

NORTH CAROLINA

**Turnpike Authority**

## **Operations Statistics Report**

Triangle Expressway

### **2016 Third Quarter Report**

July - September

1 S. Wilmington Street  
Raleigh, NC 27601



Last Updated:  
November 17, 2016

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## INTRODUCTION

### Purpose

The North Carolina Turnpike Authority (NCTA) presents the operations statistics for the Triangle Expressway during the third quarter (July – September) of 2016. 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

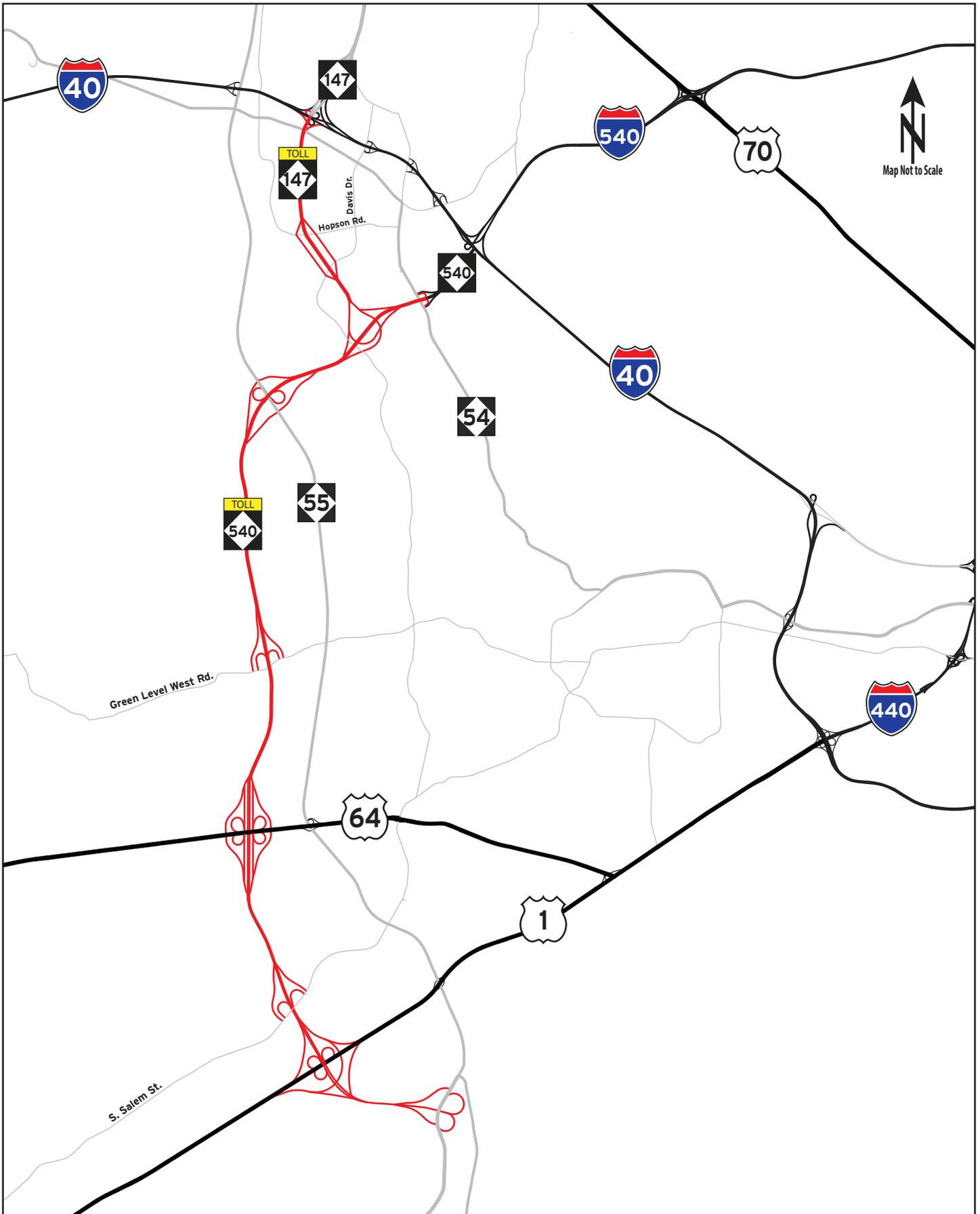
The Triangle Expressway is an 18.8-mile toll road that extends the partially complete “Outer Loop” around the greater Raleigh, North Carolina area from I-40 to NC-55 Bypass. The six-lane, controlled-access toll facility relieves congestion on NC-55, while improving access to the Research Triangle Park 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 Toll 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 includes interchanges at NC-54, NC-55, Green Level West Road, and US-64 and opened to toll-free traffic on August 1, 2012. Tolling on this section began on August 2, 2012. The section from US-64 to NC-55 Bypass includes interchanges at S. Salem St., US-1, and NC-55 Bypass and opened to toll-free traffic on December 20, 2012. Tolling on this section began on January 2, 2013.

