

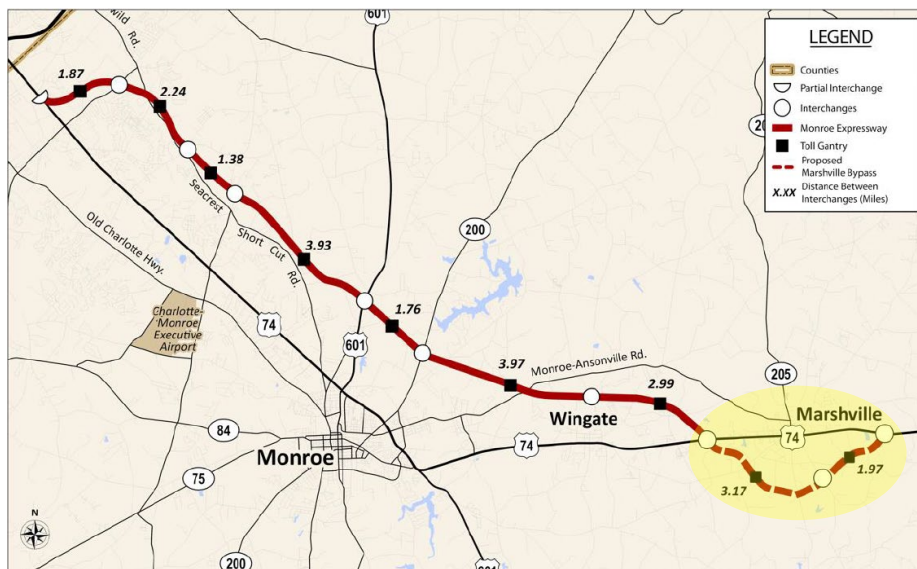
Marshville Bypass Tolling Analysis

Background

The Charlotte Regional Transportation Planning Organization (CRTPO) passed a series of resolutions requesting the North Carolina Department of Transportation (NCDOT) and North Carolina Turnpike Authority (NCTA) analyze the Marshville Bypass as a toll facility under the Tolling Pre-Submittal Assessment process. CRTPO passed the resolution to study the Marshville Bypass as a potential tolled project following requests from the Town of Marshville and Union County. The Marshville Bypass is a proposed four-lane median divided highway that would effectively extend the Monroe Expressway System by 5.1 miles from the current eastern terminus of the Monroe Expressway with a new location bypass south of Marshville. The project would have one intermediate interchange with Landsford Road south of Hasty Road and re-connect with U.S. 74 between Stegall Road and Gaddy Road. Acting as an extension of the Monroe Expressway System, it is anticipated the Marshville Bypass would be a tolled, limited access facility with posted speeds of 65 miles per hour. Exhibit 1 depicts the proposed project.

After an initial evaluation was completed using the Tolling Pre-Submittal Assessment process, looking at the proposed Marshville Bypass project as a stand-alone facility, it was determined that a sketch level traffic and revenue study should be prepared to consider the Marshville Bypass as an extension of the existing Monroe Expressway System for financing purposes. CDM Smith, a traffic and revenue consultant for NCTA, was contracted to provide a sketch level (level one) traffic and revenue study for the proposed project. This traffic and revenue study served as the basis for analysis by NCTA and its municipal Advisor, PFM, LLC. NCTA used the traffic and revenue study to develop a preliminary long-term financial plan for the project to assess the viability of tolling on the corridor. For baseline reference, the Marshville Bypass was also analyzed as a stand-alone facility, separate from the Monroe Expressway System. The main difference between these scenarios is the ability to use Monroe Expressway System revenue to support operations of the Marshville Bypass and vice versa. This synopsis outlines the analysis completed by NCTA and details the findings.

Exhibit 1: Marshville Bypass Vicinity Map



Traffic and Revenue Study

The traffic and revenue study produced by CDM Smith used the travel demand model roadway network coding to model Marshville Bypass and the interchange associated with the project. Additional model refinements are described in the report, attached as **Appendix A**. The project is assumed to have two mainline toll zones separated at the Landsford Road / U.S. 74 exit.

As mentioned above, the project was modeled both as an extension to the Monroe Expressway System and as a stand-alone project. In addition, the area was analyzed with a build and no build scenario to model traffic diversion and usage. Both scenarios were modeled by CDM Smith with the same socioeconomic projections.

General assumptions for the project include an opening year of FY 2035 with a toll collection structure similar to existing NCTA operational facilities. This structure includes toll collection for Electronic Toll Collection (ETC) and Bill By Mail (BBM) with a 50% discount for transponder users using ETC. ETC customers are required to maintain a prepaid balance for the discount, whereas BBM users are postpaid. The toll schedule for the project incorporates annual incremental toll rate increases of approximately 2% mirroring the current Monroe Expressway System schedule. The toll rates are set to align with the Monroe Expressway System on a per-mile basis.

Overall, the study shows moderate traffic diversion from existing U.S. 74 as a result of Marshville Bypass opening. Projections indicate the project would divert approximately 33-36% of weekday traffic from U.S. 74. The project is estimated to increase Monroe Expressway System transactions by roughly 13%, correlating to an increase in system-wide revenue of approximately 14%, when comparing the forecasted revenue of the Monroe Expressway System without the Marshville Bypass. The bypass is also projected to divert a higher percentage of commercial vehicles off of U.S. 74 than personal cars. The estimated impact for commercial vehicles diverting is approximately 43-47%. The full report attached as **Appendix A** further details the report and its findings.

Financial Analysis Overview

Following the traffic and revenue study, NCTA along with its financial advisor, developed a financial model to assess the financial feasibility of the project. The model uses the anticipated construction costs, modeled operational costs, current market conditions, and projected traffic and revenue streams from the Traffic and Revenue Study. Anticipated construction costs were provided by NCDOT based on conceptual designs and used to develop annual construction cashflow requirements. Monroe Expressway operational costs were used as a proxy for the project's operational costs. Monroe Expressway costs were scaled to match the length of the project. This approach is consistent with the process used to assess toll viability on potential projects through the Tolling Pre-Submittal Assessment process.

The analysis of the Marshville Bypass delivered as an extension of the Monroe Expressway System indicates that the project would likely generate enough toll revenue to fully support operational costs of the road. This includes invoice processing, routine maintenance and major maintenance and repair activities. The project would also likely be able to support some level of toll-related debt capacity for construction financing. The project funding gap is currently approximated at \$0 – \$100M. This range is representative of the multitude of variables affecting financing, including but not limited to a changing interest rate environment and refinancing/leveraging opportunities on the existing Monroe Expressway System.

Adding the Marshville Bypass as an extension to the Monroe Expressway would allow the benefits of a single lien allowing revenues to be used in combination to finance, operate and maintain the system. Financing the project in this manner would allow the project to raise significantly more capital to fund the construction. It is important to note that the addition of the Marshville Bypass would extend the existing debt on the Monroe Expressway from 2054 to 2070.

The project was also analyzed as a stand-alone project, not relying as an extension to the Monroe Expressway System. The analysis indicates that the project delivered in this manner would likely not generate sufficient revenues to support construction but would be able to cover most if not all the roads operational costs.

In summary, the analysis shows that if the project were delivered as a stand-alone project, tolling would likely support some limited operations, it would likely not generate sufficient revenue to contribute to construction nor help reduce the STIP contribution. The analysis also indicates that if delivered as an extension to the existing Monroe Expressway System, the project would likely be able to support full operations and reduce the needed NCDOT funding to less than \$100m. For the full financial analysis please see ***Appendix B***.

System Scenario (Monroe Expressway with Marshville Bypass Extension):

Revenue	Project Total (2035-2070)	Costs	Project Total (2035-2070)
Toll Revenue via Electronic Toll Collection	~\$2160M	Operations	~\$810M
Toll Revenue via Bill By Mail	~\$1170M	Maintenance	~\$315M
Uncollectable Toll Revenue	~(\$155M)	Roadway Major Maintenance	~\$245M
Revenue from Fees	~\$115M	Toll Major Maintenance	~\$140M
Net Revenue	~\$3290M	Total Costs	~\$1510M

*Revenues and costs are presented in year of expenditure with an assumed annual inflation of 2.5% for costs. Totals may not add due to rounding.

Stand-alone Scenario (Marshville Bypass not part of Monroe Expressway System):

Revenue	Project Total (2035-2070)	Costs	Project Total (2035-2070)
Toll Revenue via Electronic Toll Collection	~\$275M	Operations	~\$160M
Toll Revenue via Bill By Mail	~\$140M	Maintenance	~\$65M
Uncollectable Toll Revenue	~(\$20M)	Roadway Major Maintenance	~\$40M
Revenue from Fees	~\$5M	Toll Major Maintenance	~\$30M
Net Revenue	~\$400M	Total Costs	~\$295M

*Revenues and costs are presented in year of expenditure with an assumed annual inflation of 2.5% for costs. Totals may not add due to rounding.



