

# Maryland Transportation Authority FY2022 Traffic and Toll Revenue Forecast Update



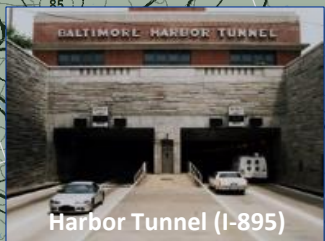
Kennedy Highway (I-95)



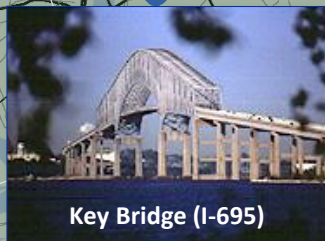
Hatem Bridge (US 40)



Fort McHenry Tunnel (I-95)



Harbor Tunnel (I-895)



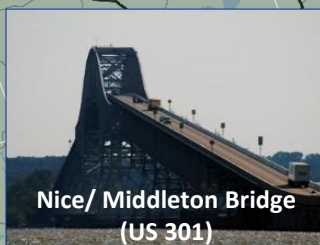
Key Bridge (I-695)



Intercounty Connector (ICC)



I-95 Express Toll Lanes (ETL)



Nice/ Middleton Bridge  
(US 301)



Bay Bridge (US 50/301)

**FINAL REPORT**  
November 4, 2021



Maryland  
Transportation  
Authority

**CDM  
Smith**

# Table of Contents

<b>1. Introduction .....</b>	<b>1-1</b>
1.1 System Description .....	1-1
1.2 Toll Rate and Civil Penalty Structure .....	1-5
1.2.1 Standard Toll Rates .....	1-5
1.2.2 COVID-19 Toll Rates and Business Rules .....	1-10
1.2.3 Upcoming Toll Rate Changes .....	1-11
1.2.4 Civil Penalties .....	1-11
1.3 Report Structure .....	1-11
<b>2. Historical Trends .....</b>	<b>2-1</b>
2.1 MDTA Traffic Impacts Due to COVID-19 .....	2-1
2.2 Maryland Vehicle Miles Traveled .....	2-56
2.3 MDTA Traffic and Revenue Trends .....	2-7
2.3.1 Collected Transactions and Revenue .....	2-7
2.3.2 In-Lane Traffic .....	2-14
2.4 Historical Traffic on Other Major Highways .....	2-14
2.5 MDTA E-ZPass Market Share .....	2-17
<b>3. Corridor Growth Review .....</b>	<b>3-1</b>
3.1 Introduction .....	3-1
3.2 Recent Growth Trend Explanatory Factors .....	3-3
3.2.1 COVID-19 Pandemic Timeline .....	3-3
3.2.2 Port of Baltimore Cargo Trends .....	3-6
3.2.3 Baltimore/Washington International Airport (BWI) Enplanement Trends .....	3-7
3.3 Socioeconomic Variables .....	3-8
3.3.1 Population .....	3-9
3.3.2 Employment .....	3-11
3.3.3 Unemployment .....	3-13
3.3.4 Per Capita Personal Income .....	3-16
3.3.5 Gross Domestic/Regional Product .....	3-17
3.3.6 Inflation .....	3-20
3.3.7 Fuel Prices .....	3-22
3.4 Risks and Conclusion .....	3-24
<b>4. Forecasts by Facility .....</b>	<b>4-1</b>
4.1 Assumptions .....	4-1
4.2 Legacy System .....	4-3
4.2.1 Forecast Methodology .....	4-3
4.2.2 Construction Impacts .....	4-3
4.2.3 Forecast Results .....	4-5
4.3 Intercounty Connector .....	4-10
4.3.1 Forecast Methodology and Assumptions .....	4-10
4.3.2 Forecast Results .....	4-10
4.3.3 Capacity Check .....	4-13

4.4 I-95 ETLs .....	4-15
4.4.1 Forecast Methodology and Assumptions.....	4-15
4.4.2 Forecast Results.....	4-17
4.5 Other Revenue .....	4-19
4.5.1 Forecast Methodology and Assumptions.....	4-19
4.5.2 Forecast Results.....	4-21
<b>5. Total Forecast Results .....</b>	<b>5-1</b>
<b>6. Forecast Comparisons .....</b>	<b>6-1</b>

## List of Figures

Figure 1-1. Facility Location Map, Maryland Toll Facilities .....	1-2
Figure 1-2. I-95 Express Toll Lanes (ETL) Existing & Future Configuration.....	1-4
Figure 1-3. FY 2021 MDTA Share of Toll Revenue by Facility and Total Revenue by Type.....	1-5
Figure 2-1. Legacy System Passenger Car Seven Day Rolling Average Impacts due to COVID-19.....	2-3
Figure 2-2. Legacy System Commercial Vehicle Seven Day Rolling Average Impacts due to COVID-19 .....	2-4
Figure 2-3. ICC and I-95 ETL Seven Day Rolling Average Impacts due to COVID-19.....	2-4
Figure 2-4. Historical Collected Transactions and Collected Toll Revenue by Facility .....	2-11
Figure 2-5. Collected Transaction E-ZPass Marketshare Trends by Facility .....	2-19
Figure 3-1. Geographies Profiled.....	3-2
Figure 3-2. Moody's/CNN Business Back-to-Normal and MDTA Traffic Indexes .....	3-6
Figure 3-3. Comparison of Monthly Port of Baltimore Total General Cargo in Tons and MDTA Legacy Facilities Commercial Vehicle In-Lane Traffic, FY 2018-2021.....	3-7
Figure 3-4. Comparison of Monthly Baltimore Washington International (BWI) Airport and MDTA Intercounty Connector In-Lane Traffic, FY 2018-2021 .....	3-8
Figure 3-5. Historical Unemployment Rates (Macro Geographies).....	3-13
Figure 3-6. Historical Unemployment Rates (Maryland Regions) .....	3-14
Figure 3-7. Forecast U.S. Unemployment Rate .....	3-15
Figure 3-8. Forecast Mid-Term Real GDP Growth.....	3-20
Figure 3-9. Historical Inflation (CPI-U).....	3-21
Figure 3-10. Forecast Inflation (CPI-U) .....	3-22
Figure 3-11. Historical Fuel Prices (Current \$) .....	3-23
Figure 3-12. Forecast Fuel Price (Current \$).....	3-24
Figure 4-1. FY 2040 Estimated AM and PM Period Segment Volumes by Mainline Segment and Direction .....	4-14
Figure 4-2. I-95 Express Toll Lanes (ETL) 2019 Average Weekday Traffic .....	4-16
Figure 5-1. Share of Collected Transactions/Trips, FY 2022 and FY 2031 .....	5-2
Figure 5-2. Share of Collected Total Revenue, FY 2022 and FY 2031.....	5-3



## List of Tables

Table 1-1. Standard MDTA Legacy System Toll Rates and Toll Collection Direction .....	1-6
Table 1-2. Other MDTA Legacy System Discount Toll Rate Programs and Rates.....	1-8
Table 1-3. Intercounty Connector Two-Axle E-ZPass Toll Rates by Movement and Time Period .....	1-9
Table 1-4. I-95 Express Toll Lane Toll Rates .....	1-10
Table 2-1. Potential COVID-19 Impact Factors Related to MDTA Traffic .....	2-2
Table 2-2. Summary of Estimated Average COVID-19 Impacts by Month.....	2-5
Table 2-3. National and Statewide Trends in Vehicle Miles Traveled.....	2-7
Table 2-4. MDTA Passenger Car Historic Transactions and Toll Revenue .....	2-8
Table 2-5. MDTA Commercial Vehicle Historic Transactions and Toll Revenue .....	2-9
Table 2-6. MDTA Total Traffic Historic Collected Transactions and Toll Revenue .....	2-10
Table 2-7. Average Annual Percent Change in Collected Transactions and Revenue by Facility.....	2-12
Table 2-8. MDTA In-Lane Traffic by Fiscal Year .....	2-15
Table 2-9. Average Annual Daily Traffic Trends on Major Highways.....	2-16
Table 3-1. National, Maryland, and MDTA COVID-19 Mandates .....	3-4
Table 3-2. Socioeconomic Variables: Terms and Sources.....	3-9
Table 3-3. Historical Population .....	3-10
Table 3-4. Forecast Population Growth.....	3-11
Table 3-5. Historical Employment .....	3-12
Table 3-6. Forecast Employment Growth.....	3-13
Table 3-7. Short-Term Forecast U.S. Unemployment Rate.....	3-15
Table 3-8. Historical Real Personal Income Per Capita (2020\$) .....	3-16
Table 3-9. Forecast Real Personal Income Per Capita Growth.....	3-17
Table 3-10. Historical Real Gross Domestic/Regional Product (2020\$).....	3-18
Table 3-11. Forecast Real Gross Domestic/Regional Product Growth .....	3-19
Table 3-12. Forecast Short-Term Real GDP Growth .....	3-19
Table 4-1. Detailed Forecast Assumptions.....	4-2
Table 4-2. Total Legacy System Forecasted Transactions and Toll Revenue Collected by Class.....	4-6
Table 4-3. Legacy System Historical and Forecasted Transactions and Toll Revenue Collected by Facility .....	4-7
Table 4-4. Monthly Collected Transactions by Method of Payment FY 2022 and FY 2023 .....	4-8
Table 4-5. Monthly Collected Toll Revenue by Method of Payment FY 2022 and FY 2023 .....	4-9
Table 4-6. Intercounty Connector Forecasted Collected Annual Trips and Collected Toll Revenue .....	4-11
Table 4-7. Intercounty Connector Forecasted Collected Monthly Trips and Collected Toll Revenue .....	4-12
Table 4-8. I-95 ETL Existing Section Forecasted Collected Annual Trips and Toll Revenue.....	4-17
Table 4-9. I-95 ETL Total with Extensions Forecasted Collected Annual Trips and Toll Revenue.....	4-17
Table 4-10. I-95 ETL Forecasted Monthly Collected Trips and Toll Revenue.....	4-18
Table 4-11. Other Revenue by Facility.....	4-22
Table 4-12. Forecasted Monthly Other Revenue .....	4-23
Table 5-1. Total System Collected Transactions/Trips.....	5-1
Table 5-2. Total System Collected Toll and Other Revenue.....	5-2
Table 5-3. Total System Collected Monthly Transactions, Toll Revenue, and Other Revenue .....	5-4
Table 6-1. Legacy System Toll Revenue Comparison .....	6-2
Table 6-2. Intercounty Connector Comparison.....	6-3



Table 6-3. I-95 ETLs Comparison.....	6-3
Table 6-4. Other Revenue Comparison.....	6-4
Table 6-5. Total System Comparison.....	6-4

# Chapter 1

## Introduction

This letter report includes ten-year forecasts through FY 2031 for the seven “Legacy” toll facilities operated by MDTA, for the Intercounty Connector (ICC), and for the I-95 Express Toll Lanes (ETLs). It summarizes the study analysis, including a presentation of historical traffic and revenue trends, relevant socioeconomic conditions and forecasts, and the ten-year forecast results.

### 1.1 System Description

The nine facilities operated by MDTA are listed below. Collectively, the first seven facilities in the list below are referred to as the Legacy System.

- Thomas J. Hatem Memorial Bridge (Hatem Bridge, TJH)
- John F. Kennedy Memorial Highway, excluding the I-95 Express Toll Lanes (Kennedy Highway, JFK)
- Baltimore Harbor Tunnel (Harbor Tunnel, BHT)
- Fort McHenry Tunnel (Fort McHenry Tunnel, FMT)
- Francis Scott Key Bridge (Key Bridge, FSK)
- William Preston Lane Jr. Memorial Bridge (Bay Bridge, WPL)
- Governor Harry W. Nice Memorial/Senator Thomas “Mac” Middleton Bridge (Nice/Middleton Bridge, HWN)
- Intercounty Connector (ICC/MD 200)
- I-95 Express Toll Lanes (I-95 ETLs)

**Figure 1-1** shows the locations of the MDTA Legacy system, ICC, and I-95 ETLs toll facilities and toll gantries in a regional context. As can be implied by the geographic distribution of the different facilities, the MDTA system serves a variety of travel purposes within the regional transportation system and consequently has a diverse mix of traffic classes and payment types.



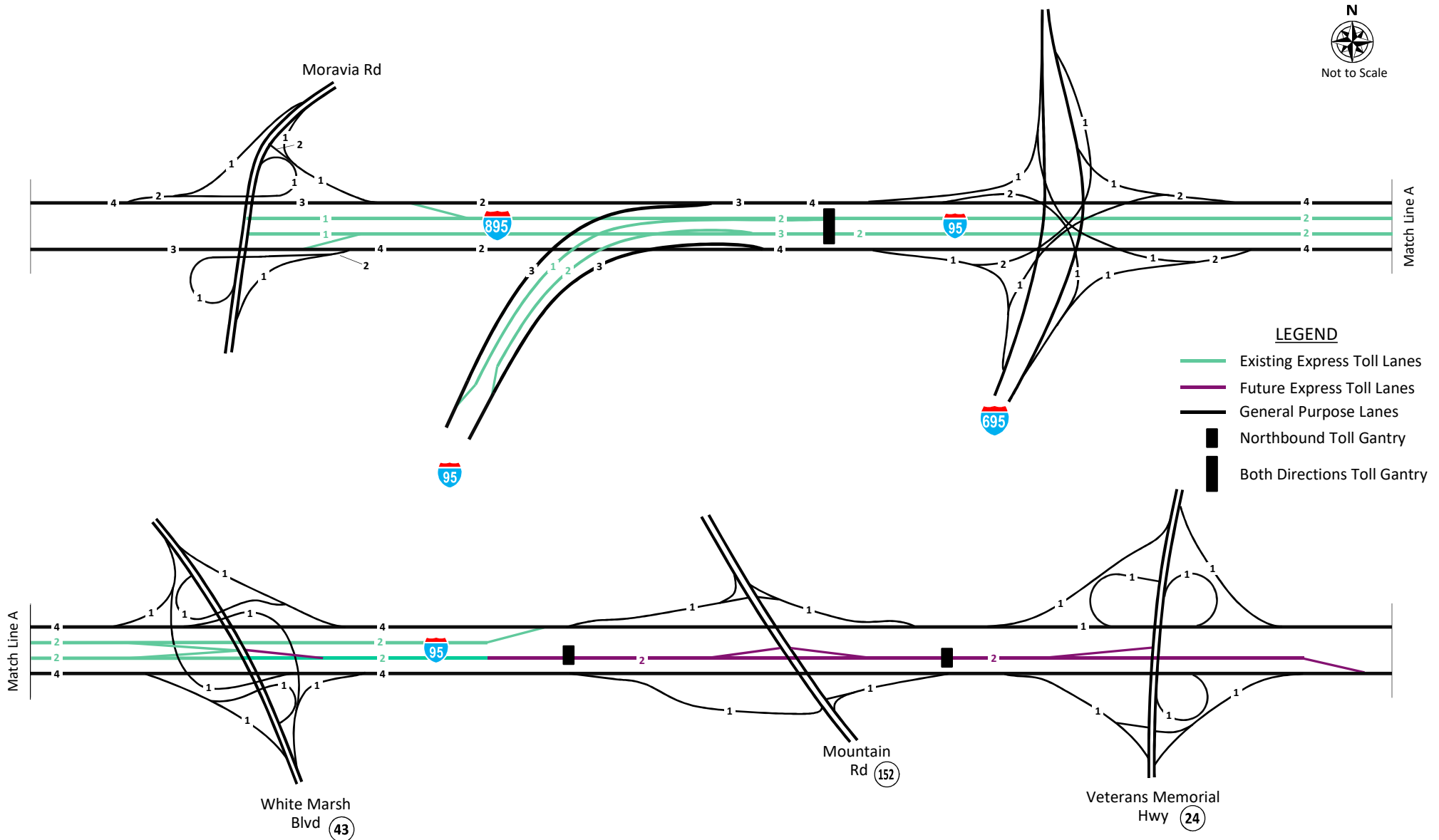


In the north, the Hatem Bridge and the Kennedy Highway form two parallel crossings of the Susquehanna River. The Hatem Bridge carries US 40 over the river and is the oldest of the MDTA's facilities, having been open to traffic since August 1940. The existing structure replaced an older bridge that first opened in 1910. The John F. Kennedy Memorial Highway is a 50-mile segment of I-95 that was opened in November 1963. It currently has one mainline toll plaza located just east of the Susquehanna River. The I-95 ETLs are a separate eight-mile toll facility on the Kennedy Highway between I-895 and MD 43 in Northeast Baltimore. The facility, which opened in December 2014, includes two express toll lanes in each direction in between the general purpose lanes on this segment of I-95. A northern extension of only the northbound I-95 ETL facility is planned to open in phases within the forecasting horizon of this report. The assumed opening dates of this extension are included in the assumptions in Chapter 4. **Figure 1-2** shows the assumed access and tolling points on the I-95 ETL extension.

There are three alternative MDTA toll routes that cross the Baltimore Harbor in the center of the region: the Baltimore Harbor Tunnel (I-895), the Francis Scott Key Bridge (I-695), and the Fort McHenry Tunnel (I-95), which are collectively referred to as the Baltimore Harbor crossings. The oldest of the three Baltimore Harbor crossings is the Harbor Tunnel which opened in November 1957. The Key Bridge was built to alleviate congestion and delays at the Harbor Tunnel and was opened in March 1977. The newest of these facilities, the Fort McHenry Tunnel, is an eight-lane crossing that opened in November 1985.

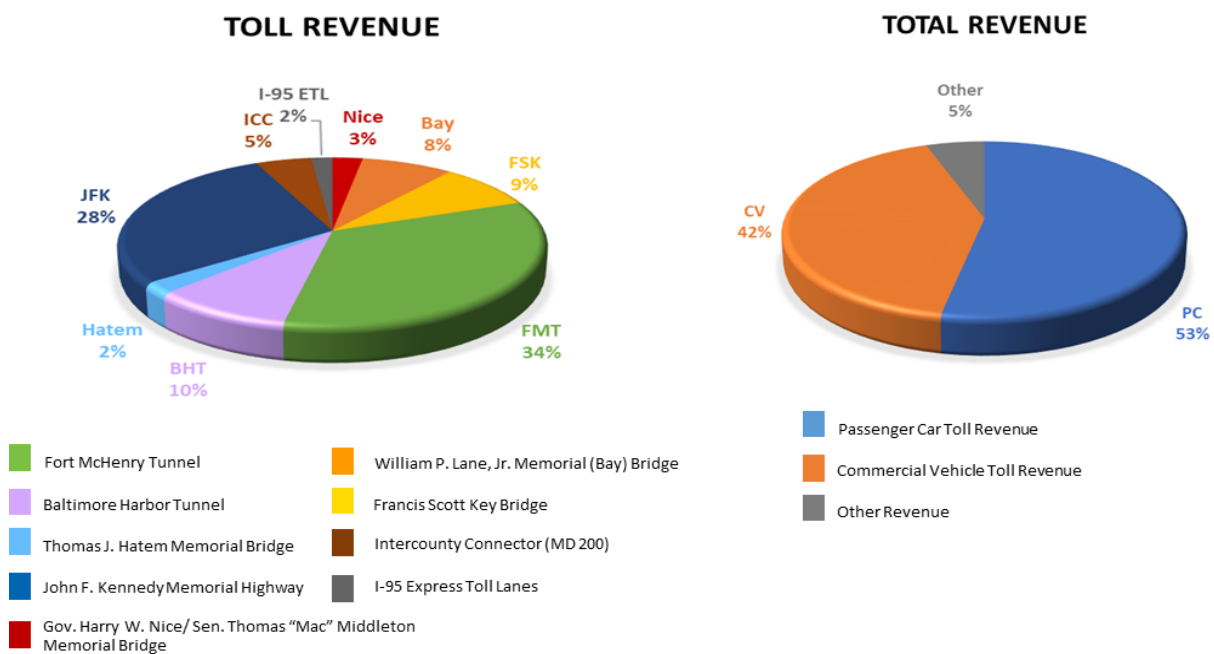
The ICC facility is in the northern Washington D.C. metro region and connects I-370 in the Gaithersburg area to I-95 and US 1 near Laurel. The ICC opened in phases. The initial segment between I-370 and MD 97 opened to traffic in February 2011 and began collecting tolls in March 2011. The segment from MD 97 to I-95 opened to traffic in November 2011 and began collecting tolls in December 2011, and the final segment between I-95 and US 1 opened and began collecting tolls in November 2014.

The southern region contains two facilities which carry US 301 to diverse destinations. The Governor Harry W. Nice Memorial/Senator Thomas "Mac" Middleton Bridge was opened in December 1940, connecting Maryland with Virginia, thereby allowing travelers making regional through-trips to bypass the Washington DC area. The William Preston Lane Jr. Memorial (Bay) Bridge was first opened to traffic in July 1952 and crosses the Chesapeake Bay. Twenty-one years later in June 1973, a parallel span carrying westbound traffic was opened, with the original span carrying eastbound traffic. A Tier 1 National Environmental Policy Act (NEPA) Study, called the Chesapeake Bay Crossing Study, is ongoing. The study is considering alternatives to address congestion on the Bay Bridge. A Record of Decision (ROD) on the study is anticipated in winter 2021-2022. A Tier 2, project-level NEPA Study could proceed following the ROD. Final project design and construction would follow final agency decisions based on completion of Tier 2 NEPA Study documents. Currently, there is no timetable for construction of a new crossing.



For context in this letter report, **Figure 1-3** shows the share of MDTA toll revenue by facility and total revenue by type for the most recent full fiscal year. As shown, over three quarters of toll revenue is from the Kennedy Highway, Fort McHenry Tunnel, Harbor Tunnel, and Key Bridge, which make up the I-95 corridor and parallel Interstate crossings near downtown Baltimore. Total revenue includes about 42 percent commercial vehicle toll revenue, about 53 percent passenger car toll revenue, and about 5 percent other revenue. Other revenue includes a combination of revenue collected and revenue deductions from unused Commuter Plan and Shoppers Plan trips, transponder fees and sales, the Hatem Bridge E-ZPass program, violation recovery (civil penalties), and commercial vehicle fees and discounts (post-usage discount, high frequency discount, and over-sized permit fees). The shares of revenue for FY 2021 were atypical compared to previous years due to the COVID-19 pandemic, business rule changes associated with COVID-19, and the conversion to all electronic tolling (AET). Commuting facilities contributed a smaller share due to increases in remote working and commercial vehicles were a higher share since they recovered to typical traffic levels much faster than passenger cars during the pandemic.

**Figure 1-3**  
**FY 2021 MDTA Share of Toll Revenue by Facility and Total Revenue by Type**



## 1.2 Toll Rate and Civil Penalty Structure

### 1.2.1 Standard Toll Rates

The toll rates described in this sub-section are standard toll rates. Several temporary toll rate changes were made in response to the COVID-19 pandemic and are described in the next sub-section.

**Table 1-1** provides the standard Legacy system toll rates and toll collection direction. Toll rates vary by facility, method of payment, and vehicle class. The toll rates are grouped into three categories: Maryland E-ZPass, base toll rates which includes out-of-state E-ZPass and the pay-by-



plate payment method, and video payment. Pay-by-Plate was introduced as another payment option for customers on April 29, 2021, which allows customers to pre-register their vehicle's license plate for video payment and receive the prior cash toll rate. A discount for early payment of video tolls was also introduced on April 29, 2021. This allows customers to receive a 15 percent discount (up to \$5.00) when they pay their video tolls before an invoice is mailed. Maryland E-ZPass toll rates apply to drivers who register for an E-ZPass account and receive a transponder from MDTA. These customers receive a discount compared to the base toll rate customers and can also enroll in discounts like the shopper and commuter rates and programs further described in **Table 1-2**. The base toll rate applies to out-of-state registered E-ZPass and pay-by-plate customers. Video customers pay a 50 percent surcharge over the base toll rate. Cash was a payment option at five of the seven Legacy facilities up until March 17, 2020 when cashless collection was initiated as a safety precaution related to the COVID-19 pandemic. The Hattem Bridge and Key Bridge facilities had already been converted to all-electronic tolling in October 2019. Permanent cashless tolling on these facilities that offered a cash payment option before the pandemic was announced on August 6, 2020.

**Table 1-1**  
**Standard MDTA Legacy System Toll Rates and Toll Collection Direction**

Class	Hattem Bridge (Eastbound)	Kennedy Highway (Eastbound)	Harbor Facilities: FMT, BHT, FSK (Both)	Bay Bridge (Eastbound)	Nice/ Middleton Bridge (Westbound)
<b>Maryland E-ZPass Payment Type</b>					
Commuter <sup>1</sup>	\$2.80	\$2.80	\$1.40	\$1.40	\$2.10
Shopper <sup>1</sup>	NA	NA	NA	\$2.00	NA
2-axle	\$6.00	\$6.00	\$3.00	\$2.50	\$5.40
3-axle	\$11.20	\$16.00	\$8.00	\$8.00	\$12.00
4-axle	\$16.80	\$24.00	\$12.00	\$12.00	\$18.00
5-axle	\$48.00	\$48.00	\$24.00	\$24.00	\$36.00
6-axle+	\$60.00	\$60.00	\$30.00	\$30.00	\$45.00
<b>Base Toll Rates: Other E-ZPass Payment Type and Pay-By-Plate Payment Type<sup>2</sup></b>					
2-axle	\$8.00	\$8.00	\$4.00	\$4.00	\$6.00
3-axle	\$16.00	\$16.00	\$8.00	\$8.00	\$12.00
4-axle	\$24.00	\$24.00	\$12.00	\$12.00	\$18.00
5-axle	\$48.00	\$48.00	\$24.00	\$24.00	\$36.00
6-axle+	\$60.00	\$60.00	\$30.00	\$30.00	\$45.00
<b>Video Payment Type<sup>3</sup></b>					
2-axle	\$12.00	\$12.00	\$6.00	\$6.00	\$9.00
3-axle	\$24.00	\$24.00	\$12.00	\$12.00	\$18.00
4-axle	\$36.00	\$36.00	\$18.00	\$18.00	\$27.00
5-axle	\$63.00	\$63.00	\$36.00	\$36.00	\$51.00
6-axle+	\$75.00	\$75.00	\$45.00	\$45.00	\$60.00

<sup>1</sup>Commuter and shopper programs for 2-axle vehicles only. Rates shown are if all trips are used

<sup>2</sup>ITOLs (video images matched to existing E-ZPass accounts) are charged the base toll rate.

<sup>3</sup>Customers that pay their video toll before an invoice is mailed are eligible for a 15% discount

**Table 1-2** provides a description of the other MDTA Legacy system discount toll rate programs available to Maryland E-ZPass customers. The programs available for two-axle vehicles aim to provide discounts for drivers who use the MDTA facilities frequently. Commuter plans are available for the Baltimore Harbor crossings, the Nice/Middleton Bridge, and the Bay Bridge. These plans allow customers to complete a set number of trips within a 45-day period at a fixed price on specific facilities. Specific details of the commuter programs are shown in **Table 1-2**. In addition to the commuter plan at the Bay Bridge, there is a shopper plan that allows drivers to take ten trips Sunday through Thursday for \$20 over a 90-day period on the Bay Bridge. The Hatem Bridge has two plans offered: Hatem Plan A and Hatem Plan B. Both plans provide unlimited trips for a flat annual fee of \$20 and vary slightly in account setup and associated fees.

Two discount plans are offered for commercial vehicles with five-or-more axles: the post usage discount and supplemental rebate plan. The post usage discount reimburses business accounts a percentage of monthly tolls in the range of 10 to 20 percent based on the toll amount accrued in a 30-day period. The supplemental rebate program provides a similar structure for individual accounts by providing a discount in the range of 10 to 20 percent for accounts that make more than 60 trips per month. Also listed in **Table 1-2** are the Baltimore Harbor Tunnel Childs Street ramp and Key Bridge Broening Highway Turnaround tolls which are a lower toll rate for three-or-more axle vehicles using specific ramps near the Harbor Tunnel and Key Bridge

Tolls on the ICC differ from the Legacy system in that they're assessed on particular interchange-to-interchange movements, as shown in **Table 1-3**. The ICC is a cashless facility with E-ZPass, Pay-by-Plate or video payment options. This table provides the two-axle E-ZPass toll rates, which vary from \$0.40 to \$3.86 depending on the length of the trip and time of day. Higher toll rates are assessed on weekdays during the Peak Periods, which are 6:00 to 9:00 AM and 3:00 to 7:00 PM, compared to the Overnight (11:00 PM to 5:00 AM) and Off-Peak (all other hours) time periods. Tolls differ on the weekends for the Overnight and Off-Peak periods. E-ZPass toll rates are higher for commercial and recreational (boat and camper) vehicles based on the number of axles. Unlike toll rates on the Legacy system, E-ZPass rates are the same on the ICC for customers holding their accounts through MDTA and through other agencies. All video toll customers pay a 50 percent surcharge over the E-ZPass rate with a minimum of \$1 and maximum of \$15 above the E-ZPass rates. Pay-by-Plate customers pay a rate in between the video toll and E-ZPass customers.

**Table 1-2**  
**Other MDTA Legacy System Discount Toll Rate Programs and Rates**

Program	Details
Baltimore Region Commuter Discount Plan	For E-ZPass Maryland accounts holders driving <b>two-axle vehicles</b> . The Baltimore Regional Plan is \$70 for 50 trips on the Fort McHenry Tunnel, Harbor Tunnel, Key Bridge, Kennedy Highway, or Hatem Bridge. Two "trips" are deducted for each crossing of the Kennedy Highway and Hatem Bridge. Plans end after 45 days or when all of the trips are used, whichever comes first.
Nice Bridge Commuter Discount Plan	For E-ZPass Maryland accounts holders driving <b>two-axle vehicles</b> . The Nice bridge plan is \$52.50 and offers 25 trips. The plans ends after 45 days or when all of the trips are used, whichever comes first.
Bay Bridge Commuter Discount Plan	For E-ZPass Maryland accounts holders driving <b>two-axle vehicles</b> . The Bay Bridge Plan is \$35.00 and offers 25 trips. The plan ends after 45 days or when all of the trips are used, whichever comes first.
Bay Bridge Shopper Discount Plan	For E-ZPass Maryland accounts holders driving <b>two-axle vehicles</b> . The Bay Bridge Shopper plan is \$20.00 for ten two-axle trips that can be used Sunday through Thursday. The plan ends after 90 days or when all of the trips are used, whichever comes first.
Hatem Bridge Discount Plan A	An E-ZPass account with transponders valid only at the Hatem Bridge. This plan applies only to <b>two-axle vehicles</b> , and includes unlimited trips. This plan is subject to a flat annual fee of \$20.00. There are NO account fees, prepaid toll deposits or account statements.
Hatem Bridge Discount Plan B	This discount plan is attached to a normal Maryland E-ZPass account. This plan applies only to <b>two-axle vehicles</b> , and includes unlimited trips. This plan is subject to a flat annual fee of \$20.00. Account fees apply as with the normal Maryland E-ZPass account.
Post Usage Discount Plan	Business accounts operating <b>five-or-more-axle vehicles</b> qualify for an E-ZPass post-usage discount based on the tolls paid in every 30-day period, with a 10 percent discount offered for total monthly tolls of \$150.00 to \$1,999.99, 15 percent for total monthly tolls of \$2,000.00 to \$7,500.00 and 20 percent for total monthly tolls of over \$7,500.00.
Supplemental Rebate Plan	A supplemental rebate program is offered to <b>five-or-more-axle vehicles</b> with individual transponders making 60 or more trips per month. As of July 1, 2015, a 10 percent discount is offered for five- or more-axle vehicle transponders making 60-79 trips per month, 15 percent for 80-99 trips per month, and 20 percent for 100 or more per month.
Baltimore Harbor Childs Street Ramps and Key Bridge Broening Highway Turnaround Toll	Vehicles with a valid E-ZPass Maryland account and transponder will pay \$2 per axle for <b>3, 4, 5 and 6+ axle vehicles</b> to use the I-895/Childs Street ramps at the Baltimore Harbor Tunnel and when making the Broening Highway Turnaround on the Key Bridge.



**Table 1-3**  
**Intercounty Connector Two-Axle E-ZPass Toll Rates by Movement and Time Period**

Entrance	Time Period <sup>1</sup>	Exit						
		I-370 / Shady Grove Rd.	SR 97 / Georgia Ave.	SR 182 / Layhill Rd.	SR 650 / New Hampshire Ave.	US 29 / Briggs Cheney Rd.	I-95	Konterra Dr. / US 1
I-370; Shady Grove Rd.	Peak		\$1.24	\$1.74	\$2.37	\$2.92	\$3.52	\$3.86
	Off-Peak		\$0.96	\$1.35	\$1.83	\$2.26	\$2.72	\$2.98
	Overnight		\$0.40	\$0.56	\$0.75	\$0.93	\$1.12	\$1.23
SR 97 / Georgia Ave.	Peak	\$1.24		\$0.50	\$1.13	\$1.68	\$2.28	\$2.61
	Off-Peak	\$0.96		\$0.40	\$0.87	\$1.30	\$1.76	\$2.02
	Overnight	\$0.40		\$0.40	\$0.40	\$0.53	\$0.72	\$0.83
SR 182 / Layhill Rd.	Peak	\$1.74	\$0.50		\$0.62	\$1.18	\$1.78	\$2.11
	Off-Peak	\$1.35	\$0.40		\$0.48	\$0.91	\$1.37	\$1.63
	Overnight	\$0.56	\$0.40		\$0.40	\$0.40	\$0.56	\$0.67
SR 650 / New Hampshire Ave.	Peak	\$2.37	\$1.13	\$0.62		\$0.55	\$1.15	\$1.49
	Off-Peak	\$1.83	\$0.87	\$0.48		\$0.43	\$0.89	\$1.15
	Overnight	\$0.75	\$0.40	\$0.40		\$0.40	\$0.40	\$0.47
US 29 / Briggs Cheney Rd.	Peak	\$2.92	\$1.68	\$1.18	\$0.55		\$0.60	\$0.94
	Off-Peak	\$2.26	\$1.30	\$0.91	\$0.43		\$0.46	\$0.72
	Overnight	\$0.93	\$0.53	\$0.40	\$0.40		\$0.40	\$0.40
I-95	Peak	\$3.52	\$2.28	\$1.78	\$1.15	\$0.60		\$0.44
	Off-Peak	\$2.72	\$1.76	\$1.37	\$0.89	\$0.46		\$0.40
	Overnight	\$1.12	\$0.72	\$0.56	\$0.40	\$0.40		\$0.40
Konterra Dr. / US 1	Peak	\$3.86	\$2.61	\$2.11	\$1.49	\$0.94	\$0.44	
	Off-Peak	\$2.98	\$2.02	\$1.63	\$1.15	\$0.72	\$0.40	
	Overnight	\$1.23	\$0.83	\$0.67	\$0.47	\$0.40	\$0.40	

<sup>1</sup>Time periods are:

Peak Period is defined as 6:00 to 9:00 AM and 4:00 to 7:00 PM on Weekdays (excluding federal holidays).

Off-Peak Period is defined as 5:00 to 6:00 AM, 9:00 AM to 4:00 PM, and 7:00 to 11:00 PM on Weekdays and 5:00 AM to 11:00 PM on Weekends and federal holidays.

Overnight is defined as 11:00 PM to 5:00 AM every day.

The I-95 ETLs are an express lane facility with a single tolling point in each direction. Similar to the ICC, toll rates vary by vehicle type and time period. It is a cashless facility with payment method options of E-ZPass, Pay-by-Plate, or video tolling. As shown previously in **Figure 1-2**, a northbound extension of the I-95 ETLs is also planned to open within the forecasting period.

**Table 1-4** provides the toll rates by axle and payment type for the existing section from I-895 to MD 43, as well as the assumed toll rates for the two northbound extension tolling points, which extend through MD 24. Unlike toll rates on the Legacy system, E-ZPass rates are the same on the I-95 ETLs for customers holding their accounts through MDTA and through other agencies. Video toll customers pay a 50 percent surcharge over the E-ZPass rate with a minimum of \$1 and maximum of \$15 above the E-ZPass rates. Pay-by-plate customers pay a rate that is in between video toll and E-ZPass customers.

