



701 Warrenville Rd, Lisle, IL 60532
tel: 630-874-7902

April 19, 2024

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

Subject: 2024 Traffic and Toll Revenue Update Letter, E-470 Public Highway Authority

Dear Mr. Donahue:

CDM Smith was recently requested by the E-470 Public Highway Authority (Authority) to perform a review of our prior traffic and toll revenue forecasts and to update the forecasts contained therein for use in support of financing. Previously, CDM Smith completed the E-470 Comprehensive Traffic and Toll Revenue Study report in May 2020 (the "May 2020 Study"). A Letter Update was subsequently conducted in April 2021. More recently, CDM Smith conducted a Planning-Level Traffic and Revenue Study, which included the preparation of a 30-year traffic and revenue forecast that was completed in October 2023; and an assessment of the E-470 roadway widening program. The final report for the Planning-Level Traffic and Revenue Study was completed in March 2024 following the widening program assessment. As part of this current Letter Update, CDM Smith reviewed the latest traffic and revenue trend data through March 24, 2024, an additional six months of actual data to assess recent growth and method of payment shares. Additionally, we reviewed the E-470 improvement project assumptions, toll rates, the latest Denver Regional Council of Governments (DRCOG) highway improvement program, and the latest project information from the Colorado Department of Transportation. Lastly, we reviewed trends in economic variables affecting E-470 transactions and revenue, such as employment, gas prices, housing permits, and enplanements at Denver International Airport (DEN). This letter summarizes our due diligence review of the items noted and presents the updated transactions and revenue forecasts for E-470 through 2053.

E-470 System Description

As shown in **Figure 1**, E-470 is a 47-mile toll road running along the eastern perimeter of the Denver Metro area. It extends from C-470 at I-25 in Douglas County south of Denver to the east and north through Aurora and then passes along the western edge of DEN. The road terminates at I-25 and Northwest Parkway in Thornton. The E-470 alignment has 25 interchanges.

E-470 operates as an all-electronic, closed-barrier system of toll collection, wherein no toll-free passage is permitted. Tolls are paid either by the ExpressToll or LicensePlateToll (LPT) methods of toll payment. ExpressToll customers are provided a 35 percent toll discount compared to LPT customers. The toll system consists of five mainline toll gantries (A through E) and 34 ramp toll gantries. **Table 1** presents historical passenger car ExpressToll and LPT toll rates from 2019 through 2024. Based on current rates, an ExpressToll customer in a passenger car making a



**Figure 1
 E-470 Alignment
 and Mainline Toll Gantries**



**Table 1
 Historical E-470 Toll Rates
 for 2-Axle Vehicles**

2019 - 2021	ExpressToll	LPT
Gantry A	\$2.70	\$4.30
Gantry C	\$2.70	\$4.30
Gantries B, D & E	\$2.95	\$4.65
Toll Ramps	\$1.25	\$2.05
Full-Length Trip	\$14.25	\$22.55
Per-Mile Toll Rate	\$0.31	\$0.48
2022 - Present	ExpressToll	LPT
Gantry A	\$2.60	\$4.20
Gantry C	\$2.65	\$4.25
Gantries B, D & E	\$2.90	\$4.60
Toll Ramps	\$1.25	\$2.05
Full-Length Trip	\$13.95	\$22.25
Per-Mile Toll Rate	\$0.30	\$0.48

Source: E-470 Public Highway Authority

full-length trip pays \$13.95, or approximately \$0.30 per mile. However, motorists making shorter trips may pay a higher per-mile toll due to the location of toll gantries. Taking into account toll rates and traffic volumes for all 2023 trips, the per-mile toll rate for the average customer was \$0.42 in 2023. Compared with 38 other AET toll roads in the U.S., E-470’s ExpressToll falls below the highest per-mile toll but still ranks in the top 30 percent.

Trends in Historical Toll Transactions

Total monthly transaction trends on E-470 from January 2014 to February 2024 are presented graphically in **Figure 2**. Average daily traffic volumes and average annual growth rates are provided for the total system and for each of the mainline toll gantries for 2014 through 2023 in **Figure 3**. During the period 2014 through 2019, annual systemwide growth averaged 6.3 percent, which was driven in part by development and higher growth in the northern part of the facility. Gantries D and E averaged annual growth rates of 9.7 percent and 6.3 percent, respectively.

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Figure 2
Historical Monthly Transaction Trends, January 2014 – February 2024

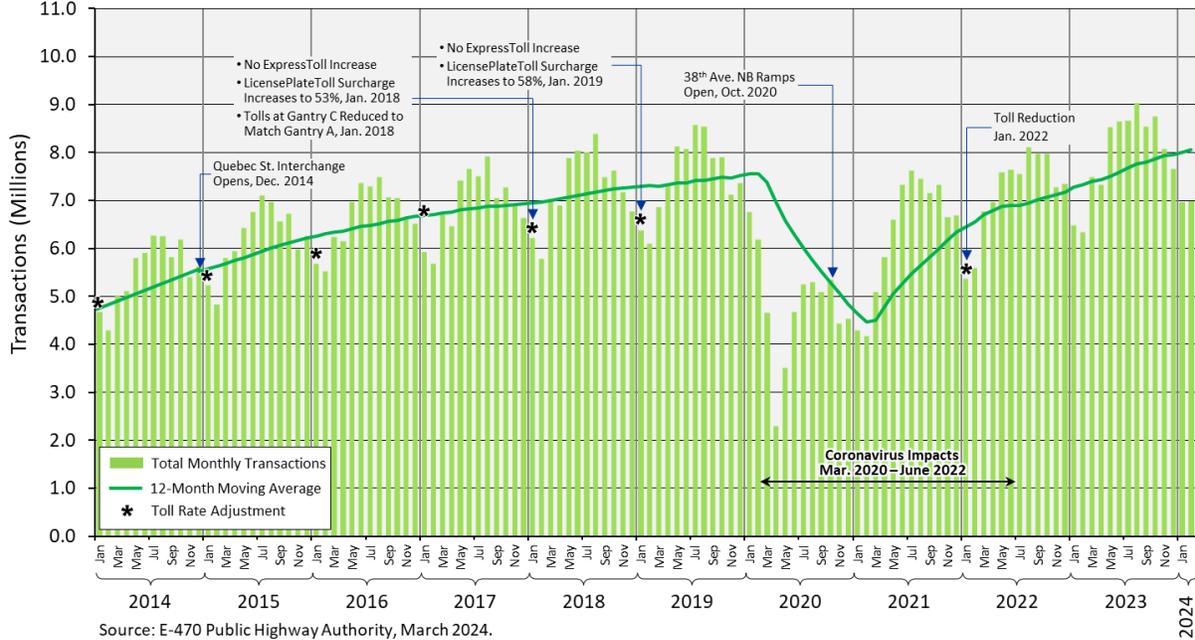
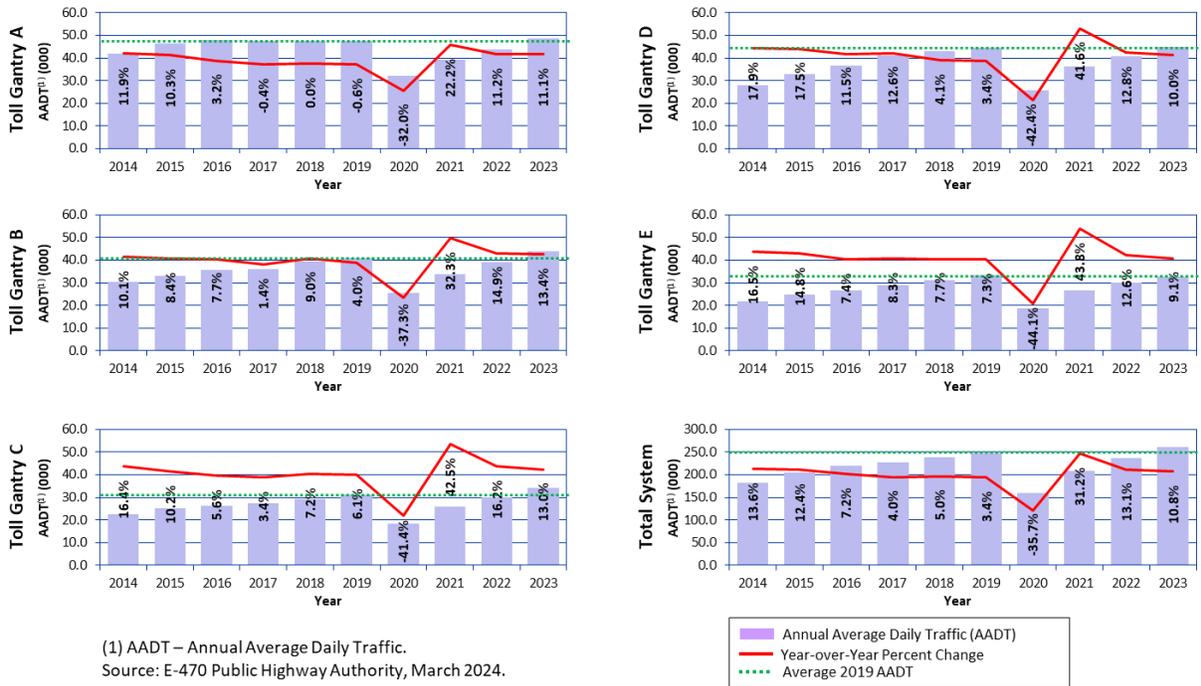


