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November 30, 2016

Ms. Cheryl Lewis-Orr
Director of Revenue
Maryland Transportation Authority
Division of Finance
2310 Broening Highway
Baltimore, MD 21224

Subject: ICC 2016 Forecast Update

Dear Ms. Lewis-Orr:

The objective of this update study was to develop a traffic and revenue forecast for the ICC using up to date actual traffic and revenue data. The forecast period extends from FY 2017, beginning on July 1, 2016, through FY 2040, ending on June 30, 2040. The study also estimated the traffic and revenue impacts associated with the toll reduction implemented on July 1, 2015 and evaluated whether future traffic levels on the ICC would be approaching capacity of the facility under the current toll rate levels.

CDM Smith has conducted previous traffic and revenue studies of the ICC for MDTA. The most recent study prior to this update was a Comprehensive Traffic and Revenue Study in 2015. A final report for that study was submitted in January 2016. The purpose of that study was to provide a new traffic and revenue forecast for the ICC, which is now in its sixth year of operation. Prior forecasts were conducted before the facility was in operation, and the 2015 study represented the first comprehensive study effort since the ICC opened to traffic in 2011.

ICC DESCRIPTION

The ICC opened to traffic in 2011 as the eighth MDTA toll facility and the first All-Electronic Toll (AET) road in Maryland. As shown in **Figure 1**, the ICC is an east-west limited access facility located in the Washington, D.C., and Baltimore Metropolitan Region. It connects I-370 in the Gaithersburg area to I-95 and US 1 in Laurel. The ICC is three lanes per direction between Shady Grove and I-95 and two lanes per direction between I-95 and US 1, with a posted speed limit of 60 MPH between I-370 and US 29 and 55 MPH between US 29 and US 1. **Figure 2** illustrates the existing configuration of the ICC and indicates the location of interchanges and toll gantries. There are currently six toll gantries per direction that cover movements between nine interchanges, as shown in **Table 1**.