Memorandum

To: David Roy, NCTA

From: Adam Aceto

Date: November 11, 2025

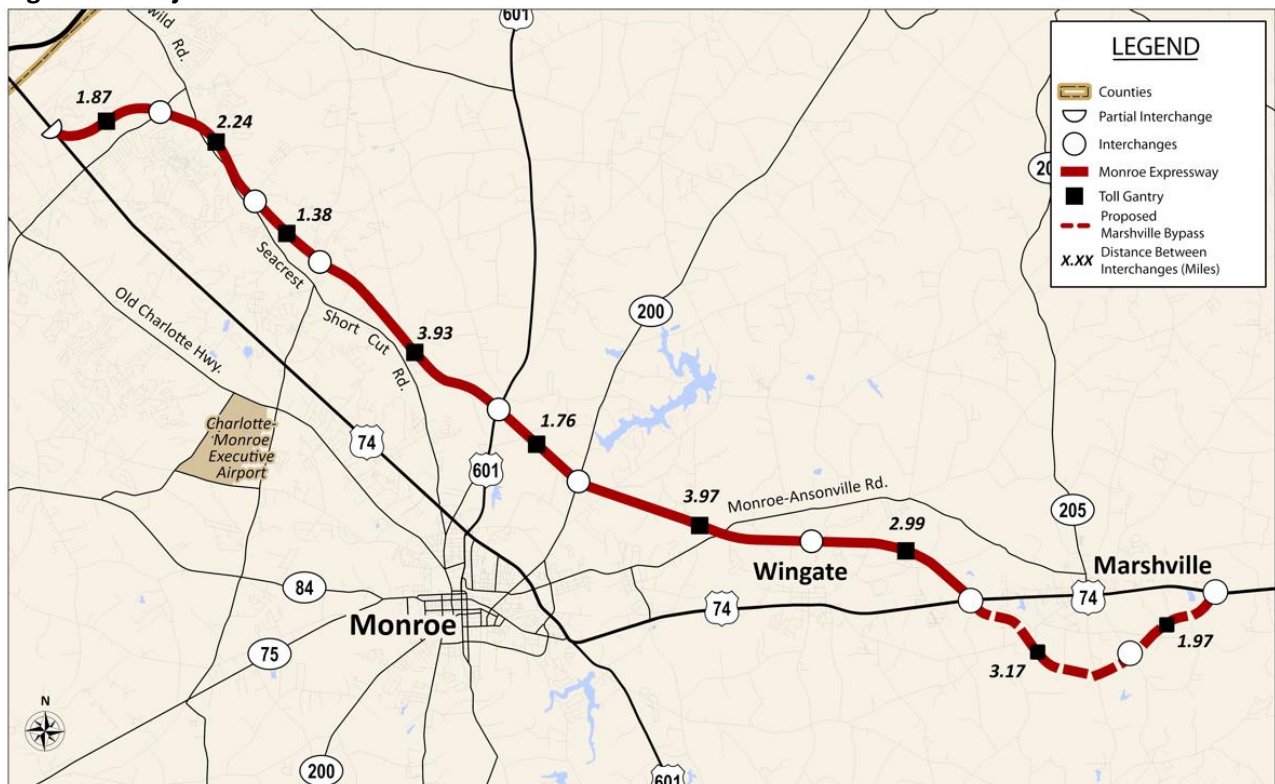
Subject: Marshville Bypass Sketch-Level Traffic and Revenue Forecast Study

This memo summarizes the sketch-level analysis and forecast for traffic and revenue impacts for the proposed Marshville Bypass, an extension of the Monroe Expressway which would bypass US 74 around the town of Marshville, NC.

Project Description

For the purposes of this study, the proposed Marshville Bypass was assumed to extend 5.1 miles from the current eastern terminus of the Monroe Expressway to the south of Marshville, have one intermediate interchange with Landsford Road south of Hasty Road, and re-connect with US 74 between Stegall Road and Gaddy Road. As an extension to Monroe Expressway, the Marshville Bypass would be two lanes per direction, limited access, and be posted at 65mph. The location of the Monroe Expressway and proposed Marshville Bypass are shown in **Figure 1**.

Figure 1 – Project Location



Model Refinements

All modeling, analysis, per-mile toll rates, and T&R forecasting tools for this study were based on the most recent available T&R studies for Monroe Expressway, including the 2024 *Monroe Expressway Traffic and Revenue Forecast Update (2024 T&R Update)* which estimated the impacts of a revised electronic toll collection (ETC) toll rate discount to be implemented on January 1, 2025, and the subsequent 2025 *Draft Monroe Expressway Planning Level Traffic and Revenue Forecast Update (2025 T&R Update)* that refined the 2024 T&R Update forecast to account for Monroe Expressway T&R performance through June 2025.

Model refinements performed in this study for the evaluation of the traffic and revenue impacts of the Marshville Bypass were limited to:

1. Travel demand model roadway network coding to include the proposed Marshville Bypass and associated interchanges
2. Toll schedule expansion to accommodate the two mainline toll zones on the Marshville Bypass (see **Table 1**)
3. Revision of toll assignment scripts to accommodate additional toll zones
4. Minor revisions to travel demand model calibration to observed traffic counts and travel speeds on US 74 in Marshville and Old Highway 74 in Marshville and Wingate

Toll rates for the two mainline toll locations on the Marshville Bypass are set to match the adopted toll rate schedule for the Monroe Expressway on a per-mile basis. Class 1 ETC transactions for the two mainline toll locations are \$0.63 and \$0.39 in 2035, escalating at 2.0 percent per year thereafter. For a complete trip along the entire 23-mile corridor on the Monroe Expressway and Marshville Bypass, Class 1 ETC customers would pay \$4.61 in 2035.

Traffic and Revenue Analysis

Subsequent to the aforementioned model refinements, tolled traffic assignments were conducted for a build condition and a no-build condition, reflecting scenarios with and without the Marshville Bypass. The resulting impacts of the Marshville Bypass to Monroe Expressway system traffic and revenue were then applied to the 2025 T&R Update forecast. The resulting traffic and revenue forecast, as well as a comparison of systemwide collected revenue to the 2025 T&R Update, are presented in **Table 2 through Table 5**. The opening date of the Marshville Bypass was assumed to be January 1, 2035. The horizon model year for this forecast was 2040. Traffic and revenue estimates beyond 2040 are based on 1.1 percent annual transaction growth from 2040 to 2045, 0.8 percent annual transaction growth from 2045 to 2068, and 2.0 percent annual toll rate escalation.

Marshville Bypass Sketch-Level Traffic and Revenue Forecast Study

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Table 1
Recommended Monroe Expressway Class 1 Toll Rates by Tolling Zone