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

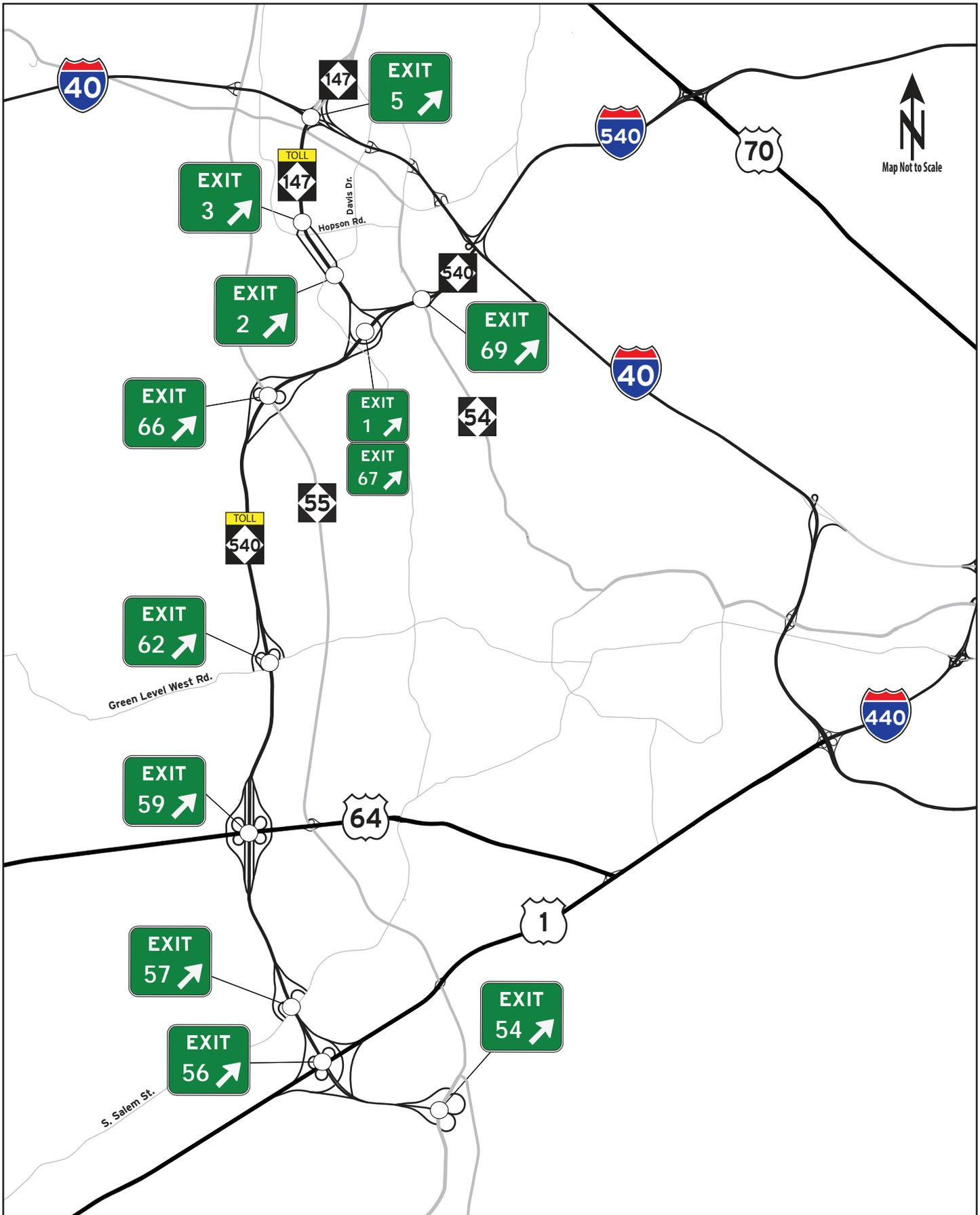
Current and historical traffic data is collected and stored through the use of roadside microwave vehicle detectors (MVD's) installed throughout the Triangle Expressway. The data provides an overview of the roadway's current utilization. The data can also be analyzed to identify trends that could more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

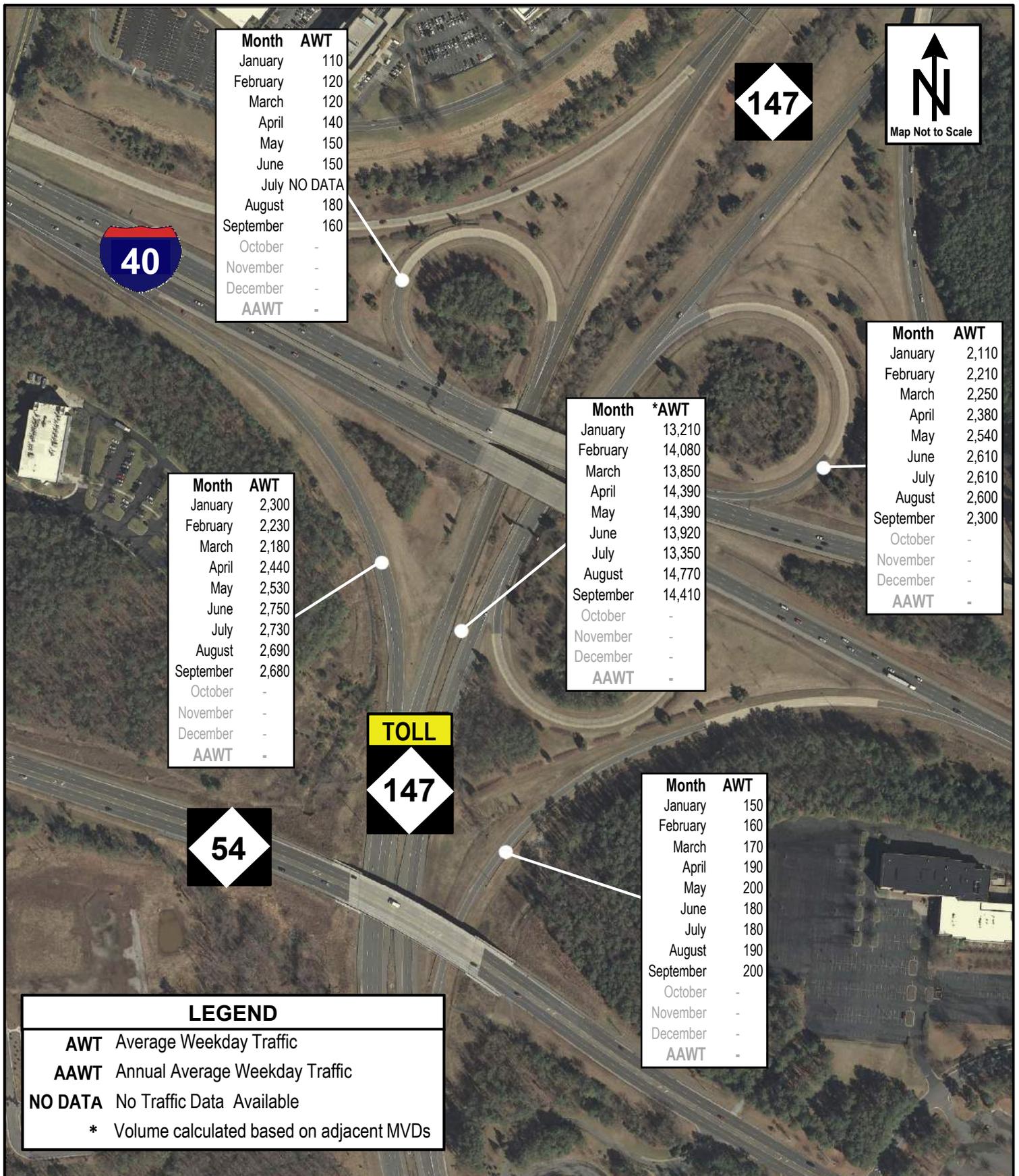
Traffic volume data is collected on all ramps and mainline segments between interchanges. The location of interchanges along the Triangle Expressway can be seen in *Figure 2*. Typically there is a large difference between peak and off-peak volumes, as well as between weekday and weekend volumes. This 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 13* 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.