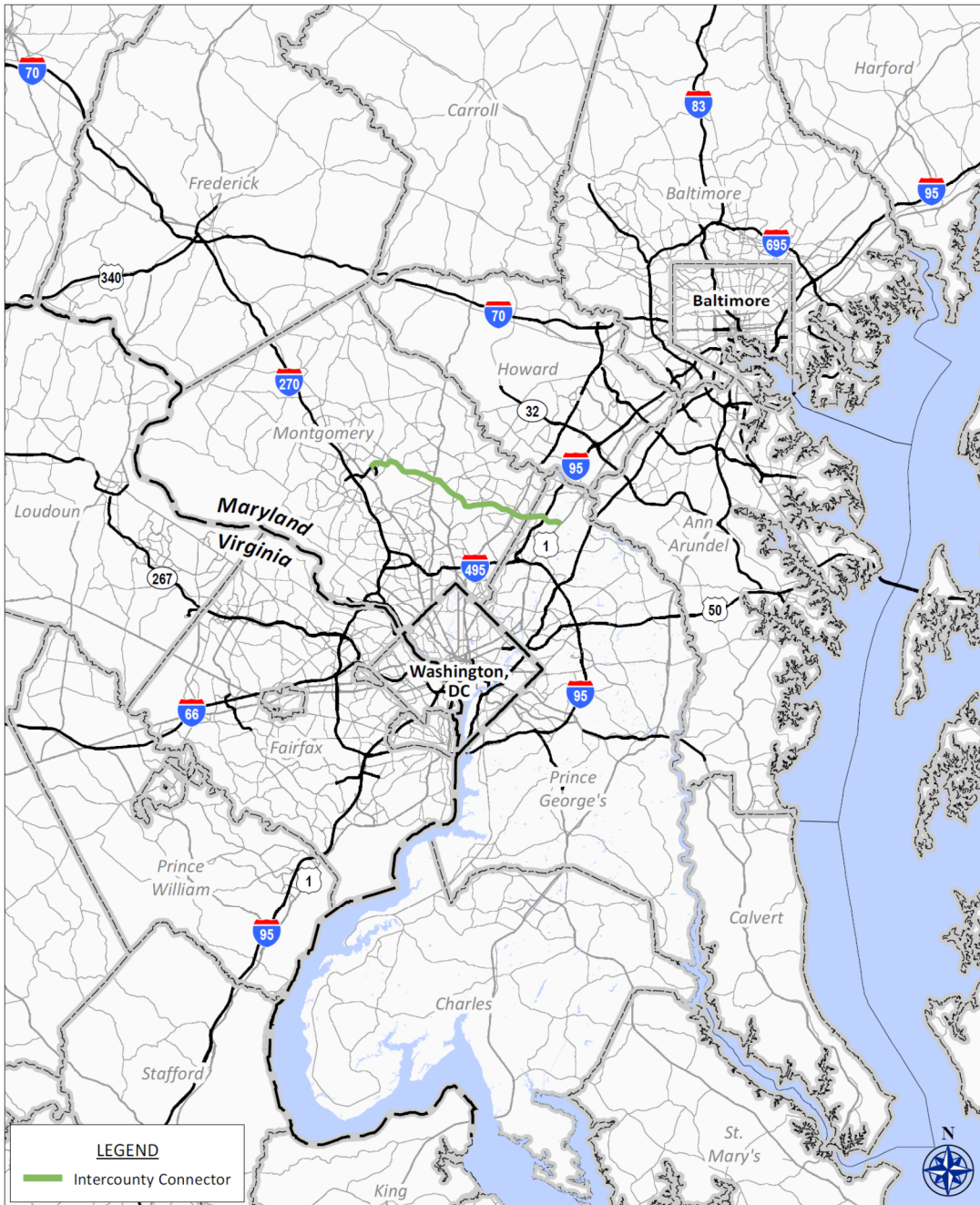


Figure 1
Regional Area Map

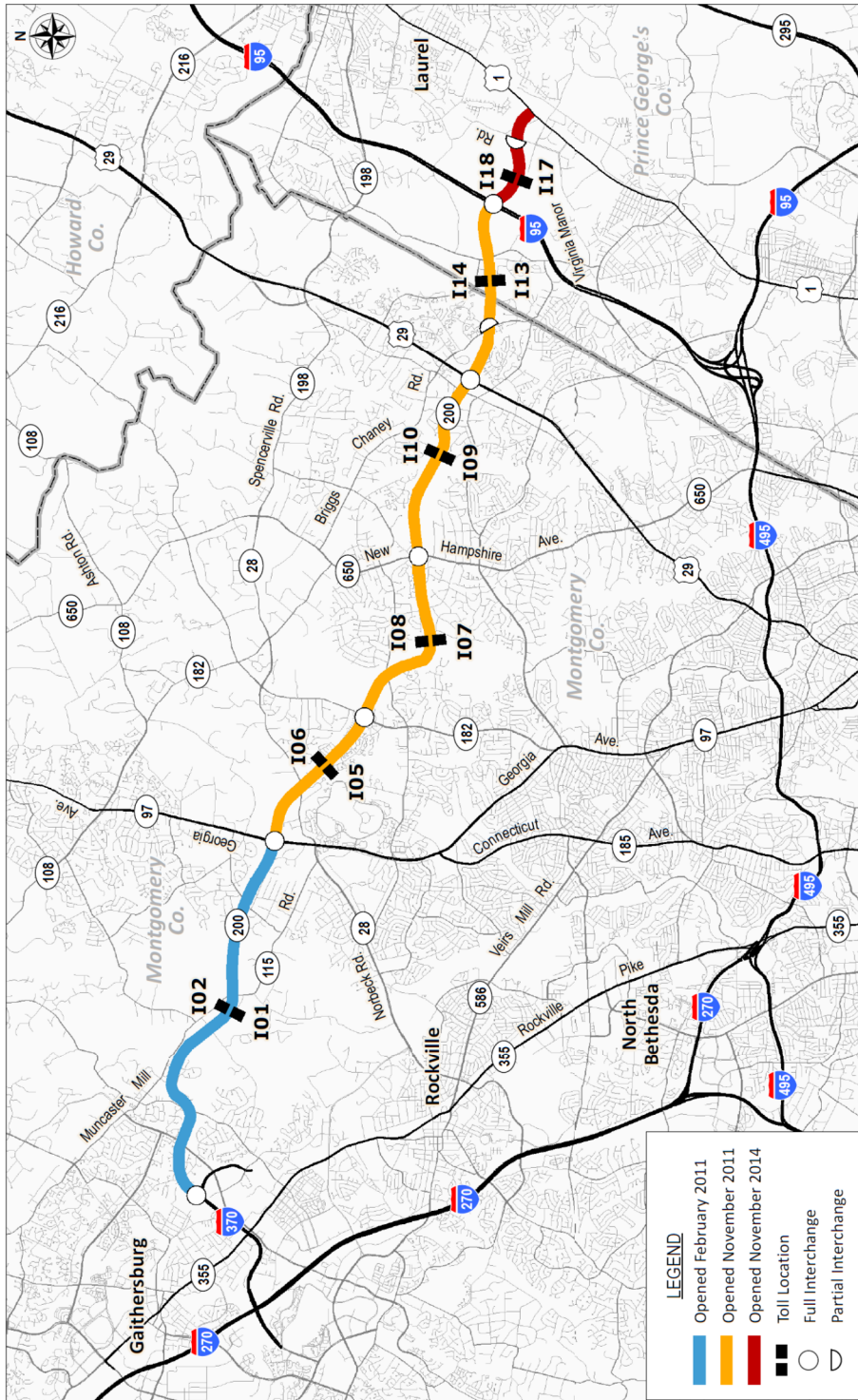


Figure 2
 Intercounty Connector Location Map

**Table 1
 Toll Gantry Locations on the Intercounty Connector**

Toll Gantry	Western Interchange(s)	Eastern Interchange(s)	Distance (mi.)
I01 / I02	I-370; Shady Grove Rd.	MD 97 / Georgia Ave.	5.65
I05 / I06	MD 97 / Georgia Ave.	MD 182 / Layhill Rd.	2.28
I07 / I08	MD 182 / Layhill Rd.	MD 650 / New Hampshire Ave.	2.84
I09 / I10	MD 650 / New Hampshire Ave.	US 29	2.51
I13 / I14	US 29 and Briggs Chaney Rd.	I-95	2.72
I17 / I18	I-95	Konterra Dr. and US 1	1.53
Total			17.53

Tolls on ICC are assessed based on particular interchange-to-interchange movements, as shown in **Table 2**. Tolls range from \$0.40 to \$3.86 for E-ZPass® customers depending on the length of the trip and time of day. Higher tolls are assessed on weekdays during Peak Period travel hours, which include 6:00 – 9:00 AM and 4:00 – 7:00 PM, than during Overnight Period hours (11:00 PM – 5:00 AM) or Off-Peak Period hours (all other hours). These toll rates reflect the toll changes implemented on July 1, 2015 (beginning of FY 2016) which reduced prior toll rates by \$0.03 per mile. This new toll structure is assumed to be in place through the forecast. On the weekends, tolls also differ between the Overnight Period (11:00 PM – 5:00 AM) and Off-Peak Period (5:00 AM – 11:00 PM). Tolls are collected using an AET system, through the use of an E-ZPass® transponder. For those customers without an E-ZPass® transponder, an image of the customer’s license plate is taken and the customer is then mailed a bill. In order to encourage E-ZPass® usage and offset the additional processing costs associated with video tolling, toll rates for video customers are 50 percent more than those using E-ZPass®, with a minimum difference of \$1.00 and a maximum difference of \$15.00. Toll rates are greater for commercial vehicles based on the number of axles.