Calendar Year (1)	Existing Monroe Expressway												Marshville Bypass														
	Zone 01/02 (1.87 mi.)			Zone 03/04 (2.24 mi.)			Zone 05/06 (1.38 mi.)			Zone 07/08 (3.93 mi.)			Zone 09/10 (1.76 mi.)			Zone 11/12 (3.97 mi.)			Zone 13/14 (2.99 mi.)			Zone 15/16 (3.17 mi.)			Zone 17/18 (1.97 mi.)		
	Indian Trail Fairview Rd. - US 74	ETC	BBM	Trail Rd. - Indian Trail Fairview Rd.	ETC	BBM	Unionville Indian River Rd. - Unionville Indian Trail Rd.	ETC	BBM	US 601 - N. Rocky River Rd.	ETC	BBM	NC 200 - US 601	ETC	BBM	Austin Chaney Rd. - NC 200	ETC	BBM	US 74 - Austin Chaney Rd.	ETC	BBM	Landsford Rd. - US 74	ETC	BBM	Landsford Rd.	ETC	BBM
2035	0.37	0.74	0.44	0.88	0.27	0.54	0.27	0.54	0.78	1.56	0.35	0.70	0.79	1.58	0.81	1.62	0.59	1.18	0.63	1.25	0.39	0.78	4.61	9.21			
2036	0.37	0.74	0.45	0.90	0.27	0.54	0.27	0.54	0.79	1.58	0.36	0.72	0.81	1.62	0.81	1.62	0.60	1.20	0.64	1.28	0.40	0.79	4.68	9.37			
2037	0.38	0.76	0.46	0.92	0.28	0.56	0.28	0.56	0.81	1.62	0.37	0.74	0.82	1.64	0.82	1.64	0.62	1.24	0.65	1.31	0.41	0.81	4.80	9.60			
2038	0.39	0.78	0.47	0.94	0.29	0.58	0.29	0.58	0.83	1.66	0.38	0.76	0.84	1.68	0.84	1.68	0.63	1.26	0.67	1.34	0.42	0.83	4.92	9.83			
2039	0.40	0.80	0.47	0.94	0.29	0.58	0.29	0.58	0.84	1.68	0.38	0.76	0.86	1.72	0.86	1.72	0.64	1.28	0.68	1.36	0.42	0.84	4.98	9.96			
2040	0.41	0.82	0.49	0.98	0.30	0.60	0.30	0.60	0.86	1.72	0.39	0.78	0.88	1.76	0.88	1.76	0.66	1.32	0.70	1.39	0.43	0.87	5.12	10.24			
2041	0.42	0.84	0.50	1.00	0.31	0.62	0.31	0.62	0.88	1.76	0.40	0.80	0.90	1.80	0.90	1.80	0.67	1.34	0.71	1.43	0.44	0.89	5.24	10.47			
2042	0.43	0.86	0.51	1.02	0.31	0.62	0.31	0.62	0.89	1.78	0.41	0.82	0.92	1.84	0.92	1.84	0.69	1.38	0.73	1.45	0.45	0.90	5.34	10.68			
2043	0.44	0.88	0.52	1.04	0.32	0.64	0.32	0.64	0.91	1.82	0.41	0.82	0.93	1.86	0.93	1.86	0.70	1.40	0.74	1.48	0.46	0.92	5.43	10.86			
2044	0.44	0.88	0.53	1.06	0.32	0.64	0.32	0.64	0.93	1.86	0.42	0.84	0.95	1.90	0.95	1.90	0.71	1.42	0.75	1.50	0.47	0.93	5.52	11.04			
2045	0.45	0.90	0.54	1.08	0.33	0.66	0.33	0.66	0.95	1.90	0.43	0.86	0.97	1.94	0.97	1.94	0.73	1.46	0.77	1.54	0.48	0.96	5.65	11.29			
2046	0.46	0.92	0.55	1.10	0.34	0.68	0.34	0.68	0.97	1.94	0.44	0.88	0.99	1.98	0.99	1.98	0.74	1.48	0.78	1.57	0.49	0.98	5.76	11.52			
2047	0.47	0.94	0.56	1.12	0.34	0.68	0.34	0.68	0.99	1.98	0.45	0.90	1.01	2.02	1.01	2.02	0.76	1.52	0.80	1.60	0.50	0.99	5.88	11.76			
2048	0.48	0.96	0.57	1.14	0.35	0.70	0.35	0.70	1.01	2.02	0.46	0.92	1.03	2.06	1.03	2.06	0.77	1.54	0.82	1.63	0.51	1.01	5.99	11.99			
2049	0.49	0.98	0.59	1.18	0.36	0.72	0.36	0.72	1.03	2.06	0.47	0.94	1.05	2.10	1.05	2.10	0.79	1.58	0.84	1.67	0.52	1.04	6.13	12.27			
2050	0.50	1.00	0.60	1.20	0.37	0.74	0.37	0.74	1.05	2.10	0.48	0.96	1.07	2.14	1.07	2.14	0.80	1.60	0.85	1.70	0.53	1.06	6.25	12.50			
2051	0.51	1.02	0.61	1.22	0.37	0.74	0.37	0.74	1.07	2.14	0.48	0.96	1.09	2.18	1.09	2.18	0.82	1.64	0.87	1.73	0.54	1.08	6.35	12.71			
2052	0.52	1.04	0.62	1.24	0.38	0.76	0.38	0.76	1.09	2.18	0.49	0.98	1.12	2.24	1.12	2.24	0.84	1.68	0.88	1.77	0.55	1.10	6.49	12.99			
2053	0.53	1.06	0.63	1.26	0.39	0.78	0.39	0.78	1.11	2.22	0.50	1.00	1.14	2.28	1.14	2.28	0.85	1.70	0.90	1.80	0.56	1.12	6.61	13.22			
2054	0.54	1.08	0.65	1.30	0.40	0.80	0.40	0.80	1.13	2.26	0.51	1.02	1.16	2.32	1.16	2.32	0.87	1.74	0.92	1.84	0.57	1.14	6.75	13.50			
2055	0.55	1.10	0.66	1.32	0.40	0.80	0.40	0.80	1.16	2.32	0.52	1.04	1.18	2.36	1.18	2.36	0.89	1.78	0.94	1.87	0.58	1.16	6.88	13.76			
2056	0.56	1.12	0.67	1.34	0.41	0.82	0.41	0.82	1.18	2.36	0.54	1.08	1.21	2.42	1.21	2.42	0.91	1.82	0.96	1.92	0.60	1.19	7.03	14.07			
2057	0.57	1.14	0.69	1.38	0.42	0.84	0.42	0.84	1.20	2.40	0.55	1.10	1.23	2.46	1.23	2.46	0.92	1.84	0.98	1.95	0.61	1.21	7.16	14.32			
2058	0.59	1.18	0.70	1.40	0.43	0.86	0.43	0.86	1.23	2.46	0.56	1.12	1.26	2.52	1.26	2.52	0.94	1.88	1.00	2.00	0.62	1.24	7.33	14.66			
2059	0.59	1.18	0.71	1.42	0.43	0.86	0.43	0.86	1.25	2.50	0.57	1.14	1.28	2.56	1.28	2.56	0.96	1.92	1.02	2.04	0.63	1.26	7.44	14.88			
2060	0.60	1.20	0.72	1.44	0.44	0.88	0.44	0.88	1.28	2.56	0.58	1.16	1.30	2.60	1.30	2.60	0.98	1.96	1.04	2.08	0.64	1.28	7.58	15.16			
2061	0.62	1.24	0.74	1.48	0.45	0.90	0.45	0.90	1.30	2.60	0.59	1.18	1.33	2.66	1.33	2.66	1.00	2.00	1.06	2.12	0.65	1.30	7.74	15.48			
2062	0.63	1.26	0.75	1.50	0.46	0.92	0.46	0.92	1.33	2.66	0.61	1.22	1.36	2.72	1.36	2.72	1.02	2.04	1.08	2.16	0.66	1.32	7.90	15.80			
2063	0.64	1.28	0.77	1.54	0.47	0.94	0.47	0.94	1.36	2.72	0.62	1.24	1.38	2.76	1.38	2.76	1.04	2.08	1.10	2.20	0.68	1.36	8.06	16.12			
2064	0.65	1.30	0.78	1.56	0.48	0.96	0.48	0.96	1.38	2.76	0.63	1.26	1.41	2.82	1.41	2.82	1.06	2.12	1.13	2.26	0.69	1.38	8.21	16.42			
2065	0.67	1.34	0.80	1.60	0.49	0.98	0.49	0.98	1.41	2.82	0.64	1.28	1.44	2.88	1.44	2.88	1.08	2.16	1.15	2.30	0.71	1.42	8.39	16.78			
2066	0.68	1.36	0.81	1.62	0.50	1.00	0.50	1.00	1.44	2.88	0.65	1.30	1.47	2.94	1.47	2.94	1.10	2.20	1.17	2.34	0.72	1.44	8.54	17.08			
2067	0.69	1.38	0.83	1.66	0.51	1.02	0.51	1.02	1.47	2.94	0.67	1.34	1.50	3.00	1.50	3.00	1.12	2.24	1.19	2.38	0.73	1.46	8.71	17.42			
2068	0.71	1.42	0.84	1.68	0.52	1.04	0.52	1.04	1.50	3.00	0.68	1.36	1.53	3.06	1.53	3.06	1.14	2.28	1.22	2.44	0.75	1.50	8.89	17.78			

1) Assumes toll rates will be increased annually on January 1.
Note: Class 2 tolls are two times the Class 1 tolls and Class 3 tolls are four times the Class 1 tolls.

Table 2 - Estimated Annual Transactions for Monroe Expressway System, Marshville Bypass Build Scenario (in thousands)

Fiscal Year	Class 1				Classes 2 and 3				All Vehicles			
	BBM	ETC	Total	% ETC	BBM	ETC	Total	% ETC	BBM	ETC	Total	% ETC
2035	18,080	38,443	56,523	68.0	1,129	6,265	7,393	84.7	19,209	44,707	63,916	69.9
2036	19,097	41,583	60,680	68.5	1,216	6,816	8,032	84.9	20,313	48,399	68,712	70.4
2037	19,039	42,369	61,408	69.0	1,225	6,930	8,155	85.0	20,264	49,299	69,563	70.9
2038	18,981	43,169	62,150	69.5	1,234	7,046	8,280	85.1	20,215	50,215	70,430	71.3
2039	18,924	43,984	62,908	69.9	1,243	7,164	8,407	85.2	20,167	51,148	71,315	71.7
2040	18,866	44,814	63,681	70.4	1,253	7,284	8,537	85.3	20,119	52,098	72,217	72.1
2041	18,853	45,581	64,434	70.7	1,258	7,391	8,650	85.5	20,111	52,972	73,083	72.5
2042	18,883	46,282	65,165	71.0	1,260	7,485	8,746	85.6	20,143	53,767	73,910	72.7
2043	18,913	46,993	65,906	71.3	1,262	7,580	8,843	85.7	20,176	54,573	74,749	73.0
2044	18,943	47,715	66,658	71.6	1,265	7,677	8,941	85.9	20,208	55,391	75,599	73.3
2045	18,974	48,447	67,421	71.9	1,267	7,774	9,041	86.0	20,240	56,221	76,462	73.5
2046	18,971	49,112	68,083	72.1	1,266	7,862	9,128	86.1	20,236	56,974	77,211	73.8
2047	18,935	49,708	68,643	72.4	1,261	7,940	9,201	86.3	20,196	57,648	77,844	74.1
2048	18,898	50,311	69,209	72.7	1,257	8,018	9,275	86.4	20,156	58,329	78,484	74.3
2049	18,862	50,920	69,783	73.0	1,253	8,097	9,350	86.6	20,116	59,018	79,133	74.6
2050	18,827	51,537	70,364	73.2	1,249	8,177	9,426	86.7	20,076	59,714	79,790	74.8
2051	18,783	52,160	70,943	73.5	1,244	8,258	9,502	86.9	20,027	60,418	80,445	75.1
2052	18,732	52,788	71,521	73.8	1,237	8,341	9,578	87.1	19,969	61,129	81,099	75.4
2053	18,682	53,424	72,106	74.1	1,230	8,425	9,655	87.3	19,912	61,849	81,761	75.6
2054	18,631	54,067	72,699	74.4	1,224	8,509	9,733	87.4	19,855	62,576	82,431	75.9
2055	18,581	54,718	73,299	74.7	1,217	8,594	9,811	87.6	19,798	63,312	83,110	76.2
2056	18,531	55,376	73,907	74.9	1,210	8,680	9,891	87.8	19,741	64,057	83,798	76.4
2057	18,481	56,042	74,523	75.2	1,204	8,768	9,971	87.9	19,685	64,810	84,494	76.7
2058	18,431	56,716	75,147	75.5	1,197	8,856	10,053	88.1	19,628	65,571	85,200	77.0
2059	18,375	57,366	75,741	75.7	1,193	8,945	10,138	88.2	19,568	66,311	85,879	77.2
2060	18,314	58,016	76,331	76.0	1,192	9,029	10,221	88.3	19,506	67,046	86,552	77.5
2061	18,254	58,674	76,928	76.3	1,191	9,115	10,306	88.4	19,445	67,789	87,234	77.7
2062	18,193	59,339	77,532	76.5	1,190	9,201	10,391	88.5	19,383	68,540	87,923	78.0
2063	18,133	60,011	78,144	76.8	1,189	9,288	10,477	88.7	19,322	69,300	88,622	78.2
2064	18,073	60,692	78,765	77.1	1,188	9,376	10,564	88.8	19,261	70,068	89,329	78.4
2065	18,013	61,379	79,393	77.3	1,187	9,465	10,652	88.9	19,200	70,844	90,045	78.7
2066	17,954	62,075	80,029	77.6	1,186	9,555	10,741	89.0	19,140	71,630	90,769	78.9
2067	17,894	62,778	80,673	77.8	1,185	9,645	10,830	89.1	19,079	72,424	91,503	79.1
2068	17,835	63,490	81,325	78.1	1,184	9,737	10,920	89.2	19,019	73,227	92,245	79.4
Average Annual Percent Change												
2035-45	0.5%	2.3%	1.8%		1.2%	2.2%	2.0%		0.5%	2.3%	1.8%	
2045-68	-0.3%	1.2%	0.8%		-0.3%	1.0%	0.8%		-0.3%	1.2%	0.8%	
2035-68	0.0%	1.5%	1.1%		0.1%	1.3%	1.2%		0.0%	1.5%	1.1%	

