Stantec

SR 520 Bridge Traffic and Revenue Study
2024 Report

June 26, 2024

Prepared for:

WSDOT Toll Division

Prepared by:

Stantec Consulting Services Inc.

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EXECUTIVE SUMMARY

Stantec Consulting Services Inc. ("Stantec") has been retained by the Washington State Department of Transportation ("WSDOT") to conduct a Traffic and Revenue ('T&R') study for the existing SR 520 bridge across Lake Washington near Seattle in the Central Puget Sound Region. The study includes forecasts of traffic and gross toll revenue potential for fiscal years 2024 through 2062.

The baseline analysis prepared as part of this study was found to generate insufficient revenues, and consequently, a toll increase will be needed to meet sufficiency requirements. As a result, a toll increase analysis is included as part of this 2024 study.

WSDOT is making major enhancements to the SR 520 Bridge Replacement and HOV Program between I-5 and I-405. The bridge configuration assumptions are based on preliminary roadway configurations identified by WSDOT and are as follows:

- Between Montlake Boulevard and the west end of the main bridge span, the assumed configuration as of the May 2024 Forecast includes a new West Approach Bridge North connector and new West Approach Bridge South connector resulting in three lanes in each direction (two general-purpose and one inside transit/HOV3+ lane).

- Additionally, as of FY 2024, a one lane transit/HOV3+ reversible direct connector between SR 520 and the I-5 reversible express lanes running in the direction of the I-5 reversible lanes has been completed but will not be operational until FY 2032 due to continued construction phasing in the area.

- Between I-5 and Montlake Boulevard, the assumed configuration as of FY 2032 will include a new Portage Bay Bridge resulting in three lanes in each direction (two general-purpose and one inside transit/HOV 3+ lane in each direction).

Table ES-1 shows the actual annual fiscal year toll transactions on SR 520 from FY 2013 through FY 2023. Annual toll transactions have increased from 20.2 million transactions in FY 2013, the first full year of toll operations, to a high of 26.5 million transactions in FY 2019 before the onset of the pandemic, a total increase of 6.3 million or about 31.2 percent. There were 20.5 million transactions in FY 2023, a 23 percent decrease from pre-pandemic high in FY 2019.

Table ES-1: Historical Annual Toll Transactions and Gross Toll Revenues, FY 2013 to 2023

Fiscal Year	Total Transactions (millions)	Gross Toll Revenue (millions)
2013	20.2	$61.3
2014	21.0	$64.6
2015	22.0	$69.4
2016	23.2	$79.4
2017	24.0	$83.0
2018*	25.8	$90.3
2019	26.5	$92.2
2020	20.9	$72.1
2021	14.6	$52.1
2022	19.3	$64.0
2023	20.5	$68.9

The traffic and revenue forecasts for the SR 520 bridge have been prepared using the actual data collected and analyzed, the socioeconomic and land use data, and the modeling processes. Using all of these data and the model, average weekday forecasts were prepared for 2025, 2030 and 2045. To convert the average weekday traffic and revenue results into an annual forecast, factors were developed from FY 2023 transaction data received from the back-office, considering May 2023 as a standard average month for traffic and revenue.

As part of the SR 520 Bridge Replacement and HOV Program, road closures due to construction are expected. WSDOT provided a schedule of these closures, as shown in Table ES-2. Traffic and revenue forecasts were adjusted to account for both the planned weekday and weekend day closures.

Table ES-2: SR 520 Closure Assumptions, Weekday Night and Weekend Days, Amounts per Fiscal Year, Actual and Forecasted

FY	SR 520 Main Span		Portage Bay Bridge		Total	
	Weekday Night	Weekend	Weekday Night	Weekend	Weekday Night	Weekend
2019	0.0	1.4	0.0	0.0	0.0	1.4
2020	0.0	2.0	0.0	0.0	0.0	2.0
2021	0.0	8.0	0.0	0.0	0.0	8.0
2022	6.5	4.0	0.0	0.0	6.5	4.0
2023	2.0	14.0	0.0	0.0	2.0	14.0
2024	7.0	22.5	0.0	0.0	7.0	22.5
2025	4.0	5.0	0.0	0.0	4.0	5.0
2026	0.0	0.0	45.0	4.0	45.0	4.0
2027	0.0	0.0	2.5	4.0	2.5	4.0
2028	0.0	0.0	2.5	5.0	2.5	5.0
2029	0.0	0.0	0.0	2.0	0.0	2.0
2030	0.0	0.0	30.0	2.0	30.0	2.0
2031	0.0	0.0	25.0	6.0	25.0	6.0
Total	**19.5**	**56.9**	**105.0**	**23.0**	**124.5**	**79.9**

The annual actual and forecasted toll transactions and gross toll revenue potential is shown in Table ES-3, along with the average revenue per toll transaction and The *Good to Go!* transaction share. Toll transactions are expected to increase from 19.6 million transactions in FY 2024 to 40.4 million transactions in FY 2062, an average annual increase of 1.9 percent per year. Gross toll revenue potential is expected to increase from $76.4 million in FY 2024 to $151.2 million in FY 2062, an average annual increase of 1.8 percent per year. The average toll rate is expected to decrease slightly over time, from $3.89 in FY24 after the July 1, 2023 toll increase to $3.75 as the *Good to Go!* share increases from 84.7 percent in FY 2024 to 86.9 percent by FY 2062.

Table ES-3: Annual Actual and Forecasted Traffic and Gross Toll Revenue Potential, FY 2012 to 2062

Fiscal Year	Annual Toll Transactions	Annual Gross Potential Revenue	Avg. Revenue per Transactions	Good to Go! Percentage Share
2012*[1]	9,600,000	$28,100,000	$2.93	
2013*	20,220,602	$61,301,711	$3.03	83.6%
2014*	20,959,573	$64,589,148	$3.08	84.2%
2015*	22,019,771	$69,383,209	$3.15	83.7%
2016*	23,220,000	$74,801,676	$3.22	84.0%
2017*	23,974,779	$81,913,285	$3.42	84.5%
2018*[2]	25,785,356	$90,349,101	$3.50	87.6%
2019*	26,523,075	$92,187,653	$3.48	87.6%
2020*	20,886,032	$72,122,698	$3.45	87.4%
2021*	14,636,937	$52,052,085	$3.56	85.5%
2022*	19,284,221	$63,958,480	$3.32	85.5%
2023*	20,480,940	$68,955,356	$3.37	84.9%
2024	20,012,000	$79,017,000	$3.95	83.2%
2025	21,967,000	$83,519,000	$3.80	84.7%
2026	22,952,000	$87,143,000	$3.80	85.0%
2027	23,765,000	$89,937,000	$3.78	85.4%
2028	24,412,000	$92,343,000	$3.78	85.7%
2029	25,589,000	$96,284,000	$3.76	86.1%
2030	26,302,000	$99,080,000	$3.77	86.1%
2031	26,560,000	$100,513,000	$3.78	86.1%
2032	30,710,000	$114,922,000	$3.74	86.5%
2033	31,203,000	$116,768,000	$3.74	86.5%
2034	31,697,000	$118,614,000	$3.74	86.6%
2035	32,191,000	$120,461,000	$3.74	86.6%
2036	32,686,000	$122,310,000	$3.74	86.6%
2037	33,181,000	$124,160,000	$3.74	86.7%
2038	33,676,000	$126,011,000	$3.74	86.7%
2039	34,171,000	$127,862,000	$3.74	86.7%
2040	34,667,000	$129,716,000	$3.74	86.8%
2041	35,163,000	$131,571,000	$3.74	86.8%
2042	35,660,000	$133,426,000	$3.74	86.8%
2043	36,155,000	$135,283,000	$3.74	86.9%
2044	36,652,000	$137,141,000	$3.74	86.9%
2045	37,150,000	$139,000,000	$3.74	86.9%
2046	37,519,000	$140,402,000	$3.74	86.9%
2047	37,798,000	$141,470,000	$3.74	86.9%
2048	38,009,000	$142,284,000	$3.74	86.9%
2049	38,168,000	$142,902,000	$3.74	86.9%
2050	38,328,000	$143,525,000	$3.74	86.9%
2051	38,488,000	$144,149,000	$3.75	86.9%
2052	38,650,000	$144,776,000	$3.75	86.9%
2053	38,812,000	$145,407,000	$3.75	86.9%
2054	38,974,000	$146,039,000	$3.75	86.9%
2055	39,137,000	$146,674,000	$3.75	86.9%
2056	39,301,000	$147,313,000	$3.75	86.9%
2057	39,465,000	$147,952,000	$3.75	86.9%
2058	39,631,000	$148,597,000	$3.75	86.9%
2059	39,797,000	$149,243,000	$3.75	86.9%
2060	39,963,000	$149,892,000	$3.75	86.9%
2061	40,131,000	$150,544,000	$3.75	86.9%
2062	40,299,000	$151,199,000	$3.75	86.9%

* Annual toll transactions and estimated actual potential gross toll revenue
(1) Tolling started on December 29, 2011, half-way through FY 2012
(2) Overnight tolling between the hours of 12am – 5am began in July FY 2018

SR 520 BRIDGE TRAFFIC AND REVENUE STUDY 2024 REPORT

Executive Summary

The forecast presented in Table ES-3 will not generate sufficient revenue, and as a result, a toll increase is required. On May 15, 2024, the Washington State Transportation Commission voted to recommend a 10 percent tailored toll increase, which will go into effect on August 15, 2024. This toll increase includes the following changes:

- Tolls will increase by an average of 10 percent for the entire week, rounded to the nearest nickel

- There will be fewer rate variations through the week, resulting in six different prices instead of the existing eight

- The toll rate adjustment would range from a decrease of $0.10 to and increase of $0.70, depending on the time of day and day of the week.

The new toll rates were incorporated into Stantec's forecast, with all other assumptions presented previously in the report remaining unchanged.

Table ES-4 shows the forecasted annual toll transactions and gross toll revenue potential with the assumption of a 10 percent tailored toll increase beginning August 15, 2024. Toll transactions are expected to increase from 20.0 million transactions in FY 2024 to 39.6 million transactions in FY 2062. Gross toll revenue potential is expected to increase from $79.0 million in FY 2024 to $162.5 million in FY 2062. When compared to the annual forecast without a toll increase in Table 6-4, transactions are reduced by roughly 1.7 percent and revenue is increased by roughly 6.4 percent in FY 2025.

Table ES-4: Annual Actual and Forecasted Traffic and Gross Toll Revenue Potential, FY 2012 to 2062 with Tailored 10 Percent Toll Increase Starting August 15, 2024 (FY 2025)

Fiscal Year	Annual Toll Transactions	Annual Gross Potential Revenue	Avg. Revenue per Transactions	Good to Go! Percentage Share
2012*[1]	9,600,000	$28,100,000	$2.93	
2013*	20,200,000	$61,300,000	$3.03	83.6%
2014*	20,959,574	$64,589,147	$3.08	84.4%
2015*	22,019,770	$69,383,209	$3.15	84.3%
2016*	23,217,000	$74,801,674	$3.22	84.5%
2017*	23,974,779	$81,913,287	$3.42	84.7%
2018*[2]	25,785,356	$90,349,101	$3.50	85.3%
2019*	26,523,075	$92,187,654	$3.48	86.7%
2020*	20,886,032	$72,122,698	$3.45	87.4%
2021*	14,636,937	$52,052,085	$3.56	85.5%
2022*	19,284,221	$63,958,480	$3.32	86.9%
2023*	20,480,940	$68,955,356	$3.37	84.9%
2024	20,012,000	$79,017,000	$3.95	83.2%
2025[3]	21,592,000	$88,874,000	$4.12	84.6%
2026	22,510,000	$93,540,000	$4.16	84.9%
2027	23,310,000	$96,560,000	$4.14	85.3%
2028	23,940,000	$99,150,000	$4.14	85.7%
2029	25,090,000	$103,400,000	$4.12	86.0%
2030	25,790,000	$106,410,000	$4.13	86.0%
2031	26,380,000	$109,370,000	$4.15	86.0%
2032	30,200,000	$123,790,000	$4.10	86.4%
2033	30,680,000	$125,770,000	$4.10	86.4%
2034	31,160,000	$127,740,000	$4.10	86.5%
2035	31,650,000	$129,720,000	$4.10	86.5%
2036	32,120,000	$131,690,000	$4.10	86.6%
2037	32,620,000	$133,680,000	$4.10	86.6%
2038	33,100,000	$135,650,000	$4.10	86.6%
2039	33,580,000	$137,630,000	$4.10	86.7%
2040	34,070,000	$139,610,000	$4.10	86.7%
2041	34,550,000	$141,600,000	$4.10	86.7%
2042	35,030,000	$143,580,000	$4.10	86.8%
2043	35,520,000	$145,570,000	$4.10	86.8%
2044	36,010,000	$147,560,000	$4.10	86.8%
2045	36,490,000	$149,540,000	$4.10	86.8%
2046	36,860,000	$151,040,000	$4.10	86.8%
2047	37,120,000	$152,180,000	$4.10	86.9%
2048	37,330,000	$153,040,000	$4.10	86.8%
2049	37,490,000	$153,710,000	$4.10	86.8%
2050	37,630,000	$154,360,000	$4.10	86.8%
2051	37,790,000	$155,030,000	$4.10	86.8%
2052	37,950,000	$155,700,000	$4.10	86.9%
2053	38,110,000	$156,380,000	$4.10	86.9%
2054	38,260,000	$157,040,000	$4.10	86.9%
2055	38,430,000	$157,720,000	$4.10	86.8%
2056	38,590,000	$158,400,000	$4.10	86.8%
2057	38,750,000	$159,080,000	$4.11	86.8%
2058	38,920,000	$159,760,000	$4.10	86.8%
2059	39,080,000	$160,450,000	$4.11	86.8%
2060	39,240,000	$161,140,000	$4.11	86.9%
2061	39,400,000	$161,830,000	$4.11	86.9%
2062	39,570,000	$162,530,000	$4.11	86.8%

* Annual toll transactions and estimated actual potential gross toll revenue
(1) Tolling started on December 29, 2011, half-way through FY 2012
(2) Overnight tolling between the hours of 12am – 5am began in July FY 2018
(3) Toll increase beginning August 15, 2024

1 INTRODUCTION

Stantec Consulting Services Inc. ("Stantec") has been retained by the Washington State Department of Transportation ("WSDOT") to conduct a Traffic and Revenue ('T&R') study for the existing SR 520 bridge across Lake Washington near Seattle in the Central Puget Sound Region. The study includes forecasts of traffic and gross toll revenue potential for fiscal years 2024 through 2062.

1.1 STUDY PURPOSE

The purpose of this 2024 study is to update the future toll traffic and gross toll revenue potential forecasts based on the most recent data available to support ongoing SR 520 traffic and revenue needs after the final SR 520 bond sale. This effort has been conducted on an annual basis since 2012, first by CDM Smith while they served as Traffic Consultant to WSDOT for this facility, and by Stantec beginning in fall of 2017.

If the forecasted toll revenue is found to be insufficient, a toll increase analysis must be completed and included in the study in addition to the base forecast, as was done recently in 2021. The baseline analysis prepared as part of this study was found to generate insufficient revenues, and consequently, a toll increase will be needed to meet sufficiency requirements. As a result, a toll increase analysis is included as part of this 2024 study.

1.2 RELEVANT STUDY HISTORY

Stantec has been monitoring transaction and revenue data on the SR520 Bridge regularly since 2017. As part of the budget monitoring process overseen by WSDOT, Stantec reviews transaction and revenue data versus forecasted transactions and revenue on a recurring monthly basis.

Over the past several years, several factors have contributed to significant changes in SR520 transactions and revenue. These include:

- construction activity along the corridor, and
- the COVID-19 Pandemic ("the pandemic") and related post-pandemic behavior changes.

The pandemic began while Stantec and WSDOT were in the process of finalizing the "SR 520 Bridge Traffic and Revenue Study 2019 Report" dated April 13, 2020 ("2019 Report" and "2019 Forecast"). Due to the unprecedented changes in traffic patterns related to the pandemic, Stantec's next annual forecast built off of the 2019 Forecast by layering on estimated Work-from-Home impacts to travel on SR520 and assumptions regarding how long it would take for things to reach a "new normal". Given that the forecast was building upon the 2019 Forecast, Stantec prepared a supplemental Bringdown Letter explaining these new layers that was attached to the original 2019 Forecast, in lieu of preparing a standalone report while still in the midst of the pandemic.

Over the following four years, Stantec continued to monitor changes and recovery trends in SR520 transactions and revenue, preparing additional bringdown letters to supplement the 2019 Report for both the 2021 Forecast, 2022 Forecast, and 2023 Forecast.

A list of the Bringdown Letters and Forecasts prepared since 2019 follows:

- Bringdown Letter dated August 13, 2021 ("2021 Report" and "2021 Forecast")

- Bringdown Letter dated May 26, 2022 ("2022 Report" and "2022 Forecast")

- Bringdown Letter dated April 3, 2023 ("2023 Report" and "2023 Forecast")

Stantec believes that changes in travel trends related to the pandemic, mainly increased Work-from-Home, have stabilized. This report, "SR 520 Bridge Traffic and Revenue Study 2024 Report" ("2024 Report"), which includes the corresponding forecast ("2024 Forecast"), is a standalone document.

Since the 2019 Report, the changes that have occurred that impact the SR 520 traffic and revenue forecasts include:

- the impact of the pandemic on near-term and longer-term travel and land use,
- revisions to the toll schedule,
- revisions to the lane closure schedule, and
- changes to WSDOT's back-office reporting of traffic by payment type.

Since the 2022 Report, the changes that have occurred that impact the SR 520 traffic and revenue forecasts are:

- the impact of the pandemic on near-term travel, and
- revisions to the lane closure schedule.

Since the 2023 Report, the changes that have occurred that impact the SR 520 traffic and revenue forecasts are:

- revisions to the construction phasing schedule and anticipated lane closure schedule
- revisions to assumptions around construction impacts to traffic, based on trends in transaction data
- additional revisions to the toll schedule

1.3 SUMMARY OF STUDY METHODOLOGY

The 2024 Forecast was developed using a base of historical transaction and revenue data through fiscal year (FY) 2023. These data were used in collaboration with a three-tiered modelling process to work through future demand, toll diversion and travel behavior changes, and process these data points into a full traffic and revenue stream for the forecast horizon.

As the first step of this tiered process, Stantec utilized the Puget Sound Regional Council ("PSRC") regional model, encompassing Seattle and much of the surrounding area. To produce updated estimates of average weekday traffic demand for the SR 520 Bridge, the analysis was run with socioeconomic forecasts of land use for each model analysis zone, prepared specifically for this toll study update.

As the second step in the process, Stantec used a customized Toll Diversion Model ("TDM") to analyze usage of the SR 520 bridge by time period, reflecting the variation in toll cost and traffic demand throughout the day. The TDM model was calibrated with 2018 data for the 2019 Forecast. This calibration was used as the basis for the TDM runs completed for this study, with additional changes to various aspects of the model such as the phasing of SR 520

improvements, assumed payment type splits, estimated commercial vehicle share, as well as the inclusion of reductions in demand to adjust for increased Work-from-Home-behavior and construction-related capacity impacts.

The third step in the development of the traffic and revenue forecasts was to feed the results of the TDM through a spreadsheet-based post-processing model that added in various assumptions to further refine the model outputs to match actual conditions on SR 520 observed in FY 2023. The post-processing included adjustments to convert average weekday estimates into annual traffic and revenue estimates for each model year and to interpolate between model years to create a full traffic and revenue stream through the forecast horizon.

1.4 ORGANIZATION OF THE REPORT

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

- Chapter 2.0 – Project Description and Historical Performance: This chapter describes the study corridor, its current configuration, and its role in the highway network. It also discusses the project history in terms of its configuration changes, and toll policy.

- Chapter 3.0 – SR 520 Traffic Characteristics: This chapter gives an overview historical traffic and revenue trends on both crossing Lake Washington and specifically on SR 520.

- Chapter 4.0 – Socioeconomic Context and Travel Behavior Trends: This chapter describes the socioeconomic projections used to develop the traffic forecasts, and an assessment of the region's economy and future development in the study area.

- Chapter 5.0 – Model Approach: This chapter explains the modeling methodology used to produce the traffic and gross toll revenue potential forecasts. It includes a discussion of the regional travel demand model, the toll diversion model, and the spreadsheet-based post-processing model.