**Table 1-4**  
**I-95 Express Toll Lane Toll Rates**

Class	Existing Section (I-895 to MD 43)			Northbound Extension Phase 1 (MD 43 to MD 152)			Northbound Extension Phase 2 (MD 152 to MD 24)		
	Peak	Off-Peak	Overnight	Peak	Off-Peak	Overnight	Peak	Off-Peak	Overnight
<b>E-ZPass Payment Type</b>									
2-axle	\$1.54	\$1.19	\$0.49	\$1.54	\$1.19	\$0.49	\$0.66	\$0.51	\$0.21
3-axle	\$3.08	\$2.38	\$0.98	\$3.08	\$2.38	\$0.98	\$1.32	\$1.02	\$0.42
4-axle	\$4.65	\$3.57	\$1.47	\$4.65	\$3.57	\$1.47	\$1.99	\$1.53	\$0.63
5-axle	\$9.24	\$7.14	\$2.94	\$9.24	\$7.14	\$2.94	\$3.96	\$3.06	\$1.26
6-axle+	\$11.55	\$8.93	\$3.68	\$11.55	\$8.93	\$3.68	\$4.95	\$3.83	\$1.58
<b>Video Payment Type</b>									
2-axle	\$2.54	\$2.19	\$1.49	\$2.54	\$2.19	\$1.49	\$1.09	\$0.94	\$0.64
3-axle	\$4.62	\$3.57	\$1.98	\$4.62	\$3.57	\$1.98	\$1.98	\$1.53	\$0.85
4-axle	\$6.93	\$5.36	\$2.47	\$6.93	\$5.36	\$2.47	\$2.97	\$2.30	\$1.06
5-axle	\$13.86	\$10.71	\$4.41	\$13.86	\$10.71	\$4.41	\$5.94	\$4.59	\$1.89
6-axle+	\$17.33	\$13.39	\$5.51	\$17.33	\$13.39	\$5.51	\$7.43	\$5.74	\$2.36

Time Periods:

Peak Period is defined as southbound from 6:00 to 9:00 AM Mon to Fri, northbound from 3:00 to 7:00 PM Mon to Fri, and both directions from 12:00 to 2:00 PM Sat and 2:00 to 5:00 PM Sun.

Off-Peak Period is defined as southbound from 5:00 to 6:00 AM/9:00 AM to 9:00 PM Mon to Fri, northbound from 5:00 AM to 3:00 PM/7:00 to 9:00 PM Mon to Fri, and both directions from 5:00 AM to 12:00 PM/2:00 to 9:00 PM Sat and 5:00 AM to 2:00 PM/5:00 to 9:00 PM Sunday.

Overnight is defined as 9:00 PM to 5:00 AM every day.

### 1.2.2 COVID-19 Toll Rates and Business Rules

On March 17, 2020 MDTA implemented systemwide cashless tolling until further notice. Most other larger toll agencies in the United States that had the capability to do so also converted to cashless (also called all-electronic) tolling around this time to prevent the potential spread of COVID-19 during exchanges of cash at toll booths. The MDTA cashless program was implemented by applying video tolling at cash toll rates at facilities where cash is normally accepted. The MDTA cashless tolling was applied to five facilities, the Kennedy Highway, Harbor Tunnel, Fort McHenry Tunnel, Bay Bridge, and Nice/Middleton Bridge. The other four MDTA facilities, the Hatem Bridge, Key Bridge, ICC, and I-95 ETLs, already operated with cashless tolling before the pandemic. The

Bay Bridge was already being planned to convert to cashless tolling before the pandemic. This facility officially converted to permanent cashless tolling on May 12, 2020.

The cashless tolling implemented during the pandemic was initially announced as temporary. Permanent cashless tolling on all facilities was announced on August 6, 2020 to provide convenience for motorists, less engine idling for better fuel efficiency and reduced emissions, decreased congestion, and increased safety. However, cash toll rates for video customers were still charged on the Kennedy Highway, Harbor Tunnel, Fort McHenry Tunnel, Bay Bridge, and Nice/Middleton Bridge until January 1, 2021 when video toll rates were reinstated. Additionally, mailing of Notice of Toll Due (NOTD) video invoices was paused in March 2020 but was resumed in the fall of 2020.

Another change due to the pandemic in March 2020 was the extension of the time limits required to use trips for the Commuter and Shopper plans. Limits on these plans were reinstated on November 1, 2020.

### 1.2.3 Upcoming Toll Rate Changes

New vehicle class toll rate categories are planned that include lower toll rates. These new classes are motorcycles and certain three and four-axle vehicles, specifically “light” vehicles towing one and two-axle trailers such as those towing watercraft or landscaping equipment. Motorcycles will pay a 50 percent lower toll than current two-axle rates. Three and four-axle light vehicles will pay 25 and 17 percent, respectively, lower toll than current three and four-axle rates. The assumed implementation schedule for the new toll rates is provided in the assumptions in Chapter 4.

Except for the changes listed in the previous paragraph, no other future toll rate changes were assumed in this MDTA system forecast for the forecasting period through FY 2031.

### 1.2.4 Civil Penalties

Before the pandemic MDTA assessed a \$50 Civil Penalty per unpaid transaction for drivers that did not pay their video tolls within 45 days. A reduction in the Civil Penalty amount from \$50 to \$25 per unpaid transaction began for all civil penalties assessed in FY 2021. The \$25 Civil Penalty was also assumed for the remainder of the forecast.

## 1.3 Report Structure

Chapter 2, Historical Traffic and Revenue Trends, provides a summary of historical trends and variations of traffic and revenue on the Legacy bridges, tunnels, and highways operated by the MDTA, including recent trends due to the COVID-19 pandemic. Trends in different payment shares are also provided.

Chapter 3, Socioeconomic Review, provides a summary of updated historical trends and forecasts of socioeconomic variables to provide the context for the traffic and revenue growth projections. The socioeconomic trend review consisted of data collection including the compilation and updating of pertinent variables such as population, employment, income, gasoline prices, and real gross regional product from a number of public and private sources.



Chapter 4, Forecasts by Facility, provides a summary of the underlying assumptions and methodology used in the traffic and revenue forecasting process. Also presented in this Chapter are the 10-year traffic and revenue forecasts by facility and vehicle class for each of the MDTA facilities, including forecasted other revenue.

Chapter 5, Total Forecast Results, summarizes the forecasts for the MDTA system.

Chapter 6, Forecast Comparisons, provides a comparison of the updated forecasts to previous forecasts for the MDTA facilities.

## Chapter 2

# Historical Trends

This chapter includes analysis of historical traffic, revenue, and payment type trends on the MDTA facilities. Analysis of traffic trends on other routes in Maryland is also provided for context. Recent historical data is especially important as an input to developing the updated forecast documented in this report. One factor in this forecast update is an assessment of the latest traffic impacts due to the ongoing COVID-19 pandemic. As such, this chapter begins with discussion and analysis of impacts on traffic on the MDTA system due to COVID-19.

## 2.1 MDTA Traffic Impacts Due to COVID-19

The COVID-19 pandemic is impacting nearly all aspects of society and the economy, including travel. Beginning in March 2020, the pandemic caused significant reductions in transactions and revenue on toll facilities around the U.S., including on the MDTA system. **Table 2-1** provides COVID-19 pandemic-related traffic impact factors that were observed statistically or anecdotally during the first year of the pandemic and apply to MDTA traffic. As the pandemic situation improved in spring 2021, certain factors shown in **Table 2-1** that were observed in the first year of the pandemic changed. Some of these are driven by a quicker than expected increase in demand for travel and leisure activities in late spring and early summer 2021. For example, fuel prices increased significantly in spring 2021 driven especially by increasing demand. Also, longer-distance domestic vacation and leisure travel began to rebound very quickly. Commercial shipping activity, which had recovered to pre-pandemic levels in many sectors even by fall 2020, continues to be strong. This is partially driven by significant growth in e-commerce during the pandemic.

Looking to the future, in the short term the Delta variant of COVID-19 has slowed the recovery in recent months and is expected to continue to do so in fall 2021. For example, many employers have delayed the implementation of new work from home and travel policies in the past month. Also, the rapid recovery of leisure and vacation travel observed in spring and early summer 2021 appears to be slowing. In the medium and long-term impacts of several of the factors continue to be actively discussed and researched in the transportation industry, including related to transit usage, e-commerce, telecommuting, and residential and job location patterns.

The COVID-19 pandemic and its impacts on underlying socioeconomic factors related to MDTA traffic is discussed in more detail in Chapter 3.

**Table 2-1**  
**Potential COVID-19 Impact Factors Related to MDTA Traffic**

Positive Traffic Impacts		Negative Traffic Impacts		Uncertain Traffic Impacts	
Passenger Cars	Commercial Vehicles	Passenger Cars	Commercial Vehicles	Passenger Cars	Commercial Vehicles
<ul style="list-style-type: none"> <li>• Health concerns with transit causing shifts to vehicular travel in urban areas</li> <li>• Lower fuel prices</li> <li>• On-demand delivery services using personal vehicles including food</li> </ul>	<ul style="list-style-type: none"> <li>• Accelerated trends in e-commerce growth</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced travel due to stay at home orders</li> <li>• Employment losses</li> <li>• Telecommuting</li> <li>• Ongoing avoidance of less-critical travel due to health concerns</li> <li>• Accelerated trends in e-commerce growth</li> <li>• Lower population growth due to lower immigration</li> </ul>	<ul style="list-style-type: none"> <li>• Less shipping activity and deliveries related to declines in economic activity</li> </ul>	<ul style="list-style-type: none"> <li>• Shifts to relatively more local vacation and leisure activity</li> <li>• Shifts in residential and job location patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Supply chain changes, for example related to international trade</li> </ul>

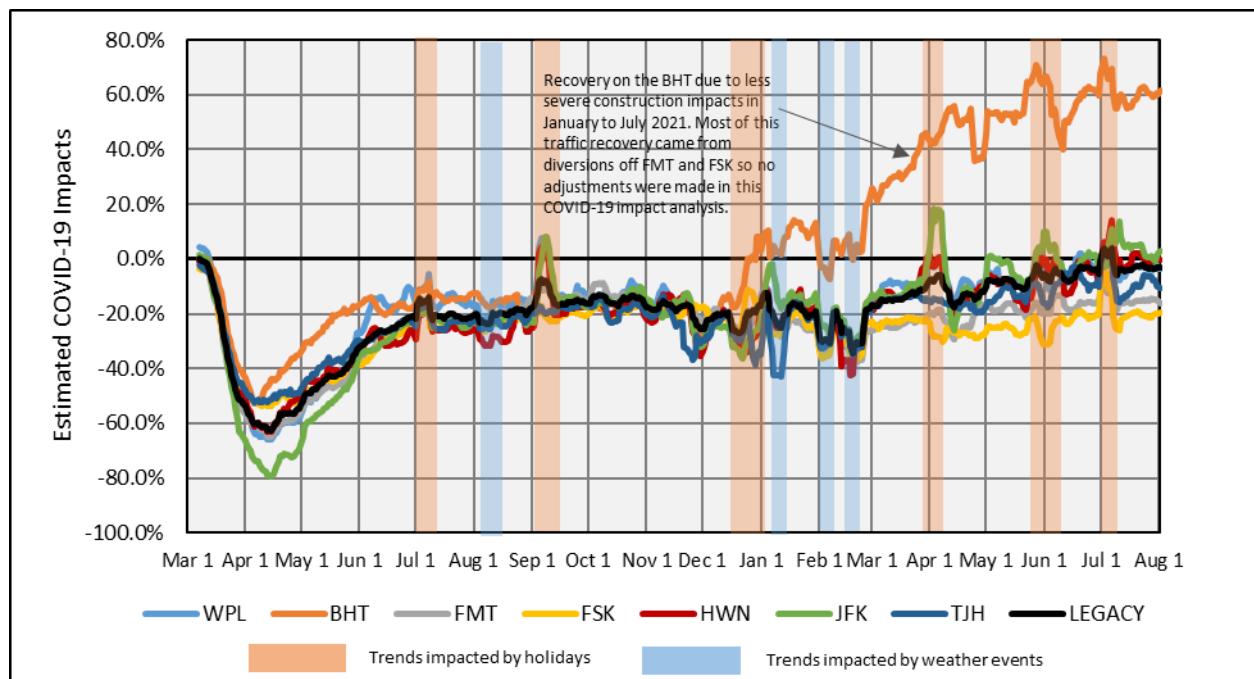
CDM Smith performed analysis using daily in-lane data from each of the MDTA facilities to determine impacts due to the COVID-19 pandemic. For the Legacy system, which includes several facilities with significant commercial vehicle usage, the analysis was conducted separately for passenger cars and commercial vehicles. The analysis methodology used is described below:

- The most recent raw daily in-lane traffic data for each of the MDTA facilities was obtained.
- Data by day for 2020 before the COVID-19 impact (from January to early March) was compared to similar data by day for 2019 to estimate the most recent actual 2019 to 2020 growth rate by facility (and passenger car versus commercial vehicle). Note that the 2019 to 2020 comparison was made by shifting the comparison dates to the same day of week rather than the same exact date. For example, Sunday March 1, 2020 was compared to Sunday March 3, 2019.
- The 2019 to 2020 pre-COVID-19 growth rates were applied to data by day from 2019 to the days corresponding to the 2020 days after the COVID-19 impact. This resulted in an estimate of 2020 traffic without the COVID-19 impact.
- Adjustments were made when necessary to better compare data. For example, the estimated 2020 without COVID-19 traffic was adjusted to account for the Easter weekend occurring at a different time in 2019 than 2020 and for Labor Day occurring earlier in September in 2019 compared to 2020, and for the Bay Bridge construction starting in late September 2019.
- The estimated 2020 and 2021 traffic was compared with actual 2020 and 2021 traffic on a seven-day rolling average basis to estimate an impact due to COVID-19. The overall analysis methodology accounts for seasonal impacts on traffic, which are significant on some MDTA facilities.

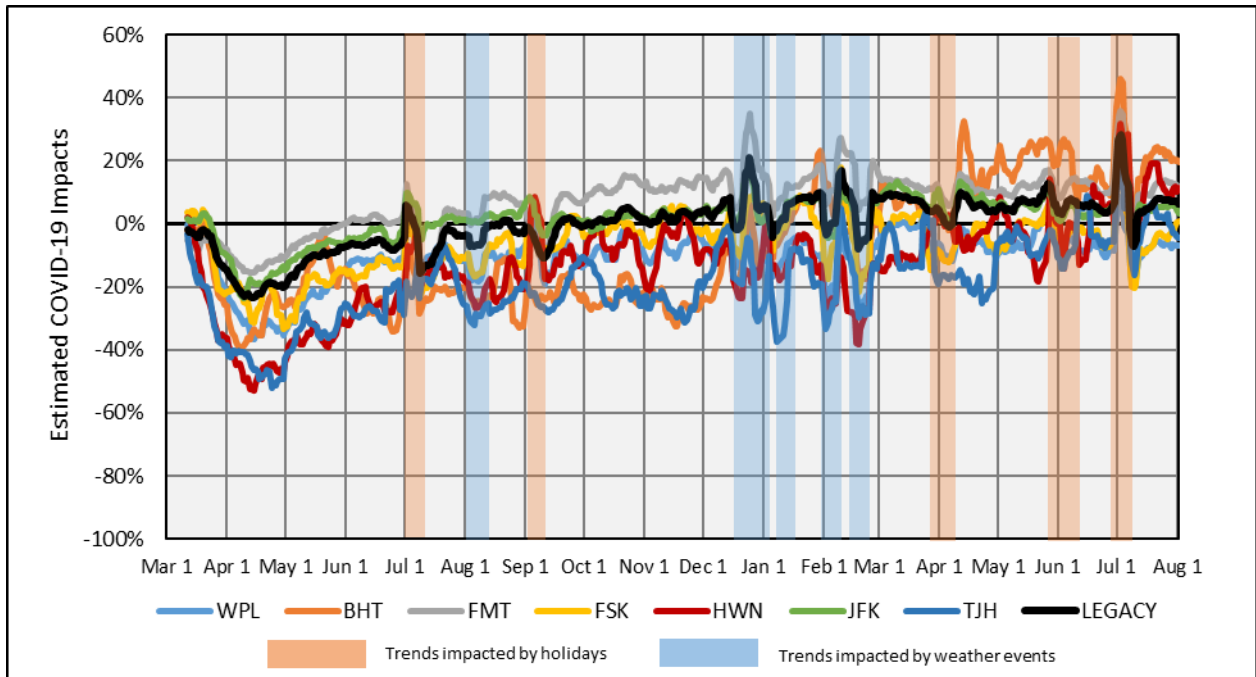
The results of the impact analysis are shown in three figures below. **Figure 2-1** shows the results for Legacy system passenger cars, **Figure 2-2** for Legacy system commercial vehicles, and **Figure 2-3** for the ICC and I-95 ETLs.

The most severe negative COVID-19 traffic impacts on all MDTA facilities was reached mid-April 2020. From mid-April through early July 2020, a rapid partial recovery occurred as Maryland reopened in a phased manner. From July through the end of the first quarter of FY 2021, impacts remained relatively stable, with Legacy passenger cars at about an average negative 18 percent impact and Legacy commercial vehicles at about a negative 3 percent impact. Commercial vehicles fully recovered in October 2020. Passenger car impacts became slightly more severe at the end of November and through December, corresponding with rising rates of new COVID-19 cases. Since February 2021, passenger car impacts have continued to improve. In the fourth quarter of FY 2021, impacts improved from negative 10 percent in April to negative 4 percent in June. Increases in local and long-distance travel for the summer and reductions in cases likely contributed to the improvement in impacts.

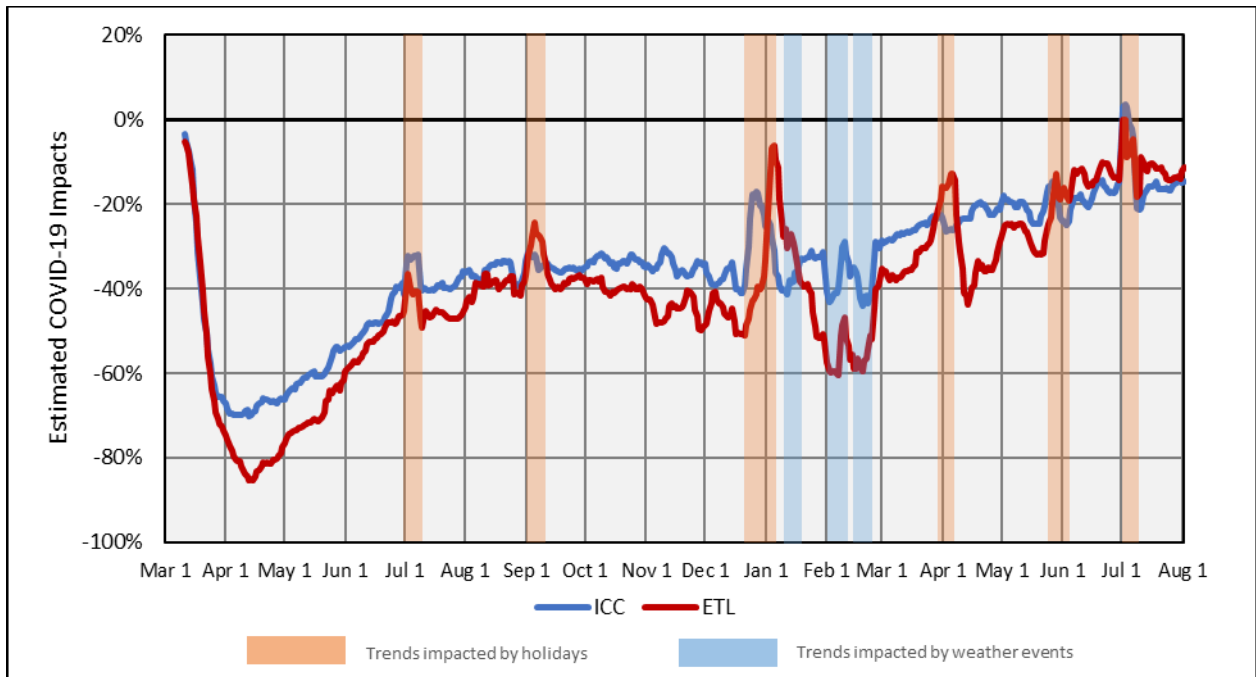
**Figure 2-1**  
**Legacy System Passenger Car Seven Day Rolling Average Impacts due to COVID-19**



**Figure 2-2**  
**Legacy System Commercial Vehicle Seven Day Rolling Average Impacts due to COVID-19**



**Figure 2-3**  
**ICC and I-95 ETL Seven Day Rolling Average Impacts due to COVID-19**





The ICC and I-95 ETL have experienced more severe negative impacts than the Legacy system through the duration of the pandemic. Relatively more severe impacts have also been observed on similar urban congestion relief-type facilities and priced managed lane-type facilities in other parts of the country. The ICC and I-95 ETLs showed a flattening of impacts through the first quarter of FY 2021, with the ICC averaging a negative 36 percent impact and the I-95 ETLs averaging a negative 40 percent impact. Similar to the Legacy facilities, there was an improvement in trends over the 4<sup>th</sup> of July and Labor Day holidays in 2020, primarily on the I-95 ETLs, which carries higher vacationing traffic due to its location on I-95/Kennedy Memorial Highway. Through the second quarter of FY 2021, impacts became more negative in December. Both facilities had a strong recovery in March, with the facilities averaging impacts of negative 26 and 33 percent for the ICC and I-95 ETLs, respectively. In the fourth quarter of FY 2021, both the ICC and I-95 ETLs had significant improvement in impacts, reaching negative 18 and negative 14 percent, respectively. Since March, the pace of recovery on these commuting-based congestion relief facilities has improved significantly, likely indicative of increasing return to work for employees who have been working remotely due to the pandemic and spring and early summer recreational travel.

**Table 2-2** summarizes the average estimated COVID-19 impacts by month shown for each of the MDTA facilities.

**Table 2-2**  
**Summary of Estimated Average COVID-19 Impacts by Month**

Calendar Year	Month	Legacy System Passenger Cars	Legacy System Commercial Vehicles	Intercounty Connector	I-95 ETL
2020	March	-19%	-4%	-27%	-29%
2020	April	-58%	-20%	-68%	-81%
2020	May	-43%	-11%	-60%	-70%
2020	June	-27%	-6%	-49%	-53%
2020	July	-20%	-5%	-38%	-45%
2020	August	-20%	-2%	-36%	-40%
2020	September	-14%	-3%	-35%	-35%
2020	October	-15%	2%	-33%	-40%
2020	November	-18%	2%	-35%	-45%
2020	December	-22%	6%	-33%	-45%
2021	January	-19%	5%	-34%	-32%
2021	February <sup>(1)</sup>	-27%	3%	-37%	-54%
2021	March	-14%	7%	-26%	-33%
2021	April	-12%	5%	-23%	-30%
2021	May	-8%	7%	-20%	-25%
2021	June	-5%	5%	-18%	-14%
2021	July	-2%	8%	-13%	-11%

<sup>(1)</sup> Impacts shown here for February 2021 were due to significant severe winter weather in addition to COVID-19.

## 2.2 Maryland Vehicle Miles Traveled

Vehicle miles traveled (VMT) trends were reviewed to better understand the general trends in traffic growth nationally and within Maryland. The Federal Highway Administration develops annual estimates of national and state-wide VMT by roadway type, which have been summarized in **Table 2-3** for years 2007 through 2020 for the United States (U.S.) and Maryland.

Total VMT growth trends for both Maryland and the U.S. have been generally similar during the Great Recession impacted years (2007 to 2009) and years following (2009 to 2019). In general, the trends indicate that total national and statewide Maryland VMT growth is similar. However, growth on Maryland's Interstate highways has been much lower than the U.S. average between 2009 and 2019, at 0.6 percent per annum versus 1.5 percent per annum, respectively. Growth in the last decade on the Maryland interstate system is still occurring, albeit at a lower rate than the nation. The percent of total VMT occurring on Interstate routes has remained relatively constant throughout the past 13 years. Approximately 25 percent of national VMT and 30 percent of Maryland VMT are made on interstate routes, which account for 2.5 percent and 3.9 percent of all roads in the nation and Maryland, respectively. In 2020, due to travel restrictions and stay-at-home mandates from the COVID-19 pandemic, interstate VMT in the United States and Maryland both declined by 15.8 percent.

These trends in VMT since 2007 are different from pre-2007 long-term historical trends (not shown on this table). Before the mid-2000s, VMT had been growing regionally and nationally by about 2 percent per year. In the years following the Great Recession VMT growth was about half of this, at 0.9 percent nationally and 0.8 percent in Maryland. These changes are indicative of changes in travel driven by underlying socioeconomic factors in Maryland and the U.S. Similar to the changes observed after the Great Recession, the potential for long-term changes in travel due to the ongoing COVID-19 pandemic will continue to be closely monitored.

**Table 2-3**  
**National and Statewide Trends in Vehicle Miles Traveled**

Calendar Year	United States <sup>(1)</sup>					Maryland				
	Interstate			Total		Interstate			Total	
	VMT (Millions)	Percent Change	Percent of Total	VMT (Millions)	Percent Change	VMT (Millions)	Percent Change	Percent of Total	VMT (Millions)	Percent Change
2007	745,457	-	24.4	3,049,027	-	17,015	-	30.1	56,503	-
2008	725,078	(2.7)	24.2	2,992,705	(1.8)	16,710	(1.8)	30.4	55,023	(2.6)
2009	722,655	(0.3)	24.3	2,975,804	(0.6)	16,965	1.5	30.7	55,293	0.5
2010	729,015	0.9	24.4	2,985,854	0.3	17,040	0.4	30.4	56,126	1.5
2011	725,787	(0.4)	24.4	2,968,990	(0.6)	16,964	(0.4)	30.2	56,221	0.2
2012	735,915	1.4	24.6	2,988,021	0.6	17,054	0.5	30.2	56,475	0.5
2013	745,106	1.2	24.8	3,006,911	0.6	17,064	0.1	30.1	56,688	0.4
2014	756,374	1.5	24.9	3,040,220	1.1	17,057	(0.0)	30.2	56,432	(0.5)
2015	782,111	3.4	25.1	3,109,937	2.3	17,102	0.3	29.7	57,516	1.9
2016	810,264	3.6	25.4	3,188,972	2.5	17,584	2.8	29.7	59,137	2.8
2017	824,910	1.8	25.6	3,227,358	1.2	17,937	2.0	29.9	59,892	1.3
2018	833,803	1.1	25.6	3,255,347	0.9	17,928	(0.1)	30.0	59,775	(0.2)
2019	842,604	1.1	25.7	3,276,482	0.6	18,058	0.7	30.0	60,216	0.7
2020 <sup>(2)</sup>	709,091	(15.8)	25.1	2,829,705	(13.6)	15,202	(15.8)	30.0	50,703	(15.8)
<b>Average Annual Percent Change</b>										
2007 to 2009		(1.5)			(1.2)		(0.1)			(1.1)
2009 to 2019		1.5			1.0		0.6			0.8
2005-2019 VMT Data source: Table VM-2, Highway Statistics 1994-2017, USDOT FHWA Office of Policy Information. 2020 VMT Data source: Monthly Travel Volume Trends Reports, USDOT FHWA Office of Policy Information. <sup>(1)</sup> Includes Puerto Rico. <sup>(2)</sup> Interstate-level VMT data for Maryland unavailable for 2019, and was estimated on the average of 2017 and 2018 interstate miles as a percent of total VMT.										

## 2.3 MDTA Traffic and Revenue Trends

### 2.3.1 Collected Transactions and Revenue

This section provides a review of the historical collected toll transaction/trip trends and toll revenue trends for each of the seven MDTA Legacy facilities, I-95 Express Toll Lanes (ETLs), and the Intercounty Connector (ICC). Toll revenue is the revenue that is collected by transponder or by various forms of video payment (and formerly by in-lane cash payment) for payment of published toll rates. Other revenue includes a combination of revenue collected and revenue deductions from unused Commuter Plan and Shoppers Plan trips, transponder fees and sales, the Hatem Bridge E-ZPass® program, violation recovery (civil penalties), and commercial vehicle fees and discounts (post-usage discount, high frequency discount, and over-sized permit fees). The historical transaction/trip and revenue trends by facility for passenger cars, commercial vehicles and total traffic are presented by fiscal year in **Table 2-4**, **Table 2-5**, and **Table 2-6**, respectively. The historical transaction/trip and revenue trends for total vehicles by facility are graphically presented in **Figure 2-4**. Despite a strong recovery for raw, in-lane traffic in FY 2021 from the pandemic as shown previously in the COVID-19 impact trends, collected transactions and revenue continued to be down due to collection challenges related to the back office transition.

**Table 2-4**  
**MDTA Passenger Car Historic Collected Transactions and Toll Revenue**

Fiscal Year	Hatem Bridge		Kennedy Highway		Harbor Tunnel		Fort McHenry Tunnel		Key Bridge		Bay Bridge		Nice/Middleton Bridge		ICC <sup>(1)</sup>		I-95 ETL <sup>(1)</sup>	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
<b>Passenger Car Transactions (in millions)</b>																		
2007	5.286	-	12.874	-	24.891	-	40.945	-	10.970	-	12.409	-	3.112	-	-	-	-	-
2008	5.296	0.2	12.722	(1.2)	24.921	0.1	40.879	(0.2)	11.093	1.1	12.312	(0.8)	3.107	(0.2)	-	-	-	-
2009	4.942	(6.7)	12.794	0.6	24.795	(0.5)	39.851	(2.5)	10.601	(4.4)	11.902	(3.3)	3.097	(0.3)	-	-	-	-
2010	4.890	(1.1)	12.977	1.4	24.553	(1.0)	40.583	1.8	9.953	(6.1)	12.093	1.6	3.134	1.2	-	-	-	-
2011	4.961	1.4	13.565	4.5	25.397	3.4	42.704	5.2	10.587	6.4	12.608	4.3	3.181	1.5	-	-	-	-
2012	4.884	(1.5)	13.154	(3.0)	25.113	(1.1)	41.103	(3.7)	10.048	(5.1)	12.766	1.3	3.100	(2.5)	-	-	-	-
2013	4.391	(10.1)	12.912	(1.8)	23.414	(6.8)	40.116	(2.4)	9.982	(0.7)	11.865	(7.1)	3.071	(0.9)	-	-	-	-
2014	4.779	8.8	12.690	(1.7)	24.325	3.9	38.290	(4.6)	9.427	(5.6)	11.878	0.1	3.040	(1.0)	-	-	-	-
2015	5.064	6.0	13.022	2.6	26.517	9.0	38.353	0.2	9.632	2.2	12.008	1.1	3.095	1.8	-	-	-	-
2016	4.880	(3.6)	13.401	2.9	27.653	4.3	38.876	1.4	10.185	5.7	12.398	3.2	3.172	2.5	-	-	-	-
2017	4.893	0.3	13.745	2.6	26.974	(2.5)	41.381	6.4	10.257	0.7	12.692	2.4	3.209	1.2	31.758	-	8.614	-
2018	4.881	(0.2)	13.576	(1.2)	27.327	1.3	40.546	(2.0)	10.330	0.7	12.631	(0.5)	3.123	(2.7)	33.433	5.3	8.915	3.5
2019	4.869	(0.2)	13.316	(1.9)	20.254	(25.9)	43.955	8.4	11.674	13.0	12.706	0.6	3.104	(0.6)	35.231	5.4	9.331	4.7
2020	4.182	(14.1)	10.669	(19.9)	13.709	(32.3)	38.242	(13.0)	10.793	(7.5)	10.723	(15.6)	2.571	(17.2)	31.850	(9.6)	7.341	(21.3)
2021	2.868	(31.4)	7.287	(31.7)	11.489	(16.2)	25.709	(32.8)	7.490	(30.6)	7.799	(27.3)	1.591	(38.1)	10.511	(67.0)	4.783	(34.9)
<b>Passenger Car Revenue (in millions of dollars)</b>																		
2007	1.119	-	58.915	-	29.926	-	56.924	-	10.805	-	24.652	-	7.154	-	-	-	-	-
2008	1.242	11.1	58.013	(1.5)	30.320	1.3	56.381	(1.0)	10.822	0.2	24.452	(0.8)	7.055	(1.4)	-	-	-	-
2009	1.255	1.0	58.467	0.8	30.840	1.7	55.224	(2.1)	10.512	(2.9)	23.740	(2.9)	7.020	(0.5)	-	-	-	-
2010	1.468	16.9	59.246	1.3	31.141	1.0	57.211	3.6	10.299	(2.0)	24.510	3.2	7.190	2.4	-	-	-	-
2011	1.622	10.5	59.906	1.1	31.856	2.3	58.288	1.9	10.658	3.5	25.105	2.4	7.233	0.6	-	-	-	-
2012	2.354	45.1	67.640	12.9	42.558	33.6	75.089	28.8	13.800	29.5	31.786	26.6	8.589	18.7	-	-	-	-
2013	3.993	69.6	73.602	8.8	46.871	10.1	87.559	16.6	16.450	19.2	36.113	13.6	9.577	11.5	-	-	-	-
2014	5.007	25.4	94.931	29.0	69.466	48.2	114.982	31.3	22.863	39.0	54.346	50.5	14.616	52.6	-	-	-	-
2015	5.113	2.1	97.301	2.5	77.033	10.9	115.294	0.3	24.330	6.4	55.630	2.4	15.198	4.0	-	-	-	-
2016	5.279	3.2	98.677	1.4	80.650	4.7	115.994	0.6	24.474	0.6	35.598	(36.0)	15.156	(0.3)	54.197	-	10.054	-
2017	5.619	6.5	101.363	2.7	80.207	(0.5)	124.262	7.1	25.478	4.1	36.562	2.7	15.419	1.7	58.795	8.5	10.765	7.1
2018	5.215	(7.2)	100.008	(1.3)	81.602	1.7	121.604	(2.1)	25.670	0.8	36.294	(0.7)	14.947	(3.1)	61.320	4.3	11.055	2.7
2019	5.298	1.6	97.883	(2.1)	61.575	(24.5)	132.376	8.9	29.335	14.3	36.714	1.2	14.897	(0.3)	62.688	2.2	11.529	4.3
2020	4.852	(8.4)	77.730	(20.6)	40.715	(33.9)	113.816	(14.0)	26.513	(9.6)	30.174	(17.8)	12.012	(19.4)	51.830	(17.3)	8.820	(23.5)
2021	3.377	(30.4)	52.666	(32.2)	32.941	(19.1)	74.337	(34.7)	18.388	(30.6)	20.418	(32.3)	7.279	(39.4)	18.146	(65.0)	5.804	(34.2)

<sup>(1)</sup> Data for the ICC and I-95 ETL are presented beginning in FY 2017 for trips and FY 2016 for revenue due to vehicle class availability in data reporting. ICC transactions reported are trips.

