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December 20, 2018

Mr. Jason Myers
Director of Finance
E-470 Public Highway Authority
22470 East 6th Parkway
Aurora, CO 80018

Subject: 2018 Traffic and Toll Revenue “Bring-Down” Letter, E-470 Public Highway Authority

Dear Mr. Myers:

CDM Smith was recently requested by the E-470 Public Highway Authority (Authority) to perform a review of the traffic and toll revenue forecasts contained in our January 2018 comprehensive traffic and revenue study entitled, E-470 Traffic and Revenue Forecasts: New Toll Structure, and to update the forecasts contained therein, if necessary. To accomplish this, we reviewed the latest monthly traffic and revenue trend data for each mainline and ramp toll gantry through October 2018 and compared these against the aforementioned January 2018 forecasts, reviewed the transaction data, comparing actual versus prior estimates of ExpressToll and LicensePlateToll (LPT) distributions, incorporated changes in assumed future toll rate increases, updated toll revenue leakage assumptions, reviewed the E-470 improvement project assumptions, including the Aurora Highlands development, reviewed the latest Denver Regional Council of Governments (DRCOG) highway improvement program versus what was contained in the 2018 study, and reviewed the latest socioeconomic and demographic forecasts.

Prior E-470 Traffic and Toll Revenue Forecasts

Prior to the 2018 E-470 Traffic and Revenue Forecast Study (referred to as “2018 Toll Rate Study” or the “January 2018 Forecast” in this letter), the Authority’s last comprehensive traffic and revenue study was prepared in 2014. That study updated the traffic and revenue forecasts associated with the existing system of toll collection and toll rates, and was performed in sufficient detail to provide rate adjustment guidance for the Authority. It included the development of an updated profile of motorists using E-470, future year forecasts of employment, population and households for the Denver Metro Region, estimates of the potential traffic diversion in response to programmed toll rate increases, 30-year traffic and revenue forecasts through year 2043, and an evaluation of future mainline operating conditions. The 2014 forecast was then updated in the January 2017 Traffic and Toll Revenue “Bring-Down” Letter based on the then latest monthly traffic and revenue trend data for each mainline and ramp toll gantry through November 2016 and a review of the highway improvement assumptions.



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The 2018 Toll Rate Study was requested by the Authority in order to provide forecasts of traffic and revenue incorporating a new toll structure. Based on the new toll rate assumptions, the Authority requested an assessment to determine if the new toll rates would (1) preserve the Authority's fiduciary responsibilities to its bondholders, (2) generate sufficient net toll revenue to provide for a financially sound long-range capital improvement program, and (3) maintain the travel time savings and safe operating conditions for which E-470 customers pay tolls. The new pricing structure included the following components for 2018-2020:

- Increase the surcharge between ExpressToll and LPT transactions;
- Continue yearly increases for LPT tolls while retaining ExpressToll rates at 2017 levels through 2020; and
- Reduce tolls at Toll Gantry C based on an optimum toll rate identified from toll sensitivity analyses.

The above-referenced toll structure and the corresponding toll rate assumptions were developed in cooperation with the Authority based, in part, on the results of a toll sensitivity analysis conducted during the study effort. The analysis and the associated forecasts of transactions and revenue also relied upon additional elements from that study, including an independent review of the region's underlying socioeconomic forecasts by Economic & Planning Systems (EPS), a survey of motorists' travel patterns, trip characteristics, and willingness to pay tolls via a Stated Preference survey, a detailed traffic and revenue evaluation, and the collection of significant amounts of traffic and revenue data.

Actual versus Forecasted Transactions and Net Toll Revenue (2016 – 2018)

Table 1 provides a comparison of the forecasted and actual transactions and gross toll revenue from 2016 through 2018 year-to-date (YTD). Included in the table are the transaction and net toll revenue forecasts from both the January 2017 "Bring Down" Letter (January 2017 Forecast) and the 2018 Toll Rate Study (January 2018 Forecast). Since 2016, actual transactions varied from the January 2017 Forecast by an average of 0.3 percent and from the January 2018 Forecast by an average of 1.4 percent. It should be noted that January 2018 Forecast assumes the currently adopted schedule of toll rate increases through 2021, while the prior January 2017 Forecast does not.

Actual year-to-date transactions fell short of the January 2018 Forecast by 3.0 percent. This was primarily due to the greater than anticipated negative impacts related to two ongoing construction projects. First, construction activity related to the C-470 Express Lane is estimated to have decreased transactions at Toll Gantry A by roughly 5.0 percent and at the Peoria Street ramps by almost 10.0 percent. Second, the anticipated traffic recovery following the completion of the E-470 widening between Parker Road and Quincy Avenue was lower than expected, particularly at the

Table 1
Estimated Versus Actual Annual Transactions and Toll Revenue

Year	Transactions (000s)				
	Jan. 2017	Jan. 2018	Actual ⁽³⁾	Percent Diff. from Forecast	
	Forecast ⁽¹⁾	Forecast ⁽²⁾		Jan. 2017	Jan. 2018
2016	79,821	79,975	79,975	0.2	0.0
2017	84,118	84,311	83,175	-1.1	-1.3
2018 YTD ⁽⁴⁾	73,401	75,655	73,387	0.0	-3.0
Total Since 2016	237,340	239,941	236,538	-0.3	-1.4
Year	Net Toll Revenue (\$000s)				
	Jan. 2017	Jan. 2018	Actual ⁽³⁾	Percent Diff. from Forecast	
	Forecast ⁽¹⁾	Forecast ⁽²⁾		Jan. 2017	Jan. 2018
2016	\$ 190,675	\$ 192,811	\$ 192,811	1.1	0.0
2017	\$ 207,935	\$ 215,752	\$ 213,766	2.8	-0.9
2018 YTD ⁽⁴⁾	\$ 185,413	\$ 205,153	\$ 197,666	6.6	-3.6
Total Since 2016	\$ 584,023	\$ 613,715	\$ 604,242	3.5	-1.5

⁽¹⁾ 2017 Traffic and Toll Revenue "Bring-Down" Letter, January 2017.
⁽²⁾ 2018 E-470 Traffic and Revenue Forecast Study, January 2018.
⁽³⁾ Actual Transactions and toll revenue through October 31, 2018.
⁽⁴⁾ 2018 transactions and revenue estimates have been adjusted to match year-to-date (YTD) through October by dividing estimated annual transactions and revenue totals by 365 and multiplying by 304.

Gartrell Road, Smoky Hill Road and Quincy Avenue Interchanges. This may represent a continuation of trip diversion from the completed widening effort as a result of the nearby C-470 Express Lane construction. The estimated difference from forecast was a reduction of about 3.5 percent. Taken together, these two impacts represent a negative impact of about 2.0 percent to total E-470 transactions. In other words, without these greater than anticipated impacts, actual E-470 transactions would have been within 1.0 percent of the January 2018 Forecast.

Net toll revenues were an average of 3.5 percent greater than the January 2017 Forecast. This observed difference is primarily due to the toll rate changes implemented in January 2018, which were not assumed in the January 2017 Forecast. These toll rate changes, which included the suspension of toll rate increases for ExpressToll, increased LPT versus ExpressToll toll rate differentials and a toll reduction at Gantry C, had the impact of increasing the average toll rate by over \$0.16 per transaction. In the January 2018 Forecasts, the greatest variance from actual net toll revenues occurred in 2018 (-3.6 percent). This is a reflection of the greater than anticipated construction impacts, as previously discussed, and higher than estimated LPT leakage.

Trends in Monthly Toll Transactions

Table 2 presents a comparison of monthly transaction trends from January 2012 through October 2018, the last month for which actual transaction data were available. Prior to and through 2012, transaction growth accelerated significantly on E-470. This acceleration in transaction growth was likely due to the gradual economic recovery from the Great Recession consistent with increases in national and state GDP over this period, as illustrated in **Figure 1**. Accelerated transaction growth correlated with increased growth in state GDP, beginning as early as 2011. In late 2014, transaction growth on E-470 began to accelerate significantly, diverging from the growth rates in state GDP. This accelerated growth coincided with the significant reduction of gasoline prices both in Colorado and the nation as illustrated in **Figure 2**. Average Colorado gasoline prices decreased from an average of \$3.39 in 2014 to \$2.40 in 2015, a reduction of almost 30 percent. These positive economic factors, coupled with the availability of land for major development along the E-470 corridor, led to a sustained period of transaction growth. Except for November 2013, October 2015 and January 2016, double-digit year-over-year transaction growth continued on E-470 from September 2013 to February 2016. Annual transaction growth in 2014 and 2015 was 13.6 percent and 12.4 percent, respectively. This level of growth occurred despite annual toll rate increases over the same period.

Since 2015, monthly transaction growth has remained robust, although generally at slightly lower, single-digit rates. Annual transaction growth in 2016 and 2017 was 7.2 percent and 4.0 percent respectively. September 2017 represented the first year-over-year decrease in transactions in almost seven years on E-470. In addition to an additional weekend day in September 2017 when compared to the prior year, the decrease was likely the result of gas price shocks resulting from the impacts of Hurricanes Harvey and Irma, which both occurred that month. The increased gas prices that followed Hurricanes Harvey and Irma, as illustrated in **Figure 2**, coupled with the weekend day difference, the ongoing construction efforts related to the C-470 Express Lane construction and the E-470 widening between Parker Road and Quincy Avenue seems to have restrained transaction growth on E-470 in the months after September 2017. As gas prices have stabilized, strong transaction growth has continued on E-470. Year-to-date growth in 2018 is 5.4 percent over the same period in 2017.