- Chapter 6.0 – Traffic and Gross Toll Revenue Potential Forecast: This chapter presents the long-range traffic and gross toll revenue potential forecasts for the SR 520 bridge, as well as the assumptions and methodology used to prepare the forecasts. Additionally, an additional forecast to maintain revenue sufficiency in presented, which includes a 10 percent tailored toll increase at the beginning of 2025.

2 PROJECT DESCRIPTION AND HISTORICAL PERFORMANCE

This chapter provides an overview of the SR 520 project, as well as the description of the WSDOT's SR 520 Bridge Replacement and HOV Program, and details of the existing and future configuration of the facility, including construction related changes. The historical toll rates and traffic and gross toll revenue potential are also discussed.

2.1 PROJECT CORRIDOR

SR 520 extends about 13 miles between I-5 in the west, over Lake Washington, and SR 202 in the east. It has a major interchange with I-405 on the east side of the Lake. The facility provides a vital highway link between Seattle on the west side of Lake Washington and the eastside communities including Bellevue, Kirkland, and Redmond. Figure 2-1 shows the location of SR 520 in the Seattle area. Tolls in both directions for crossing the floating bridge portion of the facility crossing Lake Washington are collected on the east side of the bridge via electronic tolling.

Figure 2-1: SR 520 Location Map
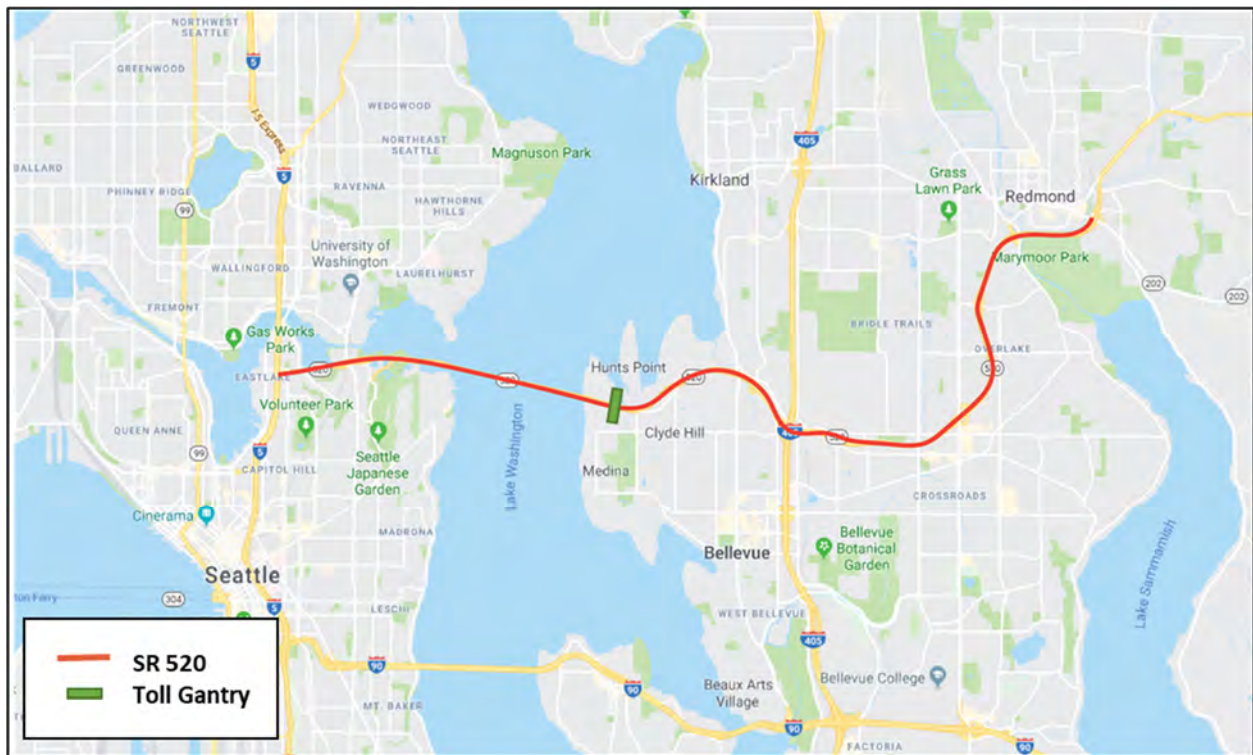
2.2 SR 520 BRIDGE REPLACEMENT AND HOV PROGRAM

WSDOT is making major enhancements to the SR 520 Bridge Replacement and HOV Program between I-5 and I-405. The program is improving traffic safety by replacing SR 520's aging and vulnerable bridges, while making other key highway improvements to enhance public mobility and transportation options throughout the corridor. The portion of SR 520 that is part of the SR 520 Bridge Replacement and HOV Program is highlighted in Figure 2-2.

Figure 2-2: SR 520 Bridge Replacement and HOV Program

The bridge configuration assumptions are based on preliminary roadway configurations identified by WSDOT and are as follows:

Between Montlake Boulevard and the west end of the main bridge span, the assumed configuration as of the May 2024 Forecast includes a new West Approach Bridge North connector and new West Approach Bridge South connector resulting in three lanes in each direction (two general-purpose and one inside transit/HOV3+ lane).

Additionally, as of FY 2024, a one lane transit/HOV3+ reversible direct connector between SR 520 and the I-5 reversible express lanes running in the direction of the I-5 reversible lanes has been completed but will not be operational until FY 2032 due to continued construction phasing in the area.

Between I-5 and Montlake Boulevard, the assumed configuration as of FY 2032 will include a new Portage Bay Bridge resulting in three lanes in each direction (two general-purpose and one inside transit/HOV 3+ lane in each direction).

2.3   SR 520 BRIDGE TOLLING HISTORY

Tolling on the SR 520 Bridge began on December 29, 2011, half-way through FY 2012. Overnight tolling between the hours of 12am and 5am began in July FY 2018. The following sections present an overview of historical traffic, revenue and toll rates on the SR 520 Bridge.

2.3.1   Overview of Historical Traffic and Revenue

Figure 2-3 shows the historical two-way AADT, by calendar year, on the SR 520 bridge. AADT is the Average Annual Daily Traffic and is equivalent to the total annual traffic (tolled and non-tolled) divided by the number of days in a given year. As shown, before tolling commenced, traffic was generally flat on SR 520; capacity constraints prevented traffic growth even through the region was growing in population and employment. Traffic did show a slight decrease in the late 2000's during the recession and the subsequent prolonged economic recovery. As shown, traffic decreased by about 36 percent when tolling commenced in December 2011; this number represents an estimate of the percent traffic diversion due to the implementation of tolling. Traffic dropped roughly 45 percent in 2020 compared to the previous year due to the pandemic. As of 2023, traffic is still not fully recovered and remains around 20 percent below pre-pandemic traffic levels in 2019.

Figure 2-3: SR 520 Bridge Two-way Average Annual Daily Traffic (AADT), CY 1992 to 2023
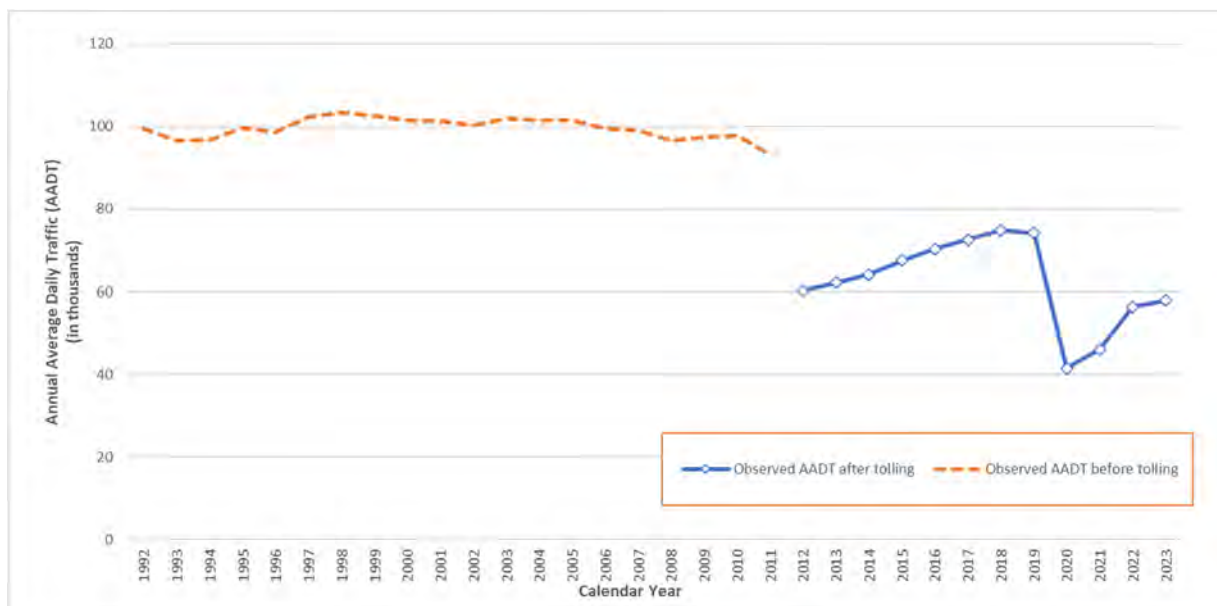
Source: WSDOT Permanent Traffic Recorder Data

Table 2-1 and

Figure 2-4 show the annual fiscal year toll transactions on SR 520 from FY 2013 through FY 2023. Annual toll transactions have increased from 20.2 million transactions in FY 2013, the first full year of toll operations, to a high of 26.5 million transactions in FY 2019 before the onset of the pandemic, a total increase of 6.3 million or about 31.2 percent. Between FY 2017 and FY 2018, annual transactions increased by 7.6 percent, partially due to the start of overnight tolling at the start of FY 2018. Prior to overnight tolling, trips between the hours of 12AM and 5AM were not included in the toll transaction count. There were 20.5 million transactions in FY 2023, a 23 percent decrease from pre-pandemic high in FY 2019.

Table 2-1: Historical Annual Toll Transactions and Gross Toll Revenues, FY 2013 to 2023

Fiscal Year	Total Transactions (millions)	Gross Toll Revenue (millions)
2013	20.2	$61.3
2014	21.0	$64.6
2015	22.0	$69.4
2016	23.2	$79.4
2017	24.0	$83.0
2018*	25.8	$90.3
2019	26.5	$92.2
2020	20.9	$72.1
2021	14.6	$52.1
2022	19.3	$64.0
2023	20.5	$68.9

Note: Tolling started in December 29, 2011, half-way through FY2012.
*Prior to FY 2018, untolled trips between 11PM and 5AM were not included in the transaction total.
Source: Annual Toll Traffic & Revenue (T&R) Reports (https://www.wsdot.wa.gov/Tolling/520/Finance.htm)

Figure 2-4: Historical SR 520 Bridge Two-way Toll Transactions, FY 2013 to 2023
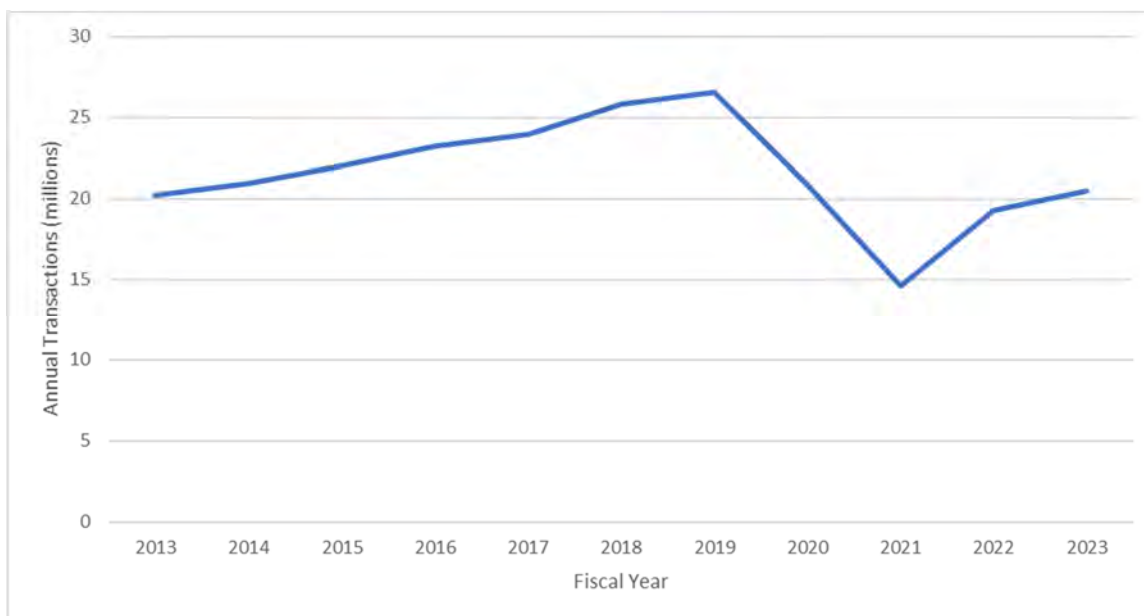
Notes: Tolling started in December 29, 2011, half-way through FY2012.
Prior to FY 2018, untolled trips between 11PM and 5AM were not included in the transaction total
Source: Annual T&R reports (https://www.wsdot.wa.gov/Tolling/520/Finance.htm)

Table 2-1, above, and Figure 2-5 show the annual gross toll revenues on SR 520, beginning FY 2013, the first full year of tolling. Annual toll revenues have increased from $61.3 million in FY 2013, to a high of $92.2 million in FY 2019 before the onset of the pandemic, a total increase of $30.9 million or about 50.4 percent. Between FY 2019 and

FY 2023, annual gross toll revenue decreased by 25 percent. This large decrease was caused by the pandemic itself and long-term changes in driver behavior following the pandemic. While SR 520 gross toll revenue is still below FY 2019 revenue, there are signs of recovery as revenue increased 8 percent from FY 2022 to FY 2023.

Figure 2-5: Historical SR 520 Bridge Two-way Reported Gross Toll Revenues, FY 2013 to 2023
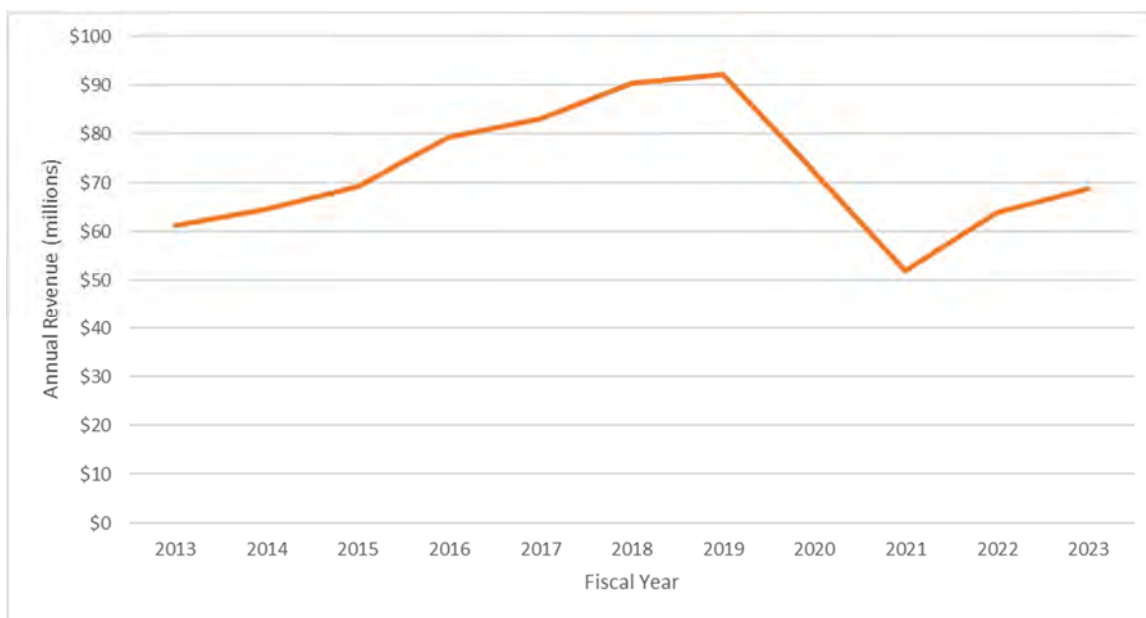
Notes: Tolling started in December 29, 2011, half-way through FY2012.
Prior to FY 2018, untolled trips between 11PM and 5AM were not included in the transaction total
Source: Annual T&R reports (https://www.wsdot.wa.gov/Tolling/520/Finance.htm)

2.3.2 Toll Rate History

Tolling on the original SR 520 bridge began in both directions on December 29, 2011 to supplement funding for the construction of the new floating bridge that opened in April 2016. Tolls vary by time of day and by weekday and weekend, but not by direction. Two primary toll payment methods are available: a *Good To Go!* prepaid account that detects the customer via a pass or license plate recognition; and Pay By Mail, in which the vehicle's registered owner's name and address are identified from the license plate and then mailed a toll bill. There is no cash toll collection. The Washington State Transportation Commission ("WSTC") has approved and implemented seven separate toll increases since tolling began in December 2011 (FY 2012). These increases commenced on July 1 (which is the start of each FY) of every year between 2013 and 2018, with another toll increase in FY 2024. Table 2-2 and Table 2-3 show the directional weekday *Good to Go!* and Pay By Mail passenger car toll schedules in effect from FY 2012 onward. Table 2-4 and Table 2-5 show the directional weekend *Good to Go!* and Pay By Mail passenger car toll schedules in effect from FY 2012 onward. The weekday *Good to Go!* passenger car rates are also shown in Figure 2-6. Vehicles with more than two axles pay a higher pro-rated toll rate. As part of the FY 2024 toll increase, the peak and shoulder peak time periods shifted slightly during the day. Figure 2-7 and Figure 2-8 depict the Good to Go! rate changes between FY 2023 and FY 2024 for weekday and weekend, respectively.

Table 2-2: SR 520 Weekday 2-Axle Toll Schedule – *Good to Go!* Rates, Each Direction, FY 2012 to Present

Time Period	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
FY 2012	$0.00					$1.60	$2.80	$3.50		$2.80	$2.25				$2.80	$3.50		$2.80	$2.25		$1.60			$0.00
FY 2013	$0.00					$1.64	$2.87	$3.59		$2.87	$2.31				$2.87	$3.59		$2.87	$2.31		$1.64			$0.00
FY 2014	$0.00					$1.70	$2.95	$3.70		$2.95	$2.35				$2.95	$3.70		$2.95	$2.35		$1.70			$0.00
FY 2015	$0.00					$1.75	$3.00	$3.80		$3.00	$2.40				$3.00	$3.80		$3.00	$2.40		$1.75			$0.00
FY 2016	$0.00					$1.80	$3.10	$3.90		$3.10	$2.45				$3.10	$3.90		$3.10	$2.45		$1.80			$0.00
FY 2017	$0.00					$1.90	$3.25	$4.10		$3.25	$2.55				$3.25	$4.10		$3.25	$2.55		$1.90			$0.00
FY 2018	$1.25					$2.00	$3.40	$4.30		$3.40	$2.70				$3.40	$4.30		$3.40	$2.70		$2.00			$1.25
FY 2024	$1.25					$2.50	$3.80	$4.50			$3.80	$3.25			$3.80	$4.50			$3.80	$3.25	$2.50			$1.25

Note: Fiscal Year (FY) is defined as the 12-month period ending June 30 of that year. For example, FY 2013 refers to the 12-month period beginning July 1, 2012 and ending June 30, 2013.

