,268	6,291,730	5,831,464	5,297,750	5,317,535	5,433,120	14,143,584	19,287,754
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	296,210,325	4,498,550	4,642,697	4,997,654	5,236,226	6,025,268	6,291,730	5,831,464	5,297,750	5,317,535	5,433,120	14,143,584	19,287,754
Major Maintenance Costs	(52,366,494)	-	-	(1,536,796)	-	-	-	-	(7,006,393)	-	-	-	-
Major Maintenance Reserve Fund Release	52,366,494	-	-	1,536,796	-	-	-	-	7,006,393	-	-	-	-
Major Maintenance Reserve Fund Deposit	(52,366,494)	(461,039)	(307,359)	(700,639)	(1,050,959)	(1,751,598)	(2,101,918)	(1,401,279)	(149,652)	(224,478)	(374,131)	(448,957)	(299,305)
Revenue Avaliable for General Fund Deposit		4,037,512	4,335,338	4,297,014	4,185,267	4,273,670	4,189,812	4,430,186	5,148,097	5,093,057	5,058,989	13,694,628	18,988,449
General Fund													
General Fund Opening Balance		63,582,873	67,620,385	71,955,723	76,252,737	80,438,004	84,711,674	88,901,486	93,331,671	98,479,769	103,572,826	108,631,815	122,326,442
Deposit/(Draw)		4,037,512	4,335,338	4,297,014	4,185,267	4,273,670	4,189,812	4,430,186	5,148,097	5,093,057	5,058,989	13,694,628	18,988,449
Closing Balance		67,620,385	71,955,723	76,252,737	80,438,004	84,711,674	88,901,486	93,331,671	98,479,769	103,572,826	108,631,815	122,326,442	141,314,892
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x	1.45x	1.43x	1.47x	1.50x	1.56x	1.60x	1.53x	1.41x	1.42x	1.43x	3.79x	
Senior and Subordinate	1.41x	1.45x	1.43x	1.47x	1.50x	1.56x	1.60x	1.53x	1.41x	1.42x	1.43x	3.79x	
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	3.70x	
Senior and Subordinate	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	3.70x	

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 3
Delayed Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		37	38	39	40	41	42	43	44	45
Start Date		1-Jul-66	1-Jul-67	1-Jul-68	1-Jul-69	1-Jul-70	1-Jul-71	1-Jul-72	1-Jul-73	1-Jul-74
End Date		30-Jun-67	30-Jun-68	30-Jun-69	30-Jun-70	30-Jun-71	30-Jun-72	30-Jun-73	30-Jun-74	30-Jun-75
Bond Year		1-Jul-67	1-Jul-68	1-Jul-69	1-Jul-70	1-Jul-71	1-Jul-72	1-Jul-73	1-Jul-74	1-Jul-75
Waterfall										
Toll Revenue	660,837,500	22,372,400	23,641,100	23,789,600	23,939,200	25,339,100	25,498,400	-	-	-
Operations and Maintenance Costs	(100,713,601)	(2,830,474)	(3,088,490)	(3,054,179)	(3,160,332)	(3,205,724)	(2,945,541)	-	-	-
Net Revenue	560,123,899	19,541,926	20,552,610	20,735,421	20,778,868	22,133,376	22,552,859	-	-	-
Senior Debt Service										
Principal	(129,070,000)	-	-	-	-	-	-	-	-	-
Interest	(157,571,262)	-	-	-	-	-	-	-	-	-
Gross Senior Debt Service	(286,641,262)	-	-	-	-	-	-	-	-	-
Capitalized Interest	12,490,500	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	10,237,188	-	-	-	-	-	-	-	-	-
Net Debt Service	(263,913,574)	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Senior Debt Service	296,210,325	19,541,926	20,552,610	20,735,421	20,778,868	22,133,376	22,552,859	-	-	-
Subordinate Debt Service										
Principal	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	296,210,325	19,541,926	20,552,610	20,735,421	20,778,868	22,133,376	22,552,859	-	-	-
Major Maintenance Costs	(52,366,494)	(1,496,523)	-	-	-	-	(23,766,119)	-	-	-
Major Maintenance Reserve Fund Release	52,366,494	1,496,523	-	-	-	-	23,766,119	-	-	-
Major Maintenance Reserve Fund Deposit	(52,366,494)	(2,376,612)	(3,564,918)	(5,941,530)	(7,129,836)	(4,753,224)	-	-	-	-
Revenue Avaliable for General Fund Deposit		17,165,314	16,987,692	14,793,891	13,649,032	17,380,152	22,552,859	-	-	-
General Fund										
General Fund Opening Balance		141,314,892	158,480,205	175,467,898	190,261,789	203,910,821	221,290,972	243,843,831	243,843,831	243,843,831
Deposit/(Draw)		17,165,314	16,987,692	14,793,891	13,649,032	17,380,152	22,552,859	-	-	-
Closing Balance		158,480,205	175,467,898	190,261,789	203,910,821	221,290,972	243,843,831	243,843,831	243,843,831	243,843,831

