



NORTH CAROLINA

**Turnpike Authority**

## **Operations Statistics Report**

Triangle Expressway

### **2017 Second Quarter Report**

April - June

1 S. Wilmington Street  
Raleigh, NC 27601



**Last Updated:  
August 02, 2017**

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## INTRODUCTION

### Purpose

The North Carolina Turnpike Authority (NCTA) presents the operations statistics for the Triangle Expressway during the second quarter (April – June) of 2017. The report includes data related to traffic volumes, customer service center operations, roadway operations, and maintenance. The statistics will allow for future analysis to identify quarterly and annual trends over time, providing a quantifiable method to track performance.

### Project

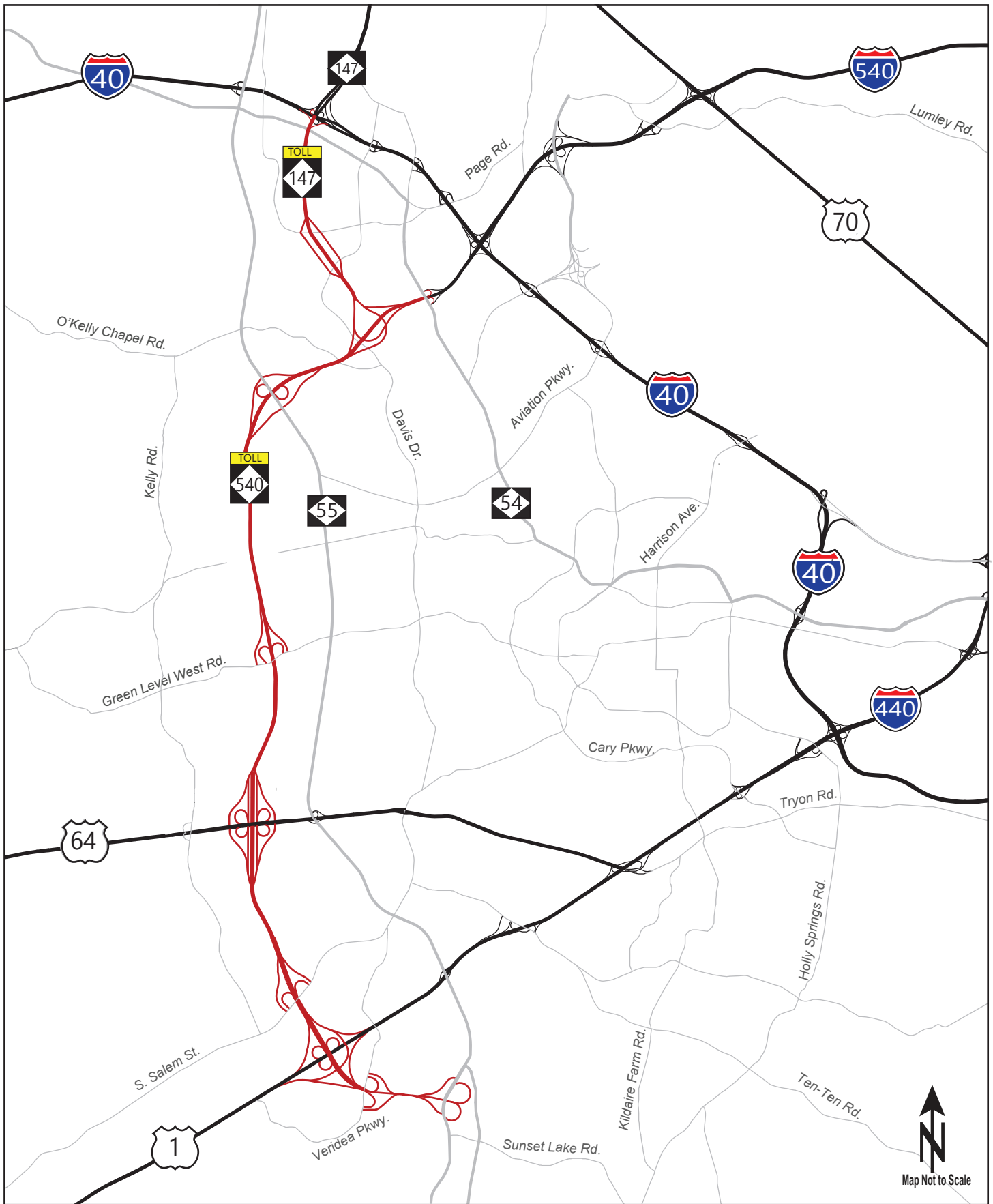
The Triangle Expressway is an 18.8-mile toll road that extends the partially complete “Outer Loop” around the greater Raleigh, North Carolina area from I-40 to NC-55 Bypass. The six-lane, controlled-access toll facility relieves congestion on NC-55 while improving access to the Research Triangle Park by reducing travel times for commuters residing to the south and east. The Triangle Expressway is currently comprised of two sections: Toll NC-147 and Toll NC-540.

Toll NC-147 includes 3.4 miles of toll road between I-40 and Toll NC-540. This section of the Triangle Expressway includes interchanges at Hopson Road, Davis Drive, and NC-540. It opened to toll-free traffic on December 8, 2011; tolling on this section began on January 3, 2012.

Toll NC-540 includes 15.4 miles of toll road between NC-54 in western Cary and the NC-55 Bypass near the Town of Holly Springs. The section from NC-54 to US-64 opened to general traffic (toll-free) on August 1, 2012, and toll collection started on August 2, 2012. This section includes interchanges at NC-54, NC-55, Green Level West Road, and US-64. The section from US-64 to NC-55 Bypass opened to general traffic (toll-free) on December 20, 2012, and toll collection started on January 2, 2013. This section includes interchanges at S. Salem Street, US-1, and NC-55 Bypass. On April 3, 2017, a new interchange at Veridea Parkway was opened in this last section Toll NC-540.

The Triangle Expressway utilizes an all-electronic, non-stop tolling system where there are no toll plazas at which drivers stop and pay cash tolls. Instead, free-flow toll zones are employed where vehicles are detected while traveling at highway speeds. Payments are accepted through an Electronic Toll Collection (ETC) program called NC Quick Pass or a video billing program called Bill by Mail.

NCTA toll zones are located along the Triangle Expressway at mainline and interchange ramp locations. An illustration of the Triangle Expressway can be seen in *Figure 1*.



**Triangle Expressway System Map**

**Figure  
1**

# Traffic Statistics



## TRAFFIC STATISTICS

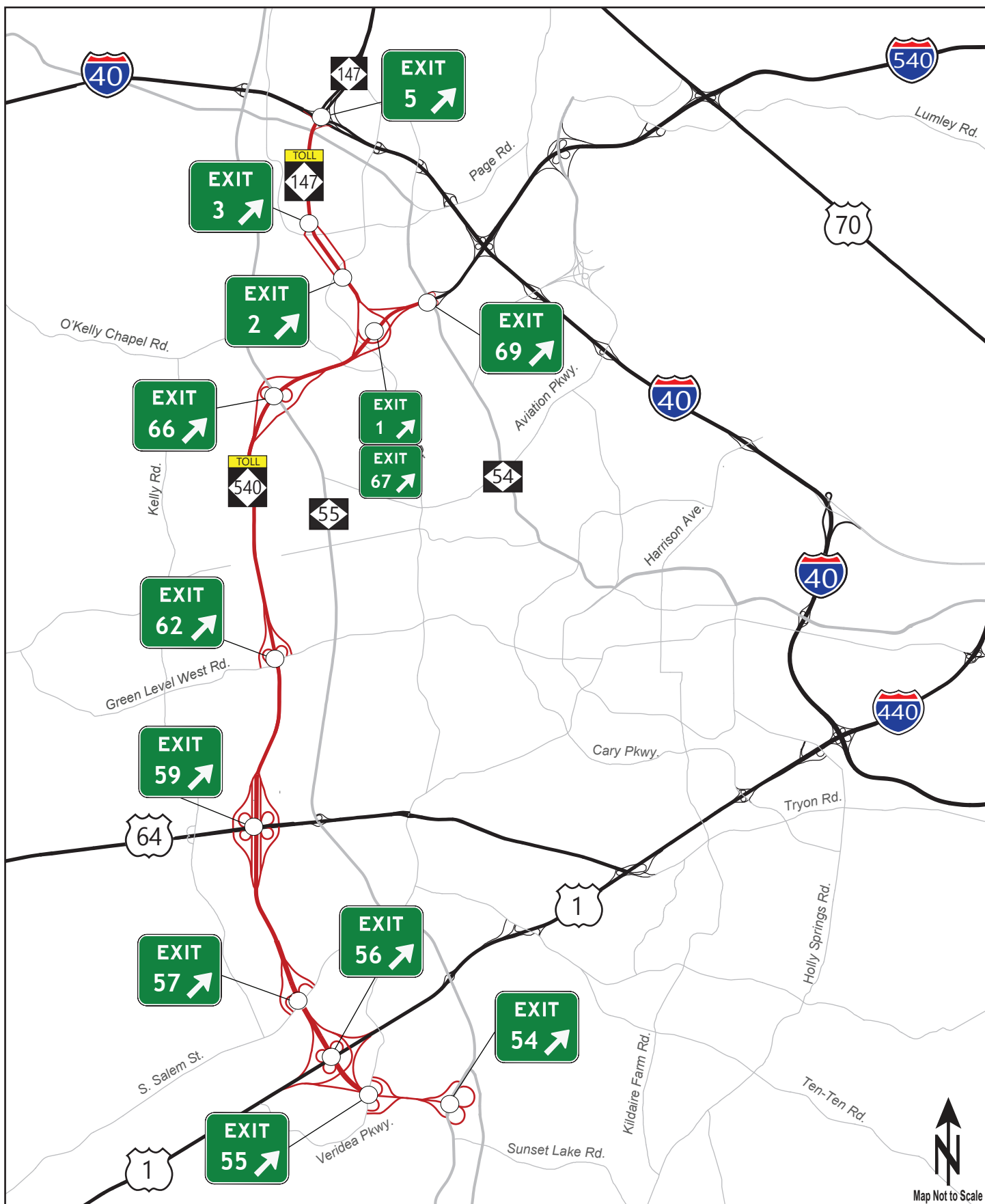
Current and historical traffic data is collected and stored through the use of roadside microwave vehicle detectors (MVD's) installed throughout the Triangle Expressway. The data provides an overview of the roadway's current utilization. The data can also be analyzed to identify trends that could more accurately predict future utilization.

It should be noted that the Triangle Expressway continues to experience a traffic pattern known as "ramp-up." During a ramp-up period, the traffic volumes on a new facility increase at a faster rate than typical growth on existing facilities. Traffic volumes increase significantly as the customers become more familiar with the facility. The ramp-up period for the Triangle Expressway is expected to continue through 2017.

### Average Weekday Traffic (AWT)

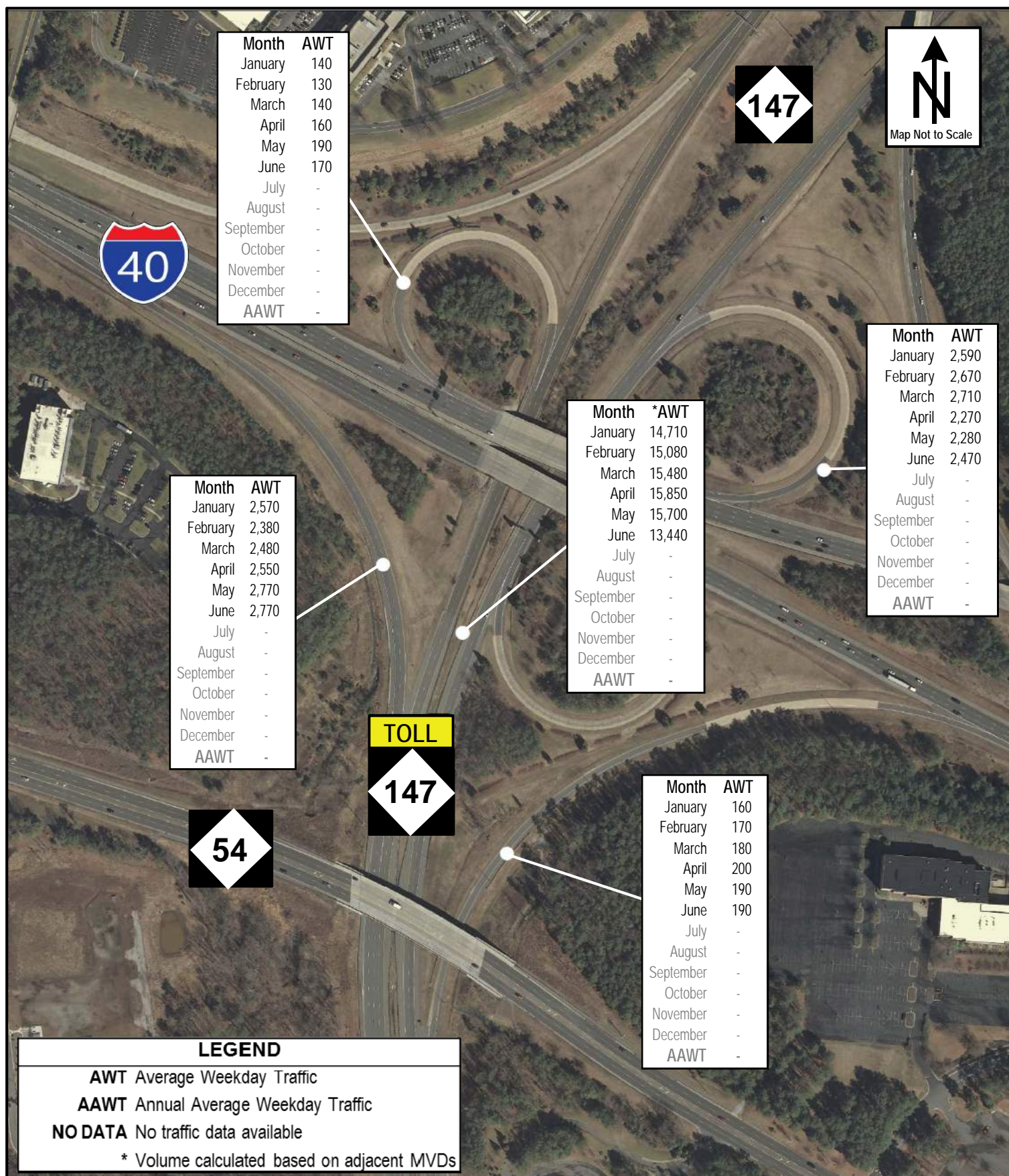
Traffic volume data is collected at all ramps and mainline segments between interchanges. The location of interchanges along the Triangle Expressway can be seen in *Figure 2*. Typically, there is a large difference between peak and off-peak volumes, as well as between weekday and weekend volumes. This gap becomes significantly larger for a tolled facility because it tends to have a much higher percentage of traffic on weekdays during peak hours than non-toll facilities, as there is less of a benefit for toll users during off-peak hours. For this reason, Average Weekday Traffic (AWT) is reported instead of Average Daily Traffic (ADT). AWT is a measure of the average daily traffic collected on a typical Monday through Friday over a designated time period.

*Figures 3 to 14* contain visual representations of AWT along the facility which are representative of NCTA's MVD data. It should be noted that if an MVD fails to provide reliable data (meeting the established threshold) for at least five days in a month then "NO DATA" is reported for that MVD.