Trends and Assumptions in ExpressToll and LicensePlateToll Transactions

Table 3 provides a summary of monthly toll transaction trends by method of toll payment. While data is presented from January 2016 through October 2018, the last month for which data was available, we have assessed ExpressToll market participation rates beginning with the first full year of ExpressToll, all-electronic tolling in 2010. The data indicates that overall levels of ExpressToll market participation had remained relatively stable between 2010 and 2013, accounting for between 70.0 to 73.0 percent of all transactions. Between 2013 and 2016, ExpressToll market participation gradually declined to 69.0 percent. This was primarily the result of LPT transactions

**Table 2
Trends in Monthly Toll Transactions**

Month	2012 ⁽¹⁾⁽³⁾	Percent Change	2013 ⁽⁴⁾	Percent Change	2014 ⁽⁵⁾	Percent Change	2015 ⁽⁶⁾	Percent Change	2016 ⁽¹⁾⁽⁷⁾	Percent Change	2017 ⁽⁸⁾	Percent Change ⁽⁹⁾	2018 ⁽¹⁰⁾
January	3,868,862	7.1	4,144,884	12.7	4,672,356	12.1	5,238,434	8.4	5,676,018	4.5	5,931,064	4.9	6,224,393
February	3,683,550	3.7	3,818,348	12.5	4,295,331	12.5	4,833,823	14.2	5,519,275	2.9	5,680,280	2.0	5,793,091
March	4,295,232	3.9	4,464,028	12.4	5,017,765	16.2	5,832,879	7.0	6,240,595	7.5	6,706,151	4.8	7,030,363
April	4,238,073	6.1	4,494,953	13.6	5,106,117	16.3	5,936,048	3.6	6,148,120	5.1	6,464,171	6.8	6,901,829
May	4,828,130	8.1	5,219,608	11.1	5,797,739	10.8	6,425,750	8.4	6,965,986	6.6	7,423,085	6.2	7,879,670
June	4,911,112	5.3	5,172,082	14.1	5,900,658	14.5	6,757,614	9.0	7,366,087	4.0	7,660,647	5.1	8,048,721
July	4,951,799	9.3	5,414,329	15.9	6,274,271	13.1	7,098,100	2.9	7,303,013	2.8	7,509,335	6.6	8,007,984
August	5,146,202	8.8	5,599,596	11.7	6,251,950	11.4	6,965,830	7.6	7,494,268	5.7	7,923,670	5.8	8,386,710
September	4,551,822	10.9	5,048,841	15.4	5,824,660	12.7	6,563,755	7.8	7,078,546	(0.3)	7,058,345 ⁽¹¹⁾	6.1	7,485,475
October	4,737,218	10.9	5,254,092	17.6	6,180,883	8.8	6,723,697	4.9	7,053,603	3.3	7,283,129	4.7	7,629,074
November	4,416,214	8.3	4,783,549	13.0	5,405,976	10.6	5,978,641	10.6	6,611,599	4.3	6,896,407	-	-
December	4,337,602	15.0	4,988,422	13.0	5,637,332	10.9	6,254,476	4.2	6,518,125	1.9	6,638,886	-	-
Total	53,965,816	8.2	58,402,732	13.6	66,365,038	12.4	74,609,047	7.2	79,975,235	4.0	83,175,170	5.4	73,387,310

Source: E-470 Public Highway Authority, 2018.

⁽¹⁾ Leap Year.

⁽³⁾ Tolls increased at Toll Gantry from \$2.15 to \$2.25 and at Toll Gantries B, C, D and E from \$2.40 to \$2.50 on January 1, 2012. Ramp toll gantries increased to \$1.00.

⁽⁴⁾ Tolls increased at Toll Gantry A from \$2.25 to \$2.35 and at Toll Gantries B, C, D and E from \$2.50 to \$2.60 on January 1, 2013. Ramp toll gantries increased to \$1.05.

⁽⁵⁾ Tolls increased at Toll Gantry A from \$2.35 to \$2.45 and at Toll Gantries B, C, D and E from \$2.60 to \$2.70 on January 1, 2014. Ramp toll gantries increased to \$1.10.

⁽⁶⁾ Tolls increased at Toll Gantry A from \$2.45 to \$2.50 and at Toll Gantries B, C, D and E from \$2.70 to \$2.75 on January 1, 2015. Ramp toll gantries increased to \$1.15.

⁽⁷⁾ Tolls increased at Toll Gantry A from \$2.50 to \$2.60 and at Toll Gantries B, C, D and E from \$2.75 to \$2.85 on January 1, 2016. Ramp toll gantries increased to \$1.20.

⁽⁸⁾ Tolls increased at Toll Gantry A from \$2.60 to \$2.70 and at Toll Gantries B, C, D and E from \$2.85 to \$2.95 on January 1, 2017. Ramp toll gantries increased to \$1.25.

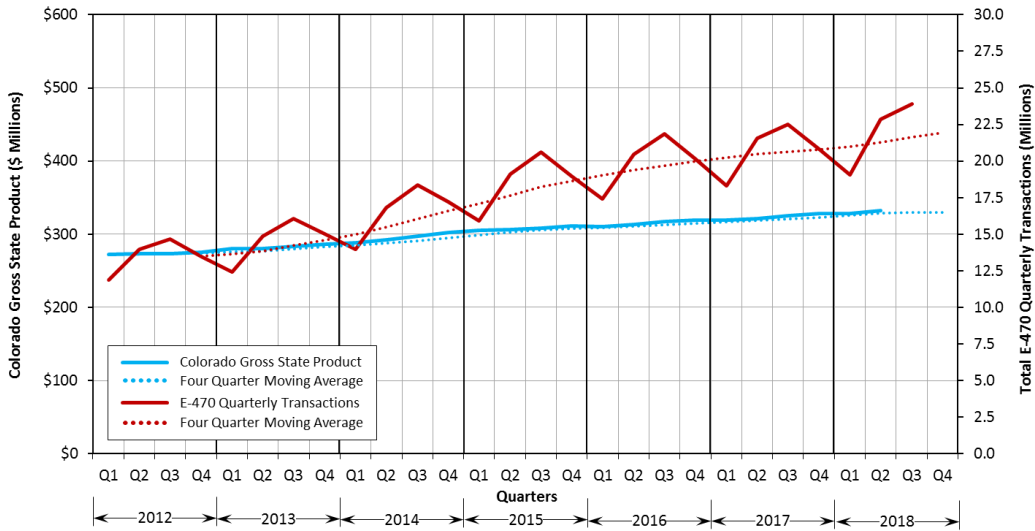
⁽⁹⁾ Represents the percent change in 2018 year-to-date versus the same period in 2017.

⁽¹⁰⁾ On January 1, 2018, tolls at Toll Gantry C were decreased to \$2.70 and the toll differential between ExpressToll and LicensePlate Toll was increased from 25 to 53 percent.

⁽¹¹⁾ Hurricanes Harvey and Irma, which temporarily disrupted national fuels supplies, occurred in September 2017.

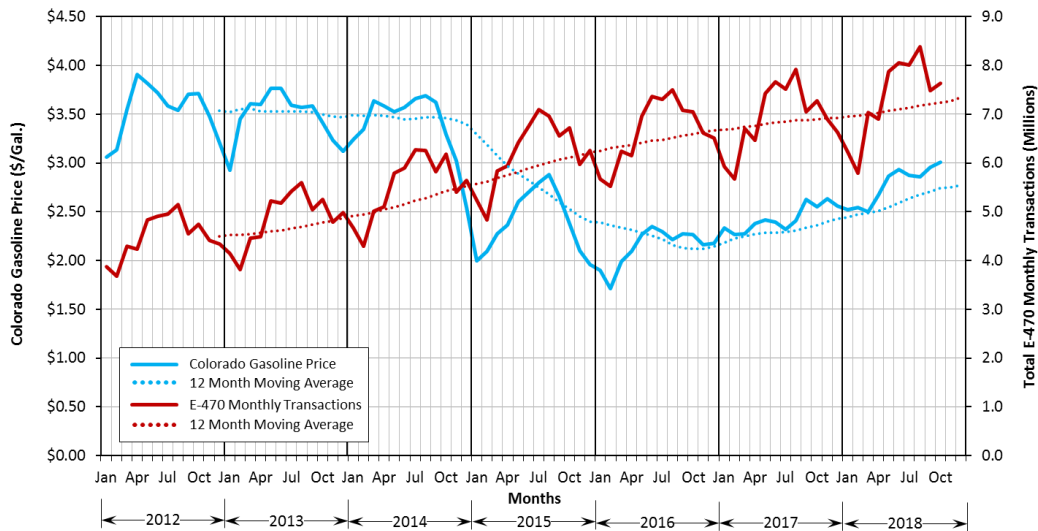
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Figure 1
Comparison of Quarterly Colorado State Product and E-470 Toll Transactions, 2012-2018



Source: US Bureau of Economic Analysis; E-470 Authority.

Figure 2
Comparison of Monthly Colorado Gasoline Prices and E-470 Toll Transactions, 2012-2018



Source: US Energy Information Administration; E-470 Authority.

Table 3
Trends in Monthly Toll Transactions by Method of Payment

Month	2016					
	ExpressToll		LPT		Total	
	Transactions	Percent	Transactions	Percent	Transactions	Percent
January	3,966,059	69.9	1,709,959	30.1	5,676,018	100.0
February	3,871,382	70.1	1,647,893	29.9	5,519,275	100.0
March	4,343,032	69.6	1,897,563	30.4	6,240,595	100.0
April	4,329,810	70.4	1,818,310	29.6	6,148,120	100.0
May	4,874,767	70.0	2,091,219	30.0	6,965,986	100.0
June	5,015,445	68.1	2,350,642	31.9	7,366,087	100.0
July	4,863,023	66.6	2,439,990	33.4	7,303,013	100.0
August	5,111,717	68.2	2,382,551	31.8	7,494,268	100.0
September	4,891,222	69.1	2,187,324	30.9	7,078,546	100.0
October	4,903,690	69.5	2,149,913	30.5	7,053,603	100.0
November	4,624,176	69.9	1,987,423	30.1	6,611,599	100.0
December	4,553,930	69.9	1,964,195	30.1	6,518,125	100.0
January to October	46,170,147	69.1	20,675,364	30.9	66,845,511	100.0
Total Year	55,348,253	69.2	24,626,982	30.8	79,975,235	100.0

Month	2017					
	ExpressToll		LPT		Total	
	Transactions	Percent	Transactions	Percent	Transactions	Percent
January	4,256,436	71.8	1,674,628	28.2	5,931,064	100.0
February	4,157,171	73.2	1,523,109	26.8	5,680,280	100.0
March	4,892,293	73.0	1,813,858	27.0	6,706,151	100.0
April	4,722,707	73.1	1,741,464	26.9	6,464,171	100.0
May	5,257,280	70.8	2,165,805	29.2	7,423,085	100.0
June	5,395,828	70.4	2,264,819	29.6	7,660,647	100.0
July	5,162,863	68.8	2,346,472	31.2	7,509,335	100.0
August	5,578,612	70.4	2,345,058	29.6	7,923,670	100.0
September	5,031,324	71.3	2,027,021	28.7	7,058,345	100.0
October	5,260,257	72.2	2,022,872	27.8	7,283,129	100.0
November	4,975,399	72.1	1,921,008	27.9	6,896,407	100.0
December	4,776,013	71.9	1,862,873	28.1	6,638,886	100.0
January to October	49,714,771	71.4	19,925,106	28.6	69,639,877	100.0
Total Year	59,466,183	71.5	23,708,987	28.5	83,175,170	100.0