Table 2-3: SR 520 Weekday 2-Axle Toll Schedule – Pay By Mail Rates, Each Direction, FY 2012 to Present

Time Period	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
FY 2012	$0.00					$3.10	$4.30	$5.00		$4.30	$3.75				$4.30	$5.00		$4.30	$3.75		$3.10			$0.00
FY 2013	$0.00					$3.18	$4.41	$5.13		$4.41	$3.84				$4.41	$5.13		$4.41	$3.84		$3.18			$0.00
FY 2014	$0.00					$3.25	$4.50	$5.25		$4.50	$3.95				$4.50	$5.25		$4.50	$3.95		$3.25			$0.00
FY 2015	$0.00					$3.35	$4.60	$5.40		$4.60	$4.05				$4.60	$5.40		$4.60	$4.05		$3.35			$0.00
FY 2016	$0.00					$3.45	$4.70	$5.55		$4.70	$4.15				$4.70	$5.55		$4.70	$4.15		$3.45			$0.00
FY 2017	$0.00					$3.90	$5.25	$6.10		$5.25	$4.55				$5.25	$6.10		$5.25	$4.55		$3.90			$0.00
FY 2018	$3.25					$4.00	$5.40	$6.30		$5.40	$4.70				$5.40	$6.30		$5.40	$4.70		$4.00			$3.25
FY 2024	$3.25					$4.50	$5.80	$6.50			$5.80	$6.70			$5.80	$8.30			$5.80	$5.25	$6.00			$3.25

Note: Fiscal Year (FY) is defined as the 12-month period ending June 30 of that year. For example, FY 2013 refers to the 12-month period beginning July 1, 2012 and ending June 30, 2013.

Table 2-4: SR 520 Weekend 2-Axle Toll Schedule – *Good to Go!* Rates, Each Direction, FY 2012 to Present

Time Period	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
FY 2012	$0.00						$1.10		$1.65			$2.20							$1.65			$1.10		$0.00
FY 2013	$0.00						$1.13		$1.69			$2.26							$1.69			$1.13		$0.00
FY 2014	$0.00						$1.15		$1.75			$2.30							$1.75			$1.15		$0.00
FY 2015	$0.00						$1.20		$1.80			$2.35							$1.80			$1.20		$0.00
FY 2016	$0.00						$1.25		$1.85			$2.40							$1.85			$1.25		$0.00
FY 2017	$0.00						$1.30		$1.95			$2.50							$1.95			$1.30		$0.00
FY 2018	$1.25						$1.40		$2.05			$2.65							$2.05			$1.40		$1.25
FY 2024	$1.25						$1.60		$2.35			$3.05							$2.35			$1.60		$1.25

Table 2-5: SR 520 Weekend 2-Axle Toll Schedule – Pay By Mail Rates, Each Direction, FY 2012 to Present

Time Period	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
FY 2012	$0.00						$2.60		$3.15			$3.70							$3.15		$2.60		$0.00	
FY 2013	$0.00						$2.67		$3.23			$3.79							$3.23		$2.67		$0.00	
FY 2014	$0.00						$2.75		$3.30			$3.90							$3.30		$2.75		$0.00	
FY 2015	$0.00						$2.80		$3.40			$4.00							$3.40		$2.80		$0.00	
FY 2016	$0.00						$2.85		$3.50			$4.10							$3.50		$2.85		$0.00	
FY 2017	$0.00						$3.30		$3.95			$4.50							$3.95		$3.30		$0.00	
FY 2018	$3.25						$3.40		$4.05			$4.65							$4.05		$3.40		$3.25	
FY 2024	$3.25						$3.60		$4.35			$5.05							$4.35		$3.60		$3.25	

Figure 2-6: SR 520 2-Axle Good to Go! Weekday Maximum Toll Rate History, Each Direction
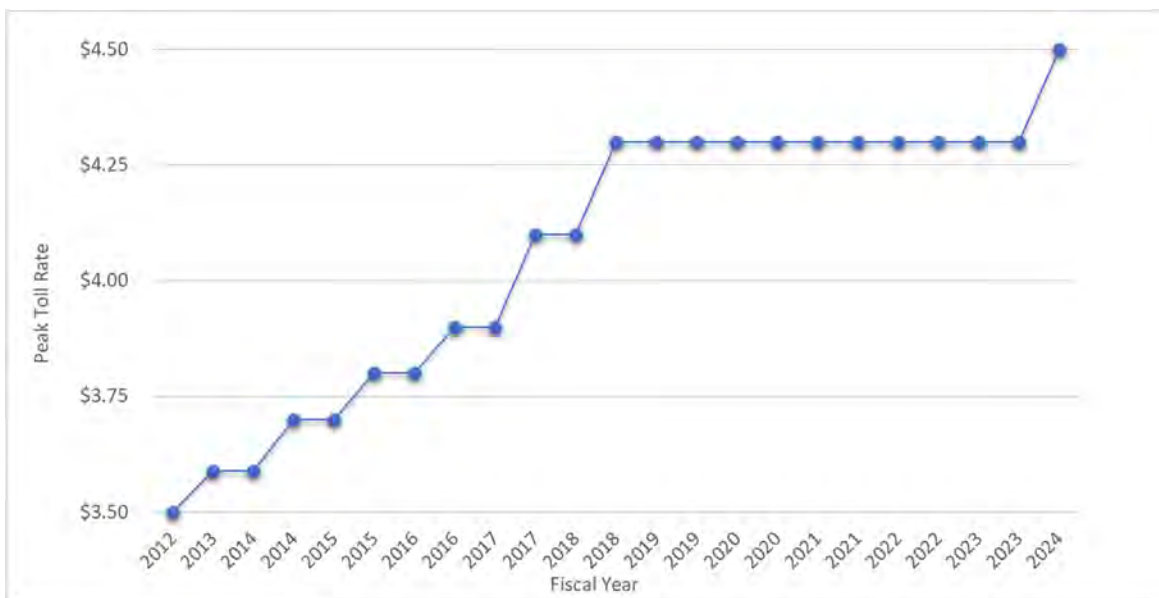
Figure 2-7: FY 2023 vs FY 2024 Weekday Toll Rate Changes, 2-Axle Good To Go!
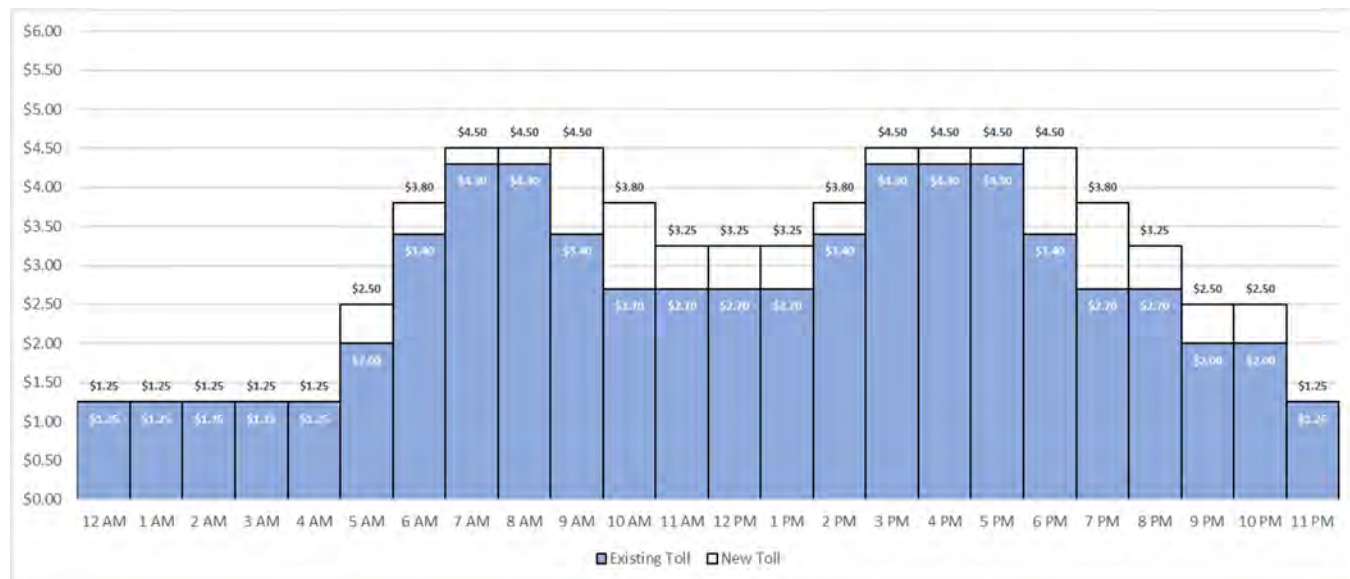
Figure 2-8: FY 2023 vs FY 2024 Weekend Toll Rate Changes, 2-Axle *Good To Go!*
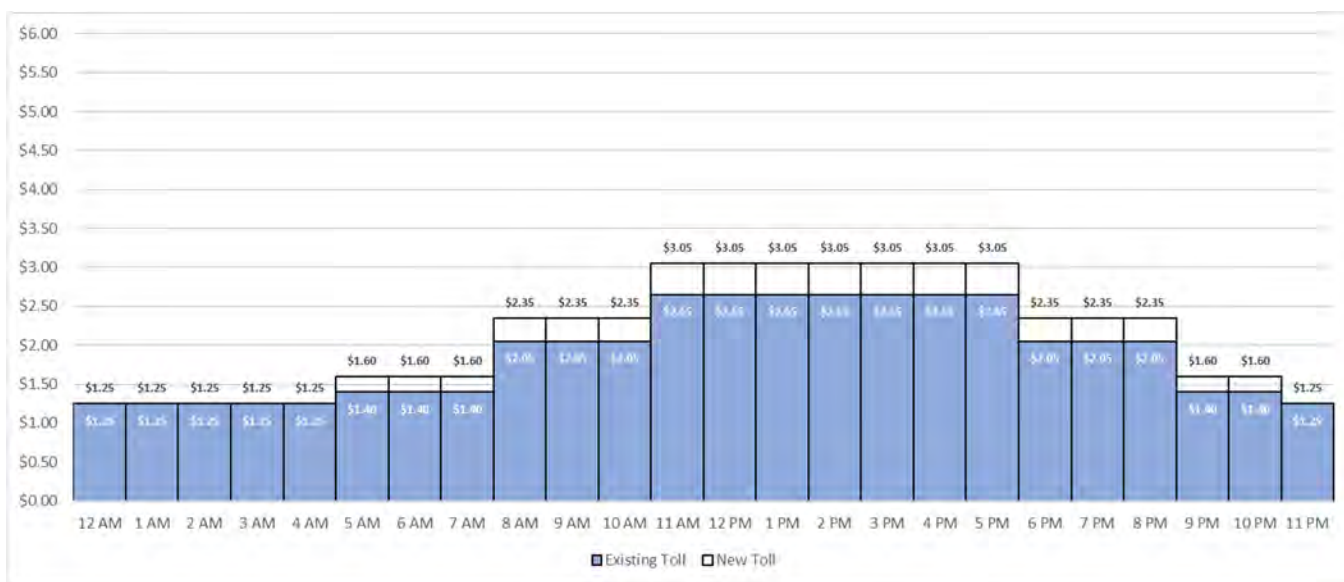
From FY 2013 through FY 2016, toll rates were increased by 2.5 percent per year; however, because rounding to the nearest $0.05 (nickel rounding) was instituted in FY 2014, the FY 2014 through FY 2016 growth in toll rates vary slightly; some toll rates show increases slightly lower than 2.5 percent while others show increases slightly higher than 2.5 percent. In FY 2017 and 2018, *Good to Go!* rates were increased by 5 percent. Again, the actual increases were slightly different than the 5 percent because tolls were rounded to the nearest nickel. Also beginning in FY 2017, the Pay By Mail rate is equal to the *Good to Go!* rate plus a $2.00 increment. The multi-axle vehicle toll rate is equal to the per-axle rate for 2-axle vehicles multiplied by the number of axles and then rounded to the nearest $0.05. The

toll rate for a vehicle with more than six axles is the 6-axle vehicle rate. As shown, overnight tolling - between 11 PM and 5 AM - began in FY 2018 on both weekdays and weekends. FY 2024 had tailored toll increases in the daytime and evening roughly averaging 15 percent.

The maximum *Good to Go!* 2-axle toll in the current toll schedule is $4.50, which is in effect on weekdays from 7 to 10 AM and from 3 to 7 PM, the peak commuting hours. During this toll increase, the AM and PM peak toll periods both grew by an hour. The maximum weekend 2-axle *Good to Go!* toll is $3.05. Overnight tolls on both weekdays and weekends are the lowest available toll rate by payment type: the *Good to Go!* 2-axle rate is $1.25.

3   SR 520 TRAFFIC CHARACTERISTICS

In this chapter, observations of recent historical traffic across lake Washington and on SR 520 is presented, detailed to hour, day of week, month, and annual. Data were summarized from CDR, MTR, and transaction summary data for FY 2019 (pre-pandemic), FY 2022, and FY 2023 (the most recent full fiscal year). These data were used in both the calibration and the evaluation of recent trends on the facility.

3.1   LAKE WASHINGTON VOLUMES

The SR520 Bridge has a parallel competitor, I-90, that also provides travel across Lake Washington. Many of the trips that utilize SR520 could also choose to use I-90, and vice versa. The following Figure 3-1 presents a comparison of monthly trips on both SR520 and I-90 combined, over the past several years, sourced from CDR loop data. This provides better context of potential "demand" for SR520 than transaction volumes on SR520 alone. The graph shows that combined crossings on these two bridges have shifted from FY 2019 (pre-pandemic) to FY 2022 and FY 2023. From 2019 through 2022, significant changes were seen in average daily traffic volumes throughout the world, as people adjusted to the presence of COVID-19. From 2022 to 2023 some improvement in traffic volumes were observed, but total Lake Washington crossings have still not returned to pre-pandemic levels.

Figure 3-1: Average Daily Screen Line Volumes Compared By Month
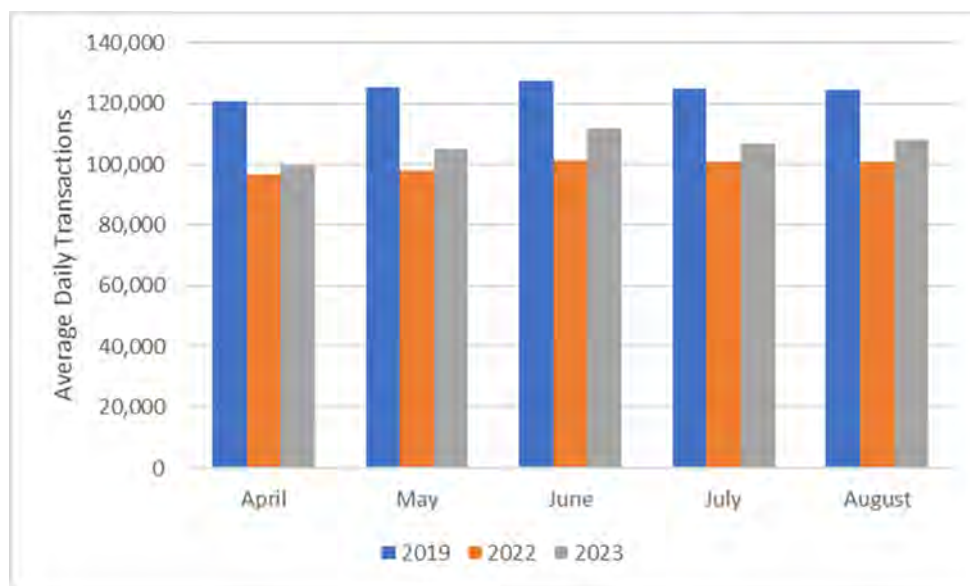
As the pandemic reduced overall lake crossings, the split between the two roadways also shifted. This is depicted in Figure 3-2. In FY 2019, prior to the pandemic, roughly 34 percent of Lake Washington crossings utilized SR 520. However, more recently, closer to 30 percent chose SR 520. This shift in screen line split away from SR 520 likely has several causes, the first of which is the fact that SR 520 is tolled while I-90 is a free road. Additionally, construction activity on SR 520 over the past few years has likely made it a less appealing option than it would be under non-construction conditions.

Figure 3-2: Screen Line Split SR 520 vs I-90

3.2 SR 520 BRIDGE TRAFFIC VOLUMES

SR 520 traffic and revenue data are reviewed on an ongoing basis. Hourly, daily, monthly, and annual data are analyzed to understand how traffic trends are evolving on SR 520.

3.2.1 Hourly Traffic Volumes on a Typical Weekday

MTR (Monthly Transaction Reports) from the toll collection system was utilized to analyze hourly data. The typical hourly traffic over the SR 520 bridge was calculated by averaging the hourly traffic for Tuesday through Thursday for the full 2023 fiscal year. Figure 3-3 shows the traffic that traveled over the SR 520 bridge on an average weekday (Tuesday through Thursday) during the full FY 2023. As the graphs show, the morning traffic peaks around 8:00 AM in the eastbound direction with about 2,800 vehicles per hour. In the westbound direction, morning traffic also peaks around 8:00 AM, with roughly 2,500 vehicles per hour. In the afternoon, eastbound traffic peaks during the 4:00 PM and 5:00 PM hours, each with about 2,500 vehicles. Westbound traffic also peaks around 4:00 PM, with roughly 2,800 vehicles per hour. AM and PM peak period volumes do not differ drastically by direction. In the westbound direction, the PM peak is slightly higher than the AM peak hour volume, while in the eastbound direction, the AM peak is somewhat higher than the PM peak hour volume. The bridge carries an average of 66,000 vehicles per average weekday, with approximately 33,000 vehicles in each direction.

Figure 3-3: Typical Tuesday to Thursday (Weekday) SR 520 Bridge Traffic, by Direction, FY 2023
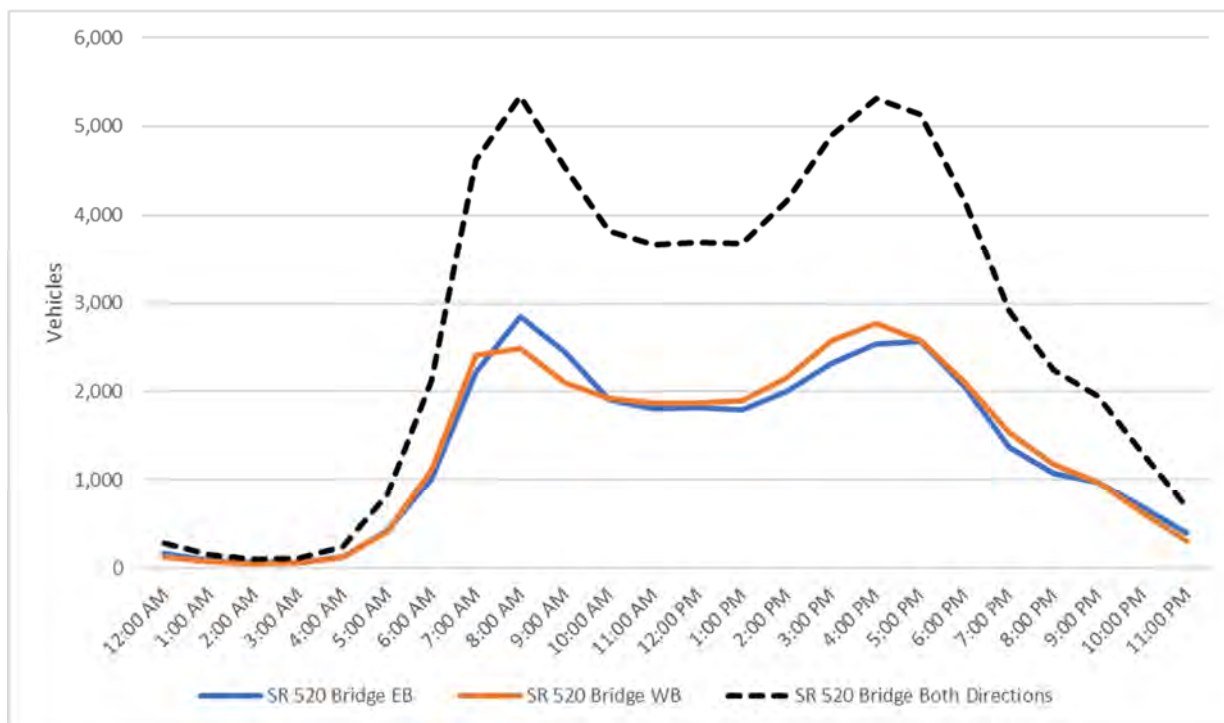
Source: Tuesday-Thursday MTR data, Fiscal Year 2023 (July 2022-June 2023)

With many daily commuters still working from home in through FY 2023 and likely beyond, volumes during peak travel periods have flattened and are yet to recover to pre-COVID levels. Stantec believes that travel behavior changes related to the pandemic, mainly increased Work-from-Home, have stabilized.

Figure 3-4 and Figure 3-5 show the average daily volumes for a typical weekday in the month of October for five years between 2019 and 2023. The percentages show the change in peak hour volume from pre-COVID levels in October 2019. In these figures, average Tuesday through Thursday traffic is compared for October 2019, October 2020, October 2021, October 2022, and October 2023 to show the changes in time-of-day travel and the recovery trend.