Table 3 - Estimated Annual Gross Toll Revenue for Monroe Expressway System, Marshville Bypass Build Scenario (in thousands \$)

Fiscal Year	Class 1				Classes 2 and 3				All Vehicles			
	BBM	ETC	Total	% ETC	BBM	ETC	Total	% ETC	BBM	ETC	Total	% ETC
2035	\$17,701	\$18,017	\$35,718	50.4	\$4,312	\$12,484	\$16,796	74.3	\$22,014	\$30,501	\$52,514	58.1
2036	19,176	19,948	39,124	51.0	4,435	12,945	17,380	74.5	23,611	32,892	56,504	58.2
2037	19,545	20,733	40,278	51.5	4,556	13,424	17,980	74.7	24,101	34,157	58,258	58.6
2038	19,825	21,557	41,382	52.1	4,680	13,922	18,602	74.8	24,505	35,479	59,983	59.1
2039	20,110	22,412	42,523	52.7	4,811	14,438	19,250	75.0	24,922	36,850	61,772	59.7
2040	20,554	23,290	43,845	53.1	4,949	14,982	19,931	75.2	25,503	38,272	63,776	60.0
2041	20,961	24,169	45,131	53.6	5,071	15,517	20,588	75.4	26,033	39,686	65,719	60.4
2042	21,326	25,047	46,373	54.0	5,180	16,031	21,211	75.6	26,506	41,078	67,584	60.8
2043	21,808	25,945	47,753	54.3	5,289	16,559	21,848	75.8	27,098	42,503	69,601	61.1
2044	22,316	26,871	49,186	54.6	5,403	17,102	22,506	76.0	27,719	43,973	71,692	61.3
2045	22,817	27,811	50,628	54.9	5,523	17,665	23,188	76.2	28,340	45,477	73,817	61.6
2046	23,261	28,743	52,004	55.3	5,632	18,222	23,854	76.4	28,893	46,965	75,857	61.9
2047	23,689	29,672	53,361	55.6	5,727	18,770	24,497	76.6	29,416	48,442	77,858	62.2
2048	24,131	30,627	54,758	55.9	5,820	19,335	25,155	76.9	29,951	49,962	79,913	62.5
2049	24,582	31,627	56,209	56.3	5,918	19,918	25,836	77.1	30,500	51,546	82,046	62.8
2050	25,009	32,650	57,659	56.6	6,019	20,518	26,537	77.3	31,028	53,167	84,196	63.1
2051	25,417	33,704	59,121	57.0	6,112	21,136	27,248	77.6	31,529	54,840	86,369	63.5
2052	25,914	34,810	60,723	57.3	6,200	21,776	27,976	77.8	32,114	56,585	88,699	63.8
2053	26,357	35,956	62,313	57.7	6,290	22,434	28,724	78.1	32,647	58,390	91,037	64.1
2054	26,794	37,105	63,899	58.1	6,379	23,112	29,491	78.4	33,173	60,217	93,390	64.5
2055	27,235	38,288	65,522	58.4	6,468	23,813	30,280	78.6	33,702	62,101	95,803	64.8
2056	27,665	39,526	67,191	58.8	6,562	24,531	31,093	78.9	34,227	64,057	98,284	65.2
2057	28,182	40,793	68,975	59.1	6,659	25,270	31,929	79.1	34,841	66,064	100,904	65.5
2058	28,619	42,115	70,734	59.5	6,754	26,036	32,790	79.4	35,373	68,151	103,524	65.8
2059	29,026	43,396	72,422	59.9	6,858	26,820	33,679	79.6	35,884	70,216	106,100	66.2
2060	29,469	44,772	74,240	60.3	6,983	27,612	34,594	79.8	36,451	72,383	108,835	66.5
2061	29,936	46,214	76,150	60.7	7,112	28,435	35,547	80.0	37,048	74,649	111,697	66.8
2062	30,432	47,738	78,170	61.1	7,243	29,278	36,521	80.2	37,675	77,016	114,690	67.2
2063	30,900	49,261	80,161	61.5	7,377	30,152	37,529	80.3	38,277	79,413	117,690	67.5
2064	31,332	50,762	82,094	61.8	7,514	31,053	38,567	80.5	38,847	81,815	120,661	67.8
2065	31,815	52,376	84,191	62.2	7,649	31,958	39,607	80.7	39,463	84,335	123,798	68.1
2066	32,304	54,039	86,343	62.6	7,790	32,910	40,700	80.9	40,094	86,950	127,043	68.4
2067	32,755	55,689	88,445	63.0	7,934	33,889	41,823	81.0	40,689	89,579	130,268	68.8
2068	33,261	57,465	90,726	63.3	8,077	34,882	42,959	81.2	41,338	92,347	133,685	69.1
Average Annual Percent Change												
2035-45	2.6%	4.4%	3.6%		2.5%	3.5%	3.3%		2.6%	4.1%	3.5%	
2045-68	1.7%	3.2%	2.6%		1.7%	3.0%	2.7%		1.7%	3.1%	2.6%	
2035-68	1.9%	3.6%	2.9%		1.9%	3.2%	2.9%		1.9%	3.4%	2.9%	

Table 4 - Estimated Annual Collected Revenue for Monroe Expressway System, Marshville Bypass Build Scenario (in thousands \$)

Fiscal Year	Collected Toll Revenue									Processing Fee Revenue	Total Collected Revenue
	Class 1			Classes 2 and 3			All Vehicles				
	BBM	ETC	Total	BBM	ETC	Total	BBM	ETC	Total		
2035	\$15,400	\$18,017	\$33,417	\$3,500	\$11,637	\$15,137	\$18,901	\$29,654	\$48,554	\$3,179	\$51,734
2036	16,683	19,948	36,631	3,859	12,945	16,803	20,542	32,892	53,434	3,223	56,657
2037	17,005	20,733	37,737	3,964	13,424	17,388	20,968	34,157	55,125	3,217	58,342
2038	17,248	21,557	38,804	4,071	13,922	17,993	21,319	35,479	56,798	3,211	60,008
2039	17,496	22,412	39,908	4,186	14,438	18,624	21,682	36,850	58,532	3,205	61,737
2040	17,882	23,290	41,173	4,306	14,982	19,287	22,188	38,272	60,460	3,199	63,659
2041	18,236	24,169	42,406	4,412	15,517	19,929	22,648	39,686	62,335	3,198	65,533
2042	18,553	25,047	43,601	4,506	16,031	20,538	23,060	41,078	64,138	3,203	67,342
2043	18,973	25,945	44,918	4,602	16,559	21,160	23,575	42,503	66,078	3,209	69,287
2044	19,415	26,871	46,285	4,701	17,102	21,803	24,115	43,973	68,088	3,214	71,302
2045	19,851	27,811	47,662	4,805	17,665	22,470	24,656	45,477	70,133	3,219	73,352
2046	20,237	28,743	48,980	4,900	18,222	23,121	25,137	46,965	72,101	3,219	75,320
2047	20,609	29,672	50,282	4,983	18,770	23,752	25,592	48,442	74,034	3,212	77,246
2048	20,994	30,627	51,621	5,064	19,335	24,399	26,057	49,962	76,019	3,206	79,225
2049	21,386	31,627	53,014	5,149	19,918	25,067	26,535	51,546	78,081	3,200	81,280
2050	21,758	32,650	54,408	5,237	20,518	25,754	26,995	53,167	80,162	3,193	83,355
2051	22,113	33,704	55,817	5,317	21,136	26,453	27,430	54,840	82,270	3,186	85,456
2052	22,545	34,810	57,355	5,394	21,776	27,170	27,939	56,585	84,525	3,176	87,701
2053	22,931	35,956	58,887	5,472	22,434	27,906	28,403	58,390	86,793	3,167	89,960
2054	23,311	37,105	60,416	5,550	23,112	28,661	28,861	60,217	89,078	3,158	92,236
2055	23,694	38,288	61,982	5,627	23,813	29,440	29,321	62,101	91,421	3,149	94,571
2056	24,069	39,526	63,594	5,709	24,531	30,240	29,778	64,057	93,835	3,140	96,975
2057	24,518	40,793	65,311	5,794	25,270	31,064	30,312	66,064	96,375	3,131	99,507
2058	24,898	42,115	67,013	5,876	26,036	31,912	30,775	68,151	98,925	3,122	102,048
2059	25,253	43,396	68,648	5,967	26,820	32,787	31,219	70,216	101,435	3,113	104,548
2060	25,638	44,772	70,409	6,075	27,612	33,687	31,713	72,383	104,096	3,103	107,199
2061	26,044	46,214	72,258	6,188	28,435	34,623	32,232	74,649	106,881	3,094	109,975
2062	26,476	47,738	74,214	6,301	29,278	35,579	32,777	77,016	109,793	3,084	112,877
2063	26,883	49,261	76,144	6,418	30,152	36,570	33,301	79,413	112,714	3,074	115,788
2064	27,259	50,762	78,021	6,537	31,053	37,590	33,797	81,815	115,611	3,065	118,676
2065	27,679	52,376	80,055	6,654	31,958	38,613	34,333	84,335	118,668	3,055	121,723
2066	28,104	54,039	82,143	6,777	32,910	39,688	34,882	86,950	121,831	3,046	124,877
2067	28,497	55,689	84,186	6,902	33,889	40,792	35,399	89,579	124,978	3,036	128,014
2068	28,937	57,465	86,402	7,027	34,882	41,909	35,964	92,347	128,311	3,027	131,338