**Table 2-5**  
**MDTA Commercial Vehicle Historic Collected Transactions and Toll Revenue**

Fiscal Year	Hattem Bridge		Kennedy Highway		Harbor Tunnel		Fort McHenry Tunnel		Key Bridge		Bay Bridge		Nice/Middleton Bridge		ICC <sup>(1)</sup>		I-95 ETL <sup>(1)</sup>	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
<b>Commercial Vehicle Transactions (in millions)</b>																		
2007	0.276	-	1.966	-	0.849	-	3.909	-	1.233	-	1.086	-	0.306	-	-	-	-	-
2008	0.260	(5.6)	1.930	(1.8)	0.850	0.1	3.950	1.1	1.250	1.3	1.058	(2.5)	0.284	(7.3)	-	-	-	-
2009	0.098	(62.1)	1.848	(4.2)	0.739	(13.1)	3.595	(9.0)	1.087	(13.0)	0.850	(19.7)	0.250	(12.0)	-	-	-	-
2010	0.103	4.9	1.773	(4.1)	0.672	(9.0)	3.480	(3.2)	1.006	(7.5)	0.901	6.0	0.220	(12.1)	-	-	-	-
2011	0.110	6.3	1.810	2.1	0.720	7.1	3.590	3.2	1.060	5.4	0.950	5.4	0.220	0.1	-	-	-	-
2012	0.150	36.6	1.670	(7.7)	0.637	(11.6)	3.420	(4.7)	1.000	(5.7)	0.900	(5.3)	0.190	(13.6)	-	-	-	-
2013	0.172	15.0	1.670	-	0.558	(12.3)	3.460	1.2	0.940	(6.0)	0.871	(3.2)	0.190	-	-	-	-	-
2014	0.169	(1.8)	1.687	1.0	0.568	1.6	3.586	3.6	0.993	5.6	0.881	1.1	0.203	7.0	-	-	-	-
2015	0.182	7.3	1.668	(1.1)	0.580	2.2	3.494	(2.6)	0.995	0.2	0.847	(3.8)	0.211	3.5	-	-	-	-
2016	0.210	15.6	1.762	5.7	0.633	9.1	3.763	7.7	1.010	1.5	0.874	3.2	0.209	(0.6)	-	-	-	-
2017	0.210	(0.2)	1.803	2.3	0.639	0.8	3.999	6.3	1.054	4.4	0.895	2.4	0.210	0.5	0.875	-	0.400	-
2018	0.205	(2.3)	1.875	4.0	0.685	7.3	4.174	4.4	1.096	3.9	0.887	(0.8)	0.203	(3.7)	0.968	10.6	0.478	19.5
2019	0.220	7.3	1.889	0.7	0.585	(14.6)	4.292	2.8	1.153	5.2	0.887	(0.1)	0.211	4.0	1.056	9.1	0.538	12.5
2020	0.212	(3.7)	1.830	(3.1)	0.459	(21.5)	4.055	(5.5)	1.142	(0.9)	0.824	(7.1)	0.183	(13.3)	1.096	3.8	0.448	(16.6)
2021	0.185	(12.8)	1.542	(15.8)	0.442	(3.7)	3.328	(17.9)	0.947	(17.1)	0.656	(20.3)	0.123	(32.5)	0.366	(66.6)	0.359	(19.9)
<b>Commercial Vehicle Revenue (in millions)</b>																		
2007	2.699	-	35.704	-	5.183	-	27.761	-	8.437	-	9.741	-	3.277	-	-	-	-	-
2008	2.652	(1.7)	34.695	(2.8)	5.007	(3.4)	27.652	(0.4)	8.586	1.8	9.427	(3.2)	3.024	(7.7)	-	-	-	-
2009	0.811	(69.4)	36.671	5.7	4.770	(4.7)	27.746	0.3	8.051	(6.2)	8.770	(7.0)	2.750	(9.1)	-	-	-	-
2010	1.145	41.2	48.103	31.2	5.869	23.0	36.809	32.7	10.238	27.2	12.284	40.1	2.956	7.5	-	-	-	-
2011	1.197	4.5	47.484	(1.3)	5.995	2.1	37.029	0.6	10.117	(1.2)	12.512	1.9	2.916	(1.4)	-	-	-	-
2012	2.896	142.0	48.370	1.9	6.176	3.0	43.730	18.1	12.020	18.8	14.956	19.5	3.011	3.3	-	-	-	-
2013	3.972	37.2	51.104	5.7	6.203	0.5	51.125	16.9	13.170	9.6	17.263	15.4	3.588	19.1	-	-	-	-
2014	5.168	30.1	67.872	32.8	8.093	30.5	68.147	33.3	17.396	32.1	25.410	47.2	5.781	61.1	-	-	-	-
2015	6.076	17.6	69.234	2.0	8.505	5.1	70.486	3.4	18.645	7.2	25.529	0.5	6.214	7.5	-	-	-	-
2016	6.524	7.4	72.499	4.7	9.222	8.4	75.293	6.8	18.805	0.9	17.193	(32.7)	6.047	(2.7)	5.116	-	1.331	-
2017	6.468	(0.9)	74.448	2.7	9.254	0.3	79.920	6.1	19.464	3.5	17.399	1.2	6.046	(0.0)	5.522	7.9	1.713	28.7
2018	6.368	(1.6)	77.192	3.7	9.786	5.8	83.458	4.4	20.208	3.8	17.136	(94.9)	5.794	(4.2)	6.190	12.1	2.093	22.2
2019	6.874	8.0	78.103	1.2	8.690	(11.2)	85.073	1.9	21.196	4.9	17.030	(0.1)	6.072	4.8	6.627	7.1	2.392	14.3
2020	6.534	(5.0)	76.356	(2.2)	6.794	(21.8)	80.530	(5.3)	21.036	(0.8)	15.823	(7.1)	5.307	(12.6)	6.312	(4.8)	1.931	(19.3)
2021	5.806	(11.1)	64.566	(15.4)	6.906	1.6	67.193	(16.6)	17.360	(17.5)	12.625	(20.2)	3.532	(33.4)	2.463	(61.0)	1.871	(3.1)

<sup>(1)</sup> Data for the ICC and I-95 ETL are presented beginning in FY 2017 for trips and FY 2016 for revenue due to vehicle class availability in data reporting. ICC transactions reported are trips.

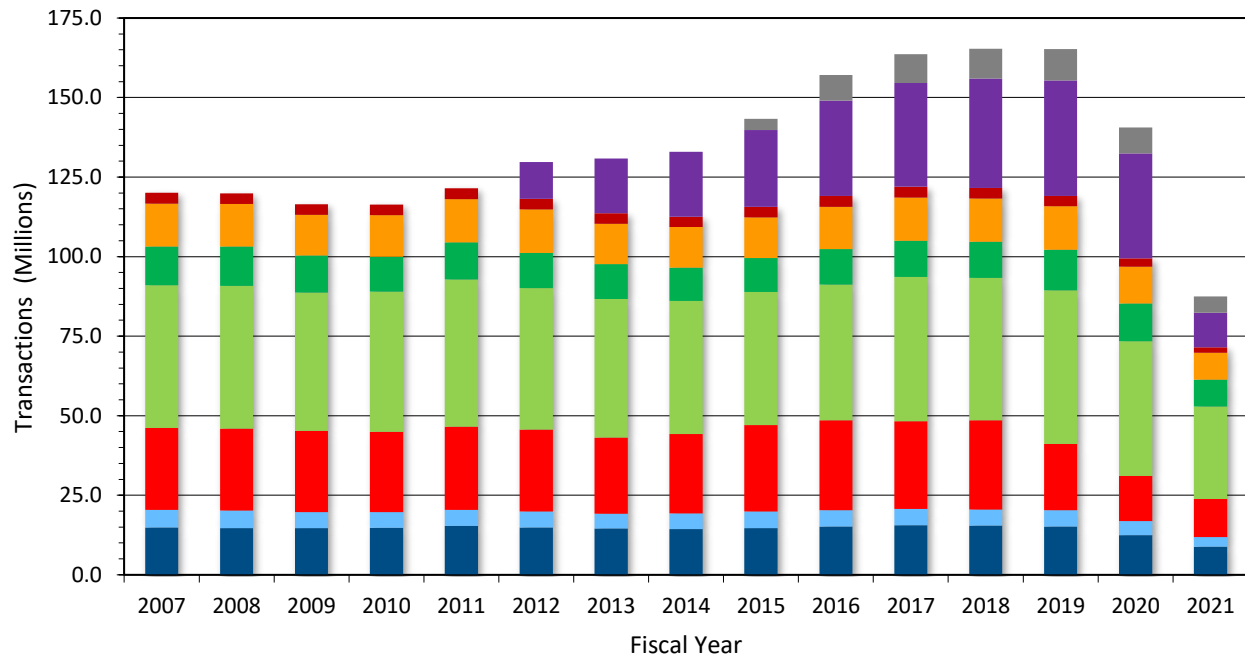


**Table 2-6**  
**MDTA Total Traffic Historic Collected Transactions and Toll Revenue**

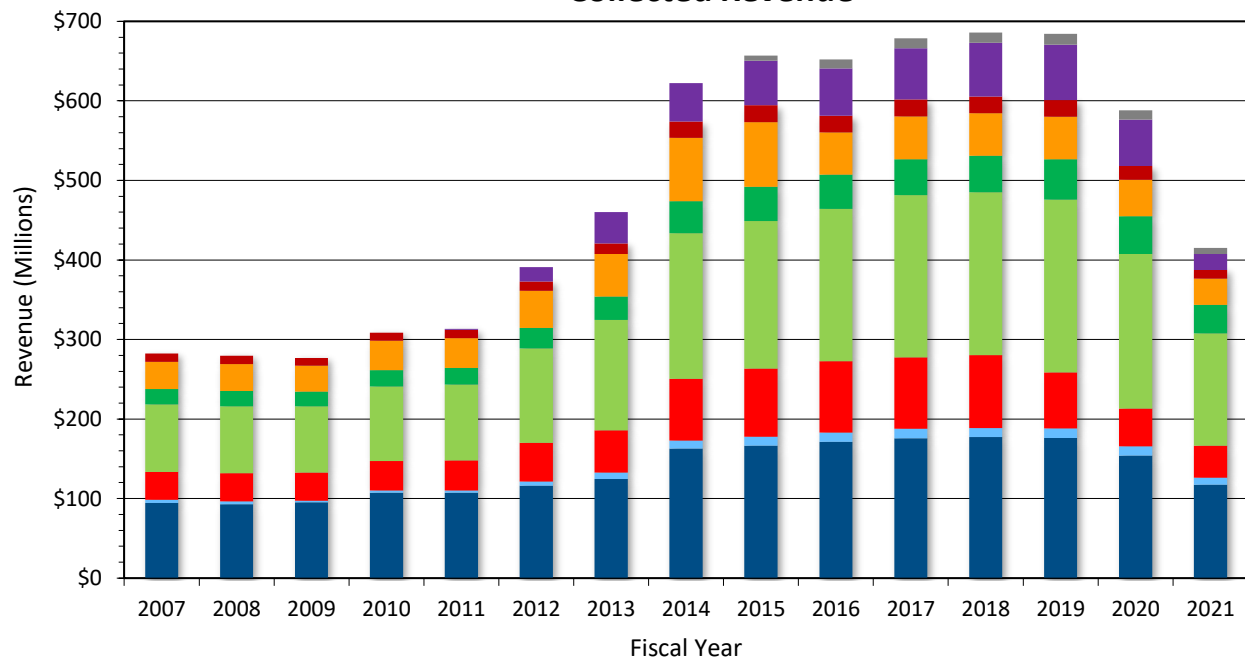
Fiscal Year	Hatem Bridge		Kennedy Highway		Harbor Tunnel		Fort McHenry Tunnel		Key Bridge		Bay Bridge		Nice/Middleton Bridge		ICC <sup>(1)</sup>		I-95 ETL	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
<b>Total Transactions (in millions)</b>																		
2007	5.561	-	14.840	-	25.740	-	44.854	-	12.203	-	13.494	-	3.418	-	-	-	-	-
2008	5.556	(0.1)	14.652	(1.3)	25.771	0.1	44.829	(0.1)	12.343	1.1	13.370	(0.9)	3.391	(0.8)	-	-	-	-
2009	5.040	(9.3)	14.642	(0.1)	25.534	(0.9)	43.446	(3.1)	11.688	(5.3)	12.752	(4.6)	3.347	(1.3)	-	-	-	-
2010	4.993	(0.9)	14.750	0.7	25.226	(1.2)	44.063	1.4	10.959	(6.2)	12.994	1.9	3.354	0.2	-	-	-	-
2011	5.070	1.5	15.375	4.2	26.117	3.5	46.294	5.1	11.647	6.3	13.558	4.3	3.401	1.4	-	-	-	-
2012	5.034	(0.7)	14.824	(3.6)	25.750	(1.4)	44.523	(3.8)	11.048	(5.1)	13.666	0.8	3.290	(3.3)	11.562	-	-	-
2013	4.563	(9.4)	14.582	(1.6)	23.973	(6.9)	43.576	(2.1)	10.922	(1.1)	12.736	(6.8)	3.261	(0.9)	17.198	48.7	-	-
2014	4.948	8.4	14.377	(1.4)	24.893	3.8	41.875	(3.9)	10.419	(4.6)	12.759	0.2	3.243	(0.6)	20.476	19.1	-	-
2015	5.246	6.0	14.690	2.2	27.098	8.9	41.847	(0.1)	10.627	2.0	12.856	0.8	3.305	1.9	24.118	17.8	3.483	-
2016	5.090	(3.0)	15.163	3.2	28.287	4.4	42.639	1.9	11.195	5.3	13.272	3.2	3.381	2.3	29.975	24.3	8.048	131.0
2017	5.102	0.2	15.548	2.5	27.612	(2.4)	45.380	6.4	11.311	1.0	13.587	2.4	3.419	1.1	32.634	8.9	9.014	12.0
2018	5.086	(0.3)	15.451	(0.6)	28.012	1.4	44.720	(1.5)	11.425	1.0	13.518	(0.5)	3.325	(2.8)	34.401	5.4	9.393	4.2
2019	5.089	0.1	15.205	(1.6)	20.839	(25.6)	48.247	7.9	12.827	12.3	13.593	0.5	3.315	(0.3)	36.287	5.5	9.868	5.1
2020	4.394	(13.6)	12.499	(17.8)	14.168	(32.0)	42.297	(12.3)	11.935	(6.9)	11.547	(15.1)	2.753	(16.9)	32.946	(9.2)	7.789	(21.1)
2021	3.052	(30.5)	8.829	(29.4)	11.931	(15.8)	29.037	(31.3)	8.437	(29.3)	8.456	(26.8)	1.714	(37.8)	10.877	(67.0)	5.142	(34.0)
<b>Total Revenue (in millions of dollars)</b>																		
2007	3.817	-	94.619	-	35.109	-	84.685	-	19.243	-	34.393	-	10.432	-	-	-	-	-
2008	3.894	2.0	92.707	(2.0)	35.328	0.6	84.032	(0.8)	19.408	0.9	33.879	(1.5)	10.079	(3.4)	-	-	-	-
2009	2.066	(46.9)	95.138	2.6	35.610	0.8	82.970	(1.3)	18.563	(4.4)	32.510	(4.0)	9.770	(3.1)	-	-	-	-
2010	2.613	26.5	107.349	12.8	37.010	3.9	94.020	13.3	20.537	10.6	36.794	13.2	10.146	3.8	-	-	-	-
2011	2.819	7.9	107.390	0.0	37.851	2.3	95.316	1.4	20.775	1.2	37.617	2.2	10.149	0.0	1.474	-	-	-
2012	5.250	86.2	116.010	8.0	48.734	28.8	118.819	24.7	25.820	24.3	46.742	24.3	11.601	14.3	18.063	1,125.4	-	-
2013	7.966	51.7	124.706	7.5	53.074	8.9	138.684	16.7	29.619	14.7	53.376	14.2	13.165	13.5	39.586	119.2	-	-
2014	10.174	27.7	162.803	30.5	77.559	46.1	183.130	32.0	40.260	35.9	79.756	49.4	20.397	54.9	48.029	21.3	-	-
2015	11.189	10.0	166.535	2.3	85.538	10.3	185.780	1.4	42.975	6.7	81.159	1.8	21.412	5.0	56.018	16.6	6.146	-
2016	11.803	5.5	171.176	2.8	89.872	5.1	191.287	3.0	43.279	0.7	52.791	(35.0)	21.203	(1.0)	59.312	5.9	11.385	85.3
2017	12.087	2.4	175.811	2.7	89.461	(0.5)	204.182	6.7	44.942	3.8	53.960	2.2	21.465	1.2	64.317	8.4	12.478	9.6
2018	11.582	(4.2)	177.199	0.8	91.388	2.2	205.063	0.4	45.878	2.1	53.429	(1.0)	20.741	(3.4)	67.511	5.0	13.148	5.4
2019	12.172	5.1	175.987	(0.7)	70.265	(23.1)	217.449	6.0	50.531	10.1	53.744	0.6	20.968	1.1	69.316	2.7	13.921	5.9
2020	11.386	(6.5)	154.086	(12.4)	47.509	(32.4)	194.346	(10.6)	47.549	(5.9)	45.997	(14.4)	17.319	(17.4)	58.142	(16.1)	10.751	(22.8)
2021	9.184	(19.3)	117.231	(23.9)	39.847	(16.1)	141.531	(27.2)	35.748	(24.8)	33.042	(28.2)	10.811	(37.6)	20.609	(64.6)	7.675	(28.6)

<sup>(1)</sup> ICC transactions reported are trips.

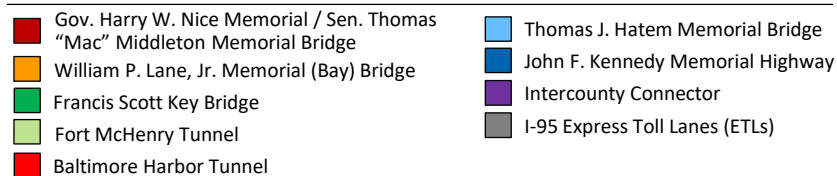
### Collected Transactions



### Collected Revenue



#### MDTA Toll Facilities



## HISTORICAL COLLECTED TRANSACTIONS AND COLLECTED TOLL REVENUE BY FACILITY

**Table 2-7** summarizes the average annual percent change in passenger car and commercial vehicle transactions and revenue trends by facility during the Great Recession years (FY 2007 to 2009) and post-recession years (FY 2009 to 2019) for the Legacy facilities based on the data provided in **Table 2-4** and **Table 2-5**. For all facilities, including the ICC and I-95 ETL, average annual percent change in passenger car and commercial vehicles transactions/trips and revenue are shown for the period from 2017 to 2019 due to data by vehicle class availability for the ICC and I-95 ETLs. FY 2019 to 2021 is shown for all facilities to show the period impacted by the COVID-19 pandemic, cashless conversion, and back office transition.

**Table 2-7**  
**Average Annual Percent Change in Collected Transactions and Revenue by Facility**

Fiscal Year	Hatem Bridge	Kennedy Highway	Harbor Tunnel	Fort McHenry Tunnel	Key Bridge	Bay Bridge	Nice/Middleton Bridge	ICC <sup>(1)</sup>	I-95 ETL <sup>(1)</sup>
<b>Passenger Car Transactions (in millions)</b>									
2007 to 2009	(3.3)	(0.3)	(0.2)	(1.3)	(1.7)	(2.1)	(0.2)	-	-
2009 to 2019	(0.1)	0.4	(2.0)	1.0	1.0	0.7	0.0	-	-
2017 to 2019	(0.2)	(1.6)	(13.3)	3.1	6.7	0.1	(1.6)	5.3	4.1
2019 to 2021	(23.3)	(26.0)	(24.7)	(23.5)	(19.9)	(21.7)	(28.4)	(45.4)	(28.4)
<b>Passenger Car Revenue (in millions of dollars)</b>									
2007 to 2009	14.8	(1.0)	3.8	(3.8)	(3.4)	(4.7)	(2.4)	-	-
2009 to 2019	38.7	13.2	17.9	22.8	27.0	11.1	19.5	-	-
2017 to 2019	(2.9)	(1.7)	(12.4)	3.2	7.3	0.2	(1.7)	3.3	3.5
2019 to 2021	(20.2)	(26.6)	(26.9)	(25.1)	(20.8)	(25.4)	(30.1)	(47.0)	(29.0)
<b>Commercial Vehicle Transactions (in millions)</b>									
2007 to 2009	(40.2)	(3.0)	(6.7)	(4.1)	(6.1)	(11.5)	(9.7)	-	-
2009 to 2019	8.4	0.2	(2.3)	1.8	0.6	0.4	(1.7)	-	-
2017 to 2019	2.4	2.3	(4.3)	3.6	4.6	(0.4)	0.1	9.8	16.0
2019 to 2021	(8.3)	(9.7)	(13.1)	(11.9)	(9.4)	(14.0)	(23.5)	(41.1)	(18.2)
<b>Commercial Vehicle Revenue (in millions of dollars)</b>									
2007 to 2009	(112.9)	3.4	(10.2)	(0.1)	(5.8)	(12.8)	(21.0)	-	-
2009 to 2019	59.6	19.6	15.5	29.6	25.4	17.2	20.6	-	-
2017 to 2019	3.1	2.4	(3.1)	3.2	4.4	(1.1)	0.2	9.6	18.2
2019 to 2021	(8.1)	(9.1)	(10.9)	(11.1)	(9.5)	(13.9)	(23.7)	(39.8)	(11.6)

<sup>(1)</sup> AAPC for ICC and I-95 ETL transactions/trips and revenue presented beginning FY 2017 due to vehicle class data availability.

As shown in **Table 2-7**, between FY 2007 and FY 2009, the passenger car transactions decreased on all seven legacy facilities, with the largest decrease of 3.3 percent per annum on the Hatem bridge. The smallest decrease in passenger car transactions during this period was 0.2 percent per annum on the Harbor Tunnel and Nice/Middleton Bridge. The commercial vehicle transactions decreased significantly between FY 2007 and FY 2009 on all the legacy facilities, with the largest decrease of 40.2 percent per annum on the Hatem Bridge. Following these decreases associated with the Great Recession, continued economic uncertainty and several toll increases resulted in the total Legacy system transactions decreasing by 3.4 percent from 116.5 million in FY 2009 to 112.5 million in FY 2014. Due to the toll increases, the Legacy system revenue grew from about 277 million in FY 2009 to 595 million in FY 2015. Total transactions

increased by 2.8 percent in FY 2015 reaching FY 115.7 million, mostly due to the high growth on Hatem Bridge and Baltimore Harbor Tunnel, where transactions increased by 6.0 percent and 8.9 percent respectively, compared to FY 2014. Similarly, the Legacy system transactions grew by 2.9 percent in FY 2016 and 2.5 percent in FY 2017 compared to previous years. The revenue decreased in FY 2016 by 2.2 percent due to the toll decrease implemented on July 1, 2015. The traffic increases between FY 2015 and FY 2017 on the system were the result of strong economic performance and the FY 2016 toll decrease. This upward trend came to an end in FY 2018, when the system transactions decreased by 0.3 percent. In FY 2019, the transactions decreased further by 2.0 percent, driven especially by the 25.6 drop in transactions on the Baltimore Harbor Tunnel due to construction. Revenue followed a similar trend decreasing by 2.1 percent and 0.7 percent in FY 2018 and FY 2019 respectively. Overall, between FY 2009 and FY 2019, the total legacy system transactions increased by 0.2 percent per annum and revenue increased by 7.8 per annum. Beginning in March 2020, the COVID-19 pandemic caused significant reductions in traffic on the MDTA system. This has caused the FY 2020 Legacy system transaction to decrease by 16.5 percent and revenue to decrease by 13.8 percent compared to FY 2019. In FY 2021, ongoing pandemic impacts, back office transition collection issues, and the conversion to cashless tolling have caused a further 28.2 percent decline over FY 2020.

For the Intercounty Connector, tolling began on the second segment of the ICC from MD-97/Georgia Avenue to I-95 in FY 2012, making FY 2013 the first full fiscal year of I-370 to I-95 operations on the ICC. Trips then increased by 19.1 percent in FY 2014. This was due primarily to facility “ramp-up,” when motorists adjust their travel patterns over time as they become aware of a new facility and the benefits that it offers over their current route of travel. This ramp-up period continued into FY 2015, with a 17.8 percent growth in trips and a 16.6 percent growth in toll revenue. FY 2015 growth also included the opening of the final segment of the ICC in November 2014; a 1.53-mile extension on the eastern end between I-95 and US 1. Trips in FY 2016 grew at a faster rate than FY 2015, which can be attributed in part to the toll reduction implemented on July 1, 2015. Toll revenue for FY 2016 was 5.9 percent higher than FY 2015, which reflects continued robust growth in trips offset in part by the negative revenue impact of the lower tolls. Trips growth for FY 2017 was strong at 8.9 percent. FY 2018 and FY 2019 had trips growth at 5.4 and 5.5 percent, respectively. This strong growth is likely due to increasing regional population and employment as well as the ICC serving as a congestion relief route as an uncongested facility in a region where congestion is growing. As was seen with the Legacy facilities, due to the COVID-19 pandemic, there was a 9.2 decrease in trips and 16.1 percent decrease in revenue in FY 2020 compared to FY 2019. FY 2021 transactions and revenue were 67 and 65.6 percent lower than FY 2021, respectively, due to ongoing pandemic impacts, back office transition collection issues, and the conversion to cashless tolling.

The I-95 ETLs opened in FY 2015, and FY 2016 was the first full fiscal year of operations. In FY 2017, transactions and revenue on the ETLs increased by 12.0 percent and 9.6 percent, respectively, compared to FY 2016. This was due primarily to facility ramp-up, the phenomenon that occurs with the opening of a new facility as explained above. This growth continued in FY 2018 and FY 2019, when transactions increased by 4.2 percent and 5.1 percent, respectively, over their previous years. Revenue grew at slightly higher levels than transactions with a 5.4 percent growth in FY 2018 and 5.9 percent growth in FY 2019. Due to COVID-19 pandemic, FY 2020 transactions and revenue decreased significantly by 21.1 percent and 22.8 percent, respectively,

compared to FY 2019. Ongoing pandemic impacts, back office transition collection issues, and the conversion to cashless tolling, caused FY 2021 transactions to be 34 percent lower than FY 2020 and revenue to be 28.6 percent lower.

### 2.3.2 In-Lane Traffic

This section provides a brief review of the historical raw in-lane traffic trends for each of the seven MDTA Legacy facilities, I-95 ETLs, and the ICC. Data shown is for traffic at the toll gantry locations. Data for the ICC, which has several toll gantries, is shown as the total in-lane traffic at all toll gantries. This is the same data that was used for estimating COVID-19 impacts shown earlier in this chapter. This data allows analysis of traffic trends without the impacts of recent collection related challenges. **Table 2-8** summarizes this data annually for FY 2019 through FY 2021 for passenger cars and commercial vehicles.

Considering FY 2020 had just three and a half months of COVID-19 impacted travel, FY 2021 made a strong recovery over FY 2020 particularly on the Kennedy Highway and the Bay Bridge for passenger cars. Due to the completion of construction on the Harbor Tunnel, passenger car traffic has increased significantly over FY 2020 and has pulled some traffic back that had diverted to the Fort McHenry and Francis Scott Key Bridge. Commercial vehicle traffic, as noted in **Section 2.1** above, has made a strong recovery and experienced significant growth over FY 2020 for all Legacy facilities.

The ICC and I-95 ETLs have not recovered at the same pace as the Legacy facilities due to their larger commuting share of traffic. This sector of traffic has dropped significantly as remote working continues through the pandemic, and will likely continue to recover at a slower pace as employees gradually return to work. Due to this, the ICC declined by 13.8 percent year-over-year in both FY 2020 and FY 2021 for passenger cars. The I-95 ETLs fared worse in FY 2021 and declined by almost 21 percent, compared to a decline of 17.5 percent in FY 2020. Commercial vehicles make up a very small portion of traffic on both of these facilities, but similar to the Legacy facilities they showed significant recovery in FY 2021, with the ICC experiencing an increase in traffic of 1.7 percent.

## 2.4 Historical Traffic on Other Major Highways

In order to better understand regional traffic growth patterns, historical traffic counts on select competing major routes were reviewed dating back to 2007. These roads include interstates and major highways that compete with or complement the MDTA Legacy facilities. The data presented in this section are based on calendar year average annual daily traffic volumes and associated growth rates at each location. Historical average annual daily traffic volumes and annual growth rates on six Maryland State Highway Authority (MSHA) roadways and one Virginia roadway through 2020 are presented in **Table 2-9**.



**Table 2-8**  
**MDTA In-Lane Traffic by Fiscal Year**

Fiscal Year	Hattem Bridge		Kennedy Highway		Harbor Tunnel		Fort McHenry Tunnel		Key Bridge		Bay Bridge		Nice/Middleton Bridge		ICC <sup>(1)</sup>		I-95 ETL <sup>(1)</sup>	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
<b>In-Lane Passenger Car Traffic (in millions)</b>																		
2019	4.898	-	13.530	-	20.908	-	44.617	-	11.866	-	12.747	-	3.147	-	104.334	-	9.349	-
2020	4.450	(9.1)	11.367	(16.0)	15.189	(27.3)	40.757	(8.7)	11.821	(0.4)	11.703	(8.2)	2.803	(10.9)	89.920	(13.8)	7.709	(17.5)
2021	4.137	(7.0)	11.472	0.9	17.964	18.3	37.951	(6.9)	10.654	(9.9)	11.510	(1.6)	2.652	(5.4)	77.548	(13.8)	6.100	(20.9)
<b>In-Lane Commercial Vehicle Traffic (in millions)</b>																		
2019	0.228	-	1.995	-	0.794	-	4.535	-	1.209	-	0.915	-	0.215	-	3.595	-	0.558	-
2020	0.228	(0.3)	2.022	1.4	0.652	(17.8)	4.496	(0.8)	1.247	3.2	0.923	0.9	0.202	(6.4)	3.528	(1.9)	0.490	(12.1)
2021	0.249	9.4	2.210	9.3	0.681	4.5	4.907	9.1	1.305	4.6	0.943	2.2	0.215	6.4	3.588	1.7	0.478	(2.6)
<b>Total In-Lane Traffic (in millions)</b>																		
2019	5.126	-	15.525	-	21.702	-	49.151	-	13.075	-	13.662	-	3.363	-	107.930	-	9.907	-
2020	4.677	(8.8)	13.389	(13.8)	15.842	(27.0)	45.253	(7.9)	13.068	(0.1)	12.626	(7.6)	3.004	(10.7)	93.448	(13.4)	8.200	(17.2)
2021	4.386	(6.2)	13.682	2.2	18.646	17.7	42.858	(5.3)	11.959	(8.5)	12.453	(1.4)	2.866	(4.6)	81.136	(13.2)	6.578	(19.8)

**Table 2-9**  
**Average Annual Daily Traffic Trends on Major Highways**

Calendar Year	US 1 E of Cedar Church Rd.		I-95 N of MD 100		I-97 N of MD 176		I-695 E of MD 146		MD 295 N of MD 100		US 301 S of MD 234		I-95 (Virginia) N of Courthouse Rd	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
2007	11,600	-	191,900	-	102,600	-	155,300	-	91,600	-	22,500	-	137,000	-
2008	11,100	(4.3)	188,000	(2.0)	100,600	(1.9)	152,200	(2.0)	88,900	(2.9)	21,400	(4.9)	133,000	(2.9)
2009	11,300	1.8	192,100	2.2	105,100	4.5	153,700	1.0	88,900	-	21,800	1.9	136,000	2.3
2010	10,100	(10.6)	192,900	0.4	105,500	0.4	150,900	(1.8)	89,400	0.6	22,500	3.2	136,000	-
2011	9,900	(2.0)	193,100	0.1	105,600	0.1	151,000	0.1	93,400	4.5	22,100	(1.8)	135,000	(0.7)
2012	9,900	-	191,300	(0.9)	106,200	0.6	151,800	0.5	92,600	(0.9)	22,100	-	135,000	-
2013	9,300	(6.1)	193,000	0.9	107,200	0.9	149,500	(1.5)	92,800	0.2	20,800	(5.9)	132,000	(2.2)
2014	9,300	-	192,800	(0.1)	107,100	(0.1)	149,300	(0.1)	107,700	16.1	20,800	-	131,000	(0.8)
2015	10,100	8.6	207,300	7.5	111,800	4.4	160,500	7.5	108,500	0.7	22,600	8.7	134,000	2.3
2016	11,500	13.9	201,600	(2.7)	108,700	(2.8)	150,200	(6.4)	103,300	(4.8)	21,900	(3.1)	136,000	1.5
2017	11,800	2.6	206,400	2.4	111,300	2.4	153,800	2.4	105,400	2.0	22,400	2.3	137,000	0.7
2018	11,700	(0.8)	205,200	(0.6)	121,100	8.8	152,900	(0.6)	104,500	(0.9)	22,200	(0.9)	136,000	(0.7)
2019	12,600	7.7	180,200	(12.2)	122,000	0.7	161,300	5.5	104,500	-	21,800	(1.8)	137,000	0.7
2020	10,971	(12.9)	145,051	(19.5)	98,182	(19.5)	129,811	(19.5)	87,223	(16.5)	18,031	(17.3)	127,000	(7.3)
<b>Average Annual Percent Change</b>														
2007 to 2009		(1.3)		0.1		1.2		(0.5)		(1.5)		(1.6)		(0.4)
2009 to 2019		1.1		(0.6)		1.5		0.5		1.6		-		0.1
2019 to 2020		(12.9)		(19.5)		(19.5)		(19.5)		(16.5)		(17.3)		(7.3)

As shown in **Table 2-9**, the traffic volumes on the northern region MSHA roadway, US 1 (east of Cedar Church Road), followed a more positive trend compared to the northern MDTA facilities, with a growth of 1.1 percent between 2009 and 2019. This compares to a transaction growth of 0.4 percent for passenger cars and 0.2 percent for commercial vehicles during this period on the Kennedy highway. Toll increases implemented during this period would contribute to the more modest growth trends on the MDTA facilities. In 2020, traffic decreased by 12.9 percent due to the COVID-19 pandemic.

The historical average annual daily traffic volumes and annual growth rates for the central region MSHA roadways are represented in **Table 2-9** by I-95 (N of MD 100), I-97 (N of MD 176) and I-695 (E of MD 146), which are all located in the Baltimore area. Traffic volumes on the MSHA facilities decreased by an average of 2.2 percent in 2008, most likely due to the impacts of the Great Recession, while traffic volumes on the Central Region MDTA facilities did not experience significant effects of the recession until 2009 with volumes decreasing by 2.7 percent. Traffic volume decreases on the central MDTA facilities also occurred in years 2012 and 2013 due to toll rate increases. Overall, during the great recession years (2007 to 2009), traffic decreased by an average of 0.1 percent and 1.3 percent per year on central region MSHA and MDTA facilities, respectively. During the 2009 to 2019 post-recession period, traffic has increased by 0.2 percent on the MDTA facilities and 0.5 percent on the MSHA facilities in the central region. In 2020 the central region MSHA facilities decreased by 19.5 percent compared to 2019.

The historical average annual daily traffic volumes and annual growth rates on one southern region MSHA roadway is represented by US 301 (South of MD 234) in **Table 2-9**. Due to the proximity of the Bay Bridge (US 50) to Virginia, one traffic count location in northern Virginia has also been included in the table. On an average, traffic volumes on the two southern region MDTA facilities (Bay Bridge and Nice/Middleton Bridge) have grown higher than the comparison locations. During the 2009 to 2019 post-recession period, traffic has increased modestly, averaging 0.5 percent per annum on the MDTA facilities and 0.1 percent on the combined MSHA and VDOT facilities. Traffic volume decreases on the southern MDTA facilities occurred in years 2012 and 2013 due to toll rate increases. Following this, both on the MDTA and on the combined Southern Region MSHA and Virginia facilities, traffic has grown at relatively higher levels. Between 2015 and 2017 growth averaged 2.1 percent on the two southern MDTA facilities and 1.6 percent on the MSHA and Virginia roads. Since then, traffic has been flat or declined on both southern region MDTA and MSHA facilities, before declining further in 2020.