**Table 2
Passenger Car E-ZPass® Toll Rates by Movement and Time Period on the Intercounty Connector**

Entrance	Time Period	Exit											
		I-370; Shady Grove Rd.	SR 97 / Georgia Ave.	SR 182 / Layhill Rd.	SR 650 / New Hampshire Ave.	US 29 and Briggs Cheney Rd.	I-95	Konterra Dr. and US 1					
I-370; Shady Grove Rd.	Peak Period	\$	1.24	\$	1.74	\$	2.37	\$	2.92	\$	3.52	\$	3.86
	Off-Peak Period	\$	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 Period	\$	1.24	\$	0.50	\$	1.13	\$	1.68	\$	2.28	\$	2.61
	Off-Peak Period	\$	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 Period	\$	1.74	\$	0.50	\$	0.62	\$	1.18	\$	1.78	\$	2.11
	Off-Peak Period	\$	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 Period	\$	2.37	\$	1.13	\$	0.62	\$	0.55	\$	1.15	\$	1.49
	Off-Peak Period	\$	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 and Briggs Cheney Rd.	Peak Period	\$	2.92	\$	1.68	\$	1.18	\$	0.55	\$	0.60	\$	0.94
	Off-Peak Period	\$	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 Period	\$	3.52	\$	2.28	\$	1.78	\$	1.15	\$	0.60	\$	0.44
	Off-Peak Period	\$	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. and US 1	Peak Period	\$	3.86	\$	2.61	\$	2.11	\$	1.49	\$	0.94	\$	0.44
	Off-Peak Period	\$	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

Note:
Peak Period is defined as 6:00 - 9:00 AM and 4:00 - 7:00 PM on Weekdays (excluding federal holidays).
Off-Peak Period is defined as 5:00 - 6:00 AM, 9:00 AM - 4:00 PM, and 7:00 - 11:00 PM on Weekdays and 5:00 AM - 11:00 PM on Weekends and federal holidays.
Overnight is defined as 11:00 PM - 5:00 AM every day.

ICC HISTORICAL TRANSACTIONS AND TOLL REVENUE TRENDS

Monthly transaction and toll revenue data for the ICC can be found in **Tables 3 and 4**, respectively. The 5.65-mile segment from I-370 to MD-97 / Georgia Avenue was the only portion open from February to November 2011. Between February 23, 2011 and March 7, 2011, this segment operated toll free. E-ZPass® toll operation began March 7, 2011 and video toll operations began April 6, 2011.

The second segment of the ICC opened from MD-97 / Georgia Avenue to I-95 on November 22, 2011. This segment was operated toll free until December 5, 2011. By January 2012, the first full month of toll operation, a total of 2,999,797 transactions were recorded for the ICC system as a whole.

Transactions increased by a total of 84 percent from FY 2012 to FY 2013 and 20 percent from FY 2013 to FY 2014. This was due primarily to both the opening of the second segment of the ICC in November 2011 and to the phenomenon of facility “ramp-up,” where motorists adjust their travel

**Table 3
ICC Historical Monthly Toll Transactions
FY 2011 - 2017**

Month	FY 2011 ⁽¹⁾	Percent Change	FY 2012 ⁽²⁾	Percent Change	FY 2013	Percent Change	FY 2014	Percent Change	FY 2015 ⁽³⁾	Percent Change	FY 2016 ⁽⁴⁾	Percent Change	FY 2017
July	-	-	354,709	1051.7	4,085,069	21.6	4,968,063	22.0	6,059,285	22.0	7,393,525	8.7	8,037,215
August	-	-	369,438	1061.6	4,291,530	20.5	5,172,549	14.1	5,899,486	22.2	7,207,909	16.8	8,422,268
September	-	-	385,184	975.5	4,142,846	23.9	5,134,767	16.6	5,987,275	23.8	7,412,760	13.0	8,378,444
October	-	-	409,338	960.1	4,339,517	25.6	5,449,704	17.5	6,405,597	23.5	7,909,398	-	-
November	-	-	2,242,615	92.6	4,319,303	18.8	5,129,634	16.1	5,956,146	25.9	7,496,219	-	-
December	-	-	3,665,085	12.5	4,124,912	19.8	4,940,797	25.1	6,179,337	21.5	7,510,457	-	-
January	-	-	2,999,797	38.6	4,156,651	16.7	4,850,107	16.4	5,647,160	12.8	6,370,282	-	-
February	189,556	1517.7	3,066,507	29.1	3,959,310	13.1	4,478,360	20.0	5,373,124	32.6	7,122,875	-	-
March	413,076	763.0	3,564,722	22.9	4,381,800	19.2	5,223,840	22.5	6,399,917	24.4	7,959,170	-	-
April	309,993	1034.2	3,515,991	36.8	4,811,301	18.2	5,685,357	20.1	6,829,125	17.6	8,029,474	-	-
May	352,666	1023.6	3,962,663	28.7	5,101,247	19.3	6,083,490	18.0	7,179,475	15.8	8,315,440	-	-
June	376,182	990.2	4,101,215	19.9	4,915,597	21.6	5,976,215	20.6	7,204,505	19.6	8,618,803	-	-
Total	1,641,473	1644.6	28,637,264	83.8	52,629,083	19.9	63,092,883	19.1	75,120,432	22.7	91,346,312	12.8	24,837,927

**Table 4
ICC Historical Monthly Toll Revenue
FY 2011 - 2017**

Month	FY 2011 ⁽¹⁾	Percent Change	FY 2012 ⁽²⁾	Percent Change	FY 2013	Percent Change	FY 2014	Percent Change	FY 2015 ⁽³⁾	Percent Change	FY 2016 ⁽⁴⁾	Percent Change	FY 2017
July	\$ -	-	\$ 410,482	625.7	\$ 2,978,742	24.2	\$ 3,699,627	23.3	\$ 4,559,966	(3.7)	\$ 4,389,381	13.2	\$ 4,968,067
August	-	-	422,735	664.4	3,231,268	13.1	3,655,486	19.7	4,375,893	(2.8)	4,254,110	28.5	5,468,283
September	-	-	446,834	609.3	3,169,578	24.2	3,935,482	13.0	4,447,191	0.6	4,473,262	11.7	4,997,850
October	-	-	472,713	587.8	3,251,361	16.4	3,784,073	31.2	4,965,811	14.3	5,677,201	-	-
November	-	-	314,796	956.9	3,327,057	16.8	3,885,860	19.2	4,631,170	26.0	5,834,056	-	-
December	-	-	1,794,065	69.4	3,038,624	34.8	4,096,985	15.1	4,713,666	(4.3)	4,508,851	-	-
January	-	-	2,020,378	58.8	3,208,521	30.1	4,175,884	(1.3)	4,121,721	0.2	4,131,701	-	-
February	-	-	2,064,501	45.3	2,998,935	20.3	3,607,784	14.2	4,121,202	11.9	4,611,929	-	-
March	258,190	826.7	2,392,567	37.1	3,280,138	20.5	3,954,160	22.7	4,852,101	7.8	5,232,530	-	-
April	345,580	585.1	2,367,500	52.8	3,617,514	12.3	4,063,734	26.5	5,142,214	0.7	5,177,603	-	-
May	396,222	568.0	2,646,582	44.1	3,814,984	16.9	4,458,570	14.8	5,119,367	(3.1)	4,960,516	-	-
June	474,133	823.8	4,379,869	(16.2)	3,669,559	28.4	4,711,132	5.4	4,967,301	22.0	6,061,303	-	-
Total	\$ 1,474,125	1238.6	\$ 19,733,024	100.6	\$ 39,586,280	21.3	\$ 48,028,779	16.6	\$ 56,017,601	5.9	\$ 59,312,440	17.7	\$ 10,436,350