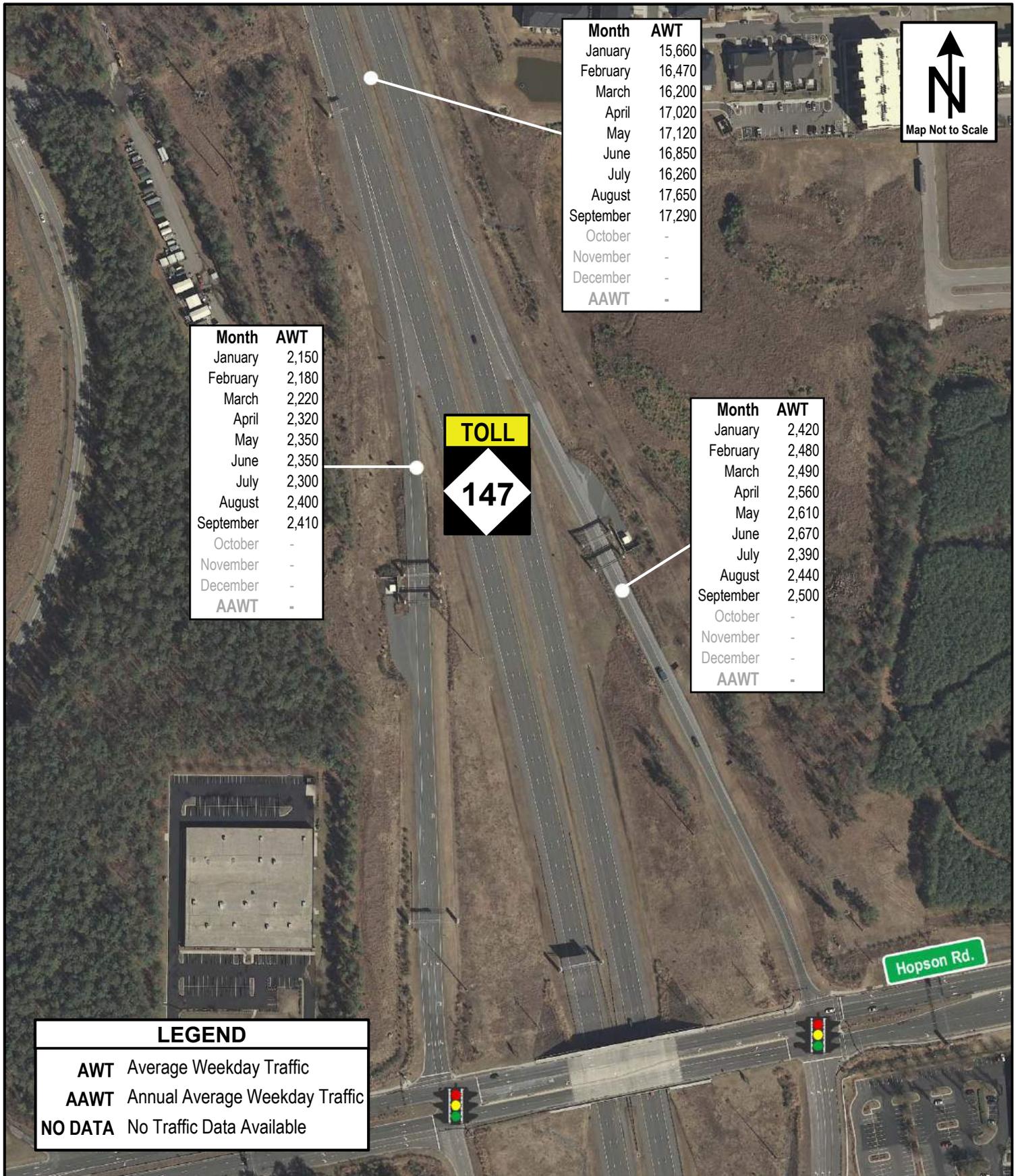
**Triangle Expressway Interchange Map**

**Figure 2**



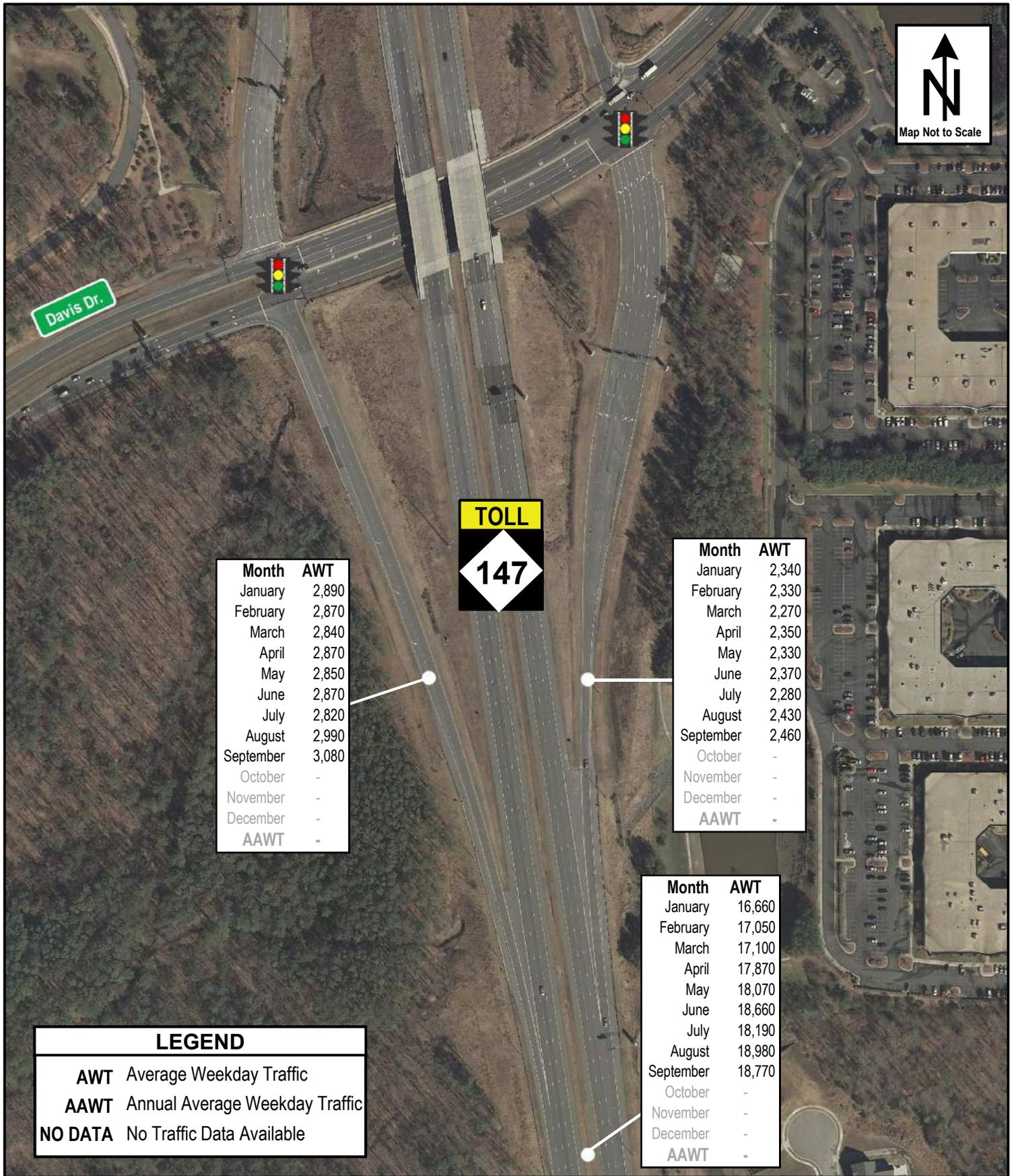
**NC-147 at I-40 Interchange**  
 