Month	2018					
	ExpressToll		LPT		Total	
	Transactions	Percent	Transactions	Percent	Transactions	Percent
January	4,600,300	73.9	1,624,093	26.1	6,224,393	100.0
February	4,301,053	74.2	1,492,038	25.8	5,793,091	100.0
March	5,186,449	73.8	1,843,914	26.2	7,030,363	100.0
April	5,151,835	74.6	1,749,994	25.4	6,901,829	100.0
May	5,801,748	73.6	2,077,922	26.4	7,879,670	100.0
June	5,781,616	71.8	2,267,105	28.2	8,048,721	100.0
July	5,717,170	71.4	2,290,814	28.6	8,007,984	100.0
August	6,091,874	72.6	2,294,836	27.4	8,386,710	100.0
September	5,506,143	73.6	1,979,332	26.4	7,485,475	100.0
October	5,693,949	74.6	1,935,125	25.4	7,629,074	100.0
November	-	-	-	-	-	-
December	-	-	-	-	-	-
January to October	53,832,137	73.4	19,555,173	26.6	73,387,310	100.0
Total Year	53,832,137	73.4	19,555,173	26.6	73,387,310	100.0

Source: E-470 Authority

Note: ExpressToll transactions presented in this table include I-Tolls.



growing at a faster rate than ExpressToll transactions, despite several systemwide toll increases. During this time, the LPT toll rate surcharge was held at a constant 25.0 percent (through 2017). The faster growth in LPT transactions was speculated to be the result of new system users coming from the developing areas in Aurora and Adams County who had yet to register for ExpressToll, in addition to the return of some of the less frequent non-resident, recreational or discretionary customers lost during the recession. Recent years have seen an increase in ExpressToll market participation, with a return to 2010 to 2013 levels. Through October 2018, ExpressToll market participation was 73.4 percent. It is believed that the new toll rates adopted in 2018 to increase the LPT surcharge and the expansion of the managed lane concept in the Denver region have been contributing factors for the increase. It is believed that penetration rates will continue to rise modestly in the future as the LPT toll rates and surcharge are adjusted in 2019 and 2020, and as the managed lane concept continues to expand along the North I-25, I-70 and C-470 travel corridors and E-470 implements programmed increases to the ExpressToll / LPT Toll differential.

Table 4 presents ExpressToll/LPT distributions used to develop the transactions and revenue estimates in the prior and current forecast efforts. The revised distributions for this current study effort were developed in cooperation with E-470 Staff based on actual ExpressToll participation rates through October 2018, and the assumption that the programmed increases in the LPT surcharge will be implemented through 2020.

Actual and Assumed Toll Rates for ExpressToll and LicensePlateToll

The toll rate assumptions presented in **Table 5** are those assumed in both prior and current forecasts. The January 2017 Forecast assumed annual toll increases, with an LPT toll rate differential of approximately 25 percent assumed throughout the forecast period. Moreover, the toll rates for Gantry C were assumed to be comparable to those of Gantries B, D and E. In January 2018, E-470 implemented a new toll policy. ExpressToll toll rates were held at 2017 levels through 2020. The LPT toll differential was gradually increased to about 63 percent through 2021. Moreover, toll rates at Gantry C were reduced, consistent with toll rates at Gantry A. This new toll rate schedule was assumed under the January 2018 Forecast and has also been assumed in this traffic and revenue update.

Under both the January 2017 Forecast and the January 2018 Forecast, toll rates beyond 2021 were assumed to increase annually at a CPI-based rate of 2.1 percent. Under the January 2017 Forecast, 2035 ExpressToll toll rates were assumed to be \$4.00 at Toll Gantry A, and \$4.35 at Toll Gantries B, C, D and E. Under the January 2018 Forecast, ExpressToll toll rates in 2035 were assumed to be \$3.70 at Gantries A and C and \$4.00 at Gantries B, D and E based on the recently approved toll rates through 2021. Under the current study effort, toll rates were assumed to increase every third year by 2.1 percent. Using this assumption, ExpressToll toll rates at Gantries A and C are assumed to be \$2.95 in 2035, while ExpressToll toll rates at Gantries B, D and E are assumed to be \$3.20. This

Table 4
Actual and Assumed ExpressToll and LicensePlateToll Percentages

Year	January 2017 Forecast ⁽¹⁾		January 2018 Forecast ⁽²⁾		Current Forecast Assumptions ⁽³⁾	
	ExpressToll	LicensePlate	ExpressToll	LicensePlate	ExpressToll	LicensePlate
2016	69	31	69	31	69	31
2017	69	31	71	29	71	29
2018	69	31	82	18	74	26
2021	70	30	86	14	76	24
2035 and Beyond	70	30	87	13	81	19

⁽¹⁾ 2017 Traffic and Revenue Update Letter, January 2017.
⁽²⁾ 2018 Toll Rate Study, January 2018.
⁽³⁾ Current forecast assumptions based on actual transaction data through October 31, 2018.


 - Actuals.

Table 5
Actual and Assumed ExpressToll and LicensePlateToll, Passenger Car-Based Tolls

Year	January 2017 Forecast ⁽¹⁾ Assumptions							
	ExpressToll				LicensePlateToll			
	Mainline Plazas			Ramp Plazas	Mainline Plazas			Ramp Plazas
	A	C	B, D, E		A	C	B, D, E	
2016 ⁽³⁾	\$ 2.60	\$ 2.85	\$ 2.85	\$ 1.20	\$ 3.25	\$ 3.55	\$ 3.55	\$ 1.50
2017 ⁽³⁾	2.70	2.95	2.95	1.25	3.40	3.70	3.70	1.55
2018	2.75	3.00	3.00	1.30	3.45	3.75	3.75	1.65
2019	2.85	3.10	3.10	1.35	3.55	3.90	3.90	1.70
2020	2.95	3.20	3.20	1.40	3.70	4.00	4.00	1.75
2021	3.00	3.25	3.25	1.45	3.75	4.05	4.05	1.80

Year	January 2018 Forecast ⁽²⁾ and Current Forecast Assumptions							
	ExpressToll				LicensePlateToll			
	Mainline Plazas			Ramp Plazas	Mainline Plazas			Ramp Plazas
	A	C	B, D, E		A	C	B, D, E	
2016 ⁽³⁾	\$ 2.60	\$ 2.85	\$ 2.85	\$ 1.20	\$ 3.25	\$ 3.55	\$ 3.55	\$ 1.50
2017 ⁽³⁾	2.70	2.95	2.95	1.25	3.40	3.70	3.70	1.55
2018 ⁽³⁾	2.70	2.70	2.95	1.25	4.15	4.15	4.50	1.95
2019	2.70	2.70	2.95	1.25	4.30	4.30	4.65	2.05
2020	2.70	2.70	2.95	1.25	4.45	4.45	4.80	2.10
2021	2.75	2.75	3.00	1.30	4.50	4.50	4.90	2.15

⁽¹⁾ 2017 Traffic and Revenue Update Letter, January 2017.
⁽²⁾ 2018 Toll Rate Study, January 2018.
⁽³⁾ Actual.

represents a toll reduction of roughly 20.0 percent over the prior forecast assumptions in 2035. Moreover, this reduction is assumed to increase to almost 35.0 percent by the end of the study period of 2048.

Review of the Highway Improvement Program

As part of the traffic and toll revenue study performed in support of the January 2018 Forecast, a detailed review was conducted of the proposed highway improvements for the immediate E-470 corridor and along principal competing and complementary freeways. A list of the highway improvements assumed in developing the traffic and revenue forecasts in the January 2018 Forecast study is provided in **Table 6**. As part of the current update, a review of the planned highway improvements was conducted by CDM Smith. The results of this review found that the underlying DRCOG highway improvement assumptions had not changed. However, the review also revealed that some of the 2025 highway improvements assumed under the January 2018 Forecast planned to be completed by 2021 may not be completed by that date. As a result, some minor reductions in short-term growth rates were made under the current forecast effort in order to recognize the later assumed opening date of these projects.

Additionally, an evaluation of the Authority's proposed capital program was conducted. The Authority conducted and finalized a Master Capital Plan in 2017 that provided more detail as well as revised forecasting of major capital projects and needs along the corridor. **Table 7** presents a summary of the changes in highway improvement assumptions between the current study and both the January 2017 Forecast and the January 2018 Forecast. These changes were based on information provided by E-470 Staff. In general, the widenings previously assumed in 2035 have been accelerated, with various segment widenings occurring as early as 2024. Moreover, the changes in major interchange opening assumptions vary, with some opening earlier and others opening later, as noted in the table.

Review of Regional Socioeconomic/Demographic Forecasts

In July 2017, EPS completed adjusted forecasts of employment, population, and household growth at the Traffic Analysis Zone (TAZ) level for the 7-County Denver Metro Area in support of the January 2018 Forecast. EPS's forecasts contained micro- (i.e. TAZs) and macro-level economic and demographic adjustments to the DRCOG land use forecasts through 2035. Adjustments were made to reflect market conditions using comprehensive research and analysis of major development plans throughout the E-470 Corridor. EPS also used the most currently available secondary data from the U.S. Census Bureau, the Colorado Department of Local Affairs (DOLA), and the Bureau of Labor Statistics (BLS) to adjust population, household, and employment data at the metro, county, and municipality levels.