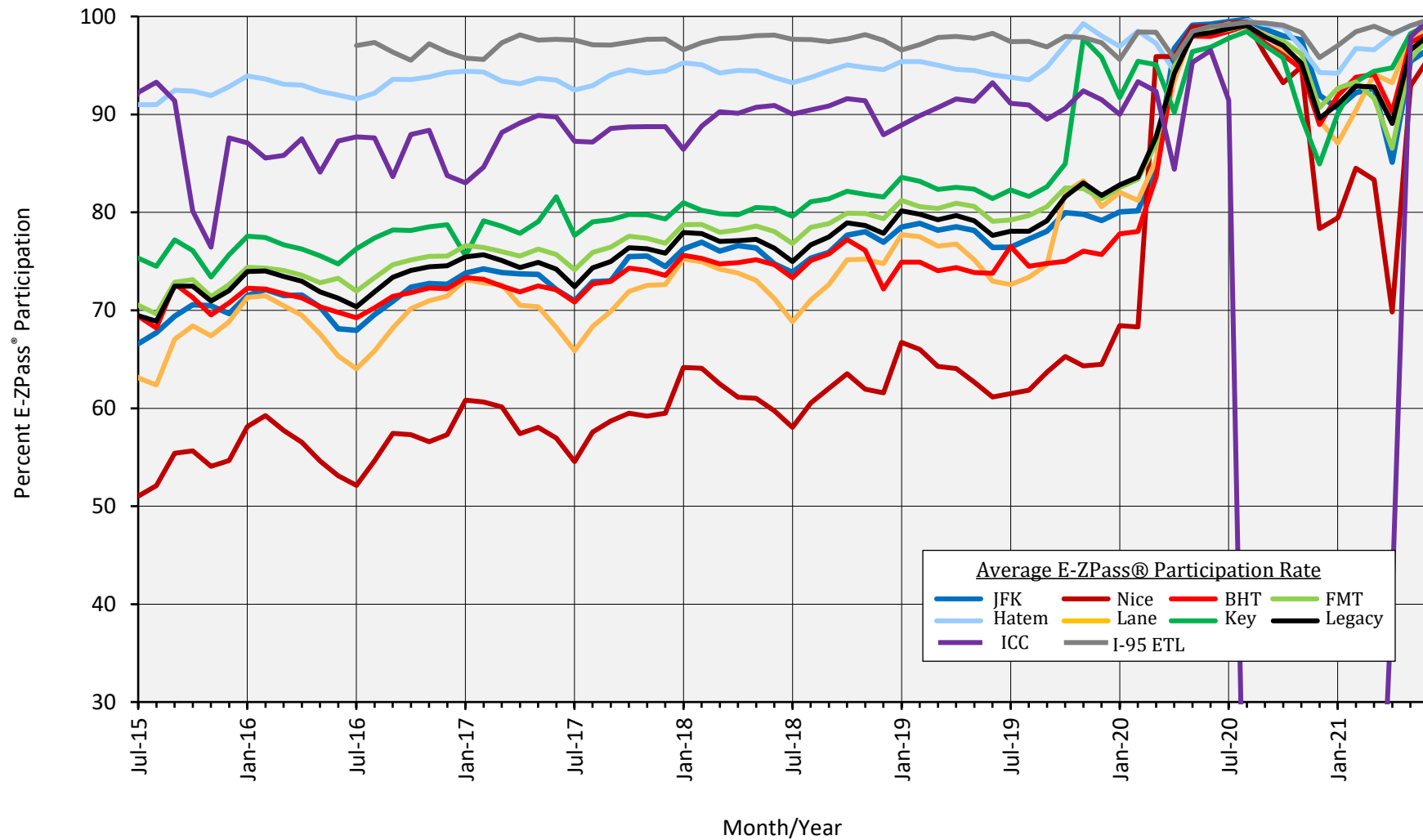
Trends over the past 13-year period for both the MDTA system and the other major highways were used as a guide in estimating the ten-year traffic growth for the traffic and revenue forecasts presented in Chapter 4.

## 2.5 MDTA E-ZPass® Market Share

In recent years, electronic toll collection has played an increasingly important role in transaction processing for toll agencies across the nation. MDTA collects electronic tolls via E-ZPass®. **Figure 2-5** provides a graphic summary of the E-ZPass® market share for each of the seven Legacy facilities, the total Legacy system, the Intercounty Connector, and the I-95 Express Toll Lanes (ETL) from July 2008 through June 2020 for collected transactions.

From July 2019 to February 2020, E-ZPass® transactions accounted for an average of 80.8 percent of the total Legacy system transactions, an increase of 2.9 percent over the same period in FY 2019. Of these, 66.8 percent were made by Maryland E-ZPass® customers, including in-state E-ZPass® customers, commuter plans, shopper plans and Hatem Bridge plans. Over the same time period, in terms of individual facilities, the Thomas J. Hatem Memorial Bridge had the greatest percentage of E-ZPass® customers at 96.3 percent of total transactions over this time period, primarily due to the Hatem Bridge Toll Plans and its conversion to cashless tolling prior to March. The Governor Harry W. Nice Memorial/Senator Thomas “Mac” Middleton Bridge had the lowest percentage of E-ZPass® transactions during this time period at 64.4 percent. On a total system basis, between July 2019 and February 2020, cash transactions accounted for a combined 17.0 percent of all transactions, a decrease of 3.3 percent over same period in FY 2019. Video transactions accounted for 2.1 percent of all transactions made between July 2019 and February 2020.

On March 17, 2020 MDTA implemented systemwide cashless tolling to prevent the potential spread of COVID-19 during exchanges of cash at toll booths. Additionally, mailing of Notice of Toll Due (NOTD) video invoices was paused until October 2020. Due to these changes and other collection challenges related to the back-office transition, E-ZPass® transactions accounted for 94 percent of all Legacy system transactions in April 2020 and about 98 percent of the total transactions in May and June 2020. The pause of the NOTD invoicing mailings and the back-office transition caused FY 2021 E-ZPass® trends to be more volatile than previous years. In particular, the ICC shows a significant drop in E-ZPass® marketshare due to challenges with trip reconstruction related to the back-office transition. By the end of the fiscal year in July, E-ZPass® marketshare for all facilities was returning to levels seen initially after transition to all-electronic tolling.



Note: Intercounty Connector toll revenue collection impacted by delay in trip reconstruction.

Collected Transaction E-ZPass® Marketshare Trends by Facility



## Chapter 3

# Corridor Growth Review

### 3.1 Introduction

Trips on Maryland's tolled facilities are made for many purposes, including commuting, business, commerce, and recreation. Preparing facility traffic forecasts requires evaluating socioeconomic data that drive trip purposes, such as population, employment, and income. Therefore, historical and projected socioeconomic data are important in developing traffic forecasts. Socioeconomic data are provided by public and private sources for different geographies and time periods. This introduction overviews the socioeconomic data reviewed. COVID-19 impacts are discussed specifically in the next section of this chapter.

Variables – Variables reviewed include population, employment, unemployment rates, real per capita income, real gross domestic product (GDP), gross regional product (GRP), inflation, and fuel prices.

Geographies – Geographies profiled include national and census divisions (U.S., Mid Atlantic, South Atlantic), as well as Maryland and six sub-state regions, as mapped in **Figure 3-1**.

Sources – Government and private sector data sources include:

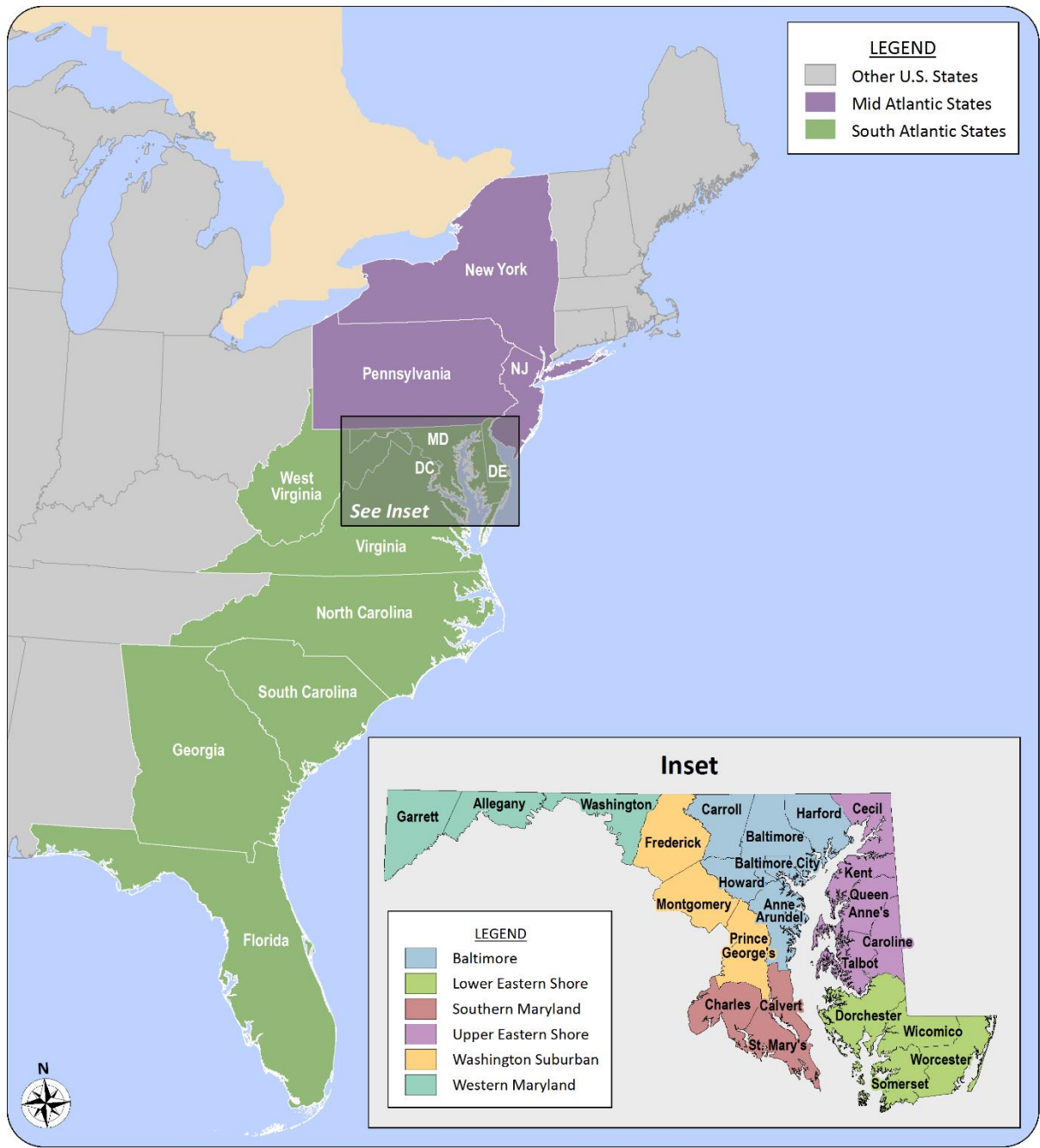
- United States Bureau of Economic Analysis (BEA)
- United States Bureau of Labor Statistics (BLS)
- Congressional Budget Office (CBO)
- United States Census Bureau (Census)
- Energy Information Administration (EIA)
- Federal Open Market Committee (FOMC)
- Office of Management and Budget (OMB)
- The State of Maryland Department of Planning State Data Center (MD SDC)
- Moody's Analytics (Moody's)
- Woods & Poole Economics, Inc., 2021 Complete Economic and Demographic Data Source (WP21)<sup>1</sup>

Analysis Horizon – Historical socioeconomic data are presented annually, including annual growth rates, and compound annual growth (CAGR) in the preceding decade. Forecasts are provided for the next decade in five-year increments (2021-2026 and 2026-2031), as available.

---

<sup>1</sup>Woods & Poole Economics, Inc. Washington, D.C. Copyright 2021. Woods & Poole does not guarantee the accuracy of this data. The use of this data and the conclusion drawn from it are solely the responsibility of CDM Smith.

**Figure 3-1**  
**Geographies Profiled**



## 3.2 Recent Growth Trend Explanatory Factors

### 3.2.1 COVID-19 Pandemic Timeline

COVID-19 has resulted in significant short-term volatility and future uncertainty. Given the importance to this forecast, impacts observed are discussed herein before the socioeconomic data discussion. Future pandemic considerations, including risk factors, are discussed in the final section of this chapter, **3.4 Summary of Risks and Conclusion**.

COVID-19 continues to pose systemic economic and transport risks. Individual and collective behavior changes have occurred, especially relating to physical interaction, travel, and the economy.

Beginning in March 2020, COVID-19 triggered withdrawals from most physical interactions to stem contagion, with tremendous initial economic and transportation impacts. Governments closed borders, restricted migration, shuttered nonessential industries, and ordered quarantines, stay-at-home, and other restrictions. Businesses furloughed or laid-off millions of employees. Telecommuting was implemented in many industries. Individuals self-isolated, retrenching from “normal” activities, including sports, social and family gatherings, vacations, conferences, and discretionary spending.

Beginning in May 2020, many states and local authorities, including in Maryland, began gradually easing restrictions. The pandemic also brought unprecedented policy responses from fiscal and monetary authorities. Significant recovery occurred in summer and early fall 2020, followed by a notable viral peak in the winter prior-to extensive vaccinations in spring 2021. Most recently vaccination rates have slowed and the Delta variant has caused widespread contagion resurgence, especially in the unvaccinated. As of late summer/early fall 2021, activity is still not entirely at pre-COVID-19 levels, with an uneven recovery and some industries recovering or exceeding pre-pandemic levels while others remain far below pre-pandemic levels.

**Table 3-1** identifies COVID-19 events, mandates, and announcements that have impacted the MDTA traffic recovery. On March 17, 2020, MDTA implemented cashless tolling; this and other MDTA-related COVID-19 changes are further discussed in **Section 1.2.2 of Chapter 1**. The most recent events shown are that Maryland achieved about 70 percent adult vaccination rates (at least one vaccine dose) in late May 2021 and that the state of emergency was lifted on July 1, 2021.

**Table 3-1 – National, Maryland, and MDTA COVID-19 Mandates**

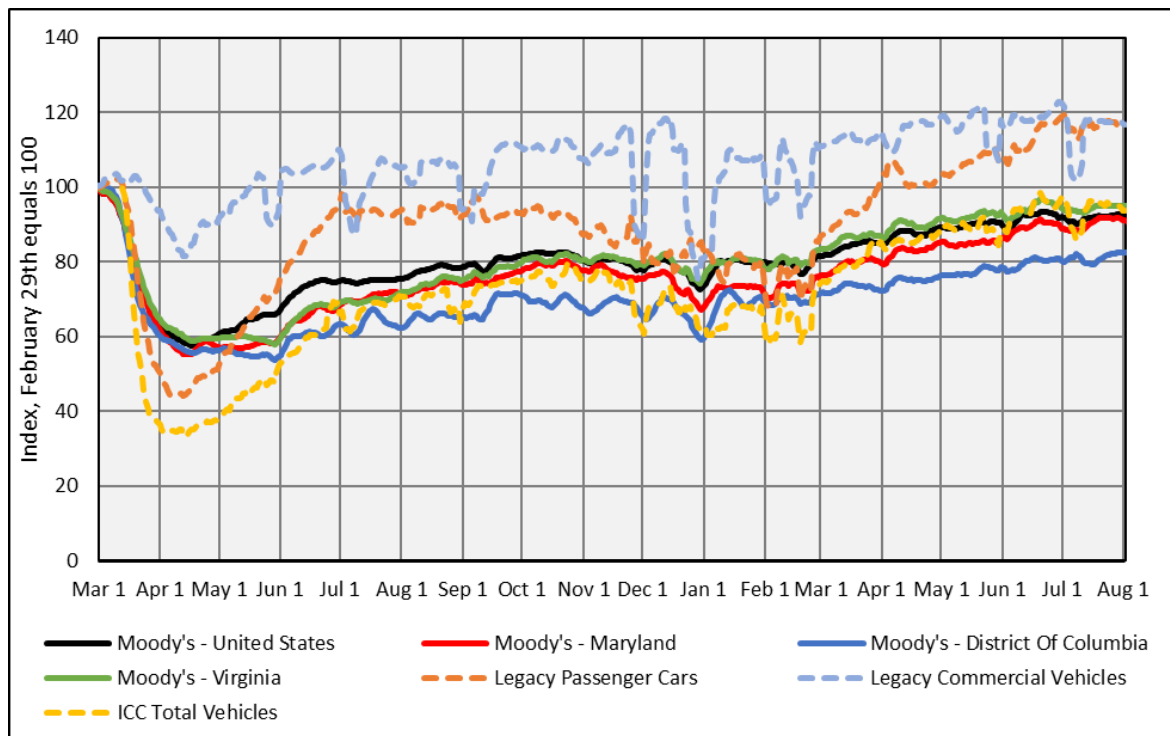
Calendar Year	Date	Location	Description
2020	March 11	USA	- International travel is halted (excluding Great Britain)
2020	March 12	MD	- Gatherings of more than 250 people banned - Schools closed until March 27th
2020	March 13	USA	- National Emergency declared
2020	March 16	MD	- Gatherings of more than 50 people banned - All bars and restaurants closed
2020	March 17	MDTA	- MDTA implements all-electronic (cashless) tolling statewide until further notice
2020	March 18	MDTA	- All E-ZPass® Maryland customer service centers closed until further notice. Motorists can still open accounts online and have their transponder mailed to them
2020	March 18-20	USA	- U.S./Canada and U.S./Mexico borders closed for non-essential travel
2020	March 19	MD	- Gatherings of more than 10 people banned - Transit for essential travel only
2020	March 23	MD	- Non-essential businesses closed
2020	March 27	MDTA	- Paused mailing for all Notices of Toll Due (NOTD) and assessing civil penalties on unpaid NOTDs. Customers can pay online rather than waiting for NOTDs to be mailed - Due dates extended until 30 days after the state of emergency is lifted for previously mailed NOTDs that have a due date of March 17, 2020 or later - E-ZPass® customers who replenish their accounts with cash have 30 days after Maryland's state of emergency is lifted to add funds to their accounts - Expiration dates for Commuter Plans were extended from 45 to 90 days and for Shoppers Plans from 90 to 150 days to give drivers more time to use their remaining trips. These expiration dates were eventually extended through November 1. These plan holders may also change or cancel their plans due to COVID-19 - Referrals of unpaid tolling accounts to the Central Collections Unit and to the Motor Vehicle Administration for registration flagging are on hold until 30 days after the state of emergency is lifted
2020	March 30	MD	- Residents ordered to stay-at-home indefinitely, persons traveling into Maryland are required to self-quarantine for 14 days.
2020	April 17	MD	- Schools closed through May 15th
2020	April 18	MD	- Residents ordered to wear face masks in public settings
2020	May 6	MD	- Schools closed through the end of the academic year
2020	May 15	MD	- Statewide Stay at Home order replaced by Safer at Home advisory. Some jurisdictions began Stage One of "Maryland Strong: Roadmap to Recovery" program but most social distancing measures generally remain in place.
2020	June 5	MD	- Maryland began moving to Stage Two of "Maryland Strong: Roadmap to Recovery" with the opening of businesses including manufacturing, construction, retail shops, specialty vendors, wholesalers, warehouses, and professional offices. Additionally, personal services (including salons, massage, and tattoo parlors) resumed operations at 50 percent capacity and the state government returned to more normal operations
2020	June 12	MD	- Additional Stage Two openings occurred including indoor dining and pools at 50 percent capacity and outdoor amusements at full capacity
2020	June 15	MDTA	- MDTA E-ZPass customer service centers reopen with limited capacity
2020	June 19	MD	- Additional Stage Two openings occurred including indoor fitness activities at 50 percent capacity and casinos, arcades, and malls at full capacity. Schools and child care centers also began partial reopening
2020	July 29	MD	- Maryland's reopening plan put on hold. Out-of-state travel advisory involving nine states is issued and the statewide face mask order is expanded
2020	August 27	MD	- All schools in Maryland authorized to reopen

**Table 3-1 – National, Maryland, and MDTA COVID-19 Mandates (Continued)**

Calendar Year	Date	Location	Description
2020	August 6	MDTA	- All-Electronic Tolling made permanent at all MDTA Facilities Statewide
2020	September 4	MD	- Maryland began moving to Stage Three of the "Maryland Strong: Roadmap to Recovery" with additional safe and gradual openings. Effective September 4th at 5 PM, outdoor venues may open to general public at 50% capacity or 250 people, whichever is less. Capacity for retail establishments and religious facilities increased from 50 to 75 percent. Indoor theaters may open to the general public at 50% capacity, or 100 people per auditorium— whichever is less
2020	September 21	MD	- Expanded capacity for indoor dining, from 50 to 75 percent, was put into place
2020	September 24	MDTA	- MDTA started accepting proactive toll payments for trips made on or before June 30, 2020 - MDTA announced that standard plan cycles will resume for discount plans on November 1 - MDTA announced that mailing of NOTDs will resume in mid-October
2020	October 1	MDTA	- Capacity limits on child care facilities lifted; indoor visitings allowed at nursing homes
2020	October 15	MDTA	- Mailing of Notices of Toll Due (NOTD) resumes, beginning with unpaid transactions for trips made from March through June 2020.
2020	November 1	MDTA	- E-Zpass Maryland commuter discount plan and shoppers plan resumed.
2020	November 5	MD	- Maryland enters red zone for coronavirus case rates; Travel advisory to avoid travel to and from states with positivity rates for 10% or higher renewed.
2020	November 20	MD	- Hospital visitations restricted until further notice. Nursing home visitations limited to compassionate care visits. - Retail businesses and religious institutions back to Stage Two 50% capacity restrictions. Restaurants and Bars to close by 10 PM. - Fans restricted at any professional or collegiate stadiums and racetracks.
2020	December 14	MD	- First COVID-19 vaccine administered in Maryland
2021	January 1	MDTA	- Standard Video Toll rates to apply for any trips not paid with a valid E-ZPass account at all toll facilities statewide.
2021	January 18	MD	- Maryland moves to Phase 1B of the COVID-19 vaccine protocols to include all Marylanders 75 and older, as well as anyone of any age living in assisted living or independent living facilities and developmental disabilities and behavioral health group homes, K-12 teachers, education staff and child care providers.
2021	January 25	MD	- Maryland moves to Phase 1C of the COVID-19 vaccine protocols to include adults 65 and older, U.S. Postal Service employees and essential workers in manufacturing and agriculture.
2021	March 23	MD	- Maryland moves to Phase 2A of the COVID-19 vaccine protocols to include all Marylanders, aged 60 and older.
2021	March 12	MD	- Capacity limits lifted on outdoor and indoor dining, retail businesses, religious facilities and personal services. - Large Outdoor and Indoor venues may operate at up to 50% capacity. - Quarantine requirements lifted on out of state travel.
2021	March 30	MD	- Maryland moves to Phase 2B of the COVID-19 vaccine protocols to include all Marylanders, aged 16 and older.
2021	April 6	MD	- COVID-19 vaccine eligibility opens for all Marylanders, aged 16 and older at any of the state's mass vaccination sites.
2021	April 12	MD	- COVID-19 vaccine eligibility opens for all Marylanders, aged 16 and older at any vaccine provider in the state.
2021	April 28	MD	- Maryland's statewide outdoor mask mandate lifted
2021	May 15	MD	- All remaining capacity restrictions lifted on all indoor entertainment venues and conventions, and all outdoor entertainment, art, and sports venues, including all ticketed events. - All remaining capacity and distancing restrictions lifted on indoor and outdoor dining. - Maryland's indoor mask mandate lifted except for public transportation, health care settings and schools.
2021	May 31	MD	- 70% of adults in Maryland have received at least one dose of the COVID-19 vaccine.
2021	June 15	MD	- State of emergency in Maryland lifted with most pandemic-related orders ending as of July 1, 2021.

Various metrics are available to quantify the pandemic impacts on society. For example, **Figure 3-2** shows Moody's/CNN Business "Back-to-Normal Index" (BNI) illustrating COVID-19 policy impacts on recovery. The index composites 37 indicators, including real GDP (Moody's), seated restaurant diners (OpenTable), Workplace Mobility Index (Google), airline traveler throughput (TSA), small businesses hours worked (Homebase), new home listings (Zillow), petroleum products supplied (EIA), railroad traffic (AAR), unemployment insurance claims, etc. The composite is indexed to February 29, 2020 equaling one. MDTA Legacy Facilities' passenger cars, commercial vehicles, and ICC data are also similarly indexed in **Figure 3-2** for comparison. Both the BNI and MDTA indices showed steep declines through mid-April 2020. BNI experienced gradual recovery, while MDTA traffic showed rapid improvement between mid-April and late June 2020. In the fall and particularly the winter months declines occurred in passenger car impacts due to weather impacts and a "second wave" of COVID-19 cases which the BNI showed smaller impacts during this period. It should also be noted that seasonal trends may influence these variations in impacts seen in Legacy passenger cars compared to the BNI. From March 2021 through the end of July, impacts have continually improved for Legacy system passenger cars at a faster pace than the BNI.

**Figure 3-2**  
**Moody's/CNN Business Back-to-Normal and MDTA Traffic Indexes**



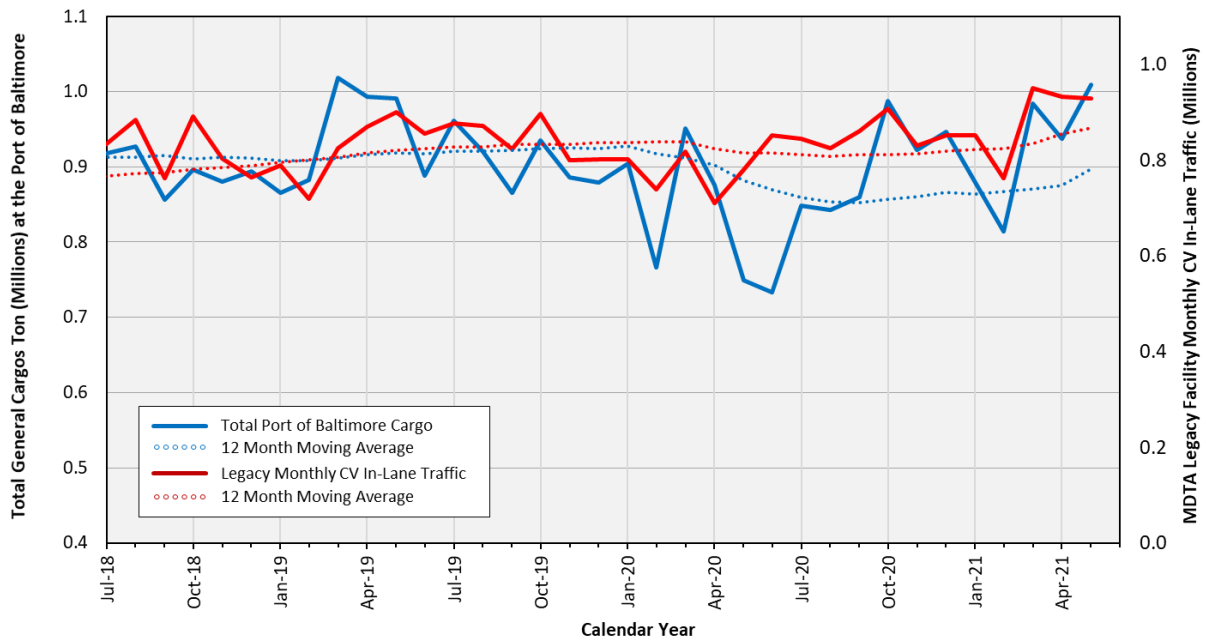
### 3.2.2 Port of Baltimore Cargo Trends

Shipping and port activity has been impacted by the pandemic. A factor that in the past has been found to be correlated to growth in commercial vehicle transactions on the Legacy facilities, particularly at the Central Region facilities, is cargo activity at the Port of Baltimore. **Figure 3-3** provides a comparison of cargo activity at the port of Baltimore to total Legacy commercial vehicle in-lane traffic from July 2018 through May 2021. The Port of Baltimore showed large



initial declines in cargo activity in the few months immediately into the pandemic (April and May 2020). Cargo activity recovered during summer 2020 and returned to more typical levels in the fall, around the same time as the COVID-19 pandemic impacts were estimated to have fully recovered for Legacy system commercial vehicles. Since the second quarter of FY 2021, commercial vehicle transactions and port activity have been exhibiting similar trends.

**Figure 3-3**  
**Comparison of Monthly Port of Baltimore Total General Cargo in Tons and MDTA Legacy Facilities Commercial Vehicle In-Lane Traffic, FY 2018 – 2021**

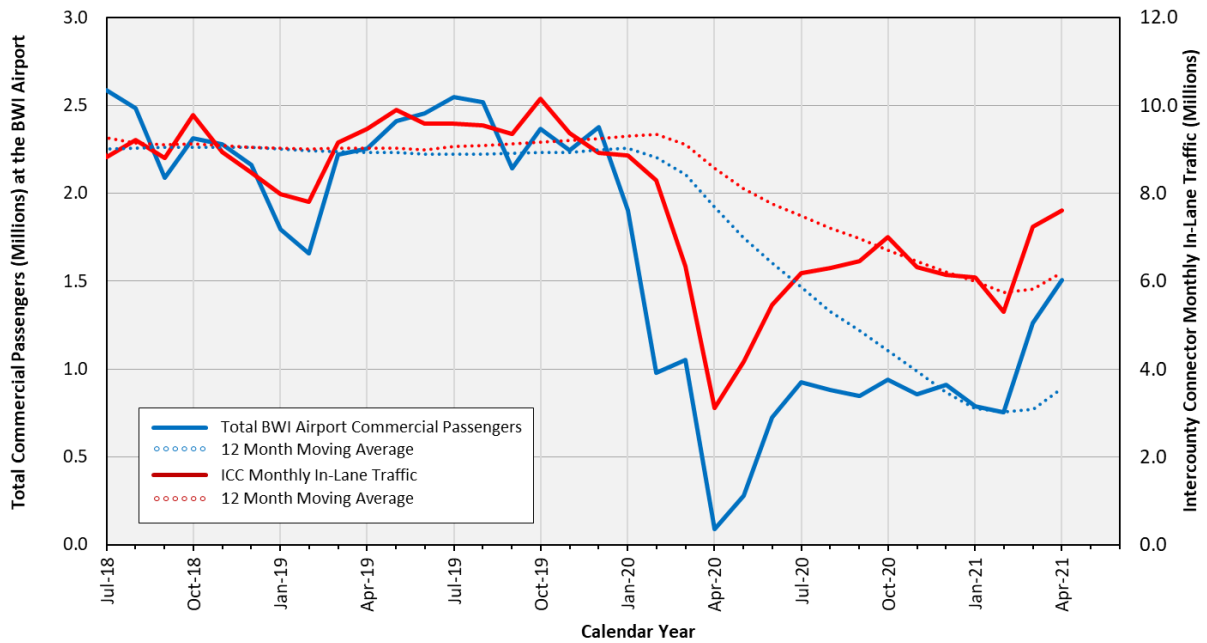


Source: Maryland Department of Transportation Port Administration.

### 3.2.3 Baltimore/Washington International Airport (BWI) Enplanement Trends

Another transportation metric being tracked in relation to leisure and business travel is airport activity. The Baltimore/Washington International Airport (BWI) enplanement data was analyzed against the Intercounty Connector monthly transactions. **Figure 3-4** shows the total passengers at BWI and the ICC toll transactions from July 2018 through April 2021. When all domestic and international travel was halted in April 2020, enplanements dropped significantly more than toll transactions. While some local travel was still occurring on the roadways, nearly all air travel was stopped except for emergency purposes. However, the direction of the trend since the first few months of the pandemic has been very similar. Travel increased last summer, but was dampened in the winter as cases increased, which is apparent in both metrics. February 2021 had winter storm impacts which impacted both road and air travel, but spring 2021 had a very strong recovery.

**Figure 3-4**  
**Comparison of Monthly Baltimore Washington International (BWI) Airport and MDTA**  
**Intercounty Connector In-Lane Traffic, FY 2018 - 2021**



Source: Baltimore/Washington International (BWI) Airport

### 3.3 Socioeconomic Variables

**Table 3-2** shows historical and forecast socioeconomic variable sources, terms and release dates.

**Subsections 3.3.1-3.3.7** discuss historical and forecast trends for population, employment, unemployment rates, real per capita personal income, real gross domestic/regional product, inflation, and fuel prices. Note that the latest available MD SDC data are from 2015 for employment and income, which is several years old, although population was recently updated.

**Table 3-2**  
**Socioeconomic Variables: Terms and Sources**

Variable	Term(s)	Historical Data	Forecast Data
Population	Persons	U.S. Census Bureau	Woods & Poole, 2021 Moody's, Jul. 2021 MD SDC, Dec. 2020
Employment	Persons	U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics	Woods & Poole, 2021 Moody's, Jul. 2021 MD SDC, Jan. 2015
Unemployment	Percentage	U.S. Bureau of Labor Statistics	CBO, Feb. 2021 FOMC, Jun. 2021 OMB, Feb. 2021 Moody's, Jul. 2021
Real Per Capita Income	2020\$	Woods & Poole, 2021	Woods & Poole, 2021 Moody's, Jul. 2021 MD SDC, Jan. 2015
Real Gross Domestic/Regional Product	2020\$	U.S. Bureau of Economic Analysis, Woods & Poole, 2021	CBO, Feb. 2021 FOMC, Jun. 2021 OMB, Feb. 2021 Moody's, Jul. 2021 Woods & Poole, 2021
Inflation	Annual Percentage Change	U.S. Bureau of Labor Statistics	CBO, Feb. 2021 FOMC, Jun. 2021 OMB, Feb. 2021 Moody's, Jul. 2021
Fuel Prices	Price per Gallon, Price per Barrel	Energy Information Administration	Moody's, Jul. 2021

### 3.3.1 Population

#### Historical

**Table 3-3** shows U.S. Census Bureau population for 2010 to 2020 (July 1<sup>st</sup> estimates). National population increased from 309.3 to 329.5 million, equating to 0.6% CAGR; the South Atlantic, which includes Maryland, grew faster at 1.0% annually, and Mid Atlantic growth was effectively flat, at 0.0% annually.

Maryland's population grew 267,000, from 5.8 to almost 6.1 million, reflecting a 0.5% CAGR. The most populous sub-state region, Baltimore, grew 0.3% annually while Southern Maryland grew relatively fastest, at 0.9%. Annual growth in Maryland's other regions ranged from a low of 0.1% CAGR contraction in Western Maryland to a high of 0.7% in Washington Suburban.

Population growth has decelerated in Maryland, dropping from 0.9% in 2011 to 0.0% in 2020, effectively plateauing. Baltimore's population decelerated earlier than the state, with effectively no growth since 2015.

**Table 3-3**  
**Historical Population**

Geography	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	'10-'19
<b>Population (Thousands)</b>												
United States	309,327	311,583	313,878	316,060	318,386	320,739	323,072	325,122	326,838	328,330	329,484	19,003
Mid Atlantic	40,911	41,076	41,189	41,264	41,313	41,317	41,298	41,277	41,245	41,153	41,002	242
South Atlantic	59,941	60,518	61,161	61,752	62,412	63,154	63,955	64,670	65,288	65,871	66,393	5,930
Maryland	5,789	5,840	5,888	5,925	5,960	5,989	6,007	6,028	6,042	6,055	6,056	266
Baltimore	2,668	2,686	2,707	2,720	2,732	2,742	2,746	2,750	2,753	2,753	2,749	85
Lower Eastern Shore	210	211	211	211	211	211	212	212	213	214	214	4
Southern Maryland	342	346	349	352	355	357	360	364	367	370	372	28
Upper Eastern Shore	240	241	241	241	241	241	241	242	243	244	244	4
Washington Suburban	2,076	2,103	2,128	2,148	2,169	2,185	2,196	2,209	2,216	2,223	2,227	147
Western Maryland	253	254	253	253	252	251	251	251	251	251	250	-2
<b>Annual Percent Change</b>												
United States		0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.6%	0.5%	0.5%	0.4%	0.7%
Mid Atlantic		0.4%	0.3%	0.2%	0.1%	0.0%	0.0%	-0.1%	-0.1%	-0.2%	-0.4%	0.1%
South Atlantic		1.0%	1.1%	1.0%	1.1%	1.2%	1.3%	1.1%	1.0%	0.9%	0.8%	1.1%
Maryland		0.9%	0.8%	0.6%	0.6%	0.5%	0.3%	0.4%	0.2%	0.2%	0.0%	0.5%
Baltimore		0.7%	0.8%	0.5%	0.4%	0.4%	0.1%	0.1%	0.1%	0.0%	-0.2%	0.4%
Lower Eastern Shore		0.4%	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.3%	0.4%	0.0%	0.2%
Southern Maryland		1.2%	0.9%	0.9%	0.7%	0.7%	0.9%	0.9%	0.9%	0.9%	0.6%	0.9%
Upper Eastern Shore		0.3%	0.0%	0.0%	0.0%	0.1%	0.1%	0.2%	0.5%	0.3%	0.2%	0.2%
Washington Suburban		1.3%	1.2%	0.9%	1.0%	0.8%	0.5%	0.6%	0.3%	0.3%	0.1%	0.8%
Western Maryland		0.3%	-0.2%	-0.2%	-0.3%	-0.3%	0.0%	-0.1%	0.0%	-0.1%	-0.2%	-0.1%

## Forecast

**Table 3-4** shows average annual population growth forecasts through 2031 by Woods & Poole (WP21), Moody's, and the Maryland State Data Center (MD SDC).