Figure 3-4 SR 520 EB Average Tuesday - Thursday Hourly Traffic, October 2019, 2020, 2021, 2022 and 2023
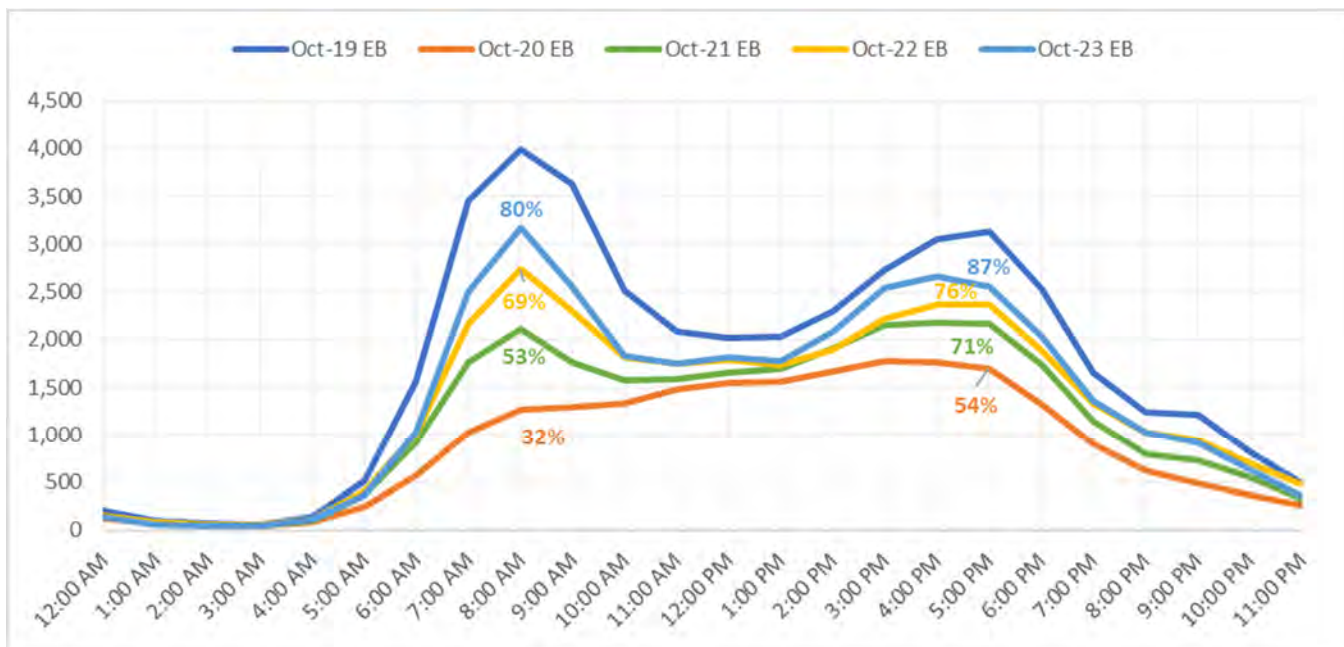
Note: Percentages represent hourly volume as a share of 2019 Baseline

Figure 3-5 SR 520 WB Average Tuesday - Thursday Hourly Traffic, October 2019, 2020, 2021, 2022, and 2023
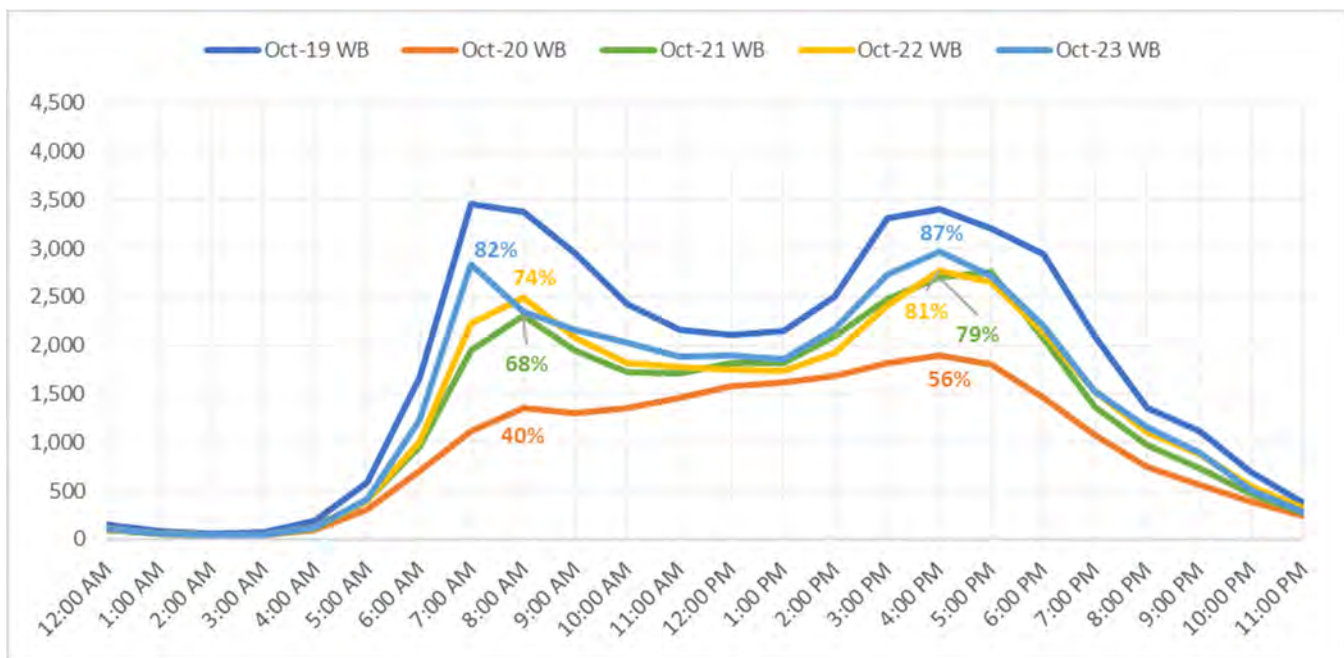
Note: Percentages represent hourly volume as a share of 2019 Baseline

3.2.2 Toll Transaction Volumes by Day of the Week

Table 3-1 shows the total daily MTR toll transaction data by day of the week for the month of May in FY 2019, FY 2022 and FY 2023. These summaries represent unadjusted data and do not include any adjustments for construction or weather-related impacts. Table 3-1 and Figure 3-6 show the average daily toll transactions by day of the week for the month of May in FY 2019, FY 2022, and FY 2023. As shown, traffic crossing the bridge in FY 2019, pre-pandemic, was much lower over the weekend than on a weekday. Sunday was the least traveled day, while Wednesday and Thursday were the most traveled days of the week. After changes in travel resulting from the pandemic, there is not nearly as much of a difference between weekday and weekend traffic in FY 2022 and FY 2023, although weekday traffic is still a bit higher than weekend traffic.

Table 3-1: SR 520 Bridge Annual Toll Transactions by Day of the Week, FY 2019, 2022 and 2023

Day of Week	May 2019 - Transactions		May 2022 - Transactions		May 2023 - Transactions	
	Day Total	Percent of Month	Day Total	Percent of Month	Day Total	Percent of Month
Mon	290,609	11.86%	264,601	14.72%	276,632	14.42%
Tue	351,117	14.33%	321,487	17.89%	341,010	17.78%
Wed	451,505	18.43%	264,713	14.73%	350,027	18.25%
Thu	456,074	18.61%	264,557	14.72%	277,291	14.46%
Fri	442,097	18.04%	256,781	14.29%	254,856	13.29%
Sat	250,050	10.20%	205,784	11.45%	223,940	11.67%
Sun	209,049	8.53%	219,304	12.20%	194,410	10.14%
Total	2,450,501	100%	1,797,227	100%	1,918,166	100%

Source: Unadjusted CSC Vendor (ETCC) TCS AVI Lane Count Reconciliation Report.

Figure 3-6 SR 520 Bridge Average Daily Toll Transactions by Day of the Week, May 2019, 2022, and 2023
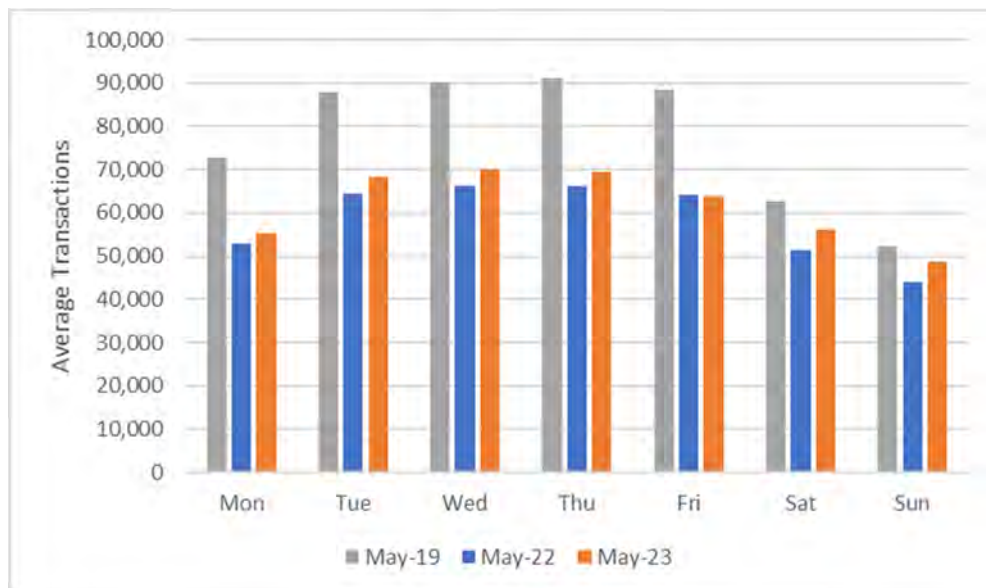
3.2.3 Toll Transactions by Month

Table 3-2 shows the historical toll transactions by month since FY 2013 as reported for the monthly reviews and as used for the basis of the forecast. The amount of toll transactions each month is affected by factors including construction closures, weather events, traffic events, and the number of weekdays and weekend days each month. Toll transactions prior to FY 2018 do not include overnight transactions, as overnight toll collection was not in effect prior to FY 2018. In FY 2020, the effects of the pandemic on traffic are clear starting in March 2020. Recovery can be seen later in FY 2021 and onward. However, when comparing monthly FY 2023 to FY 2019, each FY 2023 month is still below the pre-pandemic transactions seen in the corresponding month of FY 2019.

These summaries are not adjusted for the times when the bridge was impacted by construction and it is assumed that these data also serve to approximate the distribution of traffic volumes crossing the SR 520 bridge by month. As shown by the percentages, traffic crossing the bridge tends to be generally lower in the winter months than the summer months.

Table 3-2: SR 520 Bridge Total Toll Transactions in Both Directions by Month, FY 2013 to FY 2023

	FY 2013	FY 2014		FY 2015		FY 2016	
	Monthly Transactions	Monthly Transactions	% Annual	Monthly Transactions	% Annual	Monthly Transactions	% Annual
July	$4,976,772	$5,359,491	7.7%	$5,911,195	10.3%	$6,617,330	11.9%
August	$5,398,814	$5,693,623	5.5%	$5,682,554	-0.2%	$6,617,330	16.4%
September	$4,836,775	$5,149,693	6.5%	$5,695,356	10.6%	$6,617,330	16.2%
October	$5,459,692	$5,827,248	6.7%	$5,937,936	1.9%	$6,617,330	11.4%
November	$4,853,751	$5,138,744	5.9%	$5,084,915	-1.0%	$6,617,330	30.1%
December	$4,797,087	$5,108,936	6.5%	$5,630,420	10.2%	$6,617,330	17.5%
January	$5,138,969	$5,458,848	6.2%	$5,624,088	3.0%	$6,617,330	17.7%
February	$4,686,538	$4,821,340	2.9%	$5,361,470	11.2%	$6,617,330	23.4%
March	$5,364,149	$5,726,176	6.7%	$6,123,337	6.9%	$6,617,330	8.1%
April	$5,075,045	$5,683,192	12.0%	$6,103,275	7.4%	$6,617,330	8.4%
May	$5,574,437	$5,598,529	0.4%	$6,218,715	11.1%	$6,617,330	6.4%
June	$5,139,682	$5,023,328	-2.3%	$6,009,948	19.6%	$6,617,330	10.1%
Annual	$61,301,711	$64,589,148	5.4%	$69,383,209	7.4%	$79,407,960	14.4%

	FY 2017		FY 2018		FY 2019		FY 2020	
	Monthly Transactions	% Annual	Monthly Transactions	% Annual	Monthly Transactions	% Annual	Monthly Transactions	% Annual
July	$6,918,129	4.5%	$7,251,799	4.8%	$8,016,653	10.5%	$8,161,720	1.8%
August	$6,918,129	4.5%	$7,577,321	9.5%	$8,525,175	12.5%	$8,330,435	-2.3%
September	$6,918,129	4.5%	$7,610,261	10.0%	$7,336,869	-3.6%	$7,694,350	4.9%
October	$6,918,129	4.5%	$7,736,090	11.8%	$8,335,038	7.7%	$7,999,553	-4.0%
November	$6,918,129	4.5%	$7,259,070	4.9%	$7,398,406	1.9%	$6,827,481	-7.7%
December	$6,918,129	4.5%	$6,906,815	-0.2%	$6,936,052	0.4%	$6,901,191	-0.5%
January	$6,918,129	4.5%	$7,388,048	6.8%	$7,557,734	2.3%	$6,840,737	-9.5%
February	$6,918,129	4.5%	$6,812,754	-1.5%	$5,788,159	-15.0%	$6,835,178	18.1%
March	$6,918,129	4.5%	$7,955,736	15.0%	$8,010,151	0.7%	$3,910,044	-51.2%
April	$6,918,129	4.5%	$7,481,004	8.1%	$7,883,406	5.4%	$2,013,743	-74.5%
May	$6,918,129	4.5%	$8,259,900	19.4%	$8,337,761	0.9%	$2,853,456	-65.8%
June	$6,918,129	4.5%	$8,110,303	17.2%	$8,062,249	-0.6%	$3,754,810	-53.4%
Annual	$83,017,548	4.5%	$90,349,101	8.8%	$92,187,653	2.0%	$72,122,698	-21.8%

	FY 2021		FY 2022		FY 2023	
	Monthly Transactions	% Annual	Monthly Transactions	% Annual	Monthly Transactions	% Annual
July	$4,219,610	-48.3%	$5,595,015	32.6%	$5,707,064	2.0%
August	$4,107,377	-50.7%	$5,306,190	29.2%	$6,211,693	17.1%
September	$3,940,575	-48.8%	$5,288,822	34.2%	$6,055,041	14.5%
October	$4,448,255	-44.4%	$5,322,707	19.7%	$5,541,742	4.1%
November	$3,753,204	-45.0%	$4,923,064	31.2%	$5,395,846	9.6%
December	$4,055,751	-41.2%	$4,912,386	21.1%	$5,054,720	2.9%
January	$3,692,760	-46.0%	$4,524,868	22.5%	$5,160,175	14.0%
February	$3,429,369	-49.8%	$4,656,587	35.8%	$4,843,567	4.0%
March	$4,413,428	12.9%	$5,813,579	31.7%	$6,293,870	8.3%
April	$5,536,231	174.9%	$5,537,596	0.0%	$5,805,095	4.8%
May	$5,155,059	80.7%	$5,831,932	13.1%	$6,387,527	9.5%
June	$5,300,466	41.2%	$6,245,732	17.8%	$6,436,379	3.1%
Annual	$52,052,085	-27.8%	$63,958,480	22.9%	$68,892,719	7.7%

Note: As reported for the monthly reviews and as used for the basis of the forecast.
Overnight tolling began FY 2018.
In July and August 2018 (FY 2019) there were higher than normal volumes due to I-90 closures related to the Seafair Air Show.
In February 2019 there were lower than normal traffic volumes due to record-breaking snow in Seattle

Figure 3-7 shows graphically the monthly trends in toll transactions from FY 2019 through FY 2023. As shown, while the monthly transactions are still below pre-pandemic values, there has been growth each year since the pandemic.

Additionally, seasonality trends have shifted with pandemic recovery. What was previously greater variation throughout the months has smoothed out a bit, particularly in the summer months, when compared to FY 2019.

Figure 3-7: SR 520 Bridge Total Toll Transactions in Both Directions by Month, FY 2019 to FY 2023
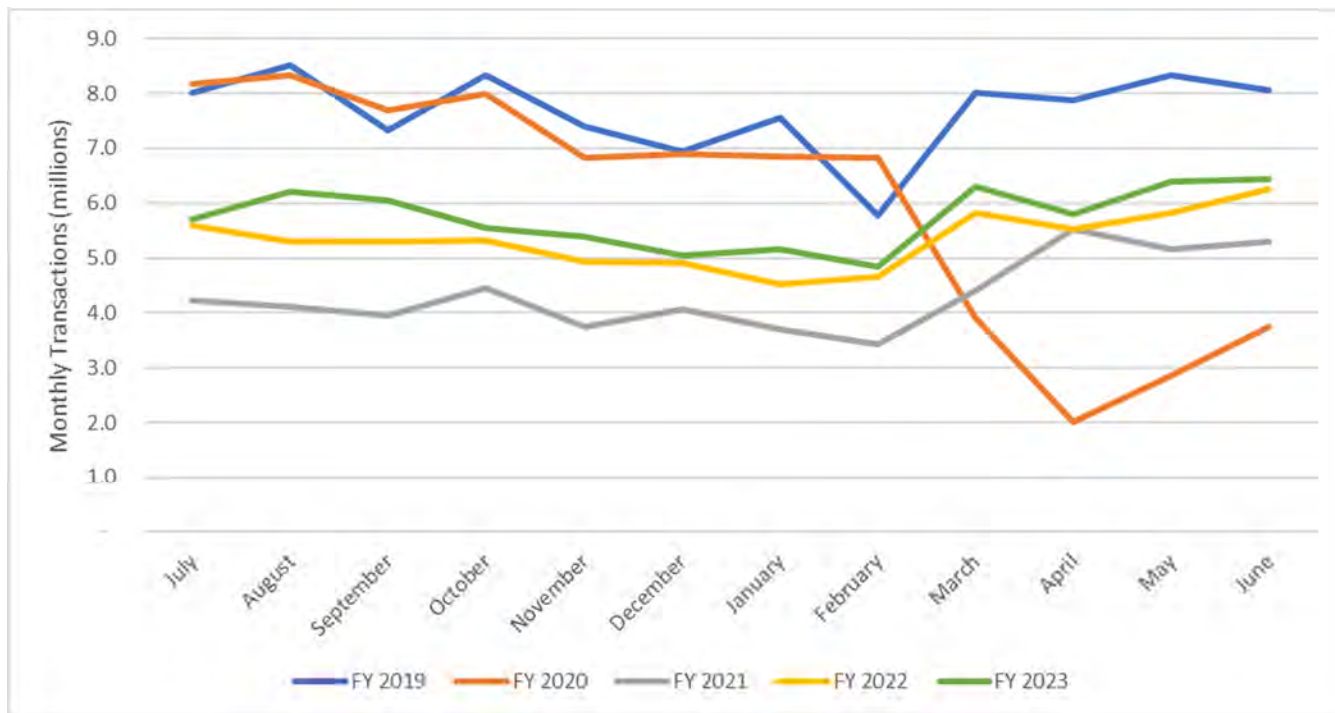
3.3 TOLL TRANSACTIONS BY PAYMENT TYPE

Table 3-3 shows the toll transactions by payment type from FY 2016 through FY 2023. The majority of transactions are paid using a *Good to Go!* account. While the use of *Good to Go!* accounts was slowly increasing over time, with over 87 percent of transactions were paid using *Good to Go!* accounts in FY 2019, payment shares of non-account based transactions have trended upward since the pandemic, likely related to a drop-off in frequent commuter travel, who tend to have accounts. It should be noted that the number of account-based transactions has been affected by changes in reporting related to the transition to a new back-office system in 2021 as well as the addition of post-paid accounts and the correlating increase in delinquent accounts. In FY 2023, the number of Pay-by-Mail (non-account) transactions was 16 percent, similar to what was reported in FY 2019. It can also be observed that the share of trips using a *Good to Go!* pass versus pay by plate account has been trending downward slowly over time. Some 75 percent of *Good to Go!* transactions were made using a *Good to Go!* pass in FY 2016; by FY 2023 this share had decreased to 69 percent. Note that the non-revenue transactions represent about two percent of the total transactions that are processed by the CSC each year.