Table 6
Programmed Regional Highway Improvements
Assumed in the January 2018 Forecast and the Current Study

Network Year of Improvement	Facility Name	From	To	Improvement	Length	Counties
2025	104th Ave.	Grandview Ponds	Mckay Rd.	Widen from 2 to 4 Lanes	0.7	Adams
2025	104th Ave.	US-85	SH-2	Widen from 2 to 4 Lanes	1.8	Adams
2025	144th Ave.	US-287	Zuni St.	Widen from 2 to 4 Lanes	3.5	Broomfield
2025	144th Ave.	Washington St.	York St.	Widen from 2 to 4 Lanes	1.0	Adams
2025	144th Ave.	York St.	Colorado Blvd.	Widen from 2 to 4 Lanes	1.0	Adams
2025	160th Ave.	Lowell Blvd.	Sheridan Pkwy.	New 2 Lanes	1.0	Broomfield
2025	48th Ave.	Picadilly Rd.	Powhaton Rd.	New 6 Lanes	3.0	Adams
2025	56th Ave.	Dunkirk St.	Himalaya St.	Widen from 4 to 6 Lanes	0.5	Denver
2025	56th Ave.	E-470	Imboden Rd.	Widen from 2 to 6 Lanes	7.0	Adams
2025	56th Ave.	Havana St.	Pena Blvd.	Widen from 2 to 6 Lanes	4.3	Denver
2025	56th Ave.	Himalaya St.	Picadilly Rd.	Widen from 2 to 6 Lanes	1.0	Denver
2025	56th Ave.	Pena Blvd.	Tower Rd.	Widen from 4 to 6 Lanes	0.7	Denver
2025	56th Ave.	Picadilly Rd.	E-470	Widen from 2 to 6 Lanes	1.0	Adams
2025	64th Ave.	Harvest Rd.	Himalaya St.	Widen from 2 to 6 Lanes	0.5	Adams
2025	64th Ave.	Himalaya Rd.	Powhaton Rd.	New 2 Lanes	1.0	Adams
2025	64th Ave.	Powhaton Rd.	Harvest Rd.	Widen from 2 to 4 Lanes	3.0	Adams
2025	64th Ave.	Powhaton Rd.	Monaghan Rd.	New 4 Lanes	1.0	Adams
2025	64th Ave.	Tower Rd.	Denver/Aurora City Limits	Widen from 2 to 4 Lanes	0.5	Denver
2025	6th Ave.	Airport Blvd.	Tower Rd.	Widen from 2 to 4 Lanes	1.0	Arapahoe
2025	6th Ave./6th Pkwy.	6th Pkwy.	Harvest Rd.	Widen from 2 to 6 Lanes	0.4	Arapahoe
2025	6th Ave./SH 30	Tower Rd.	6th Pkwy.	Widen from 2 to 6 Lanes	1.6	Arapahoe
2025	6th Pkwy.	SH-30	E-470	New 2 Lane Road	1.3	Arapahoe
2025	6th Pkwy.	E-470	Gun Club Rd.	Widen from 2 to 6 Lanes	0.3	Arapahoe
2025	96th St.	96th St. at Northwest Pkwy.	SH-128	Add Toll Lanes	2.3	Broomfield
2025	Arapahoe Rd.	Piney Creek Circle	Himalaya St.	Widen from 4 to 6 Lanes	1.3	Arapahoe
2025	Broncos Pkwy. (Easter Ave.)	Jordan Rd.	Parker Rd.	Widen from 4 to 6 Lanes	0.8	Arapahoe
2025	Broncos Pkwy.	Havana St.	Peoria St.	Widen from 4 to 6 Lanes	1.0	Adams
2025	Buckley Rd.	118th Ave.	Cameron Dr.	Widen from 2 to 6 Lanes	1.3	Adams
2025	Buckley Rd.	136th Ave.	Bromley Ln.	Widen from 2 to 4 lanes	2.0	Adams
2025	C-470	Colorado Blvd.	Wadsworth Blvd.	WB: Add New Managed Lanes	8.2	Douglas/Jefferson
2025	C-470	I-25	Colorado Blvd.	WB: Add New Managed Lanes	4.1	Douglas
2025	C-470	Wadsworth Blvd.	Lincoln Ave.	EB: Add New Managed Lanes	10.8	Douglas/Jefferson
2025	Chambers Rd.	Main Street	I-76	Widen from 2 to 4 Lanes	1.4	Douglas
2025	E. Bromley Ln.	Tower Rd.	I-76	Widen from 4 to 6 Lanes	1.1	Adams
2025	Green Valley Ranch Blvd.	Chambers Rd.	Telluride St.	Widen from 4 to 6 Lanes	1.5	Denver
2025	Green Valley Ranch Blvd.	Chambers Rd.	Pena Blvd.	Widen from 2 to 4 Lanes	1.0	Denver
2025	Green Valley Ranch Blvd.	Telluride St.	Tower Rd.	Widen from 4 to 6 Lanes	0.5	Denver
2025	Gun Club Rd.	1.5 Miles s/of Quincy Ave.	Quincy Ave.	Widen from 2 to 6 Lanes	1.6	Arapahoe

Table 6 (Continued)
Programmed Regional Highway Improvements
Assumed in the January 2018 Forecast and the Current Study

Network Year of Improvement	Facility Name	From	To	Improvement	Length	Counties
2025	Hampden Ave.	Picadilly Rd.	Gun Club Rd.	Widen from 2 to 4 Lanes	1.1	Arapahoe
2025	Harvest Rd.	56th Ave.	64th Ave.	New 3 Lanes	1.0	Adams
2025	Harvest Rd.	6th Ave.	I-70	New 6 Lanes	1.1	Adams
2025	Harvest Rd.	Alameda Ave.	6th Ave.	Widen from 3 to 6 Lanes	1.0	Arapahoe
2025	Harvest Rd.	I-70	56th Ave.	New 6 Lanes	4.1	Adams
2025	Huron St.	Mississippi Ave.	Alameda Ave.	New 6 Lanes	1.0	Arapahoe
2025	Huron St.	150th Ave.	160th Ave.	Widen from 2 to 4 lanes	1.3	Broomfield
2025	Huron St.	160th Ave.	SH-7	Widen from 2 to 4 lanes	1.2	Broomfield
2025	I-25	120th Ave.	SH-7	Add 1 Toll/Managed Lane each direction	6.0	Adams/Broomfield
2025	I-25	US-36	Thornton Pkwy.	Add 1 New SB Lane	2.8	Adams
2025	I-70	Harvest Rd.	Chambers Rd.	Add New Interchange	3.8	Adams/Arapahoe
2025	I-70	I-25	Chambers Rd.	Add 2 New Managed Lanes		Denver/Adams
2025	I-70	Picadilly Rd.		Add New Interchange		Adams
2025	Jefferson Pkwy.	Candela Pkwy.		New Partial Interchange		Jefferson
2025	Jefferson Pkwy.	Indiana St.s/o SH-128		New Partial Interchange		Jefferson
2025	Jefferson Pkwy.	SH-72		New Partial Interchange		Jefferson
2025	Jewell Ave.	SH-93	SH-128	New 4 Lane Toll Road	10.2	Jefferson
2025	Jewell Ave.	E-470	Gun Club Rd.	Widen from 2 to 6 Lanes	0.5	Arapahoe
2025	Jewell Ave.	Gun Club Rd.	Harvest Rd.	Widen from 2 to 6 Lanes	1.0	Arapahoe
2025	Lincoln Ave.	Himalaya Rd.	E-470	Widen from 3 to 6 Lanes	1.4	Arapahoe
2025	Lincoln Ave.	Keystone Blvd.	Parker Rd.	Widen from 4 to 6 Lanes	1.6	Douglas
2025	Peña Blvd.	Peoria St.	1st Ave.	Widen from 4 to 6 Lanes	0.7	Douglas
2025	Peña Blvd.	Jackson Gap St. West Ramps	DIA Terminal	Widen from 6 to 8 Lanes	1.7	Denver
2025	Peña Blvd.	Tower Rd.		Add on-ramp to WB Pena		Denver
2025	Peoria St.	E-470	E-470	Widen from 4 to 8 Lanes	6.4	Denver
2025	Picadilly Rd.	48th Ave.	.75 miles s/o Lincoln Ave.	Widen from 2 to 4 Lanes	1.9	Douglas
2025	Picadilly Rd.	56th Ave.	56th Ave.	Widen from 2 to 4 lanes	1.2	Adams
2025	Picadilly Rd.	6th Ave.	70th Ave./Aurora City Limits	Widen from 2 to 6 Lanes	1.7	Adams
2025	Picadilly Rd.	70th Ave.	Colfax Ave.	Widen from 2 to 6 Lanes	1.6	Arapahoe
2025	Picadilly Rd.	82nd Ave.	82nd Ave.	Widen from 2 to 6 Lanes	1.5	Denver
2025	Picadilly Rd.	Colfax Ave.	I-70	New 6 Lanes	0.3	Adams
2025	Picadilly Rd.	Jewell Ave.	6th Pkwy.	New 4 Lanes	2.7	Arapahoe
2025	Picadilly Rd.	I-70	Smith Rd.	Widen from 2 to 6 Lanes	0.5	Adams
2025	Picadilly Rd.	Smith Rd.	48th Ave.	Widen from 2 to 6 Lanes	2.2	Adams
2025	Quebec St.	120th Ave.	128th Ave.	Widen from 2 to 4 Lanes	1.0	Adams
2025	Quebec St.	132nd Ave.	160th Ave.	Widen from 2 to 4 Lanes	3.5	Adams
2025	Quincy Ave.	Plains Pkwy./Copperleaf Blvd.	Gun Club Rd.	Widen from 2 to 6 Lanes	0.6	Arapahoe
2025	Ridgegate Pkwy. (Mainstreet)	Havana St.	Lone Tree E. City Limit	Widen from 2 to 4 Lanes	1.8	Douglas

Table 6 (Continued)
Programmed Regional Highway Improvements
Assumed in the January 2018 Forecast and the Current Study