Figure 3
Historical Annual Average Daily Traffic by Mainline Toll Location, 2014 – 2023



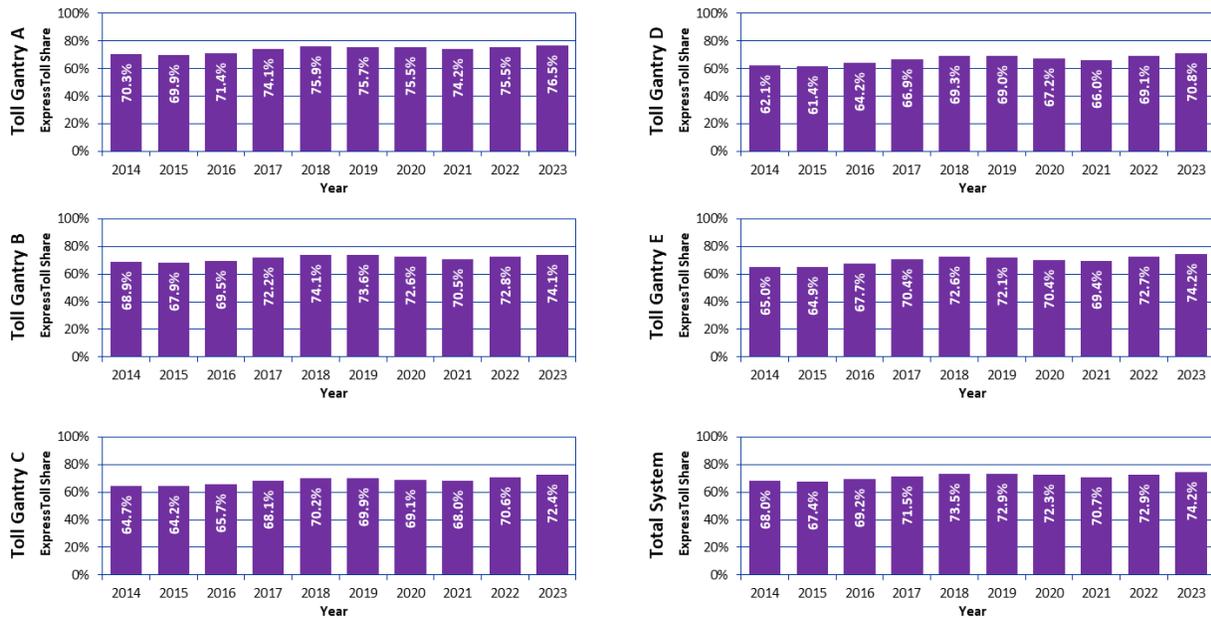
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Beginning in March 2020, transactions decreased significantly due to public space closures, event cancellations, stay-at-home orders, and reduced economic activity resulting from the COVID-19 outbreak. At the height of the Pandemic (April 2020), traffic on E-470 was down by 68.5 percent compared to the prior year. By comparison, other regional expressways only experienced about a 40 percent reduction. This is due to the reduction in the time savings offered by E-470 as well as the impacts to Denver International Airport (DEN) and the reduction of air travel.

In 2023, systemwide traffic exceeded the 2019 (pre-pandemic) level by 5.8 percent. Gantries A, B, C, and D all exceeded 2019 traffic levels, and Gantry E was below 1.4 percent. Based on data through March 24, 2024, E-470 transactions had increased by 6.4 percent year-to-date over the same period in 2023.

Historical ExpressToll shares are shown in **Figure 4** for 2014 through 2023. ExpressToll participation rates have shown consistent growth across the system, with the exception of 2020-2021 due to the COVID-19 Pandemic. This growth was driven by two increases in the toll rate differential between ExpressToll and LPT (2018 and 2019), as well as the opening of a number of other managed lane toll facilities within the region. The average ExpressToll share in 2023 for the E-470 system was 74.2 percent, which exceeded pre-pandemic levels.

Figure 4
Historical ExpressToll Share by Mainline Toll Location, 2014 – 2023



Source: E-470 Public Highway Authority, March 2024.

Three-or-more axle vehicles represented 7.0 percent of total transactions on E-470 in 2023. Of these, 20 percent were three-axle vehicles, and 54 percent were five-axle vehicles. This was an increase over 2019 levels (5.9 percent), driven largely by growth in the five-axle vehicle category. This may have been due to increases in home delivery services for groceries and other goods.