Table 3-3: Toll Transactions by Payment Type, FY 2016 to 2023

Year	Good To Go!		Pay By Mail	Total
	Pass	**Pay By Plate**	**Paid**	
Reported Transactions				
FY 2016	14,601,694	4,901,591	3,716,714	23,220,000
FY 2017	15,087,042	5,174,058	3,713,678	23,974,779
FY 2018	16,244,807	6,347,106	3,193,442	25,785,356
FY 2019	16,577,025	6,656,833	3,289,217	26,523,075
FY 2020	13,127,560	5,122,216	2,636,256	20,886,032
FY 2021	8,846,089	3,669,345	2,121,503	14,636,937
FY 2022	11,673,200	5,084,701	2,526,320	19,284,221
FY 2023	11,918,790	5,281,235	3,278,443	20,478,468
Payment Share of Tolled Transactions				
FY 2016	62.9%	21.1%	16.0%	
FY 2017	62.9%	21.6%	15.5%	
FY 2018	63.0%	24.6%	12.4%	
FY 2019	62.5%	25.1%	12.4%	
FY 2020	62.9%	24.5%	12.6%	
FY 2021	60.4%	25.1%	14.5%	
FY 2022	60.5%	26.4%	13.1%	
FY 2023	58.2%	25.8%	16.0%	

Source: WSDOT data reports

Figure 3-8 and Figure 3-9 show the weekday toll transactions by time of day for May FY 2023, a representative month from recent FY 2023. As shown, toll transactions are the highest during the peak periods and are about 30 percent lower than the peaks in the midday period. The number of transactions increase rapidly before the AM Peak and decrease relatively quickly after the PM Peak. This figure also shows the distribution of the FY 2023 transactions by payment type identified in the lane at the time of transaction. As expected, *Good to Go!* Pass payments (AVI) are most common in the AM and PM Peak periods, when the most frequent customers, commuters, are on the facility. Image-based transactions (including *Good to Go!* Pay by Plate and non-account Pay by Mail) are not as prevalent in the AM peak but more so in the midday and early PM peak; these are typically the times of the day when customers have more flexibility and are less frequent users of the facility, and therefore less likely to have a *Good to Go!* Pass installed in their vehicle. Figure 3-10 and Figure 3-11 show similar detail for an average weekend day.

Figure 3-8: FY May 2023 Weekday Toll Transaction Payment Type by Hour - Eastbound
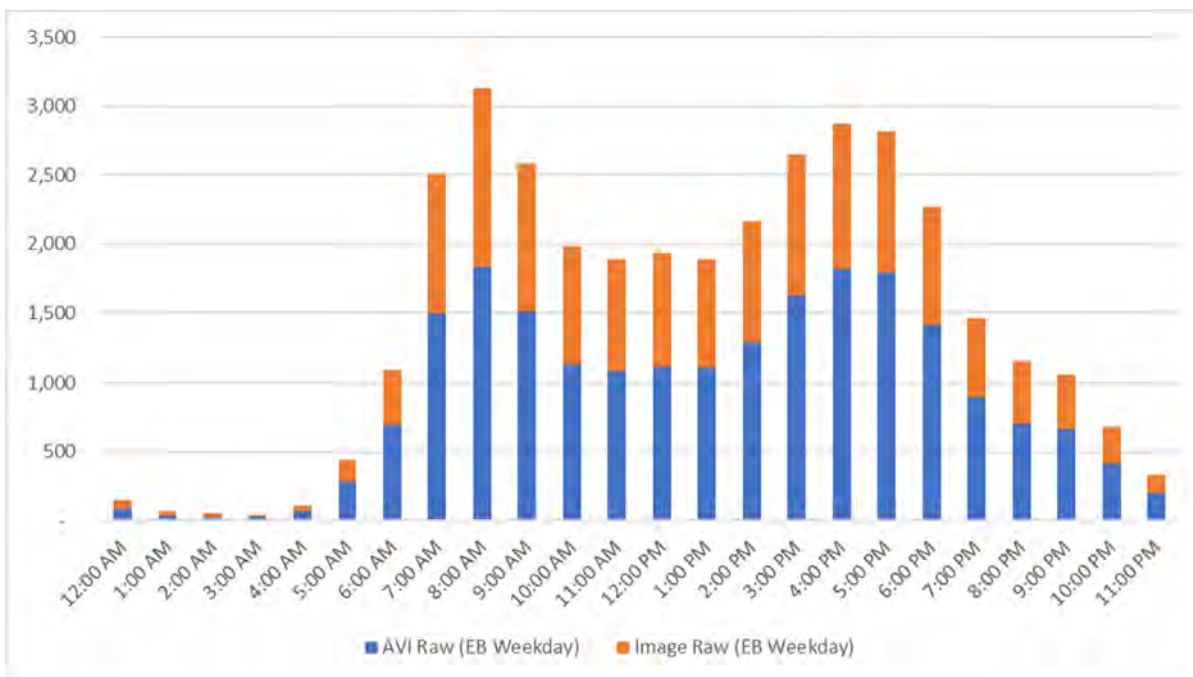
Figure 3-9: FY May 2023 Weekday Toll Transaction Payment Type by Hour - Westbound
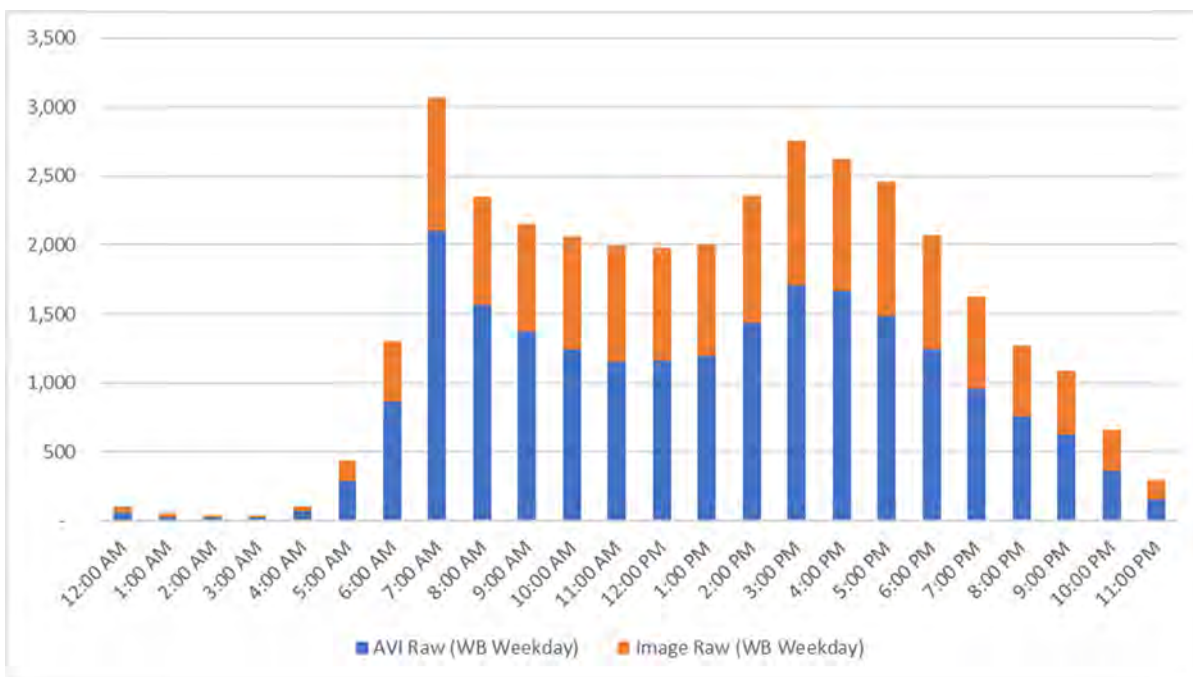
Figure 3-10: FY May 2023 Weekend Toll Transaction Payment Type by Hour - Eastbound
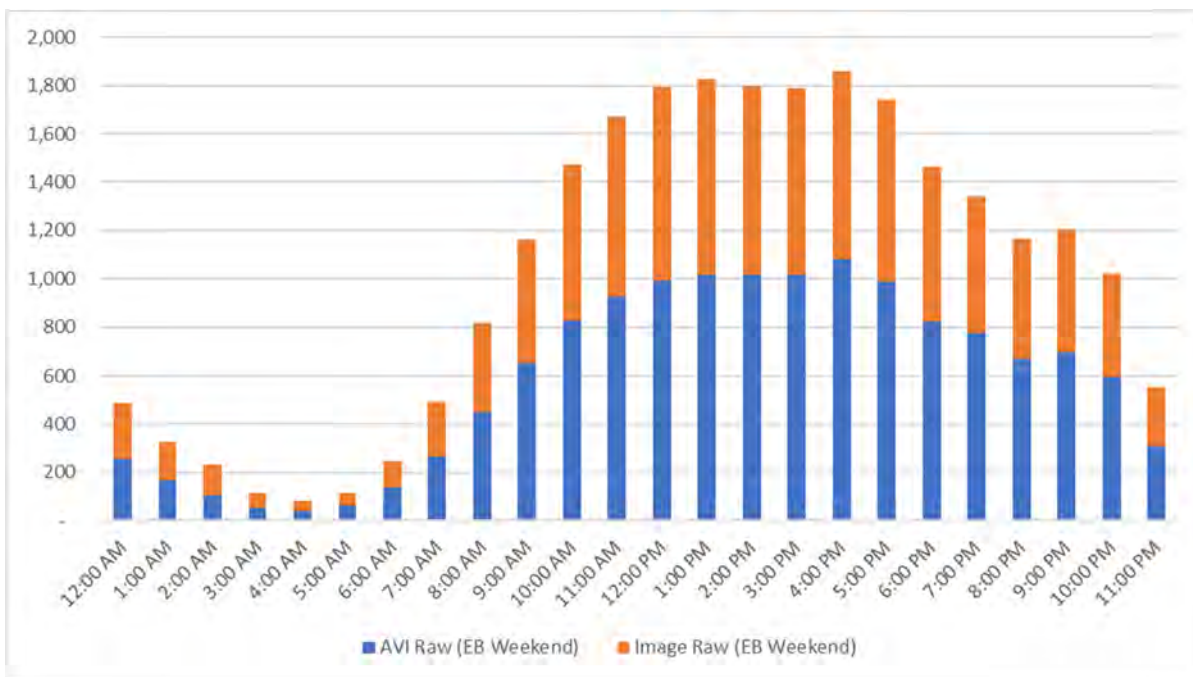
Figure 3-11: FY May 2023 Weekend Toll Transaction Payment Type by Hour - Westbound
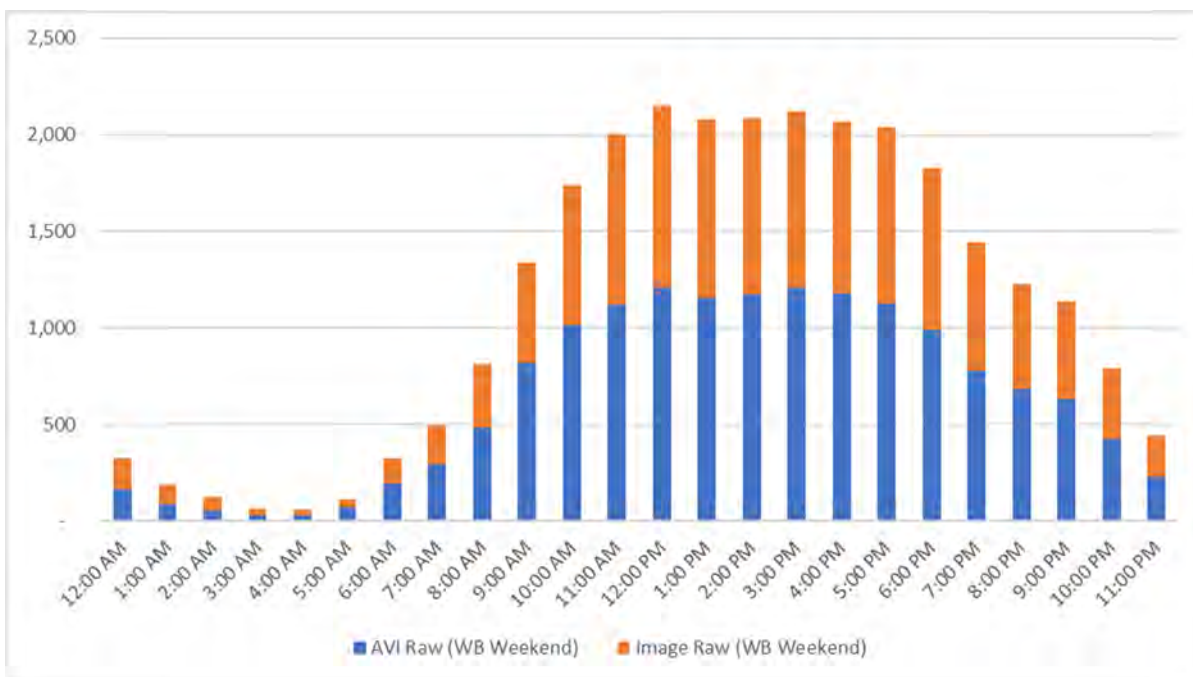
Table 3-4 shows the revenue distribution by payment type by class for FY 2023, the most recent data set available with this level of detail. As shown, most of the traffic is 2-axle vehicles with roughly one percent of annual transactions generated by vehicles larger than 2-axles. It is worth noting that the 3-axle vehicle category includes transit buses.

Table 3-4: FY 2023* Annual Toll Transactions by Payment Type and Vehicle Class

Vehicle Class	Good To Go!		Pay By Mail	Unbillable	Unresolved	Non Rev	Total Transactions	Share of Rev Transactions
	Pass	Pay By Plate	Paid					
2	11,587,039	5,701,484	1,400,088	386	1,626,058	269,584	20,584,639	99.2%
3	37,770	24,093	7,375	3	15,970	96,477	181,688	0.4%
4	15,440	10,911	3,573	1	6,056	301	36,282	0.2%
5	4,870	7,482	2,985	1	5,243	47	20,628	0.1%
6	11,190	7,152	2,780	1	2,302	14	23,439	0.1%

*Most recent data available.

3.3.1 Changes to Back-Office Reporting

As of July 1, 2021, WSDOT transitioned to a new back-office vendor, allowing for increased data granularity. The updated reporting structure allows image-based transactions to be identified as belonging to accounts more efficiently than the older data reporting process, resulting in fewer vehicles being incorrectly assigned by default the higher Pay-by-Mail (PBM) toll rate. This results in estimates of potential revenue that more accurately reflect reality and require less data modifications over time. Additionally, there is better clarity of payment methods (e.g., Good To Go! Transponder, Good To Go! Pay-by-Plate, Pay-by-Mail).

4 SOCIOECONOMIC CONTEXT AND TRAVEL BEHAVIOR TRENDS

A key factor in the development of the traffic and revenue forecast is the forecast of households, population, and employment. Stantec retained BERK Consulting (BERK) to provide an independent review of available regional and subarea land use forecasts for the Central Puget Sound region. The purpose of this independent review was to inform the preparation of a new land use forecast to be used in the development of SR 520 traffic and revenue forecasts. BERK then prepared an adjusted land use forecast, reviewing the latest available regional macroeconomic forecast and selected regional targets for population, household and employment, and then determined the likely distribution of regional growth by county by reviewing historic county growth trends. To determine the allocation of growth to cities and transportation analysis zones (TAZ), BERK analyzed permitted and pipeline development, historic growth patterns, major investments such as light rail station openings, capacity for growth, and planning for growth at the jurisdictional scale. This chapter describes the key findings of their review, and the methodology used to develop their 2019 baseline estimates and the socioeconomic forecasts for the years 2025, 2030 and 2045.

At the regional and county scales, BERK's forecast analysis was informed by the review of available macroeconomic forecast products from the Washington State Office of Financial Management (OFM), Washington State Employment Security Department (ESD) and Puget Sound Regional Council (PSRC). The distribution of forecasted growth within counties is informed by analysis of data about the following:

- Indicators of local market activity such as historic growth trends and building permits;

- Expected infrastructure changes that may impact real estate demand, such as light rail station openings;

- Capacity for new residential and non-residential development; and

- Policy-based forecasts of future land use based on regional and local plans.

4.1 SOCIOECONOMIC FORECASTS

To evaluate the reasonableness of the existing socioeconomic forecasts, BERK reviewed several sources of demographic, land use, and planned development data including:

- PSRC Land Use Vision – Implementation Targets (LUV-it) (released in 2023),

- Esri Business Analyst Household Income Data (2019),

- American Community Survey Public Use Microdata Sample (PUMS) Data,

- Office of Financial Management (OFM) Growth Management Act County Projections (2022),

- Washington State Employment Security Department (ESD) Employment Projections (2023),

- Washington State OFM Small Area Estimates,

- County-Level Assessor Property Improvement Data (2022),

- Local Jurisdiction Permitted Development (2022),

- CoStar Commercial Real Estate Data, and

- County Buildable Lands Data (2021).

4.1.1 2019 Baseline

The base year for this land use forecast is 2019. While the base year did not change compared to BERK's previous land use forecast, BERK's 2023 land use forecast does include revised 2019 estimates for both households and employment. These changes incorporate newly available data that improve the accuracy of the estimates.

4.1.2 Population Forecast

BERK assumed that future regionwide total population will be consistent with OFM's medium population projections for the four-county area in each of the three forecast years (2025, 2030, and 2045). Allocations of projected regional population growth to the county level were based on a combination of PSRC's LUV-it forecast and recent population growth trends as documented by OFM 2020-2023 population estimates. The LUV-it forecast reflects the long-term planning goals of the region, but it is based on PSRC's 2018 Macroeconomic Forecast and does not reflect the short-term effects of the recent pandemic. To account for this, BERK allocated county-level population growth for each forecast period in terms of predicted share of regional growth. BERK assigned each county a share of growth based on the LUV-it forecast, recent trends, or a combination of the two:

- 2019-2025: Allocations for 2025 assumed a continuation of recent growth trends as reflected in the OFM population estimates.

- 2025-2030: Allocations for 2030 blended each county's share of growth as projected by LUV-it with its share of 2020-2023 growth.

- 2030-2045: Allocations for 2045 assumed consistency with each county's share of 2030-2045 as projected by LUV-it.

Table 4-1 shows the projected population by county for each of the forecast years of 2025, 2050, 2045. Table 4-2 shows the calculated annual growth rate (CAGR) for the periods between each of the forecast years.

Table 4-1: Population Forecast, 2019 - 2045

County	2019	2025	2030	2045
King	2,229,511	2,391,600	2,506,417	2,803,087
Pierce	895,610	949,360	993,767	1,126,790
Snohomish	817,447	883,513	935,227	1,084,009
Kitsap	272,400	288,145	300,341	334,547
Region	4,214,968	4,512,618	4,735,752	5,348,433

Source: OFM (2022), LUV-it (2023), BERK 2023

Table 4-2: Population Forecast CAGR, 2019 - 2045

County	2019-2025	2025-2030	2030-2045
King	1.2%	0.9%	0.7%
Pierce	1.0%	0.9%	0.8%
Snohomish	1.3%	1.1%	1.0%
Kitsap	0.9%	0.8%	0.7%
Region	1.1%	1.0%	0.8%

Source: OFM (2022), LUV-it (2023), BERK 2023

4.1.3 Employment Forecast

For the years 2025 and 2030, BERK relied on employment estimates and projections from ESD to determine the projected rate of growth or loss by county and industry sector. At the regional scale, these employment totals are somewhat lower than PSRC's LUV-it forecast. This is due to significant job losses in 2020-2021 associated with the pandemic which were not anticipated in PSRC's 2018 Macroeconomic Forecast, which is the basis for LUV-it. BERK's forecast assumes that total regional employment in 2045 is equivalent to the PSRC's Macroeconomic Forecast as well as PSRC's newer LUV-it forecast.3 However, BERK's 2045 forecast varies somewhat in terms of the distribution of employment by county and sector compared to PSRC. This is because the pandemic impacted some sectors more than others and resulted in lasting impacts on the regional economy.