Network Year of Improvement	Facility Name	From	To	Improvement	Length	Counties
2025	SH-2	72nd Ave.	I-76	Widen from 2 to 4 Lanes	7.5	Adams
2025	SH-7	Boulder County Line	Sheridan Pkwy.	Widen from 2 to 4 Lanes	2.5	Broomfield
2025	SH-7	Sheridan Pkwy.	I-25	Widen from 2 to 6 Lanes	1.5	Broomfield
2025	Sheridan Pkwy.	NW Pkwy.	SH-7	Widen from 2 to 4 Lanes	1.3	Broomfield
2025	Tower Rd.	Lowell Blvd.	NW Pkwy.	Widen from 2 to 4 Lanes	1.1	Broomfield
2025	Tower Rd.	38th/40th Ave.	Green Valley Ranch Blvd.	Widen from 2/4 to 6 Lanes	1.0	Denver
2025	Tower Rd.	48th Ave.	56th Ave.	Widen from 4 to 6 Lanes	1.0	Denver
2025	Tower Rd.	56th Ave.	Pena Blvd.	Widen from 4 to 6 Lanes	2.4	Denver
2025	Tower Rd.	6th Ave.	Colfax Ave.	New 2 Lanes	1.0	Arapahoe
2025	Tower Rd.	Colfax Ave.	Smith Rd.	Widen from 2 to 6 Lanes	1.0	Adams
2025	Tower Rd.	Pena Blvd.	104th Ave.	Widen from 2 to 4 Lanes	3.8	Adams
2025	Tower/Buckley Rd.	105th Ave.	118th Ave.	New 4 Lanes	2.0	Adams
2025	Washington St.	144th Ave.	152 Ave.	Widen from 2 to 4 Lanes	0.7	Adams
2025	Washington St.	152nd Ave.	160 Ave.	Widen from 2 to 4 Lanes	1.4	Adams
2025	York St.	160th Ave. (SH-7)	168th Ave.	Widen from 2 to 4 Lanes	1.0	Adams
2025	York St.	E-470	SH-7	Widen from 2 to 4 Lanes	0.7	Adams
2035	104th Ave.	Marion St.	Colorado Blvd.	Widen from 2 to 4 Lanes	1.6	Adams
2035	104th Ave.	McKay Road	US-85	Widen from 2 to 4 Lanes	1.9	Adams
2035	120th Ave.	E-470	Picadilly Rd.	Widen from 4 to 6 Lanes	2.6	Adams
2035	120th Ave.	Sable Blvd.	E-470	Widen from 2 to 6 Lanes	2.0	Adams
2035	152nd Ave.	Washington St.	York St.	Widen from 2 to 4 Lanes	1.2	Adams
2035	48th Ave.	Imboden Rd.	Quail Run Rd.	Widen from 2 to 6 Lanes	1.0	Adams
2035	48th Ave.	Powhaton Rd.	Monaghan Rd.	Widen from 2 to 6 Lanes	1.0	Adams
2035	64th Ave.	Harvest Rd.	Powhaton Rd.	New 6 Lanes	1.0	Adams
2035	6th Pkwy.	SH-30	E-470	Widen from 2 to 4 Lanes	1.0	Adams
2035	96th Ave.	Tower Rd.	Tower Road	Widen from 2 to 4 Lanes	1.3	Arapahoe
2035	96th Ave.	Himalaya Way	Picadilly Rd.	Widen from 2 to 6 Lanes	5.0	Adams
2035	Arapahoe Rd.	Broadway	Liverpool St.	Widen from 4 to 6 lanes	2.0	Adams
2035	C-470	Colorado Blvd.	I-25	EB: Add 1 Toll/Managed Lane	0.5	Arapahoe
2035	C-470	S. Kipling Pkwy.	Lucent Blvd.	WB: Add 1 Toll/Managed Lane	6.6	Douglas
2035	C-470	Wadsworth Blvd.	Wadsworth Blvd.	EB: Add 1 Toll/Managed Lane	3.7	Douglas
2035	Colorado Blvd.	144th Ave.	S. Kipling Pkwy.	WB: Add 1 Toll/Managed Lane	3.0	Jefferson
2035	E. Bromley Ln.	Hwy 85	Sable Blvd.	Widen from 0/2 to 4 Lanes	1.4	Jefferson
2035	Gun Club Rd.	Yale Ave.	Mississippi Ave.	Widen from 4 to 6 Lanes	3.7	Adams
2035	Hampden Ave./Havana St. (SH-	Florence St.	s/o Yale Ave.	Widen from 2/4 to 6 Lanes	0.5	Adams
2035	Harvest Rd.	56th Ave.	64th Ave.	Widen from 5 to 6 Lanes	2.1	Arapahoe
2035	Harvest Rd.	Jewell Ave.	Mississippi Ave.	Widen from 3 to 6 Lanes	1.4	Denver
2035				Widen from 2 to 6 lanes	1.0	Adams
2035					1.0	Arapahoe

Table 6 (Continued)
Programmed Regional Highway Improvements
Assumed in the January 2018 Forecast and the Current Study

Network Year of Improvement	Facility Name	From	To	Improvement	Length	Counties
2035	I-225	I-25	Yosemite St.	Interchange Capacity		Denver
2035	I-70	E-470		Interchange Capacity		Adams/Arapahoe
2035	Imboden Rd.	48th Ave.	56th Ave.	Widen from 2 to 6 Lanes	1.0	Adams
2035	Lincoln Ave.	1st St.	Keystone Blvd.	Widen from 4 to 6 Lanes	1.8	Douglas
2035	Main Street	Lone Tree E. City Limit	Chambers Rd.	Widen from 2 to 4 Lanes	0.9	Douglas
2035	Monaghan Rd.	Quincy Ave.	Yale Ave.	New 6 Lanes	2.0	Arapahoe
2035	Parker Rd. (SH-83)	Quincy Ave.	Hampden Ave.	Widen from 6 to 8 Lanes	1.0	Arapahoe
2035	Peoria St.	.75 miles s/o Lincoln Ave.	Main Street	Widen from 2 to 4 Lanes	0.5	Douglas
2035	Picadilly Rd.	82nd Ave.	96th Ave.	New 6 Lanes	1.8	Adams
2035	Picadilly Rd.	96th Ave.	120th Ave.	New 6 Lanes	3.0	Adams
2035	Powhatan Rd.	Smoky Hill Rd.	County Line Rd.	Widen from 2 to 6 Lanes	1.0	Arapahoe
2035	Quail Run Rd.	I-70	48th Ave.	New 6 Lanes	3.0	Adams
2035	Quincy Ave.	Hayesmount Rd.	Watkins Rd.	Widen from 2 to 6 Lanes	2.0	Arapahoe
2035	Quincy Ave.	Monaghan Rd.	Hayesmount Rd.	Widen from 2 to 6 Lanes	1.1	Arapahoe
2035	SH-7	Riverdale Rd.	US-85	Widen from 2 to 4 Lanes	1.1	Adams
2035	SH-7	164th Ave.	Dahlia St.	Widen from 2 to 4 Lanes	2.2	Adams
2035	Smoky Hill Rd.	Pheasant Run Pkwy.	Versailles Pkwy.	Widen from 2 to 6 Lanes	4.4	Arapahoe
2035	Tower Rd.	6th Ave.	Colfax Ave.	Widen from 4 to 6 Lanes	4.4	Arapahoe
2035	Tower Rd.	Pena Blvd.	104th Ave.	Widen from 2 to 6 Lanes	1.0	Arapahoe
2035	Watkins Rd.	Quincy Ave.	I-70	Widen from 4 to 6 Lanes	3.8	Adams
2035	Yale Ave.	Monaghan Rd.	Hayesmount Rd.	Widen from 2 to 6 Lanes	7.1	Arapahoe
2035	York St.	152nd Ave.	E-470	Widen from 2 to 6 Lanes	1.1	Arapahoe
2035				Widen from 2 to 4 Lanes	0.2	Adams

Table 7
Assumed E-470 Highway Improvements under Prior and Current Forecast Efforts

Improvement	January 2017 Forecast ⁽¹⁾ and January 2018 Forecast ⁽²⁾		Current Forecast
		Assumptions	Assumptions
E-470 System Widening			
Quincy to I-70	2 to 3 Lanes	Open 2021	Open 2021
I-70 to Pena Blvd.	2 to 3 Lanes	Open 2035	Open 2024
Pena Blvd. to I-76	2 to 3 Lanes	Open 2035	Open 2027
I-25 (South) to Parker Rd.	3 to 4 Lanes	Open 2035	Open 2029
Parker Rd. to Smoky Hill	3 to 4 Lanes	Open 2035	Open 2031
Smoky Hill to I-70	3 to 4 Lanes	Not Assumed	Open 2033
I-76 to US 85	2 to 3 Lanes	Open 2035	Open 2035
US 85 to I-25 (North)	2 to 3 Lanes	Open 2035	Open 2038
Pena Blvd. to I-76	3 to 4 Lanes	Not Assumed	Open 2040
E-470 Interchange Improvements			
Right-In / Right-Out at NB Gantry C		Not Assumed	Open 2019
Partial E 38th Ave. Interchange		Not Assumed	Open 2021
Full E 38th Ave. Interchange		Not Assumed	Open 2023
E 48th Ave. Interchange		Open 2021	Open 2025
E 88th Ave. Interchange		Open 2035	Open 2026
Full Build-Out of the I-70 Interchange		Open 2035	Open 2030
E 112th Ave. Interchange		Not Assumed	Open 2031
Potomac St. Interchange		Open 2035	Open 2036
Full Build-Out of the I-76 Interchange		Open 2035	Open 2040

⁽¹⁾ 2017 Traffic and Revenue Update Letter, January 2017.
⁽²⁾ 2018 Toll Rate Study, January 2018.

In the intervening year, economic activity has exceeded the interim year projections in EPS’s overall forecasts, which may or may not warrant adjustment to either employment or population forecasts. CDM Smith requested EPS to review the latest socioeconomic data and to update its prior forecasts as necessary. This section summarizes the review EPS performed, the findings of that review and the implications for the current transaction and toll revenue updated effort.

Figure 3 illustrates actual employment levels for the 7-county Denver Metro Area compared to EPS’s 2017 employment forecasts. Since 2010, observed wage and salary employment has increased from 1.3 million to nearly 1.7 million in 2018. EPS’s 2017 adjusted forecasts from their work for the January 2018 Forecast study projected employment to reach just over 1.6 million jobs by 2018, a difference of 3.1 percent. EPS interprets these recent growth rates as high points in the cycle of activity, rather than a change in the normal rates of growth.

Figure 4 illustrates that the population of the Metro Area has steadily increased against the ups and downs of employment levels. EPS considered the latest population data available from the U.S.