**Triangle Expressway Interchange Map**

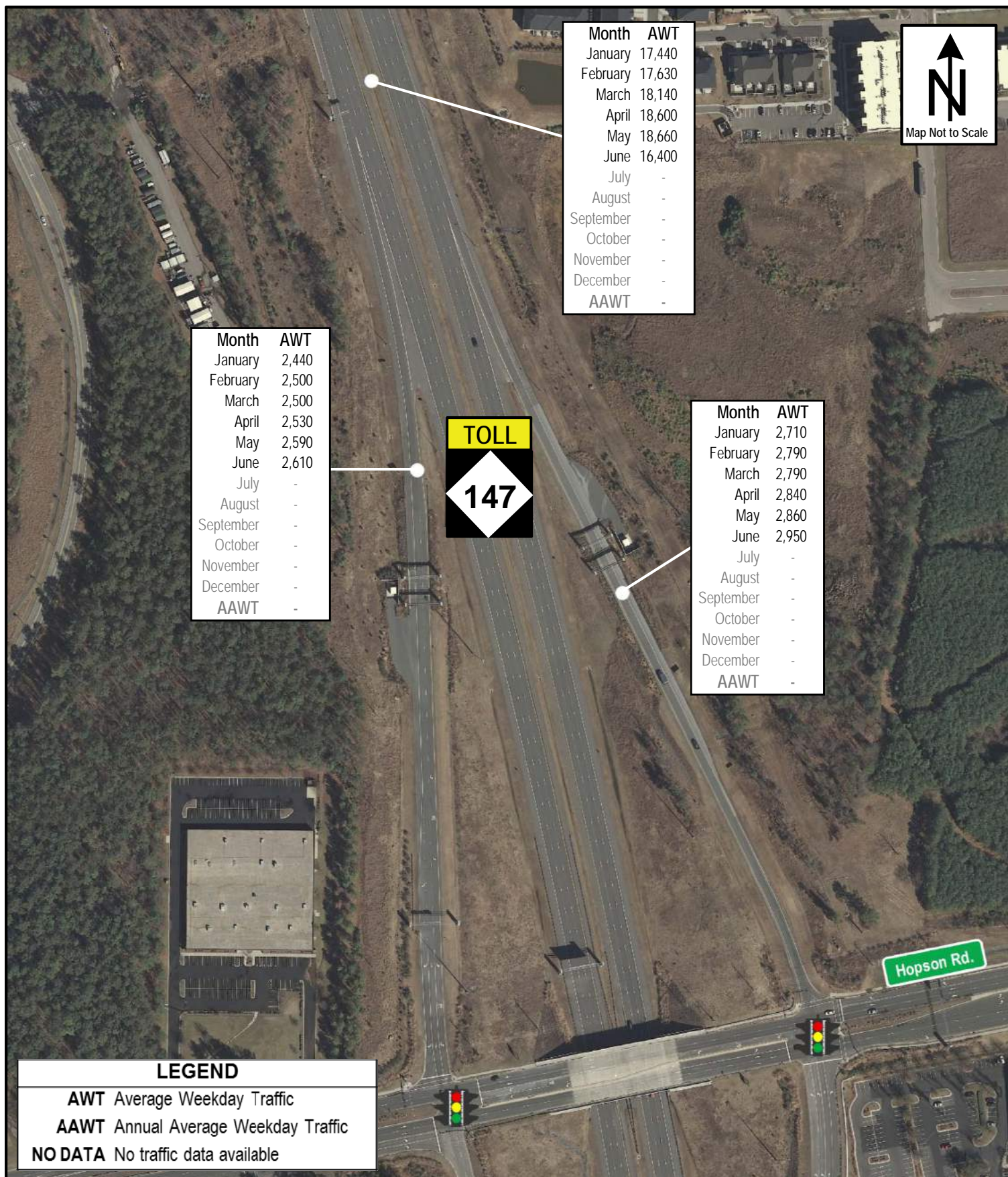
**Figure  
2**



**NC-147 at I-40 Interchange**  
2017 Average Weekday Traffic

**Figure**  
**3**

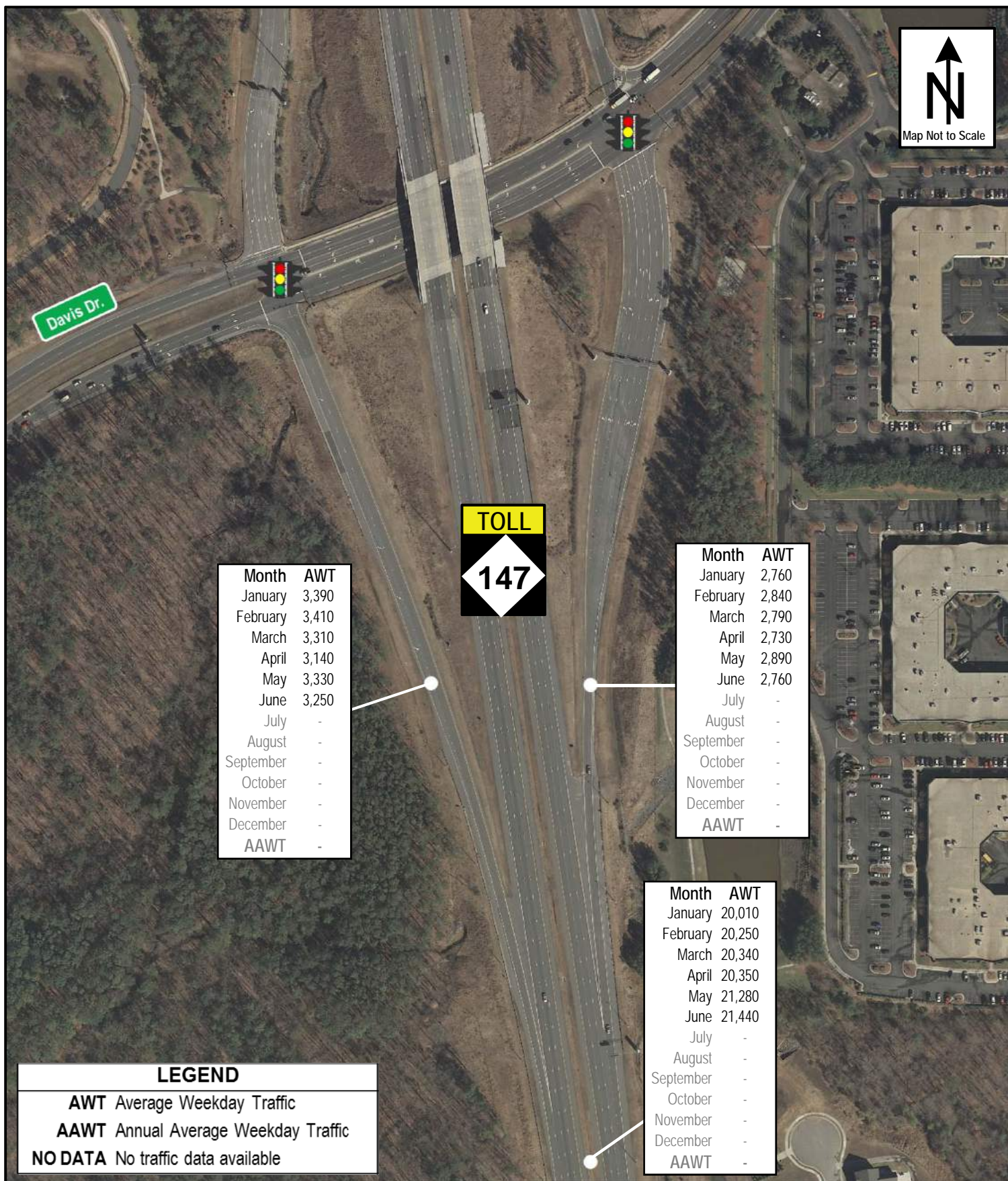




**NC-147 at Hopson Rd. Interchange**  
2017 Average Weekday Traffic

**Figure**  
**4**

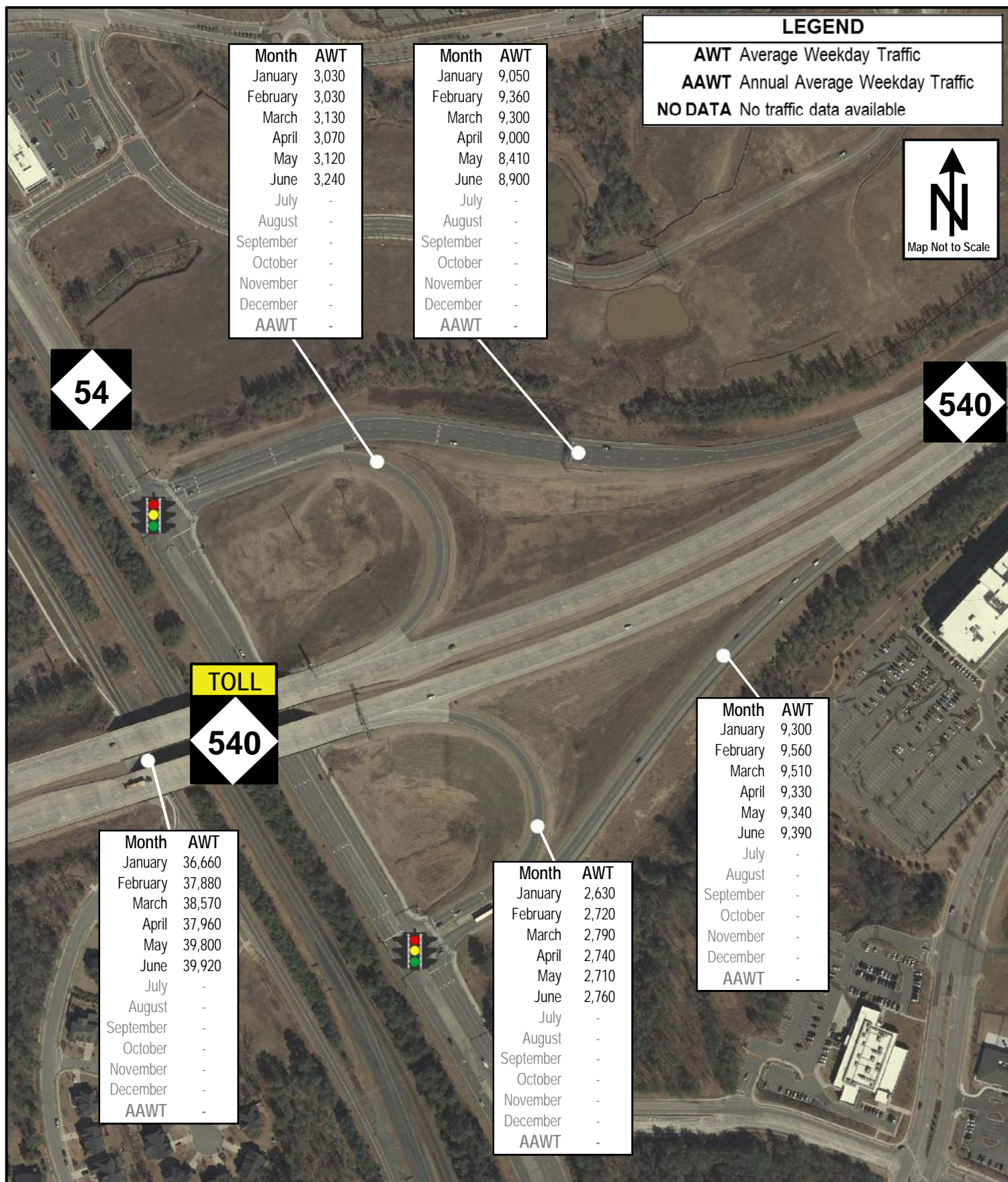




**NC-147 at Davis Dr. Interchange**  
2017 Average Weekday Traffic

**Figure**  
**5**

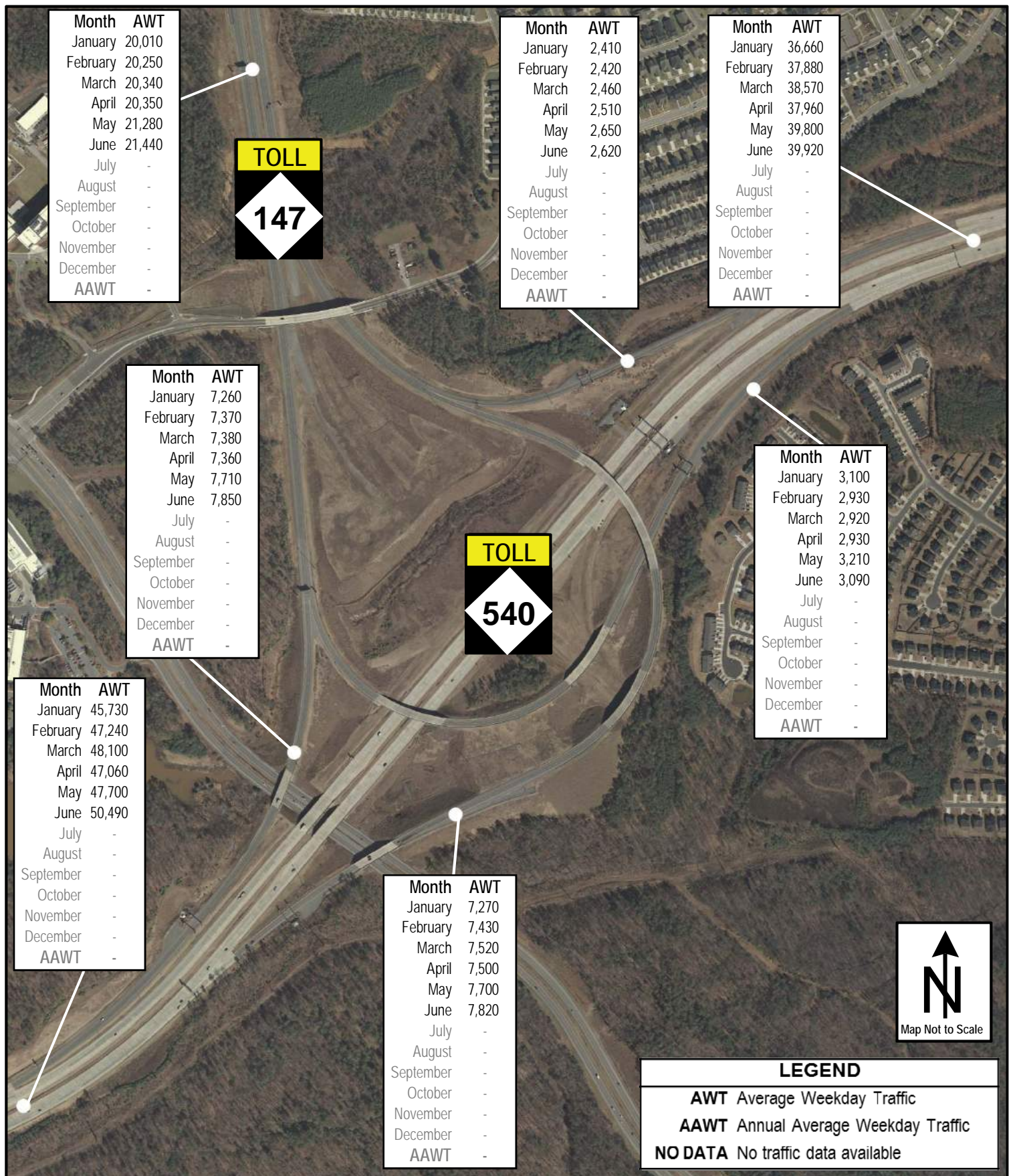




**NC-540 at NC-54 Interchange**  
 2017 Average Weekday Traffic

**Figure**  
**6**

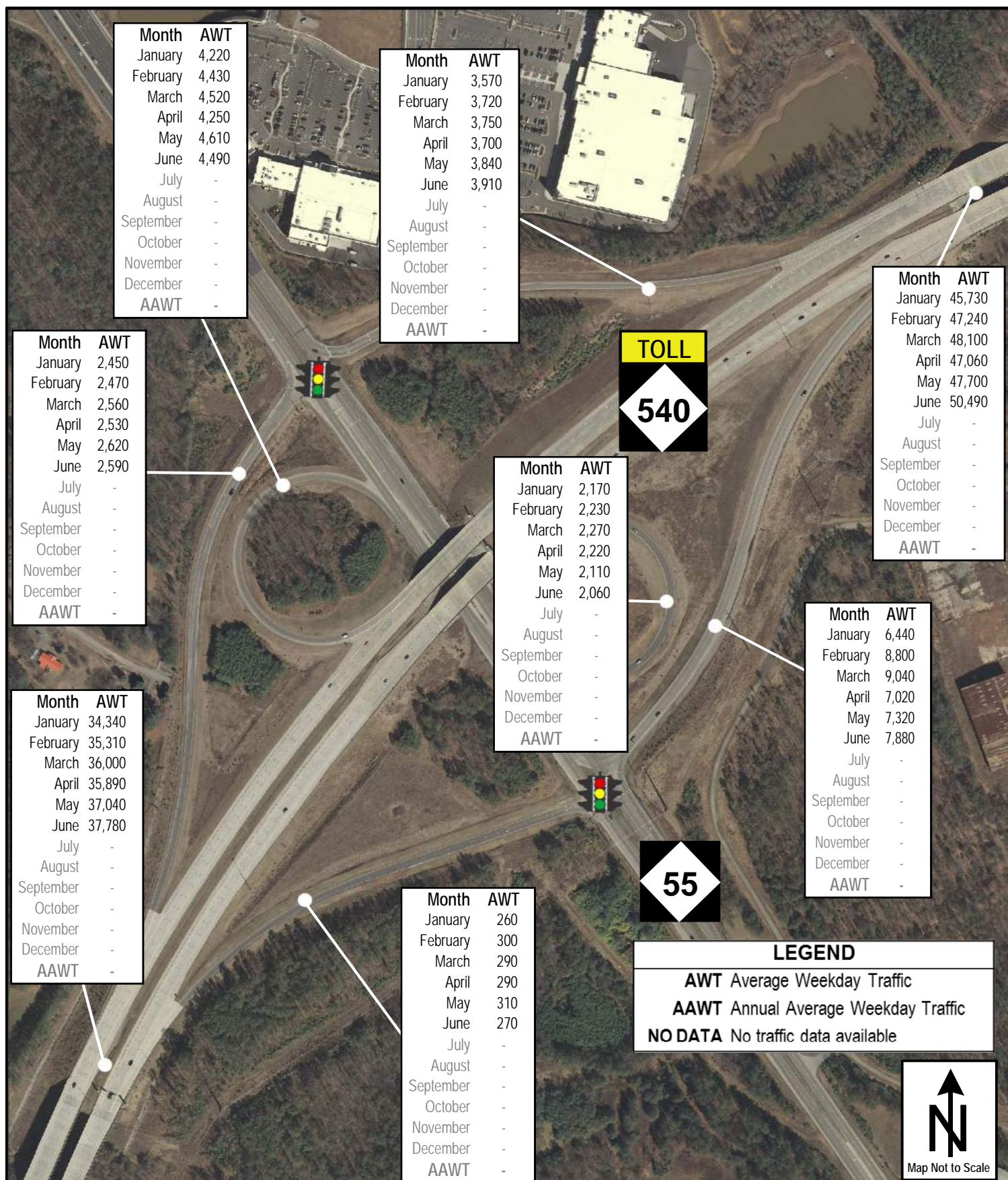




**NC-540 at NC-147 Interchange**  
2017 Average Weekday Traffic

**Figure**  
**7**

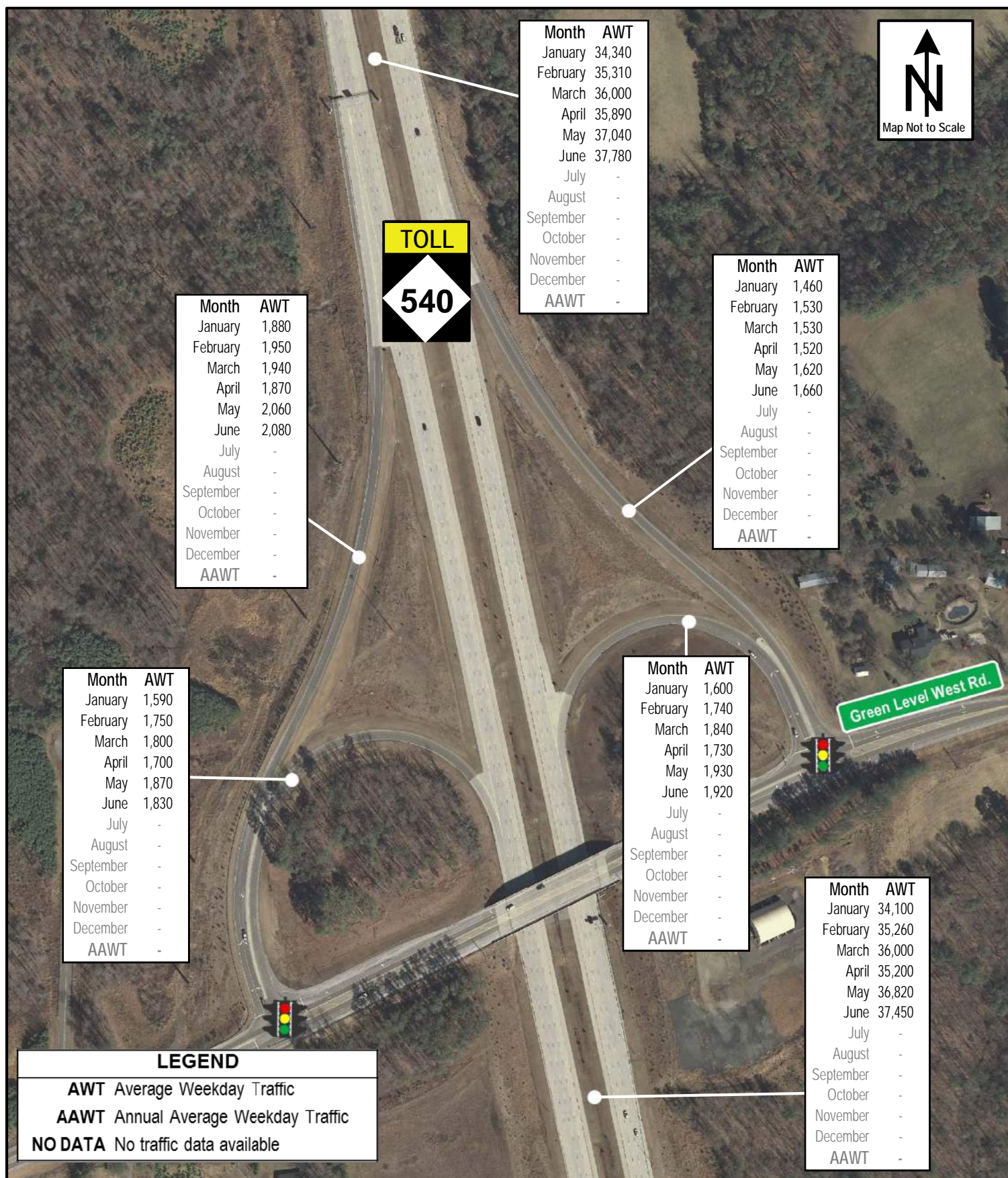




**NC-540 at NC-55 Interchange**  
2017 Average Weekday Traffic

**Figure**  
**8**





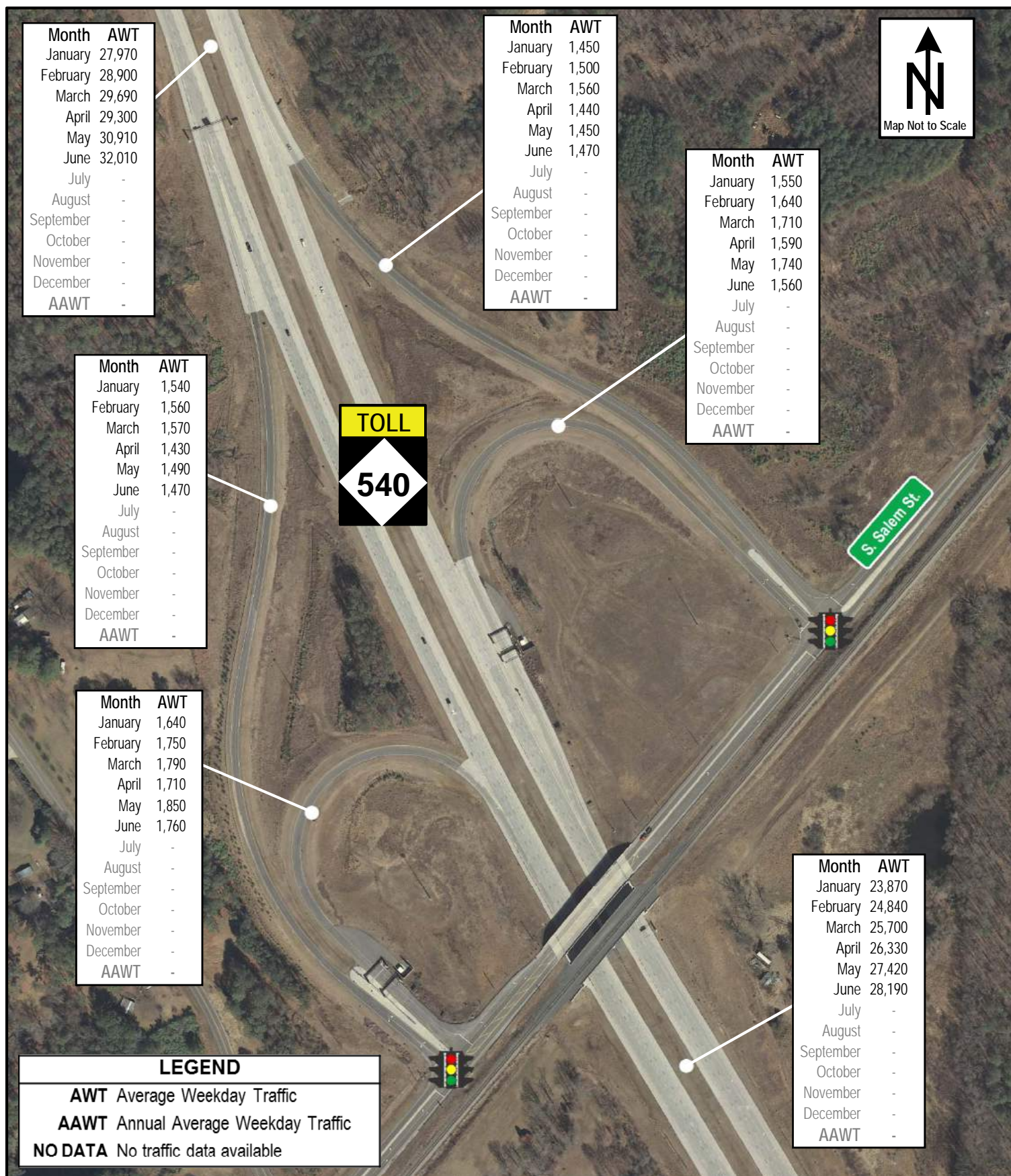
**NC-540 at Green Level West Rd. Interchange**  
2017 Average Weekday Traffic

**Figure**  
**9**





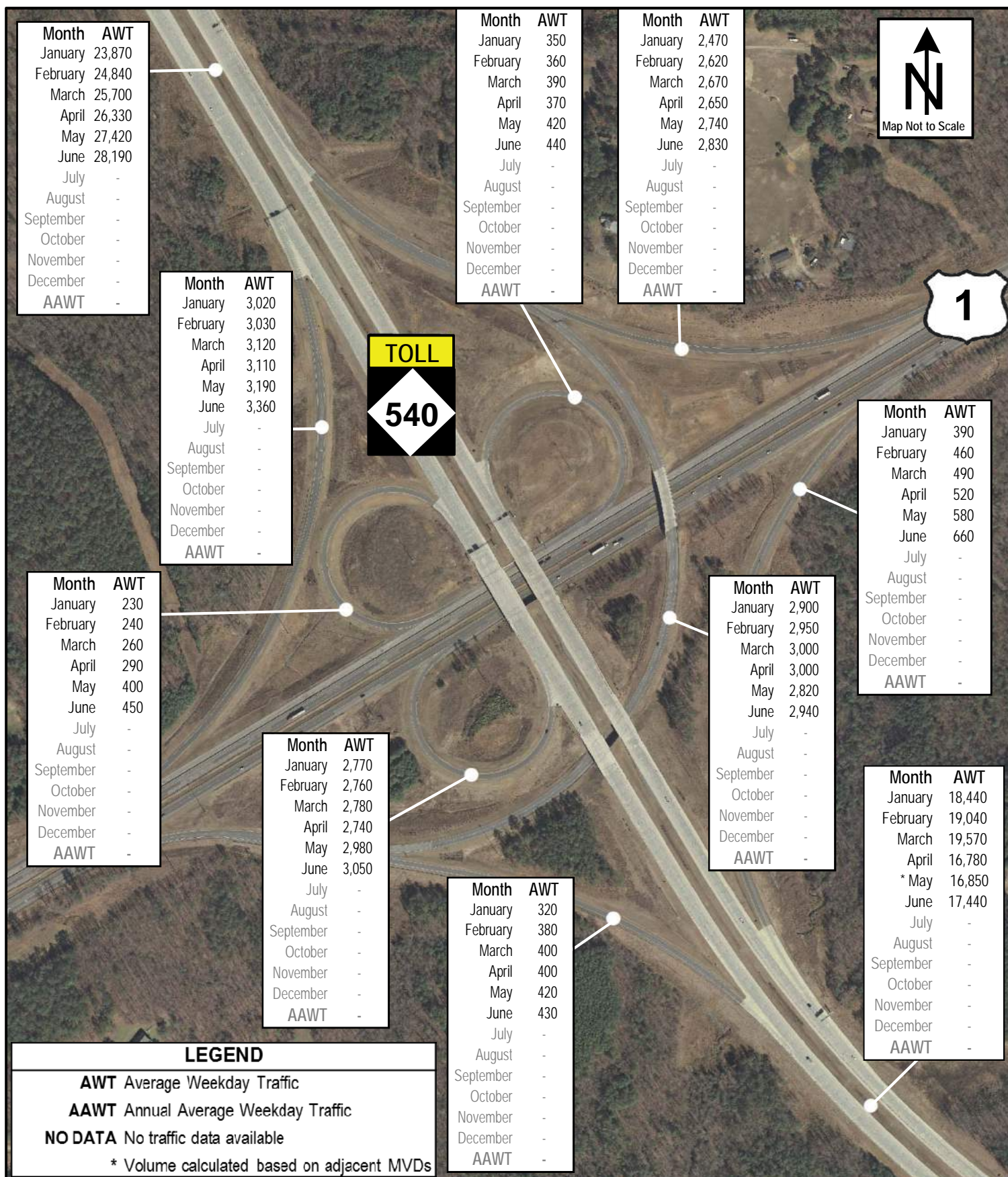