Table 4-3 shows the projected employment by county for each of the forecast years of 2025, 2030, 2045. Table 4-4 shows the calculated annual growth rate (CAGR) for the periods between each of the forecast years.

Table 4-3: Employment Forecast, 2019 - 2045

County	2019	2025	2030	2045
King	1,517,426	1,612,241	1,727,831	2,104,779
Pierce	106,626	128,990	155,118	252,490
Snohomish	372,938	378,670	399,116	502,905
Kitsap	320,830	324,206	330,045	358,735
Region	2,317,820	2,444,107	2,612,110	3,218,909

Source: ESD (2023), LUV-it (2023), BERK (2023)

Table 4-4: Employment Forecast CAGR, 2019 - 2045

County	2019-2025	2025-2030	2030-2045
King	1.0%	1.4%	1.3%
Pierce	3.2%	3.8%	3.3%
Snohomish	0.3%	1.1%	1.6%
Kitsap	0.2%	0.4%	0.6%
Region	**0.9%**	**1.3%**	**1.4%**

Source: OFM (2022), LUV-it (2023), BERK 2023

4.2 TRIP TABLE ADJUSTMENTS AS A RESULT OF THE PANDEMIC

With several years of data (through October 2023) since the onset of the pandemic, Stantec has refined our estimates of both near-term and longer-term travel impacts resulting from the pandemic. Monthly data and monitoring have revealed the nature of near-term impacts on travel, while trends in the month-to-month and year-over-year data have informed us of changes in travel behavior that are likely to linger beyond any near-term pandemic recovery period. The following sections provide more detail on how Stantec has adjusted forecasts in both the near-term and longer-term to consider impacts of the pandemic.

Throughout the pandemic, Stantec monitored transaction data on a monthly basis and updated the 10-year forecasts for the Transportation Forecast Revenue Council (TRFC) on a quarterly basis. The T&R forecasts for TRFC before the onset of the pandemic were updated only on an annual basis.

4.2.1 Estimated Longer-Term Behavioral Changes Related to Increased Work from Home Activity

People undertaking remote work, or working-from-home (WFH), had historically been a minority in the work force. The pandemic greatly changed working habits for many people, with more people working remotely than pre-pandemic levels. For several months from the onset of the pandemic, state and local restrictions required many businesses and offices to close. While offices have phased in re-openings in recent time, it is becoming apparent that the frequency of people working from home will remain higher than before the pandemic.

To accommodate this increased WFH behavior, the travel demand model was employed with adjustments in trip tables by specific trip purpose. Table 4-5 shows the percent reduction in trips from the model.

Table 4-5: Travel Demand Model Trip Table Reductions

Trip Purpose	Percent Reduction
Home Based Work	-20.0%
Home Based Other	1.6%
Non-Home Based	-11.8%
Total Auto	-6.0%
Total Truck	2.2%
Grand Total	-5.8%

It is estimated that with increased WFH levels, there will be fewer work-related trips, and marginally increased trips related to home-based-other trip purposes (non-work trip purposes). Truck traffic is also estimated to be slightly higher, due to increased deliveries.

As more data has become available, such as the continued shift in hourly profiles by year, it has become apparent that PM traffic levels are closer to pre-pandemic levels than AM traffic levels. As such, we further refined the WFH impacts by time of day, considering both trip origins and destinations. Based on observed traffic trends in the region and the nature of work-related trips, we assume that the loss of home-based work trips will be concentrated during the AM peak but will be more spread out between the midday and PM peaks.

With this estimated reduction in the regional trip table by year, the travel demand model was run to estimate the impact on SR 520 specifically. When compared to the 2019 Forecast, it is estimated that the impact of the WFH trip table reductions would lower traffic forecasts on SR 520 by approximately 12 percent in 2025 and 9 percent in the longer-term.

5 MODEL APPROACH

This chapter provides an overview of the modeling methodology, model development, and calibration of the model used to produce the SR 520 bridge traffic and gross potential toll revenue forecasts. The 2024 Study builds upon the regional travel demand model calibration efforts conducted as part of the 2018 Study.

5.1 METHODOLOGY OVERVIEW

The 2024 Forecast was developed using a base of historical transaction and revenue data through fiscal year (FY) 2023. These data were used in collaboration with a three-tiered modelling process to work through future demand, toll diversion and travel behavior changes, and process these data points into a full traffic and revenue stream for the forecast horizon. Three future year models – 2025, 2030 and 2045 - were implemented to forecast traffic on SR 520 Bridge under the various construction phasing and full-build conditions.

As the first step of this tiered process, Stantec utilized the Puget Sound Regional Council ("PSRC") regional model, encompassing Seattle and much of the surrounding area. To produce updated estimates of average weekday traffic demand for the SR 520 Bridge, the analysis was run with socioeconomic forecasts of land use for each model analysis zone, prepared specifically for this toll study update.

As the second step in the process, Stantec used a customized Toll Diversion Model ("TDM") to analyze usage of the SR 520 bridge by time period, reflecting the variation in toll cost and traffic demand throughout the day. The TDM model was calibrated with 2018 data for the 2019 Forecast. This calibration was used as the basis for the TDM runs completed for this study, with additional changes to various aspects of the model such as the phasing of SR 520 improvements, assumed payment type splits, estimated commercial vehicle share, as well as the inclusion of reductions in demand to adjust for increased Work-from-Home-behavior and construction-related capacity impacts. For the TDM, network and vehicle demand coverage were retained at the regional model level; however, the trip demand for the five time periods in the PSRC model were further stratified into twelve time periods to better the represent traffic response to the variation in toll cost on the SR 520 Bridge throughout the day.

The third step in the development of the traffic and revenue forecasts was to feed the results of the TDM through a spreadsheet-based post-processing model that added in various assumptions to further refine the model outputs to match actual conditions on SR 520 observed in FY 2023. The post-processing included adjustments to convert average weekday estimates into annual traffic and revenue estimates for each model year and to interpolate between model years to create a full traffic and revenue stream through the forecast horizon.

Figure 5-1 illustrates the modeling methodology. The following sections describe each step of the modeling framework as well as key results from the analysis.

Figure 5-1: Overview of Modeling Approach

PSRC Model	Toll Diversion Model	Spreadsheet Model

•Calibrated to 2018 Datasets
•Average Weekday Trip Generation based on Fall 2023 Land Use Forecasts
•Model Years 2025, 2030, 2045
	•Reductions in Demand based on increased Work-From-Home Behavior
	•Construction phase capacity changes
		•2023 Data Validation & refinement
		•Annualization & Interpolation between Model Years
		•Construction Impacts
		  • driver behavior
		  • lane closure schedule

5.2 REGIONAL TRAVEL DEMAND MODEL

Stantec employed the Trip-Based Travel Model 4K Version 4.03 (2015) developed by PSRC as the regional modeling platform. Stantec's primary objective was to estimate the vehicular travel demand for the trans-Lake Washington corridor, to facilitate downstream toll diversion modeling for the base year (model calibration), and the 2025, 2030 and 2045 horizon years.

The PSRC 4K model is a full-featured, 4-step travel demand model that encompasses the Central Puget Sound region, including the counties of King, Pierce, Snohomish, and Kitsap. The model consists of 3,700 internal TAZs, 18 external stations, and an additional 150 zones representing Park-and-Ride facility locations within the region. Figure 5-2 shows the PSRC regional highway network coverage.

5.2.1 Traffic Analysis Zones (TAZs) System

The model coverage consists of the four-county Puget Sound region, including King, Snohomish, Kitsap, and Pierce counties, centering on the City of Seattle. The model has a total of 3,700 internal and 18 external TAZs, in addition to 150 Park-and-Ride (PNR) zones, with corresponding highway and transit network details to support the zonal system.

Figure 5-2: PSRC Regional Highway Network Coverage
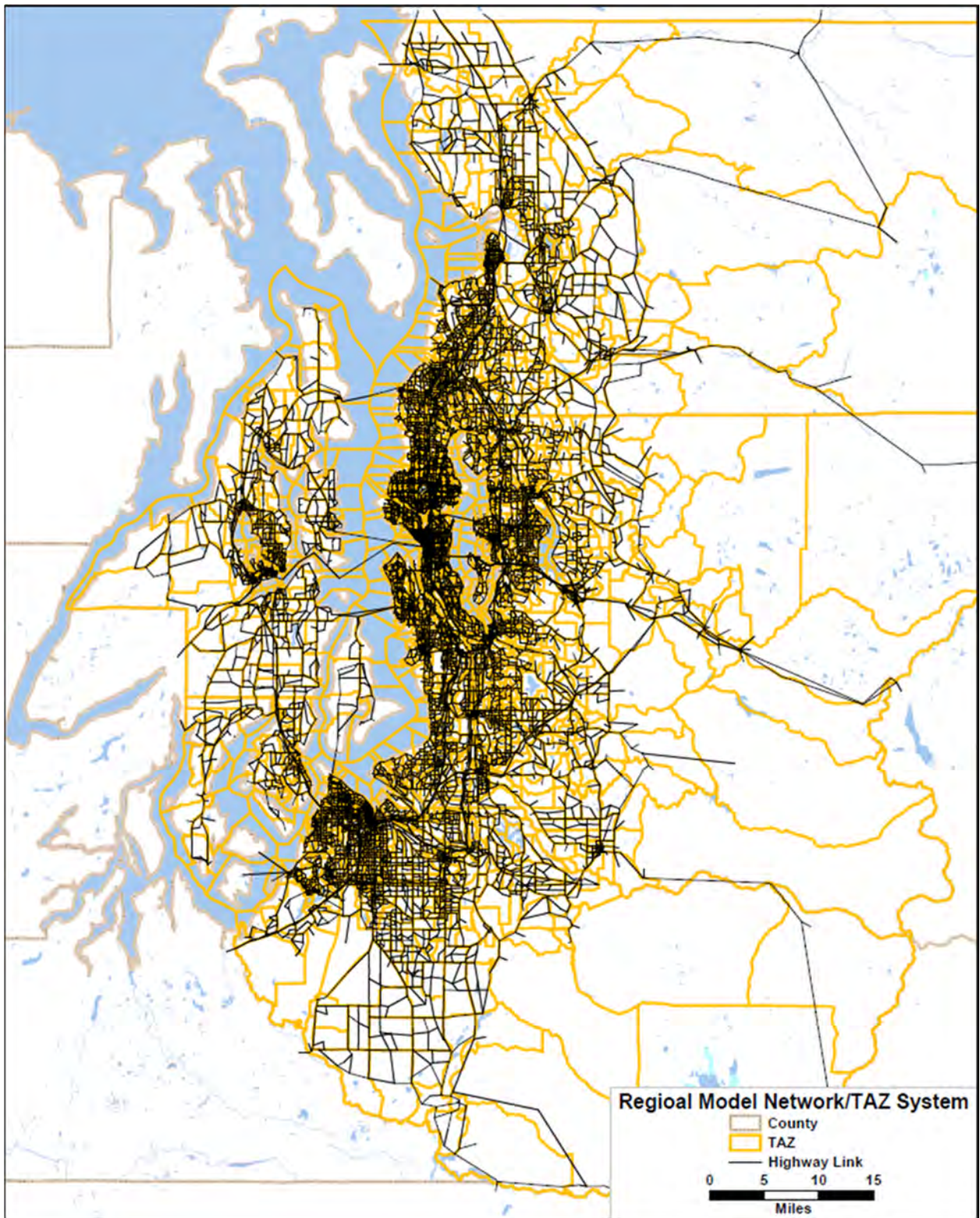
5.2.2 Roadway Network Assumptions

The base model calibration year transportation network is reflective of average weekday 2018 traffic conditions, featuring the SR 520 bridge under the existing configuration at the time with the HOV lane implemented. For the 2025, 2030 and 2045 forecast years, input highway networks were updated to include major highway capacity/connectivity improvement projects with relevance to this T&R effort, specifically along competing and feeder roadways, including I-5, I-90 and I-405, as well as major state highways such as SR 167, SR 522, and SR 509. Networks were also created to reflect the interim-build and final build conditions along the SR 520 Bridge. In addition, significant transit improvements as identified in the Sound Transit 3 Plan were also incorporated.

5.2.3 Calibration Datasets

The 2024 Study builds upon the regional travel demand model calibration efforts conducted as part of the 2018 Study. Datasets included historical toll transaction and revenue data, vehicle classification, volume and speed data for key locations along the corridor and parallel I-90 both eastbound and westbound, as well as volume and speed data along connecting freeways such as I-405 and I-5.

5.2.4 Corridor Calibration Summary at Regional Level

The goal of the regional calibration process is to ensure that the model can be relied upon to predict future traffic volumes. As such, the process was focused on replicating observed vehicular traffic flows consistent with 2018 base year travel conditions across the Trans-Lake Washington corridor. In Table 5-1, the combined GP and Express/HOV lane traffic estimated by the regional model was compared to observed data at various roadway segments along a screenline crossing Lake Washington. At an aggregate level, the estimated traffic flows resulting from the model are closely approximating the observed 2018 daily traffic, showing that the model overpredicts traffic by between two and four percent. Note that this regional-level calibration is an initial step in the broader calibration process and the differences for individual links in modelled versus observed traffic are further refined in the toll diversion model calibration.

Table 5-1: 2018 Estimated Average Daily Traffic, Observed v. Modeled, Screenline 1, by Direction

Facility	Daily Volume					
	Eastbound			Westbound		
	Obs	Est	% Diff (Est-Obs)	Obs	Est	% Diff (Est-Obs)
SR 522 at 68th Ave NE	17,442	18,631	7%	22,879	25,652	12%
SR 520/Evergreen Point Floating Bridge	40,711	39,497	-3%	42,045	38,785	-8%
I-90/Murrow Memorial Bridge	81,154	86,317	6%	83,773	86,365	3%
SR 900 East of I-5	15,000	15,734	5%	15,000	14,178	-5%
I-405 East of SR 181	88,609	90,184	2%	88,919	92,087	4%
Total	242,916	250,363	3%	252,617	257,067	2%

5.2.5 Regional Level Forecasting

In the PSRC trip-based demand modeling process, daily person trips are estimated from the SED variables (including the number of households and jobs by employment type) pertinent to the internal TAZs within the Puget Sound region, based on a set of pre-defined trip production and attraction relationships, in additional to the trips specified for

the 18 external stations in the model. A total of 7 trip purposes are maintained in the modeling process, from trip generation to mode choice with further stratification by four Income levels, where applicable:

- Home-Based Work (HBW)
- Home-Based College (COL)
- Home-Based School (SCH)
- Home-Based Shopping (HBS)
- Home-Based Other (HBO)
- Non-Home-Based Work (WBO)
- Non-Home-Based Other (OBO)

In addition to household resident trips, commercial vehicles (or trucks), are also considered in the PSRC model, respectively for light, medium, and heavy truck classes. Truck trips are generated for individual TAZ and specified for each external station from SED attributes (primarily zonal employment).

The mode choice modeling process apportions each person trip matrix by purpose to the available travel modes at a daily level after the trip distribution step. The available mode choice options are specified as below:

- Drive alone (SOV)—Single-occupancy auto trips
- Shared ride 2 (HOV2)—Auto trips with two occupants
- Shared ride 3+ (HOV3+)—Auto trips with three or more occupants
- Transit – Walk access
- Transit - Drive access
- Walk
- Bicycle

A time-of-day choice modeling process then respectively stratifies the household resident and commercial vehicle trips using pre-defined survey-based factors or, where applicable, probabilistic functions which consider the time period-specific congested highway travel time to stratify daily trips into different time periods. A total of five time periods are maintained in the PSRC trip-based model, including AM (6am to 9am), MD (9am to 3pm), PM (3pm to 6pm), EV (6pm to 1pm), and NI (10pm to 6am). A subsequent modeling step will then prepare the corresponding input trip matrices for traffic assignment purposes. For auto/highway vehicle assignment, person trips are converted to vehicles with appropriate occupancy factors for HOV2 and HOV3+ trips. The highway assignment considers a total of 11 vehicle classes as listed below:

- SOV (HBW Income 1)
- SOV (HBW Income 2)
- SOV (HBW Income 3)
- SOV (HBW Income 4)
- SOV (all other purposes)
- HOV2 (all purposes)
- HOV3+ (all purposes)
- Vanpool Vehicles
- Light Truck
- Medium Truck
- Heavy Truck

Travel demand in the Central Puget Sound region is forecasted to grow between 2025 and 2045, resulting in more travel delay, and decreasing network-wide travel speeds. While daily person-trips increase over the forecast period, it is important to note that the mode by which trips are made is likely to shift. The share of people walking, biking and using transit is estimated to increase slightly, and conversely, the share of SOV trips is estimated to decrease slightly.

While the overall share of transit trips remains relatively constant, the growth in daily transit trips outpaces the growth in daily vehicle trips. Vehicular travel demand in the region is estimated to grow over the forecast horizon.

5.3 TOLL DIVERSION MODEL (TDM)

The second element of the modeling process involved a toll diversion model (TDM) incorporated into EMME software environment. The input trip tables were adopted from the regional level model and the highway network was adopted from the regional level highway network with enhanced coding to enable toll diversion modeling. The TDM is a logit-based route choice model embedded within an equilibrium assignment routine. The calibration of the base year 2018 model focused on both matching the observed corridor volumes as well as calibrating the model to adequately predict the SR 520 floating bridge usage.

In the TDM, the five time periods from the regional model are further broken down into sub-periods, reflective of the 12 toll periods implemented by WSDOT on the SR 520 bridge under the existing and future year schemes. The regional model and the TDM time periods are listed in Table 5-2.

Table 5-2: Travel Demand Model (TDM) Weekday Time Periods Analyzed

Regional Model Period	Toll Diversion Model Period	Toll Periods
NI (10:00 PM - 6:00 AM)	NI2	12:00-5:00
	AM1	5:00-6:00
AM (6:00 AM - 9:00 AM)	AM2	6:00-7:00
	AM3	7:00-9:00
MD (9:00 AM - 3:00 PM)	MD1	9:00-10:00
	MD2	10:00-2:00
	MD1	2:00-3:00
PM (3:00 PM - 6:00 PM)	PM1	3:00-6:00
EV (6:00 PM - 10:00 PM)	EV1	6:00-7:00
	EV2	7:00-9:00
NI (10:00 PM - 6:00 AM)	NI1	9:00-11:00
	NI2	11:00-12:00

5.3.1 Toll Diversion Modeling (TDM) Parameters

The toll diversion model adopted for this project is based on a process that Stantec initially developed in 2001. This model has successfully predicted traffic and revenue for several toll facilities and, as noted within this report, was recently calibrated to replicate current conditions for the SR 520 bridge. The diversion model is a logit-based route choice model embedded within a highway assignment routine to allocate traffic into appropriate toll-usage type. The structure of the toll diversion model is defined as follows:

Toll Share = $(1 / (1 + e^U))$

Where:

Toll Share = Probability of selecting a toll road
e = Natural Logarithm
U = "Utility" of Toll Route: a * (TimeTR-TimeFR) + b * Cost + CTR + CETC
TimeTR = Toll road travel time in minutes
TimeFR = Nontoll road travel time in minutes
Cost = Toll in dollars
CTR = Constant for toll road bias
CETC = Constant for ETC bias
a,b = Coefficients

The value of time used in the modelling effort varies by trip purpose and vehicle occupancy as shown in Table 5-3. Of the three trip purposes listed (Home Based Work (HBW), Home Based Other (HBO) and Non-Home Based (NHB)), HBW trips have the highest value of time. The value of time for vehicles with two and more occupants is higher than the value of time for single occupant vehicles because there is more than one individual in the vehicle who experiences time savings. For this study, the values of time were derived from 2015 Household Income supplied by The American Community Survey. The prior study used values of time derived from 2014 Household Income data from the same source.

Table 5-3: Travel Demand Model (TDM) Value of Time by Trip Purpose and Vehicle Occupancy (2015$)

Trip Purpose		Occupany/ Vehicle Type	Value of Time
HBW	Income 1	SOV	$9.40
	Income 2	SOV	$17.41
	Income 3	SOV	$24.12
	Income 4	SOV	$34.42
	All-Income	SOV	$20.33
		HOV2	$23.36
		HOV3+	$29.20
HBO		SOV	$16.37
		HOV2	$18.83
		HOV3+	$23.52
NHB		SOV	$16.90
		HOV2	$19.44
		HOV3+	$24.29
Trucks		Light	$16.90
		Medium	$26.54
		Heavy	$59.18

Source: Stantec derived from American Community Survey Data

5.4 SPREADSHEET-BASED MODEL

The third step in the development of the traffic and revenue forecasts was to feed the results of the TDM through a spreadsheet-based post-processing model that added in various assumptions to further refine the model outputs to match actual conditions on SR 520 observed in FY 2023. The post-processing included adjustments to convert average weekday estimates into annual traffic and revenue estimates for each model year and to interpolate between model years to create a full traffic and revenue stream through the forecast horizon.