Figure 3
Divergence of EPS 2017 Adjusted Denver 7-County MSA Employment Forecast from Actual

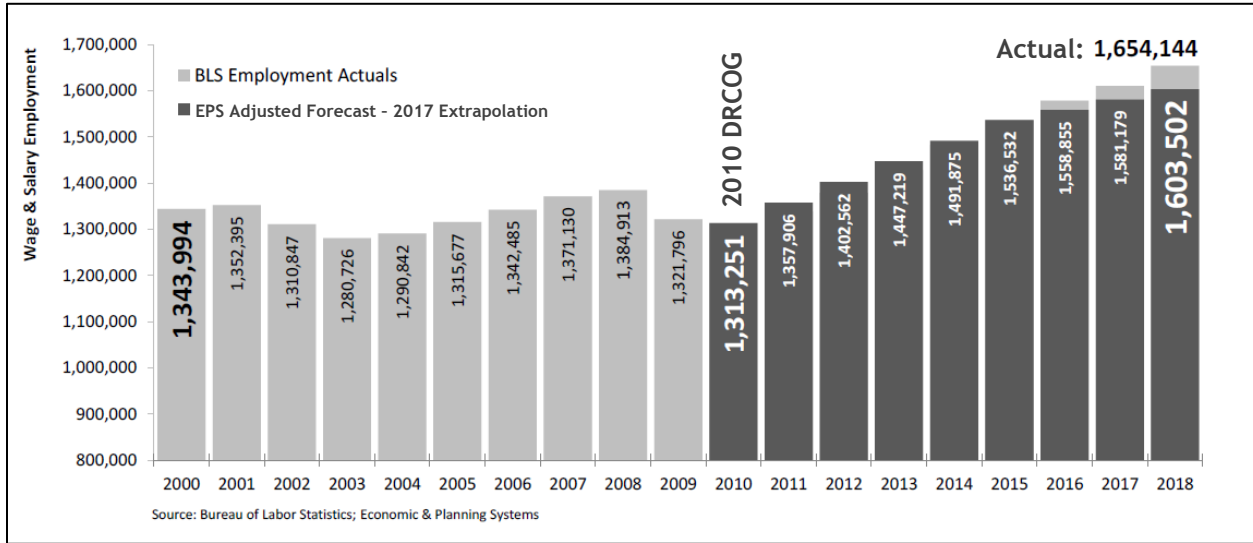
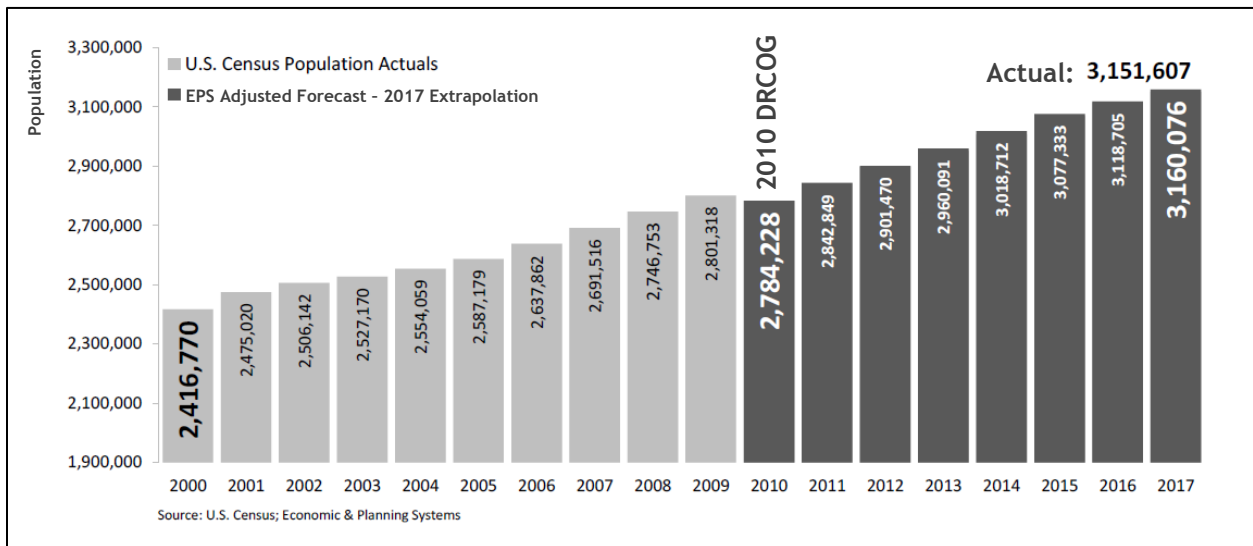


Figure 4
Divergence of EPS 2017 Adjusted Denver 7-County MSA Population Forecast from Actual



Census Bureau, which were through 2017. As shown, the 7-County Denver Metro Area population has increased since 2010 from 2.8 million to just over 3.1 million, falling short of EPS's 2017 population estimate by just 9,000, or 0.3 percent.

To better ascertain whether the current positive growth trends are outliers or higher longer-term growth and thus warrant 2035 control total adjustment, EPS analyzed the longer-term cyclical nature of employment and population in the Metro Area. This was done by revisiting a few of the same sources of economic forecasts and outlooks as were used to inform the 2017 adjusted forecasts. EPS made the following conclusions based on its review of the updated forecasts by state economists and the most recent socioeconomic data, as previously discussed:

Employment:

- State economists have forecasted that positive employment growth will continue in the near-term albeit at slower rates;
- Forecasts of employment by state economists suggest that the current employment cycle will be of a greater duration (likely closer to 10 years) than the previous one (5 years); and
- Data and short-term outlook suggest that the 7-County Denver Metro Area is achieving a higher short-term growth rate than previously forecasted.

EPS does not interpret the results of this analysis to warrant a change in the employment forecasts from their 2017 estimate.

Population:

- While population growth has remained strong, housing price and supply limitations are likely to begin affecting the rate of growth, particularly in-migration rates, although not negatively;
- This outlook is consistent with state economists who have forecasted population to stay on a path of long-term growth that is more aligned with longer-term growth trends; and
- The data and short-term outlook suggest that the 7-County Denver Metro Area is currently achieving a higher than average rate of population growth, but that in the long run, will resemble longer-term historical averages.

EPS does not interpret the result to warrant a change in the population forecasts from their 2017 estimate.

EPS believes that, given information available and analyzed, neither the adjusted employment or population forecasts need to be changed. Based on this recommendation, CDM Smith did not change long-term normal growth rates (beyond 2021) as previously estimated using EPS's

socioeconomic inputs and the modified DRCOG model used in developing the January 2018 Forecast. Thus, any differences in future year transaction and toll revenue growth rates are the result of changes in highway improvement, method of payment distributions, toll rates, or leakage assumptions.

Transaction and Toll Revenue Forecast Development

CDM Smith identified 6 major categories of forecast assumption changes from the most recent transaction and toll revenue forecast, the January 2018 Forecast. These changes, which have been discussed in this letter report, include:

- Re-benchmarking E-470 transactions to 2018 Levels;
- Revision of short-term growth rates;
- Interchange and widening improvement impacts;
- Changes in assumed ExpressToll participation rates;
- Changes in assumed toll rates, including CPI toll rate assumptions after 2021; and
- Changes in assumed LPT leakage rates.

CDM Smith then developed a methodology for estimating the impacts of each of these assumption changes. This section summarizes the methodology and estimated impacts of these changes.

First, the forecast was re-benchmarked to 2018 transaction levels. This was achieved by estimating the remainder of 2018 (November and December) based on current transaction trends and assumed construction impacts, such as the C-470 Express Lane and the E-470 widening between Parker Road and Quincy Avenue. This change represented an estimated annual reduction of 4.0 to 5.0 percent to annual systemwide transactions and an estimated annual reduction of 5.5 to 6.5 percent to systemwide net toll revenues over the forecast period, as compared to the January 2018 Forecast. As previously discussed, the major reason for this reduction is the higher than anticipated impact of construction related to both the C-470 Express Lanes and the E-470 widening between Parker Road and Quincy Avenue.

Then, normal growth rates were revised based on the review of recent transaction trends. As previously noted, short-term growth rates (2019 through 2021) were reduced based on later assumed opening dates of various non-E-470 highway improvement projects. This impact resulted in an estimated annual reduction of 5.0 to 6.0 percent in both transactions and net toll revenues over the forecast period, as compared to the January 2018 Forecast. No additional changes were assumed to long-term normal growth rates beyond 2021 based on the socioeconomic review conducted by EPS.

The impacts of the E-470 interchange and widening improvements were developed based on traffic assignments conducted as part of prior forecasts and the 2018 38th Avenue Interchange Study.

These impacts included the assumptions of the Aurora Highlands Development, a 4,000-acre planned development located east of E-470. CDM Smith included a conservative “50 percent Build” assumption, based on development plans, for the Aurora Highlands Development reviewed in July 2017, and included the impacts of the local interchange ramps based on construction schedules provided by E-470 Staff. These highway improvement assumptions represented an estimated positive annual impact of roughly 3.0 percent to transactions and net toll revenue in the early years of the forecast (2021), as compared to the January 2018 Forecast, and an estimated annual impact of 9.0 to 13.0 percent by the end of the forecast period (2048). Minor construction impacts related to these highway improvements (a reduction of roughly 0.5 percent on an annual systemwide basis) were also assumed.

As previously noted, ExpressToll market participation rates were reduced in the current forecast as compared with those from the January 2018 Forecast. The reductions were based on recent transaction data and discussions with E-470 Staff. This change had almost no impact on transactions. However, estimated annual gross toll revenues were increased between 3.5 and 7.5 percent, while estimated annual net toll revenues were increased by between 1.5 and 3.0 percent, versus the January 2018 Forecast.

The impacts of the assumed toll rates beyond 2021 were developed based on the toll sensitivity analysis conducted as part of the January 2018 Forecast study. While the toll rate reduction itself was estimated to reduce annual revenues by almost 33.0 percent in the out-year of the study (2048), these reduced toll rates were also assumed to attract additional traffic to E-470. As a result, transactions in 2035 and 2048 are estimated to increase by 7.0 and 12.0 percent, respectively, as compared to the January 2018 Forecast, while net toll revenues in these years are estimated to decrease by 11.0 and 20.0 percent, respectively. This means that about 65.0 percent of the nominal toll rate reduction is estimated to be realized in E-470 revenue.

Lastly, CDM Smith applied assumed changes in toll revenue leakage to the forecasts. The assumed toll revenue leakage rates, which are summarized in **Table 8**, were developed in cooperation with E-470 Staff based on historical leakage data and assumed improvements in toll collection. While these changes are not anticipated to impact transactions, the increased toll revenue leakage rates (particularly to unbilled LPT transactions), coupled with the assumed reductions in ExpressToll participation rate, are estimated to decrease annual net toll revenues by 0.5 to 2.0 percent over the forecast period, as compared to the January 2018 Forecast.

Table 8
Assumed Toll Revenue Leakage Rates

Year	Jan. 2017 Forecast ⁽¹⁾	Jan. 2018 Forecast ⁽²⁾				Current Forecast Assumptions ⁽³⁾			
	Total Leakage	Unbillable LicensePlate	Unpaid ExpressToll	Unpaid LicensePlate	Total Leakage	Unbillable LicensePlate	Unpaid ExpressToll	Unpaid LicensePlate	Total Leakage
2018	14.9	22.0	2.3	14.0	10.4	25.3	2.5	15.0	15.3
2019	14.5	22.3	2.3	14.1	9.8	24.0	2.2	15.0	14.8
2020	14.1	22.5	2.2	14.2	9.2	23.5	2.2	16.0	14.8
2021	13.7	21.0	2.2	13.0	8.5	23.0	2.2	16.0	14.2
2035 and Beyond	10.5	20.0	2.0	10.0	7.7	20.5	2.2	16.0	11.5

⁽¹⁾ 2017 Traffic and Revenue Update Letter, January 2017.
⁽²⁾ 2018 Toll Rate Study, January 2018.
⁽³⁾ Revised assumptions based on actual transaction data through October 31, 2018.