2016 Average Weekday Traffic

**Figure**  
**3**



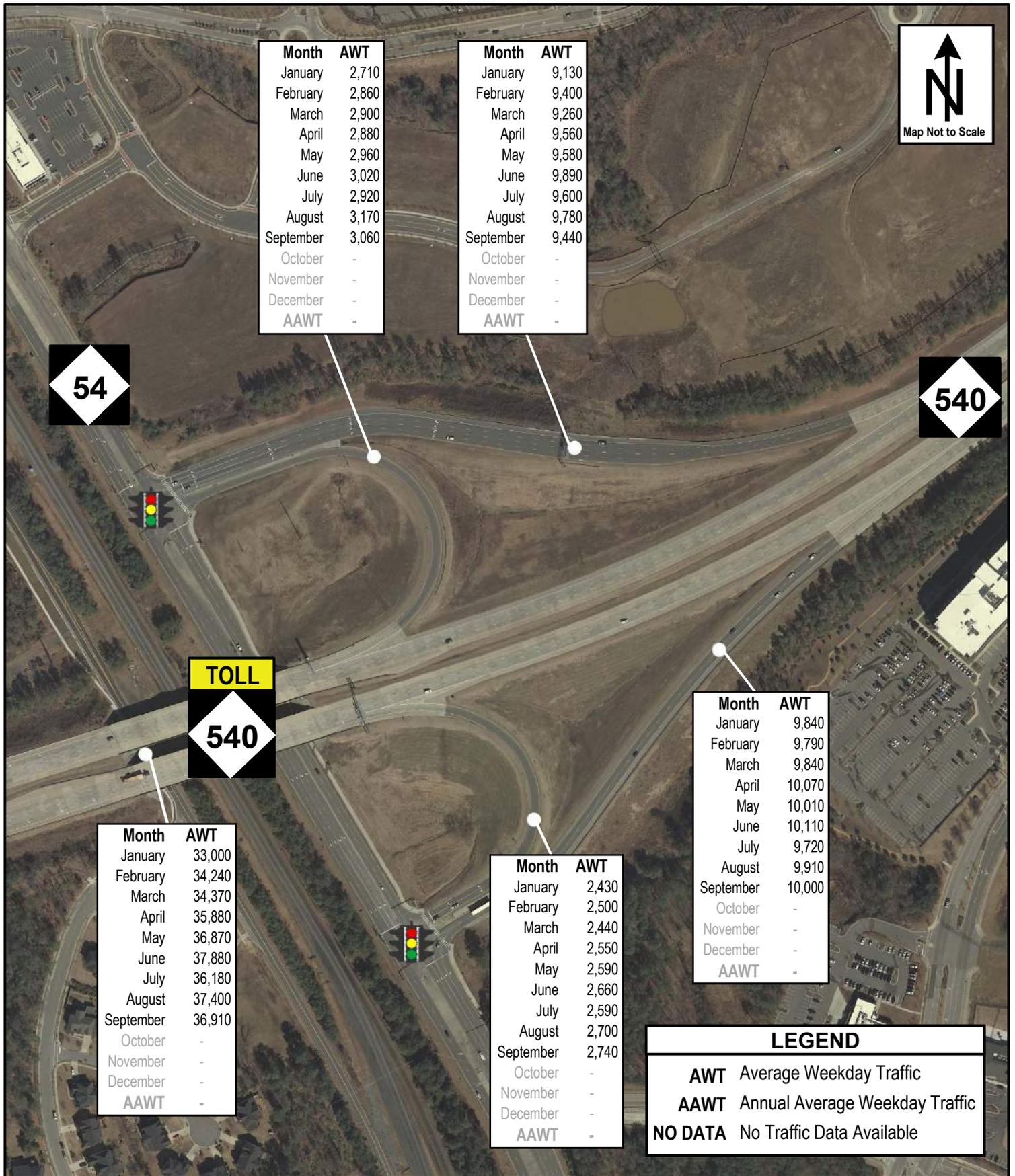
**NC-147 at Hopson Rd. Interchange**  
2016 Average Weekday Traffic