Calibrated travel demand models are tools to allow us to understand and forecast average Tuesday through Thursday weekday travel pattern demands by time of day. However, T&R studies ultimately require annual projections for traffic and toll revenue. To do this, one must post-process those average weekday TDM results to reflect variations throughout the overall week such as, for example, the potentially lighter traffic demand during a Monday AM Peak, the potentially higher traffic demand on Friday afternoon, and potentially different traffic demand and travel patterns for weekend traffic.

Additionally, manual adjustments in a post-processing spreadsheet model made for tolled traffic and revenue forecasting can account for nuances beyond the scope of the TDM, such as but not limited to vehicle classes, toll payment types, variable toll rate schedules, time/week of day adjustments, annualization factors, construction, and roadway maintenance schedules, etc.

5.4.1 Post-Processing Adjustment Factors

Results from the TDM by travel direction, vehicle class, and time period were compared with FY 2023 transaction data from the back-office. Adjustment factors were developed from this relationship to post-process the TDM traffic estimates into a more finely tuned representation of FY 2023 toll transaction patterns for the purpose of revenue validation. These post-processing factors were applied universally to all model year results generated by the TDM, by travel direction, vehicle class and time period.

5.4.1.1 Lake Washington Screen Line Demand Adjustments

The work-from-home adjustments layered into the TDM model were based on general regional changes to traffic based on changes to average estimated work-from-home adjustments for specific trip types across the region. While many other facilities have seen significant recovery in traffic volumes over the past two to three years, demand across Lake Washington has not returned to pre-pandemic levels. There are several factors beyond typically observed telecommuting behavior changes that could be affecting the I-90 and SR 520 corridors, specific to travel into and out of Seattle. The City of Seattle may be attracting fewer daily visitors for both work and pleasure due to a significant rise in the population of unhoused peoples over the past few years, as well as heightened safety concerns for those less comfortable with urban atmosphere and changing socioeconomic conditions. As fewer people have a desire to work in the city and office and retail space remains less desirable as well, this trend may continue for some time. It is likely that over time, as real estate prices adjust and become more attractive to businesses, that the city will cycle back to a more stable position and again become attractive for daily visitors.

To account for this temporary drop in demand specific to the travel into and out of urban Seattle, a post-processing adjustment was applied to total demand crossing Lake Washington to bring down model-estimated demand to a level close to what has been observed in FY 2023, which required a reduction of roughly 15 percent. Over time, this adjustment factor was reduced, so that in 2045 the spreadsheet-based analysis assume the same demand for crossing Lake Washington as is indicated by the TDM.

5.4.1.2 Construction Activity and Toll-Road Market Share of Lake Washington Crossings

Ongoing construction activity, which includes a lane reduction on the SR520 ramp to southbound I-5, and well as signage indicating closures, has likely caused some people to avoid using SR 520 and chose alternate routes. As a result, the split of traffic between SR 520 and I-90 for each model year was adjusted based on two factors:

- Active construction vs completed construction
- Total hourly traffic demand crossing Lake Washington, by direction
- Daytime vs overnight

Based on recent observed data during construction, the share of daytime hourly demand crossing Lake Washington under construction conditions was assumed to range from 25 percent at hours with low demand for crossing Lake Washington, up to 33 percent during hours with high demand. For model years after construction is completed, the daytime SR 520 share of the Lake Washington screen line demand ranges from 32 percent for hours with low volume to 40 percent for hours with higher volumes. Overnight, SR 520 is estimated to capture roughly 23 percent of screen line demand.

5.4.1.3 Changes in Hourly Split to Accommodate Additional Toll Rate Tiers

The time periods analyzed in the TDM created in 2018 were structured to correspond to the toll rate tiers in operation in 2018. However, as the July 1, 2023 toll increase included a shift in the time period splits, the current (FY 2024) toll rate time periods do not match the time periods used in the TDM. The two sets of time periods are compared below in Table 5-4. In order to forecast revenue, the toll rate time periods need to correspond correctly to the traffic results from the TDM. As a result, the TDM weekday average volumes by time period were converted into hourly volumes. The May 2023 average weekday volumes were assumed to be a typical example of an average weekday hourly split and these proportions were used to convert the TDM time period volumes into hourly.

Table 5-4: Toll Increase Hourly Time Period Changes

Hour	TDM Toll Period Split	FY24 Toll Increase Toll Period Split
12:00 AM	NI2	NI2
1:00 AM		
2:00 AM		
3:00 AM		
4:00 AM		
5:00 AM	AM1	AM1
6:00 AM	AM2	AM2
7:00 AM	AM3	AM3
8:00 AM	AM3	
9:00 AM	MD1	
10:00 AM	MD2	MD1
11:00 AM		MD2
12:00 PM		
1:00 PM		
2:00 PM	MD1	MD1
3:00 PM	PM1	PM1
4:00 PM		
5:00 PM		
6:00 PM	EV1	
7:00 PM	EV2	EV1
8:00 PM	EV2	EV2
9:00 PM	NI1	NI1
10:00 PM		
11:00 PM	NI2	NI2

5.4.1.4 Final Post-Processing Model Results

Table 5-5 compares the average weekday traffic by direction from May 2023 to traffic results directly from the model without any spreadsheet adjustments. Following the additional 15 percent screen line cut in 2025 and the adjusted market share of traffic crossing Lake Washington, an annual growth rate of 1.6 percent is estimated between FY 2023 and FY 2025.

Table 5-5: Model Results with Screen Line and Construction Related Post-Processing

Direction	May 23 MTR	2025	Annual Growth
Eastbound	35,341	36,465	1.58%
Westbound	34,909	36,094	1.68%
Two-Way	**70,250**	**72,559**	1.63%

6 TRAFFIC AND GROSS TOLL REVENUE POTENTIAL FORECAST

The traffic and revenue forecasts for the SR 520 bridge have been prepared using the actual data collected and analyzed (Chapter 3), the socioeconomic and land use data (Chapter 4), and the modeling processes (Chapter 5). Using all of these data and the model, average weekday forecasts were prepared for 2025, 2030 and 2045. This chapter documents the future year modeling assumptions and the procedures that were used to convert the daily weekday traffic and revenue model results to an annual forecast for fiscal years 2024 through 2062.

6.1 GENERAL ASSUMPTIONS FOR FUTURE YEARS

The following is a summary of the assumptions underlying the development of the traffic and gross toll revenue potential forecast.

6.1.1 Study Area Improvements

6.1.1.1 SR 520 Improvements

As described in Chapter 2, the SR 520 bridge is part of the SR 520 Bridge Replacement and HOV Program. Other Study Area Improvements

The forecasts assume that the highway network improvements in the regional model would be implemented as assumed by the Puget Sound Regional Council in their latest regional transportation plan. The forecasts also assume that no new competing highway facilities or transportation projects or additional improvements to competing projects will be made during the forecast period.

6.1.2 Socioeconomic Assumptions

The future year socioeconomic assumptions are documented in Chapter 4 of this report.

6.1.3 Commercial Vehicle Assumptions

The forecast assumes that the heavy truck percentages using SR 520 remain very low (less than two percent of annual transaction) and generally consistent with recent observations, as discussed in section 3.3 of this report.

6.1.4 Payment Type Assumptions

Recent trends show that although the *Good to Go!* market share continues to slightly increase year over year, the percent of *Good to Go!* customers choosing to Pay-By-Plate has been increasing within the percentage share of total *Good to Go!* transactions. It was assumed that these trends would continue into the future. In addition, as a function of a new back office process, there was a re-allocation of some trips from Pay by Mail to Pay-By-Plate. The modeling took these new allocations into account for the forecast period.

6.1.5 Other Assumptions

Other assumptions integral to the forecast include:

- The SR 520 Project will continue to be maintained and efficiently operated.

- The tolls on other toll projects in the Central Puget Sound region shall be comparable to the rates currently envisioned during the forecast period through FY 2062.

- The average cost of owning and operating a personal vehicle will not increase at a rate greater than the general rate of inflation. Motor fuel will continue to be in plentiful supply at prices in line with the general rate of inflation.

- Economic conditions in the country and the Central Puget Sound region will be relatively stable and no major economic recession will occur during the forecast period through FY 2062.

- No material natural disaster or local, state, or national emergency will occur that would alter travel patterns and divert traffic from SR 520.

As for the long-term projections themselves, while they are stated year by year, they are intended to show the long-term trends that may be reasonably anticipated during the forecast period.

6.2 ANNUALIZATION

To convert the average weekday traffic and revenue results into an annual forecast, factors were developed from FY 2023 transaction data received from the back-office, considering May 2023 as a standard average month for traffic and revenue. Using FY 2023 data, the resulting factor to convert weekday traffic to annual traffic is 316 and the resulting factor to convert weekday revenue to annual revenue is 274. The annual revenue factor is lower than the annual traffic factor because the toll rates vary by weekday and weekend; weekend rates are lower than weekday rates. Also, toll rates vary by time of day, which also reduces the revenue factor, since overnight tolls are much lower than peak hour tolls.

6.2.1 Construction Closures

As part of the SR 520 Bridge Replacement and HOV Program, road closures due to construction are expected. WSDOT provided a schedule of these closures, as shown in Table 6-1. Traffic and revenue forecasts were adjusted to account for both the planned weekday and weekend day closures.

Closure assumptions are separated for weekend days and weekday nights. The closure assumptions are also distinguished between closures of the SR 520 main toll span, and closures related to construction of the Portage Bay Bridge and I-5 transit/HOV3+ connector improvements. In the case of the Portage Bay Bridge closures, traffic is assumed to be allowed to use the tolled floating bridge between the Montlake interchange and I-405; only the section of SR 520 west of the Montlake interchange is assumed to be closed. As construction continues in the SR 520 corridor, the schedule of construction-related road closures continues to evolve.

Table 6-1 : SR 520 Closure Assumptions, Weekday Night and Weekend Days, Amounts per Fiscal Year

FY	SR 520 Main Span		Portage Bay Bridge		Total	
	Weekday Night	Weekend	Weekday Night	Weekend	Weekday Night	Weekend
2019	0.0	1.4	0.0	0.0	0.0	1.4
2020	0.0	2.0	0.0	0.0	0.0	2.0
2021	0.0	8.0	0.0	0.0	0.0	8.0
2022	6.5	4.0	0.0	0.0	6.5	4.0
2023	2.0	14.0	0.0	0.0	2.0	14.0
2024	7.0	22.5	0.0	0.0	7.0	22.5
2025	4.0	5.0	0.0	0.0	4.0	5.0
2026	0.0	0.0	45.0	4.0	45.0	4.0
2027	0.0	0.0	2.5	4.0	2.5	4.0
2028	0.0	0.0	2.5	5.0	2.5	5.0
2029	0.0	0.0	0.0	2.0	0.0	2.0
2030	0.0	0.0	30.0	2.0	30.0	2.0
2031	0.0	0.0	25.0	6.0	25.0	6.0
Total	**19.5**	**56.9**	**105.0**	**23.0**	**124.5**	**79.9**

Source: WSDOT, February 2024

Table 6-2 shows the differences in the assumed closure schedule from the 2023 Forecast. Overall, the number of weekday night closures are fewer by 7.5 units and weekend closures are greater by 0.9 units. On the Portage Bay Bridge, there has been a shift in estimated closures between FY 2030 and FY 2031, with more closures expected later in FY 2031.

Table 6-2 : Differences in Lane Closure Assumptions since 2023 Forecast

FY	SR 520 Main Span		Portage Bay Bridge		Total	
	Weekday Night	Weekend	Weekday Night	Weekend	Weekday Night	Weekend
2019	0.0	0.0	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0	0.0	0.0
2023	-11.0	-12.5	0.0	0.0	-11.0	-12.5
2024	-0.5	8.5	0.0	0.0	-0.5	8.5
2025	4.0	5.0	0.0	-1.0	4.0	4.0
2026	0.0	0.0	0.0	-3.0	0.0	-3.0
2027	0.0	0.0	0.0	2.0	0.0	2.0
2028	0.0	0.0	0.0	0.0	0.0	0.0
2029	0.0	0.0	-30.0	0.0	-30.0	0.0
2030	0.0	0.0	5.0	-2.0	5.0	-2.0
2031	0.0	0.0	25.0	4.0	25.0	4.0
Total	**-7.5**	**0.9**	**0.0**	**0.0**	**-7.5**	**0.9**

6.2.2 Roadway Configuration / Construction Staging

To account for the geometric changes on SR 520 due to the construction staging, 2025 was modeled using two different configurations: the FY 2024-2028 configuration and the FY 2029-2056 configuration. The results indicated that the changes in configuration would have impacts in the annual traffic and revenue, and the traffic and revenue streams were adjusted to reflect construction phasing. Post-processing assumptions for construction-related driver behavior changes were discussed in section 5.4.1.

6.3 CURRENT TOLL POLICY ASSUMPTIONS

The future forecasts presented herein assume the current toll schedule on the SR 520 bridge (FY 2024, or as of July 1, 2024) will remain in effect over the entire forecast period. No future changes in toll rates were assumed, nor were any future changes assumed to the available payment options or fees. Because the future toll rates do not increase over time, the real toll cost to the customer decreases over time in comparison to inflationary increases in wages and the prices of other goods and services, thus making the toll route more attractive. Table 6-3 shows the toll rates assumed in our forecasts for all future years.

Table 6-3: Assumed Directional 2-axle Vehicle Toll Rates by Time Period and by Payment Type, FY 2024 Onwards

| Time Period | FY 2024 and After | | | |
| | Good to Go![1] | | Pay By Mail[2] | |
	Weekday	Weekend	Weekday	Weekend
12:00 AM	$1.25	$1.25	$3.25	$3.25
1:00 AM				
2:00 AM				
3:00 AM				
4:00 AM				
5:00 AM	$2.50	$1.60	$4.50	$3.60
6:00 AM	$3.80		$5.80	
7:00 AM	$4.50		$6.50	
8:00 AM		$2.35		$4.35
9:00 AM				
10:00 AM	$3.80		$5.80	
11:00 AM	$3.25	$3.05	$5.80	$5.05
12:00 PM				
1:00 PM				
2:00 PM	$3.80		$5.80	
3:00 PM	$4.50		$6.50	
4:00 PM				
5:00 PM				
6:00 PM		$2.35		$4.35
7:00 PM	$3.80		$5.80	
8:00 PM	$3.25		$5.25	
9:00 PM	$2.50	$1.60	$4.50	$3.60
10:00 PM				
11:00 PM	$1.25	$1.25	$3.25	$3.25

[1] *Good to Go!* rates are shown for payment via tag. *Good to Go!* Pay By Plate rates are equal to the *Good to Go!* pass rate plus a 25-cent increment per transaction.
[2] Pay By Mail rates are equal to the *Good to Go!* toll rate plus a $2.00 increment.

6.3.1 ANNUAL Traffic and Gross Toll Revenue Potential Forecasts with Current Toll Policy

The annual actual and forecasted toll transactions and gross toll revenue potential is shown in Table 6-4, along with the average revenue per toll transaction and The *Good to Go!* transaction share. Toll transactions are expected to increase from 19.6 million transactions in FY 2024 to 40.4 million transactions in FY 2062, an average annual increase of 1.9 percent per year. Gross toll revenue potential is expected to increase from $76.4 million in FY 2024 to $151.2 million in FY 2062, an average annual increase of 1.8 percent per year. The average toll rate is expected to

decrease slightly over time, from $3.89 in FY24 after the July 1, 2023 toll increase to $3.75 as the *Good to Go!* share increases from 84.7 percent in FY 2024 to 86.9 percent by FY 2062. The annual toll transaction and gross toll revenue potential forecast is shown in Table 6-4.

Table 6-4: Annual Actual and Forecasted Traffic and Gross Toll Revenue Potential, FY 2012 to 2062

Fiscal Year	Annual Toll Transactions	Annual Gross Potential Revenue	Avg. Revenue per Transactions	Good to Go! Percentage Share
2012*(1)	9,600,000	$28,100,000	$2.93	
2013*	20,220,602	$61,301,711	$3.03	83.6%
2014*	20,959,573	$64,589,148	$3.08	84.2%
2015*	22,019,771	$69,383,209	$3.15	83.7%
2016*	23,220,000	$74,801,676	$3.22	84.0%
2017*	23,974,779	$81,913,285	$3.42	84.5%
2018*(2)	25,785,356	$90,349,101	$3.50	87.6%
2019*	26,523,075	$92,187,653	$3.48	87.6%
2020*	20,886,032	$72,122,698	$3.45	87.4%
2021*	14,636,937	$52,052,085	$3.56	85.5%
2022*	19,284,221	$63,958,480	$3.32	85.5%
2023*	20,480,940	$68,955,356	$3.37	84.9%
2024	20,012,000	$79,017,000	$3.95	83.2%
2025	21,967,000	$83,519,000	$3.80	84.7%
2026	22,952,000	$87,143,000	$3.80	85.0%
2027	23,765,000	$89,937,000	$3.78	85.4%
2028	24,412,000	$92,343,000	$3.78	85.7%
2029	25,589,000	$96,284,000	$3.76	86.1%
2030	26,302,000	$99,080,000	$3.77	86.1%
2031	26,560,000	$100,513,000	$3.78	86.1%
2032	30,710,000	$114,922,000	$3.74	86.5%
2033	31,203,000	$116,768,000	$3.74	86.5%
2034	31,697,000	$118,614,000	$3.74	86.6%
2035	32,191,000	$120,461,000	$3.74	86.6%
2036	32,686,000	$122,310,000	$3.74	86.6%
2037	33,181,000	$124,160,000	$3.74	86.7%
2038	33,676,000	$126,011,000	$3.74	86.7%
2039	34,171,000	$127,862,000	$3.74	86.7%
2040	34,667,000	$129,716,000	$3.74	86.8%
2041	35,163,000	$131,571,000	$3.74	86.8%
2042	35,660,000	$133,426,000	$3.74	86.8%
2043	36,155,000	$135,283,000	$3.74	86.9%
2044	36,652,000	$137,141,000	$3.74	86.9%
2045	37,150,000	$139,000,000	$3.74	86.9%
2046	37,519,000	$140,402,000	$3.74	86.9%
2047	37,798,000	$141,470,000	$3.74	86.9%
2048	38,009,000	$142,284,000	$3.74	86.9%
2049	38,168,000	$142,902,000	$3.74	86.9%
2050	38,328,000	$143,525,000	$3.74	86.9%
2051	38,488,000	$144,149,000	$3.75	86.9%
2052	38,650,000	$144,776,000	$3.75	86.9%
2053	38,812,000	$145,407,000	$3.75	86.9%
2054	38,974,000	$146,039,000	$3.75	86.9%
2055	39,137,000	$146,674,000	$3.75	86.9%
2056	39,301,000	$147,313,000	$3.75	86.9%
2057	39,465,000	$147,952,000	$3.75	86.9%
2058	39,631,000	$148,597,000	$3.75	86.9%
2059	39,797,000	$149,243,000	$3.75	86.9%
2060	39,963,000	$149,892,000	$3.75	86.9%
2061	40,131,000	$150,544,000	$3.75	86.9%
2062	40,299,000	$151,199,000	$3.75	86.9%

* Annual toll transactions and estimated actual potential gross toll revenue
(1) Tolling started on December 29, 2011, half-way through FY 2012
(2) Overnight tolling between the hours of 12am – 5am began in July FY 2018

6.4 TOLL INCREASE FOR REVENUE SUFFICIENCY

The forecast presented in Table 6-4 will not generate sufficient revenue, and as a result, a toll increase is required. On May 15, 2024, the Washington State Transportation Commission voted to recommend a 10 percent tailored toll increase, which will go into effect on August 15, 2024. This toll increase includes the following changes:

- Tolls will increase by an average of 10 percent for the entire week, rounded to the nearest nickel

- There will be fewer rate variations through the week, resulting in six different prices instead of the existing eight

- The toll rate adjustment would range from a decrease of $0.10 to and increase of $0.70, depending on the time of day and day of the week.