Review of Economic Conditions

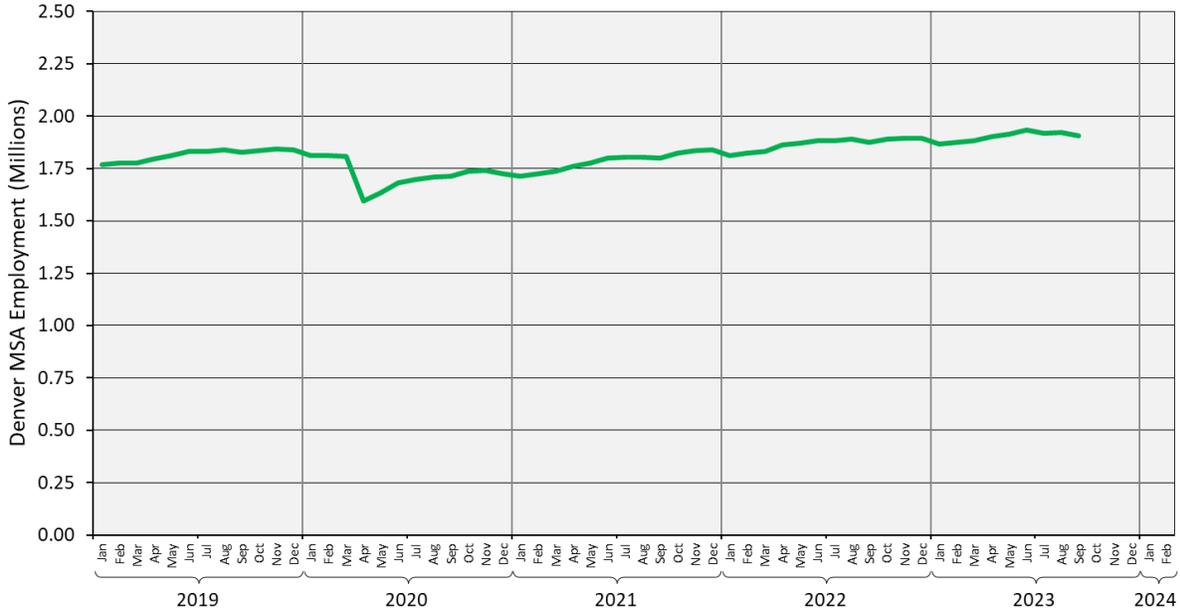
In 2023, Economic & Planning Systems (EPS) reviewed the 2020 to 2050 employment, population, and household projections of the Denver Regional Council of Governments (DRCOG). The focus of this independent review was to assess economic and demographic conditions in a dynamic regional market that continues to change and expand. EPS ultimately recommended minor changes to DRCOG's growth forecasts, both at an aggregate level and for specific traffic analysis zones (TAZ), which serve as an input to the regional travel demand model. The goal of the recommended adjustment was to include the latest economic conditions and major development plans that could influence E-470 traffic demand. The findings from this work served as a basic input to the travel demand model, which, in turn, aided in forecasting traffic and revenue for E-470.

For the current study effort, it was assumed that the long-term employment, population, and household projections provided by EPS in 2023 (summarized in **Appendix A**) still reflected underlying regional conditions. However, it was important to review the major economic factors influencing transactions on E-470. This effort included a review of monthly data for employment, enplanements at DEN, housing permit activity, and regional gas prices. The objective of the review was to compare the emerging patterns against the prior patterns incorporated into the 2023 EPS forecasts, as well as review trends before and after the COVID-19 Pandemic.

Total employment for the Denver Metropolitan Statistical Area (MSA) is presented in **Figure 5**, with the latest available Bureau of Labor Statistics (BLS) data provided through September 2023. In April 2020, at the height of the COVID-19 Pandemic, employment within the Denver MSA was 10.0 percent below that of the prior year. This was comparable to the year-over-year differences for the State of Colorado and significantly less than the average nationwide impact. As indicated in the figure, normal employment growth trends have continued following the COVID-19 Pandemic. Employment within the Denver MSA grew by 2.4 percent in 2023, reaching an estimated 1.9 million jobs on average. This level of growth is consistent with pre-pandemic trends. Moreover, no changes in previously assumed trends were observed in the most recent monthly data.

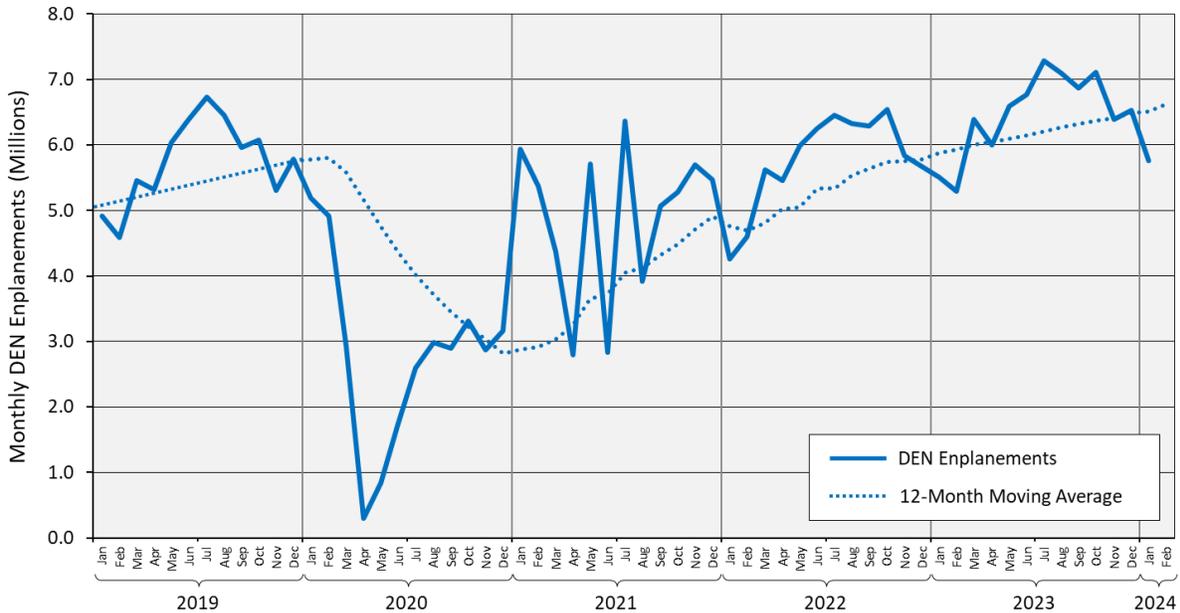
Roughly 22 percent of trips on E-470 are to or from DEN, making the airport facility a critical generator of traffic on E-470. **Figure 6** provides monthly enplanements for DEN through January 2024, based on available data. At the start of the COVID-19 Pandemic, air travel was reduced by roughly 95 percent, both at DEN and nationally. Total 2023 enplanements at DEN averaged 6.5 million per month, representing a 12.3 percent increase over 2022 and a 12.8 percent increase over 2019. Thus, DEN enplanements have largely recovered from the COVID-19 Pandemic and are continuing normal growth trends and season patterns.

Figure 5
Historical Monthly Employment within the Denver Region, 2019 - 2023



Source: Bureau of Labor Statistics Quarterly Census of Employment and Wages, March 2024.
 Includes Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Gilpin, Jefferson and Weld Counties.

Figure 6
Historical Enplanements at Denver International Airport, 2019 - 2024



Source: Denver International Airport (DEN), March 2024.