**Figure**  
**4**



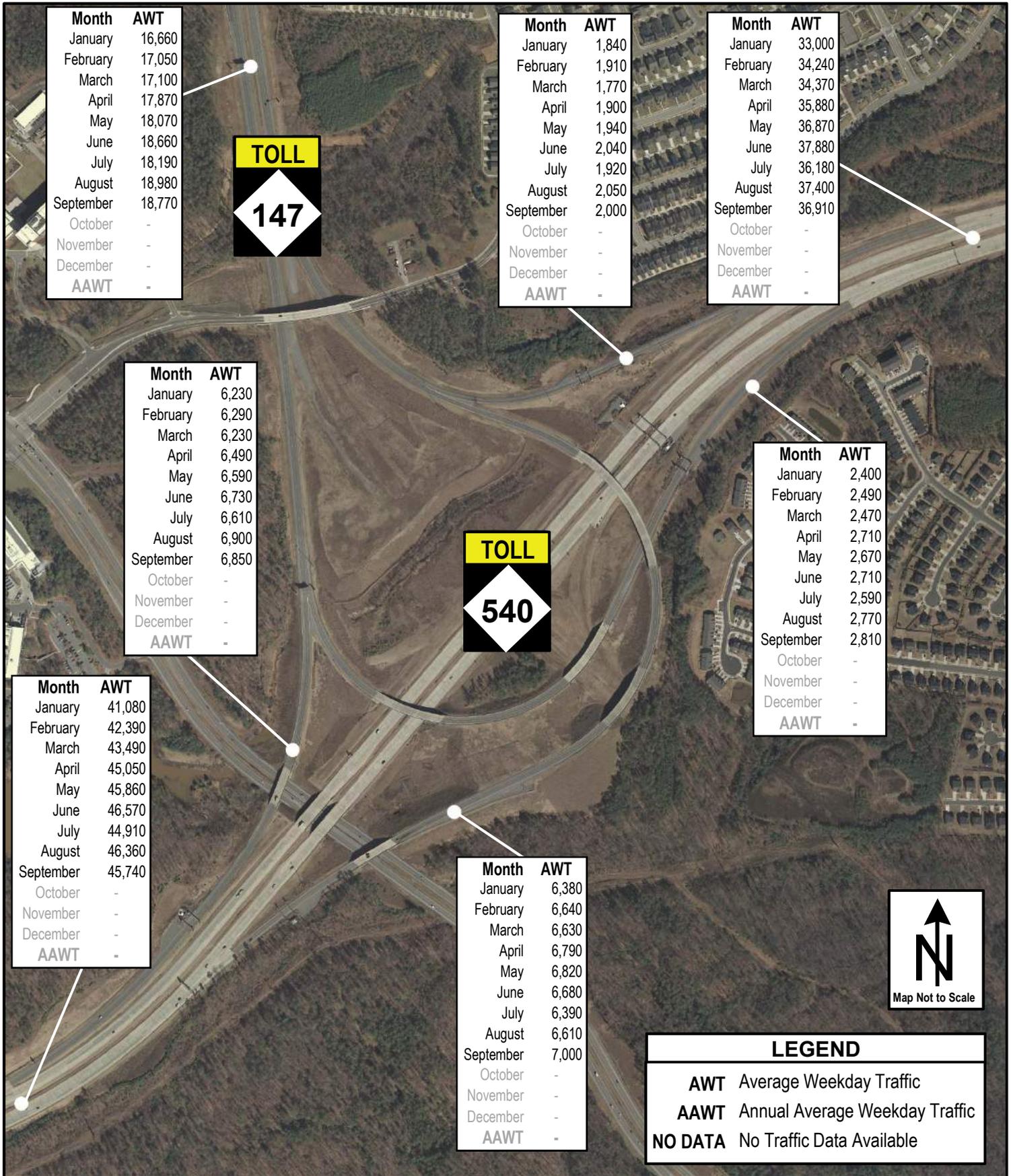
**NC-147 at Davis Dr. Interchange**  
2016 Average Weekday Traffic