WP21 projects 0.7% National annualized growth between 2021 and 2031, slightly higher than Moody's 0.4%. WP21 predicts Mid-Atlantic CAGR of 0.2% and South Atlantic at 0.9%. As with National forecasts, Moody's projects Mid-Atlantic and South Atlantic growth slightly lower than WP21's, at -0.1% and 0.8%, respectively.

Both WP21 and MD SDC project Maryland's population growth at around 0.6% and that Southern Maryland will grow relatively faster than other regions, at 1.0%, similar to recent history. In Baltimore and Washington Suburban, the two major metro areas, WP21 projects 0.5% and 0.7% CGAR, respectively. MD SDC projects slightly lower growth at 0.4% and 0.6%, respectively. Maryland and sub-regional forecasts from WP21 and MD SDC appear optimistic given actual population growth (plateauing) observed in recent years. This will continue to be monitored.

**Table 3-4**  
**Forecast Population Growth**

Geography	Historical	WP21			Moody's			MD SDC		
	'10-'19	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31
United States	0.7%	0.7%	0.7%	0.7%	0.5%	0.4%	0.4%	-	-	-
Mid Atlantic	0.1%	0.2%	0.2%	0.2%	0.0%	-0.2%	-0.1%	-	-	-
South Atlantic	1.1%	1.0%	0.9%	0.9%	0.8%	0.8%	0.8%	-	-	-
Maryland	0.5%	0.6%	0.6%	0.6%	-	-	-	0.6%	0.5%	0.5%
Baltimore	0.4%	0.5%	0.5%	0.5%	-	-	-	0.4%	0.4%	0.4%
Lower Eastern Shore	0.2%	0.5%	0.5%	0.5%	-	-	-	0.9%	0.9%	0.9%
Southern Maryland	0.9%	1.0%	1.0%	1.0%	-	-	-	1.1%	1.0%	1.0%
Upper Eastern Shore	0.2%	0.5%	0.5%	0.5%	-	-	-	0.8%	1.0%	0.9%
Washington Suburban	0.8%	0.7%	0.6%	0.7%	-	-	-	0.6%	0.6%	0.6%
Western Maryland	-0.1%	0.3%	0.3%	0.3%	-	-	-	0.6%	0.7%	0.6%

### 3.3.2 Employment

#### Historical

Employment (civilian nonfarm) data in **Table 3-5** are from the U.S. Bureau of Economic Analysis (BEA) through 2019, with 2020 derived via the Bureau of Labor Statistics' 2020/2019 growth. Between 2010 and 2019, employment increased faster than population, but notably declined in 2020 due to COVID-19. Growth in the South Atlantic was 1.4% CAGR, higher than the Mid-Atlantic (0.5%) and nationally (1.0%). Mid-Atlantic exhibited the relatively steepest employment decline in 2020 compared to the South Atlantic and the Nation.

Historical growth in Maryland was 1.4% CAGR from 2010 to 2019, with a decline in 2020 slightly greater than the Nation, at 6.3% versus 6.0%. Maryland's annual employment growth was higher than population growth, except for in 2020. Growth in Baltimore and Washington Suburban metro areas both were stronger than other substate regions, and Western Maryland had the relatively weakest growth, actually declining in 2020 and prior-to COVID-19.

**Table 3-5**  
**Historical Employment**

Geography	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	'10-'19
<b>Employment (Thousands)</b>												
United States	172,902	176,092	178,980	182,325	186,234	190,326	193,379	196,337	200,284	203,810	191,519	30,908
Mid Atlantic	23,086	23,530	23,771	24,103	24,507	24,913	25,244	25,501	25,966	26,383	24,386	3,297
South Atlantic	32,872	33,546	34,027	34,673	35,561	36,541	37,333	38,180	39,206	40,002	37,760	7,130
Maryland	3,345	3,395	3,439	3,494	3,538	3,603	3,656	3,693	3,751	3,804	3,566	459
Baltimore	1,624	1,655	1,685	1,712	1,732	1,765	1,789	1,809	1,840	1,863	1,748	240
Lower Eastern Shore	114	114	116	116	117	118	119	120	121	123	115	9
Southern Maryland	150	151	152	153	155	159	163	164	164	167	159	17
Upper Eastern Shore	115	115	117	120	121	122	124	124	126	128	119	13
Washington Suburban	1,206	1,221	1,230	1,253	1,272	1,297	1,320	1,334	1,359	1,382	1,293	176
Western Maryland	136	138	139	140	140	141	141	140	140	140	131	4
<b>Annual Percent Change</b>												
United States		1.8%	1.6%	1.9%	2.1%	2.2%	1.6%	1.5%	2.0%	1.8%	-6.0%	1.8%
Mid Atlantic		1.9%	1.0%	1.4%	1.7%	1.7%	1.3%	1.0%	1.8%	1.6%	-7.6%	1.5%
South Atlantic		2.1%	1.4%	1.9%	2.6%	2.8%	2.2%	2.3%	2.7%	2.0%	-5.6%	2.2%
Maryland		1.5%	1.3%	1.6%	1.3%	1.8%	1.5%	1.0%	1.6%	1.4%	-6.3%	1.4%
Baltimore		2.0%	1.8%	1.6%	1.2%	1.9%	1.4%	1.1%	1.7%	1.3%	-6.2%	1.5%
Lower Eastern Shore		0.2%	1.1%	0.7%	0.6%	1.0%	0.9%	0.8%	0.7%	1.4%	-5.3%	0.8%
Southern Maryland		0.8%	0.1%	1.0%	1.2%	2.4%	2.5%	0.6%	0.1%	2.0%	-5.1%	1.2%
Upper Eastern Shore		0.2%	1.5%	2.1%	1.4%	0.7%	1.6%	0.3%	1.6%	1.3%	-6.8%	1.2%
Washington Suburban		1.2%	0.7%	1.9%	1.5%	2.0%	1.7%	1.1%	1.9%	1.7%	-6.5%	1.5%
Western Maryland		1.1%	1.3%	0.2%	0.1%	0.9%	-0.1%	-0.5%	0.0%	0.0%	-6.3%	0.3%

## Forecast

**Table 3-6** shows the national employment growth forecast of 1.2% CAGR through 2031, per WP21; Moody's expects similar growth through 2026, but it decelerates to 0.4% after. According to Moody's, the South Atlantic forecast CAGR (1.0%) is expected to be higher than the U.S. (0.8%) and Mid-Atlantic (0.4%). Similar relative growth is projected by WP21, with relatively faster growth in the South Atlantic. Forecasts from WP21 and Moody's are slightly decelerated from the historical growth observed pre-COVID-19.

According to the MD SDC, Maryland's employment forecast is 0.6% through 2031; however, such data were published in 2015 and are antiquated. WP21's forecast is 1.2% CAGR with a slight deceleration over the decade. For Baltimore and Washington Suburban, WP21 projects 1.3% and 1.1%, respectively, with Southern Maryland as the relatively fastest region, at 1.5%. In effect, the next decade is generally projected to resume pre-pandemic growth, albeit slightly decelerated.

**Table 3-6**  
**Forecast Employment Growth**

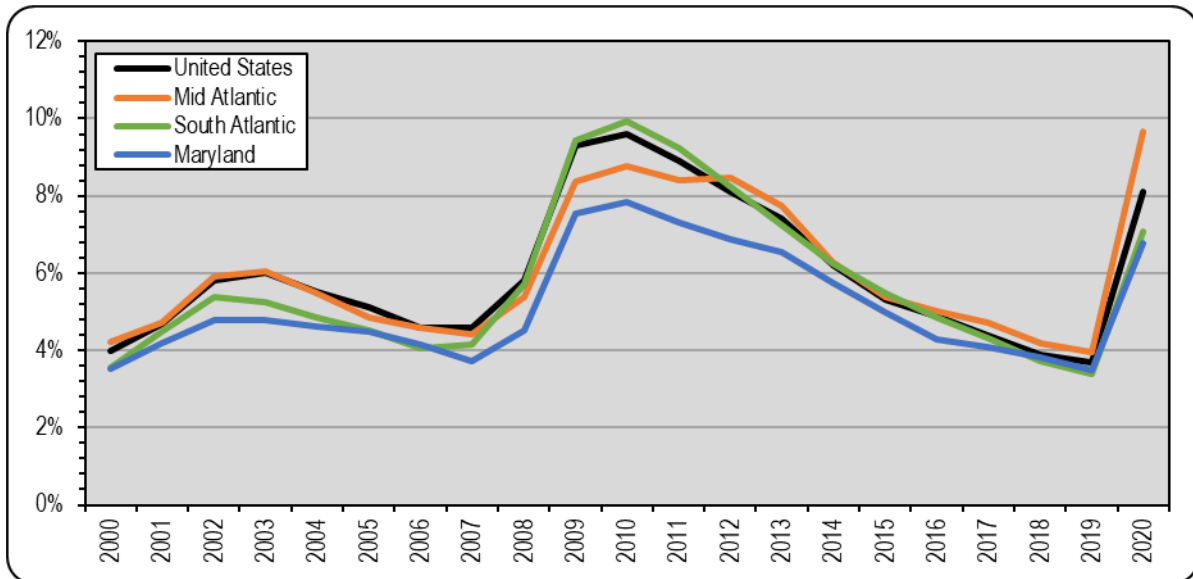
Geography	Historical	WP21			Moody's			MD SDC		
	'10-'19	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31
United States	1.8%	1.3%	1.2%	1.2%	1.2%	0.4%	0.8%	-	-	-
Mid Atlantic	1.5%	1.1%	1.0%	1.0%	1.1%	-0.2%	0.4%	-	-	-
South Atlantic	2.2%	1.5%	1.4%	1.5%	1.3%	0.6%	1.0%	-	-	-
Maryland	1.4%	1.2%	1.1%	1.2%	-	-	-	0.6%	0.5%	0.6%
Baltimore	1.5%	1.3%	1.2%	1.3%	-	-	-	0.6%	0.4%	0.5%
Lower Eastern Shore	0.8%	0.9%	0.8%	0.8%	-	-	-	0.6%	0.5%	0.6%
Southern Maryland	1.2%	1.5%	1.4%	1.5%	-	-	-	1.1%	0.7%	0.9%
Upper Eastern Shore	1.2%	1.2%	1.2%	1.2%	-	-	-	1.0%	0.6%	0.8%
Washington Suburban	1.5%	1.1%	1.0%	1.1%	-	-	-	0.7%	0.5%	0.6%
Western Maryland	0.3%	0.7%	0.6%	0.7%	-	-	-	0.8%	0.4%	0.6%

### 3.3.3 Unemployment

#### Historical

**Figure 3-5** shows annual unemployment rates from 2000 to 2020 from the BLS. Maryland's rate was universally lower than both the Mid-Atlantic and Nation albeit paralleling very closely. In 2020, with the COVID-19 onset, unemployment rates unprecedentedly spiked very quickly, jumping enormously in April 2020, and then steadily declining in the following months. On an annualized basis, national unemployment was 8.1% in 2020, with Maryland at 6.8%.

**Figure 3-5**  
**Historical Unemployment Rates (Macro Geographies)**



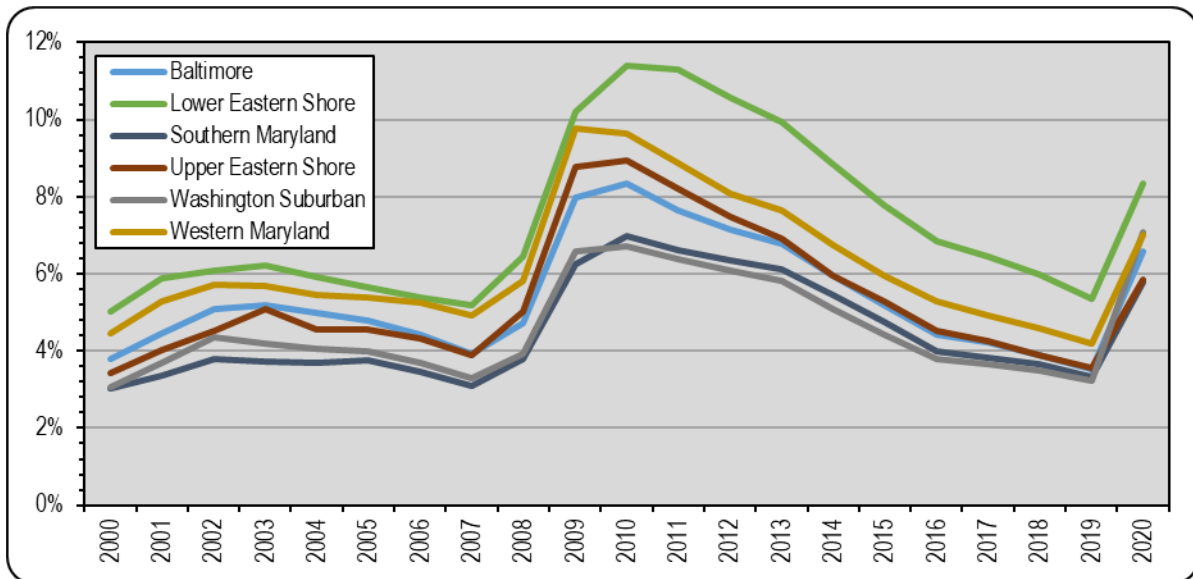
**Figure 3-6** shows annual unemployment rates for Maryland's regions. In every year, Southern Maryland and Washington Suburban exhibited lower unemployment rates than elsewhere;



unsurprising given the federal (D.C.) jobs concentrated there. Conversely, the Lower Eastern Shore and Western Maryland exhibited relatively higher unemployment rates than elsewhere.

Annual unemployment peaked between 2009 and 2011, during and following the Great Recession, reaching 11.4% in the Lower Eastern Shore, 9.8% in Western Maryland, 8.9% in the Upper Eastern Shore, and 8.3% in Baltimore. In the Washington Suburban region, unemployment peaked at 6.7% while Maryland's statewide rate reached 7.8%. Following those recessionary peak years, unemployment rates steadily declined to historically low levels in 2019. However, similar to the national level, COVID-19 reversed that trend quickly, with extraordinary unemployment rates peaking in the second-and-third quarters of 2020, followed by a decline. On an annual basis, 2020 resulted in unemployment rates ranging between 5.8% and 8.3% for the state regions, which are not as high as during the Great Recession.

**Figure 3-6**  
**Historical Unemployment Rates (Maryland Regions)**



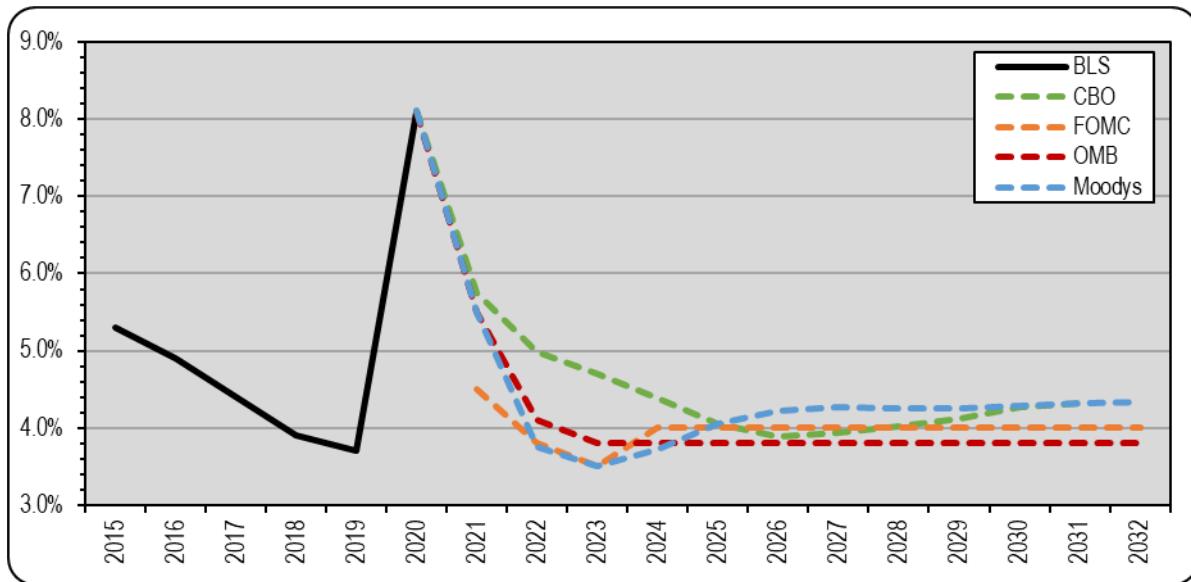
### Forecast

National unemployment rates in 2020 spiked from COVID-19. However, unemployment rate projections from the Congressional Budget Office, the Federal Reserve (FOMC), Office of Management and Budget, and Moody's expect the annual rates to normalize relatively quickly. In 2021, the forecasts range between 5.7% (CBO) to 4.5% (FOMC), and then fall further to around 4.0%, per **Figure 3-7**.

**Table 3-7** provides more detail on the short-term unemployment outlook for 2021, 2022, and 2023, sourced from a wide variety of forecasters. The table is organized from most optimistic to most pessimistic forecasts for 2021. Data were compiled in July 2021 with most forecasters publishing data in June or July, with a few in April or May; the more-recently released forecasts are generally more optimistic than earlier releases, with a range from 6.0% to 4.5% in 2021,

averaging 5.5% and then declining further to 4.2% in 2022. However, these forecasts would not fully consider more recent developments related to the Delta variant of COVID-19.

**Figure 3-7**  
**Forecast U.S. Unemployment Rate**



**Table 3-7**  
**Short-Term Forecast U.S. Unemployment Rate**

Source	Release Date	2021	2022	2023
Federal Reserve Bank: Federal Open Market Committee (FOMC)	June 16, 2021	4.5%	3.8%	3.5%
Royal Bank of Canada (RBC) Economics	June 9, 2021	5.3%	4.2%	#N/A
Energy Information Administration (EIA): Short-Term Energy Outlook	July 7, 2021	5.4%	3.7%	#N/A
Congressional Budget Office (CBO)	June 29, 2021	5.5%	3.8%	3.7%
Moody's Analytics	July 6, 2021	5.5%	3.8%	3.5%
Office of Management and Budget (OMB)	June 14, 2021	5.5%	4.1%	3.8%
Federal Reserve Bank of Philadelphia: Survey of Professional Forecasters*	May 14, 2021	5.5%	4.4%	3.9%
Bank of Montreal (BMO) Capital Markets Economics	July 2, 2021	5.6%	4.3%	#N/A
Conference Board	July 14, 2021	5.6%	4.2%	#N/A
TD Economics	June 17, 2021	5.6%	3.9%	#N/A
Wells Fargo Securities Economics Group	July 8, 2021	5.6%	4.3%	#N/A
ScotiaBank Global Economics	June 11, 2021	5.6%	4.0%	#N/A
Organization for Economic Cooperation and Development (OECD)	May 18, 2021	5.6%	4.3%	#N/A
PNC Financial Services Group	June 23, 2021	5.6%	4.4%	3.9%
National Association for Business Economics (NABE)*	May 13, 2021	5.6%	4.3%	#N/A
University of Michigan: Research Seminar in Quantitative Economics (RSQE)	May 21, 2021	5.7%	4.8%	4.3%
International Monetary Fund (IMF): World Economic Outlook	April 6, 2021	5.8%	4.2%	3.7%
National Association of Realtors	April 27, 2021	6.0%	5.7%	#N/A
Average		5.5%	4.2%	3.8%

### 3.3.4 Per Capita Personal Income

Personal income indicates the relative affluence of a region's residents. Real per capita income includes the sum of wages and salaries, other labor income, proprietors' income, rental income of persons, dividend income, personal interest income, and transfer payments, less personal contributions for government social insurance, on a per-person basis. Real (above inflation) increases in per capita income can lead to an increased willingness to pay tolls.

#### Historical

Historical real personal income per capita, in constant 2020\$<sup>2</sup>, is presented in **Table 3-8**, from WP21. Per capita personal income nationally increased from \$47,090 in 2010 to \$58,358 in 2020, or 2.2% CAGR. In the Mid-Atlantic and South Atlantic, the CAGRs were 2.3% and 1.9%, respectively. Maryland's growth was 1.3%. In Maryland's regions, historical growth was lower than the nation, ranging from 1.0% in Washington Suburban to 1.8% in Western Maryland.

While historical growth was relatively slower in Maryland than nationally, the absolute real income per capita was relatively higher. At \$66,365, Maryland's per capita personal income was 13.7% higher than the Nation, and 21.3% higher than the South Atlantic in 2020. The Washington Suburban region, at \$72,035 in 2020, was 23.4% higher than the nation, and Baltimore's \$65,832 was 12.8% higher.

**Table 3-8**  
**Historical Real Personal Income Per Capita (2020\$)**

Geography	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	'10-'19
<b>Total Real Personal Income/Capita (2020\$)</b>												
United States	47,090	48,409	49,578	49,199	50,879	52,875	53,391	54,658	56,075	57,158	58,358	10,068
Mid Atlantic	54,988	56,300	57,642	57,391	59,008	61,396	62,710	64,769	66,297	67,984	68,781	12,996
South Atlantic	45,380	46,340	46,901	45,902	47,495	49,560	50,143	51,341	52,471	53,230	54,727	7,849
Maryland	58,077	59,390	59,517	58,189	59,121	61,523	62,994	63,719	64,395	65,404	66,365	7,327
Baltimore	56,559	57,739	57,960	57,236	58,604	60,650	61,800	62,632	63,635	64,693	65,832	8,135
Lower Eastern Shore	41,926	42,314	42,450	42,769	44,058	46,283	45,962	46,959	46,524	46,889	48,940	4,963
Southern Maryland	55,910	56,846	56,292	55,217	55,770	57,631	58,474	58,839	59,353	60,281	62,994	4,371
Upper Eastern Shore	50,437	51,522	51,857	51,838	52,841	54,594	55,611	56,594	57,318	58,441	58,977	8,004
Washington Suburban	64,979	66,661	66,673	64,019	64,349	67,463	69,724	70,348	70,742	71,750	72,035	6,771
Western Maryland	40,987	41,686	41,972	41,987	43,067	44,396	45,166	45,397	46,061	47,071	48,935	6,084
<b>Annual Percent Change</b>												
United States		2.8%	2.4%	-0.8%	3.4%	3.9%	1.0%	2.4%	2.6%	1.9%	2.1%	2.2%
Mid Atlantic		2.4%	2.4%	-0.4%	2.8%	4.0%	2.1%	3.3%	2.4%	2.5%	1.2%	2.4%
South Atlantic		2.1%	1.2%	-2.1%	3.5%	4.3%	1.2%	2.4%	2.2%	1.4%	2.8%	1.8%
Maryland		2.3%	0.2%	-2.2%	1.6%	4.1%	2.4%	1.2%	1.1%	1.6%	1.5%	1.3%
Baltimore		2.1%	0.4%	-1.2%	2.4%	3.5%	1.9%	1.3%	1.6%	1.7%	1.8%	1.5%
Lower Eastern Shore		0.9%	0.3%	0.8%	3.0%	5.1%	-0.7%	2.2%	-0.9%	0.8%	4.4%	1.3%
Southern Maryland		1.7%	-1.0%	-1.9%	1.0%	3.3%	1.5%	0.6%	0.9%	1.6%	4.5%	0.8%
Upper Eastern Shore		2.2%	0.7%	0.0%	1.9%	3.3%	1.9%	1.8%	1.3%	2.0%	0.9%	1.7%
Washington Suburban		2.6%	0.0%	-4.0%	0.5%	4.8%	3.4%	0.9%	0.6%	1.4%	0.4%	1.1%
Western Maryland		1.7%	0.7%	0.0%	2.6%	3.1%	1.7%	0.5%	1.5%	2.2%	4.0%	1.5%

<sup>2</sup> WP21 provides real income per capita in 2012\$, per current BEA data conventions; dollars in inflated to 2020\$ using WP21's PCE index.

## Forecast

**Table 3-9** provides real personal income per capita forecasts. According to WP21, national growth is projected at 1.6% CAGR between 2021-2031; the Mid-Atlantic, South Atlantic, Maryland, and sub-state regions are expected to exhibit similar growth patterns, ranging between 1.6% and 1.7%. Moody's predicts similar CAGRs as WP21 overall, but with a different pattern, exhibiting slower growth in 2021-2026, and then higher growth from 2026-2031. Maryland's SDC forecasts a relatively slower growth than WP21, with decelerating growth around or below 1.0% CAGR; however, the data are from 2015.

Similar to the other variables, the pandemic added significant uncertainty to the future of real per capita income growth. White-collar professional industries with telecommuting opportunities and typically higher salaries were less affected than blue-collar industries with lower salaries. This will continue to be monitored moving forward.

**Table 3-9**  
**Forecast Real Personal Income Per Capita Growth**

Geography	Historical	WP21			Moody's			MD SDC		
	'10-'19	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31
United States	2.2%	1.6%	1.6%	1.6%	0.8%	2.1%	1.5%	-	-	-
Mid Atlantic	2.4%	1.7%	1.7%	1.7%	0.8%	2.1%	1.5%	-	-	-
South Atlantic	1.8%	1.7%	1.6%	1.7%	0.7%	2.1%	1.4%	-	-	-
Maryland	1.3%	1.6%	1.6%	1.6%	-	-	-	1.1%	0.8%	0.9%
Baltimore	1.5%	1.8%	1.7%	1.8%	-	-	-	1.1%	0.8%	1.0%
Lower Eastern Shore	1.3%	1.5%	1.5%	1.5%	-	-	-	1.0%	0.9%	0.9%
Southern Maryland	0.8%	1.5%	1.4%	1.4%	-	-	-	1.1%	0.9%	1.0%
Upper Eastern Shore	1.7%	1.7%	1.6%	1.6%	-	-	-	1.1%	0.9%	1.0%
Washington Suburban	1.1%	1.4%	1.3%	1.4%	-	-	-	1.0%	0.7%	0.8%
Western Maryland	1.5%	1.7%	1.6%	1.6%	-	-	-	1.2%	0.9%	1.0%

### 3.3.5 Gross Domestic/Regional Product

Gross domestic product (national level) and gross regional product (state- and county-level) measure the value of all final goods and services produced within a geographic area and are general indicators of a region's economic activity.

#### Historical

Historical real gross domestic product (GDP) and gross regional product (GRP), in real 2020\$<sup>3</sup>, are presented in **Table 3-10**. Real GDP grew at 2.3% CAGR between 2010-2019, and a relatively large 3.5% annual decline in 2020 effectively reset the national economy to 2017 to 2018 levels. Growth in the Mid-Atlantic was slightly lower at 1.5%, and the South Atlantic was 0.9% due to the relatively larger COVID-19-related downturn. At 0.9%, Maryland's real GRP historical growth was about half the U.S.

<sup>3</sup> BEA provides real GDP and GRP in 2012\$; dollars in inflated to 2020\$ using WP21's PCE index. BEA provided county-level data through 2019; data for 2020 are based on WP21's growth.

Data in **Tables 3-3** and **3-5** show in 2020, Maryland comprised 9.1% of the South Atlantic's population and 9.4% of employment. **Table 3-10** shows that Maryland accounted for 13.7% of the South Atlantic's real GRP. Within Maryland, the sub-state regions of Baltimore and Washington Suburban accounted for 87.3% of Maryland's real GRP in 2020, and the region exhibited the relatively fastest historical growth within the state.

**Table 3-10**  
**Historical Real Gross Domestic/Regional Product (2020\$)**

Geography	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	'10-'19
<b>Gross Regional Product (2020\$ billions)</b>												
United States	17,338	17,607	18,003	18,335	18,798	19,376	19,707	20,167	20,771	21,220	20,481	3,882
Mid Atlantic	3,118	3,150	3,168	3,203	3,274	3,385	3,465	3,555	3,659	3,736	3,632	617
South Atlantic	2,675	2,681	2,761	2,782	2,822	2,879	2,923	2,958	3,029	3,083	2,924	408
Maryland	363.6	371.2	371.9	371.7	377.9	388.1	400.1	406.7	409.9	415.7	399.6	52.2
Baltimore	177.3	180.7	182.4	183.8	187.1	191.9	197.4	200.6	204.3	207.7	200.6	30.4
Lower Eastern Shore	9.7	9.7	9.6	10.0	10.4	10.8	11.0	11.0	11.0	11.1	10.6	1.4
Southern Maryland	16.6	17.1	16.8	16.6	16.9	17.2	18.0	18.3	17.5	17.9	17.3	1.3
Upper Eastern Shore	9.7	9.6	9.7	9.9	10.0	10.4	10.7	11.0	11.6	11.9	11.3	2.2
Washington Suburban	139.0	142.6	142.1	139.9	141.8	146.1	151.2	153.7	153.7	154.9	148.1	15.9
Western Maryland	11.3	11.5	11.3	11.5	11.6	11.7	12.0	12.0	12.0	12.3	11.7	1.1
<b>Annual Percent Change</b>												
United States		1.6%	2.2%	1.8%	2.5%	3.1%	1.7%	2.3%	3.0%	2.2%	-3.5%	2.3%
Mid Atlantic		1.0%	0.6%	1.1%	2.2%	3.4%	2.4%	2.6%	2.9%	2.1%	-2.8%	2.0%
South Atlantic		0.2%	3.0%	0.8%	1.4%	2.0%	1.5%	1.2%	2.4%	1.8%	-5.1%	1.6%
Maryland		2.1%	0.2%	0.0%	1.7%	2.7%	3.1%	1.6%	0.8%	1.4%	-3.9%	1.5%
Baltimore		1.9%	0.9%	0.8%	1.8%	2.5%	2.8%	1.7%	1.8%	1.7%	-3.4%	1.8%
Lower Eastern Shore		-0.5%	-0.6%	4.6%	3.9%	3.9%	1.2%	0.2%	-0.2%	0.8%	-4.7%	1.5%
Southern Maryland		2.9%	-1.7%	-0.9%	1.6%	1.7%	4.6%	2.0%	-4.7%	2.4%	-3.4%	0.8%
Upper Eastern Shore		-0.4%	0.4%	2.4%	1.6%	3.7%	3.2%	2.8%	4.7%	2.7%	-4.6%	2.3%
Washington Suburban		2.6%	-0.4%	-1.5%	1.4%	3.0%	3.5%	1.7%	0.0%	0.8%	-4.4%	1.2%
Western Maryland		2.3%	-1.5%	1.0%	1.2%	0.9%	2.2%	0.6%	-0.1%	2.5%	-3.4%	1.0%

## Forecast

**Table 3-11** provides gross domestic/regional product forecasts. Moody's national forecast growth is higher than WP21's; WP21 projects 2.0% annual real growth through 2031 while Moody's is 2.5%. WP21 projects the South Atlantic to grow faster (2.3%) than the nation, with Maryland's GRP closer to the national 2.0%. Within Maryland, the highest real GRP growth is expected in Baltimore (2.2%), Southern Maryland (2.1%) and Upper Eastern Short (2.0%).

**Table 3-11**  
**Forecast Real Gross Domestic/Regional Product Growth**

	Historical	WP21			Moody's		
Geography	'10-'19	'21-'26	'26-'31	'21-'31	'21-'26	'26-'31	'21-'31
United States	2.3%	2.1%	2.0%	2.0%	2.9%	2.0%	2.5%
Mid Atlantic	2.0%	1.9%	1.8%	1.9%	-	-	-
South Atlantic	1.6%	2.3%	2.2%	2.3%	-	-	-
Maryland	1.5%	2.1%	2.0%	2.0%	-	-	-
Baltimore	1.8%	2.2%	2.1%	2.2%	-	-	-
Lower Eastern Shore	1.5%	1.7%	1.7%	1.7%	-	-	-
Southern Maryland	0.8%	2.2%	2.1%	2.1%	-	-	-
Upper Eastern Shore	2.3%	2.1%	2.0%	2.0%	-	-	-
Washington Suburban	1.2%	2.0%	1.8%	1.9%	-	-	-
Western Maryland	1.0%	1.5%	1.4%	1.4%	-	-	-

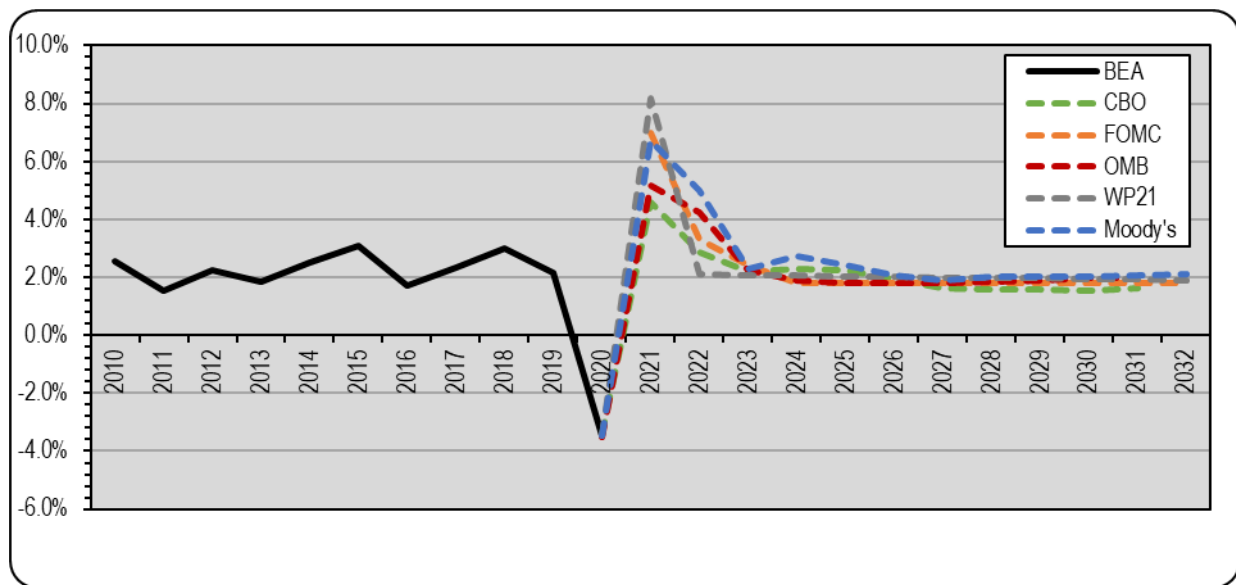
**Table 3-12** provides detail on short-term GDP outlook for 2021, 2022 and 2023, sourced from various private and public sector agencies, and is organized from most optimistic to most pessimistic for 2021. As shown, most forecasters expect some rebounding growth following the contraction in 2020, with an average of 6.5% in 2021.