Lastly, CDM Smith reviewed available regional gasoline price data through February 2024, as summarized in **Figure 7**. Average 2019 gasoline prices were \$2.64 per gallon in the Denver region. Average prices dropped slightly during the initial months of the COVID-19 Pandemic due to a reduction in travel demand due to closures and travel restrictions. However, due to a restriction in supply at the national level resulting from the closure of several oil pipelines, pricing began to increase beginning in February 2021. Prices continued to increase through 2022, with a significant jump in June and July 2022 due to supply concerns related to the conflict in Ukraine. These price increases resulted in the lower-than-expected performance of transactions on E-470 during the Summer of 2022. Average 2023 gasoline prices were \$3.66, a 5.5 percent decrease over 2022 and a 38.8 percent increase over 2019. Actual trends through February 2024 match previous assumptions and normal season patterns.

Much of the growth in transactions on E-470 over the last decade has been driven by residential and commercial development within the E-470 corridor. Thus, CDM Smith reviewed available historical housing permits through February 2024 to observe recent trends, as presented in **Figure 8**. As shown in the figure, housing permits fluctuate by month but do exhibit some overall increasing trends between 2019 and 2024. Between February 2020 and April 2020, the effective federal funds rate was lowered from 1.58 to 0.05 in response to the COVID-19 Pandemic. As a result, home purchases increased significantly, leading to an increased demand for new housing in late 2020 and 2021. As interest rates increased beginning in early 2022, demand for housing decreased, and permits for new housing also decreased. Total 2023 housing permits in the Denver region were 21,400 in 2023, representing a 9.0 percent decrease over the higher demand levels of 2022 and a 9.1 percent increase over 2019. **Figure 9** depicts selected developments significant to E-470 that were identified based on a review of municipal development plans, local reconnaissance, and experience from prior analyses.

Overall, the review of economic conditions suggested the following findings:

- Employment has recovered past its pre-COVID peak for the Denver Metro Region;
- Enplanements at DEN have largely recovered from the COVID-19 Pandemic and are following assumed growth trends with normal seasonal patterns;
- Denver residential construction activity in 2023 was higher than pre-COVID levels, but lower than the period of low interest rates (2020-2021);
- Gas price “shocks,” such as during the Summer of 2022, have resulted in less than expected growth in monthly transactions on E-470; otherwise, gas prices have not significantly impacted larger E-470 growth trends; and
- Actual trends in employment, enplanements, housing permits, and gas prices have generally performed as previously expected.

Figure 7
Historical Average Monthly Gas Prices within the Denver Region, 2019 – 2024

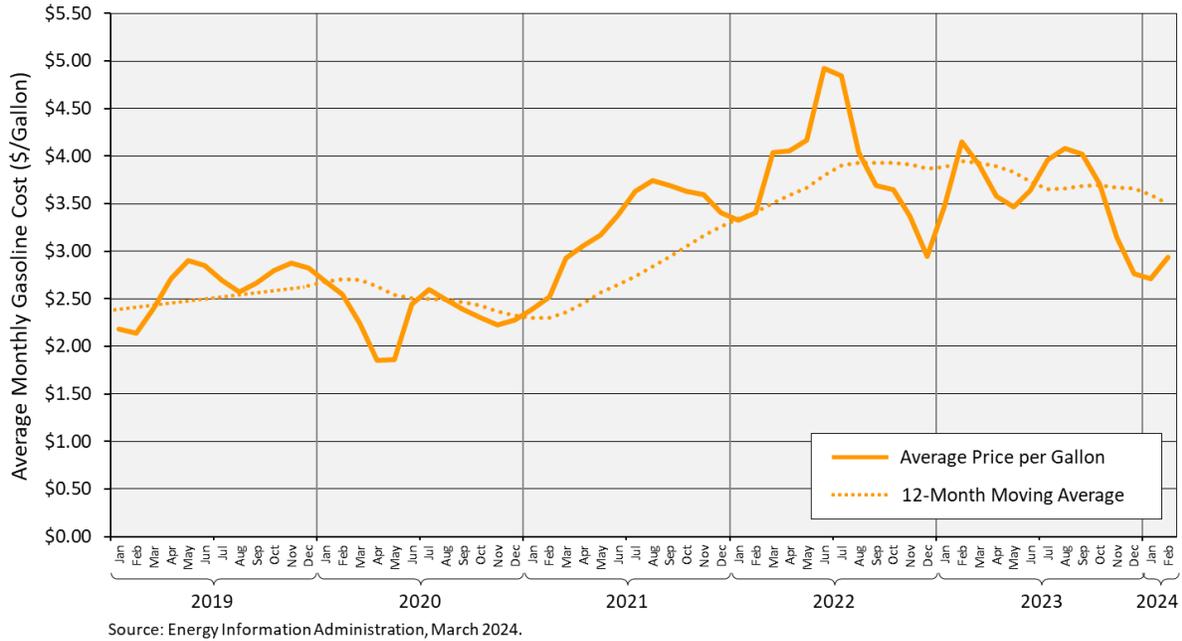


Figure 8
Historical Monthly Housing Unit Permits within the Denver Region, 2019 – 2024