**NC-540 at S. Salem St. Interchange**  
2017 Average Weekday Traffic

**Figure**  
**11**

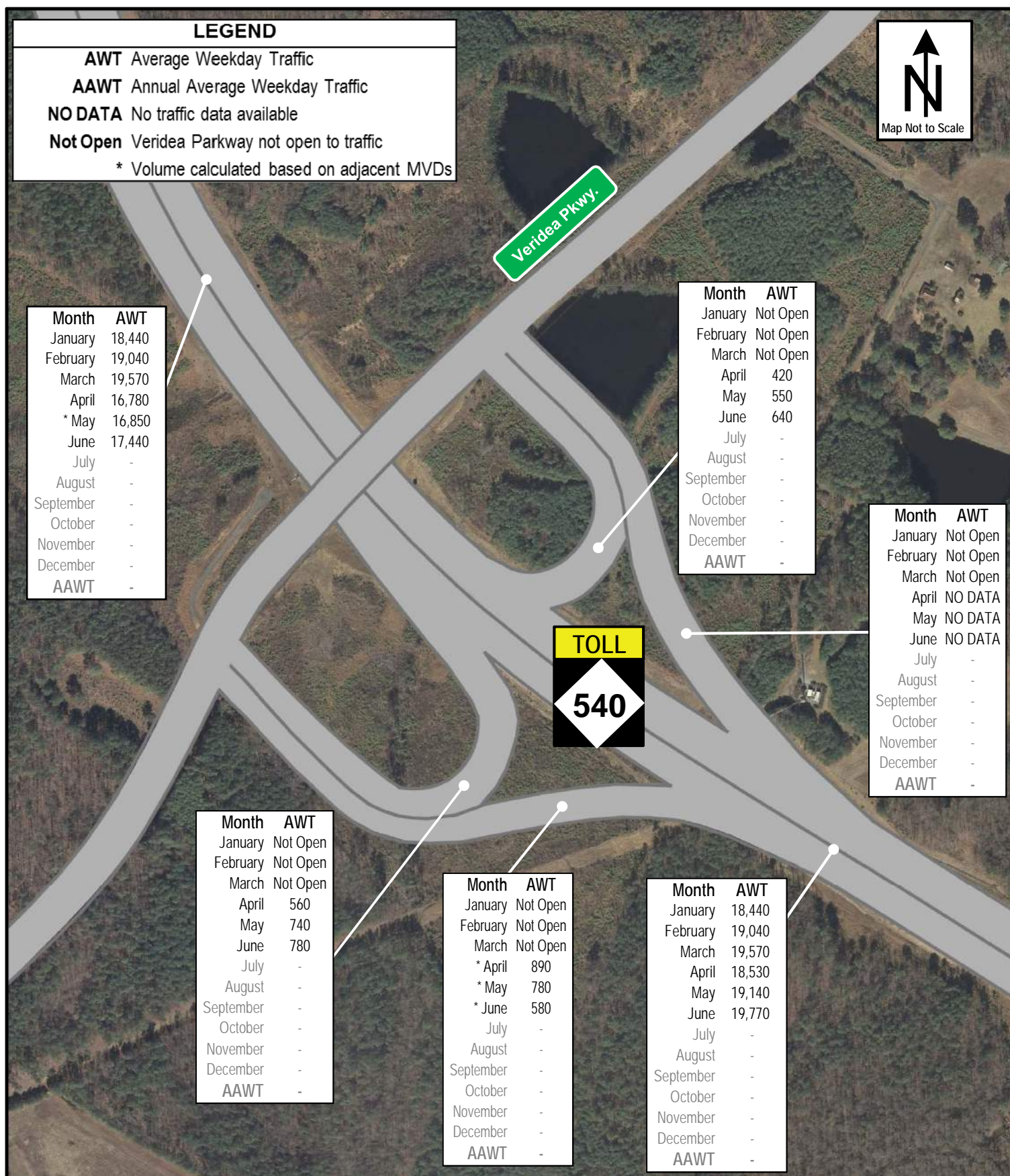




**NC-540 at US-1 Interchange**  
2017 Average Weekday Traffic

**Figure**  
**12**

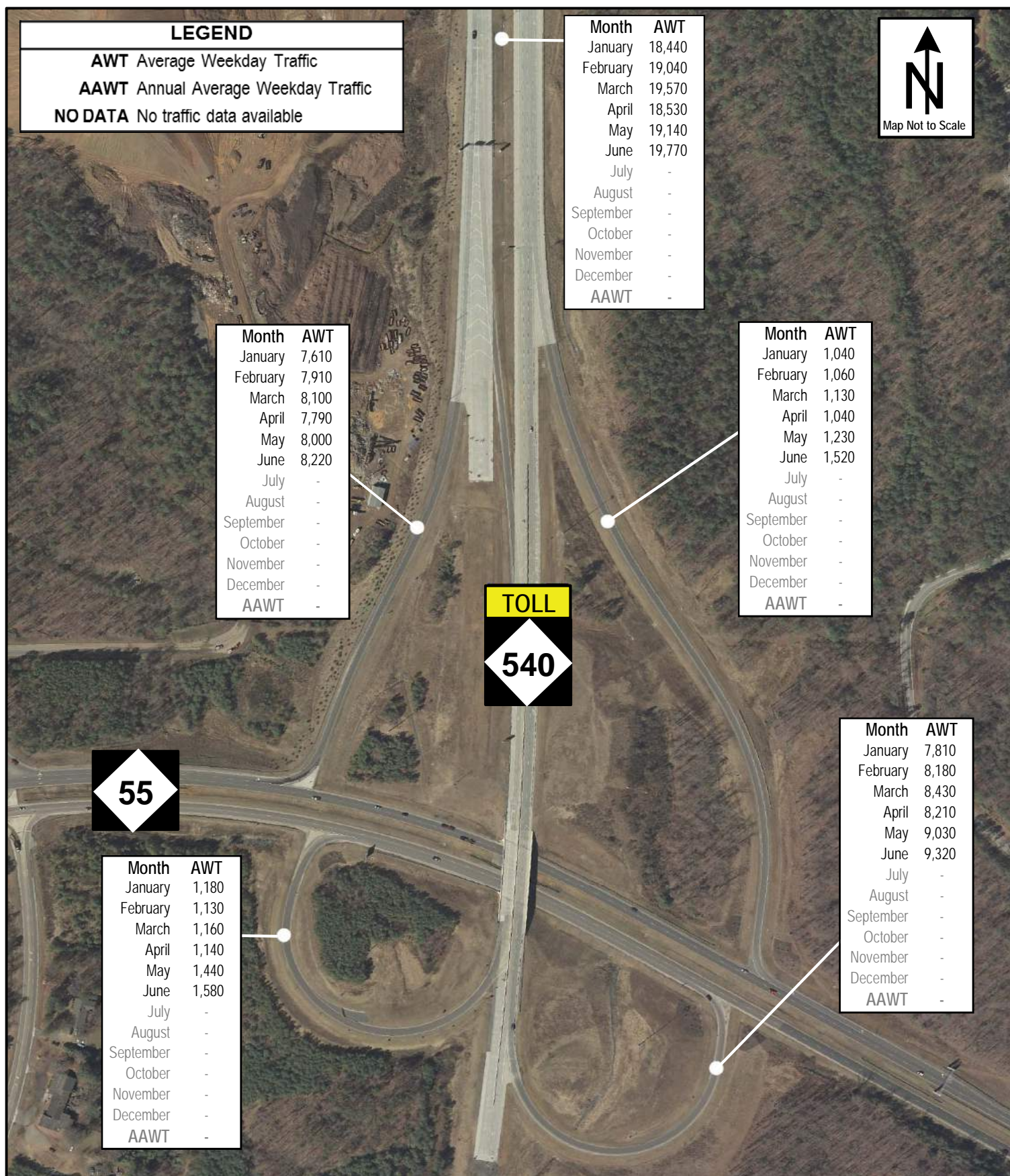




**NC-540 at Veridea Pkwy. Interchange**  
2017 Average Weekday Traffic

**Figure**  
**13**





**NC-540 at NC-55 Bypass Interchange**  
2017 Average Weekday Traffic

**Figure**  
**14**

# **Customer Service Center Operations Statistics**

## CUSTOMER SERVICE CENTER OPERATIONS STATISTICS

The function of the Customer Service Center (CSC) is to provide customer-facing activities such as account management services and customer call and walk-in services. The CSC also provides support services such as mail room, transponder inventory management and fulfillment, financial/banking, accounting and reconciliation, Bill by Mail document quality control (QC), video image review and processing services, and interoperability/reciprocity management with E-ZPass®, SunPass®, and PeachPass®.

