

To Megan McLain

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From David Cuneo

Date June 25, 2016

Project LSIORB Traffic & Revenue Study

Project No. 22527405

Revised Traffic & Revenue Forecasts

In 2013, Steer Davies Gleave undertook a traffic and revenue study for the Louisville-Southern Indiana Ohio River Bridges Project and the traffic and revenue forecasts included in the study were used to help develop the plan of finance used for the Project.

We have now undertaken a study to analyze the impact of the recently approved toll policy along with recent traffic and economic conditions in order to revise the 2013 forecasts. This memo summarizes Steer Davies Gleave's analysis of these conditions and presents our revised traffic and revenue forecasts.

Current Conditions of the Study Area

As part of this effort to revise our traffic and revenue forecasts, we conducted a visit to the study area to monitor the project progress and overall travel conditions in the study area.

Project-related construction activity is easily observed in the study area. Construction has completed on the new Abraham Lincoln Bridge (formerly referred to as the Downtown Bridge) and I-65 traffic now crosses the Ohio River using the new bridge. Downtown Crossing construction activity has now shifted to refurbishing the Kennedy Bridge and improving the connections to the bridges. Figure 1 presents a picture of the Abraham Lincoln Bridge now carrying traffic, while Figure 2 through Figure 4 present pictures of construction-related activity associated with the Project. Due to the construction, some movements require detours, such as I-64/I-71 EB from west of Downtown Crossing to I-65 NB requires traveling a few extra exits EB before coming back WB in order to access I-65 NB.

Overall, project-related construction is active and appears to be progressing towards the scheduled completion and opening to traffic by late 2016.

Figure 1: Newly Constructed Abraham Lincoln Bridge with Kennedy Bridge in Background



Source: Steer Davies Gleave

Figure 2: Construction Activity on Downtown Crossing



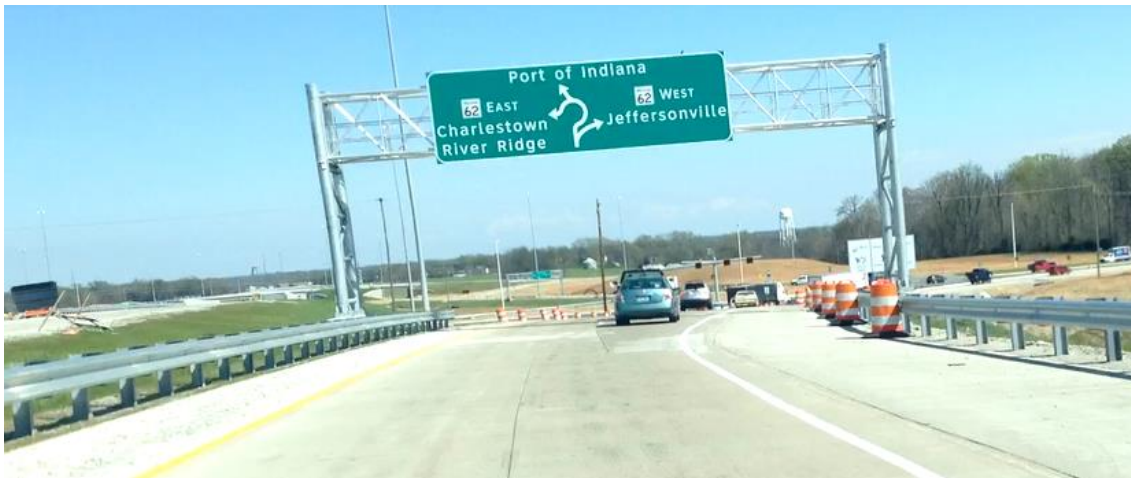
Source: Steer Davies Gleave

Figure 3: Construction Activity Near Downtown Crossing



Source: Steer Davies Gleave

Figure 4: Construction Activity Near East End Crossing



Source: Steer Davies Gleave

In addition to project-related construction, there seems to be other construction activity in the area. Figure 5 and Figure 6 present images of construction activity currently taking place at two lots in Downtown Louisville. This activity likely indicates the strong health of the local economy, particularly near the Downtown Crossing.