**Table 3-12**  
**Forecast Short-Term Real GDP Growth**

Source	Release Date	2021	2022	2023
Woods & Poole Economics, Inc.	June 21, 2021	8.2%	2.1%	2.1%
Energy Information Administration (EIA): Short-Term Energy Outlook	July 7, 2021	7.4%	5.0%	#N/A
Wells Fargo Securities Economics Group	July 8, 2021	7.0%	5.7%	#N/A
Federal Reserve Bank: Federal Open Market Committee (FOMC)	June 16, 2021	7.0%	3.3%	2.4%
TD Economics	June 17, 2021	6.9%	4.3%	#N/A
Organization for Economic Cooperation and Development (OECD)	May 18, 2021	6.9%	3.6%	#N/A
Bank of Montreal (BMO) Capital Markets Economics	July 2, 2021	6.8%	4.3%	#N/A
ScotiaBank Global Economics	June 11, 2021	6.8%	4.1%	#N/A
Moody's Analytics	July 6, 2021	6.7%	5.0%	2.3%
Congressional Budget Office (CBO)	June 29, 2021	6.7%	5.0%	1.5%
Conference Board	July 14, 2021	6.6%	3.8%	2.5%
Royal Bank of Canada (RBC) Economics	June 9, 2021	6.5%	3.0%	#N/A
National Association for Business Economics (NABE)*	May 13, 2021	6.5%	4.4%	#N/A
PNC Financial Services Group	June 23, 2021	6.4%	4.3%	2.3%
International Monetary Fund (IMF): World Economic Outlook	April 6, 2021	6.4%	3.5%	1.4%
Federal Reserve Bank of Philadelphia: Survey of Professional Forecasters*	May 14, 2021	6.3%	4.3%	2.6%
University of Michigan: Research Seminar in Quantitative Economics (RSQE)	May 21, 2021	6.2%	4.2%	2.7%
Economist Intelligence Unit (EIU): Global Forecasting Service	June 15, 2021	6.0%	3.7%	2.2%
World Bank	June 22, 2021	5.4%	4.0%	2.2%
Office of Management and Budget (OMB)	June 14, 2021	5.2%	3.2%	2.0%
National Association of Realtors	April 27, 2021	4.5%	3.2%	#N/A
Average		6.5%	4.0%	2.2%

**Figure 3-8** shows real GDP historical growth from 2010-2020 and forecasted growth for about the next decade by the CBO, FOMC, OMB, WP21, and Moody's. In 2021, the CBO and OMB forecast growth of around 5.0%, while the FOMC, Moody's, and WP21 project higher growth at 7.0%, 6.7%, and 8.2%, respectively. After 2021, all sources forecast a decelerating growth to over 2.0% by 2023, and continuation of that around 2.0% into the future.

**Figure 3-8**  
**Forecast Mid-Term Real GDP Growth**



### 3.3.6 Inflation

Comparing inflation rates with future toll policy plans can indicate the relative real cost of tolls over time. For example, if toll rates are unchanged during an inflation period, the real toll costs become relatively less expensive.

#### Historical

From 2000-2020, the national inflation rate<sup>4</sup> via the BLS averaged 2.1%, ranging from a high of 3.8% in 2008 to a low of -0.4% in 2009, and ending at 1.2% in 2020. **Figure 3-9** shows that from 2007-2016, inflation rates in the Northeast,<sup>5</sup> South,<sup>6</sup> and Washington DC MSA<sup>7</sup> closely tracked the U.S. rate. However, from 2016-2020, the U.S. inflation rate was mostly slightly higher than those of the Northeast, South, and DC MSA.

<sup>4</sup> Measured by the Consumer Price Index for urban consumers (CPI-U).

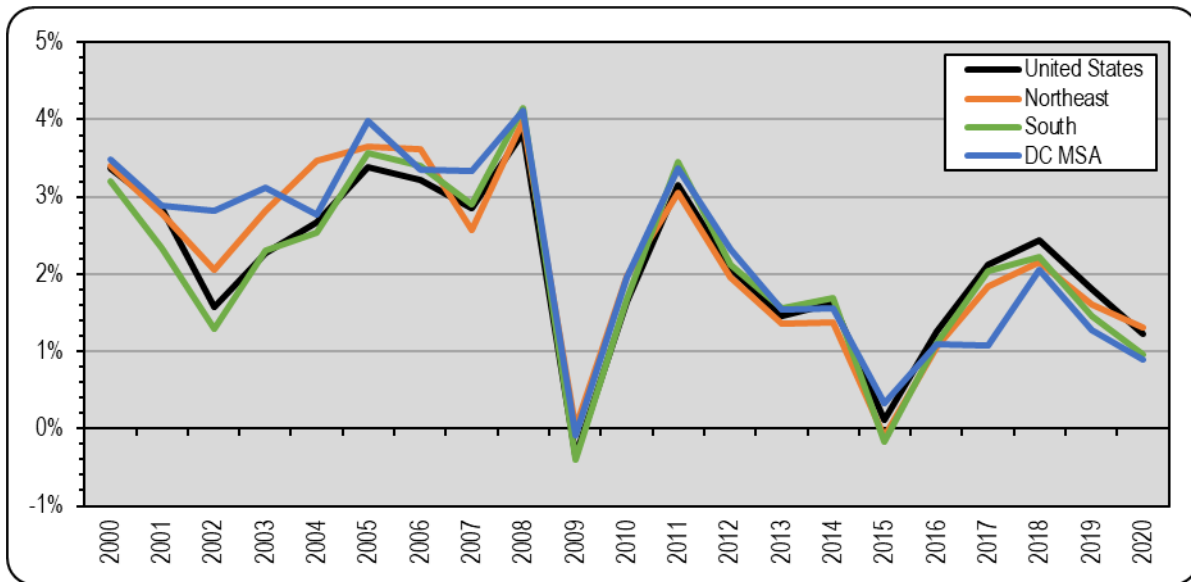
<sup>5</sup> Northeast census defined as CT, ME, MA, NH, NJ, NY, PA, RI, and VT.

<sup>6</sup> South census defined as AR, AL, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV.

<sup>7</sup> Washington-Arlington-Alexandria, DC-MD-VA-WV Metropolitan Statistical Area.



**Figure 3-9**  
**Historical Inflation (CPI-U)**

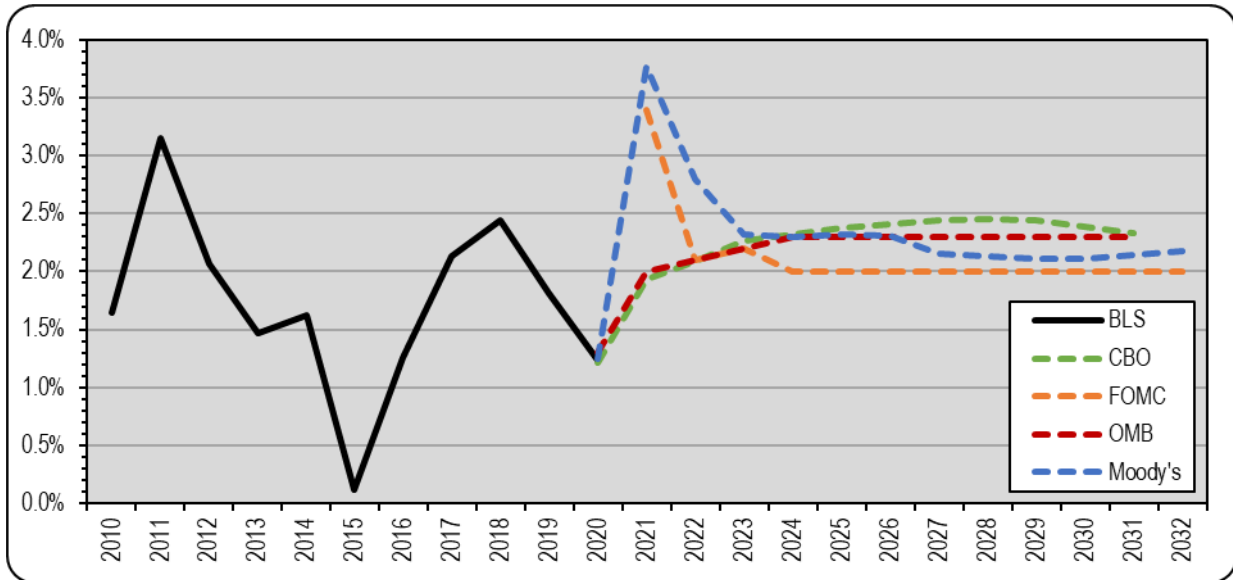


### Forecast

**Figure 3-10** shows the national inflation forecasts by the CBO, FOMC, OMB, and Moody's. In 2021, the CBO and OMB expect U.S. inflation around 2.0% and slightly increase in the next decade to around 2.3%. FOMC and Moody's predicts higher inflation in 2021, closer to 3.5%, then gradually declining to lower rates around 2.0% thereafter. FOMC measures inflation via the Personal Consumption Expenditure (PCE) index, which closely parallels the CPI-U measure.

Forecasts developed in early 2021 mostly illustrate tempered inflation expectations for 2021; however, as COVID-19 vaccinations were implemented and some "normalcy" returned to everyday activities, including spending patterns, sources released later in the year, such as the FOMC, exhibit a higher, temporary inflation in 2021.

**Figure 3-10**  
**Forecast Inflation (CPI-U)**



### 3.3.7 Fuel Prices

Fuel prices are another important variable related to traffic forecasting. Fuel price increases beyond inflation leads to increasing vehicle operating cost and generally less travel, including less travel on toll facilities. In the reverse, declining fuel prices results in generally more travel.

#### Historical

**Figure 3-9** illustrates the monthly crude oil<sup>8</sup> and retail gasoline prices<sup>9</sup> from 2000 to mid-2021. The price data in **Figure 3-11** are shown in nominal dollars (i.e., current dollars)<sup>10</sup> and are measured by price per barrel (crude oil) and price per gallon (gasoline).

U.S. gasoline prices ranged from a low of \$1.13 per gallon in December 2001 to a high of \$4.11 per gallon in July 2008. Monthly gasoline prices remained below \$3.00 per gallon since November 2014 until recently, with \$3.08 per gallon in May 2021 and increasing. Retail gasoline prices in the Central Atlantic<sup>11</sup> and Lower Atlantic<sup>12</sup> generally tracked national prices, with the Central Atlantic typically 2.1% higher and the Lower Atlantic 2.7% lower.

<sup>8</sup> Cushing OK WTI (West Texas Intermediate) spot price per barrel, free on-board delivery.

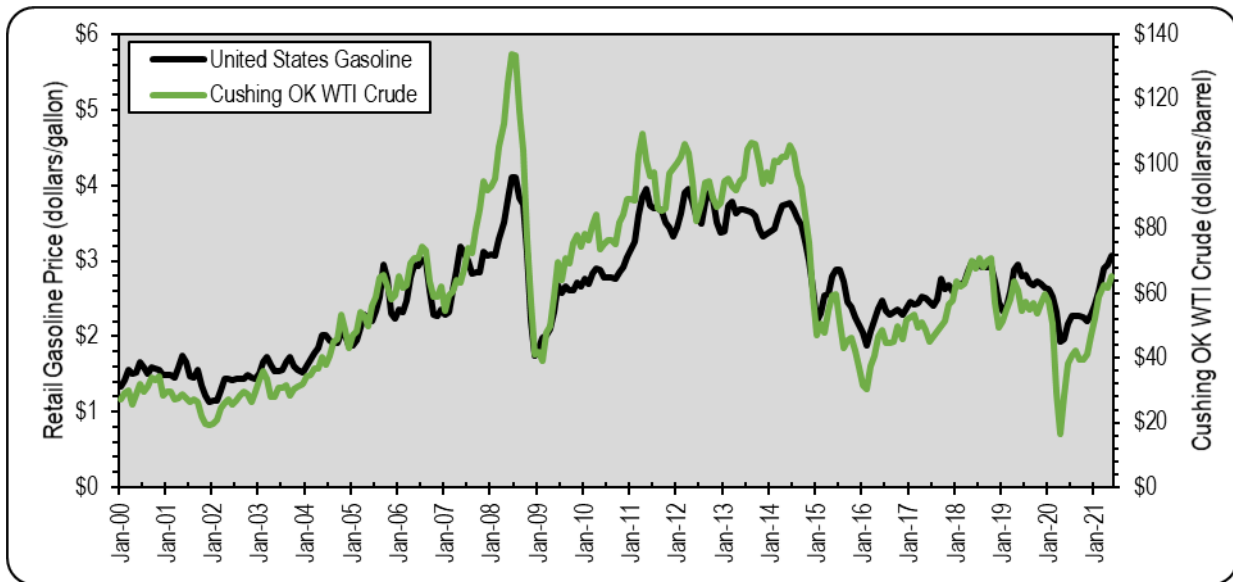
<sup>9</sup> Retail price per gallon of unleaded gasoline, all grades, all formulations.

<sup>10</sup> 2000 data are presented in 2000 dollars, 2001 data in 2001 dollars, etc.

<sup>11</sup> Central Atlantic includes DE, DC, MD, NJ, NY and PA.

<sup>12</sup> Lower Atlantic includes FL, GA, NC, SC, VA and WV.

**Figure 3-11**  
**Historical Fuel Prices (Current \$)**

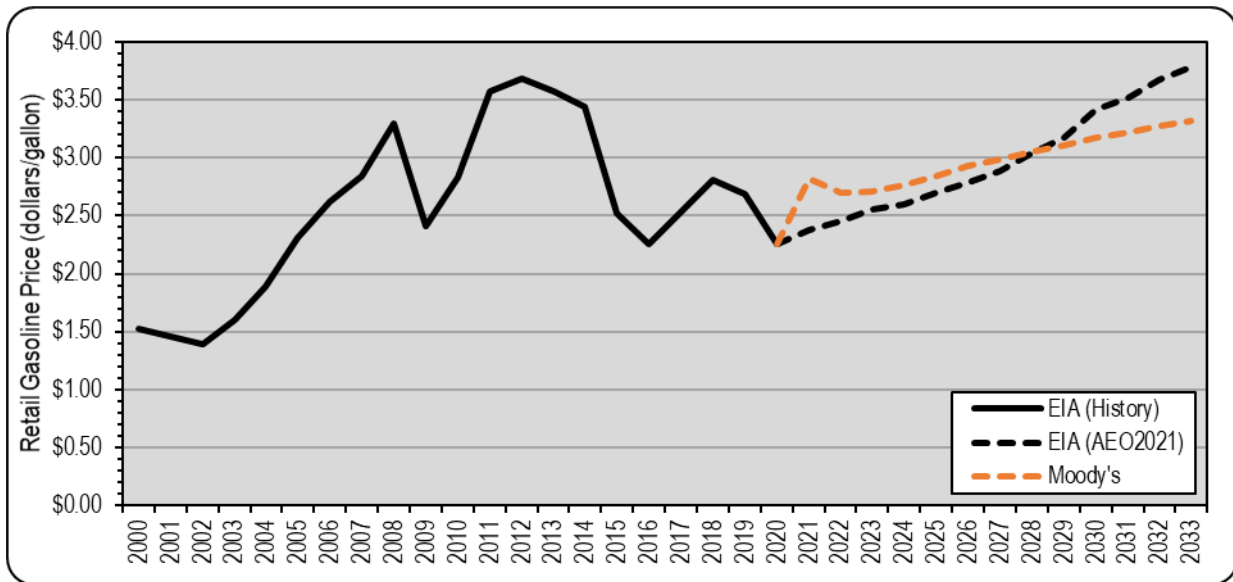


Gasoline retail prices generally mirrors crude oil prices since crude oil historically accounted for approximately 50% of gasoline's production costs. **Figure 3-8** shows that crude oil ranged from \$16.55 in April 2020 to \$133.88 in June 2008, a with some pronounced volatility in certain months attributable to various reasons (recessions, OPEC, hurricanes, supply/storage shortages, etc.). Crude oil averaged approximately \$65.00 per barrel in 2018, \$57.00 in 2019, dropping to \$39.00 in 2020, mostly due to the precipitous drop in late-Spring/early-Summer with the onset of COVID-19. Since then, in the first half of 2021, prices increased to \$60.00 per barrel.

### Forecast

**Figure 3-12** provides national gasoline price forecasts in current dollars. Retail gasoline prices, averaging \$2.26 in 2020 but increasing to over \$3.00 per gallon in 2021, are expected to continue increasing by the EIA and Moody's. However, the EIA's forecasts, developed in early 2021, before the steady increase, is anchored to the lower 2020 levels, and have already missed target. Moody's Analytics (July 2021) forecasts a fuel price increase to \$2.82 in 2021, reduced to \$2.70 in 2022 and then a steady increase to \$3.32 by 2033.

**Figure 3-12**  
**Forecast Fuel Price (Current \$)**



### 3.4 Risks and Conclusion

COVID-19 has significantly impacted the economy and travel. Prior to COVID-19, economic growth was supported by low unemployment, low inflation, and gains in per capita personal income. COVID-19 caused significant and ongoing disruptions.

Because of the pandemic, some businesses, especially in certain sectors, will continue experiencing significant financial hardship. This will continue to impact employment. Some immediate and acute impacts related to business activity and employment were mitigated by Federal stimulus programs. However, additional stimulus prospects and long-term impacts are uncertain. Federal Reserve Chairman Jerome Powell has repeatedly stated the Federal Reserve expects a prolonged and erratic economic recovery. The COVID-19 recession differs from all previous recessions, since it is a public health emergency and not caused by market factors, such as a housing bubble, lax lending standards, or a troubled financial system. Even when or if the virus becomes contained, many mid- and long-term changes may persist. The short-term impacts will accelerate preexisting early-stage trends and induce new changes.

In the mid-term, supply chain industries will be indirectly impacted (such as professional, financial, and real estate) by the more significantly impacted industries (such as leisure, hospitality, education, and retail). Pessimistic consumer confidence, coupled with employment losses may contract spending. Increasing default rates and bankruptcies may hinder the recovery. Impacts and related decisions may alter trade patterns, supply chains, and demand. International trade may be impacted due to demand changes, border restrictions, and accelerated reshoring and supply-chain redundancy trends. For example, the ongoing semiconductor chip shortage will likely continue to have significant impacts on international trade in the coming years. Consumer spending may continue to focus more on essentials (for example, groceries, medical emergencies,

and necessary home improvements), and will be more often purchased via e-commerce, if possible.

In the long-term, some impacts and shifts will be institutionalized. Some industries may not fully recover or may structurally change. For example, this may include some medical care switching to telehealth and in-person college attendance switching to e-learning. Some population trend changes and impacts may occur including deferral of planned births, lower immigration, and a shift of urban to rural locales. If e-commerce and telecommuting increase even moderately, shifts may arise in commercial real estate, warehousing, distribution, and land use patterns.

Considering travel specifically, the potential macroeconomic changes would impact travel demand and patterns. Much of the immediately observed travel demand contraction in May and April 2020 has already rebounded. However, a full recovery continues to be much more gradual and protracted for some travel sectors. The risks for post-vaccination COVID-19 resurgence (mutations and effects on unvaccinated) impacts may result in another temporary travel retraction. In the mid- and long-term, some baseline travel demand may disappear entirely or shift, and other new changes in travel may emerge. Telecommuting is expected to accelerate; e-commerce will accelerate shifting passenger to delivery vehicles.

A series of COVID-19 impact factors were developed by CDM Smith to incorporate into this forecast, based on observed travel impacts thus far (per **Chapter 2**), and future outlooks and risks considerations. However, many factors are concurrent that could change travel demand dynamics positively or negatively in the mid- and long-term.

## Chapter 4

### Forecasts by Facility

This chapter summarizes the development of the forecasts of future year transactions and toll revenue for the MDTA system. Separate sections and discussions are provided for the overall assumptions, the Legacy facilities, ICC, I-95 ETLs, and other revenue. The 10-year annual forecast results by facility through FY 2031 are included in this chapter. Monthly forecasts for FY 2022 and FY 2023 are also included.

#### 4.1 Assumptions

Transaction and revenue forecasts were predicated upon the following basic assumptions, which are considered reasonable by CDM Smith for purposes of the forecast:

1. The MDTA toll facilities and approach roads will continue to be well-maintained and effectively signed;
2. No competing highway projects other than those identified in this report will be constructed or significantly improved during the forecast period;
3. MDTA will continue to operate within its business rules and practices;
4. For the purposes of this forecast, it is assumed that no toll rate or toll schedule adjustments will be made during the forecasting period other than those presented in **Chapter 1**;
5. Annual revenue estimates are expressed in future year dollars (nominal);
6. No major recession, natural disasters, future pandemics, or other significant exogenous events will occur that would significantly reduce travel in the region;
7. Socioeconomic growth, including related to population and employment, will occur as presented in this study; and
8. Motor fuel will remain in adequate supply, and future price increases will not significantly exceed the long-term rate of inflation.

Any significant departure from these basic assumptions could materially affect forecasted transactions and toll revenue.

#### Detailed Assumptions

In addition to the basic assumptions listed above, several other more specific assumptions were made as provided in **Table 4-1**.

**Table 4-1**  
**Detailed Forecast Assumptions**

Assumption Category	Assumption Detail
COVID-19 Impacts	Future ICC and I-95 ETL COVID-19 impact factors assumed are based on the latest COVID-19 impact analysis. Legacy System passenger car COVID-19 impact factors were assumed for typical peak cold and flu months (late fall through winter) for the next few years. No future COVID-19 impact factors were assumed for Legacy System commercial vehicles.
Construction	Construction projects assumed with significant impacts to traffic and revenue include: Bay Bridge Eastbound Rehabilitation, Rehabilitation of Decks at the Curtis Creek Bascule Span Approaches, subgrade Improvements east of Bear Creek (I-695), the FSK bridge deck replacement, replacement of I-895 over I-695 bridge, BHT geometric improvements and AET gantry installation, and I-95 Northbound ETL extension.
Legacy cashless tolling	Temporary cashless tolling was introduced on the remaining Legacy system facilities with cash tolling on 3/17/2020. Permanent cashless tolling assumed for remaining Legacy facilities was announced on 8/6/2020.
3G Toll System Conversion (DriveEzMD Launch)	The new toll system was launched on 4/29/21. Customer service was not available and toll collections did not occur between 4/20/21 and 4/28/21 while the new system was brought online.
Backlogged E-ZPass Transactions	A portion of FY 2021 E-ZPass transactions from summer 2020 to March 1, 2021 were backlogged as off mid-July 2021. These include Itolls on the full system and Etolls on the ICC. It was assumed backlogged E-ZPass transactions would be collected by early May 2022.
Backlogged Video Transactions	A portion of FY 2021 video transactions from summer 2020 to March 1, 2021 were backlogged as off mid-July 2021. Also a portion of video transactions from March 2, 2021 to June 2021 were not yet invoiced as of early August 2021. It was assumed that video invoicing would all be current by the end of FY 2022. A lower than normal video payment rate was also assumed for FY 2022 due to the age of the transactions.
Video Toll Rates	This assumption is relevant for forecasting revenue collections for backlogged FY 2021 transactions. Cash toll rates for Kennedy Highway, Fort McHenry Tunnel, Harbor Tunnel, Nice/Middleton Bridge, and Bay Bridge video payment type transactions were charged through 12/31/2020. Video rates resumed on these facilities beginning 1/1/2021. The Key and Hatem Bridges, which converted to cashless in FY 2020 before the pandemic, continued to charge video toll rates (along with the ICC and I-95 ETLs) for video payment type transactions during the entire FY 2021.
Video Invoices	After pausing processing and mailing NOTDs on 3/17/2020 due to the pandemic, processing and mailing of NOTDs resumed in mid-October 2020.
Civil Penalties	Assumed \$25 civil penalties for all citations beginning in FY 2021, but with delays and reductions in civil penalty collections due to the pandemic and backlogged transactions.
Vehicle Registration Holds	Was not applied in FY 2021 but will resume in FY 2022.
Tax Intercept	Was not applied in FY 2021 but will be applied in FY 2022.
Pay-by-Plate and Early Pay NOTD Payment Options	The availability of new payments methods coincided with the launch of DriveEzMD on 4/29/21. A two year ramp up to full adoption levels of these programs was assumed in the forecast.
Itolls	Itolls are video images that end up being associated with existing E-ZPass accounts and can be caused by improper transponder mounting. They are charged the base toll rate. About 45 percent of raw video images are estimated to be Itolls.
New Vehicle Classifications	Assumed the new motorcycle, 3-axle light, and 4-axle light vehicle classifications and toll rates will go into effect later in FY 2022.
Commuter & Shopper Discount Plans	The time limits for discount plans were suspended on 3/17/2020 due to the pandemic. Effective November 1, 2020, standard 45-day plan cycles resumed for E-ZPass Maryland Discount Plans and the standard 90-day plan cycle resumed for the Bay Bridge (US 50/301) Shoppers Plan. The time limits were also temporarily extended after the DriveEzMD Launch as the new system was brought online.
Toll Changes	No future toll rate changes other than those discussed above are assumed.
Forecasting Approach	All transactions and toll revenue as well as civil penalty revenue are forecasted in the month of collection (cash accounting).

As discussed previously in **Chapter 1** and shown in **Table 4-1**, several business rules were changed in FY 2021 due to the COVID-19 pandemic that led to additional assumptions for this forecast related to the backlogged transactions. The latest COVID-19 impact analysis was discussed previously in **Chapter 2**. The Pay-by-Plate payment option, Early Pay NOTD payment option, and New Vehicle Classifications are discussed in **Chapter 1**. Assumptions related to the construction projects listed in **Table 4-1** are discussed in more detail later in this chapter.



## 4.2 Legacy System

This section provides an overview of the development of the traffic and toll revenue forecasts for the Legacy system. The inputs to the forecast included toll rates by payment method, traffic growth forecasts, E-ZPass® participation percentages, and the impacts associated with planned roadway improvements on the Legacy facilities.

### 4.2.1 Forecast Methodology

Econometric models were developed and used for the Legacy system traffic growth forecasts in the March 2015 Legacy system Traffic and Revenue Study. The econometric models sought to establish correlative relationships between various socioeconomic independent variables (such as population, employment, GRP, etc.) and the dependent variable, transactions. The selected independent variables were then used in the forecasting process in the 2015 study based on the latest future year forecast data available at the time. The normal traffic growth used in this current study is based on the growth estimated in the 2015 study with growth adjustments as necessary to account for the most recent actual traffic and revenue performance. The latest historical data and forecasts of socioeconomic/independent variable data were collected and analyzed in this update, with the findings summarized in **Chapter 3**. This latest socioeconomic data was also used to form any adjustment made to normal traffic growth. Passenger car and commercial vehicle transactions were forecasted independently by facility using these normal growth rates and by benchmarking to actual pre-COVID-19 trends.

Assumptions including those related to construction impacts, the new Pay-by-Plate payment program, Early Pay NOTD payment program, and new toll rates for some vehicle classifications were then applied to the estimated normal growth rates. The end-product of the model was a baseline 10-year forecast of transactions and revenue by facility, by passenger cars and commercial vehicles, and by method of payment (electronic, video, and cash) without COVID-19 impacts and without cashless tolling. These results were then processed through a “Waterfall” analysis spreadsheet model developed by CDM Smith to estimate the impacts of cashless tolling, including leakage and violation processing. Video and ITOL revenue were then adjusted using a spreadsheet model to account for the changes in MDTA business rules and NOTD mailing of the backlog transactions listed in **Table 4-1**. Finally, transactions and revenue by facility, vehicle class, and payment type from the different files were adjusted using forecasted COVID-19 impact factors to account for impacts related to the ongoing pandemic.

### 4.2.2 Construction Impacts

The major construction projects expected to impact traffic and revenue on the MDTA Legacy system are described below. In reviewing these projects and estimating the traffic impacts, it was estimated that during the construction periods, some traffic would divert to the next best alternative tolled or toll-free crossing if possible, while a small portion of more discretionary trips would be suppressed.

1. **Eastbound Span of William Preston Lane, Jr Memorial Bridge (US-50)** – This project will rehabilitate the deck of the eastbound span of the William Preston Lane (Bay) Bridge. Construction is scheduled to be for three years, but the construction start time is not finalized

yet. Preliminary completion is estimated for Fall 2025. For the purposes of this study construction was assumed to start in FY 2023.

2. **Subgrade Improvements east of Bear Creek, Francis Scott Key (I-695)** - This project involves drainage repairs and replacement, major roadway subgrade improvements, and roadway paving necessary to address ongoing road and barrier settlement. The project is scheduled to begin in the Spring of 2023. Construction will require long term closure of one direction of I-695 (two lanes) and placing single lane contra flow traffic in the other travel direction. Once the improvements on the closed side is complete, traffic will be switched on to the completed roadway while the other side will be closed to perform improvements. The estimated construction duration is 24 months. For this study, construction was assumed to begin to April 2023.
3. **Rehabilitation of Decks at Curtis Creek Bascule Span, Francis Scott Key Bridge (I-695)** – This project involves replacing the deck of the approach spans of the bascule spans of both inner loop and outer loop bridges of the Curtis Creek bridge. The project is scheduled to begin in the spring of 2025. Construction will require long term closure of one direction of I-695 and placing contra flow traffic in the other travel direction. Once the deck replacement of the closed side is complete, traffic will be switched on to the completed deck while the other side will be closed to perform deck replacement. The estimated construction duration is 18 months. For this study, this project was assumed to begin after the completion of the subgrade improvements east of Bear Creek.
4. **Francis Scott Key Bridge Deck Replacement** - This project involves replacing the deck for the entire length of the bridge as well as the installation of fiberglass jacket protection system at the water pier columns. This project is scheduled to begin the spring of 2026. Construction will require long term closure of one direction of I-695 and placing contra flow traffic in the other travel direction. Once the deck replacement of the closed side is complete, traffic will be switched on to the completed deck while the other side will be closed to perform deck replacement. The estimated construction duration is 30 months.
5. **Replacement of I-895 over I-695 Bridge** - This project proposes to replace the two existing I-895 four simple span steel stringer bridges with two span continuous steel girder bridges crossing over I-695 in Lansdowne, within Baltimore County Maryland. Additional work will include replacement of existing traffic barriers and resurfacing of the roadway within the project limits. One lane will be maintained in each direction utilizing one bridge while constructing the other bridge. Construction will occur on the I-895 southbound bridge first and then on the northbound bridge. Temporary crossovers for the traffic shift and temporary concrete barriers between the two travel directions will both be used. The ramp from the I-695 outer loop to I-895 northbound will be closed when the I-895 northbound bridge is under construction. Traffic will be detoured to continue on the I-695 outer loop, use the exit to MD 295 northbound, and then to get back on I-895 northbound. Construction is anticipated to begin in 2024 and continue for three years.
6. **Baltimore Harbor Tunnel (I-895) AET Conversion** - This project supports the recent conversion of the facility to cashless tolling by permanently removing the existing toll plaza and installing a gantry tolling system. The project scope also includes geometric improvements to the adjacent interchange ramps at Childs Street, Frankfurst Avenue, and Shell Road to comply

with AASHTO standards, as well as removal and replacement of the Shell Road ramp, Frankfurst Avenue, and access road bridge structures along I-895. The project is tentatively scheduled to begin construction in 2024 with an estimated construction duration of 3 years. For this study, construction was assumed to begin April 2024.

7. **I-95 ETL Northbound Extension** – This project will involve the widening and reconstruction of I-95 northbound from MD 43 to north of MD 24 to accommodate two new ETL lanes in the northbound direction. The lane configuration from MD 43 to MD 24 will be four general purpose lanes and two ETLs. From MD 24 northbound the configuration will be three general purpose lanes and two ETLs. The ETLs will transition to a single lane ETL and then run concurrent to the three GP lanes until the four lanes transition back to three lanes in advance of the MD 136/Calvary Road Overpass approximately two miles north of MD 24. The completion of construction through the MD 152 Interchange is scheduled for the summer of 2024. The completion of construction through the MD 24 Interchange is scheduled for fall of 2027. Upon completion of the program, there will be three northbound tolling zones on the I-95 ETLs between the I-95/895 split and MD 24: from the I-95/895 split to MD 43, MD 43 to MD 152, and MD 152 to MD 24.

Additional construction projects on the MDTA facilities and competing non-MDTA highways and arterials were also reviewed, but it was determined that the construction activity associated with these projects will result in negligible impacts on MDTA traffic and toll revenue.

### 4.2.3 Forecast Results

**Table 4-2** presents actual collected transactions and toll revenue for the Legacy system for FY 2021 and forecasted collected transactions and toll revenue for FY 2022 through FY 2031 by passenger cars and commercial vehicles. The forecasts reflect collections after assumed reductions due to unbillable and unpaid trips. **Table 4-3** provides historical and forecasted total transactions and toll revenue for the Legacy system by facility. FY 2022 transactions and revenue are forecasted to increase significantly over FY 2021 due to ongoing processing of backlogged transactions from FY 2021. Once the backlog processing of E-ZPass transactions and invoicing of video transactions is completed by the end of FY 2022, transactions and revenue are forecasted to return to levels generally more consistent with pre-pandemic transactions and revenue. Some declines are forecasted to occur in FY 2024 to FY 2026 due to the construction planned for the I-696/Francis Scott Key Bridge and I-895/Baltimore Harbor Tunnel facilities as detailed previously in **Section 4.2.2**. These projects are forecasted to cause diversion to other MDTA Legacy facilities and some diversion off the MDTA system from customers foregoing trips or using non-tolled alternatives. These changes can be observed in **Table 4-3**. After FY 2026, transactions and revenue are not assumed to be impacted by construction projects and show a normal progression through the end of the forecast period in FY 2031.

For purposes of budgeting and the tracking of actual versus forecasted transactions and revenue, monthly forecasts of transaction and toll revenue were developed for FY 2022 and FY 2023.

**Table 4-4** provides the forecasted monthly transactions and **Table 4-5** provides the forecasted monthly toll revenue for the total Legacy system. Actual July 2021 data is shown for both transactions and revenue. All other monthly data presented in these tables is forecasted.

**Table 4-2**  
**Total Legacy System Forecasted Transactions and Toll Revenue Collected by Class**

Fiscal Year	Transactions (Millions) <sup>(1)</sup>			Toll Revenue (\$ Millions) <sup>(1)</sup>		
	PC	CV	Total	PC	CV	Total
2021 <sup>(2)</sup>	64.2	7.2	<b>71.5</b>	209.5	178.0	<b>387.5</b>
2022	109.4	10.6	<b>120.0</b>	448.1	252.2	<b>700.3</b>
2023	102.5	9.5	<b>112.0</b>	376.0	234.1	<b>610.0</b>
2024	101.2	9.5	<b>110.7</b>	367.4	233.2	<b>600.6</b>
2025	99.9	9.6	<b>109.5</b>	362.5	235.0	<b>597.5</b>
2026	100.9	9.6	<b>110.5</b>	365.9	236.6	<b>602.4</b>
2027	102.9	9.7	<b>112.5</b>	373.3	237.1	<b>610.4</b>
2028	104.8	9.7	<b>114.5</b>	380.4	237.9	<b>618.3</b>
2029	106.6	9.8	<b>116.5</b>	384.8	241.0	<b>625.8</b>
2030	107.9	9.9	<b>117.8</b>	388.2	242.1	<b>630.4</b>
2031	108.5	9.9	<b>118.5</b>	390.8	243.3	<b>634.0</b>

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

<sup>(2)</sup> Represents actual data.