Table 5 – Transaction and Revenue Forecast Comparison: 2025 T&R Update Study and Marshville Bypass Build Scenario

Fiscal Year	Estimated Annual Transactions (000)				Estimated Annual Collected Revenue (\$000)			
	2025 T&R Update	Current Study	Difference	Percent Difference	2025 T&R Update	Current Study	Difference	Percent Difference
2035	59,954	63,916	3,962	6.6%	\$48,451	\$51,734	\$3,282	6.8%
2036	60,715	68,712	7,997	13.2%	49,861	56,657	6,797	13.6%
2037	61,491	69,563	8,072	13.1%	51,319	58,342	7,023	13.7%
2038	62,282	70,430	8,148	13.1%	52,828	60,008	7,180	13.6%
2039	63,090	71,315	8,225	13.0%	54,390	61,737	7,347	13.5%
2040	63,913	72,217	8,304	13.0%	56,006	63,659	7,653	13.7%
2041	64,693	73,083	8,391	13.0%	57,634	65,533	7,899	13.7%
2042	65,425	73,910	8,486	13.0%	59,270	67,342	8,072	13.6%
2043	66,167	74,749	8,582	13.0%	60,957	69,287	8,330	13.7%
2044	66,920	75,599	8,679	13.0%	62,696	71,302	8,606	13.7%
2045	67,683	76,462	8,778	13.0%	64,490	73,352	8,862	13.7%
2046	68,346	77,211	8,864	13.0%	66,229	75,320	9,090	13.7%
2047	68,907	77,844	8,937	13.0%	67,909	77,246	9,337	13.7%
2048	69,474	78,484	9,010	13.0%	69,636	79,225	9,589	13.8%
2049	70,049	79,133	9,085	13.0%	71,413	81,280	9,867	13.8%
2050	70,630	79,790	9,160	13.0%	73,240	83,355	10,115	13.8%
2051	71,210	80,445	9,235	13.0%	75,105	85,456	10,351	13.8%
2052	71,789	81,099	9,310	13.0%	77,009	87,701	10,692	13.9%
2053	72,375	81,761	9,386	13.0%	78,968	89,960	10,992	13.9%
2054	72,969	82,431	9,463	13.0%	80,983	92,236	11,253	13.9%
2055	73,570	83,110	9,541	13.0%	83,055	94,571	11,516	13.9%
2056	74,179	83,798	9,619	13.0%	85,187	96,975	11,788	13.8%
2057	74,795	84,494	9,699	13.0%	87,380	99,507	12,127	13.9%
2058	75,420	85,200	9,780	13.0%	89,636	102,048	12,412	13.8%
2059	76,021	85,879	9,858	13.0%	91,826	104,548	12,722	13.9%
2060	76,617	86,552	9,936	13.0%	94,149	107,199	13,050	13.9%
2061	77,220	87,234	10,014	13.0%	96,581	109,975	13,394	13.9%
2062	77,830	87,923	10,093	13.0%	99,123	112,877	13,753	13.9%
2063	78,448	88,622	10,174	13.0%	101,674	115,788	14,114	13.9%
2064	79,074	89,329	10,255	13.0%	104,204	118,676	14,472	13.9%
2065	79,707	90,045	10,337	13.0%	106,873	121,723	14,849	13.9%
2066	80,349	90,769	10,421	13.0%	109,637	124,877	15,240	13.9%
2067	80,998	91,503	10,505	13.0%	112,385	128,014	15,629	13.9%
2068	81,655	92,245	10,591	13.0%	115,297	131,338	16,041	13.9%

Traffic Impacts on US 74 in Marshville

Upon the opening of the Marshville Bypass, traffic is expected to divert from the existing toll-free US 74 that runs through Marshville. **Table 6** provides the estimated average weekday traffic by vehicle class for two locations on US 74 under the no-build and build conditions for model assignment years 2030 and 2040. Class 1 represents two-axle vehicles and Classes 2 & 3 represent vehicles with three-or-more axles. The table also includes the percent difference in traffic between the no-build and build conditions to illustrate the impact of the Marshville Bypass.

Table 6 – Estimated US 74 Average Weekday Traffic Impacts by Vehicle Class, No-Build vs. Build Condition

Model Year	Location	Vehicle Class	No Build	Build	Impact to US 74
2030	US 74 to N Elm St	Class 1	27,900	19,100	-31.5%
		Classes 2&3	2,900	1,600	-44.8%
		Total	30,800	20,700	-32.8%
	N White St to Belk St	Class 1	24,800	16,200	-34.7%
		Classes 2&3	3,000	1,700	-43.3%
		Total	27,800	17,900	-35.6%
2040	US 74 to N Elm St	Class 1	30,500	21,000	-31.1%
		Classes 2&3	3,200	1,700	-46.9%
		Total	33,700	22,700	-32.6%
	N White St to Belk St	Class 1	27,400	17,800	-35.0%
		Classes 2&3	3,300	1,800	-45.5%
		Total	30,700	19,600	-36.2%

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 NCTA. 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 NCTA. 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 NCTA and designated parties approved by NCTA 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 NCTA and does not owe a fiduciary duty pursuant to Section 15B of the Exchange Act to NCTA with respect to the information and material contained in this report. CDM Smith is not recommending and has not recommended any action to NCTA. NCTA 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.

I. Sources and Uses

Sources					
	Senior Lien Toll Rev. Bonds	Subordinated Toll Rev. TIFIA Loan	Trust Fund Funding	Funding Gap	Total
Tax-Exempt Governmental Purpose Bonds					
Current Interest Bonds (Par)	123,450,000				123,450,000
Capital Appreciation Bonds					-
Convertible Capital Appreciation Bonds (Par)	-				-
+Premium/-Discount	4,524,931				4,524,931
Total Bond Proceeds	127,974,931				127,974,931
TIFIA Loan		196,991,754			196,991,754
Trust Fund Funding					-
Funding Gap	-		-	71,738,968	71,738,968
Total Sources	127,974,931	196,991,754	-	71,738,968	396,705,653

Uses					
	Senior Lien Toll Rev. Bonds	Subordinated Toll Rev. TIFIA Loan	Trust Fund Funding	Funding Gap	Total
Construction Cost*	64,496,478	196,991,754	-	71,738,968	333,227,200
Capitalized Interest Fund - Toll Rev. Bonds	36,121,503				36,121,503
Debt Service Reserve Fund - Toll Rev. Bonds	8,888,159				8,888,159
Debt Service Reserve Fund - Toll Rev. TIFIA Loan*	17,542,916				17,542,916
Underwriter's Discount	617,250				617,250
Cost of Issuance	308,625				308,625
Tolling Reserve					-
Additional Proceeds					-
Total Uses	127,974,931	196,991,754	-	71,738,968	396,705,653

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*Under the current tax law, TIFIA DSRF may not be funded by TE Bonds proceeds. Model assumes a small taxable tranche of bonds is issued.