Figure 5: Construction Activity in Louisville



Source: Steer Davies Gleave

Figure 6: More Construction Activity in Louisville



Source: Steer Davies Gleave

Traffic Counts

To help understand the study area conditions and gain insight into how they may have changed since our initial traffic and revenue study, we had the traffic vendor return to the study area to collect new traffic count data. For the 2013 study, we collected data in December 2012, while for this update, we collected counts in December 2015 and January 2016.¹ Table 1 presents the comparison of the seasonally adjusted December 2012 and December 2015 / January 2016 counts. It shows that the total for all bridges increased by 4.3% over the past three years despite the construction in the area, the effect of which is particularly observed on I-65 which experienced a reduction of traffic. While the traffic counts collected at this time are certainly impacted by construction, they do show that there is a strong levels of traffic in the study area which should be well-served by the new capacity that will become available once construction is complete later this year.

Table 1: Seasonally Adjusted Ohio River Crossing Traffic Counts

	2012				2015/2016			
	Auto	Medium Truck	Heavy Truck	Total	Auto	Medium Truck	Heavy Truck	Total
I-65	101,600	4,200	16,200	122,000	94,800	4,800	16,100	115,700
I-64	69,800	1,700	6,600	78,100	77,700	2,200	7,600	87,500
US 31	23,800	300	NA	24,100	29,800	800	NA	30,600
Total	195,200	6,200	22,800	224,200	202,300	7,800	23,700	233,800

Source: Steer Davies Gleave analysis of the Traffic Group Data

Toll Policy Approval

During our 2013 traffic & revenue study, an initial toll rate schedule was established and approved. The schedule included toll rates for three classes of vehicles: passenger vehicles, medium vehicles, and heavy (large) vehicles. Recently on May 11, 2016, the Tolling Body approved a refinement to the vehicle classification, specifying more clearly the distinction between vehicle classes. Figure 7 displays the approved classification scheme.

¹ Due to construction activity, we were not able to obtain counts for all locations in December 2015.

Figure 7: Toll Rate Vehicle Classification

CLASSIFICATION	VEHICLE DESCRIPTION	TOLL WITH TRANSPONDER	TOLL WITH REGISTERED PLATE	TOLL WITH UNREGISTERED PLATE
Passenger Vehicle	2-axle up to 7 ½ feet in height 	\$2	\$3	\$4
Medium Vehicle	2-axle more than 7 ½ feet in height 	\$5	\$6	\$7
	All 3-axle 			
Large Vehicle	All 4-axle 	\$10	\$11	\$12
	5-axle or more 			

Source: Ohio River Bridges Project Website

The approved vehicle classification differs from the vehicle classification that was assumed as part of our 2013 traffic & revenue forecasts. Our prior forecasts were based on two types of vehicle classification data: length-based and FHWA classification (axle-based). Where axle-based classification counts were available, our prior study treated FHWA vehicle classes 7 and 8 as heavy vehicles, and where length-based classification most FHWA class 8 vehicles would have been counted as heavy vehicles whereas the recent policy classifies these vehicles as medium vehicles.

In order to assess the magnitude of this change, we sought to first quantify the relative share of vehicles that would be classified differently and then tested the impact through our forecasting model to assess the potential impact on the traffic and revenue forecasts.

Magnitude of Truck Segment Impacted by Toll Policy Clarification

We utilized three different sets of information to estimate the magnitude of vehicles that are impacted by this clarification of the Toll Policy:

- FHWA classification count data collected by INDOT in 2011 and 2012
- Manual review of video collected by the Traffic Group in 2015
- Manual observation of corridor traffic in 2016

INDOT Classification Data

During 2011 and 2012, INDOT collected traffic data on I-65 near the Kentucky border. Table 2 presents a summary of the data, indicating that the toll policy clarification will result in roughly 10% of vehicles that had been classified as Heavy vehicles in our prior study now being considered Medium vehicles.

Table 2: Observed Truck Classification Data

	Class 7 & 8	Class 9+	Shift from Heavy to Medium
2011	2.2%	16.0%	12.2%
2012	2.1%	22.2%	8.5%
Average	2.1%	19.1%	10.4%

Source: Steer Davies Gleave analysis of INDOT classification count data

Manual Review of Video

In December 2015, the Traffic Group collected traffic data on I-65 in Indiana, just north of the Kennedy Bridge. Ideally, this traffic data would have been collected using an axle-based classification approach, but this location requires a non-intrusive traffic collection method. Accordingly, a length-based classification approach was conducted, which included the capture of video from the collection.