**Table 4-3**  
**Legacy System Historical and Forecasted Transactions and Toll Revenue Collected by Facility**

Fiscal Year <sup>(1)</sup>	Transactions (Millions) <sup>(5)</sup>								Percent Growth
	JFK	Hatem	BHT	FMT	FSK	Bay	Nice	Total <sup>(2)</sup>	
2016 <sup>(3,4)</sup>	15.2	5.1	28.3	42.6	11.2	13.3	3.4	<b>119.0</b>	2.8
2017	15.5	5.1	27.6	45.4	11.3	13.6	3.4	<b>122.0</b>	2.5
2018	15.5	5.1	28.0	44.7	11.4	13.5	3.3	<b>121.5</b>	(0.3)
2019	15.2	5.1	20.8	48.2	12.8	13.6	3.3	<b>119.1</b>	(2.0)
2020 <sup>(3)</sup>	12.5	4.4	14.2	42.3	11.9	11.5	2.8	<b>99.6</b>	(16.4)
2021	8.8	3.1	11.9	29.0	8.4	8.5	1.7	<b>71.5</b>	(28.3)
2022	15.7	4.7	29.1	43.8	10.3	13.4	3.1	<b>120.0</b>	67.9
2023	14.2	4.9	28.1	40.9	8.7	12.3	2.9	<b>112.0</b>	(6.7)
2024 <sup>(3)</sup>	14.3	4.9	27.3	42.8	6.2	12.3	2.9	<b>110.7</b>	(1.1)
2025	14.4	4.9	20.7	46.2	7.9	12.4	2.9	<b>109.5</b>	(1.1)
2026	14.5	5.0	20.9	46.4	8.0	12.7	2.9	<b>110.5</b>	0.9
2027	14.7	5.0	26.5	44.0	6.6	12.8	2.9	<b>112.5</b>	1.8
2028 <sup>(3)</sup>	14.8	5.0	31.1	42.3	5.6	12.8	3.0	<b>114.5</b>	1.8
2029	14.9	5.0	29.4	42.4	8.8	12.8	3.0	<b>116.5</b>	1.7
2030	15.1	5.1	28.7	42.7	10.4	12.9	3.0	<b>117.8</b>	1.1
2031	15.2	5.1	28.8	43.0	10.4	12.9	3.0	<b>118.5</b>	0.6
Fiscal Year <sup>(1)</sup>	Toll Revenue (\$ Millions) <sup>(5)</sup>								Percent Growth
	JFK	Hatem	BHT	FMT	FSK	Bay	Nice	Total <sup>(2)</sup>	
2016 <sup>(3,4)</sup>	\$171.2	\$11.8	\$89.9	\$191.3	\$43.3	\$52.8	\$21.2	<b>\$581.4</b>	2.8
2017	175.8	12.1	89.5	204.2	44.9	54.0	21.5	<b>601.9</b>	3.5
2018	177.2	11.6	91.4	205.1	45.9	53.4	20.7	<b>605.3</b>	0.6
2019	176.0	12.2	70.3	217.4	50.5	53.7	21.0	<b>601.1</b>	(0.7)
2020 <sup>(3)</sup>	154.1	11.4	47.5	194.3	47.5	46.0	17.3	<b>518.2</b>	(13.8)
2021	117.2	9.2	39.8	141.5	35.7	33.0	10.8	<b>387.4</b>	(25.2)
2022	202.1	13.8	114.8	235.4	50.4	61.2	22.6	<b>700.3</b>	80.8
2023	180.6	12.1	99.7	206.6	40.1	51.3	19.6	<b>610.0</b>	(12.9)
2024 <sup>(3)</sup>	180.0	12.0	95.9	211.1	30.2	51.6	19.8	<b>600.6</b>	(1.5)
2025	181.4	12.1	73.1	222.8	36.2	51.8	20.0	<b>597.5</b>	(0.5)
2026	182.8	12.2	73.7	223.7	36.4	53.4	20.1	<b>602.4</b>	0.8
2027	184.2	12.2	93.0	215.4	31.6	53.6	20.3	<b>610.4</b>	1.3
2028 <sup>(3)</sup>	185.6	12.3	108.4	209.6	28.1	53.9	20.5	<b>618.3</b>	1.3
2029	187.1	12.4	100.9	209.1	41.6	54.1	20.6	<b>625.8</b>	1.2
2030	188.5	12.5	98.6	210.1	45.7	54.3	20.8	<b>630.4</b>	0.7
2031	189.9	12.5	99.2	211.0	45.9	54.6	20.9	<b>634.0</b>	0.6

<sup>(1)</sup> Actual data presented for FY 2015 through FY 2021.

<sup>(2)</sup> Summations may not equal total due to rounding.

<sup>(3)</sup> Leap Year

<sup>(4)</sup> Year of toll decrease.

<sup>(5)</sup> Includes impacts due to leakage, including unpaid transactions.

**Table 4-4**  
**Monthly Collected Transactions by Method of Payment**  
**FY 2022 and FY 2023**

Month	Passenger Cars (2-Axle)							Commercial Vehicles (3+ Axle)			Total <sup>(1)</sup>
	Commuters & Shoppers	MD E-ZPass	Full Fare E-ZPass	Video	Official Duty	Hatem Plan A & B	Total 2-Axle	E-ZPass	Video	Total 3+ Axle	
FY 2022											
July	1.602	3.320	5.323	0.234	-	0.151	10.629	1.293	0.212	1.506	12.135
August	2.100	3.057	2.425	0.414	0.088	0.325	8.409	0.791	0.014	0.805	9.214
September	2.057	2.944	1.931	1.249	0.093	0.320	8.594	0.777	0.048	0.825	9.419
October	2.292	2.870	2.089	1.683	0.103	0.322	9.359	0.776	0.062	0.838	10.196
November	2.044	2.920	2.074	1.766	0.087	0.304	9.194	0.752	0.061	0.812	10.007
December	1.995	2.993	2.168	1.854	0.084	0.307	9.400	0.797	0.059	0.856	10.256
January	2.131	2.676	1.636	1.829	0.089	0.294	8.656	0.733	0.064	0.797	9.453
February	1.943	2.616	1.598	1.800	0.084	0.282	8.322	0.687	0.055	0.742	9.064
March	2.216	2.526	1.973	1.873	0.101	0.331	9.020	0.796	0.071	0.868	9.888
April	2.202	2.363	2.358	1.906	0.095	0.328	9.252	0.775	0.071	0.846	10.097
May	2.170	2.477	2.223	1.980	0.092	0.338	9.280	0.766	0.075	0.840	10.120
June	2.048	2.562	2.213	2.024	0.089	0.335	9.271	0.774	0.079	0.853	10.124
FY TOTAL	24.801	33.324	28.011	18.610	1.004	3.636	109.387	9.717	0.869	10.586	119.973
FY 2023											
July	2.131	2.709	2.325	2.080	0.092	0.328	9.664	0.718	0.072	0.790	10.454
August	2.107	2.727	2.348	1.763	0.088	0.342	9.375	0.767	0.063	0.831	10.206
September	2.045	2.623	1.874	1.703	0.092	0.330	8.667	0.744	0.064	0.808	9.475
October	2.264	2.511	1.999	1.501	0.102	0.325	8.703	0.757	0.053	0.810	9.514
November	2.028	2.581	2.002	1.380	0.087	0.310	8.388	0.743	0.047	0.790	9.178
December	1.969	2.627	2.105	1.292	0.083	0.307	8.383	0.742	0.044	0.786	9.169
January	2.113	2.340	1.564	1.301	0.089	0.300	7.707	0.713	0.049	0.762	8.469
February	1.928	2.301	1.534	1.127	0.083	0.287	7.259	0.666	0.041	0.707	7.966
March	2.228	2.337	1.927	1.183	0.102	0.340	8.117	0.762	0.045	0.806	8.924
April	2.163	2.340	2.270	1.448	0.094	0.330	8.645	0.734	0.052	0.785	9.430
May	2.158	2.472	2.205	1.454	0.091	0.345	8.725	0.783	0.055	0.838	9.563
June	2.036	2.565	2.240	1.552	0.089	0.338	8.821	0.769	0.058	0.827	9.648
FY TOTAL	25.169	30.132	24.394	17.784	1.092	3.883	102.454	8.898	0.643	9.541	111.995

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions. Summations may not equal total due to rounding.

**Table 4-5**  
**Monthly Collected Toll Revenue by Method of Payment**  
**FY 2022 and FY 2023**

Month	Passenger Cars (2-Axle)							Commercial Vehicles (3+ Axle)			Total <sup>(1)</sup>
	Commuters & Shoppers	MD E-ZPass	Full Fare E-ZPass	Video	Official Duty	Hattem Plan A & B	Total 2-Axle	E-ZPass	Video	Total 3+ Axle	
FY 2022											
July	\$ 2.347	\$ 10.900	\$ 27.590	\$ 0.088	\$ -	\$ -	\$ 40.925	\$ 32.101	\$ 0.342	\$ 32.443	\$ 73.368
August	3.004	14.240	12.046	2.300	-	-	31.591	18.676	0.348	19.025	50.615
September	3.016	13.919	9.750	6.962	-	-	33.647	18.314	1.213	19.527	53.175
October	3.395	13.761	10.666	9.457	-	-	37.279	18.442	1.598	20.040	57.318
November	2.945	13.653	10.343	10.026	-	-	36.967	17.881	1.596	19.478	56.445
December	2.842	13.784	10.707	12.405	-	-	39.737	18.829	1.834	20.663	60.401
January	3.209	12.808	8.373	12.324	-	-	36.715	17.298	1.985	19.283	55.998
February	2.852	12.441	8.055	12.576	-	-	35.924	16.264	1.778	18.042	53.966
March	3.290	12.502	9.996	12.521	-	-	38.308	18.763	2.223	20.986	59.294
April	3.200	12.535	11.886	12.736	-	-	40.357	18.345	2.182	20.527	60.885
May	3.151	13.167	11.553	12.911	-	-	40.782	18.792	2.246	21.039	61.820
June	2.930	8.169	11.181	13.550	-	-	35.830	18.760	2.422	21.182	57.012
FY TOTAL	\$ 36.181	\$ 151.881	\$ 142.146	\$ 117.854	\$ -	\$ -	\$ 448.062	\$ 232.467	\$ 19.769	\$ 252.235	\$ 700.297
FY 2023											
July	\$ 3.072	\$ 8.693	\$ 11.915	\$ 13.306	\$ -	\$ -	\$ 36.985	\$ 17.304	\$ 2.039	\$ 19.343	\$ 56.329
August	3.012	8.681	11.862	11.619	-	-	35.174	18.476	1.872	20.348	55.522
September	3.001	8.490	9.706	11.036	-	-	32.233	17.905	1.872	19.777	52.010
October	3.353	8.279	10.438	9.806	-	-	31.876	18.367	1.582	19.949	51.825
November	2.924	8.278	10.226	8.994	-	-	30.423	17.979	1.421	19.400	49.823
December	2.810	8.347	10.694	8.518	-	-	30.369	17.880	1.328	19.208	49.578
January	3.182	7.764	8.240	8.358	-	-	27.544	17.219	1.455	18.674	46.218
February	2.834	7.528	7.946	7.362	-	-	25.670	16.080	1.242	17.322	42.991
March	3.309	7.682	10.006	7.875	-	-	28.872	18.373	1.374	19.746	48.618
April	3.146	7.541	11.715	9.560	-	-	31.962	17.754	1.532	19.286	51.248
May	3.132	7.966	11.327	9.657	-	-	32.082	19.017	1.650	20.667	52.749
June	2.915	8.197	11.336	10.336	-	-	32.784	18.578	1.757	20.335	53.119
FY TOTAL	\$ 36.690	\$ 97.448	\$ 125.410	\$ 116.427	\$ -	\$ -	\$ 375.975	\$ 214.932	\$ 19.122	\$ 234.054	\$ 610.029

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions. Summations may not equal total due to rounding.



## 4.3 Intercounty Connector

### 4.3.1 Forecast Methodology and Assumptions

Base ICC annual collected trip and toll revenue forecasts were made using a review and analysis of the most recent historical trends (pre-pandemic) and adjusting base growth rates estimated in the most recent previous ICC forecast update, as necessary. Additionally, updated COVID-19 impact factors were applied to the resulting base forecasts. Estimated trips and revenue reflects collected toll revenue by MDTA after assumed reductions due to leakage of unbillable and unpaid trips. The forecasts assume the assumptions listed in **Section 4.1**, including the assumptions listed in **Table 4-1** related to MDTA business rules, such as NOTD invoicing, new payment methods, and new classifications.

Related to other projects that may potentially impact the ICC, previous sketch-level modeling of the impacts of the Maryland I-495 and I-270 Managed Lanes Traffic Relief Plan (TRP) on the ICC showed the potential for impacts on ICC traffic. The TRP is broken down into multiple phases. On May 12, 2021 the recommended preferred alternative (RPA) for the TRP program was announced to be American Legion Bridge I-270 to I-370 (Phase 1 South). This RPA focuses solely on building a new American Legion Bridge and delivering two high occupancy toll (HOT) managed lanes in each direction on Phase 1 South. No action was taken on the remainder of I-495 east of the I-270 eastern spur. Based on sketch-level modeling, Phase 1 South is not anticipated to have any negative impacts on the ICC forecast projections and could instead have a positive impact. In the future should other phases of the TRP program advance, the potential impacts would need to be monitored. Sketch-level modeling has shown that the ICC appeared to be negatively impacted by priced managed lanes on the I-495 north beltway between I-270 and I-95, as this section of I-495 is parallel to and serves as an alternative route to the ICC for some trips.

### 4.3.2 Forecast Results

**Table 4-6** provides the Intercounty Connector actual collected trips and revenue for FY 2021 and the forecasted collected trips and revenue for FY 2022 through FY 2031, by ETC and video. Due to the changes in MDTA business rules discussed previously in the Legacy section, ETC and video transactions and revenue are forecasted to increase significantly in FY 2022 over FY 2021 but will be back to normal levels by FY 2023 and remain stable through the end of the forecast in FY 2031.

For purposes of budgeting and the tracking of actual versus forecasted transactions and revenue, monthly forecasts of transaction and toll revenue were developed for FY 2022 and FY 2023.

**Table 4-7** presents the Intercounty Connector monthly forecasted trips and collected toll revenue for FY 2022 and FY 2023. Actual July 2021 data is shown for transactions and revenue. All other monthly data presented in this table is forecasted.

**Table 4-6**  
**Intercounty Connector Forecasted Collected Annual Trips and Collected Toll Revenue**

Fiscal Year	Trips (Millions) <sup>(1)</sup>			Toll Revenue (\$ Millions) <sup>(1)</sup>		
	E-ZPass	Video	Total	E-ZPass	Video	Total
2021 <sup>(2)</sup>	9.4	1.5	<b>10.9</b>	17.4	2.6	<b>20.0</b>
2022	43.7	2.8	<b>46.5</b>	75.9	8.0	<b>83.9</b>
2023	35.8	2.9	<b>38.7</b>	62.6	8.5	<b>71.2</b>
2024	36.9	2.8	<b>39.8</b>	64.7	8.2	<b>72.9</b>
2025	37.7	2.9	<b>40.5</b>	66.0	8.4	<b>74.4</b>
2026	38.4	2.9	<b>41.3</b>	67.3	8.6	<b>75.9</b>
2027	39.2	3.0	<b>42.2</b>	68.6	8.7	<b>77.4</b>
2028	40.0	3.0	<b>43.0</b>	70.0	8.9	<b>78.9</b>
2029	40.8	3.1	<b>43.9</b>	71.4	9.1	<b>80.5</b>
2030	41.6	3.2	<b>44.7</b>	72.8	9.3	<b>82.1</b>
2031	42.2	3.2	<b>45.4</b>	73.9	9.4	<b>83.3</b>

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

<sup>(2)</sup> Represents actual data.

**Table 4-7**  
**Intercounty Connector Forecasted Collected Monthly Trips and Collected Toll Revenue**

Month	Trips (Millions) <sup>(1)</sup>				Toll Revenue (\$ Millions) <sup>(1)</sup>			
	PC E-ZPass	CV E-ZPass	Video	Total	PC E-ZPass	CV E-ZPass	Video	Total
<b>FY 2022</b>								
July	4.259	0.179	0.030	<b>4.468</b>	\$ 7.193	\$ 1.253	\$ 0.076	<b>\$ 8.522</b>
August	4.011	0.086	0.108	<b>4.205</b>	6.460	0.563	0.283	<b>7.306</b>
September	3.948	0.076	0.211	<b>4.235</b>	6.357	0.501	0.548	<b>7.406</b>
October	4.144	0.082	0.269	<b>4.496</b>	6.674	0.541	0.695	<b>7.909</b>
November	3.938	0.076	0.286	<b>4.299</b>	6.342	0.496	0.738	<b>7.575</b>
December	3.835	0.073	0.266	<b>4.174</b>	6.175	0.477	0.785	<b>7.437</b>
January	3.660	0.064	0.259	<b>3.984</b>	5.890	0.411	0.776	<b>7.077</b>
February	2.819	0.064	0.292	<b>3.175</b>	4.536	0.411	0.900	<b>5.847</b>
March	3.082	0.083	0.254	<b>3.420</b>	4.959	0.533	0.756	<b>6.248</b>
April	3.084	0.085	0.257	<b>3.426</b>	4.962	0.545	0.755	<b>6.262</b>
May	2.984	0.086	0.286	<b>3.356</b>	4.801	0.552	0.823	<b>6.177</b>
June	2.906	0.092	0.302	<b>3.300</b>	4.676	0.590	0.887	<b>6.154</b>
<b>FY TOTAL</b>	<b>42.670</b>	<b>1.047</b>	<b>2.821</b>	<b>46.538</b>	<b>\$ 69.025</b>	<b>\$ 6.872</b>	<b>\$ 8.021</b>	<b>\$ 83.919</b>
<b>FY 2023</b>								
July	2.791	0.088	0.283	<b>3.161</b>	\$ 4.490	\$ 0.561	\$ 0.834	<b>\$ 5.885</b>
August	2.941	0.098	0.254	<b>3.293</b>	4.732	0.630	0.753	<b>6.115</b>
September	2.876	0.085	0.279	<b>3.240</b>	4.627	0.543	0.838	<b>6.008</b>
October	3.058	0.092	0.264	<b>3.414</b>	4.921	0.587	0.787	<b>6.296</b>
November	2.907	0.085	0.253	<b>3.245</b>	4.678	0.546	0.751	<b>5.975</b>
December	2.738	0.082	0.216	<b>3.035</b>	4.406	0.523	0.633	<b>5.562</b>
January	2.582	0.074	0.216	<b>2.872</b>	4.155	0.476	0.640	<b>5.270</b>
February	2.489	0.073	0.219	<b>2.781</b>	4.005	0.466	0.656	<b>5.127</b>
March	3.053	0.093	0.190	<b>3.336</b>	4.912	0.597	0.552	<b>6.061</b>
April	2.992	0.091	0.221	<b>3.304</b>	4.814	0.585	0.648	<b>6.047</b>
May	3.179	0.098	0.239	<b>3.515</b>	5.115	0.625	0.702	<b>6.442</b>
June	3.110	0.100	0.256	<b>3.465</b>	5.004	0.640	0.749	<b>6.393</b>
<b>FY TOTAL</b>	<b>34.715</b>	<b>1.058</b>	<b>2.889</b>	<b>38.662</b>	<b>\$ 55.858</b>	<b>\$ 6.779</b>	<b>\$ 8.544</b>	<b>\$ 71.180</b>

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

### 4.3.3 Capacity Check

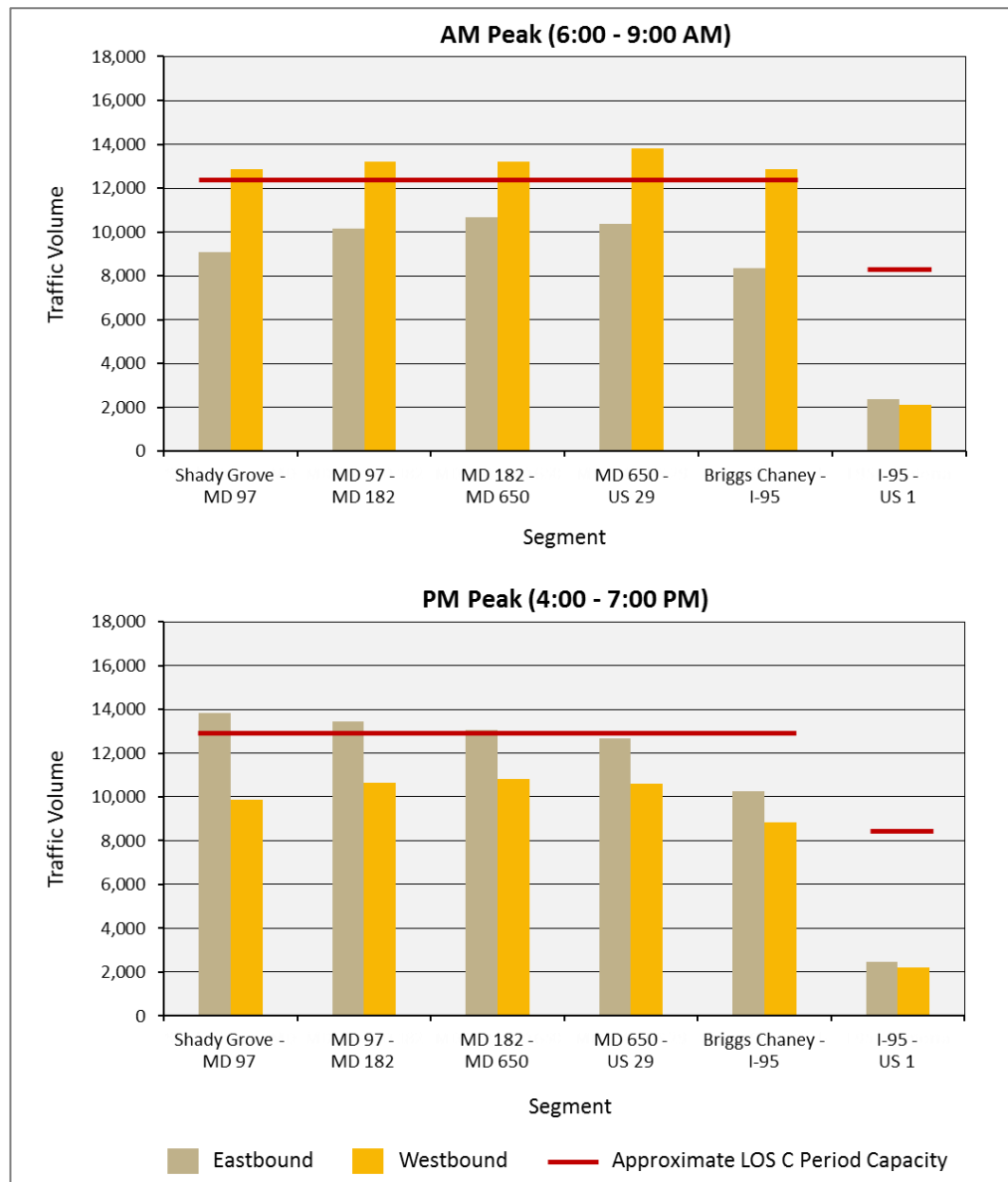
One consideration for the future-year traffic volumes was whether travel demand along the individual mainline segments would exceed a theoretical capacity of the ICC. Although MDTA has not determined what threshold might trigger congestion-managed toll increases, for the purposes of this analysis it was assumed that “Level of Service C” represented that threshold. **Figure 4-1** illustrates the relationship between the theoretical “Level of Service C” Peak Period capacity and the estimated FY 2040 volumes during the AM Peak (6:00 to 9:00 AM) and PM Peak (4:00 to 7:00 PM) Periods on the ICC by segment and direction. Other important assumptions related to this analysis are listed below:

- This analysis focused on the mainlines of the ICC and not any potential future operational issues that could be experienced at ramp junctions or intersections.
- Given the uncertainty in peak period future ICC volumes due to COVID-19, this capacity check analysis is unchanged from the last pre-COVID-19 forecast.
- This capacity analysis does not include potential impacts on the ICC due to the proposed I-495 and I-270 Managed Lanes project.

As is shown in the figure, FY 2040 estimated average Peak Period volumes on the ICC range between about 8,500 and 14,000 vehicles during the AM and PM Peak Periods and directions west of I-95, with the westbound direction in the AM Peak forecasted to exceed “Level of Service C” in all segments by 2040. The eastbound direction in the PM Peak is forecasted to exceed capacity in three of the five segments. The ICC section between I-95 and US 1 is estimated to carry between 2,000 and 2,500 vehicles during both the AM and PM Peak Periods, which is much less than the theoretical “Level of Service C” capacity for this section.

This analysis, which is based on estimated average weekday travel volumes along the ICC mainline travel segments in the peak month of travel, indicates toll increases would be required to maintain “Level of Service C” travel conditions. It is estimated that the westbound travel direction during the AM Peak could begin exceeding capacity in FY 2033 and the eastbound direction in the PM Peak in FY 2036. However, specific hourly traffic volumes will vary by day and hour within the peaks, and it is probable that the “Level of Service C” threshold will be reached in certain segments, travel directions, and hours sooner than FY 2031.

**Figure 4-1**  
**FY 2040 Estimated AM and PM Period Segment Volumes**  
**by Mainline Segment and Direction**



Note: Although MDTA has not determined what Level of Service threshold might trigger congestion managed toll increases, for purposes of this analysis, it is assumed that "Level of Service C" would be the maximum threshold (indicated by the red line).

## 4.4 I-95 ETLs

### 4.4.1 Forecast Methodology and Assumptions

The I-95 ETL forecasts were made using a spreadsheet modeling methodology. The spreadsheet model was calibrated to actual pre-COVID-19 I-95 ETL traffic and revenue performance and was then used to forecast future traffic and revenue for the existing ETL section and the future ETL extensions.

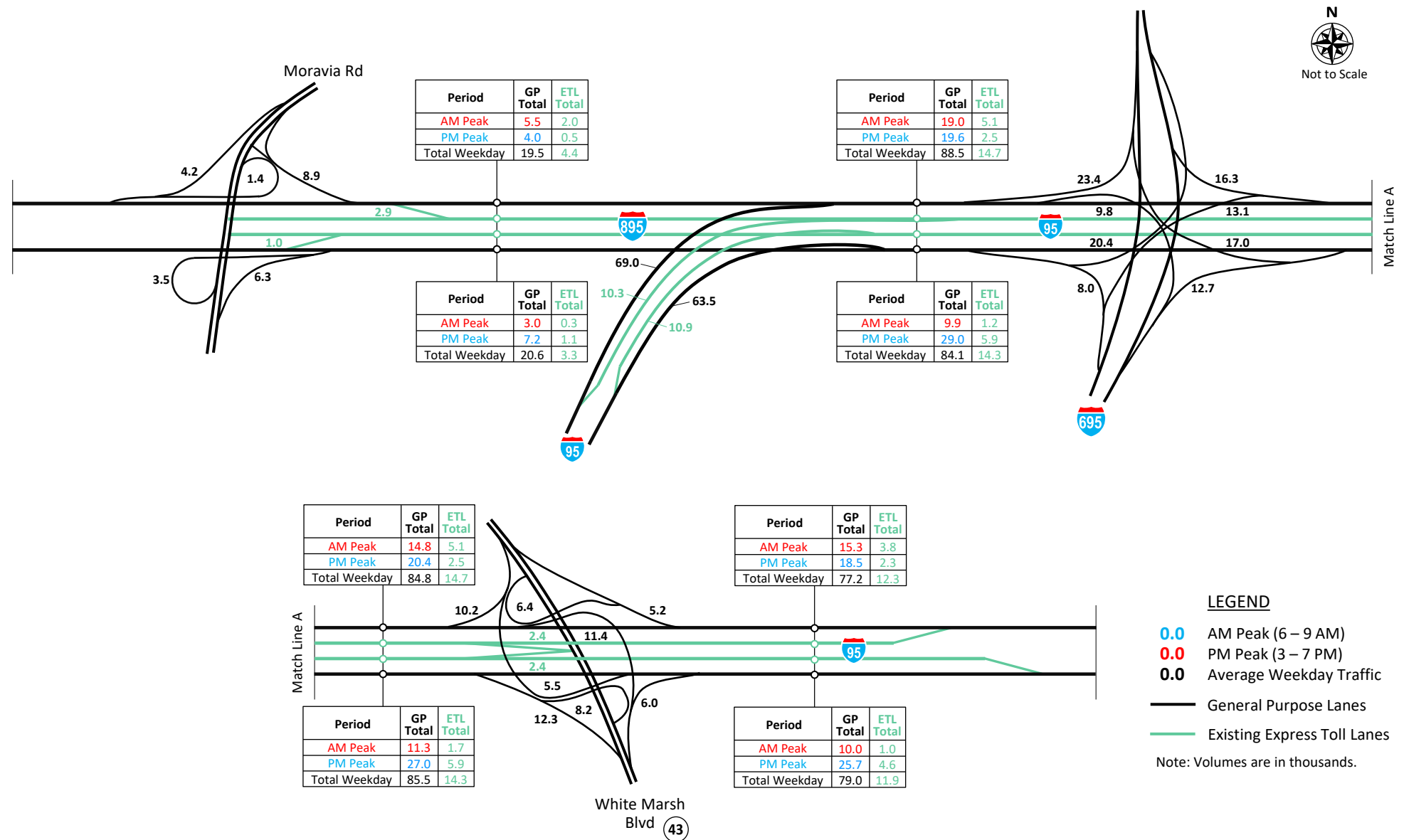
To develop the I-95 ETL forecast spreadsheet model, a series of counts were first obtained from the Maryland ITMS count monitoring site to produce a 2019 average weekday traffic profile. The profile was balanced to 2019 levels so to provide a “normal” traffic profile excluding any impacts of the COVID-19 pandemic. Using the available mainline and ramp locations within the I-95 ETL corridor, the traffic data was balanced through the corridor on an hourly basis and by total passenger cars and commercial vehicles. The results of this balancing analysis are summarized for the AM and PM peak period and total weekday in **Figure 4-2**. In addition to the traffic profile, average weekday speeds in the general purpose and express lanes were obtained from the speed data provider INRIX and incorporated into the model.

The balanced traffic profile and speed data were used to calibrate the tolling algorithms built into the spreadsheet model and to recognize the different peaking patterns by time of day and direction. Similar to a full travel demand model for a priced managed lane forecast, the spreadsheet model tolling algorithm considered value of time, toll rates, travel time savings, and travel time reliability to estimate demand for the ETL.

Once the spreadsheet model was calibrated, it was used to develop the 10-year forecast. The I-95 ETL forecast used the assumptions described in **Section 4.1**, including the detailed assumptions related to methods of payment and vehicle classifications. Also included for the I-95 ETL forecast was the assumption of the future northbound extension. This project will include widening and construction of the I-95 ETLs northbound from MD 43 to beyond MD 24 to accommodate two ETL lanes as detailed in the construction impacts discussion within **Section 4.2**. A schematic showing the I-95 ETL extensions is included in **Chapter 1**. A baseline growth forecast was applied to estimate future volumes on the corridor. Based on the calibrated settings within the model, the future year models estimated what percent of traffic will choose to use the ETLs based on capacity, estimated future speeds within the corridor, value of time, toll rates, and travel time reliability.

The spreadsheet model was developed without COVID-19 impacts. COVID-19 impact factors were then applied to the forecast results without COVID-19.

# 2020 Traffic and Toll Revenue Forecast Update – Total System



## I-95 EXPRESS TOLL LANES (ETL) 2019 AVERAGE WEEKDAY TRAFFIC

FIGURE 4-2



### 4.4.2 Forecast Results

**Table 4-8** provides the forecasted collected annual trips and collected toll revenue for the I-95 ETL existing section through MD 43. **Table 4-9** provides the forecasted annual trips and toll revenue for the total of the existing section and extensions of the I-95 ETLs. Access changes to and from the ETLs are planned with the opening of the extensions. The access changes are forecasted to cause trips to decrease with the extensions compared to without the extensions. However, revenue is forecasted to increase with the extensions due to longer trips on the facility.

**Table 4-8**  
**I-95 ETL Existing Section Forecasted Collected Annual Trips and Toll Revenue**

Fiscal Year	Trips (Millions) <sup>(1)</sup>			Toll Revenue (\$ Millions) <sup>(1)</sup>		
	PC	CV	Total	PC	CV	Total
2021 <sup>(2)</sup>	4.8	0.4	<b>5.1</b>	5.8	1.9	<b>7.7</b>
2022	9.8	0.6	<b>10.4</b>	12.1	2.8	<b>14.9</b>
2023	10.9	0.7	<b>11.6</b>	13.5	3.2	<b>16.7</b>
2024	11.5	0.8	<b>12.3</b>	14.3	3.5	<b>17.8</b>
2025	12.1	0.9	<b>13.0</b>	15.0	3.7	<b>18.8</b>
2026	12.7	0.9	<b>13.6</b>	15.8	4.0	<b>19.8</b>
2027	13.3	1.0	<b>14.3</b>	16.5	4.3	<b>20.8</b>
2028	13.9	1.1	<b>15.0</b>	17.3	4.6	<b>21.9</b>
2029	14.6	1.2	<b>15.7</b>	18.1	5.0	<b>23.1</b>
2030	15.2	1.2	<b>16.4</b>	18.9	5.3	<b>24.2</b>
2031	15.9	1.3	<b>17.2</b>	19.7	5.7	<b>25.4</b>

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

<sup>(2)</sup> Represents actual data.

**Table 4-9**  
**I-95 ETL Total with Extensions Forecasted Collected Annual Trips and Toll Revenue**

Fiscal Year	Trips (Millions) <sup>(1)</sup>			Toll Revenue (\$ Millions) <sup>(1)</sup>		
	PC	CV	Total	PC	CV	Total
2021 <sup>(2)</sup>	4.8	0.4	<b>5.1</b>	5.8	1.9	<b>7.7</b>
2022	9.8	0.6	<b>10.4</b>	12.1	2.8	<b>14.9</b>
2023	10.9	0.7	<b>11.6</b>	13.5	3.2	<b>16.7</b>
2024	11.5	0.8	<b>12.3</b>	14.3	3.5	<b>17.8</b>
2025	11.6	0.8	<b>12.4</b>	15.8	3.7	<b>19.6</b>
2026 <sup>(3)</sup>	11.6	0.8	<b>12.4</b>	17.4	4.1	<b>21.5</b>
2027	12.2	0.9	<b>13.0</b>	18.3	4.4	<b>22.7</b>
2028 <sup>(4)</sup>	13.0	0.9	<b>13.9</b>	19.9	4.8	<b>24.8</b>
2029	13.7	1.0	<b>14.7</b>	21.7	5.3	<b>26.9</b>
2030	14.4	1.1	<b>15.5</b>	22.8	5.7	<b>28.5</b>
2031	15.1	1.1	<b>16.2</b>	23.9	6.1	<b>30.0</b>

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

<sup>(2)</sup> Represents actual data.

<sup>(3)</sup> Phase 1 of northbound extension assumed opening on Jan 1, 2025.

<sup>(4)</sup> Phase 2 of northbound extension assumed opening on Jan 1, 2028.

For purposes of budgeting and the tracking of actual versus forecasted trips and revenue, monthly forecasts of collected trips and toll revenue were developed for FY 2022 and FY 2023. **Table 4-10** provides the monthly forecasted collected trips and toll revenue for the I-95 ETLs by passenger car and commercial vehicle. Actual July 2021 data is shown for transactions and revenue. All other monthly data presented in this table is forecasted.