TIFIA Loan Amount Estimate	
Total Construction Cost	333,227,200
Financing Cost	
Toll Revenue Bonds - Capitalized Interest Fund	36,121,503
Toll Revenue Bonds - Debt Service Reserve Fund	8,888,159
Toll Revenue Bonds - Cost of Issuance	308,625
Sub-total	45,318,287
Engineering and Prior Expenditures	23,478,500
Total Eligible Cost	402,023,987
% of Eligible Cost	49%
Constraint - 49% Eligible Cost	196,991,754
Portion Requested	100%
Requested TIFIA	196,991,754

Funding Gap (\$YOE)	\$71,738,968	2030
PV Gap (2025\$)	\$56,209,359	2025

IV. Toll Revenue Flow of Funds

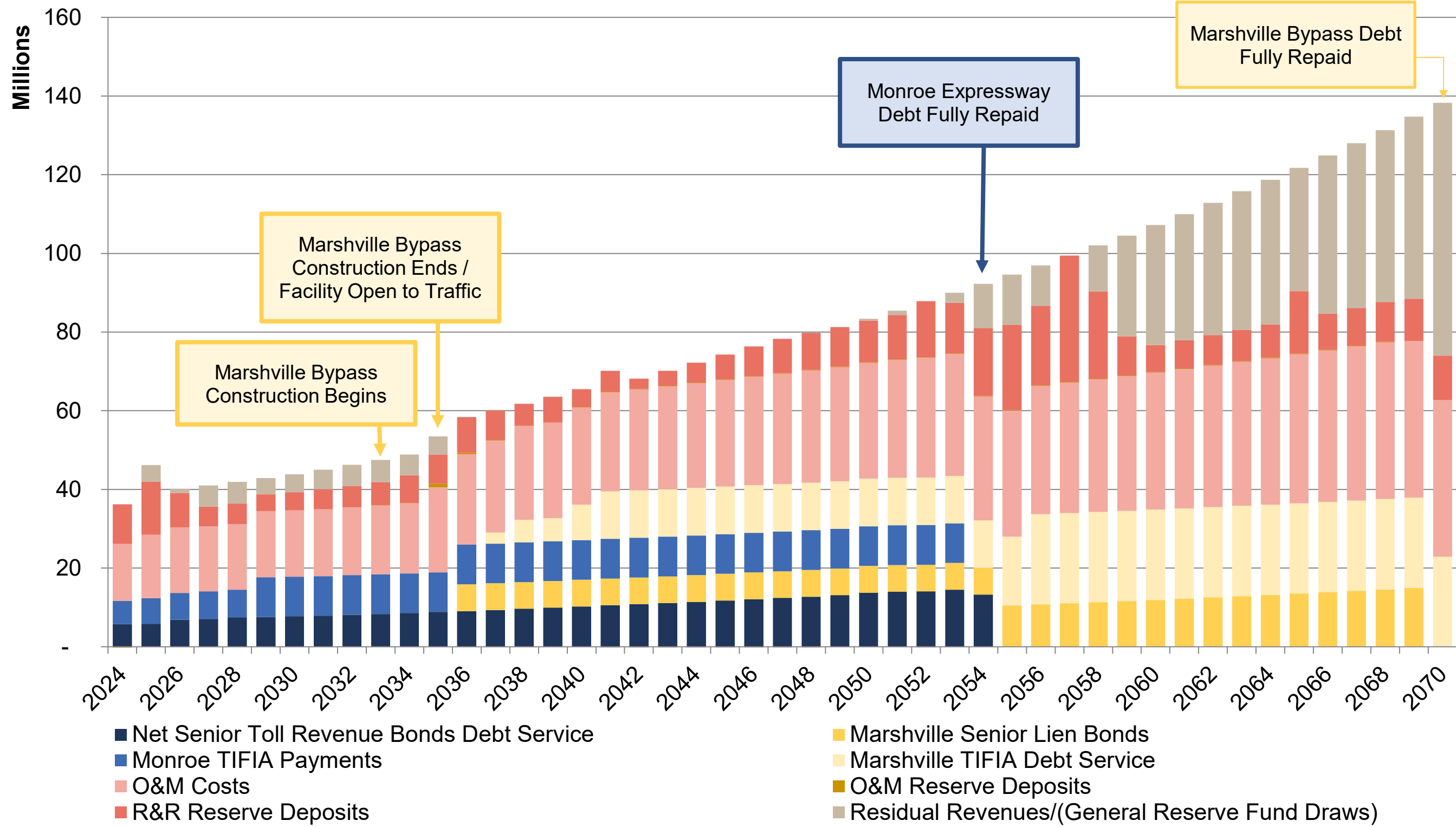
Assumes all Mandatory

Fiscal Year (6/30)	Aggregate Revenue						Series 2016 Toll Revenue Bonds	Marshville Toll Revenue Debt Service	TIFIA Loan (Mandatory Payments)	Marshville TIFIA Loan	O&M and R&R Expenses and Reserve				Excess Revenue/ Shortfall	TIFIA Loan (Scheduled Payments)	Excess Revenue after Prepayment					
	Toll Revenue	Surplus App Revenue	Prior Bond Fund Int (a/o 9/30/2016) ¹	Toll Rev. Bond DSRF Earnings	TIFIA DSRF Earnings	Pledged Acct. Earnings					Total Revenues	Net DS	Debt Service	Debt Service				Debt Service	Operations & Maintenance Expense	O&M Expense Prefund/ Earnings Adj.	O&M Reserve ²	R&R Deposit
2011		26,929,079				26,929,079									26,929,079		26,929,079					
2012		742,454				742,454									1,765		1,765					
2013		803,881				803,881																
2014		678,068				678,068																
2015		692,046				692,046																
2016		696,777	1,056,951			1,753,727									1,056,951		1,056,951					
2017		696,223			183,891	880,113							(1,154,125)		841,115		841,115					
2018		710,134			367,782	1,077,916								(1,000,000)	77,916		77,916					
2019	6,516,170	723,600			21,500	7,261,270					(2,843,312)	(1,177,893)	(1,510,396)	(984,568)	745,101		745,101					
2020	21,335,260	903,989			513,525	500,553	(\$4,420,049)				(9,502,204)		(824,576)	(4,272,211)	4,234,287		4,234,287					
2021	20,950,428	978,533			63,267	480,074	(\$5,968,594)				(11,204,940)		(238,603)	(1,470,915)	1,060,456		1,060,456					
2022	27,023,684			65,433	17,915	66,664	(6,062,433)				(12,532,450)	(1,254,082)	(321,120)	(4,395,177)	310,370		310,370					
2023	29,024,789	3,042,870		179,738	107,977	571,100	(6,929,524)				(14,716,742)	529,918		(7,104,225)	527,586		527,586					
2024	34,490,420	3,041,104		181,583	86,287	787,904	(5,730,680)				(14,498,076)	(1,864,768)	322,656	(10,062,520)	839,159		839,159					
2025	41,483,938	2,032,652		90,208	95,559	601,689	(5,822,054)				(16,162,032)	(1,722,265)		(13,467,069)	601,689		601,689					
2026	38,520,747	1,448,500		255,487	268,374	612,079	(6,843,929)				(16,706,467)			(8,745,307)	2,000,000		2,000,000					
2027	39,320,273	1,435,875		255,487	268,374	652,079	(7,066,429)				(16,523,254)			(5,027,724)	6,284,655		6,284,655					
2028	40,187,539	1,434,375		255,487	268,374	777,772	(7,501,013)				(16,636,309)			(5,224,978)	6,531,222		6,531,222					
2029	41,126,012	1,425,000		255,487	268,374	908,396	(7,557,679)				(16,844,569)			(4,217,963)	5,272,454		5,272,454					
2030	42,139,414	1,419,250		255,487	268,374	1,013,845	(7,738,513)				(16,850,568)			(4,629,638)	5,787,047		5,787,047					
2031	43,269,934	1,413,500		255,487	268,374	1,129,586	(7,881,013)				(17,012,268)			(5,045,776)	6,307,220		6,307,220					
2032	44,500,135	1,399,125		255,487	268,374	1,255,731	(8,106,013)				(17,240,166)			(5,441,016)	6,801,270		6,801,270					
2033	45,772,737	1,398,250		255,487	268,374	1,391,756	(8,331,846)				(17,496,127)		(57,027)	(5,852,456)	7,258,543		7,258,543					
2034	47,089,288	1,386,750		255,487	268,374	1,536,927	(8,569,763)				(17,806,250)		(77,531)	(7,035,104)	6,957,574		6,957,574					
2035	51,733,685	1,386,875		255,487	268,374	1,676,079	(8,838,513)				(21,584,039)		(944,447)	(7,403,672)	6,459,224		6,459,224					
2036	56,657,278	1,374,875		255,487	268,374	1,805,263	(9,092,263)	(6,789,750)	(10,090,386)		(22,971,121)		(346,770)	(9,070,987)	2,000,000		2,000,000					
2037	58,342,149	1,363,125		255,487	268,374	1,845,263	(9,340,179)	(6,789,750)	(10,090,604)	(2,808,127)	(23,381,689)		(102,642)	(7,561,406)	2,000,000		2,000,000					
2038	60,008,324	1,353,625		255,487	268,374	1,885,263	(9,668,929)	(6,789,750)	(10,090,604)	(5,719,408)	(23,801,964)		(105,069)	(5,595,348)	2,000,000		2,000,000					
2039	61,737,002	1,343,250		255,487	268,374	1,925,263	(9,931,429)	(6,789,750)	(10,090,604)	(5,859,758)	(24,232,198)		(107,558)	(6,518,079)	2,000,000		2,000,000					
2040	63,658,610	1,334,375		255,487	268,374	1,965,263	(10,225,596)	(6,789,750)	(10,090,384)	(9,023,519)	(24,672,649)		(110,113)	(4,570,099)	2,000,000		2,000,000					
2041	65,532,734	1,752,925		255,487	268,374	2,005,263	(10,559,366)	(6,789,750)	(10,090,605)	(12,079,873)	(25,131,095)		(114,612)	(5,365,085)	15,460,723		15,460,723					