During the collection of the traffic data, video of the site was collected. We reviewed samples of the video and manually classified the trucks in order to develop an estimate of how many vehicles will be impacted by the toll policy clarification. From our review of 10 hours of video, we found 4-axle vehicles to represent between 2 and 12% of all vehicles with 4 or more axles, depending on the time period. Overall, we observed on average that 4-axle vehicles represented 8% of vehicles with 4 or more axles. This value is generally consistent with the 10% value found in the INDOT classification data.

Manual Observation of Corridor Traffic

Steer Davies Gleave staff also performed ad hoc manual classification during a visit to the study area in April 2016. During an afternoon period in the northbound direction and morning period in the southbound direction, we observed that 4-axle vehicles represented 10-12% of vehicles with 4 or more axles. Again, this value is generally consistent with the 10% value found in the INDOT classification data.

Potential Revenue Impact of the Toll Policy Clarification

In order to test the impact of the toll policy clarification, we ran our travel demand model shifting 10% of heavy truck traffic to the medium vehicle class. This test showed the revenue impact to be low, within 1% of the prior impact, as the revenue that was lost due to less heavy vehicles was offset by an increase in the number of toll-paying medium vehicles.

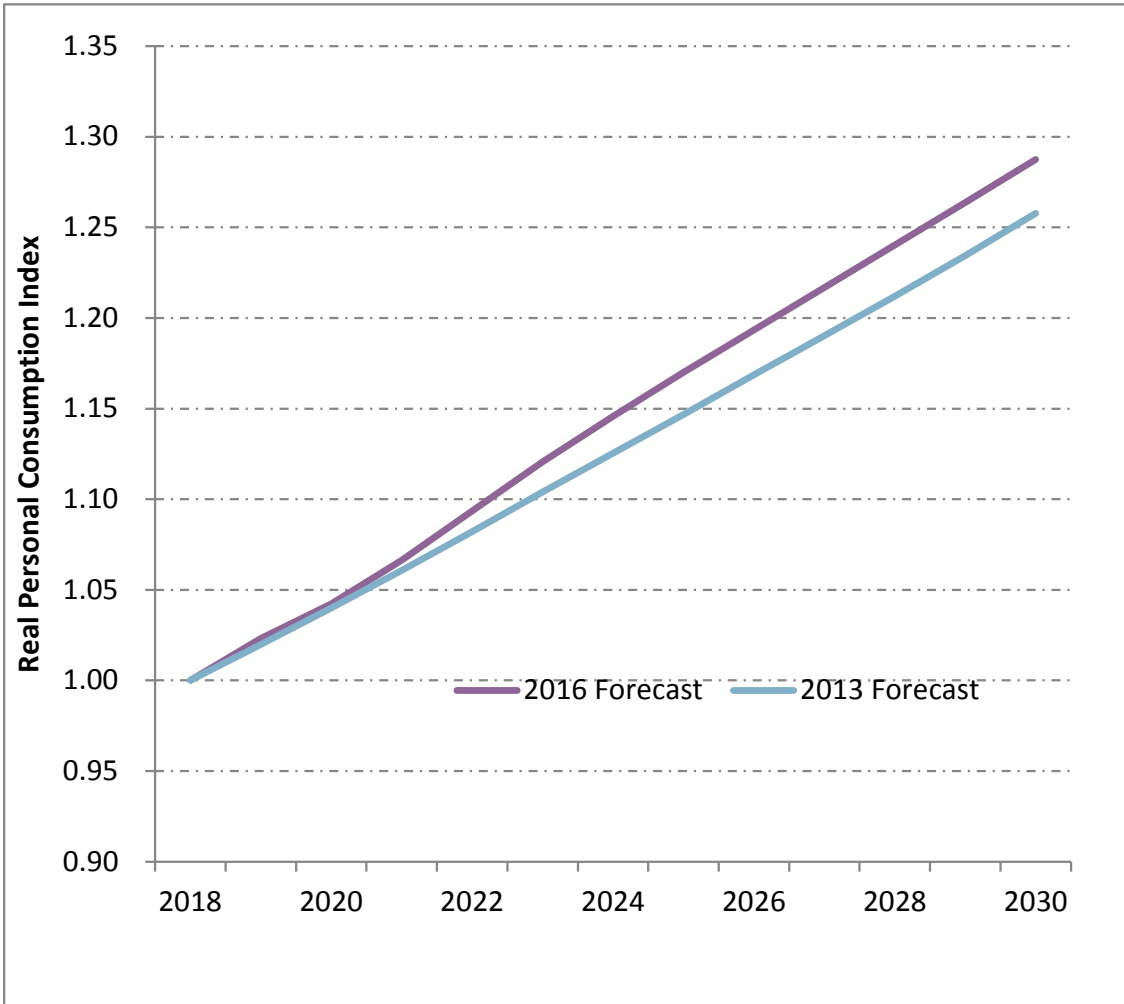
Current Economic Conditions

As part of the updating of our traffic and revenue forecasts, we reviewed current economic conditions and outlook as part of the process to update our growth forecasts.

Given recent construction impacts in the corridor, our growth forecast update methodology consisted of maintaining previous traffic growth forecasts through 2018, while beyond 2018 we updated the forecasts to reflect the most recent outlook for the two economic driver variables of our growth model. These variables are Real Personal Consumption in the US and Employment in Louisville Metropolitan Statistical Area (MSA), and we obtained recent forecasts for each developed by Moody’s Analytics and compared these to the forecasts we had obtained from Moody’s in 2013.

The outlook for Personal Consumption in the US has increased slightly with personal consumption increasing from the 2013 forecast of 1.9% per annum during 2018-2030 to 2.1% per annum as part of the 2016 update. The figure below compares the forecasted growth in personal consumption for the two updates.

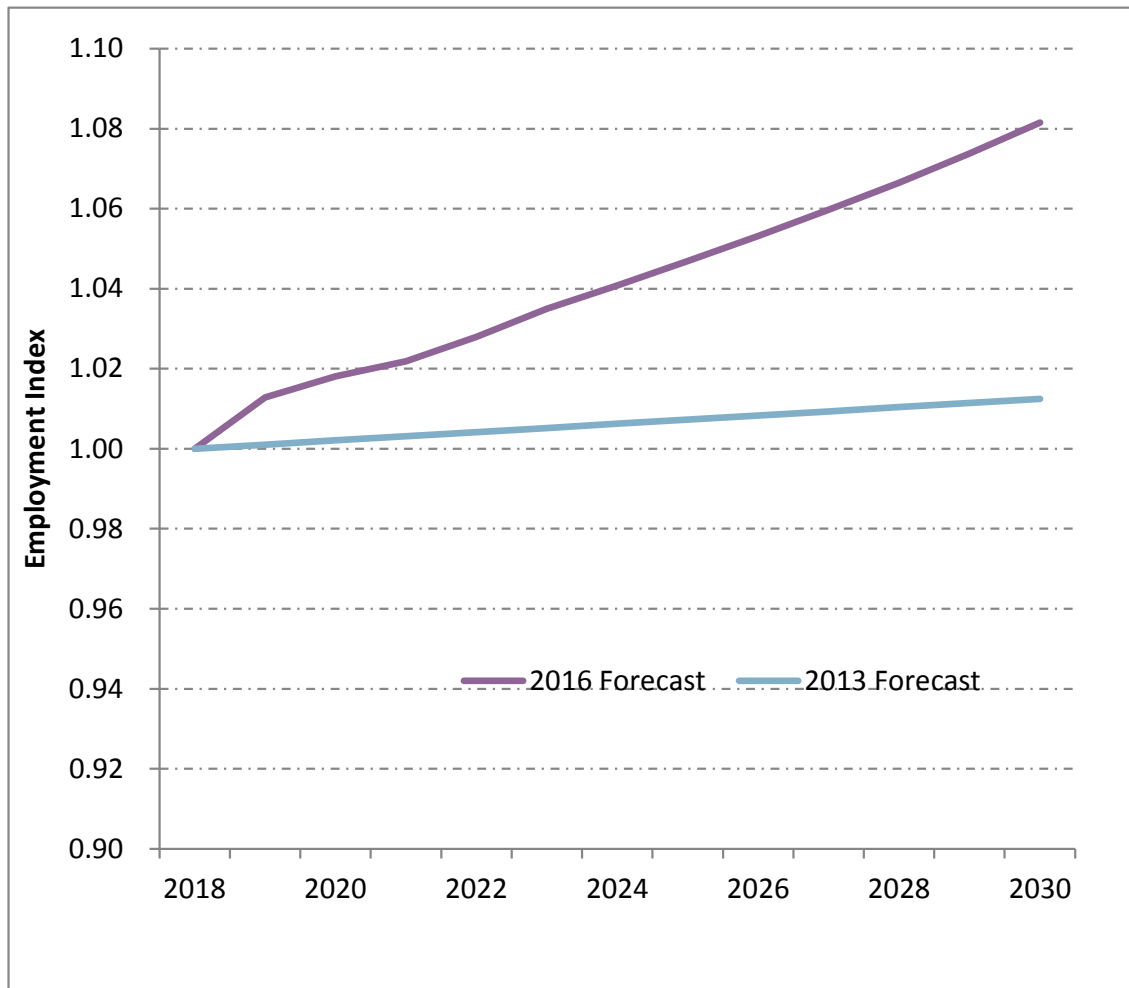
Figure 8: Comparison of Moody’s Forecasts of Personal Consumption in the US