**Table 4-10**  
**I-95 ETL Forecasted Monthly Collected Trips and Toll Revenue**

Month	Trips (Millions) <sup>(1)</sup>			Toll Revenue (\$ Millions) <sup>(1)</sup>		
	PC	CV	Total	PC	CV	Total
<b>FY 2022</b>						
July	1.153	0.084	<b>1.237</b>	1.388	0.416	<b>1.804</b>
August	0.839	0.051	<b>0.890</b>	1.043	0.223	<b>1.265</b>
September	0.717	0.049	<b>0.766</b>	0.891	0.212	<b>1.103</b>
October	0.870	0.054	<b>0.924</b>	1.081	0.235	<b>1.317</b>
November	0.795	0.051	<b>0.845</b>	0.988	0.219	<b>1.207</b>
December	0.795	0.053	<b>0.848</b>	0.988	0.230	<b>1.218</b>
January	0.588	0.041	<b>0.629</b>	0.732	0.177	<b>0.909</b>
February	0.684	0.042	<b>0.726</b>	0.851	0.180	<b>1.031</b>
March	0.721	0.051	<b>0.772</b>	0.897	0.222	<b>1.118</b>
April	0.885	0.052	<b>0.937</b>	1.100	0.227	<b>1.326</b>
May	0.868	0.056	<b>0.924</b>	1.079	0.242	<b>1.320</b>
June	0.856	0.056	<b>0.912</b>	1.063	0.243	<b>1.306</b>
<b>FY TOTAL</b>	<b>9.771</b>	<b>0.640</b>	<b>10.412</b>	<b>\$ 12.101</b>	<b>\$ 2.825</b>	<b>\$ 14.926</b>
<b>FY 2023</b>						
July	0.981	0.060	<b>1.042</b>	1.216	0.264	<b>1.480</b>
August	0.953	0.063	<b>1.016</b>	1.180	0.276	<b>1.456</b>
September	0.827	0.059	<b>0.886</b>	1.024	0.259	<b>1.283</b>
October	0.978	0.064	<b>1.043</b>	1.212	0.283	<b>1.495</b>
November	0.920	0.062	<b>0.982</b>	1.140	0.272	<b>1.412</b>
December	0.918	0.063	<b>0.980</b>	1.137	0.275	<b>1.412</b>
January	0.687	0.051	<b>0.738</b>	0.851	0.223	<b>1.073</b>
February	0.793	0.051	<b>0.844</b>	0.982	0.225	<b>1.207</b>
March	0.841	0.062	<b>0.903</b>	1.042	0.274	<b>1.315</b>
April	1.009	0.062	<b>1.071</b>	1.250	0.273	<b>1.522</b>
May	0.986	0.068	<b>1.054</b>	1.221	0.298	<b>1.519</b>
June	0.972	0.066	<b>1.038</b>	1.204	0.291	<b>1.495</b>
<b>FY TOTAL</b>	<b>10.864</b>	<b>0.732</b>	<b>11.596</b>	<b>\$ 13.457</b>	<b>\$ 3.213</b>	<b>\$ 16.670</b>

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

## 4.5 Other Revenue

### 4.5.1 Forecast Methodology and Assumptions

In addition to collected toll revenue, MDTA also collects “Other Revenue” associated with the operation of its facilities. These have been summarized into the following categories:

1. Unused Commuter and Shoppers Plan Trips
2. Transponder Fees and Sales
  - a. Transponder sales
  - b. Monthly Service Fees
3. Hatem E-ZPass® program
4. Violation Recovery
5. Commercial Vehicles Fees and Discounts
  - a. Post-Usage Discount
  - b. High Frequency Discount
  - c. Over-Size Permit Fee

The following sub-sections provide a description of each of the other revenue categories that are considered in this forecast. Not that previously CDM Smith also included another category called concession revenue in the annual forecast update. At the direction of MDTA, in this forecast concession revenue is no longer included in other revenue.

#### Unused Commuter and Shoppers Plan Trips

MDTA provides customers the option to enroll in commuter plans which provide discounts for frequent trips. As discussed previously in **Chapter 1**, MDTA offers three different Commuter Plans based on the facilities included in the plan as well as a Shoppers Plan. All plans allow customers to purchase a large number of discounted trips that must be used in a specific time period. Any remaining balance after the time periods have expired is included in other revenue as “unused pre-paid trip revenue”.

#### Transponder Fees and Sales

As of May 23, 2018, the \$7.50 cost for the Standard E-ZPass® transponder was eliminated, while costs for the Exterior and Fusion transponders remained unchanged at \$15.00 and \$50.00, respectively. The Standard is the more typical windshield mounted transponder, the Exterior is mounted to a passenger car’s front license plate, and the Fusion is for commercial vehicles such as trucks and RVs.

Prior to July 1, 2015, account holders were subject to a monthly account fee of \$1.50. Accounts making three-or-more transactions per month were exempt from this fee, but any user with less than three transactions were charged. As of July 1, 2015, this monthly account fee was eliminated for Maryland E-ZPass® account holders.

#### Hatem E-ZPass® Program

The Hatem Bridge E-ZPass® Program provides drivers with two possible plan options. Choice A allows drivers with a two-axle vehicle to pay \$20 per year for unlimited trips plus a transponder fee without any additional fees or prepaid toll deposits. However, this plan allows the E-ZPass® to only be used on the Hatem Bridge, and cannot be used at other toll facilities or with other E-ZPass® discount plans. Choice B is an add-on to a standard Maryland E-ZPass® account. This

allows drivers to pay \$20 per year for unlimited trips at the Hatem Bridge. There are associated account maintenance fees for non-Maryland accounts as well as a pre-paid toll balance, but this plan also gives drivers a discount off the base toll rate for two-axle vehicles at all Maryland toll facilities, excluding the Intercounty Connector and I-95 Express Toll Lanes, and can be combined with other discount plans. The discount provided is 37.5 percent for the Bay Bridge and 25 percent for all other facilities. Revenue associated with purchasing these plans is included in the other revenue.

### **Violation Recovery**

Historical violation recovery data through FY 2021 have been provided by MDTA. Prior to FY 2016, “violation fees” were charged to drivers who chose not to initially pay their toll. Since video customers are no longer assessed “violations fees” but are instead assessed civil penalties if they do not pay their video tolls within 45 days, no estimates of future “violation fee” revenue for the Legacy facilities, the ICC and I-95 Express Toll Lanes are included in the other revenue forecast. Future forecasts of civil penalty revenue are based on the following assumptions:

- Baseline civil penalty revenue forecasts were lowered by about 24 percent due to the implementation of a civil penalty program change which was assumed to begin with all civil penalties assessed in FY 2021. This program change assumes civil penalties will be reduced from \$50 to \$25 for all transactions with civil penalties. The 24 percent revenue impact was estimated based on CDM Smith analysis of historical civil penalty payment rates. Note that this change was already included in last year’s annual forecast update.
- Additional civil penalty revenue was included due to the implementation of full cashless tolling on the remaining Legacy facilities.
- Civil penalty collections were adjusted due to MDTA business rule changes related to the pandemic.

### **Commercial Vehicles Fees and Discounts**

There are two available discount programs for commercial vehicles with five-or-more-axles. The first plan is the post-usage plan, which is account specific and can be used on all eligible facilities. With this plan, each account is assessed after 30 days and the post-usage discount is calculated based on the total toll usage. The fee estimates for this program were developed from existing data and historical trends.

The other available discount plan is similar in that it is account specific and can be used on all eligible facilities. With this plan however, the account assessment after 30 days calculates the discount based on the total trips per transponder.

In addition to the two discount plans available to commercial vehicles, there is a fee for over-sized and/or overweight vehicles. As of May 1, 2009, a \$25 permit fee was charged and covered all MDTA maintained roadways along the vehicle’s route. This fee is a one-time charge and is not applied at any specific tolling location.

### 4.5.2 Forecast Results

**Table 4-11** provides the historical and forecasted other revenue for the Legacy facilities, ICC, and I-95 ETLs. Historical data is shown for FY 2016 through FY 2021. Due to COVID-19 and the associated business rule changes, other revenue declined by 47 percent from FY 2020 to FY 2021. Other revenue is forecasted to significantly increase in FY 2022 and FY 2023 due to increased collections. The MDTA business rule changes have caused a delay in the processing of civil penalty revenue, which accounts for a majority of other revenue. Additionally, unused prepaid trip revenue is forecasted to increase in FY 2022 after further declines in FY 2021 due to reduced trip frequency for commuters and other temporary business rule changes.

**Table 4-12** provides the FY 2022 and FY 2023 monthly other revenue forecast for the Legacy facilities, ICC, and I-95 ETLs. Due to the change in MDTA business rules due to the pandemic, other revenue is forecasted to be negative through August from usage and frequency discounts.

**Table 4-11  
Other Revenue by Facility**

Fiscal Year <sup>(1)</sup>	Legacy Facilities									Intercounty Connector & I-95 ETLs				Total Other Revenue <sup>(3)</sup>
	Service Fees and Sales				Violation Recovery		Commercial Vehicles			Service Fees and Sales		Violation Recovery		
	Unused Pre-Paid Trip Revenue	Trans- ponder Sales	Monthly Account Fees	Hattem E-Z Pass Program	Civil Penalties	Violation Fees	Post- Usage Discount	High Frequency Discount	Over- size Permit Fee	Trans- ponder Sales	Monthly Account Fees	Violation Fees	Civil Penalties	
2016 <sup>(2)</sup>	17.36	1.66	1.29	1.60	10.00	-	(6.39)	(1.06)	1.13	0.27	0.22	-	8.28	34.36
2017	14.04	2.00	1.42	1.62	20.65	-	(6.79)	(1.16)	1.16	0.22	0.24	-	21.04	54.46
2018	13.64	1.40	1.51	1.67	16.13	-	(7.91)	(1.29)	1.16	0.35	0.26	-	13.61	40.52
2019	14.00	(0.60)	1.59	1.68	21.27	-	(8.58)	(1.20)	1.26	(0.10)	0.27	-	10.19	39.78
2020	10.64	0.22	2.05	1.69	16.93	-	(8.63)	(1.30)	1.06	0.04	0.34	-	11.93	34.96
2021	4.49	(0.12)	2.01	1.57	13.66	-	(6.76)	(0.84)	1.05	(0.00)	0.05	-	3.58	18.70
2022	10.40	-	1.77	1.60	16.61	-	(10.27)	(1.42)	1.16	-	0.28	-	3.67	23.80
2023	13.14	-	1.62	1.60	25.27	-	(8.84)	(1.22)	1.17	-	0.28	-	5.15	38.16
2024	13.20	-	1.62	1.65	32.08	-	(8.93)	(1.23)	1.18	-	0.28	-	4.51	44.37
2025	13.27	-	1.63	1.66	36.66	-	(9.02)	(1.23)	1.19	-	0.28	-	4.63	49.07
2026	13.33	-	1.64	1.67	36.91	-	(9.11)	(1.24)	1.21	-	0.28	-	4.75	49.44
2027	13.40	-	1.65	1.67	37.90	-	(9.20)	(1.25)	1.22	-	0.29	-	5.08	50.76
2028	13.47	-	1.66	1.68	39.38	-	(9.29)	(1.25)	1.23	-	0.29	-	5.22	52.38
2029	13.54	-	1.67	1.69	38.97	-	(9.39)	(1.26)	1.24	-	0.29	-	5.37	52.11
2030	13.60	-	1.67	1.70	39.12	-	(9.48)	(1.26)	1.26	-	0.29	-	5.52	52.41
2031	13.67	-	1.68	1.71	39.35	-	(9.58)	(1.27)	1.27	-	0.29	-	5.58	52.70

Source: Historical data from MDTA

(1) FY 2016 - 2021 represents actual data.

(2) Year of select toll rate reductions.

(3) Summations may not match total due to rounding.

**Table 4-12**  
**Forecasted Monthly Other Revenue**

Month	Total Other Revenue
<b>FY 2022</b>	
July	(1.303)
August	(1.287)
September	0.612
October	1.044
November	2.310
December	2.927
January	2.853
February	2.853
March	2.898
April	3.157
May	3.731
June	4.002
<b>FY TOTAL</b>	<b>\$ 23.797</b>
<b>FY 2023</b>	
July	4.090
August	4.055
September	3.805
October	3.351
November	3.344
December	3.161
January	2.918
February	2.751
March	2.865
April	2.536
May	2.445
June	2.838
<b>FY TOTAL</b>	<b>\$ 38.159</b>



## Chapter 5

### Total Forecast Results

This chapter provides a summary of the total MDTA system collected transactions/trips and revenue for all facilities. **Table 5-1** provides the total annual collected transactions for the Legacy system and total trips for the Intercounty Connector (ICC) and I-95 ETLs for FY 2021 actual and the FY 2022 to FY 2031 forecast.

**Table 5-1**  
**Total System Collected Transactions/Trips**

Fiscal Year	Transactions (millions)				Percent Change
	Legacy	ICC	I-95 ETL	Total <sup>(1)</sup>	
2021 <sup>(2)</sup>	71.5	10.9	5.1	<b>87.5</b>	-
2022	120.0	46.5	10.4	<b>176.9</b>	102.3
2023	112.0	38.7	11.6	<b>162.3</b>	(8.3)
2024	110.7	39.8	12.3	<b>162.8</b>	0.3
2025	109.5	40.5	12.4	<b>162.4</b>	(0.2)
2026	110.5	41.3	12.4	<b>164.3</b>	1.1
2027	112.5	42.2	13.0	<b>167.7</b>	2.1
2028	114.5	43.0	13.9	<b>171.4</b>	2.2
2029	116.5	43.9	14.7	<b>175.0</b>	2.1
2030	117.8	44.7	15.5	<b>177.9</b>	1.7
2031	118.5	45.4	16.2	<b>180.1</b>	1.2

<sup>(1)</sup> Summations may not equal total due to rounding.

<sup>(2)</sup> Represents actual data.

**Table 5-2** provides the total system collected revenue, summarized by Legacy system toll revenue, ICC toll revenue, I-95 ETL toll revenue, and other revenue for all MDTA facilities for FY 2021 actual and the FY 2022 to FY 2031 forecast.

**Figure 5-1** provides a graphical representation of the share of transactions/trips by facility for the first and last years of the 10-year forecast, FY 2022 and 2031. In FY 2022, the Legacy system is forecasted to account for nearly 68 percent of total transactions and trips, and the I-95 ETLs are forecasted to account for the smallest share at six percent. By FY 2031, due to comparatively higher growth rates on the ICC and I-95 ETLs, more significant recovery from the COVID-19 impacts, and the I-95 ETL extension, the Legacy system is forecasted to decrease to 66 percent of total transactions. ICC trips are forecasted to decrease slightly from 26 to 25 percent, and the I-95 ETL trips are forecasted to increase to 9 percent by FY 2031. The ICC trips are forecasted to decline because they have a higher than average share of transactions in FY 2022 due to the delay in collections from the COVID-19 related business rule changes.

**Table 5-2**  
**Total System Collected Toll and Other Revenue**

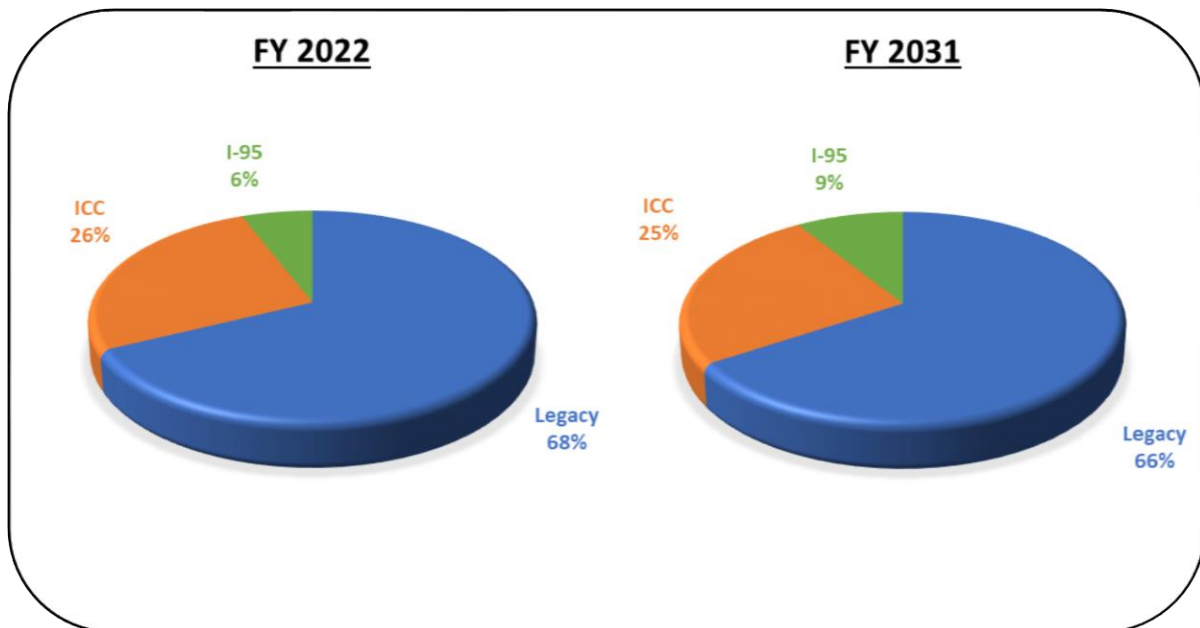
Fiscal Year	Revenue (\$ millions)					Percent Change
	Legacy	ICC	I-95 ETL	Other <sup>(1)</sup>	Total <sup>(2)</sup>	
2021 <sup>(3)</sup>	387.5	20.0	7.7	18.7	<b>433.9</b>	-
2022	700.3	83.9	14.9	23.8	<b>822.9</b>	89.7
2023	610.0	71.2	16.7	38.2	<b>736.0</b>	(10.6)
2024	600.6	72.9	17.8	44.4	<b>735.7</b>	(0.0)
2025	597.5	74.4	19.6	49.1	<b>740.6</b>	0.7
2026	602.4	75.9	21.5	49.4	<b>749.2</b>	1.2
2027	610.4	77.4	22.7	50.8	<b>761.3</b>	1.6
2028	618.3	78.9	24.8	52.4	<b>774.4</b>	1.7
2029	625.8	80.5	26.9	52.1	<b>785.3</b>	1.4
2030	630.4	82.1	28.5	52.4	<b>793.3</b>	1.0
2031	634.0	83.3	30.0	52.7	<b>800.1</b>	0.9

<sup>(1)</sup> Includes Other Revenue from Legacy, ICC, and I-95 ETL. Does not include concession revenue.

<sup>(2)</sup> Summations may not equal total due to rounding.

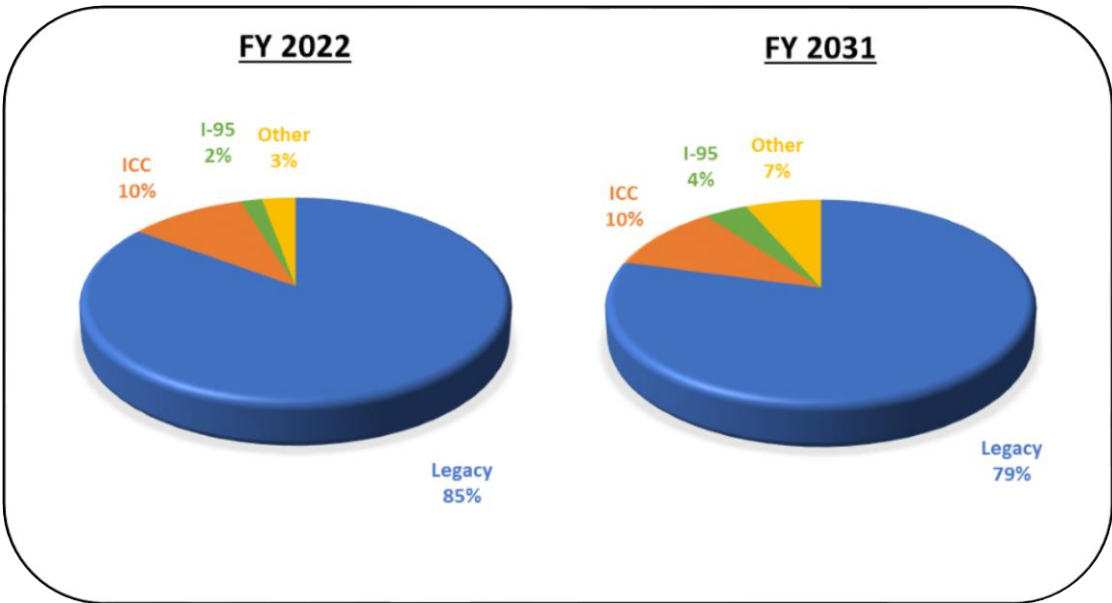
<sup>(3)</sup> Represents actual data.

**Figure 5-1**  
**Share of Collected Transactions/Trips, FY 2022 and FY 2031**



**Figure 5-2** provides the same graphical representation for collected total revenue, separated by facility toll revenue and other revenue. Due to the higher share of transactions, the Legacy system also provides the highest share of total revenue and is forecasted to decrease from 85 percent in FY 2022 to 79 percent by FY 2031 for the same reasons as the transaction share changes. The ICC and I-95 ETLs will increase slightly from FY 2022 to FY 2031, while other revenue is forecasted to have the biggest increase in share of total revenue from three percent in FY 2022 to seven percent in FY 2031 due to the conversion to all cashless-tolling and forecasted corresponding increase in civil penalty revenue.

**Figure 5-2**  
**Share of Collected Total Revenue, FY 2022 and FY 2031**



**Table 5-3** summarizes the FY 2022 and FY 2023 monthly forecasted transactions, toll revenue, and other revenue for the combined Legacy system, ICC, and I-95 ETL's.

**Table 5-3**  
**Total System Collected Monthly Transactions, Toll Revenue, and Other Revenue**

Month	Transactions (Millions) <sup>(1)</sup>	Revenue (\$ Millions) <sup>(1)(2)</sup>		
		Toll	Other	Total
FY 2022				
July	17.840	83.694	(1.303)	82.391
August	14.310	59.186	(1.287)	57.899
September	14.420	61.684	0.612	62.296
October	15.616	66.545	1.044	67.589
November	15.151	65.227	2.310	67.537
December	15.278	69.055	2.927	71.982
January	14.066	63.983	2.853	66.836
February	12.965	60.845	2.853	63.698
March	14.080	66.660	2.898	69.559
April	14.461	68.474	3.157	71.630
May	14.400	69.317	3.731	73.048
June	14.335	64.472	4.002	68.474
FY TOTAL	176.923	\$ 799.142	\$ 23.797	\$ 822.939
FY 2023				
July	14.657	63.694	4.090	67.784
August	14.514	63.093	4.055	67.148
September	13.600	59.300	3.805	63.106
October	13.970	59.615	3.351	62.966
November	13.405	57.210	3.344	60.554
December	13.184	56.552	3.161	59.712
January	12.079	52.562	2.918	55.479
February	11.591	49.326	2.751	52.077
March	13.163	55.994	2.865	58.859
April	13.805	58.817	2.536	61.353
May	14.132	60.710	2.445	63.155
June	14.152	61.007	2.838	63.845
FY TOTAL	162.254	\$ 697.879	\$ 38.159	\$ 736.038

<sup>(1)</sup> Includes impacts due to leakage, including unpaid transactions.

<sup>(2)</sup> Other revenue does not include concession revenue.

## Chapter 6

### Forecast Comparisons

This chapter provides comparisons of the current forecasts for the Legacy system, Intercounty Connector, and I-95 ETL's against previous forecasts. The Legacy system and Intercounty Connector forecasts are compared to the October 2019 CDM Smith forecasts summarized in the reports "Maryland Transportation Authority FY 2020 Traffic and Toll Revenue Forecast Update (Legacy Facilities)" and "FY 2020 Intercounty Connector Forecast Update". They are also compared to the June 2020 updated forecast summarized in "Maryland Transportation Authority COVID-19 Traffic and Revenue Analysis Letter Report" and the November 2020 annual update in the report "Maryland Transportation Authority FY 2021 Traffic and Toll Revenue Forecast Update."

The comparison provided for the I-95 ETLs includes the October 2019 forecast prepared by Jacobs Engineering Group, Inc., summarized in the report "I-95 ETL T&R Update Existing and Extension", and a June 2020 adjusted forecast which was estimated using the October 2019 Jacobs forecast and applying CDM Smith forecasted COVID impacts and a shift in opening date assumptions for the northbound I-95 ETL extension. The forecast is also compared to the November 2020 I-95 ETL forecast prepared by CDM Smith, also summarized in the report "Maryland Transportation Authority FY 2021 Traffic and Toll Revenue Forecast."

**Table 6-1** provides the forecast comparison for the Legacy system. The June 2020 forecasted toll revenue was considerably lower than the October 2019 forecast primarily due to forecasted COVID-19 impacts and business rule changes related to the pandemic. Compared to the June 2020 forecast, the November 2020 forecast was lower in FY 2021 by nearly 20 percent. The outer years were about one percent lower than previously forecasted for passenger cars while commercial vehicle toll revenue was forecasted to be higher than in June 2020 in FY 2021 to FY 2023, lower in FY 2024 and FY 2025, and then about the same in the other years.

The changes in Legacy system revenue in the current forecast were primarily due to updated COVID-19 impacts, business rule changes related to the pandemic, collection challenges due to the back-office transition, and the implementation of systemwide cashless tolling. FY 2021 actual passenger car revenue was 15 percent lower than the November 2020 forecast, and the current forecast FY 2022 passenger car revenue is forecasted to be 27 percent higher than the previous forecast. Due to backlogged transactions from FY 2021, collections in FY 2022 are forecasted to increase significantly as the backlog is recovered. From FY 2023 to FY 2026, incorporating more significant construction impact assumptions resulted in passenger car revenue forecasted to be lower than the November 2020 forecast in the range of one to three percent. After FY 2026 revenue the current forecast is higher than the November 2020 forecast. Commercial vehicles have performed well during the pandemic and have shown growth even over pre-pandemic levels. Due mostly to adjustments resulting from benchmarking the current commercial vehicle forecast to recent trends, commercial vehicle toll revenue for the forecast years is higher than was forecasted in November 2020. FY 2022 commercial vehicle revenue is also higher due to backlogged transactions from FY 2021.

**Table 6-1**  
**Legacy System Toll Revenue Comparison**

Fiscal Year	Passenger Cars						
	Oct. 2019	% Diff - June vs. Oct.	June 2020	% Diff - Nov. vs. June	Nov. 2020	% Diff - Current vs. Nov.	Current
2019	\$ 378.1	0.0%	\$ 378.1	0.0%	\$ 378.1	0.0%	\$ 378.1
2020	370.8	-17.7%	305.0	0.3%	305.8	0.0%	305.8
2021	368.7	-16.3%	308.6	-19.7%	247.8	-15.4%	209.5
2022	384.2	-4.2%	368.2	-4.4%	351.9	27.3%	448.1
2023	385.8	-4.2%	369.5	1.9%	376.5	-0.1%	376.0
2024	390.5	-4.2%	374.2	1.0%	377.9	-2.8%	367.4
2025	391.9	-4.2%	375.5	-1.7%	369.2	-1.8%	362.5
2026	394.4	-4.2%	377.8	-1.3%	372.8	-1.9%	365.9
2027	396.8	-4.2%	380.1	-0.9%	376.8	-0.9%	373.3
2028	400.4	-4.2%	383.5	-1.1%	379.2	0.3%	380.4
2029	401.8	-4.2%	384.9	-0.8%	381.6	0.8%	384.8
2030	-	0.0%	-	0.0%	384.0	1.1%	388.2
2031	-	0.0%	-	0.0%	-	0.0%	390.8

Fiscal Year	Commercial Vehicles						
	Oct. 2019	% Diff - June vs. Oct.	June 2020	% Diff - Nov. vs. June	Nov. 2020	% Diff - Current vs. Nov.	Current
2019	\$ 223.0	0.0%	\$ 223.0	0.0%	\$ 223.0	0.0%	\$ 223.0
2020	223.9	-5.5%	211.7	0.3%	212.4	0.0%	212.4
2021	221.9	-8.1%	203.9	0.9%	205.8	-13.5%	178.0
2022	223.4	-6.5%	209.0	3.8%	217.0	16.3%	252.2
2023	224.0	-4.0%	215.0	1.9%	219.1	6.8%	234.1
2024	225.8	-2.5%	220.1	-1.3%	217.3	7.3%	233.2
2025	226.3	-2.5%	220.5	-1.8%	216.6	8.5%	235.0
2026	228.5	-2.6%	222.6	0.0%	222.7	6.2%	236.6
2027	229.5	-2.6%	223.7	0.0%	223.7	6.0%	237.1
2028	231.2	-2.6%	225.3	-0.2%	224.8	5.8%	237.9
2029	231.7	-2.6%	225.7	0.1%	225.9	6.7%	241.0
2030	-	0.0%	-	0.0%	227.0	6.7%	242.1
2031	-	0.0%	-	0.0%	-	0.0%	243.3

**Table 6-2** provides the forecast comparison for the Intercounty Connector. Similar to the Legacy system, the June 2020 forecasted toll revenue for the ICC was considerably lower than the October 2019 forecast due to COVID-19 impacts. Compared to the June 2020 forecast, the November 2020 forecast includes estimated COVID-19 impacts for the ICC that are higher than forecasted in June and updates to the forecast due to MDTA business rule changes related to the pandemic. The current forecast compared to the November 2020 forecast is higher by 0.7 percent in the outer years due to slightly reduced outer year COVID-19 impacts. FY 2022 is forecasted to be nearly 29 percent higher than the November 2020 forecast due to increased revenue collections from backlogged transactions from FY 2021 that are anticipated to be collected in FY 2022.

**Table 6-2**  
**Intercounty Connector Comparison**

Fiscal Year	Oct. 2019	% Diff - June vs. Oct.	June 2020	% Diff - Nov. vs. June	Nov. 2020	% Diff - Current vs. Nov.	Current
2019	\$ 69.3	0.0%	\$ 69.3	0.0%	\$ 69.3	0.0%	\$ 69.3
2020	70.1	-15.8%	59.0	-1.5%	58.1	0.0%	58.1
2021	71.0	-19.7%	57.0	-23.8%	43.4	-53.9%	20.0
2022	72.5	-5.5%	68.5	-4.7%	65.3	28.6%	83.9
2023	74.0	-4.0%	71.0	1.2%	71.9	-1.0%	71.2
2024	75.5	-4.0%	72.5	1.2%	73.3	-0.5%	72.9
2025	77.0	-4.0%	73.9	0.0%	73.9	0.7%	74.4
2026	78.5	-4.0%	75.4	0.0%	75.4	0.7%	75.9
2027	80.1	-4.0%	76.9	0.0%	76.9	0.7%	77.4
2028	81.7	-4.0%	78.4	0.0%	78.4	0.7%	78.9
2029	83.3	-4.0%	79.9	0.0%	79.9	0.7%	80.5
2030	-	0.0%	-	0.0%	81.5	0.0%	82.1
2031	-	0.0%	-	0.0%	-	0.0%	83.3

**Table 6-3** provides the forecast comparison for the I-95 ETLs. Changes in the current forecast compared to November 2020 are due to incorporating backlogged FY 2021 transactions into FY 2022, incorporating the latest COVID-19 impact forecasts, and modifications to the annualization factor in outer years.

**Table 6-3**  
**I-95 ETLs Comparison**

Fiscal Year	Oct. 2019 (Jacobs)	% Diff - June vs. Oct.	June 2020 (Jacobs*)	% Diff - Nov. vs. June	Nov. 2020	% Diff - Current vs. Nov.	Current
2019	\$ 13.9	0.0%	\$ 13.9	0.0%	\$ 13.9	0.0%	\$ 13.9
2020	14.7	-20.0%	11.8	-8.6%	10.8	0.0%	10.8
2021	15.2	-30.0%	10.6	-9.7%	9.6	-20.1%	7.7
2022	15.7	-7.0%	14.6	-2.6%	14.2	5.2%	14.9
2023	16.2	-5.0%	15.4	6.2%	16.4	1.8%	16.7
2024	21.2	-24.7%	16.0	7.8%	17.2	3.1%	17.8
2025	23.9	-13.1%	20.8	-6.9%	19.3	1.3%	19.6
2026	25.4	-8.1%	23.3	-7.7%	21.6	-0.4%	21.5
2027	26.4	-6.0%	24.8	-8.3%	22.7	-0.3%	22.7
2028	27.4	-6.0%	25.8	-3.9%	24.8	-0.2%	24.8
2029	28.5	-5.9%	26.8	0.5%	27.0	-0.1%	26.9
2030	-	0.0%	-	0.0%	28.6	-0.3%	28.5
2031	-	0.0%	-	0.0%	-	0.0%	30.0



**Table 6-4** provides the forecast comparison for other revenue. The June 2020 forecasted other revenue was lower than the October 2019 forecast mostly due to incorporation of forecasted COVID-19 impacts and the incorporation of the \$25 civil penalty rate change. The November 2020 forecast was lower than the June 2020 forecast primarily due to COVID-19 impacts and the MDTA business rule changes related to the pandemic. Actual FY 2021 other revenue came in higher than forecast. FY 2023 other revenue is forecasted to be nearly 32 percent higher than the previous forecast due to the delay in civil penalty collections after all transactions are processed in FY 2022 that were delayed due to backlogged FY 2021 transactions.

**Table 6-4**  
**Other Revenue Comparison<sup>(1)</sup>**

Fiscal Year	Oct. 2019	% Diff - June vs. Oct.	June 2020	% Diff - Nov. vs. June	Nov. 2020	% Diff - Current vs. Nov.	Current
2019	\$ 39.8	0.0%	\$ 39.8	0.0%	\$ 39.8	0.0%	\$ 39.8
2020	41.5	-21.3%	32.6	7.2%	35.0	0.0%	35.0
2021	37.1	-39.5%	22.5	-77.5%	5.0	270.9%	18.7
2022	40.3	-29.4%	28.5	-17.5%	23.5	1.3%	23.8
2023	39.9	-27.7%	28.9	0.3%	29.0	31.8%	38.2
2024	43.4	-27.9%	31.3	36.7%	42.8	3.8%	44.4
2025	43.4	-27.7%	31.4	57.8%	49.5	-0.9%	49.1
2026	44.4	-27.0%	32.4	53.7%	49.8	-0.7%	49.4
2027	44.6	-26.9%	32.6	53.8%	50.2	1.2%	50.8
2028	44.7	-26.6%	32.8	53.4%	50.4	4.0%	52.4
2029	44.7	-26.4%	32.9	53.5%	50.6	3.0%	52.1
2030	-	0.0%	-	0.0%	50.8	3.2%	52.4
2031	-	0.0%	-	0.0%	-	0.0%	52.7

<sup>(1)</sup> Other revenue forecasts do not include concession revenue.

**Table 6-5** provides the forecasted total revenue comparison for the entire MDTA system.

**Table 6-5**  
**Total System Revenue Comparison**

Fiscal Year	Total System						
	Oct. 2019	% Diff - June vs. Oct.	June 2020	% Diff - Nov. vs. June	Nov. 2020	% Diff - Current vs. Nov.	Current
2019	\$ 724.1	0.0%	\$ 724.1	0.0%	\$ 724.1	0.0%	\$ 724.1
2020	720.9	-14.0%	620.1	0.3%	622.0	0.0%	622.0
2021	713.8	-15.6%	602.5	-15.1%	511.6	-15.2%	433.9
2022	736.0	-6.4%	688.6	-2.4%	671.8	22.5%	822.9
2023	740.0	-5.4%	699.9	1.8%	712.8	3.3%	736.0
2024	756.4	-5.6%	714.0	2.0%	728.5	1.0%	735.7
2025	762.4	-5.3%	722.1	0.9%	728.5	1.7%	740.6
2026	771.2	-5.1%	731.6	1.5%	742.2	0.9%	749.2
2027	777.5	-5.1%	738.0	1.7%	750.3	1.5%	761.3
2028	785.5	-5.0%	745.9	1.6%	757.6	2.2%	774.4
2029	790.0	-5.0%	750.3	2.0%	765.0	2.7%	785.3
2030	-	0.0%	-	0.0%	771.9	2.8%	793.3
2031	-	0.0%	-	0.0%	-	0.0%	800.1

## Disclaimer

CDM Smith used currently-accepted professional practices and procedures in the development of the traffic and revenue estimates in this report. However, as with any forecast, it should be understood that differences between forecasted and actual results may occur, as caused by events and circumstances beyond the control of the forecasters. In formulating the estimates, CDM Smith reasonably relied upon the accuracy and completeness of information provided (both written and oral) by the MDTA. CDM Smith also relied upon the reasonable assurances of independent parties and is not aware of any material facts that would make such information misleading.

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

All estimates and projections reported herein are based on CDM Smith's experience and judgment and on a review of information obtained from multiple agencies, including MDTA. These estimates and projections may not be indicative of actual or future values, and are therefore subject to substantial uncertainty. Certain variables such as future developments, economic cycles, pandemics, government actions, climate change related events, or impacts related to advances in automotive technology etc. cannot be predicted with certainty and may affect the estimates or projections expressed in this report, such that CDM Smith does not specifically guarantee or warrant any estimate or projection contained within this report.

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

The report and its contents are intended solely for use by the MDTA and designated parties approved by MDTA and CDM Smith. Any use by third-parties, other than as noted above, is expressly prohibited. In addition, any publication of the report without the express written consent of CDM Smith is prohibited.

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