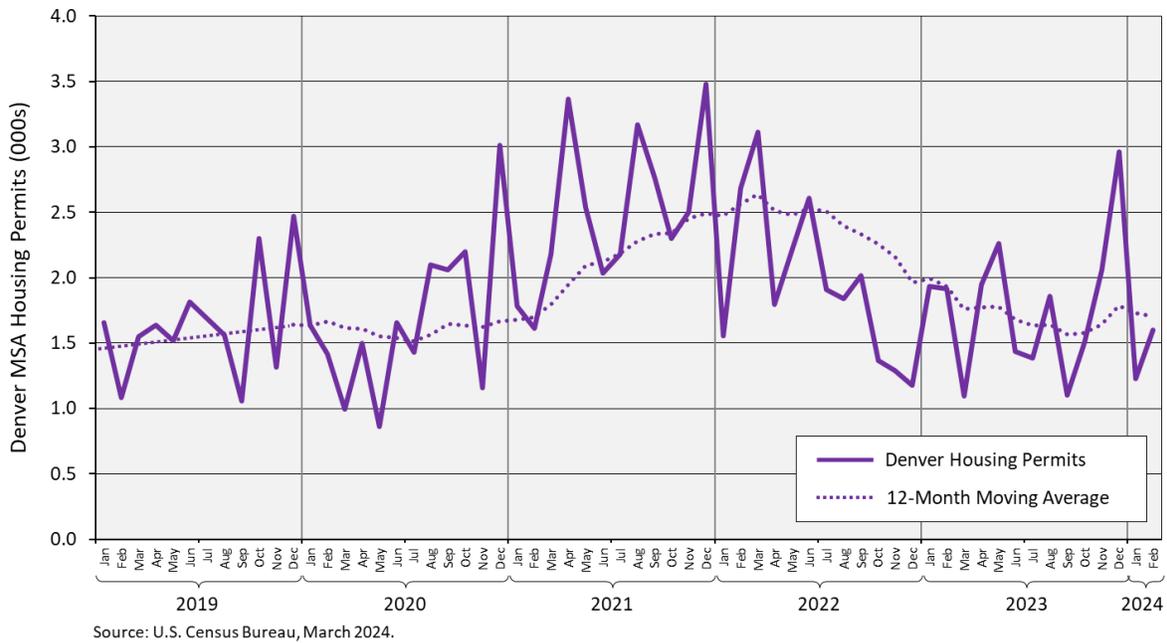
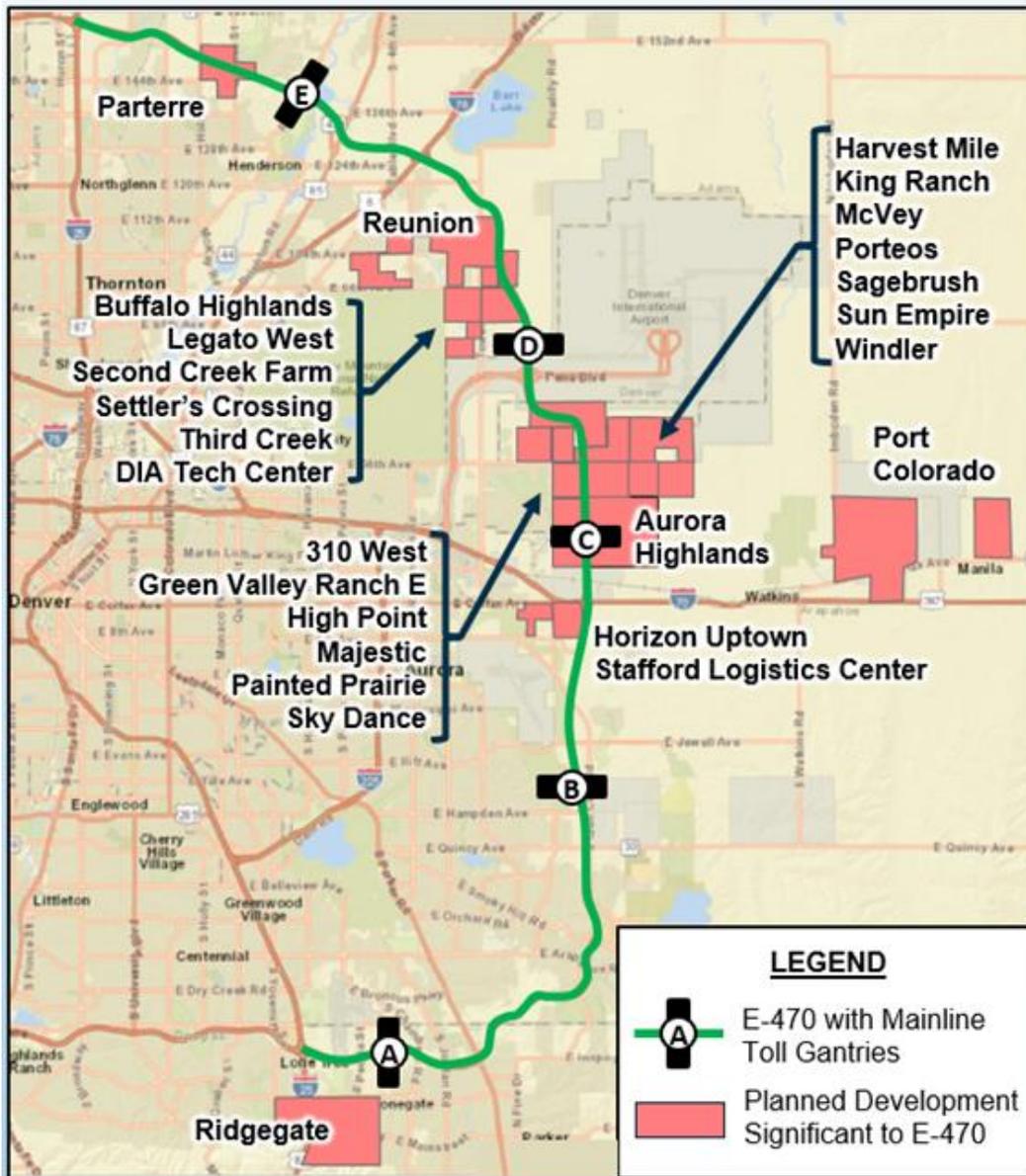


Figure 9
Selected Planned Developments Significant to E-470



Review of the Highway Improvement Program

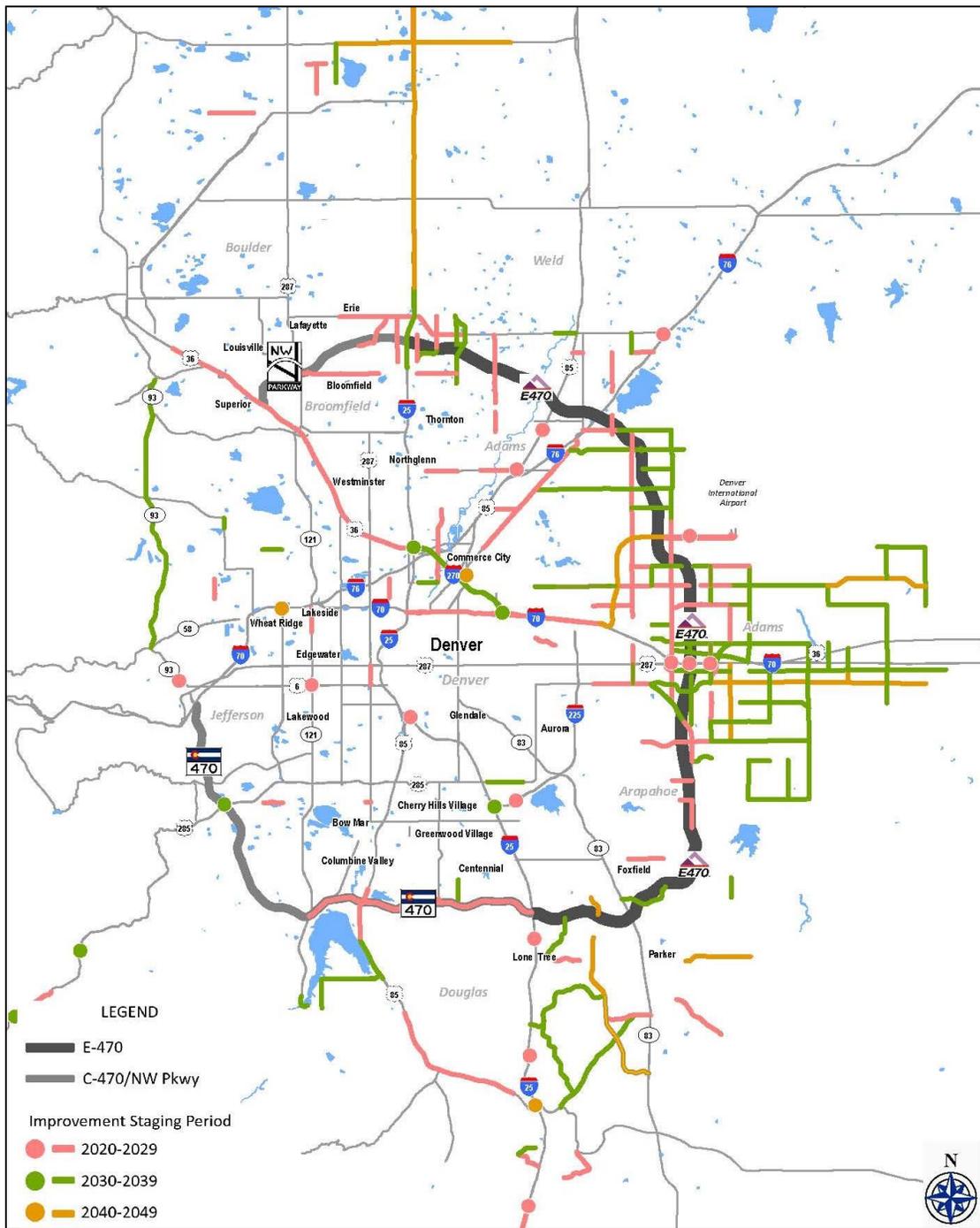
A detailed review of the proposed highway improvements for the immediate E-470 corridor and along principal competing and complementary freeways was conducted. The highway improvement assumptions underlying the ultimate E-470 transaction and revenue forecasts were compared to the DRCOG 2050 Metro Vision Regional Transportation Plan (RTP)¹. CDM Smith also reviewed highway improvement plans from CDOT and selected local jurisdictions. The regional Metro Vision, CDOT, and local projects within the E-470 corridor area, as well as those included in the CDM Smith updated E-470 toll model, are also presented graphically in **Figure 10**. Note that E-470 improvement projects are excluded from this figure and are covered in a separate summary below. In general, this review resulted in no changes to the underlying DRCOG highway improvement assumptions utilized in the travel demand modeling effort. Additionally, any variations in the assumed opening year based on local roadway development plans are not expected to present a significant impact on the E-470 System transaction and revenue forecasts.