⁽¹⁾ The segment between I-370 and MD 97 (location of Toll Gantries 101/102) opened on February 23, 2011 and was the only segment open in FY 2011.

The segment operated toll free until the beginning of E-ZPass® toll operations on March 7, 2011 and the beginning of video toll operations on April 6, 2011.

⁽²⁾ Toll Gantries 105/106, 107/108, 109/110, and 113/114 opened in November 22, 2011 (FY 2012). Toll operations began December 5, 2011.

⁽³⁾ Toll Gantries 117/118 opened November 10, 2014 (FY 2015).

⁽⁴⁾ Toll Rates were decreased effective July 2015 (FY 2016).



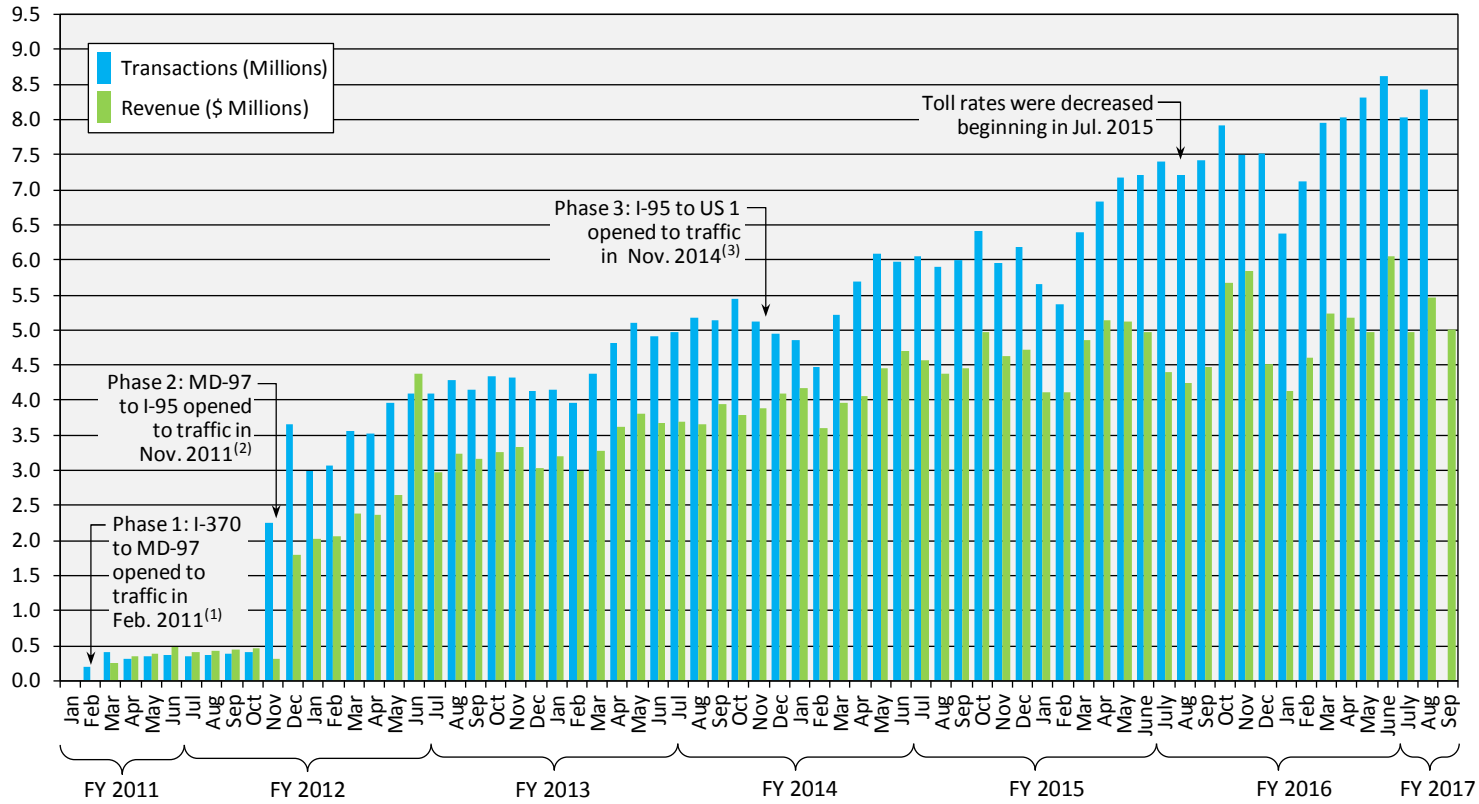
patterns over time as they become aware of a new facility and the benefits that it offers over their current route of travel. This ramp-up period continued into FY 2015, with a 19.1 percent growth in transactions and a 16.6 percent growth in toll revenue. FY 2015 also included the opening of the final segment of the ICC in November 2014; a 1.53-mile extension on the eastern end between I-95 and US 1. Transactions in FY 2016 (July 2015 through June 2016) grew at a faster rate than FY 2015, which can be attributed to the continued recovery in the economy, lower gas prices, relatively good weather, and the toll reduction implemented on July 1, 2015. Toll revenue for FY 2016 was 5.9 percent higher than FY 2015, which reflects the negative revenue impact of the lower toll in combination with continued robust growth in transactions. Had ICC toll rates not been reduced in FY 2016; toll revenue would have been roughly 17 percent higher than FY 2015. Initial FY 2017 transactions and toll revenue show a relatively strong start to FY 2017 for the ICC. **Figure 3** graphically demonstrates the historical progression of monthly transactions and toll revenue on the ICC.