Debt Service Coverage Ratio by Net Revenue

Senior	1.41x
Senior and Subordinate	1.41x

Debt Service Coverage Ratio by Net Revenue less MMRF Retention

Senior	1.40x
Senior and Subordinate	1.40x

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Appendix D: Case 4 Model Output

RBC Capital Markets

Kansas Department of Transportation
K92 Bridge Financing

Case: 4
Description: High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Version: 1.01
Date: 2/4/2016

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Kansas Department of Transportation
K92 Bridge Financing
Case: 4
High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Summary
USD$

Sources and Uses of Funds

Sources		
Senior Lien Bond Proceeds	$	96,286,380
TIFIA Loan		-
Total Sources	**$**	**96,286,380**
Uses		
Construction	$	75,000,000
Debt Service Reserve Fund		9,293,468
Capitalized Interest Fund		10,989,000
Financing Costs		1,003,912
Total Uses	**$**	**96,286,380**
Shortfall	**$**	-
Feasibility		**100.00%**

Key Dates

Financial Close	7/1/2020
Construction End	6/30/2022
Capitalized Interest End	7/1/2023
First TIFIA Interest Payment	6/30/2027
First TIFIA Principal Payment	6/30/2032

Debt Summary

		Par Amount	**Final Maturity**
Current Interest Bonds	$	73,260,000	7/1/2052
Capital Appreciation Bonds	$	9,775,758	7/1/2033
Convertible Capital Appreciation Bonds	$	31,665,000	7/1/2044
TIFIA Loan	$	-	-
Total Debt Issued	**$**	**114,700,758**	
Statistics			
Senior Lien All-in TIC		5.33%	
TIFIA Loan Rate			

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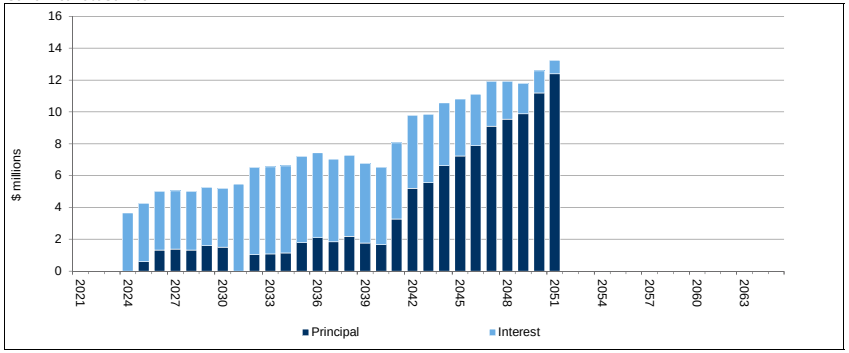
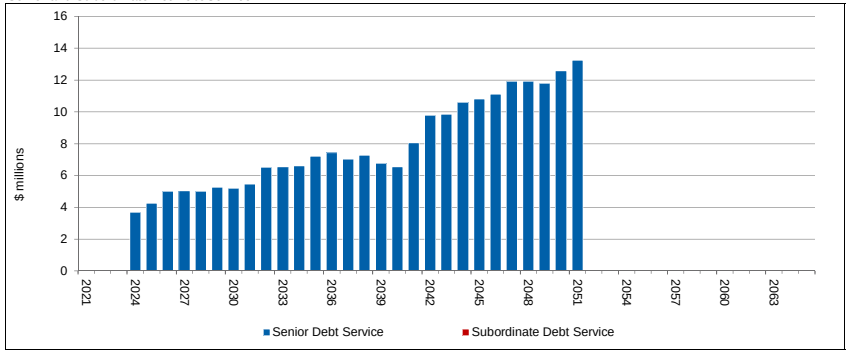
Kansas Department of Transportation
K92 Bridge Financing
Case: 4
High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Graphs
USD$