Current and historical Triangle Expressway customer service statistics are collected and reported through the NC Quick Pass® CSC, located in Morrisville, NC. These statistics provide an overview of the current toll operations on the facility and identifies any utilization trends. It also allows for comparison of historical and projected data. Transaction data is collected from the toll zones throughout the facility using all-electronic tolling (AET); toll gantries and the roadside toll vaults house the AET equipment.

### Weekly, Monthly and Year-to-Date (YTD) Statistics

The statistics provided in the following section are representative of the entire Triangle Expressway facility. Weekly, monthly, and/or year-to-date (YTD) statistics are presented in the following datasets:

- Customer Calls by Reason
- Payments Processed
- Walk-in Customers
- Transactions
- Classification
- Accounts
- Transponders

It should be noted that the percentages of the total provided in this section might not sum to 100% due to rounding. In addition, weekly statistics are based on weeks starting Monday and ending Sunday.



## Operations Statistics Report for the Triangle Expressway

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### Customer Calls by Reason

This section presents the number of calls handled by customer service representatives (CSRs) from the NC Quick Pass® CSC. The number of calls presented in this section are broken down by pre-determined calling reason categories including Bill by Mail Payment, Bill by Mail Inquiry, NC Quick Pass® Inquiry, Registration Hold Inquiry, Registration Hold Removal, Vehicle/Account Information Update, and License Plate Mismatch Dispute. The Other category encompasses calling reasons other than the pre-determined categories.

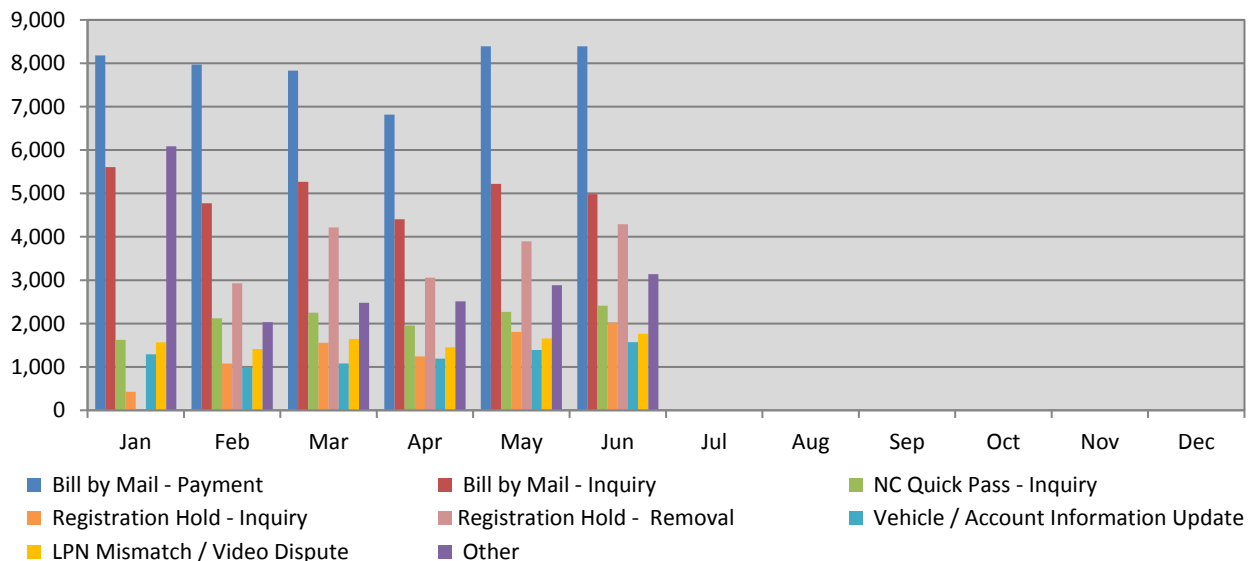
Table 1 presents a summary of the total monthly number of customer calls handled by CSRs, by reason.

**Table 1: NC Quick Pass® CSC Calls by Reason, Second Quarter by Month**

Month	April	May	June
Bill by Mail - Payment	6,815	8,393	8,392
Bill by Mail - Inquiry	4,403	5,220	4,983
NC Quick Pass® - Inquiry	1,954	2,268	2,413
Registration Hold - Inquiry	1,242	1,807	2,021
Registration Hold - Removal	3,059	3,894	4,290
Vehicle / Account Information Update	1,189	1,390	1,569
License Plate Mismatch Dispute	1,451	1,654	1,764
Other	2,513	2,883	3,138
<b>Total</b>	<b>22,626</b>	<b>27,509</b>	<b>28,570</b>

Figure 15 presents the total monthly number of customer calls handled by CSRs during 2017, by reason.

**Figure 15: 2017 NC Quick Pass® CSC Calls by Reason, YTD**



## Payments Processed

This section presents the volume of payments processed by the NC Quick Pass® CSC by payment channel. Payment channels considered in this section include the Web, Call Center, Mail, Interactive Voice Response (IVR), and Walk-in. The Back Office System (BOS) records payment volume based on the number of different revenue types and invoices paid during a given period. For example, if a Bill by Mail invoice including two tolls and one Processing Fee is paid the BOS counts that as two payments, one for tolls and one for Processing Fee, even though only a single payment was received and processed.

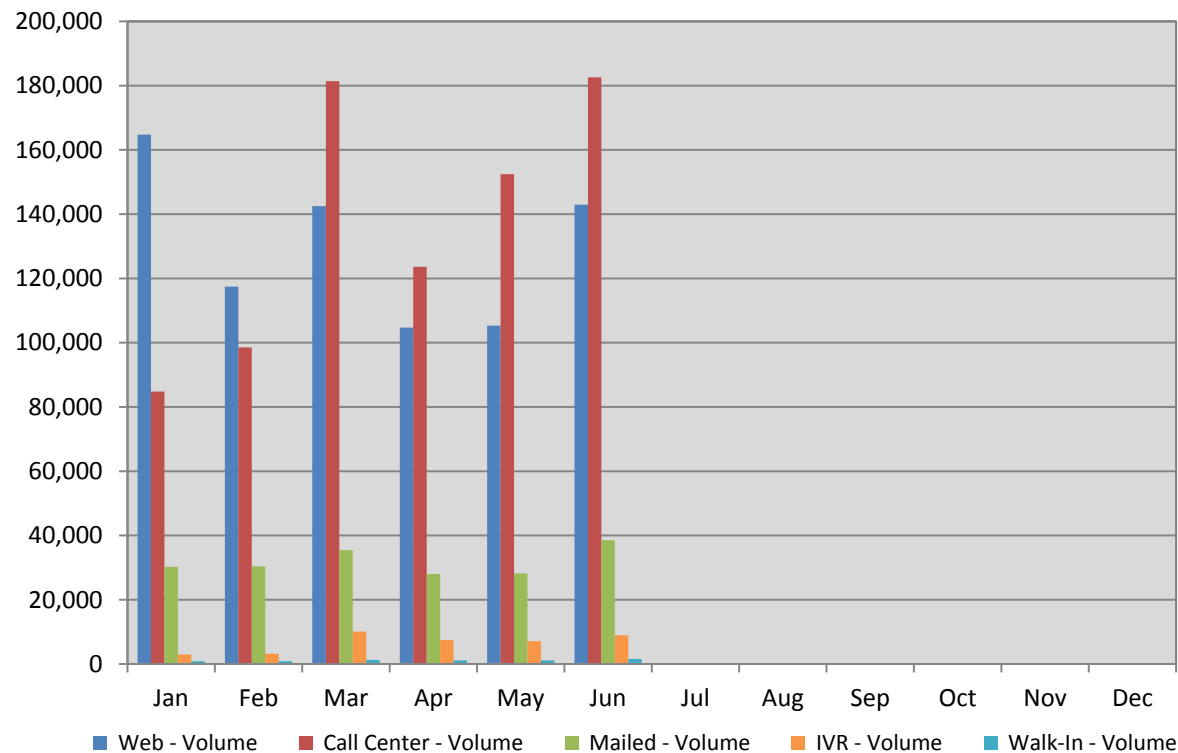
Table 2 presents a summary of the total monthly payments processed by the NC Quick Pass® CSC, by payment channel.

**Table 2: NC Quick Pass® CSC Payments Processed, Second Quarter by Month**

Month	Web Volume	Call Center Volume	Mailed Volume	IVR Volume	Walk-In Volume	Total
April	104,712	123,615	27,996	7,455	1,114	264,892
May	105,275	152,450	28,182	7,104	1,130	294,141
June	142,964	182,563	38,493	8,924	1,554	374,498

Figure 16 presents the total monthly payments processed by the NC Quick Pass® CSC during 2017, by payment channel.

**Figure 16: 2017 NC Quick Pass® CSC Payments Processed by Channel, YTD**



## Walk-in Customers

This section presents the number of customers who visited the NC Quick Pass® CSC Walk-In Center.

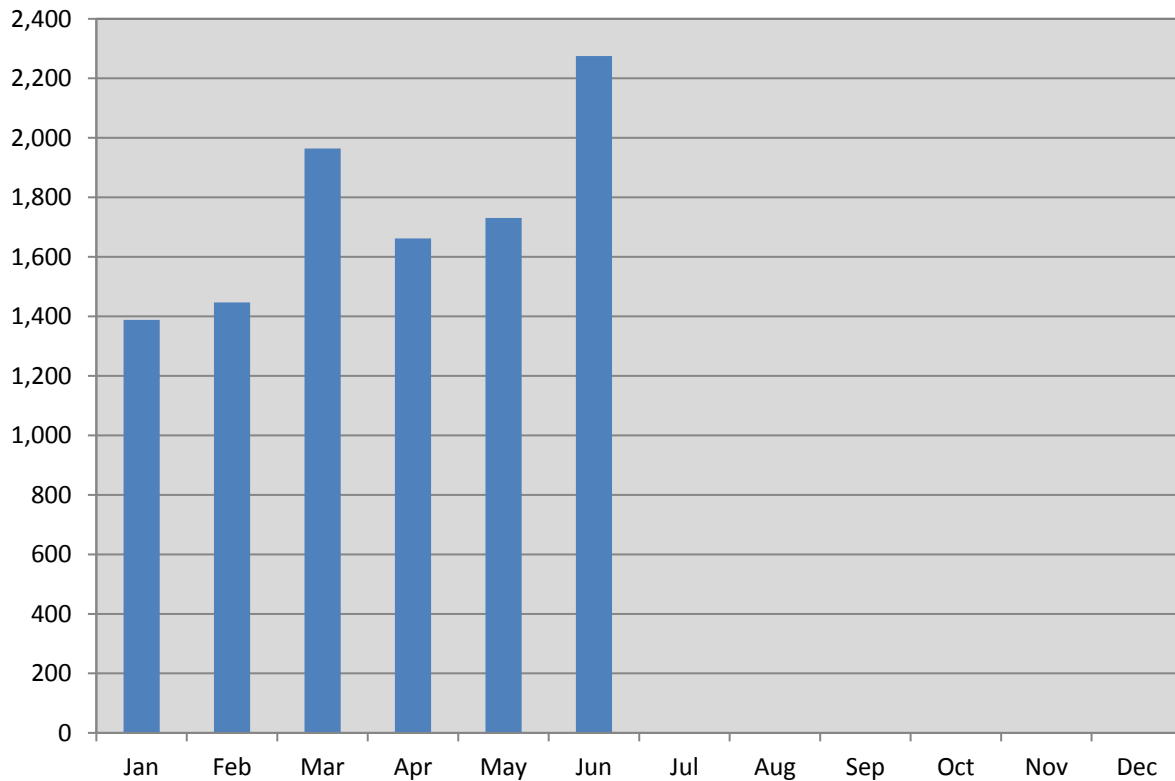
Table 3 presents a summary of the total monthly number of walk-in customers serviced in the NC Quick Pass® CSC Walk-In Center.

**Table 3: NC Quick Pass® CSC Walk-In Customers, Second Quarter by Month**

Month	Number of Walk-In Customers
April	1,662
May	1,731
June	2,275

Figure 17 depicts the number of walk-in customers that were serviced in the NC Quick Pass® CSC Walk-In Center during 2017.

**Figure 17: 2017 NC Quick Pass® CSC Walk-in Customers, YTD**



## Operations Statistics Report for the Triangle Expressway

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### Transactions

This section presents the volume and percentage of North Carolina Quick Pass® (NCQP) users compared to Bill by Mail users. NCQP users have established accounts that are identified using the vehicle's onboard transponder, whereas Bill by Mail users do not have established accounts and are identified using vehicle recognition software.

Table 4 presents a summary of the total weekly transactions for NC Quick Pass® and Bill by Mail users.

**Table 4: Transactions, Second Quarter by Week**

Week Ending	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
4/2/2017 <sup>1</sup>	87,583	51.1%	83,661	48.9%	171,244
4/9/2017	568,918	59.4%	388,673	40.6%	957,591
4/16/2017 <sup>2</sup>	511,774	57.8%	373,883	42.2%	885,657
4/23/2017	578,438	58.9%	404,087	41.1%	982,525
4/30/2017	582,673	59.5%	397,253	40.5%	979,926
5/7/2017	583,887	59.4%	399,619	40.6%	983,506
5/14/2017	595,540	58.9%	415,704	41.1%	1,011,244
5/21/2017	596,271	58.4%	425,591	41.6%	1,021,862
5/28/2017	562,497	58.9%	392,337	41.1%	954,834
6/4/2017 <sup>3</sup>	531,098	58.1%	383,626	41.9%	914,724
6/11/2017	595,376	58.6%	421,456	41.4%	1,016,832
6/18/2017	578,855	58.3%	413,698	41.7%	992,553
6/25/2017	567,604	58.6%	400,966	41.4%	968,570
6/30/2017 <sup>4</sup>	495,260	59.4%	339,066	40.6%	834,326

<sup>1</sup> Week ending consists of two days of data

<sup>2</sup> Week ending includes Good Friday

<sup>3</sup> Week ending includes Memorial Day

<sup>4</sup> Week ending consists of five days of data

Table 5 presents a summary of the total monthly transactions for NC Quick Pass® and Bill by Mail users.

**Table 5: Transactions, Second Quarter by Month**

Month	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
April	2,329,386	58.6%	1,647,557	41.4%	3,976,943
May	2,577,072	58.9%	1,794,914	41.1%	4,371,986
June	2,529,316	58.5%	1,797,149	41.5%	4,326,465

## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

Figure 18 presents the total monthly transactions and NC Quick Pass® utilization during 2017.

**Figure 18: 2017 Transactions, YTD**

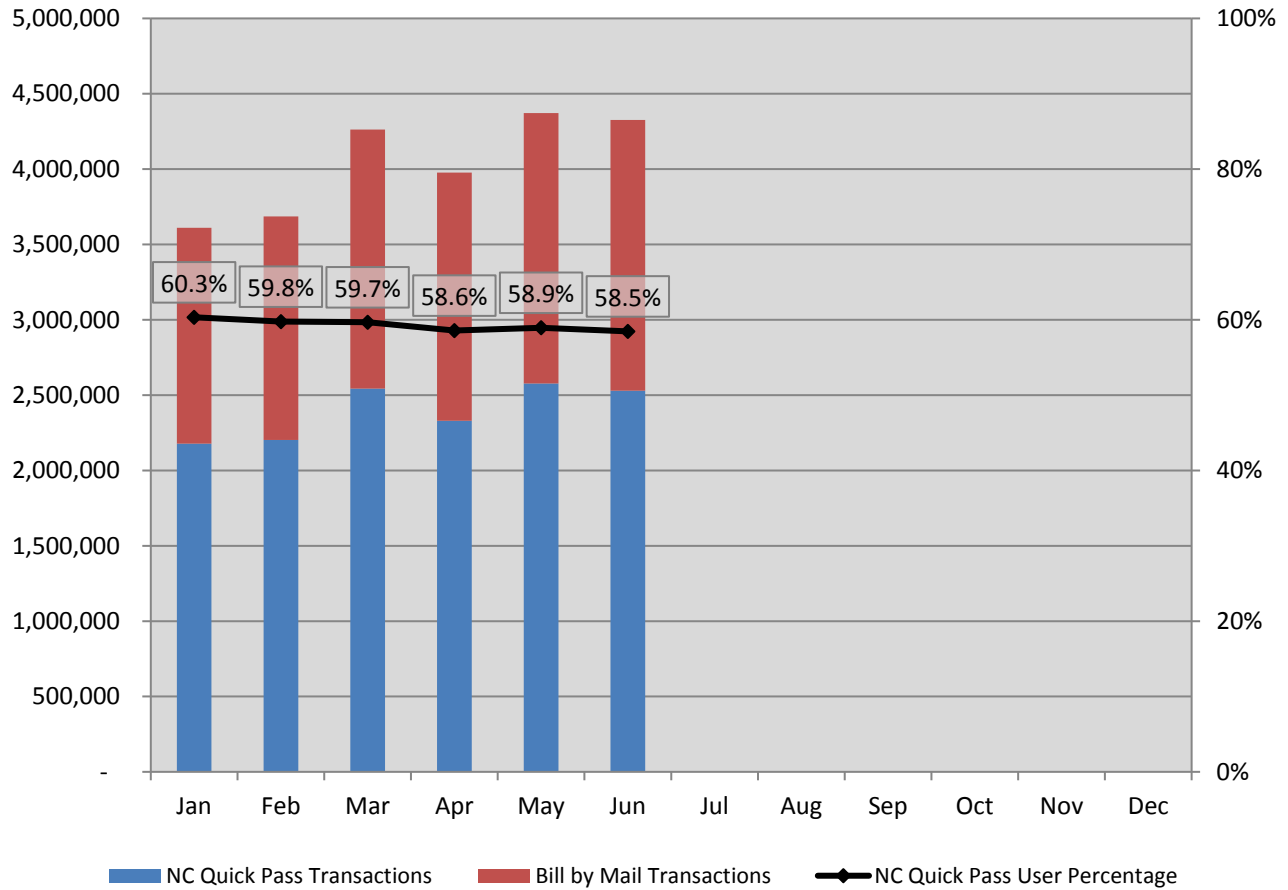


Table 6 presents a summary of the total NC Quick Pass® and Bill by Mail transactions, by year. Project to date is the total number of transactions since opening the facility to toll traffic.