TOLL RATE REDUCTION ANALYSIS

To assess the impacts of the FY 2016 toll rate decrease and the sensitivity of the traffic response on the ICC system, CDM Smith reviewed actual transaction data provided by MDTA prior to and after the toll decrease. This analysis was a longer-term look at the toll decrease impacts and used a different approach to take advantage of more data being available (both on the ICC and other national toll facilities), compared to the analysis included in the January 2016 report. The previous analysis included data through September 2015 only.

The analysis first looked at year-over-year trends in transaction data prior to the toll decrease in FY 2015 and then following the toll decrease in the first few months of FY 2017. These trends were analyzed by gantry, by Passenger Cars (PC) vs. Commercial Vehicles (CV), and by weekdays vs. weekends/holidays. Year-over-year percent growth trends from FY 2015 and FY 2017 were used to estimate a hypothetical transaction total for FY 2016 assuming the toll decrease had not happened. The hypothetical transactions assuming no toll decrease were then compared with actual transactions to estimate the toll decrease impacts. The analysis was based on data from Gantries 1 to 14 only. Due to the timing of the opening of Gantries 17 and 18 (I-95 to US 1 segment), it was difficult to separate ramp-up on this segment with normal growth trends. When estimating impacts for the entire ICC facility, it was assumed that the average impacts due to the toll decrease on Gantries 1 to 14 were also reasonable for Gantries 17 and 18.

Table 5 shows a total ICC facility summary of the results of the toll decrease impacts analysis for FY 2016. As shown, transactions were estimated to be 4.0 percent higher and revenue 9.4 percent lower than what they would have been without the toll decrease.



(1) The segment between I-370 and MD 97 (location of Toll Gantries I01/I02) opened on February 23, 2011 and was the only segment open in FY 2011. The segment operated toll free until the beginning of E-ZPass® toll operations on March 7, 2011 and the beginning of video toll operations on April 6, 2011.
 (2) Toll Gantries I05/I06, I07/I08, I09/I10, and I13/I14 opened in November 22, 2011 (FY 2012). Toll operations began December 5, 2011.
 (3) Toll Gantries I17/I18 opened November 10, 2014 (FY 2015).

Figure 3
Intercounty Connector Historical Monthly Transactions and Toll Revenue



**Table 5
 Total Summary of Toll Rate Decrease Impacts for Fiscal Year 2016**

	2015 Actual	2016 Actual		2016 Estimated Without Toll Decrease		Impact of Toll Decrease	
		Amount	% Change from Prev Year	Amount	% Change from Prev Year	Amount	% Difference
Transactions	75,120,432	91,346,312	21.6	87,833,000	16.9	3,513,312	4.0
Revenue	\$56,017,601	\$59,312,440	5.9	\$65,497,000	16.9	-\$6,184,560	-9.4

The estimated transaction impacts by toll gantry is presented in **Table 6** by weekdays, weekends/holidays, and all days. The analysis of the impacts on CVs due to the toll decrease were inconclusive, thus results are presented for total traffic (PCs and CVs total) rather than breaking them down by class. This is likely due to relatively low volumes of CVs on the facility making their growth trends very sensitive to other factors in addition to the toll decrease. An estimated elasticity was developed by gantry based on an approximate toll decrease of 15 percent for all days, which is an average of all time periods (Peak, Off-Peak and Overnight) for both weekdays (about a 14.8 percent decrease) and weekends (about a 16.5 percent decrease) based on the relative traffic volumes in each period.

As shown, the overall 4.0 percent impact (all days, all gantries) was roughly the same across gantries I05/I06, I07/I08, and I09/I10. Gantries I01/I02 showed a somewhat lower impact and gantries I13/I14 showed a slightly higher impact than the total average. Weekends/holidays were found to have a higher impact due to the toll decrease than weekdays, estimated to be a 6.6 percent impact compared to a 3.2 percent impact, respectively. Based on an approximate percent toll rate decrease of 15.0 percent for all days, the estimated total toll elasticity of the ICC is -0.264. This means that for every 10 percent decrease in the toll rate, transactions would increase by roughly 2.6 percent. This is a relatively modest elasticity, implying that the toll rates that were in place prior to the toll decrease were in a reasonable and appropriate range and confirming the value being placed by users on the ICC. The forecast included in the January 2016 report had estimated there would be a 3.5 percent increase in traffic due to the toll decrease.

Table 6
Estimated Toll Rate Decrease Traffic Impacts by Gantry

	Toll Gantry Location ⁽¹⁾					Total
	I01/I02	I05/I06	I07/I08	I09/I10	I13/I14	
Weekdays						
Toll Decrease Impact	2.6%	3.2%	3.3%	3.5%	3.7%	3.2%
Approximate Percent Toll Decrease	-14.8%	-14.8%	-14.8%	-14.8%	-14.8%	-14.8%
Estimated Toll Elasticity	-0.174	-0.216	-0.224	-0.233	-0.249	-0.218
Weekends/Holidays						
Toll Decrease Impact	6.0%	6.6%	6.7%	6.4%	7.2%	6.6%
Approximate Percent Toll Decrease	-16.5%	-16.5%	-16.5%	-16.5%	-16.5%	-16.5%
Estimated Toll Elasticity	-0.364	-0.400	-0.408	-0.387	-0.434	-0.398
All Days						
Toll Decrease Impact	3.3%	3.9%	4.1%	4.1%	4.5%	4.0%
Approximate Percent Toll Decrease	-15.0%	-15.0%	-15.0%	-15.0%	-15.0%	-15.0%
Estimated Toll Elasticity	-0.223	-0.263	-0.270	-0.274	-0.297	-0.264
Assumed Percent Impact in Traffic and Revenue Forecasts in the January 2016 Report.						3.5%
⁽¹⁾ The ICC Extension to US 1 opened in Nov. 2014. As a result, estimates are unavailable for I17/I18 due to difficulty in separating ramp-up with normal growth trends.						