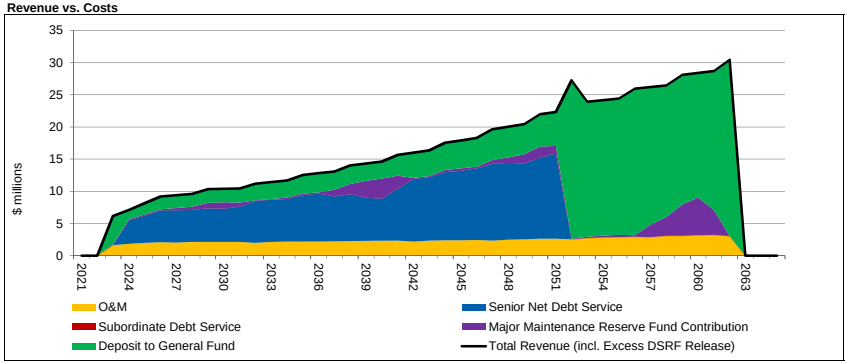
Senior Net Debt Service



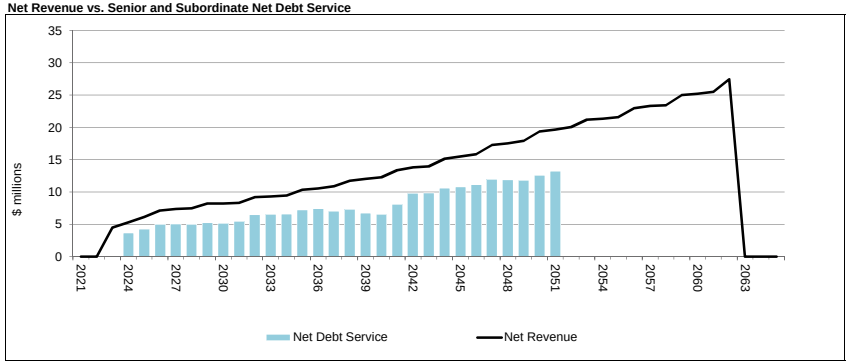
Senior and Subordinate Net Debt Service



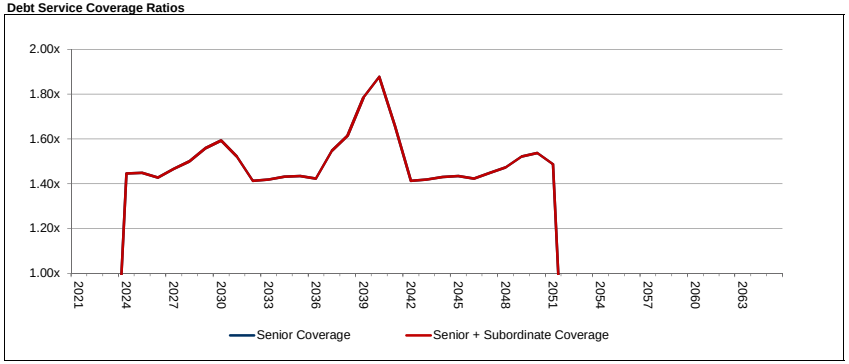
Revenue vs. Costs



Net Revenue vs. Senior and Subordinate Net Debt Service



Debt Service Coverage Ratios



Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 4
High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		1	2	3	4	5	6	7	8	9	10	11	12
Start Date		1-Jul-20	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31
End Date		30-Jun-21	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-31	30-Jun-32
Bond Year		1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-30	1-Jul-31	1-Jul-32
Waterfall													
Toll Revenue	692,017,900	-	-	6,146,700	7,120,600	8,134,700	9,208,800	9,413,600	9,623,000	10,328,900	10,389,200	10,443,200	11,209,900
Operations and Maintenance Costs	(97,160,945)	-	-	(1,648,462)	(1,822,008)	(1,970,932)	(2,080,806)	(2,026,586)	(2,131,676)	(2,122,347)	(2,143,694)	(2,125,499)	(2,011,252)
Net Revenue	594,856,955	-	-	4,498,238	5,298,592	6,163,768	7,127,994	7,387,014	7,491,324	8,206,553	8,245,506	8,317,701	9,198,648
Senior Debt Service													
Principal	(114,700,758)	-	-	-	-	(590,000)	(1,330,000)	(1,375,000)	(1,330,000)	(1,600,000)	(1,510,000)	-	(1,045,000)
Interest	(123,212,020)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(5,463,749)	(5,463,749)
Gross Senior Debt Service	(237,912,778)	(3,663,000)	(3,663,000)	(3,663,000)	(3,663,000)	(4,253,000)	(4,993,000)	(5,038,000)	(4,993,000)	(5,263,000)	(5,173,000)	(5,463,749)	(6,508,749)
Capitalized Interest	10,989,000	3,663,000	3,663,000	3,663,000	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	9,293,468	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(217,630,310)	-	-	-	(3,663,000)	(4,253,000)	(4,993,000)	(5,038,000)	(4,993,000)	(5,263,000)	(5,173,000)	(5,463,749)	(6,508,749)
Revenue Avaliable after Senior Debt Service	377,226,645	-	-	4,498,238	1,635,592	1,910,768	2,134,994	2,349,014	2,498,324	2,943,553	3,072,506	2,853,952	2,689,899
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	377,226,645	-	-	4,498,238	1,635,592	1,910,768	2,134,994	2,349,014	2,498,324	2,943,553	3,072,506	2,853,952	2,689,899
Major Maintenance Costs	(42,958,764)	-	-	-	-	-	-	(677,761)	-	-	-	-	(3,329,678)
Major Maintenance Reserve Fund Release	42,958,764	-	-	-	-	-	-	677,761	-	-	-	-	3,329,678
Major Maintenance Reserve Fund Deposit	(42,958,764)	-	-	(169,440)	(169,440)	(203,328)	(135,552)	(332,968)	(499,452)	(832,420)	(998,903)	(665,936)	(82,619)
Revenue Avaliable for General Fund Deposit		-	-	4,328,798	1,466,152	1,707,440	1,999,442	2,016,047	1,998,873	2,111,134	2,073,602	2,188,017	2,607,280