Several significant regional improvements were explored based on their relation to the RTP project list:

- **Jefferson Parkway** – The RTP list includes the Jefferson Corridor and Interlocken Loop improvements associated with the extension of Northwest Parkway and the addition of Jefferson Parkway. However, based on discussions with E-470 staff and the latest information available, it was decided not to include these improvements in the analysis.
- **C-470 Toll Express Lanes** – Based on discussions with the Colorado Transportation Investment Office (CTIO), which manages the express lane facilities in Colorado, the extension of C-470 beyond the current western terminus is unlikely within the study period. As a result, it was removed from the forecasting model used for this study.
- **I-25 Managed Lanes Extension** – The RTP list includes the extension of the single managed lanes in each direction along I-25 between E-470 and Weld County Road 38 and between Crystal Valley Parkway and the El Paso County Line. These projects are included in the model used in this study.
- **Aurora Parkway** - This project is development-driven and developer-built and will provide a six-lane parallel facility to E-470 running between Parker Road and S. Ireland Way.
- **Aurora Highlands Development Local Roadways** - A number of Aurora Highlands developer-driven and -built projects are included in the travel demand model.

¹ DRCOG 2050 Metro Vision Regional Transportation Plan. Adopted Sept. 21, 2022.
https://drcog.org/sites/default/files/resources/2050_RTP_22_11_4.pdf

Figure 10
DRCOG 2050 Metro Vision Regional Transportation Projects



Source: Denver Regional Council of Governments (DRCOG), 2050 Metro Vision Regional Transportation Plan.

Additionally, an evaluation of the Authority’s proposed capital program was conducted. **Table 2** and **Figure 11** list E-470 capital improvement projects focusing on mainline widenings, new interchanges, and new interchange ramps. This list of major E-470 improvement projects was developed based on information provided by E-470 staff. These projects include the addition of five new tolled interchanges, new direct ramps to two major interstates, and the effective addition of at least one travel lane to the full E-470 facility. These changes represent a major upgrade to the E-470 system, expanding capacity and providing new movements, which are reflected in the transaction and toll revenue forecasts. The impact of these updates to the Authority’s proposed capital program and the resulting changes to the assumed construction dates of these projects have been incorporated into the updated traffic and revenue forecasts.

Table 2
E-470 Major Improvement Projects

Completion Year	From	To	Improvement
2024	38th Ave.		New diamond interchange
2024	48th Ave.		New diamond interchange
2025	I-70	Pena Blvd.	Widen from 4 to 6 lanes
2025	Pena Blvd.	E 104th Ave.	Widen from 4 to 6 lanes
2026	Sable Blvd.		New diamond interchange
2028	E 104th Ave.	I-76	Widen from 4 to 6 lanes
2029	88th Ave.		New diamond interchange
2029	112th Ave.		New diamond interchange
2030	I-25 South	Parker Rd.	Widen from 6 to 8 lanes
2030	I-70		Ramp C - EB I-70 to SB E-470
2033	Parker Rd.	Smoky Hill Rd.	Widen from 6 to 8 lanes
2035	Smoky Hill Rd.	I-70	Widen from 6 to 8 lanes
2035	I-76		Ramp - NB E-470 to WB I-76
2036	I-70		Fully directional interchanges at I-70
2037	I-76	US 85	Widen from 4 to 6 lanes
2038	US 85	I-25 N	Widen from 4 to 6 lanes
2039	I-76		Ramp - WB I-76 to NB E-470
2040	Pena Blvd.	I-76	Widen from 6 to 8 lanes
2040	I-76		Remaining buildout of interchange

Source: E-470 Public Highway Authority, March 2024.

**Figure 11
E-470 Major Improvement Projects**



Source: E-470 Public Highway Authority, March 2024.

Transaction and Toll Revenue Forecast Assumptions

Table 3 provides the underlying ExpressToll market participation rates assumed in the current study effort. The method of payment distributions shown in the table are consistent with prior forecasting efforts, which were based on historic trends and anticipated future increases in ExpressToll participation.

**Table 3
 Assumed ExpressToll Market Participation Rates
 and Forecasted Method of Payment Distributions**

<u>Year</u>	<u>Percent of E-470 Transactions</u>
2022 ⁽¹⁾	72.9%
2023 ⁽¹⁾	74.2%
2024 ⁽¹⁾	74.6%
2030	75.6%
2040	74.8%
2050	74.1%

⁽¹⁾ Based on actual transaction data through February 2024.

The prior forecasts relied on Values of Time (VOTs) estimated by combining the VOTs developed from Stated Preference (SP) surveys and county-level VOTs generated based on data obtained from the U.S. Census Bureau American Community Survey. For the current study, VOT values at the county level were adjusted to 2022 levels (model base year) based on actual hourly earnings increases derived from Census data: population, hours worked, and household income. Future VOT values were then estimated using inflation assumptions derived from the latest CBO economic outlook.

Vehicle operating costs for the current study effort were based on average Denver regional fuel costs, as well as average maintenance, oil, and tire costs, as estimated by the American Automobile Association. Factors such as depreciation and insurance were not included in the vehicle operating cost estimate. Future vehicle operating costs were then projected based on gas/diesel price forecasts from the Energy Information Administration (EIA), fuel efficiency improvements based on current national CAFÉ standards, and inflation assumptions derived from the latest economic outlook published by the Congressional Budget Office (CBO).