The new Good to Go! toll rates for Weekday and Weekend passenger cars are presented in Table 6-5. Figure 6-1 and Figure 6-2 compare new toll rates to the current toll rates, which began on July 1, 2023.

The new toll rates were incorporated into Stantec's forecast, with all other assumptions presented previously in the report remaining unchanged.

Table 6-5: New Toll Rates with 10 Percent Tailored Toll Increase

Time Period	Good to Go! - Weekday		Time Period	Good to Go! - Weekend	
	FY 2024	FY 2025		FY 2024	FY 2025
12:00 AM	$1.25	$1.35	12:00 AM	$1.25	$1.35
1:00 AM			1:00 AM		
2:00 AM			2:00 AM		
3:00 AM			3:00 AM		
4:00 AM			4:00 AM		
5:00 AM	$2.50	$2.75	5:00 AM	$1.60	$1.70
6:00 AM	$3.80	$3.95	6:00 AM		
7:00 AM	$4.50	$4.90	7:00 AM		
8:00 AM			8:00 AM	$2.35	$2.95
9:00 AM			9:00 AM		
10:00 AM	$3.80	$3.95	10:00 AM		
11:00 AM	$3.25		11:00 AM	$3.05	
12:00 PM			12:00 PM		
1:00 PM			1:00 PM		
2:00 PM	$3.80		2:00 PM		
3:00 PM	$4.50	$4.90	3:00 PM		
4:00 PM			4:00 PM		
5:00 PM			5:00 PM		
6:00 PM			6:00 PM	$2.35	
7:00 PM	$3.80	$3.95	7:00 PM		
8:00 PM	$3.25		8:00 PM		
9:00 PM	$2.50	$2.75	9:00 PM	$1.60	$1.70
10:00 PM			10:00 PM		
11:00 PM	$1.25	$1.35	11:00 PM	$1.25	$1.35

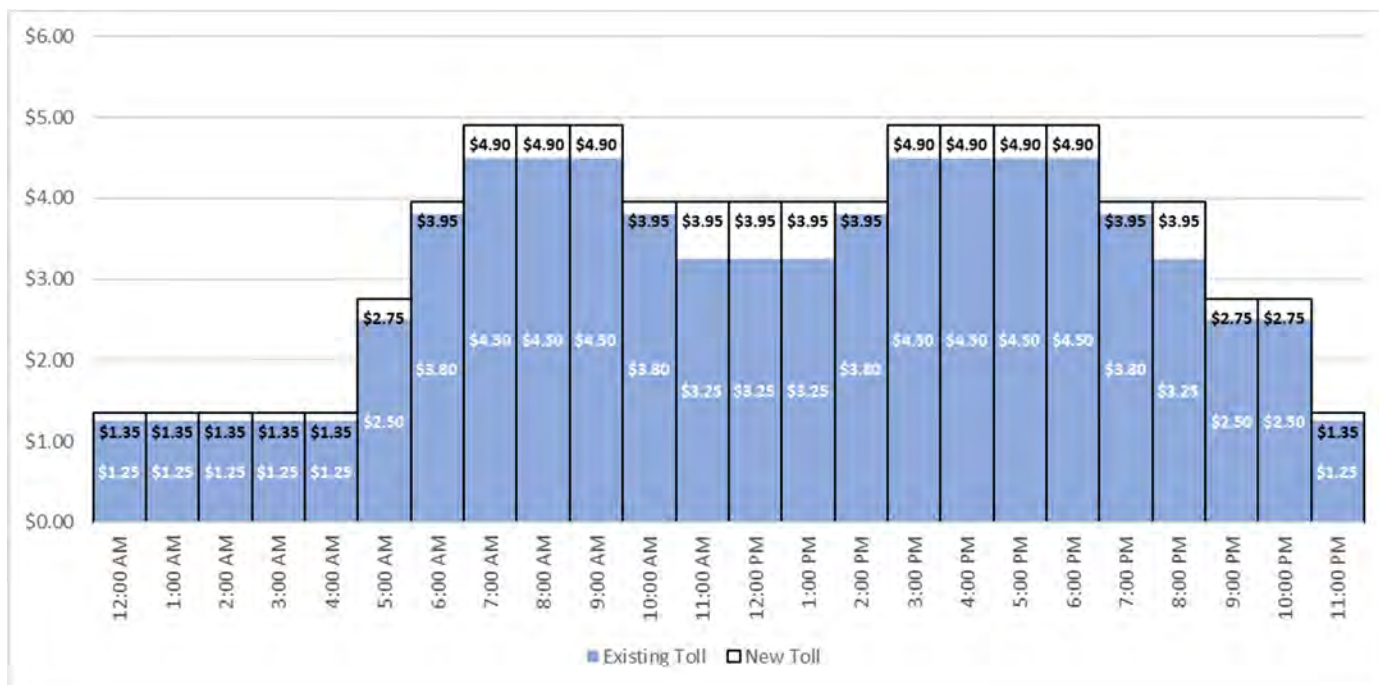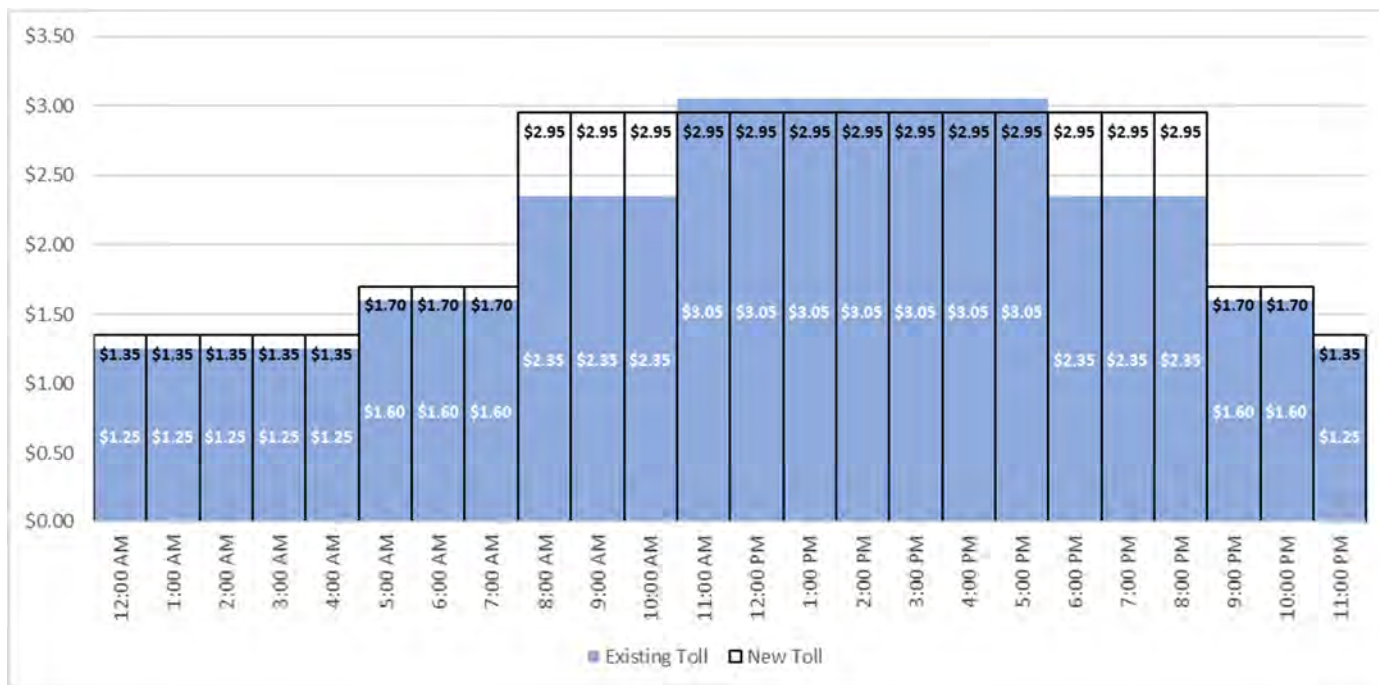**Figure 6-1: New Toll Rates vs Existing Toll Rates: Weekday**

Figure 6-2: New Toll Rates vs Existing Toll Rates: Weekend

6.4.1 ANNUAL Traffic and Gross Toll Revenue Potential Forecasts with Assumed Toll Policy Adjustment

Table 6-6 shows the forecasted annual toll transactions and gross toll revenue potential with the assumption of a 10 percent tailored toll increase beginning August 15, 2024. Toll transactions are expected to increase from 20.0 million transactions in FY 2024 to 39.6 million transactions in FY 2062. Gross toll revenue potential is expected to increase from $79.0 million in FY 2024 to $162.5 million in FY 2062. When compared to the annual forecast without a toll increase in Table 6-4, transactions are reduced by roughly 1.7 percent and revenue is increased by roughly 6.4 percent in FY 2025. A comparison of the annual toll transaction and gross toll revenue potential forecast against the forecast with no toll increase is shown in Figure 6-3 and in Figure 6-4.

Table 6-6: Annual Actual and Forecasted Traffic and Gross Toll Revenue Potential, FY 2012 to 2062 with Toll Increase

Fiscal Year	Annual Toll Transactions	Annual Gross Potential Revenue	Avg. Revenue per Transactions	Good to Go! Percentage Share
2012*[1]	9,600,000	$28,100,000	$2.93	
2013*	20,200,000	$61,300,000	$3.03	83.6%
2014*	20,959,574	$64,589,147	$3.08	84.4%
2015*	22,019,770	$69,383,209	$3.15	84.3%
2016*	23,217,000	$74,801,674	$3.22	84.5%
2017*	23,974,779	$81,913,287	$3.42	84.7%
2018*[2]	25,785,356	$90,349,101	$3.50	85.3%
2019*	26,523,075	$92,187,654	$3.48	86.7%
2020*	20,886,032	$72,122,698	$3.45	87.4%
2021*	14,636,937	$52,052,085	$3.56	85.5%
2022*	19,284,221	$63,958,480	$3.32	86.9%
2023*	20,480,940	$68,955,356	$3.37	84.9%
2024	20,012,000	$79,017,000	$3.95	83.2%
2025[3]	21,592,000	$88,874,000	$4.12	84.6%
2026	22,510,000	$93,540,000	$4.16	84.9%
2027	23,310,000	$96,560,000	$4.14	85.3%
2028	23,940,000	$99,150,000	$4.14	85.7%
2029	25,090,000	$103,400,000	$4.12	86.0%
2030	25,790,000	$106,410,000	$4.13	86.0%
2031	26,380,000	$109,370,000	$4.15	86.0%
2032	30,200,000	$123,790,000	$4.10	86.4%
2033	30,680,000	$125,770,000	$4.10	86.4%
2034	31,160,000	$127,740,000	$4.10	86.5%
2035	31,650,000	$129,720,000	$4.10	86.5%
2036	32,120,000	$131,690,000	$4.10	86.6%
2037	32,620,000	$133,680,000	$4.10	86.6%
2038	33,100,000	$135,650,000	$4.10	86.6%
2039	33,580,000	$137,630,000	$4.10	86.7%
2040	34,070,000	$139,610,000	$4.10	86.7%
2041	34,550,000	$141,600,000	$4.10	86.7%
2042	35,030,000	$143,580,000	$4.10	86.8%
2043	35,520,000	$145,570,000	$4.10	86.8%
2044	36,010,000	$147,560,000	$4.10	86.8%
2045	36,490,000	$149,540,000	$4.10	86.8%
2046	36,860,000	$151,040,000	$4.10	86.8%
2047	37,120,000	$152,180,000	$4.10	86.9%
2048	37,330,000	$153,040,000	$4.10	86.8%
2049	37,490,000	$153,710,000	$4.10	86.8%
2050	37,630,000	$154,360,000	$4.10	86.8%
2051	37,790,000	$155,030,000	$4.10	86.8%
2052	37,950,000	$155,700,000	$4.10	86.9%
2053	38,110,000	$156,380,000	$4.10	86.9%
2054	38,260,000	$157,040,000	$4.10	86.9%
2055	38,430,000	$157,720,000	$4.10	86.8%
2056	38,590,000	$158,400,000	$4.10	86.8%
2057	38,750,000	$159,080,000	$4.11	86.8%
2058	38,920,000	$159,760,000	$4.10	86.8%
2059	39,080,000	$160,450,000	$4.11	86.8%
2060	39,240,000	$161,140,000	$4.11	86.9%
2061	39,400,000	$161,830,000	$4.11	86.9%
2062	39,570,000	$162,530,000	$4.11	86.8%

* Annual toll transactions and estimated actual potential gross toll revenue
(1) Tolling started on December 29, 2011, half-way through FY 2012
(2) Overnight tolling between the hours of 12am – 5am began in July FY 2018
(3) Toll increase beginning August 15, 2024

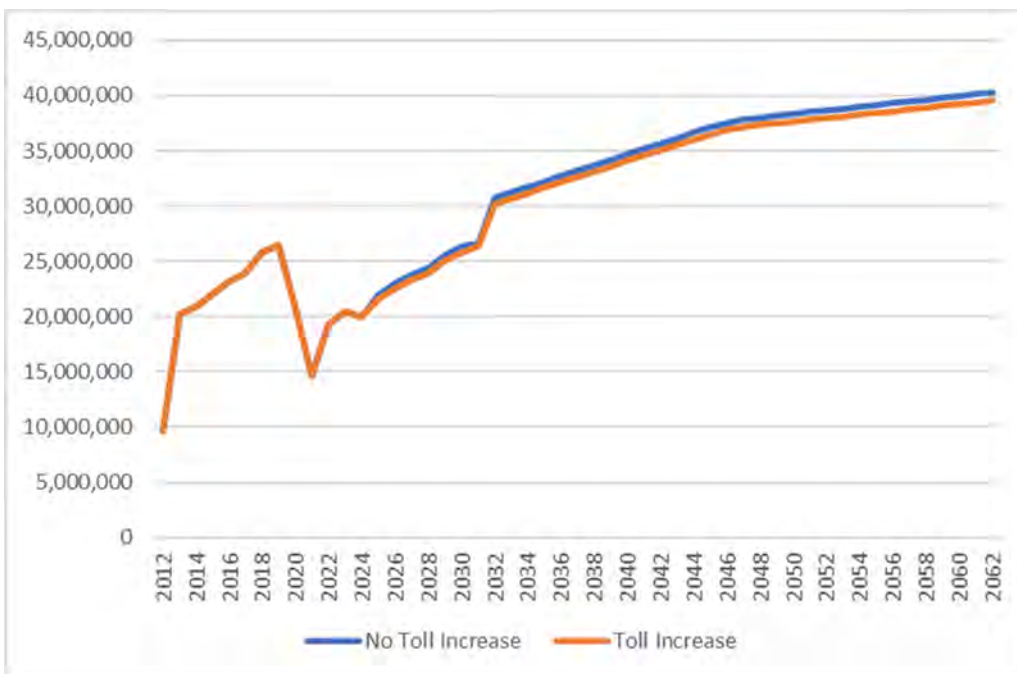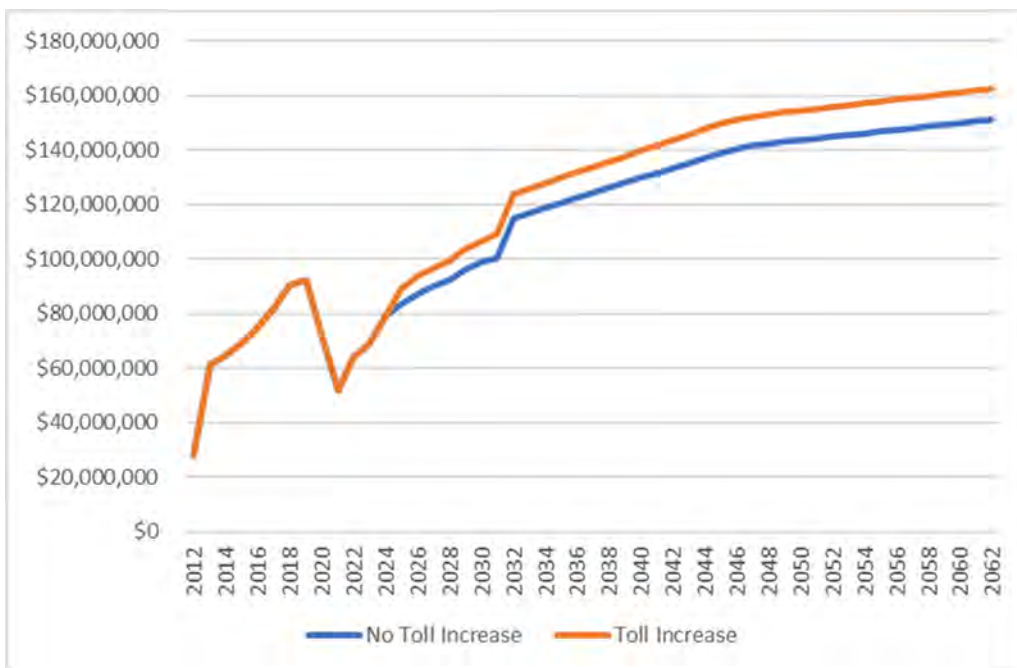**Figure 6-3: Transactions Compared: Current Toll Rates vs. FY 2025 Toll Increase**

Figure 6-4: Revenue Compared: Current Toll Rates vs. FY 2025 Toll Increase

7 DISCLAIMER

It is Stantec's opinion that the traffic and toll revenue estimates provided herein represent reasonable and achievable levels of traffic and toll revenues that can be expected to accrue on SR 520 over the forecast period and that they have been prepared in accordance with accepted industry-wide practice. Stantec considers it is necessary to state that the traffic and revenue projections take into consideration the following caveats:

- This synopsis presents the highlighted results of Stantec's consideration of the information available at the time of the study and the application of our experience and professional judgment to that information. It is not a guarantee of any future events or trends.

- The traffic and toll revenue estimates will be subject to future economic and social conditions, demographic developments that cannot be predicted with certainty.

- The traffic and toll revenue estimates will be subject to future construction activities affecting this corridor that cannot be predicted with certainty.

- The estimates contained in this document, while presented with numeric specificity, are based on a number of estimates and assumptions which, though considered reasonable to us, are inherently subject to economic and competitive uncertainties and contingencies, most of which are beyond the control of WSDOT and cannot be predicted with certainty. In many instances, a broad range of alternative assumptions could be considered reasonable with the availability of alternative toll schedules, and any changes in the assumptions used could result in material differences in estimated outcomes.

- The standards of operation and maintenance on SR 520 will be maintained as planned within the business rules and practices.

- The general configuration and location of SR 520 and its interchanges will remain as discussed herein.

- Access to and from SR 520 will remain as discussed herein.

- No other new competing highway projects are assumed to be constructed or significantly improved in the project corridor during the project period, except those identified herein.

- Major highway improvements that are currently underway or fully funded will be completed as planned.

- SR 520 will be well maintained, efficiently operated, and effectively signed to encourage usage.

- No reduced growth initiatives or related controls that would significantly inhibit normal development patterns will be introduced during the forecast period.

- There will be no future serious protracted recession during the forecast period.

- There will be no protracted fuel shortage during the forecast period.

- No local, regional, or national emergency will arise that will abnormally restrict the use of motor vehicles.

- If, for any reason, any of these stated conditions should change due to changes in the economy or competitive environment, the pandemic conditions and associated actions, or other factors, Stantec's opinions or estimates may require amendment or further adjustments.

- Stantec's toll revenue projections only represent its best judgment and Stantec does not warrant or represent that actual toll revenues will not vary from its projections, estimates, and forecasts.

Many statements contained in this document that are not historical facts are forward-looking statements, which are based on Stantec's opinions, as well as assumptions made by, and information currently available to, the management and staff of Stantec. Because the statements are based on expectations about future events and economic performance and are not statements of fact, actual results may differ materially from those projected. The words "anticipate", "assume", "estimate", "expect", "objective", "projection", "plan", "forecast", "goal", "budget", or similar words are intended to identify forward-looking statements. The words or phrases "to date", "now", "currently", and the like are intended to mean as of the date of this document.

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

In Stantec's opinion, the assumptions underlying the study provide a reasonable basis for the analysis. However, any financial projection is subject to uncertainties. Inevitably, some assumptions used to develop the projections will not be realized, and unanticipated events and circumstances may occur.