**Figure**  
**5**



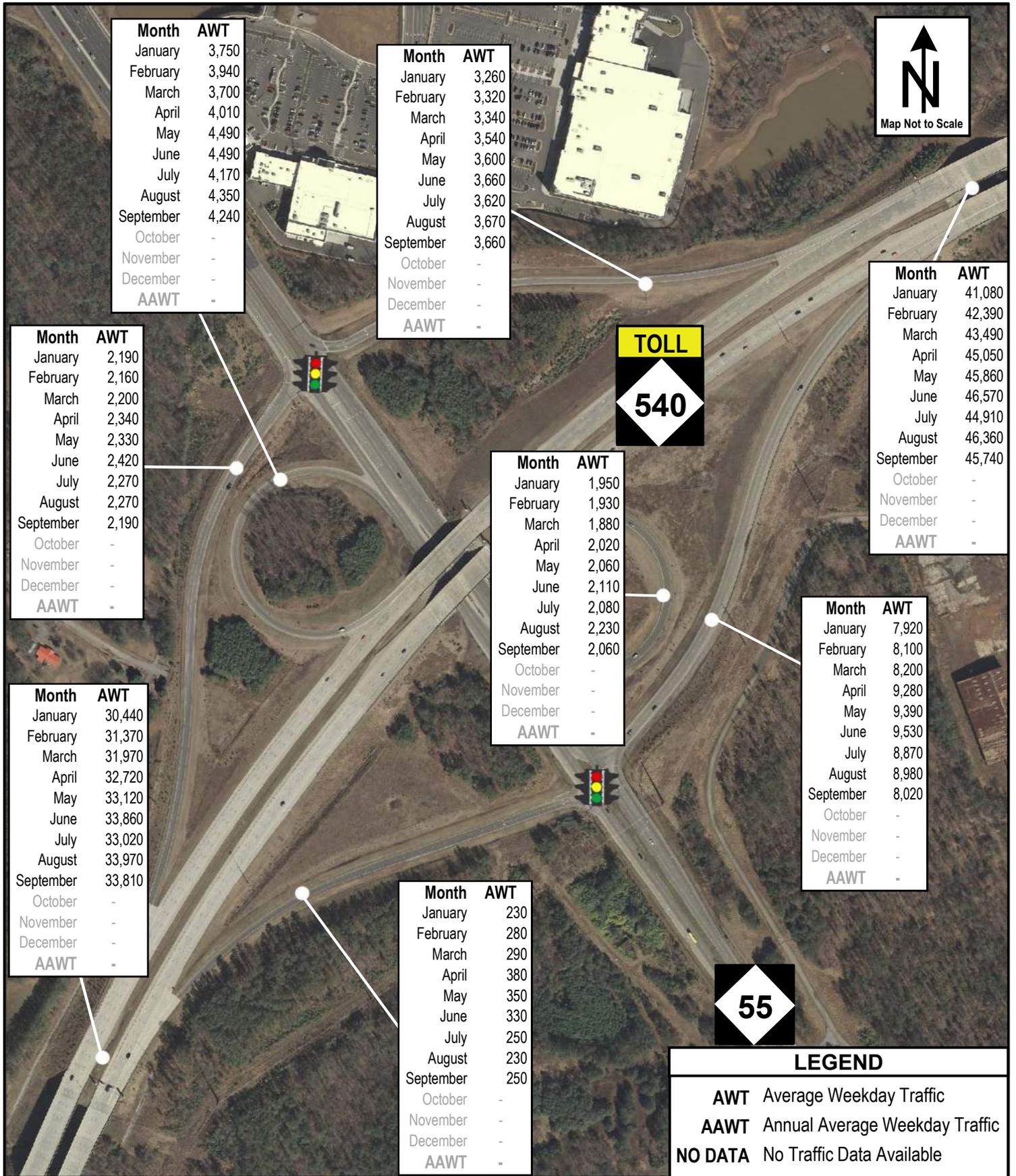
**NC-540 at NC-54 Interchange**  
2016 Average Weekday Traffic

**Figure**  
**6**



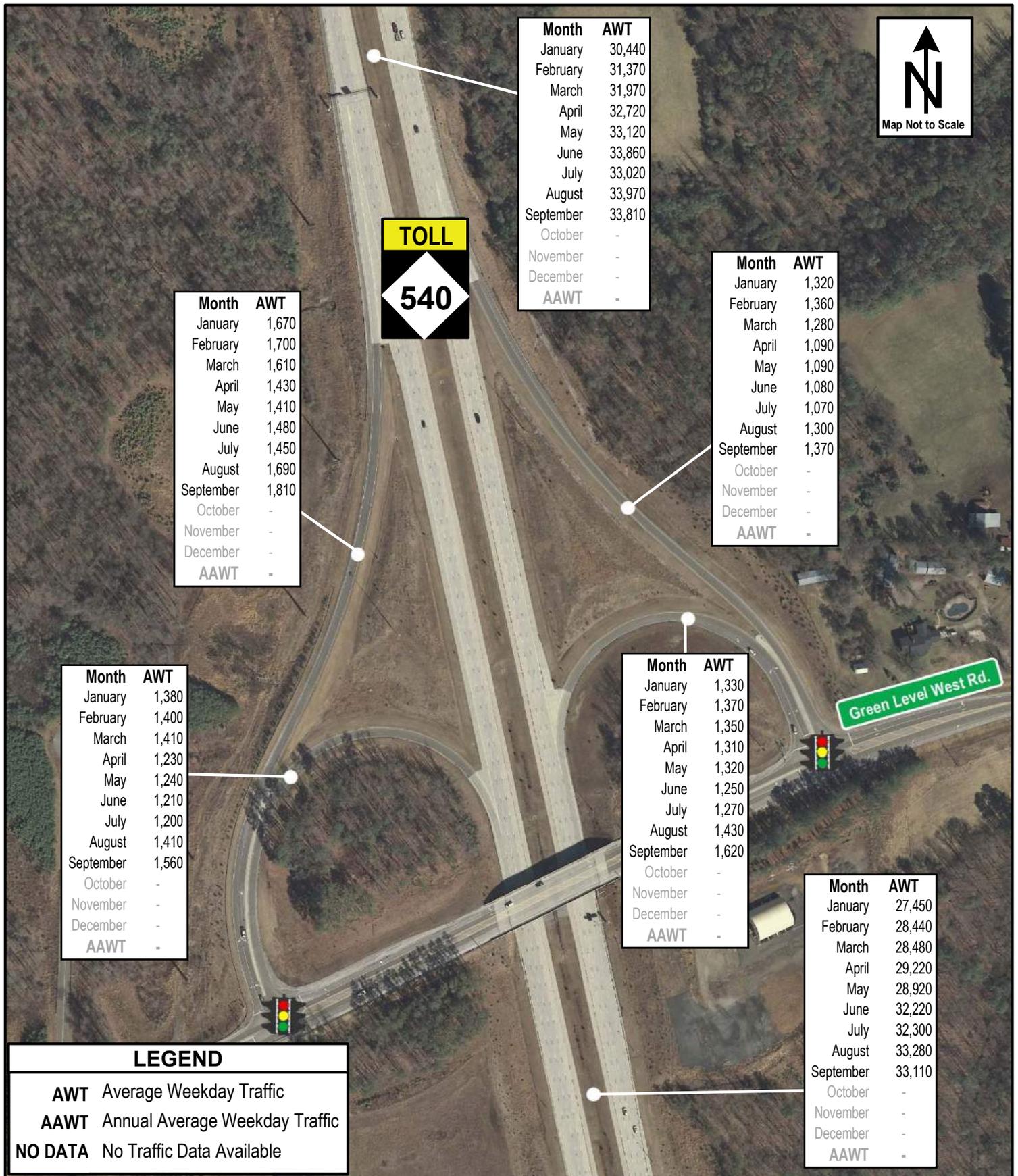
**NC-540 at NC-147 Interchange**  
2016 Average Weekday Traffic