Based on directions from E-470 Staff, CDM Smith assumed that current toll rates would be maintained throughout the forecast period. Thus, no toll rate increases were assumed on E-470 in this study. However, toll rates for other facilities such as Northwest Parkway, C-470 Express Lanes, and other managed lane facilities were assumed to increase through the forecast period at the rate of inflation. The assumed rate of inflation is 2.5 percent annually through 2030 and 2.0 percent annually thereafter.

Lastly, CDM Smith reviewed current rates of toll revenue leakage for the E-470 System. Following discussions with E-470 Staff, it was decided that no changes would be made to the assumed rates of toll revenue leakage compared to prior forecast efforts. Thus, the forecasts were adjusted to reflect actual revenues through February 2024. The toll revenue leakage rates estimated for the forecast period, which were based on historical collection rates and some assumed improvements over time, are summarized in **Table 4**.

Table 4
Assumed Toll Revenue Leakage Rates

Year	Leakage as a Percent of Revenue by Method of Payment				
	Unbillable		Unpaid		Total Leakage
	LicensePlate	Unpaid ExpressToll	LicensePlate		
2022 ⁽¹⁾	26.7%	0.2%	21.0%	15.6%	
2023 ⁽¹⁾	22.0%	0.5%	20.1%	13.4%	
2024 ⁽¹⁾	26.0%	0.5%	22.7%	15.1%	
2030	28.0%	0.5%	24.0%	14.5%	
2040	27.1%	0.5%	23.0%	14.5%	
2050	26.5%	0.5%	22.3%	14.5%	

(1) Based on actual revenue data through February 2024.

Transaction and Toll Revenue Forecast Development

The transaction and revenue forecasts contained in this letter were developed based on traffic assignments performed using the DRCOG Focus 2.3.1 regional travel demand model. The model was modified to incorporate the socioeconomic forecasts, highway improvement assumptions, and other forecast variables indicated in this letter, with special attention paid to the E-470 corridor. Traffic assignments were run at 2022, 2030, 2040, and 2050 levels. Based on these assignments, estimates of normal growth and highway improvement impacts were developed. These impacts were applied to actual 2023 transaction data to develop forecasts by year through 2053. Normal growth and estimated impacts of the programmed DRCOG regional highway improvements were estimated based on interpolation between model years. Estimated impacts of the E-470 mainline

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widenings and interchange improvements were applied in the assumed opening year, preceded by two years of minor construction impacts. The transaction and revenue forecasts were developed by method of payment and by toll location.

Following the development of these forecasts using the modified regional travel demand model, CDM Smith identified three major categories of adjustments based on the most recent transaction and toll revenue data:

- Re-benchmarking E-470 transactions to 2023/2024 levels based on actual data through February 2024;
- Revising estimated 2024 growth rates based on actual performance year-to-date through March 2024; and
- Adjusting estimated method of payment splits based on recent ExpressToll performance.

CDM Smith benchmarked the transactions and revenue forecasts developed using the regional model to match actual 2023 transactions and toll revenue. Additionally, CDM Smith increased the estimated transactions for 2024 based on actual data through March 24, 2024. Method of payment distributions were also updated based on the latest ExpressToll share data through March 24, 2024. These adjustments resulted in an upward adjustment of almost 2.4 million transactions in 2024, as compared to transaction levels and growth trends estimated based only on transaction data through September 2023. CDM Smith maintained this increase in transactions through 2030, assuming that 2024 to 2030 growth would proceed at an average of 2.8 percent annually based on long-range historical trends and the output of the modified regional travel demand model. Between 2030 and 2040, CDM Smith normalized transaction growth so as to match 2040 transaction levels forecasted through the modified regional travel demand model. The effect of this adjustment was a minor reduction in annual average growth from 2.3 percent to 2.1 percent. For all forecast years, estimated toll revenues were developed using the updated transaction estimates, nominal toll rates and leakage rate assumptions.

Basic Study Assumptions

Traffic and toll revenue estimates for E-470 are predicated upon the following assumptions, which are considered reasonable for purposes of the forecasts:

1. The toll collection concept and toll schedules as shown in this letter will be adopted. Both ExpressToll and LPT will be employed.
2. The percentage of ExpressToll and LPT customers will occur as assumed in this letter.
3. Improvements to the present highway and local road system in the travel corridor will be limited to those described in this letter. No other competing facilities, or capacity expansions, will be added during the forecast period.

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4. Underlying regional and corridor growth will be generally as forecasted by DRCOG, and as reviewed and refined by Economic & Planning Systems in their 2023 estimates.
5. No major recession or significant economic restructuring will occur which would substantially reduce traffic in the region.
6. Over the long-term, motor fuel will remain in adequate supply, and future increases in fuel price will not significantly exceed the overall rate of inflation.
7. Inflation will average 2.5 percent through 2030 and 2.0 percent per year through 2053.
8. Revenue leakage due to unreadable plates or uncollectable ExpressToll or LPT transactions or any transactions that cannot be processed and payment collected will occur. Leakage estimates have been estimated by CDM Smith using actual historical data provided by the Authority.
9. The E-470 toll road will be well-maintained and effectively signed.
10. No natural disasters will occur that could significantly alter travel patterns through the area.
11. No local, regional, or national emergency will arise that would abnormally restrict the use of motor vehicles.

Any significant departure from these basic assumptions could materially affect estimated traffic and toll revenue for the E-470.

Transaction and Toll Revenue Estimates

The resulting annual transactions are provided by method of payment in **Table 5**, along with total gross and net toll revenue estimates. These estimates reflect the re-benchmarking of transactions based on data through March 24, 2024 and the other changes noted in this letter. Annual transactions are expected to increase from 99.3 million in 2024 to 117.0 million by 2030. By 2053, annual transactions are expected to reach 185.5 million, for an average 29-year annual growth rate between 2024 and 2053 of 2.2 percent.

Table 5
Estimated Annual Transactions and Toll Revenue (In Thousands)
2024 - 2053