**Table 6: Transactions, by Year**

Year	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
2012	2,803,043	49.2%	2,892,496	50.8%	5,695,539
2013	13,249,972	57.5%	9,792,975	42.5%	23,042,947
2014	17,733,089	58.1%	12,802,237	41.9%	30,535,326
2015	22,083,270	57.6%	16,235,360	42.4%	38,318,630
2016	26,360,672	58.3%	18,883,195	41.7%	45,243,867
2017 <sup>1</sup>	14,359,388	59.3%	9,874,010	40.7%	24,233,398
<b>Project to Date</b>	<b>96,589,434</b>	<b>57.8%</b>	<b>70,480,273</b>	<b>42.2%</b>	<b>167,069,707</b>

<sup>1</sup>2017 transactions reported include six months of data (January – June).

## Operations Statistics Report for the Triangle Expressway

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### Classification

This section presents the volume and percentage of users based on classification. The classification system used by NCTA includes three classes, determined by the vehicle's number of axles.

Table 7 presents a summary of the total weekly transactions for Class 1 (2-axle), Class 2 (3-axle), and Class 3 (4+axle) vehicles.

**Table 7: Classification, Second Quarter by Week**

Week Ending	Class 1 (2-axle)			Class 2 (3-axle)			Class 3 (4+axle)	
	Transactions	% of Total		Transactions	% of Total		Transactions	% of Total
4/2/2017 <sup>1</sup>	167,817	98.0%		1,374	0.8%		2,053	1.2%
4/9/2017	921,270	96.2%		11,790	1.2%		24,531	2.6%
4/16/2017 <sup>2</sup>	848,551	95.8%		12,528	1.4%		24,578	2.8%
4/23/2017	943,407	96.0%		13,193	1.3%		25,925	2.6%
4/30/2017	948,076	96.7%		10,194	1.0%		21,656	2.2%
5/7/2017	943,138	95.9%		13,573	1.4%		26,795	2.7%
5/14/2017	972,446	96.2%		12,643	1.3%		26,155	2.6%
5/21/2017	980,197	95.9%		13,961	1.4%		27,704	2.7%
5/28/2017	922,596	96.6%		10,571	1.1%		21,667	2.3%
6/4/2017 <sup>3</sup>	879,128	96.1%		11,940	1.3%		23,656	2.6%
6/11/2017	977,524	96.1%		12,848	1.3%		26,460	2.6%
6/18/2017	951,965	95.9%		13,256	1.3%		27,332	2.8%
6/25/2017	932,715	96.3%		11,706	1.2%		24,149	2.5%
6/30/2017 <sup>4</sup>	795,773	95.4%		12,409	1.5%		26,144	3.1%

<sup>1</sup> Week ending consists of two days of data

<sup>2</sup> Week ending includes Good Friday

<sup>3</sup> Week ending includes Memorial Day

<sup>4</sup> Week ending consists of five days of data

Table 8 presents a summary of the total monthly transactions by classification.

**Table 8: Classification, Second Quarter by Month**

Month	Class 1 (2-axle)			Class 2 (3-axle)			Class 3 (4+axle)	
	Transactions	% of Total		Transactions	% of Total		Transactions	% of Total
April	3,829,121	96.3%		49,079	1.2%		98,743	2.5%
May	4,203,697	96.2%		55,573	1.3%		112,716	2.6%
June	4,151,785	96.0%		57,334	1.3%		117,346	2.7%

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Figure 19 presents the total monthly percentage of transactions during 2017 for Class 1 (2-axle), Class 2 (3-axle), and Class 3 (4+axle) vehicles.

**Figure 19: 2017 Classification, Percentage YTD**

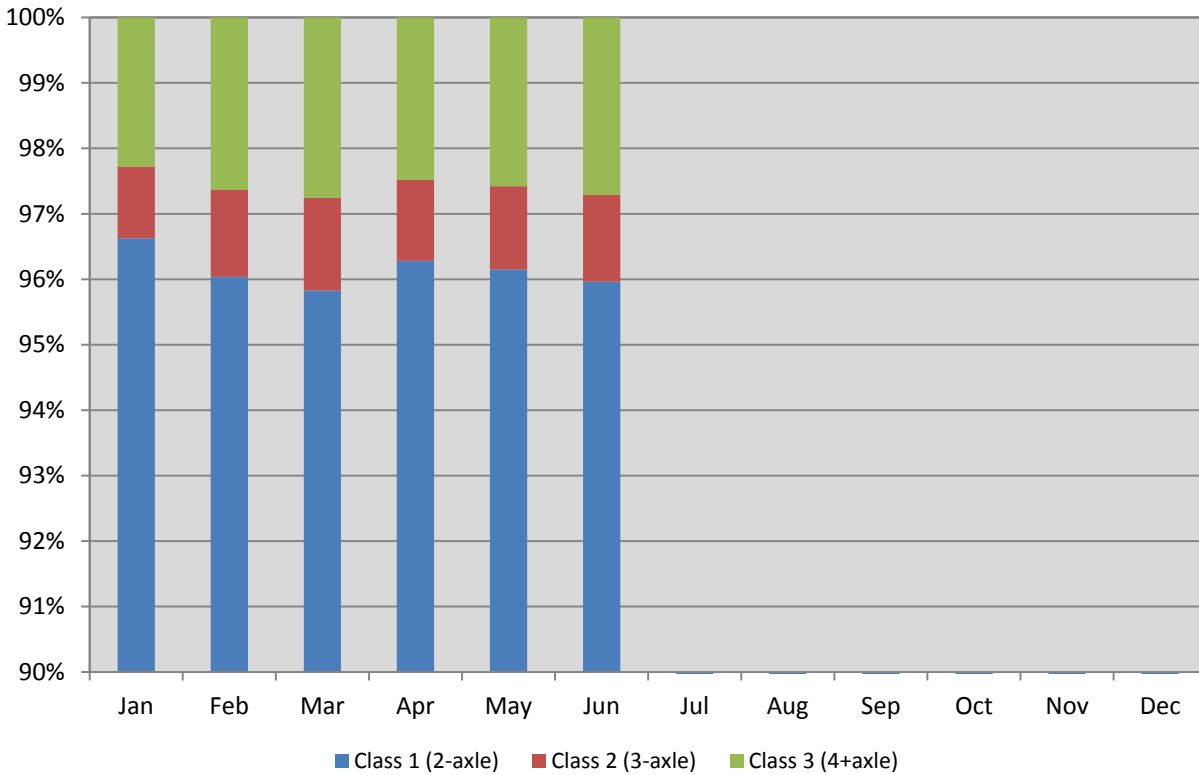


Table 9 presents a summary of the total transactions for Class 1 (2-axle), Class 2 (3-axle), and Class 3 (4+axle) vehicles, by year. Project to date is the total number of transactions since opening the facility to toll traffic.

**Table 9: Classification, by Year**

Year	Class 1 (2-axle)		Class 2 (3-axle)		Class 3 (4+axle)	
	Transactions	% of Total	Transactions	% of Total	Transactions	% of Total
2012	5,562,061	97.7%	46,935	0.8%	86,543	1.5%
2013	22,282,351	96.7%	267,558	1.2%	493,038	2.1%
2014	29,530,077	96.7%	355,721	1.2%	649,528	2.1%
2015	37,050,375	96.7%	426,656	1.1%	841,599	2.2%
2016	43,567,844	96.3%	566,221	1.3%	1,109,803	2.5%
2017 <sup>1</sup>	23,297,029	96.1%	310,889	1.3%	625,480	2.6%
<b>Project to Date</b>	<b>161,289,737</b>	<b>96.5%</b>	<b>1,973,980</b>	<b>1.2%</b>	<b>3,805,991</b>	<b>2.3%</b>

<sup>1</sup>2017 transactions reported include six months of data (January – June).

## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

### Accounts

The statistics provided in this section outline the volume of accounts established and managed by the NC Quick Pass® CSC.

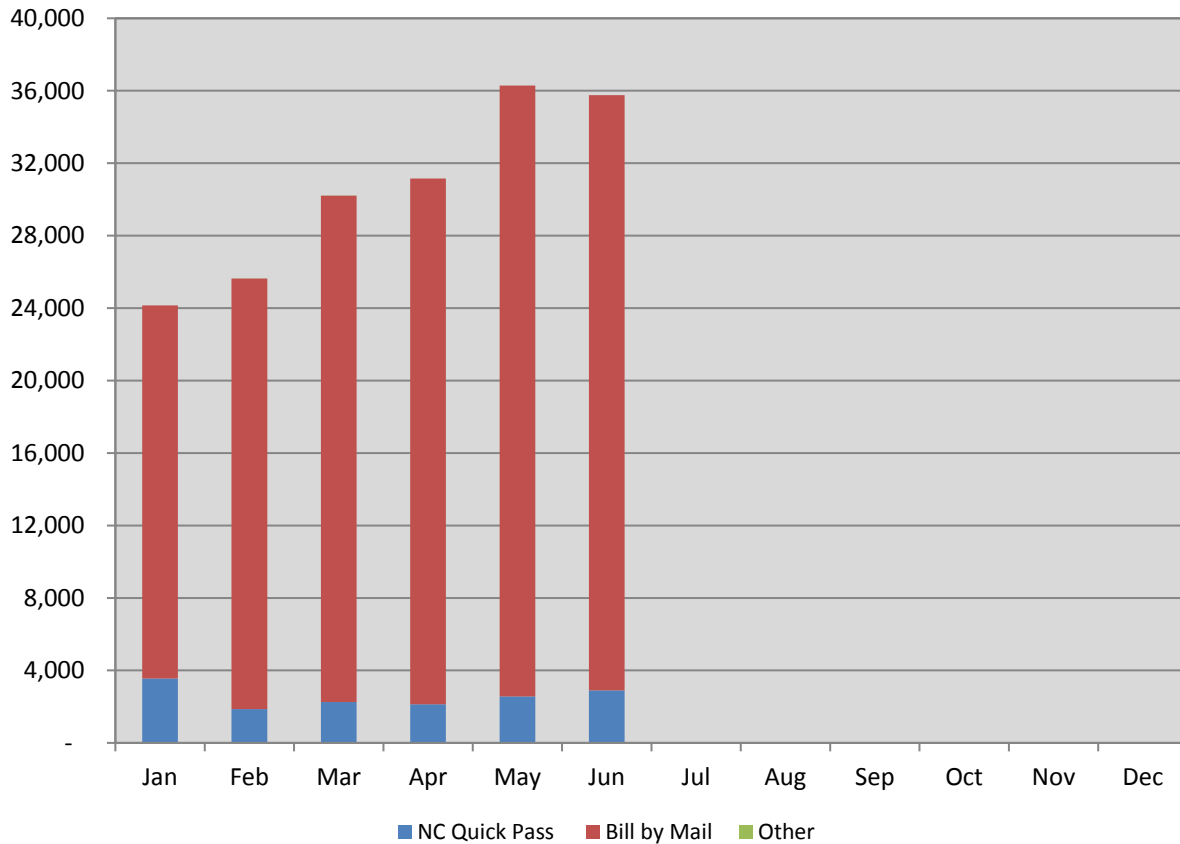
Table 10 presents a summary of the monthly established accounts being managed by the NC Quick Pass® CSC. Numbers presented in parentheses represent a reduction in accounts.

**Table 10: Established Accounts, Second Quarter by Month**

Month	NC Quick Pass®	Bill by Mail	Registered Video	Non-Revenue	Government	Total
April	2,131	29,026	0	0	(1)	<b>31,156</b>
May	2,560	33,724	0	0	0	<b>36,284</b>
June	2,901	32,852	0	0	0	<b>35,753</b>

Figure 20 presents the monthly established accounts managed by the NC Quick Pass® CSC during 2017. The “Other” category includes registered video, non-revenue, and government accounts.

**Figure 20: 2017 Established Accounts, YTD**





## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

*Table 11* presents a summary of the total established accounts managed by the NC Quick Pass® CSC, by year. Project to date is the total number of accounts established since project opening. Numbers presented in parentheses represent a reduction in accounts.

**Table 11: Established Accounts, by Year**

Year	NC Quick Pass®	Bill by Mail	Registered Video	Non-Revenue	Government	Total
2012	27,179	359,431	5	38	18	386,671
2013	24,268	306,581	(1)	19	9	330,876
2014	18,652	342,476	2	13	3	361,146
2015	24,222	380,897	0	4	0	405,123
2016	31,358	348,654	1	4	0	380,017
2017 <sup>1</sup>	15,271	167,913	1	3	(1)	183,187
<b>Project to Date</b>	<b>140,950</b>	<b>1,905,952</b>	<b>8</b>	<b>81</b>	<b>29</b>	<b>2,047,020</b>

<sup>1</sup>2017 established accounts reported include six months of data (January – June).

## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

### Transponders

This section presents the volume of transponders sold.

Table 12 presents a summary of the total transponders sold, by month.

**Table 12: Transponders Sold, Second Quarter by Month**

Month	Sticker Transponder	Hard Case Transponder	Exterior Transponder	Total
April	2,459	2,179	60	4,698
May	2,898	2,687	77	5,662
June	2,839	3,225	84	6,148

Figure 21 presents monthly transponders sold during 2017.

**Figure 21: 2017 Transponders Sold, YTD**

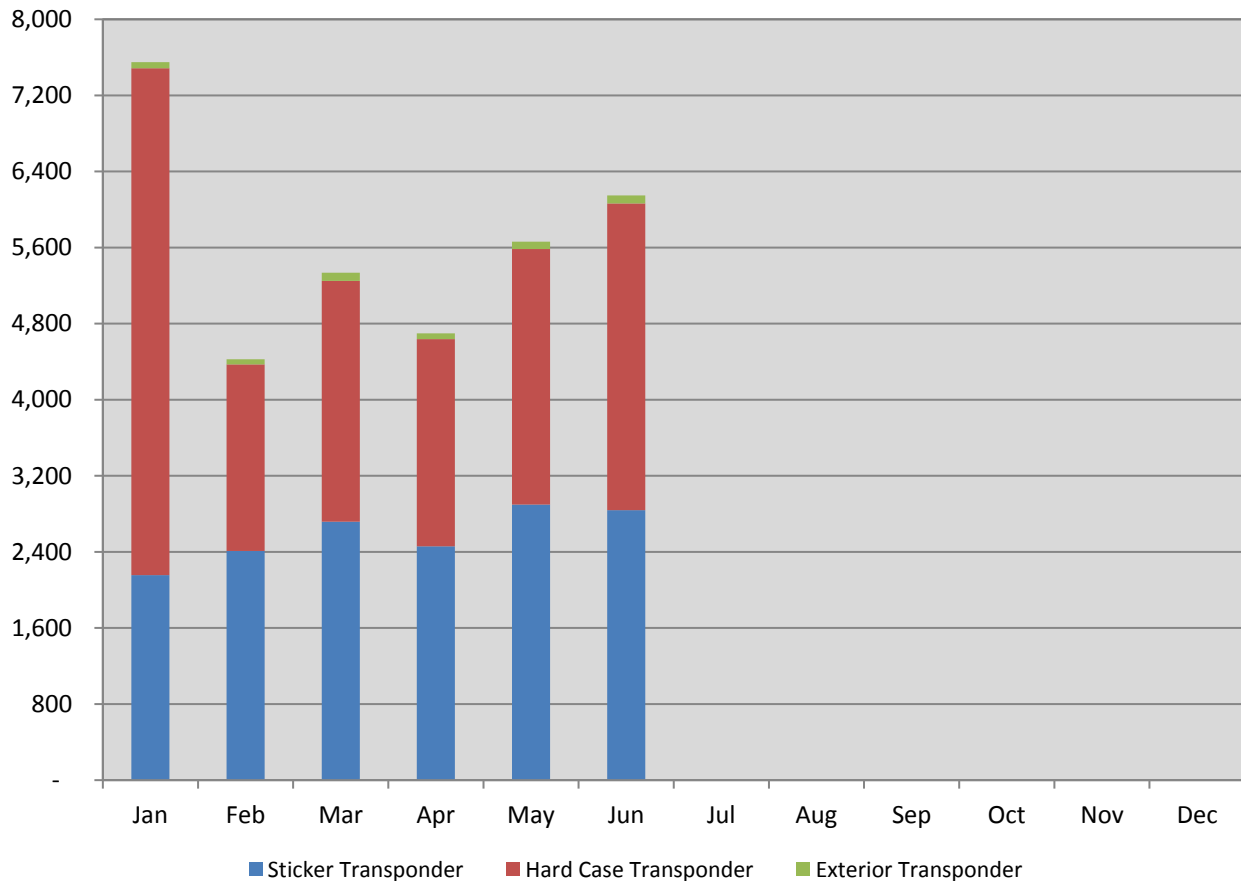


Table 13 presents a summary of the total transponders sold, by year. In October 2011, transponders went on sale prior to the opening of the roadway to provide potential motorists sufficient time to establish their accounts. Project to date is the total number of transponders sold to date.

## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

**Table 13: Transponders Sold, by Year**

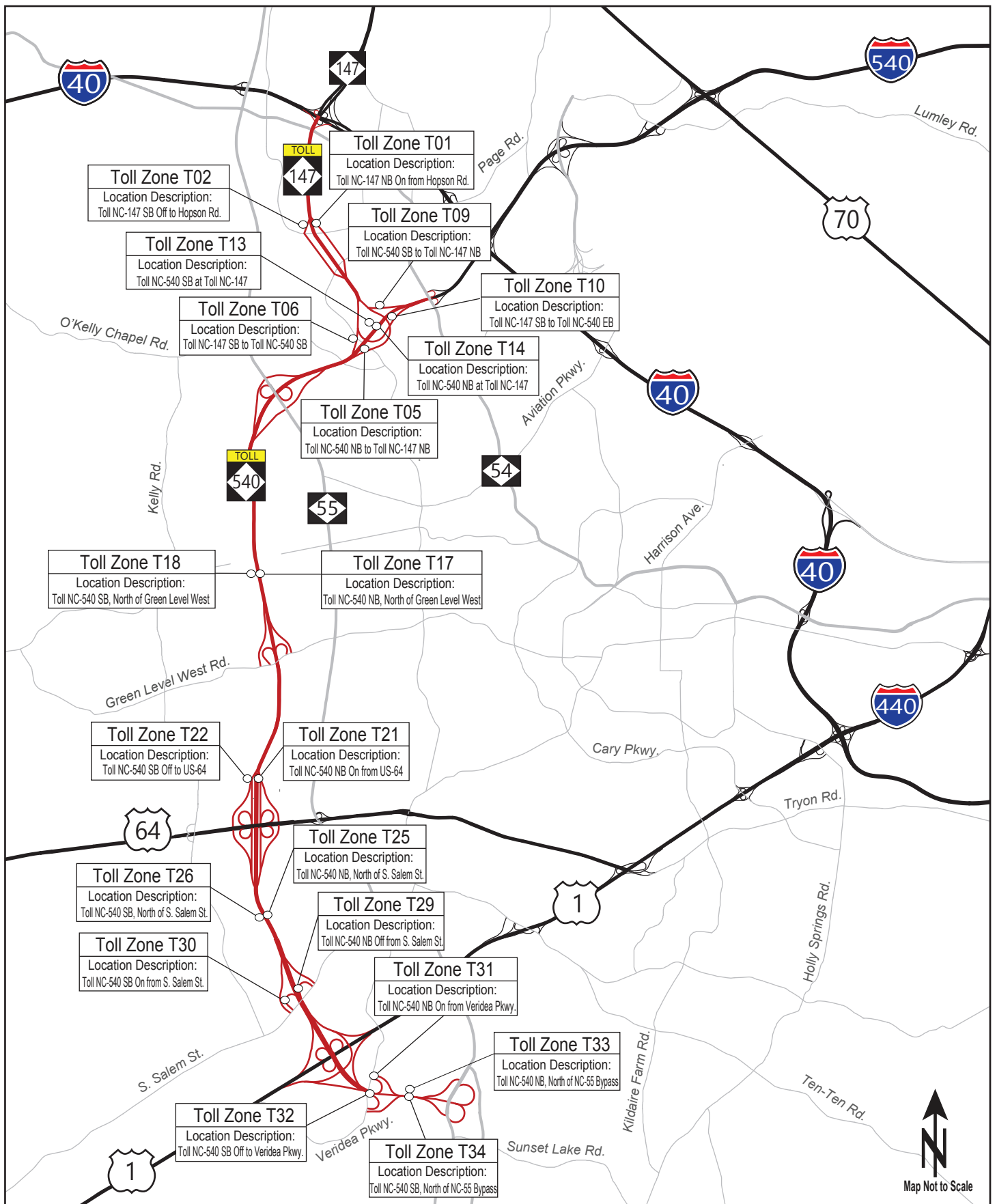
Year	Sticker Tag	Hard Case Tag	Exterior Tag	Total
2011	7,315	2,806	200	10,321
2012	35,338	6,861	250	42,449
2013	34,784	13,980	257	49,021
2014	26,066	14,778	221	41,065
2015	31,866	20,047	588	52,501
2016	29,287	36,969	822	67,078
2017 <sup>1</sup>	15,479	17,916	424	33,819
<b>Project to Date</b>	<b>180,135</b>	<b>113,357</b>	<b>2,762</b>	<b>296,254</b>

<sup>1</sup>2017 transponders sold reported include six months of data (January – June).

# Toll Zone Statistics

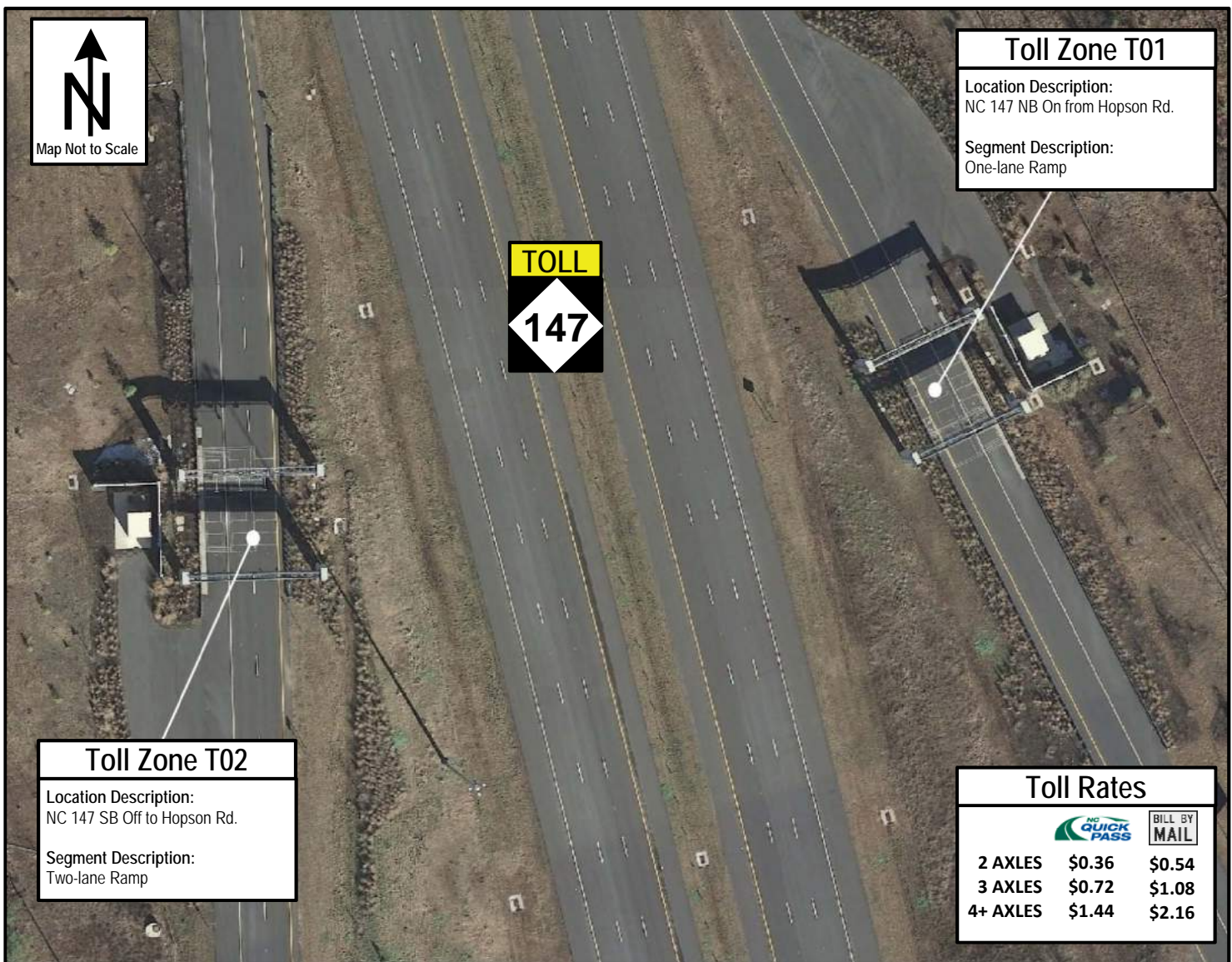
## TOLL ZONE STATISTICS

The location of the toll zones along the Triangle Expressway can be seen in *Figure 22*. *Figures 23 - 32* present the average weekday transactions (excludes holidays and days of inclement weather conditions) recorded at toll zones along the facility.



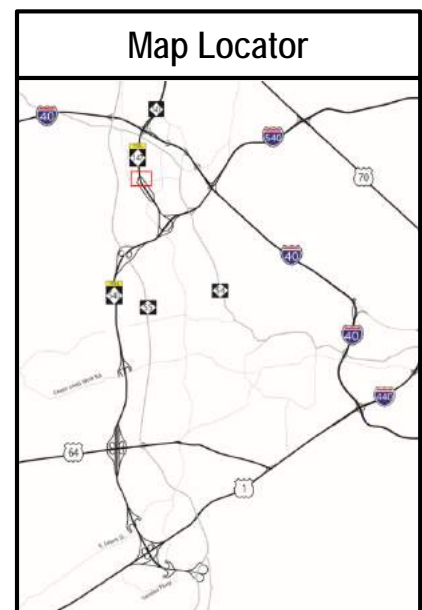
# Triangle Expressway Toll Zone Map

## Figure 22



Transactions by Direction		
Month	T01	T02
January	2,640	2,460
February	2,700	2,510
March	2,710	2,520
April	2,780	2,590
May	2,830	2,630
June	2,870	2,630
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T01	T02
January	61%	63%
February	62%	63%
March	61%	62%
April	60%	61%
May	60%	61%
June	59%	60%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**Hopson Road Ramp Toll Zones**  
 2017 Average Weekday Toll Transactions

**Figure**  
**23**





Transactions by Direction		
Month	T05	T06
January	7,370	7,360
February	7,500	7,450
March	7,600	7,470
April	7,690	7,600
May	7,870	7,830
June	7,900	7,950
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T05	T06
January	62%	64%
February	62%	64%
March	62%	64%
April	62%	63%
May	62%	63%
June	61%	62%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**NC-147 South Ramp Toll Zones**  
 2017 Average Weekday Toll Transactions

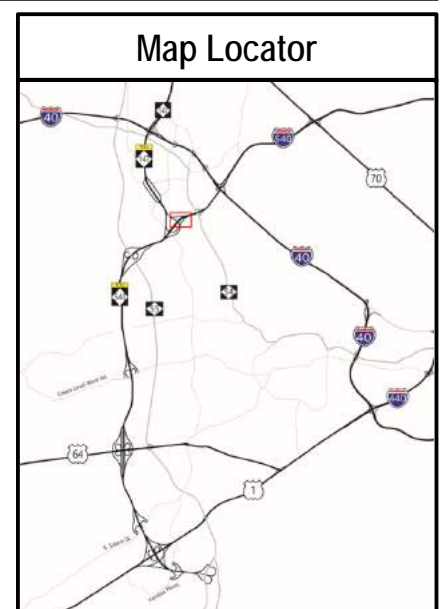
**Figure**  
**24**





Transactions by Direction		
Month	T13	T14
January	15,800	15,510
February	16,310	16,110
March	16,650	16,470
April	16,610	16,160
May	17,290	16,960
June	17,320	16,810
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

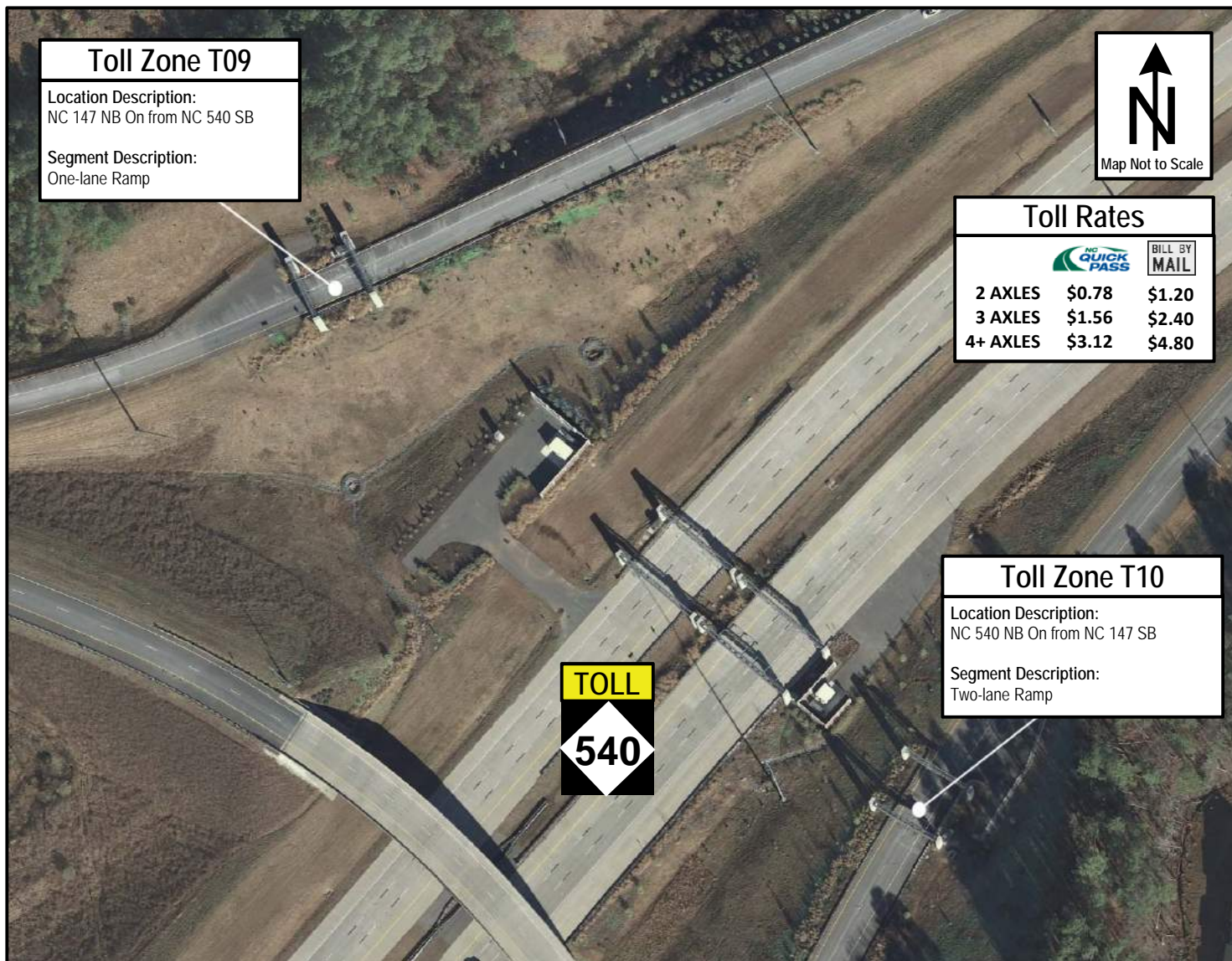
NC Quick Pass Percentage		
Month	T13	T14
January	61%	63%
February	59%	62%
March	60%	61%
April	60%	61%
May	60%	61%
June	59%	61%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**NC-540 Morrisville Mainline Toll Zones**  
 2017 Average Weekday Toll Transactions

**Figure 25**





Transactions by Direction		
Month	T09	T10
January	2,430	3,140
February	2,440	2,930
March	2,450	2,930
April	2,530	3,030
May	2,640	3,150
June	2,640	3,100
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T09	T10
January	57%	58%
February	58%	61%
March	58%	60%
April	57%	59%
May	55%	57%
June	56%	57%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**NC-147 North Ramp Toll Zones**  
 2017 Average Weekday Toll Transactions

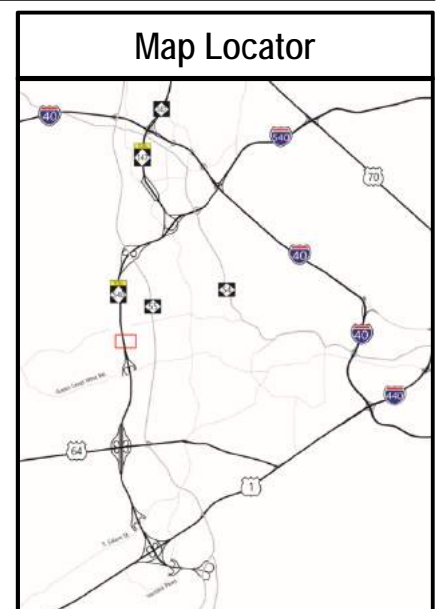
**Figure**  
**26**





Transactions by Direction		
Month	T17	T18
January	16,760	17,820
February	17,230	18,130
March	17,670	18,420
April	17,780	18,750
May	18,200	19,320
June	18,360	19,570
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