**Figure**  
**7**



**NC-540 at NC-55 Interchange**  
2016 Average Weekday Traffic

**Figure**  
**8**

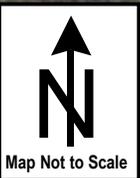


**NC-540 at Green Level West Rd. Interchange**  
 2016 Average Weekday Traffic

**Figure**  
**9**

**LEGEND**

**AWT** Average Weekday Traffic  
**AAWT** Annual Average Weekday Traffic  
**NO DATA** No Traffic Data Available



Month	AWT
January	700
February	720
March	840
April	910
May	900
June	940
July	880
August	860
September	840
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	2,450
February	2,510
March	2,560
April	2,610
May	2,630
June	2,690
July	2,640
August	2,740
September	2,670
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	2,280
February	2,450
March	2,580
April	2,760
May	2,800
June	2,810
July	2,680
August	2,700
September	2,680
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	1,010
February	1,050
March	1,160
April	1,340
May	1,340
June	1,400
July	1,410
August	1,330
September	1,260
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	27,450
February	28,440
March	28,480
April	29,220
May	28,920
June	32,220
July	32,300
August	33,280
September	33,110
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	2,260
February	2,340
March	2,290
April	2,420
May	2,470
June	2,480
July	2,460
August	2,500
September	2,480
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	890
February	940
March	1,000
April	1,130
May	1,150
June	1,200
July	1,190
August	1,110
September	1,040
October	-
November	-
December	-
<b>AAWT</b>	-

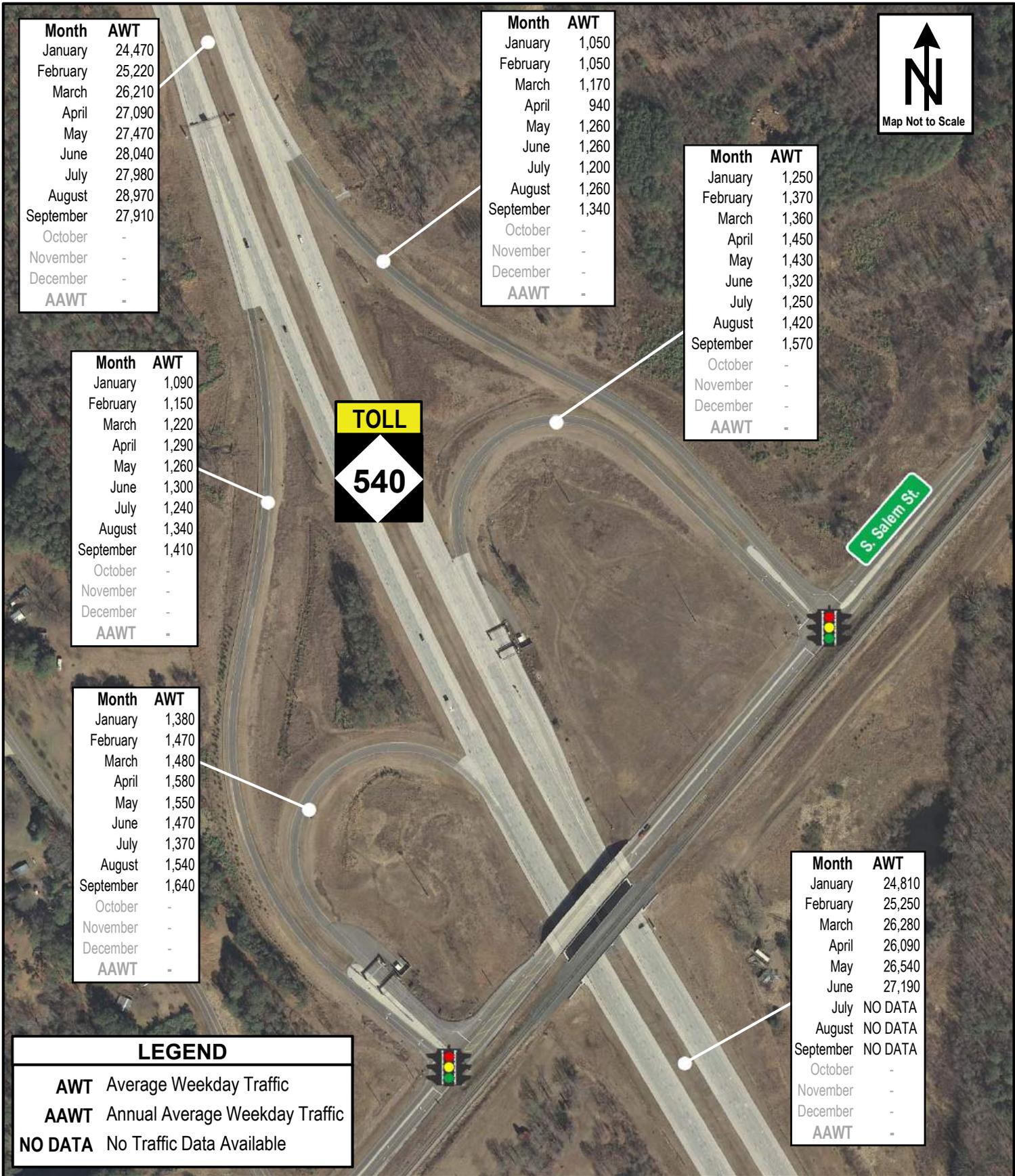
Month	AWT
January	2,360
February	2,480
March	2,550
April	2,690
May	2,760
June	2,630
July	2,670
August	2,690
September	2,650
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	720
February	750
March	810
April	870
May	880
June	890
July	830
August	860
September	860
October	-
November	-
December	-
<b>AAWT</b>	-