General Fund													
General Fund Opening Balance		-	-	-	4,328,798	5,794,950	7,502,390	9,501,831	11,517,878	13,516,751	15,627,884	17,701,487	19,889,504
Deposit/(Draw)		-	-	4,328,798	1,466,152	1,707,440	1,999,442	2,016,047	1,998,873	2,111,134	2,073,602	2,188,017	2,607,280
Closing Balance		-	-	4,328,798	5,794,950	7,502,390	9,501,831	11,517,878	13,516,751	15,627,884	17,701,487	19,889,504	22,496,784
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x				1.45x	1.45x	1.43x	1.47x	1.50x	1.56x	1.59x	1.52x	1.41x
Senior and Subordinate	1.41x				1.45x	1.45x	1.43x	1.47x	1.50x	1.56x	1.59x	1.52x	1.41x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x				1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x
Senior and Subordinate	1.40x				1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 4
High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		13	14	15	16	17	18	19	20	21	22	23	24
Start Date		1-Jul-32	1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42	1-Jul-43
End Date		30-Jun-33	30-Jun-34	30-Jun-35	30-Jun-36	30-Jun-37	30-Jun-38	30-Jun-39	30-Jun-40	30-Jun-41	30-Jun-42	30-Jun-43	30-Jun-44
Bond Year		1-Jul-33	1-Jul-34	1-Jul-35	1-Jul-36	1-Jul-37	1-Jul-38	1-Jul-39	1-Jul-40	1-Jul-41	1-Jul-42	1-Jul-43	1-Jul-44
Waterfall													
Toll Revenue	692,017,900	11,442,700	11,680,300	12,552,700	12,813,300	13,079,300	14,020,900	14,312,000	14,609,100	15,675,900	16,001,400	16,333,600	17,538,900
Operations and Maintenance Costs	(97,160,945)	(2,155,394)	(2,213,405)	(2,198,990)	(2,243,928)	(2,185,617)	(2,288,218)	(2,273,053)	(2,335,155)	(2,316,585)	(2,175,083)	(2,361,648)	(2,408,779)
Net Revenue	594,856,955	9,287,306	9,466,895	10,353,710	10,569,372	10,893,683	11,732,682	12,038,947	12,273,945	13,359,315	13,826,317	13,971,952	15,130,121
Senior Debt Service													
Principal	(114,700,758)	(1,080,758)	(1,150,000)	(1,815,000)	(2,125,000)	(1,850,000)	(2,180,000)	(1,775,000)	(1,670,000)	(3,280,000)	(5,200,000)	(5,565,000)	(6,625,000)
Interest	(123,212,020)	(5,463,749)	(5,459,355)	(5,398,865)	(5,301,944)	(5,186,981)	(5,085,971)	(4,965,853)	(4,867,163)	(4,773,476)	(4,581,924)	(4,278,244)	(3,953,248)
Gross Senior Debt Service	(237,912,778)	(6,544,507)	(6,609,355)	(7,213,865)	(7,426,944)	(7,036,981)	(7,265,971)	(6,740,853)	(6,537,163)	(8,053,476)	(9,781,924)	(9,843,244)	(10,578,248)
Capitalized Interest	10,989,000	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	9,293,468	-	-	-	-	-	-	-	-	-	-	-	-
Net Debt Service	(217,630,310)	(6,544,507)	(6,609,355)	(7,213,865)	(7,426,944)	(7,036,981)	(7,265,971)	(6,740,853)	(6,537,163)	(8,053,476)	(9,781,924)	(9,843,244)	(10,578,248)