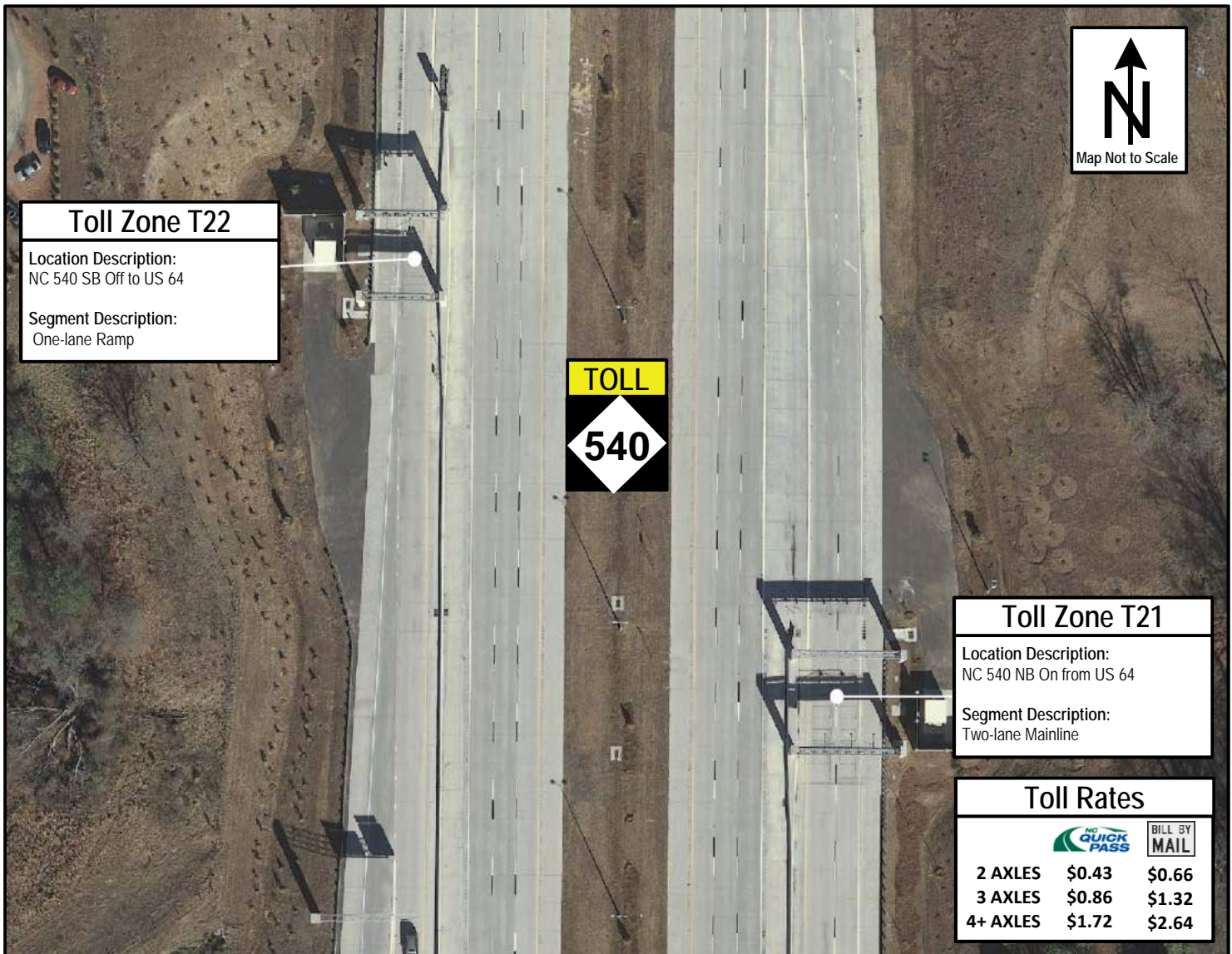
NC Quick Pass Percentage		
Month	T17	T18
January	62%	62%
February	60%	62%
March	60%	61%
April	61%	60%
May	61%	60%
June	60%	59%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**NC-540 Cary Mainline Toll Zones**  
 2017 Average Weekday Toll Transactions

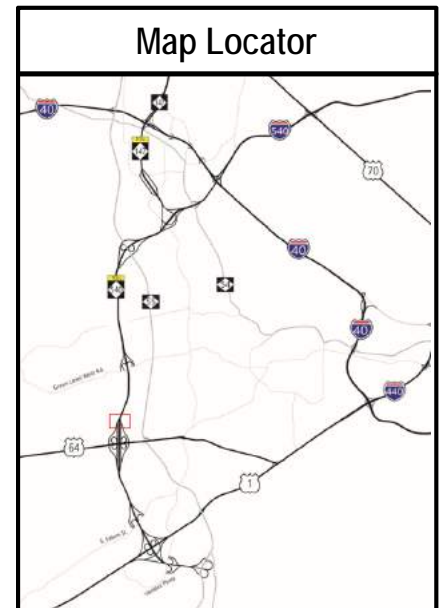
**Figure**  
**27**





Transactions by Direction		
Month	T21	T22
January	5,150	5,420
February	5,370	5,660
March	5,480	5,750
April	5,540	5,850
May	5,680	6,020
June	5,670	6,040
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T21	T22
January	62%	63%
February	62%	63%
March	61%	62%
April	61%	61%
May	61%	60%
June	61%	61%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**US-64 Ramp Toll Zones**  
 2017 Average Weekday Toll Transactions

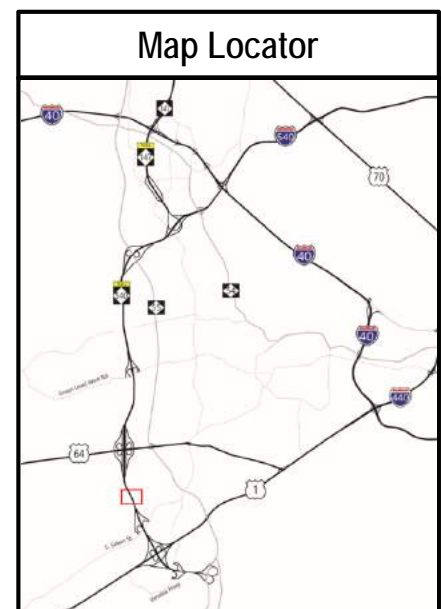
**Figure 28**





Transactions by Direction		
Month	T25	T26
January	13,850	14,100
February	14,330	14,440
March	14,750	14,710
April	14,910	14,940
May	15,360	15,500
June	15,660	15,880
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

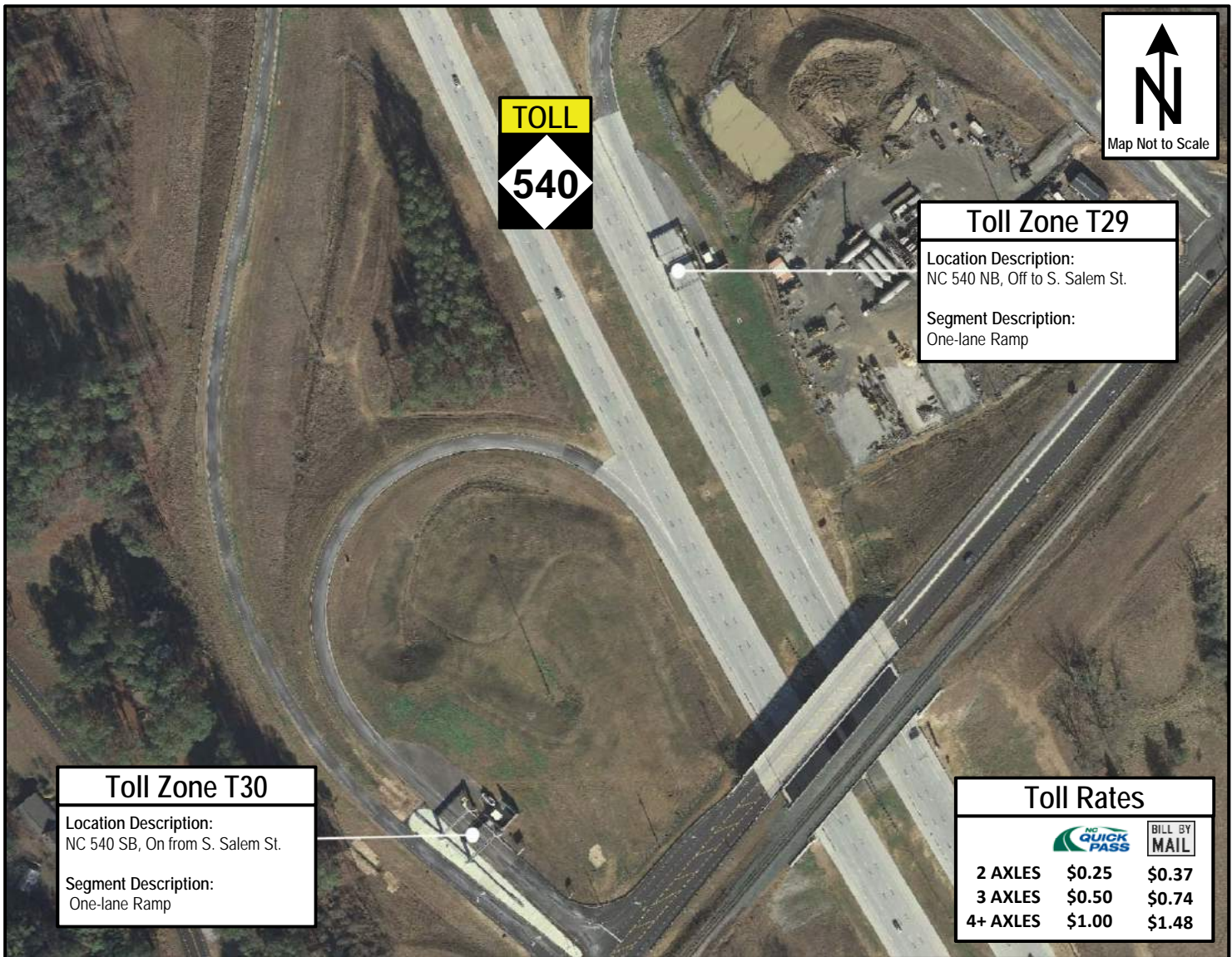
NC Quick Pass Percentage		
Month	T25	T26
January	61%	60%
February	60%	59%
March	60%	59%
April	60%	58%
May	59%	58%
June	58%	58%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**NC-540 Apex Mainline Toll Zones**  
 2017 Average Weekday Toll Transactions

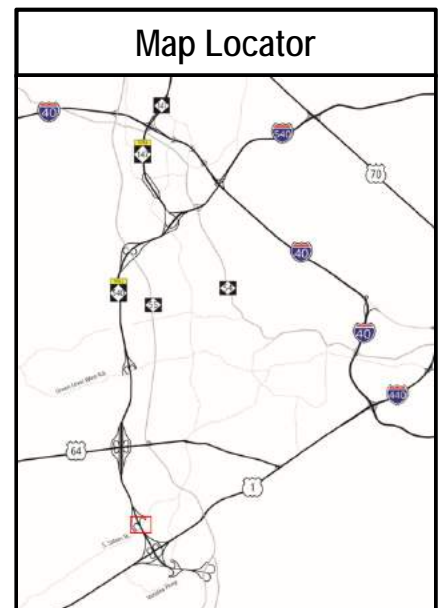
**Figure**  
**29**





Transactions by Direction		
Month	T29	T30
January	1,590	1,650
February	1,660	1,750
March	1,740	1,800
April	1,670	1,770
May	1,800	1,890
June	1,610	1,770
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

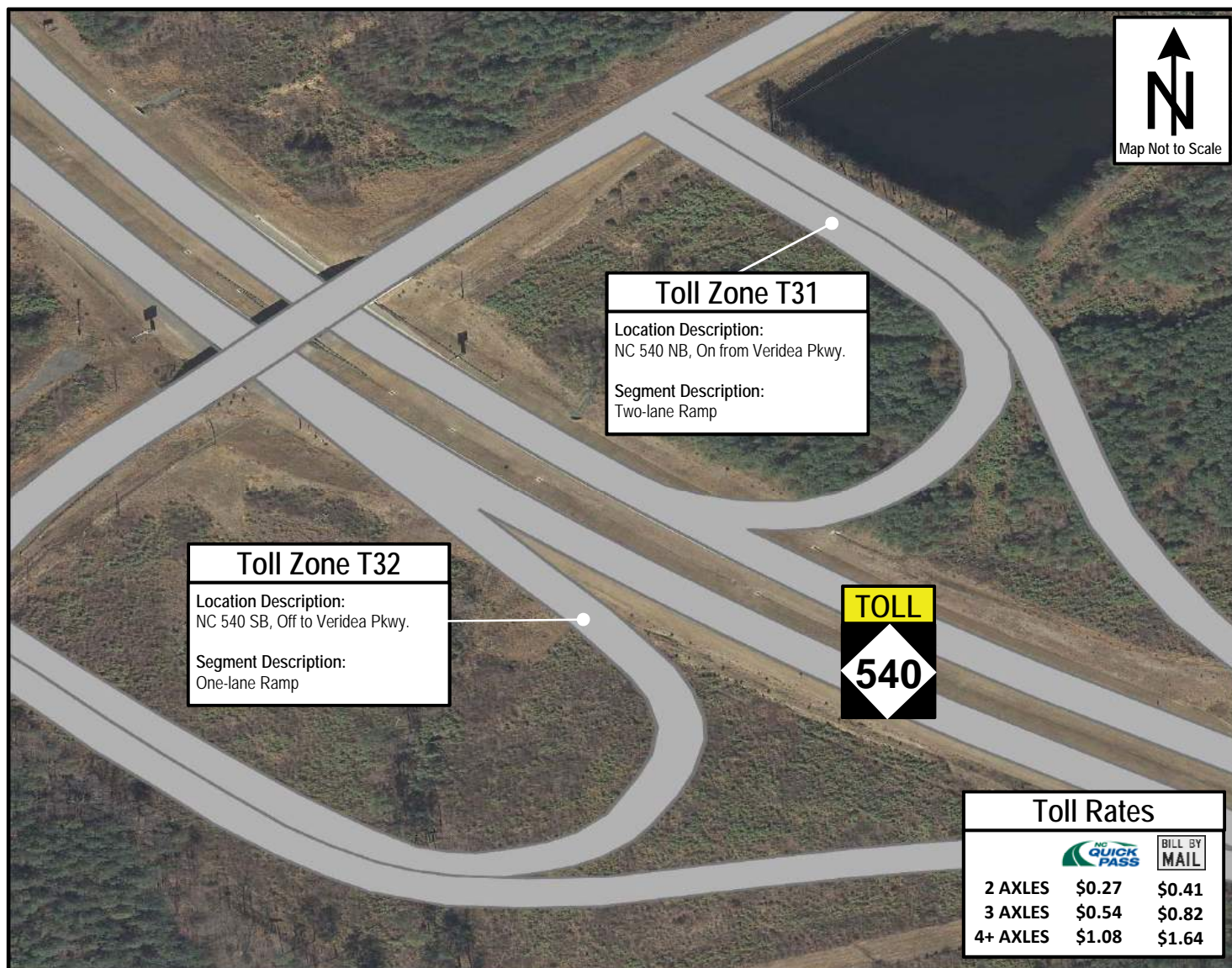
NC Quick Pass Percentage		
Month	T29	T30
January	67%	69%
February	67%	69%
March	66%	68%
April	66%	69%
May	67%	69%
June	65%	68%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**South Salem Street Ramp Toll Zones**  
 2017 Average Weekday Toll Transactions

**Figure 30**





Transactions by Direction		
Month	T31	T32
January	N/A	N/A
February	N/A	N/A
March	N/A	N/A
April	380	550
May	530	720
June	630	780
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

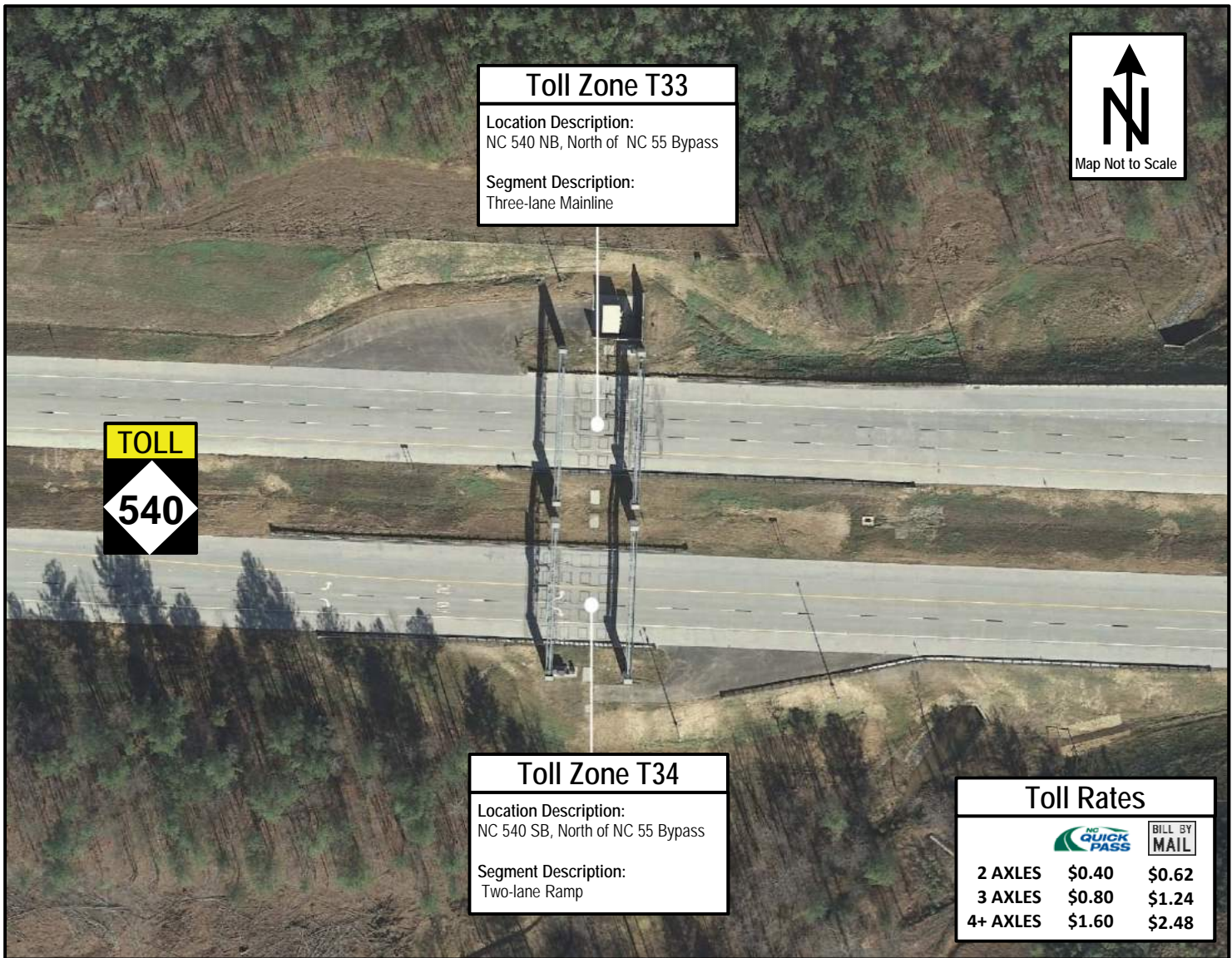
NC Quick Pass Percentage		
Month	T31	T32
January	N/A	N/A
February	N/A	N/A
March	N/A	N/A
April	53%	69%
May	40%	67%
June	43%	67%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**Toll NC 540 Ramps at Veridea Parkway**  
 2017 Average Weekday Toll Transactions