Updated Transaction and Toll Revenue Estimates

The resulting revised annual transaction are provided by method of payment in **Table 9**, along with total gross and net toll revenue estimates. These estimates reflect the re-benchmarking of transactions to 2018 levels, adjustments to short-term growth rates, the revised highway improvement assumptions, and changes to ExpressToll participation rates, toll rate and leakage assumptions. Annual transactions are expected to increase from 87.6 million in 2018 to almost 100.9 million by 2021. By 2035 annual transactions are expected to reach 162.8 million, for an average 14-year annual growth rate of 3.5 percent. The estimated normal growth rates between 2021 and 2035 and relevant forecast assumption change impacts were then used to develop the transaction and revenue estimates beyond 2035. Annual transactions for 2048 are estimated at 243.3 million, representing an average annual increase of 3.1 percent between 2035 and 2048.

Annual toll revenue estimates are also provided in **Table 9**. Gross toll revenues, excluding revenue adjustments to account for non-revenue vehicles, unbillable LPT images and unpaid ExpressToll and LPT transactions, were calculated by multiplying the estimated transactions by the nominal toll rates. Gross toll revenues are estimated to increase from \$274.0 million in 2018 to \$320.5 million by 2021. Assuming triennial toll increases of 2.1 percent beyond 2021, annual gross toll revenues are estimated to reach \$529.1 million by 2035. This represents an average annual increase of 3.7 percent over 2021. This rate of growth is projected to continue through 2048, with gross toll revenues reaching an estimated \$835.9 million in that year.

Adjustments for uncollectible and unpaid revenue were developed in cooperation with E-470 Staff, as previously discussed, in order to estimate net toll revenues, which include revenue adjustments to account for non-revenue vehicles, unbillable LPT images and unpaid ExpressToll and LPT transactions. Based on these assumed rates of leakage, net toll revenues are estimated to increase

Table 9
Estimated Annual Transactions and Revenue by Method of Payment (In Thousands)

Year	Total Annual Transactions (000s)			Total Annual Toll Revenue (\$000s)		
	ExpressToll	LPT	Total	Gross ⁽¹⁾	Uncollectible and Unpaid ⁽²⁾	Net ⁽³⁾
2018 ⁽⁴⁾	63,706	23,883	87,589	\$ 274,023	\$ (41,957)	\$ 232,066
2019	67,616	24,695	92,311	291,881	(43,255)	248,626
2020 ⁽⁵⁾	70,735	24,492	95,227	302,817	(44,863)	257,954
2021 ⁽⁶⁾⁽⁷⁾	75,885	25,012	100,897	320,505	(45,374)	275,131
2022	78,590	25,546	104,136	331,694	(46,331)	285,363
2023 ⁽⁷⁾	81,551	26,006	107,557	342,584	(46,961)	295,623
2024 ⁽⁵⁾⁽⁶⁾⁽⁸⁾	85,094	26,635	111,729	363,704	(49,121)	314,583
2025 ⁽⁷⁾	87,840	26,957	114,797	373,697	(49,616)	324,081
2026 ⁽⁹⁾	90,533	27,388	117,921	382,246	(49,971)	332,275
2027 ⁽⁶⁾⁽⁸⁾	94,316	27,976	122,292	402,227	(51,493)	350,734
2028 ⁽⁵⁾	98,064	28,654	126,718	414,845	(52,448)	362,397
2029 ⁽⁶⁾	102,956	29,626	132,582	431,954	(54,007)	377,947
2030 ⁽⁸⁾⁽¹⁰⁾	106,716	29,922	136,638	451,313	(55,470)	395,843
2031 ⁽⁶⁾⁽¹¹⁾	111,329	30,724	142,053	464,378	(56,360)	408,018
2032 ⁽⁵⁾	116,201	31,355	147,556	478,930	(57,352)	421,578
2033 ⁽⁶⁾⁽⁸⁾	121,374	32,080	153,454	504,947	(59,822)	445,125
2034	126,750	32,725	159,475	520,352	(60,743)	459,609
2035 ⁽⁶⁾	129,860	32,936	162,796	529,134	(60,958)	468,176
2036 ⁽⁵⁾⁽⁸⁾⁽¹²⁾	134,802	33,396	168,198	551,254	(62,400)	488,854
2037	138,422	34,367	172,789	565,006	(64,009)	500,997
2038 ⁽⁶⁾	143,384	35,673	179,057	584,767	(66,303)	518,464
2039 ⁽⁸⁾	146,828	36,476	183,304	608,829	(69,103)	539,726
2040 ⁽⁵⁾⁽⁶⁾⁽¹³⁾	155,276	38,652	193,928	642,014	(72,972)	569,042
2041	159,551	39,796	199,347	658,636	(74,924)	583,712
2042 ⁽⁸⁾	163,624	40,851	204,475	685,832	(77,877)	607,955
2043	168,541	42,160	210,701	705,357	(80,158)	625,199
2044 ⁽⁵⁾	174,045	43,618	217,663	727,292	(82,714)	644,578
2045 ⁽⁸⁾	177,966	44,617	222,583	755,756	(85,959)	669,797
2046	183,224	46,020	229,244	776,960	(88,434)	688,526
2047	188,851	47,517	236,368	799,168	(91,004)	708,164
2048 ⁽⁵⁾⁽⁸⁾	194,414	48,862	243,276	835,915	(95,285)	740,630

Note: Programmed toll increases are assumed through 2021.

- (1) Gross toll revenue represents toll revenues not adjusted for uncollectible or unpaid toll revenue.
- (2) Uncollectible toll revenue represents non-revenue vehicles, bad or duplicate license plate images, or any other transactions for which revenue cannot be collected.
- (3) Net toll revenue represents toll revenues adjusted for uncollectible and unpaid revenues.
- (4) Based on actual data through October 2018.
- (5) Leap Year.
- (6) Under the Current Forecast, assumed widening of various segments of the E-470 mainline.
- (7) Under the Current Forecast, the 38th Avenue / 48th Avenue interchange is assumed to open in phases: partial 38th Avenue interchange in 2021, full 38th Avenue interchange in 2023 and 48th Avenue ramps t/f North in 2025.
- (8) Under the Current Forecast, toll rates are assumed to be escalated by 2.1 percent every three years after 2021.
- (9) Under the Current Forecast, the 88th Avenue interchange is assumed to open in 2026.
- (10) Under the Current Forecast, the completion of the I-70 interchange is assumed to open in 2030.
- (11) Under the Current Forecast, the 112th Avenue interchange is assumed to open in 2031.
- (12) Under the Current Forecast, the Potomac Avenue interchange is assumed to open in 2036.
- (13) Under the Current Forecast, the completion of the I-76 interchange is assumed to open in 2040.

from \$232.1 million in 2018 to \$275.1 million by 2021. Aided by assumed improvements in toll revenue collection, annual gross toll revenues are estimated to reach \$468.2 million by 2035, representing an average annual increase of 3.9 percent over 2021. Gross toll revenues are estimated to be \$740.6 million by 2048.

Table 10 compares the updated transactions and toll revenue estimates against the January 2018 Forecast. Annual system-wide transactions in 2021 under the current forecast effort are estimated to be 6.0 million, or 5.6 percent less than the January 2018 Forecast, as a result of various forecast assumption changes. Estimated net toll revenues in 2021 are estimated to be \$22.5 million less in the current forecast, a difference from the January 2018 Forecast of 7.8 percent.

By 2035, the estimated differences between the current forecast and the January 2018 Forecast are a 5.5 million increase in transactions and a \$107.3 million reduction in net toll revenue. These differences represent an increase of 3.5 percent in annual toll transactions and reduction of 18.7 percent in annual gross toll revenue. The difference in net toll revenues between the current forecast and the January 2018 Forecast are primarily due to the changes in assumed toll rates beyond 2021.

The updated transactions and toll revenue estimates are compared against the January 2017 Forecast in **Table 11**. Annual system-wide transactions in 2021 under the current forecast effort are estimated to be 3.4 million greater than the January 2017 Forecast, or 3.4 percent. Estimated net toll revenues in 2021 are estimated to be \$6.5 million greater under the current forecast effort, a difference from the January 2017 Forecast of 3.5 percent. These differences are primarily related to the incorporation of recent transaction growth trends, which have generally exceeded those estimated in the January 2017 Forecast effort.

Estimated differences between the current forecast effort and the January 2017 Forecast in 2035 are a 21.4 million increase in transactions and a \$54.2 million reduction in net toll revenue. These differences represent an increase of 15.1 percent in annual toll transactions and reduction of 10.4 percent in annual gross toll revenue. As with the January 2018 Forecast, the differences in net toll revenues between the current forecast effort and the January 2017 Forecast are primarily due to the changes in assumed toll rates beyond 2021.

Table 10
Comparison of January 2018 Forecast and Current Forecast (In Thousands)