Source: Steer Davies Gleave analysis of Moody’s Analytics data

Forecasts for Employment in the Louisville MSA were similarly updated for the period starting in 2018. The outlook for employment has increased from a 2013 forecast of 0.1% per annum for 2018-30 to 0.7% per annum for the 2016 update. The figure below shows an index comparing the different employment forecasts with the 2016 forecast providing about 8% higher employment in 2030 for the MSA. While the updated employment growth forecasted for the region is higher, this forecasted growth is reasonable when compared to the recent experience in the Louisville MSA.

Figure 9: Comparison of Moody’s Forecasts of Employment in the Louisville MSA



Source: Steer Davies Gleave analysis of Moody’s Analytics data

We ran the Moody’s 2016 forecasts for regional employment and personal consumption in the US through our traffic growth model and produced a new river crossing traffic growth forecast. Table 3 presents three sets of river crossing traffic growth forecasts:

1. 2013 Traffic Growth Forecasts: the original river crossing traffic forecasts we established in 2013
2. Using 2016 Moody’s Outlook: updated forecasts using the 2016 Moody’s values, and
3. Updated 2016 Traffic Growth Forecast: these are the updated set of forecasts that we decided to use in our updated traffic and revenue forecasting; this third set of forecasts is the average of the forecasts produced using Moody’s outlook from 2013 and 2016.

We decided to use the third set of forecasts to develop our revised traffic and revenue forecasts, as we felt it was more robust to use socioeconomic inputs to our growth model that reflected the average of Mood’s outlook at two different times.

Table 3: River Crossing Traffic Growth Forecasts

Period	2013 Traffic Growth Forecast		Using 2016 Moody's Outlook		Updated 2016 Traffic Growth Forecast	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
2018-23	1.04%	1.00%	1.52%	1.54%	1.28%	1.27%
2023-30	0.98%	0.94%	1.34%	1.36%	1.16%	1.15%

The table shows that using the 2016 Moody's outlook indicates an increase to river crossing traffic growth for all periods, from roughly 1% annual growth to roughly 1.5% from 2018 to 2023, and from a little less than 1% to over 1.3% for 2023 to 2030. The updated traffic growth forecasts we use as an input to our traffic and revenue forecast model, as shown in the right-most columns, provide a lower increase over the 2013 traffic growth forecasts.

Revised Traffic & Revenue Forecasts

In order to develop our current outlook on traffic and revenue for the Project, we combined the updated truck toll rates, the updated growth forecasts, along with a refinement of our application of early year ramp-up. The updated truck toll rates were applied as described in the first section of this memo. For the updated river crossing growth forecasts, we used those in the right-most columns of Table 3.

As discussed in our 2013 traffic and revenue report, we apply a ramp-up adjustment in the early years of the Project to allow travel patterns to reach normal conditions after the new project is opened and to allow travelers to obtain transponders. After conferring with the Project's tolling consultant, AECOM, on their view on likely early year transponder shares and to better reflect the likely build-up of transponder penetration rate, we adjusted our application of ramp-up to have a greater share of the ramp-up effects be attributed to transponder traffic. In applying this refinement of the ramp-up application, we also used AECOM's view on leakage rates, which are presented in Table 4.