Revenue Avaliable after Senior Debt Service	377,226,645	2,742,798	2,857,541	3,139,845	3,142,429	3,856,702	4,466,711	5,298,094	5,736,782	5,305,839	4,044,393	4,128,708	4,551,873
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	377,226,645	2,742,798	2,857,541	3,139,845	3,142,429	3,856,702	4,466,711	5,298,094	5,736,782	5,305,839	4,044,393	4,128,708	4,551,873
Major Maintenance Costs	(42,958,764)	-	-	-	-	(826,187)	-	-	-	-	(10,392,583)	-	-
Major Maintenance Reserve Fund Release	42,958,764	-	-	-	-	826,187	-	-	-	-	10,392,583	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(123,928)	(206,547)	(247,856)	(165,237)	(1,039,258)	(1,558,887)	(2,598,146)	(3,117,775)	(2,078,517)	(126,071)	(189,106)	(315,177)
Revenue Avaliable for General Fund Deposit		2,618,870	2,650,994	2,891,989	2,977,192	2,817,444	2,907,823	2,699,949	2,619,007	3,227,322	3,918,322	3,939,602	4,236,696
General Fund													
General Fund Opening Balance		22,496,784	25,115,654	27,766,648	30,658,637	33,635,829	36,453,273	39,361,096	42,061,045	44,680,052	47,907,374	51,825,696	55,765,298
Deposit/(Draw)		2,618,870	2,650,994	2,891,989	2,977,192	2,817,444	2,907,823	2,699,949	2,619,007	3,227,322	3,918,322	3,939,602	4,236,696
Closing Balance		25,115,654	27,766,648	30,658,637	33,635,829	36,453,273	39,361,096	42,061,045	44,680,052	47,907,374	51,825,696	55,765,298	60,001,994
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x	1.42x	1.43x	1.44x	1.42x	1.55x	1.61x	1.79x	1.88x	1.66x	1.41x	1.42x	1.43x
Senior and Subordinate	1.41x	1.42x	1.43x	1.44x	1.42x	1.55x	1.61x	1.79x	1.88x	1.66x	1.41x	1.42x	1.43x
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x
Senior and Subordinate	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 4
High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		25	26	27	28	29	30	31	32	33	34	35	36
Start Date		1-Jul-44	1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54	1-Jul-55
End Date		30-Jun-45	30-Jun-46	30-Jun-47	30-Jun-48	30-Jun-49	30-Jun-50	30-Jun-51	30-Jun-52	30-Jun-53	30-Jun-54	30-Jun-55	30-Jun-56
Bond Year		1-Jul-45	1-Jul-46	1-Jul-47	1-Jul-48	1-Jul-49	1-Jul-50	1-Jul-51	1-Jul-52	1-Jul-53	1-Jul-54	1-Jul-55	1-Jul-56
Waterfall													
Toll Revenue	692,017,900	17,903,000	18,274,700	19,632,900	20,040,500	20,456,700	21,983,600	22,324,800	22,556,500	23,933,500	24,181,900	24,432,900	25,930,700
Operations and Maintenance Costs	(97,160,945)	(2,388,078)	(2,454,385)	(2,359,442)	(2,502,209)	(2,538,695)	(2,634,662)	(2,645,801)	(2,518,549)	(2,753,626)	(2,839,972)	(2,865,209)	(2,957,088)
Net Revenue	594,856,955	15,514,922	15,820,315	17,273,458	17,538,291	17,918,005	19,348,938	19,678,999	20,037,951	21,179,874	21,341,928	21,567,691	22,973,612