January 2018 Forecast			Current Forecast		
Year	Total Annual Transactions (000s)	Total Annual Net Toll Revenue (\$000s) ⁽¹⁾	Year	Total Annual Transactions (000s)	Total Annual Net Toll Revenue (\$000s) ⁽¹⁾
2016 ⁽²⁾⁽³⁾	79,975	\$ 192,811	2016 ⁽²⁾⁽³⁾	76,600	\$ 192,811
2017	84,311	215,752	2017 ⁽²⁾	83,774	213,766
2018	90,836	246,318	2018	87,589	232,066
2019	96,084	259,738	2019	92,311	248,626
2020 ⁽³⁾	102,096	275,244	2020 ⁽³⁾	95,227	257,954
2021 ⁽⁴⁾⁽⁵⁾	106,859	297,664	2021 ⁽⁴⁾⁽⁵⁾⁽⁹⁾⁽¹⁰⁾	100,897	275,131
2022	109,447	310,478	2022	104,136	285,363
2023	112,098	323,842	2023 ⁽¹¹⁾	107,557	295,623
2024 ⁽³⁾	115,128	338,790	2024 ⁽³⁾⁽⁸⁾⁽⁹⁾	111,729	314,583
2025	117,594	352,311	2025 ⁽¹²⁾	114,797	324,081
2026	120,443	367,471	2026 ⁽¹³⁾	117,921	332,275
2027	123,359	383,280	2027 ⁽⁸⁾⁽⁹⁾	122,292	350,734
2028 ⁽³⁾	126,694	400,964	2028 ⁽³⁾	126,718	362,397
2029	129,408	416,961	2029 ⁽⁹⁾	132,582	377,947
2030	132,542	434,893	2030 ⁽⁸⁾⁽¹⁴⁾	136,638	395,843
2031	135,753	453,593	2031 ⁽⁹⁾⁽¹⁵⁾	142,053	408,018
2032 ⁽³⁾	139,422	474,513	2032 ⁽³⁾	147,556	421,578
2033	142,409	493,435	2033 ⁽⁸⁾⁽⁹⁾	153,454	445,125
2034	145,857	514,646	2034	159,475	459,609
2035 ⁽⁶⁾⁽⁷⁾	157,317	575,523	2035 ⁽⁶⁾⁽⁷⁾⁽⁹⁾	162,796	468,176
2036 ⁽³⁾	161,691	602,703	2036 ⁽³⁾⁽⁸⁾⁽¹⁶⁾	168,198	488,854
2037	165,281	627,723	2037	172,789	500,997
2038	169,412	655,574	2038 ⁽⁹⁾	179,057	518,464
2039	173,647	684,660	2039 ⁽⁸⁾	183,304	539,726
2040 ⁽³⁾	178,476	716,996	2040 ⁽³⁾⁽⁹⁾⁽¹⁷⁾	193,928	569,042
2041	182,438	746,762	2041	199,347	583,712
2042	186,999	779,894	2042 ⁽⁸⁾	204,475	607,955
2043	191,673	814,498	2043	210,701	625,199
2044 ⁽³⁾	197,003	852,967	2044 ⁽³⁾	217,663	644,578
2045	201,377	888,378	2045 ⁽⁸⁾	222,583	669,797
2046	206,411	927,794	2046	229,244	688,526
			2047	236,368	708,164
			2048 ⁽³⁾⁽⁸⁾	243,276	740,630

Note: Programmed toll increases are assumed through 2021.

- (1) Net Toll Revenue represents toll revenues adjusted for unbillable and unpaid revenues.
- (2) Actual.
- (3) Leap Year.
- (4) Under the January 2018 Forecast, the 48th Avenue and 88th Avenue interchanges are assumed to open in 2021.
- (5) Under the January 2018 Forecast, toll rates are assumed to increase annually after 2021 at the rate of inflation, which is 2.1 percent.
- (6) Under the January 2018 Forecast, the Potomac Avenue interchanges, as well as completion of the I-70 and I-76 interchange, are assumed to open in 2035.
- (7) Under the January 2018 Forecast, widening of the entire E-470 mainline is also assumed in 2035.
- (8) Under the Current Forecast, toll rates are assumed to be escalated by 2.1 percent every three years after 2021.
- (9) Under the Current Forecast, assumed widening of various segments of the E-470 mainline.
- (10) Under the Current Forecast, partial 38th Avenue interchange is assumed to open in 2021.
- (11) Under the Current Forecast, full 38th Avenue interchange is assumed open in 2023.
- (12) Under the Current Forecast, 48th Avenue Interchange ramps I/f North are assumed to be open in 2025.
- (13) Under the Current Forecast, the 88th Avenue interchange is assumed to open in 2026.
- (14) Under the Current Forecast, the completion of the I-70 interchange is assumed to open in 2030.
- (15) Under the Current Forecast, the 112th Avenue interchange is assumed to open in 2031.
- (16) Under the Current Forecast, the Potomac Avenue interchange is assumed to open in 2036.
- (17) Under the Current Forecast, the completion of the I-76 interchange is assumed to open in 2040.

Table 11
Comparison January 2017 Forecast and Current Forecast (In Thousands)

January 2017 Forecast			Current Forecast		
Year	Total Annual Transactions (000s)	Total Annual Net Toll Revenue (\$000s) ⁽¹⁾	Year	Total Annual Transactions (000s)	Total Annual Net Toll Revenue (\$000s) ⁽¹⁾
2016 ⁽³⁾	79,821	\$ 190,675	2016 ⁽²⁾⁽³⁾	76,600	\$ 192,811
2017	84,118	207,935	2017 ⁽²⁾	83,774	213,766
2018	88,129	222,618	2018	87,589	232,066
2019	91,373	239,058	2019	92,311	248,626
2020 ⁽³⁾	94,754	256,122	2020 ⁽³⁾	95,227	257,954
2021 ⁽⁴⁾⁽⁵⁾	97,535	268,537	2021 ⁽⁴⁾⁽⁵⁾⁽⁹⁾⁽¹⁰⁾	100,897	275,131
2022	98,109	276,460	2022	104,136	285,363
2023	98,856	284,909	2023 ⁽¹¹⁾	107,557	295,623
2024 ⁽³⁾	99,770	293,644	2024 ⁽³⁾⁽⁸⁾⁽⁹⁾	111,729	314,583
2025 ⁽⁶⁾	102,258	304,972	2025 ⁽¹²⁾	114,797	324,081
2026	104,791	319,453	2026 ⁽¹³⁾	117,921	332,275
2027	107,404	334,569	2027 ⁽⁸⁾⁽⁹⁾	122,292	350,734
2028 ⁽³⁾	110,102	350,448	2028 ⁽³⁾	126,718	362,397
2029	112,887	367,344	2029 ⁽⁹⁾	132,582	377,947
2030	115,763	384,923	2030 ⁽⁸⁾⁽¹⁴⁾	136,638	395,843
2031	118,733	403,466	2031 ⁽⁹⁾⁽¹⁵⁾	142,053	408,018
2032 ⁽³⁾	121,802	422,793	2032 ⁽³⁾	147,556	421,578
2033	124,971	443,643	2033 ⁽⁸⁾⁽⁹⁾	153,454	445,125
2034	128,247	465,170	2034	159,475	459,609
2035 ⁽⁷⁾	141,446	522,344	2035 ⁽⁶⁾⁽⁷⁾⁽⁹⁾	162,796	468,176
2036 ⁽³⁾	145,181	547,841	2036 ⁽³⁾⁽⁸⁾⁽¹⁶⁾	168,198	488,854
2037	149,019	574,564	2037	172,789	500,997
2038	152,962	602,573	2038 ⁽⁹⁾	179,057	518,464
2039	157,013	631,927	2039 ⁽⁸⁾	183,304	539,726
2040 ⁽³⁾	162,611	666,484	2040 ⁽³⁾⁽⁹⁾⁽¹⁷⁾	193,928	569,042
2041	166,934	698,945	2041	199,347	583,712
2042	171,377	732,968	2042 ⁽⁸⁾	204,475	607,955
2043	175,942	768,626	2043	210,701	625,199
2044 ⁽³⁾	180,633	805,999	2044 ⁽³⁾	217,663	644,578
2045	185,454	845,168	2045 ⁽⁸⁾	222,583	669,797
2046	190,408	886,220	2046	229,244	688,526
			2047	236,368	708,164
			2048 ⁽³⁾⁽⁸⁾	243,276	740,630

Note: Programmed toll increases are assumed through 2021.

(1) Net Toll Revenue represents toll revenues adjusted for unbillable and unpaid revenues.

(2) Actual.

(3) Leap Year.

(4) Under the January 2017 Forecast, the 48th Avenue and 88th Avenue interchanges are assumed to open in 2021.

(5) Under the January 2017 Forecast, toll rates are assumed to increase annually after 2021 at the rate of inflation, which is 2.1 percent.

(6) Under the January 2017 Forecast, the Potomac Street interchange and the completion of the I-70 interchange are assumed to open in 2021.

(7) Under the January 2017 Forecast, completion of the I-70 interchange and widening of the entire E-470 mainline is assumed in 2035.

(8) Under the Current Forecast, toll rates are assumed to be escalated by 2.1 percent every three years after 2021.

(9) Under the Current Forecast, assumed widening of various segments of the E-470 mainline.

(10) Under the Current Forecast, partial 38th Avenue interchange is assumed to open in 2021.

(11) Under the Current Forecast, full 38th Avenue interchange is assumed open in 2023.

(12) Under the Current Forecast, 48th Avenue Interchange ramps I/f North are assumed to be open in 2025.

(13) Under the Current Forecast, the 88th Avenue interchange is assumed to open in 2026.

(14) Under the Current Forecast, the completion of the I-70 interchange is assumed to open in 2030.

(15) Under the Current Forecast, the 112th Avenue interchange is assumed to open in 2031.

(16) Under the Current Forecast, the Potomac Avenue interchange is assumed to open in 2036.

(17) Under the Current Forecast, the completion of the I-76 interchange is assumed to open in 2040.



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CDM Smith appreciates the important nature of this assignment and the opportunity to work with the Authority. As always, please do not hesitate to contact us with any comments and/or questions.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Kamran Khan", with a horizontal line underneath.

Kamran Khan
Senior Vice President
CDM Smith Inc.



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Disclaimer

Current accepted professional practices and procedures were used in the development of these traffic and revenue estimates. However, as with any forecast of the future, it should be understood that there may be differences between forecasted and actual results caused by events and circumstances beyond the control of the forecasters. In formulating its estimates, CDM Smith has reasonably relied upon the accuracy and completeness of information provided (both written and oral) by the E-470 Public Highway Authority and other local and state agencies. CDM Smith also has relied upon the reasonable assurances of some independent parties and is not aware of any facts that would make such information misleading.

CDM Smith has made qualitative judgments related to several key variables in the development and analysis of the traffic and revenue estimates that must be considered as a whole; therefore, selecting portions of any individual result without consideration of the intent of the whole may create a misleading or incomplete view of the results and the underlying methodologies used to obtain the results. CDM Smith gives no opinion as to the value or merit to partial information extracted from this report.

All forecasts and projections reported herein are based on CDM Smith's experience and judgment and on a review of information obtained from multiple state and local agencies, including the E-470 Public Highway Authority, the Denver Regional Council of Governments, and by independent third parties. These estimates and projections may not be indicative of actual or future values, and are therefore subject to substantial uncertainty. Future developments, economic conditions cannot be predicted with certainty, and may affect the estimates or projections expressed in this report, such that CDM Smith does not specifically guarantee or warrant any estimate or projection contained within this report.

While CDM Smith believes that some of the projections or other forward-looking statements contained within the report are based on reasonable assumptions as of the date in the report, such forward looking statements involve risks and uncertainties that may cause actual results to differ materially from the results predicted. Therefore, following the date of this report, CDM Smith will take no responsibility or assume any obligation to advise of changes that may affect its assumptions contained within the report, as they pertain to socioeconomic and demographic forecasts, proposed residential or commercial land use development projects and/or potential improvements to the regional transportation network.

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