Table 4: Revised Revenue Leakage Rates

Fiscal Year	ETC Leakage Rate	Video Leakage Rate
FY17	2%	15%
FY18	2%	15%
FY19	2%	10%
FY20	2%	10%
FY21	2%	10%
FY22	2%	5%
FY23	2%	5%
FY24	2%	5%
FY25	2%	5%
FY26	2%	5%
FY27	2%	5%
FY28	2%	5%
FY29	2%	5%
FY30	2%	5%
FY31	2%	5%
FY32	2%	5%
FY33	2%	5%
FY34	2%	5%
FY35	2%	5%
FY36	2%	5%
FY37	2%	5%
FY38	2%	5%
FY39	2%	5%
FY40	2%	5%
FY41	2%	5%
FY42	2%	5%
FY43	2%	5%
FY44	2%	5%
FY45	2%	5%
FY46	2%	5%
FY47	2%	5%
FY48	2%	5%
FY49	2%	5%
FY50	2%	5%
FY51	2%	5%
FY52	2%	5%
FY53	2%	5%
FY54	2%	5%
FY55	2%	5%
FY56	2%	5%
FY57	2%	5%
FY58	2%	5%

Source: AECOM

Applying all the adjustments to our model described above, we developed revised traffic and revenue forecasts. We present these revised forecasts, as well as the 2013 forecasts for comparison, in Table 5. The table shows that the revised forecasts start a little lower than the prior forecasts, due to the combination of new leakage rates with the refinement of the ramp-up application along with the change to the truck toll rates, before becoming higher starting in 2022 due to the stronger economic growth outlook leading to higher river crossing traffic.

Table 5: Comparison of Revised and Prior Traffic and Revenue Forecasts (000s and 000s Nominal Dollars)

Fiscal Year	Original Forecasts (2013)		Revised Forecasts (2016)	
	Annual Traffic After Ramp-Up	Annual Revenue Less Toll Evasion After Ramp-Up	Annual Traffic After Ramp-Up	Annual Revenue Less Toll Evasion After Ramp-Up
2017	10,860	\$33,841	9,410	\$32,936
2018	24,803	\$79,252	22,475	\$75,615
2019	30,356	\$98,158	29,593	\$96,619
2020	33,575	\$110,248	33,890	\$108,424
2021	35,122	\$117,222	35,590	\$115,197
2022	36,162	\$122,529	36,732	\$123,692
2023	36,683	\$126,165	37,314	\$127,238
2024	37,238	\$130,096	37,952	\$131,195
2025	37,811	\$134,281	38,633	\$135,525
2026	38,418	\$138,703	39,350	\$140,107
2027	39,058	\$143,377	40,105	\$144,960
2028	39,734	\$148,198	40,900	\$150,100
2029	40,445	\$153,297	41,736	\$155,545
2030	41,193	\$158,691	42,614	\$161,315
2031	41,930	\$164,985	43,484	\$167,980
2032	42,643	\$172,079	44,332	\$175,540
2033	43,368	\$179,381	45,197	\$183,440
2034	44,105	\$186,994	46,078	\$191,696
2035	44,855	\$194,931	46,978	\$200,325
2036	45,522	\$202,773	47,779	\$208,830
2037	46,103	\$210,497	48,478	\$217,186
2038	46,692	\$218,517	49,188	\$225,877
2039	47,288	\$226,843	49,908	\$234,916
2040	47,892	\$235,486	50,639	\$244,317
2041	48,402	\$243,936	51,256	\$253,471
2042	48,814	\$252,167	51,757	\$262,346
2043	49,230	\$260,676	52,262	\$271,533
2044	49,650	\$269,472	52,773	\$281,041
2045	50,073	\$278,566	53,288	\$290,882
2046	50,500	\$287,967	53,809	\$301,068
2047	50,931	\$297,685	54,335	\$311,611
2048	51,366	\$307,732	54,866	\$322,524
2049	51,804	\$318,119	55,402	\$333,819
2050	52,246	\$328,857	55,943	\$345,510
2051	52,692	\$339,958	56,490	\$357,610
2052	53,142	\$351,434	57,042	\$370,135
2053	53,596	\$363,298	57,599	\$383,098
2054	54,053	\$375,563	58,162	\$396,516

Conclusions

Based upon our site visit and analysis of the factors that influence the Project, we developed revised traffic and revenue forecasts that are a little lower than the prior forecasts in the early years, but higher than the prior forecasts starting in 2022. We note that there has been much construction activity in the project in recent years, but believe that the travel demand for the project remains strong. We await the opening of the Project and the opportunity to monitor its traffic and revenue performance.