2042	67,341,693			255,487	268,374	2,314,477	(10,826,625)	(6,789,750)	(10,090,605)	(12,079,873)	(25,607,463)		(119,092)	(2,666,624)	2,000,000		2,000,000					
2043	69,286,981			255,487	268,374	2,354,477	(11,117,646)	(6,789,750)	(10,090,605)	(12,079,873)	(26,093,976)		(121,628)	(3,871,842)	2,000,000		2,000,000					
2044	71,302,188			255,487	268,374	2,394,477	(11,428,396)	(6,789,750)	(10,090,381)	(12,079,873)	(26,590,866)		(124,222)	(5,117,039)	2,000,000		2,000,000					
2045	73,351,630			255,487	268,374	2,434,477	(11,772,375)	(6,789,750)	(10,090,606)	(12,079,873)	(27,098,370)		(126,876)	(6,352,118)	2,000,000		2,000,000					
2046	75,319,779			255,487	268,374	2,474,477	(12,115,625)	(6,789,750)	(10,090,606)	(12,079,873)	(27,582,027)		(120,914)	(7,539,323)	2,000,000		2,000,000					
2047	77,246,261			255,487	268,374	2,514,477	(12,423,646)	(6,789,750)	(10,090,606)	(12,079,873)	(28,040,724)		(114,674)	(8,745,325)	2,000,000		2,000,000					
2048	79,225,275			255,487	268,374	2,554,477	(12,740,250)	(6,789,750)	(10,090,375)	(12,079,873)	(28,508,693)		(116,992)	(9,442,211)	2,535,469		2,535,469					
2049	81,280,109			255,487	268,374	2,605,187	(13,114,979)	(6,789,750)	(10,090,612)	(12,079,873)	(28,986,139)		(119,361)	(10,068,777)	3,159,666		3,159,666					
2050	83,355,158			255,487	268,374	2,668,380	(13,749,375)	(6,789,750)	(10,090,614)	(12,079,873)	(29,473,270)		(121,783)	(10,577,134)	3,665,601		3,665,601					
2051	85,455,751			255,487	268,374	2,741,692	(13,988,000)	(6,789,750)	(10,090,620)	(12,079,873)	(29,964,807)		(122,884)	(11,299,002)	4,386,367		4,386,367					
2052	87,701,045			255,487	268,374	2,829,420	(14,065,771)	(6,789,750)	(10,090,358)	(12,079,873)	(30,460,838)		(124,008)	(14,235,695)	3,208,033		3,208,033					
2053	89,959,959			255,487	268,374	2,893,580	(14,497,542)	(6,789,750)	(10,090,289)	(12,079,873)	(30,967,051)		(126,553)	(12,871,323)	5,955,019		5,955,019					
2054	92,235,829			255,487	268,374	3,012,681	(13,287,313)	(6,789,750)	(10,090,605)	(12,079,873)	(31,483,676)		(129,156)	(17,298,448)	14,704,154		14,704,154					
2055	94,570,776			255,487	268,374	3,306,764		(10,504,750)		(17,519,414)	(32,010,946)		(131,817)	(21,720,463)	16,514,011		16,514,011					
2056	96,975,083			255,487	268,374	3,637,044		(10,770,425)		(22,958,954)	(32,549,098)		(134,538)	(20,279,083)	14,443,890		14,443,890					
2057	99,506,536			255,487	268,374	3,925,922		(11,055,250)		(22,958,954)	(33,098,376)		(137,320)	(32,202,364)	4,504,055		4,504,055					
2058	102,047,783			255,487	268,374	4,016,003		(11,336,750)		(22,958,954)	(33,659,031)		(140,164)	(22,208,738)	16,284,009		16,284,009					
2059	104,548,143			255,487	268,374	4,341,683		(11,613,550)		(22,958,954)	(34,223,238)		(141,052)	(9,964,558)	30,512,333		30,512,333					
2060	107,199,337			255,487	268,374	4,951,930		(11,909,275)		(22,958,954)	(34,795,501)		(143,066)	(6,865,084)	36,003,247		36,003,247					
2061	109,974,815			255,487	268,374	5,671,995		(12,216,175)		(22,958,954)	(35,379,554)		(146,013)	(7,229,020)	38,240,953		38,240,953					
2062	112,876,529			255,487	268,374	6,436,814		(12,541,775)		(22,958,954)	(35,975,660)		(149,027)	(7,612,824)	40,598,964		40,598,964					
2063	115,788,090			255,487	268,374	7,248,793		(12,863,050)		(22,958,954)	(36,584,090)		(152,107)	(8,002,212)	43,000,329		43,000,329					
2064	118,676,014			255,487	268,374	8,108,799		(13,183,075)		(22,958,954)	(37,205,120)		(155,257)	(8,393,075)	45,413,193		45,413,193					
2065	121,722,903			255,487	268,374	9,017,063		(13,524,650)		(22,958,954)	(37,839,031)		(158,478)	(15,907,287)	40,875,426		40,875,426					
2066	124,876,721			255,487	268,374	9,834,572		(13,874,200)		(22,958,954)	(38,486,114)		(161,771)	(9,223,761)	50,530,354		50,530,354					
2067	128,014,349			255,487	268,374	10,845,179		(14,223,700)		(22,958,954)	(39,146,665)		(165,138)	(9,659,721)	53,229,211		53,229,211					
2068	131,337,656			255,487	268,374	11,909,763		(14,590,400)		(22,958,954)	(39,820,985)		(168,580)	(10,123,918)	56,108,443		56,108,443					
2069	134,747,237			255,487	268,374	13,031,932		(14,970,450)		(22,958,954)	(39,820,985)			(10,690,386)	59,862,255		59,862,255					
2070	138,245,333			255,487	268,374	14,229,177				(22,882,343)	(39,820,985)			(11,286,880)	79,008,163		79,008,163					
2071	141,834,241			255,487	268,374	15,809,340					(39,820,985)			(14,793,307)	103,553,150		103,553,150					
2072	145,516,318			255,487	268,374	17,880,403					(39,820,985)			(15,512,450)	108,587,148		108,587,148					
2073	149,293,983			255,487	268,374	20,052,146					(39,820,985)			(16,256,126)	113,792,880		113,792,880					
2074	153,169,719			255,487	268,374	22,328,004					(39,820,985)			(17,025,075)	119,175,524		119,175,524					
2075	157,146,070																					