Senior Debt Service													
Principal	(114,700,758)	(7,230,000)	(7,900,000)	(9,100,000)	(9,540,000)	(9,880,000)	(11,190,000)	(12,395,000)	(4,370,000)	-	-	-	-
Interest	(123,212,020)	(3,580,250)	(3,218,750)	(2,823,750)	(2,368,750)	(1,891,750)	(1,397,750)	(838,250)	(218,500)	-	-	-	-
Gross Senior Debt Service	(237,912,778)	(10,810,250)	(11,118,750)	(11,923,750)	(11,908,750)	(11,771,750)	(12,587,750)	(13,233,250)	(4,588,500)	-	-	-	-
Capitalized Interest	10,989,000	-	-	-	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	9,293,468	-	-	-	-	-	-	-	9,293,468	-	-	-	-
Net Debt Service	(217,630,310)	(10,810,250)	(11,118,750)	(11,923,750)	(11,908,750)	(11,771,750)	(12,587,750)	(13,233,250)	4,704,968	-	-	-	-
Revenue Avaliable after Senior Debt Service	377,226,645	4,704,672	4,701,565	5,349,708	5,629,541	6,146,255	6,761,188	6,445,749	24,742,919	21,179,874	21,341,928	21,567,691	22,973,612
Subordinate Debt Service													
Principal	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	377,226,645	4,704,672	4,701,565	5,349,708	5,629,541	6,146,255	6,761,188	6,445,749	24,742,919	21,179,874	21,341,928	21,567,691	22,973,612
Major Maintenance Costs	(42,958,764)	-	-	(1,260,708)	-	-	-	-	(5,747,683)	-	-	-	-
Major Maintenance Reserve Fund Release	42,958,764	-	-	1,260,708	-	-	-	-	5,747,683	-	-	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(378,212)	(252,142)	(574,768)	(862,152)	(1,436,921)	(1,724,305)	(1,149,537)	(122,767)	(184,151)	(306,918)	(368,301)	(245,534)
Revenue Avaliable for General Fund Deposit		4,326,460	4,449,424	4,774,940	4,767,389	4,709,334	5,036,884	5,296,213	24,620,152	20,995,724	21,035,010	21,199,390	22,728,078
General Fund													
General Fund Opening Balance		60,001,994	64,328,454	68,777,877	73,552,817	78,320,206	83,029,540	88,066,424	93,362,636	117,982,789	138,978,512	160,013,523	181,212,912
Deposit/(Draw)		4,326,460	4,449,424	4,774,940	4,767,389	4,709,334	5,036,884	5,296,213	24,620,152	20,995,724	21,035,010	21,199,390	22,728,078
Closing Balance		64,328,454	68,777,877	73,552,817	78,320,206	83,029,540	88,066,424	93,362,636	117,982,789	138,978,512	160,013,523	181,212,912	203,940,990
Debt Service Coverage Ratio by Net Revenue													
Senior	1.41x	1.44x	1.42x	1.45x	1.47x	1.52x	1.54x	1.49x					
Senior and Subordinate	1.41x	1.44x	1.42x	1.45x	1.47x	1.52x	1.54x	1.49x					
Debt Service Coverage Ratio by Net Revenue less MMRF Retention													
Senior	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x					
Senior and Subordinate	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x	1.40x					