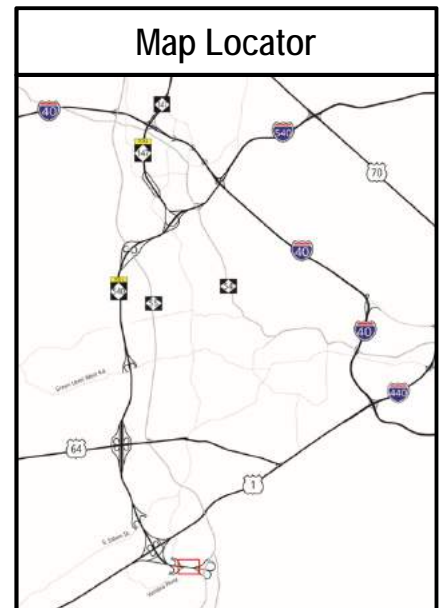
**Figure 31**





Transactions by Direction		
Month	T33	T34
January	9,000	8,910
February	9,310	9,090
March	9,690	9,390
April	9,500	9,210
May	9,760	9,360
June	9,740	9,530
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T33	T34
January	64%	63%
February	64%	63%
March	63%	63%
April	62%	62%
May	63%	62%
June	61%	61%
July	-	-
August	-	-
September	-	-
October	-	-
November	-	-
December	-	-



**NC-540 Holly Springs Mainline Toll Zones**  
2017 Average Weekday Toll Transactions

**Figure**  
**32**



# Roadway Safety Statistics

## ROADWAY SAFETY STATISTICS

Traffic crashes are often related to deficiencies in the safety and capacity characteristics of a transportation facility. In an effort to identify these deficiencies early, and therefore reduce the likelihood of crashes on the Triangle Expressway, NCTA monitors safety conditions on the facility through quarterly crash analyses. These analyses involve the use of the Traffic Engineering Accident Analysis System (TEAAS) to collect monthly crash data along the facility, separated into four (4) segments:

- NC 147, from I 40 to NC 540
- NC 540, from I 40 to NC 55
- NC 540, from NC 55 to US 64
- NC 540, from US 64 to NC 55 Bypass

The data collected includes total crashes and the number of fatal and injury crashes reported along each segment. This data is analyzed over a rolling three-year period to determine the Total Crash Rate of each of the four segments selected, as well as for the entire facility. These crash rates can then be compared to the Critical Crash Rates.

Total Crash Rates are a function of the length of roadway, average daily traffic, and number of reported crashes along a route during a specific time frame. These rates are expressed in crashes per 100 million vehicle miles traveled (MVMT). In the crash analysis conducted during the second quarter, the Total Crash Rates of the four segments selected and the entire facility were calculated based on the roadway segment length, the average annual daily traffic (AADT) and the number of crashes recorded from June 2014 through May 2017 for each segment. The AADT used for this quarter analysis was collected from the NCDOT 2015 Wake County AADT Map. The Statewide Crash Rate (97.32 crashes per 100 MVMT) used for comparison purposes in this analysis was collected from the 2013-2015 NCDOT Statewide Total Crash Rates for freeway facilities, as the Triangle Expressway operates more similar to a freeway or interstate than a state route.

Critical Crash Rates are crash rates that have been statistically adjusted with a 95% level of confidence to remove the element of chance and randomness. They are used as a reference to determine if the Total Crash Rate, at a particular location, is significantly higher than a predetermined average rate for locations with similar characteristics.

*Table 14* provides a summary of the crash data collected and the results of the second quarter analysis.

# Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

**Table 14: Safety Statistics, June 2014 - May 2017**

Segment	Length	AADT <sup>1</sup>	Total Crashes	Vehicle Exposure (MVMT)	Total Crash Rate	Statewide Crash Rate <sup>2</sup>	Critical Crash Rate
NC 147 I 40 to NC 540	3.1	13,000	39	44.22	88.20	97.32	99.77
NC 540 I 40 to NC 55	2.8	31,500	67	96.41	69.50	97.32	98.98
NC 540 NC 55 to US 64	6.7	23,600	80	172.60	46.35	97.32	98.56
NC 540 US 64 to NC 55 Bypass	5.9	17,400	49	111.67	43.88	97.32	98.86
<b>Triangle Expressway</b>	<b>18.4</b>	<b>21,100</b>	<b>235</b>	<b>426.08</b>	<b>55.15</b>	<b>97.32</b>	<b>98.11</b>

<sup>1</sup> AADT provided from NCDOT 2015 AADT Maps, Wake County

<sup>2</sup> Statewide Crash Rate for Interstate Facilities Applied

# Roadway Operations Statistics

## ROADWAY OPERATIONS STATISTICS

Highly trained NCTA operators monitor and manage traffic operations and coordinate incident response and maintenance/construction work along the Triangle Expressway. These operators work at the Traffic Management Center (TMC) located in the North Carolina National Guard's Joint Force Headquarters in Raleigh. They are responsible for monitoring the facility 24-hours a day, 7-days a week, and 365-days a year using closed-circuit TV (CCTV) cameras, microwave vehicle detectors (MVD), toll zone security cameras, and Roadway Weather Information System (RWIS). Additionally, they monitor roadside toll technology and toll facilities.

Operators can communicate travel conditions and emergencies to customers via 10 full-color Dynamic Message Signs (DMS), NCDOT's 511 system, and Traveler Information Management System (TIMS) website. They can also quickly dispatch toll technology technicians to address equipment failures via the Maintenance Online Management Software (MOMS). Additionally, in the event of incidents on the facility, they can use interoperable 800MHz radio frequency dispatch from local 911 and statewide Highway Patrol communications to dispatch State Highway Patrol (SHP) and Incident Management Assistance Patrol (IMAP).

The NCTA Toll Safety Patrol program consists of dedicated SHP and IMAP services provided on Triangle Expressway. This program provides one SHP officer and one IMAP responder to the facility during working hours, Monday through Friday. During this time, the assigned SHP officer and IMAP driver are responsible for patrolling the facility and responding to incidents reported by operators.

This section presents operations statistics reported by SHP and IMAP during the second quarter of 2017. It includes driver violations and warnings placed by SHP and total IMAP assistance recorded, as well as average monthly IMAP response and clearance time.

*Table 15* and *Table 16* present SHP operation statistics during 2017. "Chargeable Activities" are SHP activities involving fines. It should be noted that the "Other Violations" category includes chargeable activities such as load and equipment violations, driver's license violations, vehicle registration violations, and littering.

## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

**Table 15: SHP Chargeable Activities**

Chargeable Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Speed Violations	50	67	60	63	91	84							415
Alcohol Violations	0	0	0	0	0	0							0
Seat Belt Violations	1	6	23	15	6	10							61
Child Restraint Violations	0	0	0	0	0	0							0
Reckless Driving	4	1	2	1	11	6							25
Drug Violations	0	0	0	1	0	0							1
Obstructed Plates	0	0	0	0	0	1							1
Other Violations	36	27	37	49	57	37							243
<b>Total Charges</b>	<b>91</b>	<b>101</b>	<b>122</b>	<b>129</b>	<b>165</b>	<b>138</b>							<b>746</b>

**Table 16: SHP Non-Chargeable Activities**

Non-Chargeable Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Warnings	52	78	48	25	48	23							274
Vehicles Towed	0	0	0	0	0	2							2
Crashes Investigated	6	8	5	4	10	5							38
<b>Total</b>	<b>58</b>	<b>86</b>	<b>53</b>	<b>29</b>	<b>58</b>	<b>30</b>							<b>314</b>

The IMAP assists with stranded motorists and incident clearance, thereby maintaining the flow of traffic along the roadway. *Table 17* and *Figure 33* present the monthly breakdown of IMAP assists, by type, for the Triangle Expressway during 2017. The “other” category includes the reporting categories of assist other unit, secured load, called for assistance, directions, and transported motorist.

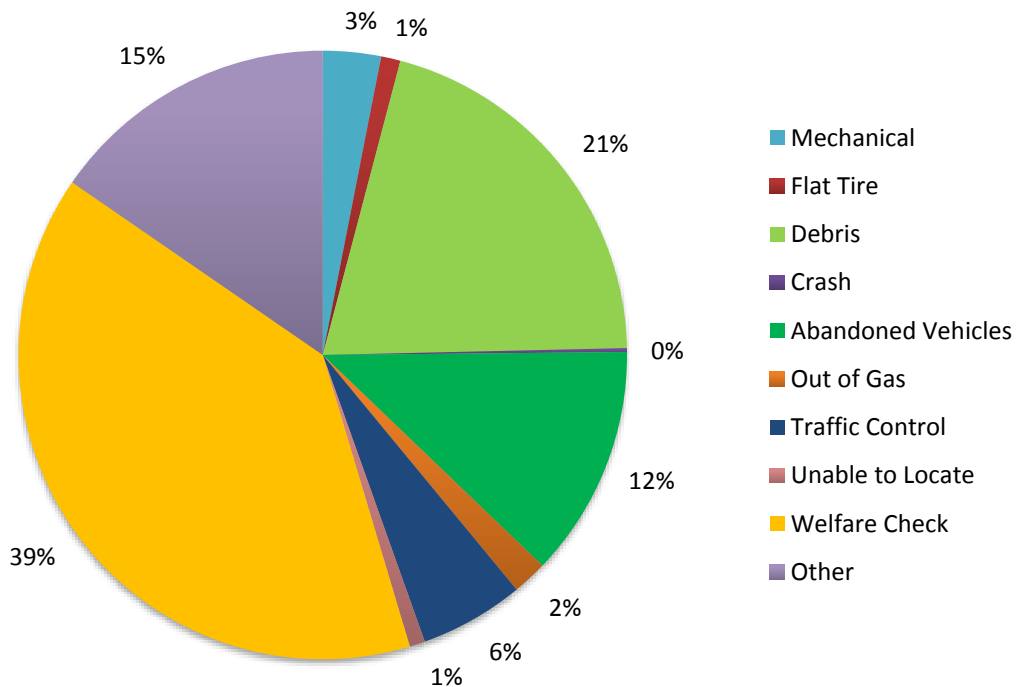
## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

**Table 17: IMAP Assistance**

Assist Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mechanical	9	0	4	0	1	1							15
Flat Tire	1	2	0	2	0	0							5
Debris	15	14	20	15	18	18							100
Crash	1	0	0	0	0	0							1
Abandoned Vehicles	14	8	11	9	9	9							60
Out of Gas	1	0	0	2	3	3							9
Traffic Control	0	2	7	4	7	7							27
Unable to Locate	1	1	0	2	0	0							4
Welfare Check	49	38	33	24	28	19							191
Other	9	15	14	22	7	8							75
<b>Total Assist</b>	<b>100</b>	<b>80</b>	<b>89</b>	<b>80</b>	<b>73</b>	<b>65</b>							<b>487</b>

**Figure 33: 2017 IMAP Assistance by Type, YTD**



## Operations Statistics Report for the Triangle Expressway

Second Quarter, April – June 2017

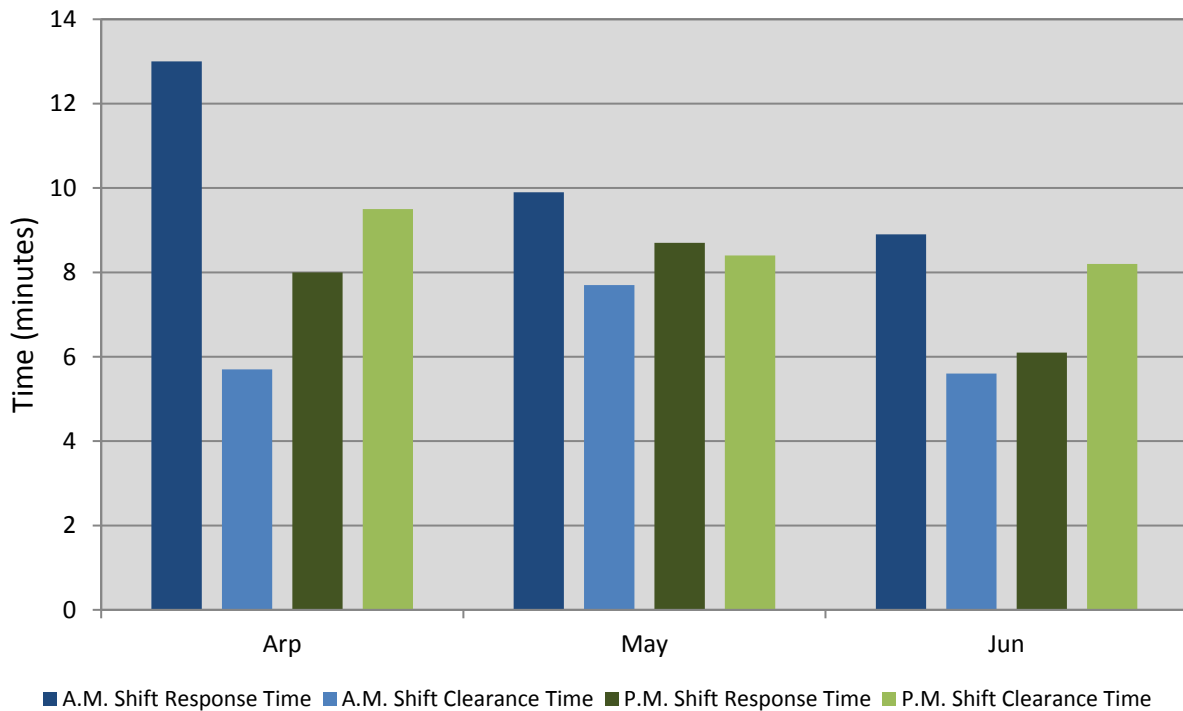
The response and clearance times for all IMAP assists are logged by IMAP and provided to the NCTA. Response time is the time from which a responder receives a call to the time they arrive on the scene. Clearance time is the time it takes the responder to clear the incident and return the roadway to normal operation. The IMAP staff's A.M. shift occurs from 6AM to 2PM, while the P.M. shift occurs from 2PM to 10PM. Shift response times may differ due to the number of drivers on duty and their coverage areas.

Table 18 and Figure 34 present the average IMAP assistance response and clearance times, in minutes, for the Triangle Expressway.

**Table 18: Average IMAP Assistance Response and Clearance Times (in Minutes)**

Response Type	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	2017 Average
A.M. Shift Response	10	10	9	13	10	9							10
A.M. Shift Clearance	8	8	8	6	8	6							7
P.M. Shift Response	9	9	10	8	9	6							8
P.M. Shift Clearance	6	8	10	10	8	8							8

**Figure 34: Average IMAP Assistance Response and Clearance Times (in Minutes)**





# Roadway Maintenance Statistics

## ROADWAY MAINTENANCE STATISTICS

This section outlines the NCTA Maintenance Rating Program (MRP), which is a maintenance evaluation program for roadway features and toll facilities. MRP is a comprehensive planning, measuring, and managing process that provides a means for communicating to managers, stakeholders, and key customers the impacts of policy and budget decisions on program service delivery.

Using outcome-based performance measures and the service level scale (0 through 100), the inspection results are rated against established threshold criteria. The program analysis is accomplished through the use of sampling procedures that capture the level of service being provided for individual asset features. Over time, these ratings will then be charted to identify work needs and subsequent necessary actions. The evaluations are based on the establishment of threshold conditions that quantify the maximum defect allowed to exist for a characteristic before it is considered unacceptable. The NCTA performance standards, threshold criteria, and maintenance rating program were developed through a collaborative effort by NCTA managers, NCDOT maintenance staff, and consultants.

Using field survey information, a maintenance matrix can be developed to show the ties between maintenance activities and the characteristics of various roadway features. The purpose of this evaluation is to provide information that will be used to schedule and prioritize routine maintenance activities and provide uniform maintenance conditions that meet established objectives.

### Assessment Schedule

As part of the NCTA MRP, a “baseline” assessment is scheduled for each newly opened roadway section soon after opening to toll collection. The baseline assessments include a complete inventory data collection and assessment on 100% of the roadway assets. With the recent opening of the Veridea Parkway interchange, a baseline assessment of the interchange area has been scheduled to be completed by December 2017.

After the baseline assessment is completed, future assessments for that segment switch over to a statistical sampling assessment. Inspections are performed during the months of February, May, August, and November to account for dynamic seasonal changes to assets. These inspections are accomplished through the use of statistically valid, random sampling procedures that capture the level of service for individual assets with a 95% confidence level in sampling.

## Assessment Results

Table 19 presents the 2017 quarterly and annual MRP Assessment rating. It is important to note that the Quarterly Ratings are only representative of the samples inspected during each quarter. Therefore, they are not a statistically valid representation of the assets' conditions; only the annual rating will provide a 95% confidence level in statistical sampling.

**Table 19: MRP Assessment Results**

Element	Q1 2017 Rating	Q2 2017 Rating	Q3 2017 Rating	Q4 2017 Rating	2017 Annual Rating
Road Surface	97.8	100.0	N/A	N/A	N/A
Unpaved Shoulders and Ditches	95.6	95.5	N/A	N/A	N/A
Drainage	86.7	92.3	N/A	N/A	N/A
Roadside	90.3	87.4	N/A	N/A	N/A
Traffic Control Devices	91.4	88.5	N/A	N/A	N/A
<b>Overall MRP Performance Rating</b>	<b>92.7</b>	<b>92.7</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

N/A (Not Applicable) – MRP Assessment has not been conducted yet.