ANNUAL TRIPS AND TOLL REVENUE FORECAST

Estimates of annual toll trips and toll revenue for the ICC through FY 2040 are presented in **Table 7**. Actual data between FY 2011 and FY 2016 are also provided for comparative purposes. Short-term annual trip and toll revenue forecasts are based on a review and analysis of the most recent historical trends and adjusting growth rates estimated in the 2015 Comprehensive Study.

Estimated revenue reflects collected toll revenue by MDTA after assumed reductions due to unbillable and unpaid transactions. Leakage rates were assumed to be constant throughout the forecast period.

An 8.4 percent increase in trips to 32.5 million and an 8.0 percent increase in collected toll revenues to \$64.1 million is estimated for FY 2017, as compared to FY 2016. Trips in FY 2018 are estimated to increase by 4.8 percent over FY 2017 to 34.1 million. Collected toll revenues in FY 2018 are estimated to increase by 4.7 percent over FY 2017 to \$67.1 million.

**Table 7
ICC Estimated Annual Trips and Toll Revenue
October 12, 2016 Forecast**

Fiscal Year	Peak / Off Peak / Overnight Per Mile Toll Rate	Estimated Annual Trips (000s)						Estimated Collected Revenue (\$000s) ⁽¹⁾											
		ETC			Video			Total			ETC			Video			Total		
		Trips	AAPC ⁽²⁾	Percent ETC	Trips	AAPC ⁽²⁾	Percent ETC	Trips	AAPC ⁽²⁾	Percent ETC	Toll Revenue	AAPC ⁽²⁾	Average Toll	Toll Revenue	AAPC ⁽²⁾	Average Toll	Toll Revenue	AAPC ⁽²⁾	Average Toll
2011 ⁽⁴⁾	\$0.25 / \$0.20 / \$0.10	1,639		74.7	554		2,193			\$ 1,434		\$ 0.87	\$ 40		\$ 0.07	\$ 1,474		\$ 0.67	
2012 ⁽⁴⁾	\$0.25 / \$0.20 / \$0.10	9,413	474.3	93.7	630	13.7	10,043	358.0		18,062	1,159.6	1.92	1,671	4,077.5	2.65	19,733	1,238.7	1.96	
2013 ⁽⁴⁾	\$0.25 / \$0.20 / \$0.10	15,683	66.6	91.2	1,515	140.5	17,198	71.2		34,696	92.1	2.21	4,891	192.7	3.23	39,587	100.6	2.30	
2014 ⁽⁴⁾	\$0.25 / \$0.20 / \$0.10	18,356	17.0	89.6	2,120	39.9	20,476	19.1		40,924	18.0	2.23	7,104	45.2	3.35	48,028	21.3	2.35	
2015 ⁽⁴⁾	\$0.25 / \$0.20 / \$0.10	21,598	17.7	89.6	2,520	18.9	24,118	17.8		47,705	16.6	2.21	8,313	17.0	3.30	56,018	16.6	2.32	
2016 ⁽⁴⁾	\$0.22 / \$0.17 / \$0.07	25,827	19.6	86.2	4,148	64.6	29,975	24.3		47,702	(0.0)	1.85	11,611	39.7	2.80	59,313	5.9	1.98	
2017	\$0.22 / \$0.17 / \$0.07	28,111	8.8	86.5	4,380	5.6	32,491	8.4		51,939	8.9	1.85	12,139	4.5	2.77	64,078	8.0	1.97	
2018	\$0.22 / \$0.17 / \$0.07	29,571	5.2	86.8	4,479	2.3	34,051	4.8		54,582	5.1	1.85	12,539	3.3	2.80	67,122	4.7	1.97	
2019	\$0.22 / \$0.17 / \$0.07	30,219	2.2	86.8	4,578	2.2	34,797	2.2		55,778	2.2	1.85	12,814	2.2	2.80	68,592	2.2	1.97	
2020	\$0.22 / \$0.17 / \$0.07	30,882	2.2	86.8	4,678	2.2	35,560	2.2		57,002	2.2	1.85	13,095	2.2	2.80	70,097	2.2	1.97	
2021	\$0.22 / \$0.17 / \$0.07	31,560	2.2	86.8	4,781	2.2	36,341	2.2		58,253	2.2	1.85	13,383	2.2	2.80	71,636	2.2	1.97	
2022	\$0.22 / \$0.17 / \$0.07	32,253	2.2	86.8	4,886	2.2	37,139	2.2		59,532	2.2	1.85	13,676	2.2	2.80	73,208	2.2	1.97	
2023	\$0.22 / \$0.17 / \$0.07	32,961	2.2	86.8	4,993	2.2	37,954	2.2		60,838	2.2	1.85	13,977	2.2	2.80	74,815	2.2	1.97	
2024	\$0.22 / \$0.17 / \$0.07	33,616	2.0	86.8	5,092	2.0	38,708	2.0		62,047	2.0	1.85	14,254	2.0	2.80	76,302	2.0	1.97	
2025	\$0.22 / \$0.17 / \$0.07	34,284	2.0	86.8	5,193	2.0	39,477	2.0		63,280	2.0	1.85	14,538	2.0	2.80	77,818	2.0	1.97	
2026	\$0.22 / \$0.17 / \$0.07	34,964	2.0	86.8	5,296	2.0	40,261	2.0		64,537	2.0	1.85	14,826	2.0	2.80	79,363	2.0	1.97	
2027	\$0.22 / \$0.17 / \$0.07	35,659	2.0	86.8	5,402	2.0	41,061	2.0		65,819	2.0	1.85	15,121	2.0	2.80	80,940	2.0	1.97	
2028	\$0.22 / \$0.17 / \$0.07	36,368	2.0	86.8	5,509	2.0	41,877	2.0		67,128	2.0	1.85	15,422	2.0	2.80	82,549	2.0	1.97	
2029	\$0.22 / \$0.17 / \$0.07	37,091	2.0	86.8	5,618	2.0	42,709	2.0		68,462	2.0	1.85	15,728	2.0	2.80	84,190	2.0	1.97	
2030	\$0.22 / \$0.17 / \$0.07	37,828	2.0	86.8	5,730	2.0	43,558	2.0		69,822	2.0	1.85	16,040	2.0	2.80	85,862	2.0	1.97	
2031	\$0.22 / \$0.17 / \$0.07	38,409	1.5	86.8	5,818	1.5	44,227	1.5		70,894	1.5	1.85	16,287	1.5	2.80	87,181	1.5	1.97	
2032	\$0.22 / \$0.17 / \$0.07	38,999	1.5	86.8	5,907	1.5	44,906	1.5		71,983	1.5	1.85	16,537	1.5	2.80	88,520	1.5	1.97	
2033	\$0.22 / \$0.17 / \$0.07	39,599	1.5	86.8	5,998	1.5	45,597	1.5		73,091	1.5	1.85	16,791	1.5	2.80	89,882	1.5	1.97	
2034	\$0.22 / \$0.17 / \$0.07	40,207	1.5	86.8	6,090	1.5	46,297	1.5		74,213	1.5	1.85	17,049	1.5	2.80	91,262	1.5	1.97	
2035	\$0.22 / \$0.17 / \$0.07	40,826	1.5	86.8	6,184	1.5	47,010	1.5		75,356	1.5	1.85	17,312	1.5	2.80	92,667	1.5	1.97	
2036	\$0.22 / \$0.17 / \$0.07	41,455	1.5	86.8	6,280	1.5	47,734	1.5		76,516	1.5	1.85	17,578	1.5	2.80	94,095	1.5	1.97	
2037	\$0.22 / \$0.17 / \$0.07	42,092	1.5	86.8	6,376	1.5	48,468	1.5		77,692	1.5	1.85	17,849	1.5	2.80	95,541	1.5	1.97	
2038	\$0.22 / \$0.17 / \$0.07	42,740	1.5	86.8	6,474	1.5	49,214	1.5		78,888	1.5	1.85	18,123	1.5	2.80	97,011	1.5	1.97	
2039	\$0.22 / \$0.17 / \$0.07	43,398	1.5	86.8	6,574	1.5	49,971	1.5		80,102	1.5	1.85	18,402	1.5	2.80	98,505	1.5	1.97	
2040	\$0.22 / \$0.17 / \$0.07	44,066	1.5	86.8	6,675	1.5	50,742	1.5		81,337	1.5	1.85	18,686	1.5	2.80	100,023	1.5	1.97	