Year	Annual Transactions (000s)			Annual Toll Revenue (\$000s)		
	ExpressToll	LPT	Total	Gross (1)	Uncollectible and Unpaid (2)	Net (3)
2024 (4)(5)(6)	74,140	25,198	99,338	\$ 311,689	\$ (47,074)	\$ 264,615
2025 (7)	76,307	25,632	101,939	318,493	(48,017)	270,476
2026 (6)	78,620	26,133	104,753	326,222	(48,994)	277,228
2027	80,624	26,603	107,227	333,642	(49,815)	283,827
2028 (5)(7)	83,485	27,354	110,839	344,699	(51,083)	293,616
2029 (6)	85,506	27,637	113,143	348,880	(51,295)	297,585
2030 (6)(7)	88,515	28,489	117,004	360,259	(52,402)	307,857
2031	90,127	29,138	119,265	367,239	(53,424)	313,815
2032 (5)	92,034	29,888	121,922	375,418	(54,620)	320,798
2033 (7)	93,730	30,557	124,287	382,019	(55,583)	326,436
2034	95,439	31,253	126,692	389,351	(56,653)	332,698
2035 (6)(7)	97,388	32,042	129,430	398,627	(57,997)	340,630
2036 (5)(6)	98,682	32,563	131,245	403,785	(58,744)	345,041
2037 (7)	100,798	33,395	134,193	411,752	(59,901)	351,851
2038 (7)	103,690	34,459	138,149	423,969	(61,674)	362,295
2039 (6)	105,617	35,249	140,866	432,249	(62,864)	369,385
2040 (5)(6)(7)	107,718	36,173	143,891	442,743	(64,400)	378,343
2041	109,538	36,926	146,464	450,735	(65,566)	385,169
2042	111,699	37,799	149,498	460,139	(66,937)	393,202
2043	113,905	38,694	152,599	469,750	(68,337)	401,413
2044 (5)	116,478	39,721	156,199	480,886	(69,958)	410,928
2045	118,463	40,555	159,018	489,612	(71,229)	418,383
2046	120,816	41,521	162,337	499,873	(72,721)	427,152
2047	123,220	42,512	165,732	510,362	(74,246)	436,116
2048 (5)	126,021	43,648	169,669	522,511	(76,011)	446,500
2049	128,188	44,572	172,760	532,042	(77,393)	454,649
2050	130,753	45,643	176,396	543,244	(79,018)	464,226
2051	132,851	46,521	179,372	552,406	(80,346)	472,060
2052 (5)	135,356	47,548	182,904	563,271	(81,921)	481,350
2053	137,159	48,334	185,493	571,224	(83,071)	488,153

(1) Gross Revenue does not include adjustments for unbillable or uncollectable toll revenue.
 (2) Collectible Revenue includes adjustments for uncollectable toll revenue, including bad and duplicate images, and plates with invalid DMV addresses.
 (3) Net Revenue includes adjustments for unbillable or uncollectable toll revenue.
 (4) Includes actual data through March 24, 2024.
 (5) Leap Year.
 (6) Assumed new interchange or interchange improvement for E-470.
 (7) Assumed widening of various segments of the E-470 mainline.

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Annual toll revenue estimates are also provided in **Table 5**. 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 \$311.7 million in 2024 to \$360.3 million by 2030. Assuming no toll increase over the forecast period, annual gross toll revenues are estimated to reach \$571.2 million by 2053. This represents an average annual increase of 2.1 percent over the forecast period, consistent with transaction growth.

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 from \$264.6 million in 2024 to \$307.9 million by 2030. Annual gross toll revenues are then estimated to grow to \$488.2 million by 2053. This represents an average annual increase of 2.1 percent over the forecast period.

* * *

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 of partial information extracted from this letter.

All estimates and projections reported herein are based on CDM Smith's experience and judgment and on a review of information obtained from multiple agencies, including the E-470 Public Highway Authority. These estimates and projections may not be indicative of actual or future values and are, therefore, subject to substantial uncertainty. Certain variables such as future developments, economic cycles, pandemics, government actions, climate change-related events, or impacts related to advances in automotive technology, etc., cannot be predicted with certainty and may affect the estimates or projections expressed in this letter, such that CDM Smith does not specifically guarantee or warrant any estimate or projection contained within this letter. While CDM Smith believes that some of the projections or other forward-looking statements contained within the letter are based on reasonable assumptions as of the date in the letter, 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 letter, CDM Smith will take no responsibility or assume any obligation to advise of changes that may affect its assumptions contained within the letter, 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.

The letter and its contents are intended solely for use by the E-470 Public Highway Authority and designated parties approved by the E-470 Public Highway Authority and CDM Smith. Any use by third parties other than as noted above is expressly prohibited. In addition, any publication of the letter for purposes of financing without the express written consent of CDM Smith is prohibited.

CDM Smith is not, and has not been, a municipal advisor as defined in Federal law (the Dodd-Frank Bill) to the E-470 Public Highway Authority and does not owe a fiduciary duty pursuant to Section 15B of the Exchange Act to the E-470 Public Highway Authority with respect to the information and material contained in this letter. CDM Smith is not recommending and has not recommended any action to the E-470 Public Highway Authority. The E-470 Public Highway Authority should discuss the information and material contained in this letter with any and all internal and external advisors that it deems appropriate before acting on this information.

Appendix A: 2023 Socioeconomic Forecasts by the Denver Regional Council of Governments (DRCOG) and Economic and Planning Systems (EPS)

**Table A-1
 Summary of Denver-Region Population Projections, 2020 - 2050**

	2020	2022*	2030	2040	2050	2022-2050				Annual Percentage		
						Growth		Annual		2022-2030	2030-2040	2040-2050
						Total	%	Average	%			
11-County Denver Region												
Original DRCOG	3,408,152	3,517,103	3,865,007	4,246,892	4,478,343	961,240	27.3%	34,330	0.87%	1.19%	0.95%	0.53%
EPS Adjusted**	3,363,157	3,434,343	3,646,991	3,991,293	4,378,508	944,165	27.5%	33,720	0.87%	0.75%	0.91%	0.93%
Difference	-44,995	-82,760	-218,016	-255,599	-99,835	-17,075	0.2%	-610	0.00%	-0.43%	-0.04%	0.40%
As % of DRCOG	-1.3%	-2.4%	-5.6%	-6.0%	-2.2%							

**Table A-2
 Summary of Denver-Region Household Projections, 2020 - 2050**

	2020	2022*	2030	2040	2050	2022-2050				Annual Percentage		
						Growth		Annual		2022-2030	2030-2040	2040-2050
						Total	%	Average	%			
11-County Denver Region												
Original DRCOG	1,361,781	1,407,577	1,588,770	1,761,979	1,882,031	474,454	33.7%	16,945	1.04%	1.53%	1.04%	0.66%
EPS Adjusted**	1,322,176	1,374,344	1,473,791	1,639,896	1,829,296	454,952	33.1%	16,248	1.03%	0.88%	1.07%	1.10%
Difference	-39,605	-33,233	-114,979	-122,083	-52,735	-19,502	-0.6%	-697	-0.02%	-0.65%	0.03%	0.44%
As % of DRCOG	-2.9%	-2.4%	-7.2%	-6.9%	-2.8%							

**Table A-3
 Summary of Denver-Region Employment Projections, 2020 - 2050**

	2020	2022*	2030	2040	2050	2022-2050				Annual Percentage		
						Growth		Annual		2022-2030	2030-2040	2040-2050
						Total	%	Average	%			
11-County Denver Region												
Original DRCOG	2,180,587	2,235,707	2,467,274	2,733,136	3,000,647	764,940	34.2%	27,319	1.06%	1.24%	1.03%	0.94%
EPS Adjusted**	2,071,228	2,237,240	2,404,686	2,674,965	2,976,044	738,804	33.0%	26,386	1.02%	0.91%	1.07%	1.07%
Difference	-109,359	1,533	-62,588	-58,171	-24,603	-26,136	-1.2%	-933	-0.03%	-0.33%	0.04%	0.13%
As % of DRCOG	-5.0%	0.1%	-2.5%	-2.1%	-0.8%							

* 2022 was interpolated

** Before Transportation Analysis Zone (TAZ) level adjustments

Note: The DRCOG model, Focus 2.3.1, includes growth projects for 11-counties within their planning area boundary:

Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and part of Weld County.