Strictly Private and Confidential

Kansas Department of Transportation
K92 Bridge Financing
Case: 4
High Case Revenues - Traditional Municipal Toll Road Revenue Bonds

Cash Flow Waterfall
USD$

Year		37	38	39	40	41	42	43	44	45
Start Date		1-Jul-56	1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64
End Date		30-Jun-57	30-Jun-58	30-Jun-59	30-Jun-60	30-Jun-61	30-Jun-62	30-Jun-63	30-Jun-64	30-Jun-65
Bond Year		1-Jul-57	1-Jul-58	1-Jul-59	1-Jul-60	1-Jul-61	1-Jul-62	1-Jul-63	1-Jul-64	1-Jul-65
Waterfall										
Toll Revenue	692,017,900	26,199,900	26,471,900	28,097,600	28,389,300	28,684,000	30,444,800	-	-	-
Operations and Maintenance Costs	(97,160,945)	(2,873,105)	(3,077,497)	(3,084,666)	(3,182,253)	(3,211,024)	(3,035,569)	-	-	-
Net Revenue	594,856,955	23,326,795	23,394,403	25,012,934	25,207,047	25,472,976	27,409,231	-	-	-
Senior Debt Service										
Principal	(114,700,758)	-	-	-	-	-	-	-	-	-
Interest	(123,212,020)	-	-	-	-	-	-	-	-	-
Gross Senior Debt Service	(237,912,778)	-	-	-	-	-	-	-	-	-
Capitalized Interest	10,989,000	-	-	-	-	-	-	-	-	-
Debt Service Reserve Fund Release	9,293,468	-	-	-	-	-	-	-	-	-
Net Debt Service	(217,630,310)	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Senior Debt Service	377,226,645	23,326,795	23,394,403	25,012,934	25,207,047	25,472,976	27,409,231	-	-	-
Subordinate Debt Service										
Principal	-	-	-	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-	-	-	-
Subordinate Debt Service	-	-	-	-	-	-	-	-	-	-
Revenue Avaliable after Subordinate Debt Service	377,226,645	23,326,795	23,394,403	25,012,934	25,207,047	25,472,976	27,409,231	-	-	-
Major Maintenance Costs	(42,958,764)	(1,227,670)	-	-	-	-	(19,496,495)	-	-	-
Major Maintenance Reserve Fund Release	42,958,764	1,227,670	-	-	-	-	19,496,495	-	-	-
Major Maintenance Reserve Fund Deposit	(42,958,764)	(1,949,650)	(2,924,474)	(4,874,124)	(5,848,949)	(3,899,299)	-	-	-	-
Revenue Avaliable for General Fund Deposit		21,377,146	20,469,929	20,138,810	19,358,098	21,573,677	27,409,231	-	-	-
General Fund										
General Fund Opening Balance		203,940,990	225,318,136	245,788,065	265,926,875	285,284,973	306,858,650	334,267,881	334,267,881	334,267,881
Deposit/(Draw)		21,377,146	20,469,929	20,138,810	19,358,098	21,573,677	27,409,231	-	-	-
Closing Balance		225,318,136	245,788,065	265,926,875	285,284,973	306,858,650	334,267,881	334,267,881	334,267,881	334,267,881

Debt Service Coverage Ratio by Net Revenue

Senior	1.41x
Senior and Subordinate	1.41x

Debt Service Coverage Ratio by Net Revenue less MMRF Retention

Senior	1.40x
Senior and Subordinate	1.40x

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