IV. Toll Revenue Flow of Funds

Fiscal Year (6/30)	Ramp-Up Reserve/Restricted Account						General Reserve							Unpledged Account			
	Beginning Balance	Excess Cash Flow / Actual True Up	Transfers in/ (out) ³	Interest Earnings/Actual True-Up	Release to Revenue Fund	Ending Balance	Beginning Balance	Pledged Account		Draw to Pay			Ending Balance	Beginning Balance	Transfers in/ (out) ⁷	Interest Earnings ⁶	Ending Balance
								Excess CF/ Dep.from Pledged Acct	Transfers at Fin. Close ⁴	Draw to Pay Prior Debt ⁵	Interest Earnings ⁶	Release to Revenue Fund					
2011								24,085,760					24,085,760	-		-	-
2012							24,085,760						24,085,760	-		-	-
2013							24,085,760						24,225,654			-	-
2014							24,225,654				139,894		24,392,592			-	-
2015							24,392,592				166,938		24,512,926			-	-
2016							24,512,926				120,334		24,512,926			-	-
2017		841,115	25,000,000			25,841,115	24,682,636		(26,154,125)		1,471,489		24,682,636			12,097,969	12,097,969
2018	25,841,115	77,916				25,919,031							12,097,969			61,626	12,159,595
2019	25,919,031	745,101				26,664,132							12,159,595			201,164	12,360,759
2020	26,664,132	4,234,287		500,553	(500,553)	31,215,072							12,360,759			366,180	12,726,939
2021	31,215,072	4,889,842	17,220,223	480,074	(480,074)	53,325,137							12,726,939	13,390,837		87,548	26,205,324
2022	53,325,137	310,370		66,664	(66,664)	53,635,508							26,205,324	(3,968,063)		39,572	22,276,833
2023	53,635,508	527,586		571,100	(571,100)	54,163,093							22,276,833			362,746	22,639,579
2024	54,163,093	839,159	(55,002,252)	787,904	(787,904)		55,002,252					55,002,252	22,639,579			501,333	23,140,912
2025		601,689	(601,689)				55,002,252	601,689	(25,000,000)		601,689	(601,689)	30,603,941	25,000,000		1,209,825	49,350,737
2026		2,000,000	(2,000,000)				30,603,941	2,000,000			612,079	(612,079)	32,603,941			987,015	50,337,752
2027		6,284,655	(6,284,655)				32,603,941	6,284,655			652,079	(652,079)	38,888,596			1,006,755	51,344,507
2028		6,531,222	(6,531,222)				38,888,596	6,531,222			777,772	(777,772)	45,419,818			1,026,890	52,371,397
2029		5,272,454	(5,272,454)				45,419,818	5,272,454			908,396	(908,396)	50,692,272			1,047,428	53,418,825
2030		5,787,047	(5,787,047)				50,692,272	5,787,047			1,013,845	(1,013,845)	56,479,319			1,068,377	54,487,202
2031		6,307,220	(6,307,220)				56,479,319	6,307,220			1,129,586	(1,129,586)	62,786,539			1,089,744	55,576,946
2032		6,801,270	(6,801,270)				62,786,539	6,801,270			1,255,731	(1,255,731)	69,587,809			1,111,539	56,688,485
2033		7,258,543	(7,258,543)				69,587,809	7,258,543			1,391,756	(1,391,756)	76,846,352			1,133,770	57,822,254
2034		6,957,574	(6,957,574)				76,846,352	6,957,574			1,536,927	(1,536,927)	83,803,926			1,156,445	58,978,699
2035		6,459,224	(6,459,224)				83,803,926	6,459,224			1,676,079	(1,676,079)	90,263,150			1,179,574	60,158,273
2036		2,000,000	(2,000,000)				90,263,150	2,000,000			1,805,263	(1,805,263)	92,263,150			1,203,165	61,361,439
2037		2,000,000	(2,000,000)				92,263,150	2,000,000			1,845,263	(1,845,263)	94,263,150			1,227,229	62,588,668
2038		2,000,000	(2,000,000)				94,263,150	2,000,000			1,885,263	(1,885,263)	96,263,150			1,251,773	63,840,441
2039		2,000,000	(2,000,000)				96,263,150	2,000,000			1,925,263	(1,925,263)	98,263,150			1,276,809	65,117,250
2040		2,000,000	(2,000,000)				98,263,150	2,000,000			1,965,263	(1,965,263)	100,263,150			1,302,345	66,419,595
2041		15,460,723	(15,460,723)				100,263,150	15,460,723			2,005,263	(2,005,263)	115,723,873			1,328,392	67,747,987
2042		2,000,000	(2,000,000)				115,723,873	2,000,000			2,314,477	(2,314,477)	117,723,873			1,354,960	69,102,947
2043		2,000,000	(2,000,000)				117,723,873	2,000,000			2,354,477	(2,354,477)	119,723,873			1,382,059	70,485,005
2044		2,000,000	(2,000,000)				119,723,873	2,000,000			2,394,477	(2,394,477)	121,723,873			1,409,700	71,894,706
2045		2,000,000	(2,000,000)				121,723,873	2,000,000			2,434,477	(2,434,477)	123,723,873			1,437,894	73,332,600
2046		2,000,000	(2,000,000)				123,723,873	2,000,000			2,474,477	(2,474,477)	125,723,873			1,466,652	74,799,252
2047		2,000,000	(2,000,000)				125,723,873	2,000,000			2,514,477	(2,514,477)	127,723,873			1,495,985	76,295,237
2048		2,535,469	(2,535,469)				127,723,873	2,535,469			2,554,477	(2,554,477)	130,259,342			1,525,905	77,821,141
2049		3,159,666	(3,159,666)				130,259,342	3,159,666			2,605,187	(2,605,187)	133,419,008			1,556,423	79,377,564
2050		3,665,601	(3,665,601)				133,419,008	3,665,601			2,668,380	(2,668,380)	137,084,608			1,587,551	80,965,116
2051		4,386,367	(4,386,367)				137,084,608	4,386,367			2,741,692	(2,741,692)	141,470,976			1,619,302	82,584,418
2052		3,208,033	(3,208,033)				141,470,976	3,208,033			2,829,420	(2,829,420)	144,679,009		(0)	1,651,688	84,236,106
2053		5,955,019	(5,955,019)				144,679,009	5,955,019			2,893,580	(2,893,580)	150,634,028			1,684,722	85,920,828
2054		14,704,154	(14,704,154)				150,634,028	14,704,154			3,012,681	(3,012,681)	165,338,182			1,718,417	87,639,245
2055		16,514,011	(16,514,011)				165,338,182	16,514,011			3,306,764	(3,306,764)	181,852,194			1,752,785	89,392,030
2056		14,443,890	(14,443,890)				181,852,194	14,443,890			3,637,044	(3,637,044)	196,296,084			1,787,841	91,179,870
2057		4,504,055	(4,504,055)				196,296,084	4,504,055			3,925,922	(3,925,922)	200,800,139		(0)	1,823,597	93,003,468
2058		16,284,009	(16,284,009)				200,800,139	16,284,009			4,016,003	(4,016,003)	217,084,148			1,860,069	94,863,537
2059		30,512,333	(30,512,333)				217,084,148	30,512,333			4,341,683	(4,341,683)	247,596,482			1,897,271	96,760,808
2060		36,003,247	(36,003,247)				247,596,482	36,003,247			4,951,930	(4,951,930)	283,599,728			1,935,216	98,696,024
2061		38,240,953	(38,240,953)				283,599,728	38,240,953			5,671,995	(5,671,995)	321,840,682			1,973,920	100,669,945
2062		40,598,964	(40,598,964)				321,840,682	40,598,964			6,436,814	(6,436,814)	362,439,646			2,013,399	102,683,343
2063		43,000,329	(43,000,329)				362,439,646	43,000,329			7,248,793	(7,248,793)	405,439,975			2,053,667	104,737,010
2064		45,413,193	(45,413,193)				405,439,975	45,413,193			8,108,799	(8,108,799)	450,853,167			2,094,740	106,831,750
2065		40,875,426	(40,875,426)				450,853,167	40,875,426			9,017,063	(9,017,063)	491,728,593		(0)	2,136,635	108,968,385
2066		50,530,354	(50,530,354)				491,728,593	50,530,354			9,834,572	(9,834,572)	542,258,947			2,179,368	111,147,753
2067		53,229,211	(53,229,211)				542,258,947	53,229,211			10,845,179	(10,845,179)	595,488,158			2,222,955	113,370,708
2068		56,108,443	(56,108,443)				595,488,158	56,108,443			11,909,763	(11,909,763)	651,596,601			2,267,414	115,638,122
2069		59,862,255	(59,862,255)				651,596,601	59,862,255			13,031,932	(13,031,932)	711,458,856			2,312,762	117,950,885
2070		79,008,163	(79,008,163)				711,458,856	79,008,163			14,229,177	(14,229,177)	790,467,019			2,359,018	120,309,903
2071		103,553,150	(103,553,150)				790,467,019	103,553,150			15,809,340	(15,809,340)	894,020,169			2,406,198	122,716,101
2072		108,587,148	(108,587,148)				894,020,169	108,587,148			17,880,403	(17,880,403)	1,002,607,317			2,454,322	125,170,423
2073		113,792,880	(113,792,880)				1,002,607,317	113,792,880			20,052,146	(20,052,146)	1,116,400,197			2,503	

Financial Model (Monroe Expressway System + Marshville Extension)



Marshville Bypass Tolling Pre-Submittal Assessment (PSA)

1. Average travel time savings in 2050
 - a. Average peak travel time savings in 2050 is approximately 6 minutes.
 - b. Peak travel time in 2050 using US 74 is approximately 11 minutes, compared to 5 minutes using the Marshville Bypass. This seems reasonable as Google Maps estimates peak travel time on US 74 today to fall within 9-12 minutes.
2. Percent diversion for Marshville Bypass 2050
 - a. 65% of trips travel through Marshville in no build scenario and are eligible to divert if Bypass is built.
 - b. Diversion
 - i. Westbound Traffic
 1. 100% of eligible through trips and 5% of local trips use the Bypass if the facility is toll free.
 - ii. Eastbound Traffic
 1. From Monroe Expressway - 100% of eligible through trips and 9% of local trips use the Bypass if the facility is toll free.
 2. From US 74 (west of Monroe Expressway - 75% of eligible through trips (48%) and 7% of local trips use the Bypass if the facility is toll free.
 - c. Tolling the facility results in roughly 40% reduction of travel on the Bypass
 - d. MRM22v1 toll rates for Marshville Bypass assume the same rates as the Monroe Expressway model pricing structure of \$0.16/mile.
 - e. Please note - the MRM22v1.0 diversion curve is approximately 10 years old.
3. Model needs to be run as a free facility.
 - a. See table below.
4. Model numbers on each side of the bypass.
 - a. See table and corresponding map below.

Model Used: MRM22v1.0

- Recommended volume range for 2025 facility with no tolls : 15,000-19,000
- Recommended volume range for 2050 facility with no tolls : 19,000-23,500

Street	ID	Between	2019 Count*	2018 Volume	2025 Volume (No Build)	2050 Volume (No Build)	2025 Volume (No Toll)	2025 Volume (Toll)**	2050 Volume (No Toll)	2050 Volume (Toll)**	
US 74	1	East of Marshville Bypass	External Station	19,980	20,000	21,000	26,500	21,500	21,500	27,000	27,000
	2	West of Marshville Bypass	Marshville	22,140	20,000	23,200	27,900	6,400	15,500	8,000	19,400
	3	Marshville	Monroe Bypass	25,900	20,000	27,200	33,300	11,400	22,600	14,400	28,300
Marshville Bypass	4	US 74	Marshville Interchange				15,100	6,000	19,000	7,600	
	5	Marshville Interchange	US 74/Monroe Bypass				18,600	7,400	23,200	9,300	
Monroe Expressway	6	US 74		10,260	13,000	11,000	13,200	11,000	11,000	13,200	13,200

*2019 NCDOT adjusted AAWT. **Toll rate used in MRM22v1.0 for Monroe Expressway \$0.16/mile.