(1) Includes revenue impacts due to leakage, including unpaid transactions.

(2) Average Annual Percent Change.

(3) Percent of Gross Toll Revenue collected after including revenue impacts due to leakage.

(4) Actual, also indicated with blue shading.

Note that this forecast does not reflect a toll increase throughout the forecast period.

Toll rate increases may be needed in the future to manage congestion during peak periods.



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By FY 2020, annual total trips are estimated to reach more than 35.6 million, representing an average annual increase of 2.2 percent from FY 2018. These trips produce \$70.1 million in annual toll revenue. From FY 2020 to FY 2030, annual trips are then expected to increase by an average of 2.0 percent per year to 43.6 million. This is estimated to generate annual collected toll revenue of \$85.9 million. Increasing at an average annual rate of 1.5 percent between FY 2030 and FY 2040, annual toll trips are expected to reach 50.7 million by FY 2040. This translates to \$100.0 million in annual collected toll revenue. It should be noted that while the current forecast does not assume any toll rate increases, there may be a need to increase tolls during peak periods in the future to manage congestion.

MONTHLY TRIPS AND TOLL REVENUE FORECAST

CDM Smith developed estimates of monthly trips and toll revenue for the ICC for all months of FY 2017 and FY 2018 are presented in **Table 8**. FY 2017 estimates incorporate actuals for July, August, and September. September data was preliminary from MDTA.

Table 8
ICC Estimated Monthly Trips and Collected Toll Revenue
October 12, 2016 Forecast

FY 2017								
Month	Estimated Trips				Estimated Collected Toll Revenue ⁽¹⁾			
	PC ETC	CV ETC	Video	Total	PC ETC	CV ETC	Video	Total
Jul ⁽²⁾	2,181,417	56,670	313,565	2,551,652	\$ 3,720,805	\$ 399,828	\$ 847,434	\$ 4,968,067
Aug ⁽²⁾	2,218,772	62,206	447,196	2,728,174	3,861,887	440,265	1,166,131	5,468,283
Sep ⁽²⁾	2,149,002	55,141	335,144	2,539,287	3,679,376	387,349	931,125	4,997,850
Oct	2,404,051	61,808	396,396	2,862,255	4,110,827	440,622	1,109,645	5,661,095
Nov	2,338,492	58,704	368,634	2,765,830	3,998,723	418,494	1,031,931	5,449,148
Dec	2,224,794	53,920	358,935	2,637,649	3,804,305	384,391	1,004,779	5,193,475
Jan	2,144,020	52,341	332,305	2,528,665	3,666,184	373,132	930,233	4,969,549
Feb	2,012,023	48,950	309,425	2,370,398	3,440,475	348,960	866,184	4,655,619
Mar	2,366,033	62,377	359,416	2,787,826	4,045,818	444,676	1,006,127	5,496,621
Apr	2,346,214	61,496	368,516	2,776,226	4,011,928	438,398	1,031,599	5,481,925
May	2,501,519	63,347	384,577	2,949,443	4,277,492	451,597	1,076,561	5,805,650
Jun	2,519,492	68,113	406,258	2,993,863	4,308,226	485,569	1,137,253	5,931,047
Total	27,405,830	705,071	4,380,368	32,491,269	\$ 46,926,046	\$ 5,013,281	\$ 12,139,001	\$ 64,078,328
FY 2018								
Month	Estimated Trips				Estimated Collected Toll Revenue ⁽¹⁾			
	PC ETC	CV ETC	Video	Total	PC ETC	CV ETC	Video	Total
Jul	2,322,300	60,771	390,791	2,773,862	\$ 3,971,036	\$ 433,232	\$ 1,093,955	\$ 5,498,223
Aug	2,435,791	68,390	394,028	2,898,209	4,165,100	487,549	1,103,015	5,755,664
Sep	2,384,553	62,218	381,935	2,828,706	4,077,486	443,547	1,069,163	5,590,196
Oct	2,551,103	66,491	404,510	3,022,105	4,362,280	474,011	1,132,360	5,968,651
Nov	2,435,775	60,875	372,521	2,869,171	4,165,074	433,974	1,042,811	5,641,858
Dec	2,276,046	53,904	359,491	2,689,440	3,891,943	384,273	1,006,336	5,282,552
Jan	2,263,224	55,944	337,068	2,656,236	3,870,018	398,821	943,567	5,212,406
Feb	2,088,388	50,575	311,270	2,450,233	3,571,057	360,543	871,348	4,802,948
Mar	2,415,144	62,254	360,820	2,838,218	4,129,795	443,803	1,010,057	5,583,654
Apr	2,481,087	66,121	372,062	2,919,271	4,242,555	471,374	1,041,527	5,755,455
May	2,596,431	65,444	386,919	3,048,794	4,439,789	466,544	1,083,117	5,989,449
Jun	2,580,299	68,207	408,004	3,056,510	4,412,203	486,241	1,142,141	6,040,585
Total	28,830,141	741,195	4,479,419	34,050,756	\$ 49,298,334	\$ 5,283,913	\$ 12,539,396	\$ 67,121,642

(1) Includes revenue impacts due to leakage, including unpaid transactions.

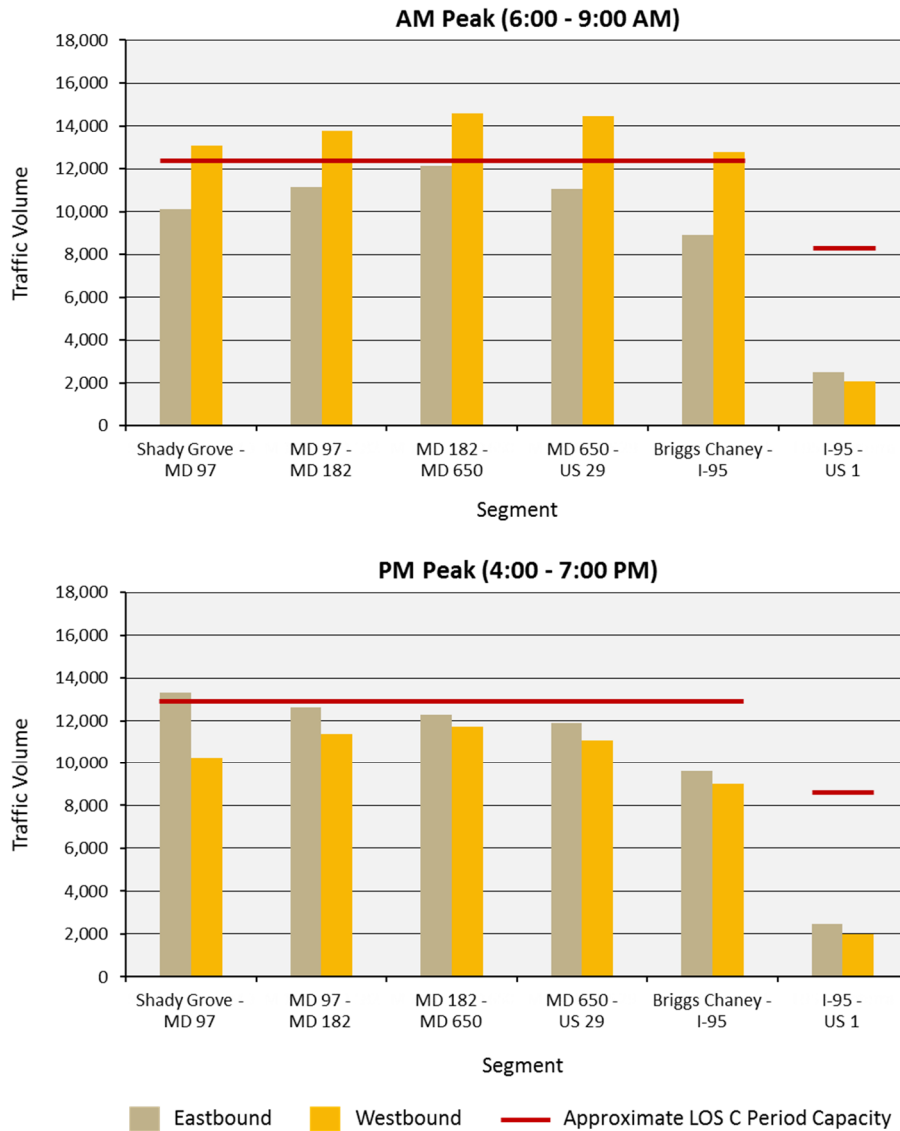
(2) From July Final, August Final, and September Preliminary TVI Reports, also indicated with blue shading.

CAPACITY ANALYSIS

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** 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 – 9:00 AM) and PM Peak (4:00 – 7:00 PM) Periods on the ICC by segment and direction. Note that 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.

As is shown in the figure, FY 2040 estimated average Peak Period volumes on the ICC range between about 9,000 and 15,000 vehicles during the AM and PM Peak Periods west of I-95, with the westbound direction in the AM Peak forecasted to exceed “Level of Service C” by 2040. The eastbound direction in the PM Peak is forecasted to be approaching capacity at the three middle gantries west of I-95 and just exceed capacity in the Shady Grove to MD 97 gantry. The ICC Extension between I-95 and US 1 is estimated to carry between 2,000 and 3,000 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 annual average weekday travel volumes along the ICC mainline travel segments, indicates toll increases would be required to maintain “Level of Service C” travel conditions in the 2017-2040 forecast period. It is estimated that the westbound travel direction during the AM Peak could begin exceeding capacity in FY 2030 and the eastbound direction between Shady Grove to MD 97 in the PM Peak in FY 2038. However, specific hourly traffic volumes will vary by day and time of the year, and it is probable that the “Level of Service C” threshold will be reached in certain segments, travel directions, and at certain times of the year considerably sooner than FY 2030.



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).

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

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 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. Future developments, economic conditions cannot be predicted with certainty, and may affect the estimates or projections expressed in this report, such that CDM Smith does not specifically guarantee or warrant any estimate or projection contained within this report.

While CDM Smith believes that 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.



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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.

Sincerely,

Scott A. Allaire

Scott A. Allaire
Vice President
CDM Smith Inc.

cc: Jaclyn Hartman
David Chapin