Month	AWT
January	24,470
February	25,220
March	26,210
April	27,090
May	27,470
June	28,040
July	27,980
August	28,970
September	27,910
October	-
November	-
December	-
<b>AAWT</b>	-

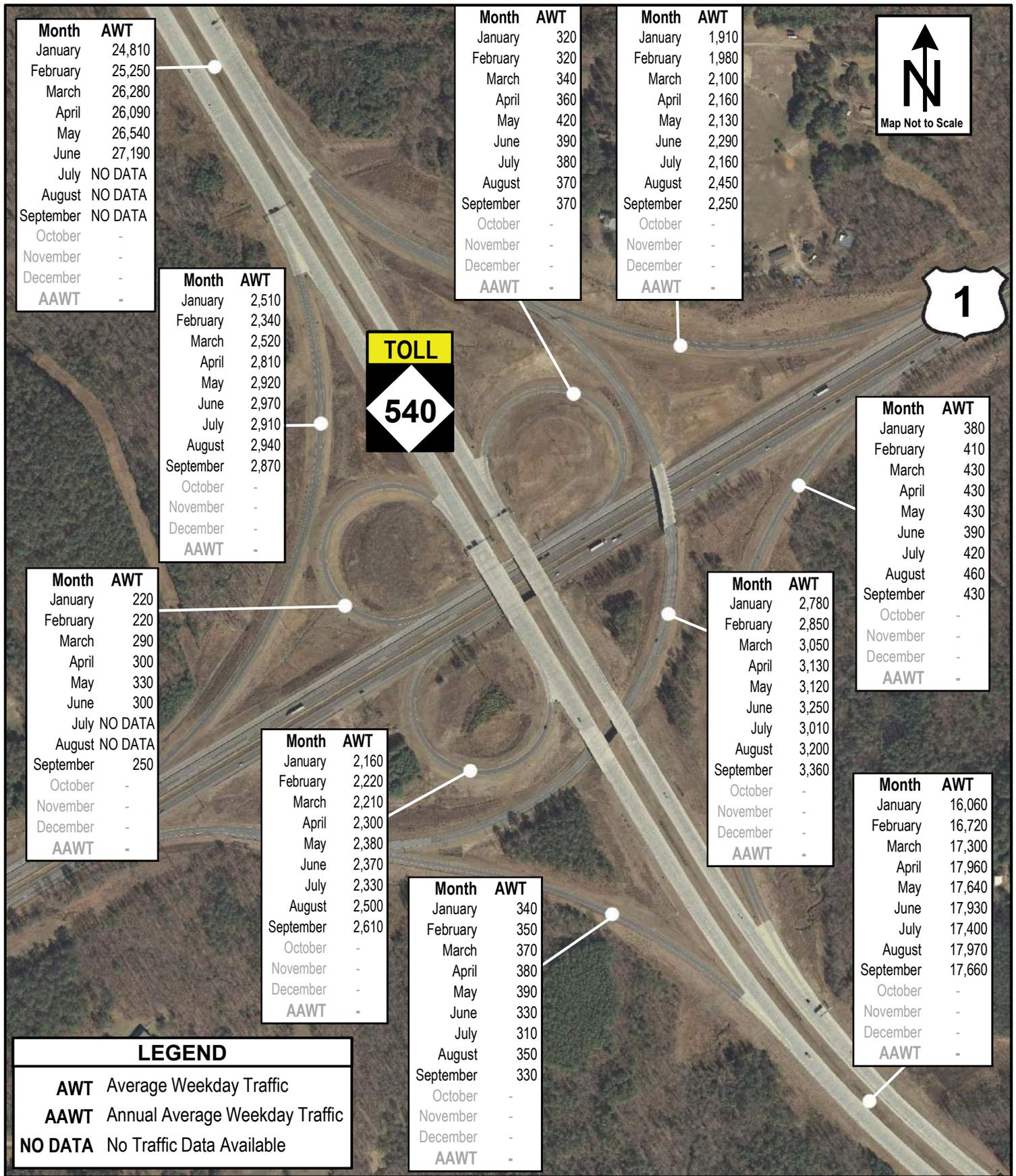
**NC-540 at US-64 Interchange**  
 2016 Average Weekday Traffic

**Figure 10**



**NC-540 at S. Salem St. Interchange**  
 2016 Average Weekday Traffic

**Figure**  
**11**



Month	AWT
January	24,810
February	25,250
March	26,280
April	26,090
May	26,540
June	27,190
July	NO DATA
August	NO DATA
September	NO DATA
October	-
November	-
December	-
AAWT	-

Month	AWT
January	320
February	320
March	340
April	360
May	420
June	390
July	380
August	370
September	370
October	-
November	-
December	-
AAWT	-

Month	AWT
January	1,910
February	1,980
March	2,100
April	2,160
May	2,130
June	2,290
July	2,160
August	2,450
September	2,250
October	-
November	-
December	-
AAWT	-



Month	AWT
January	2,510
February	2,340
March	2,520
April	2,810
May	2,920
June	2,970
July	2,910
August	2,940
September	2,870
October	-
November	-
December	-
AAWT	-



Month	AWT
January	380
February	410
March	430
April	430
May	430
June	390
July	420
August	460
September	430
October	-
November	-
December	-
AAWT	-

Month	AWT
January	220
February	220
March	290
April	300
May	330
June	300
July	NO DATA
August	NO DATA
September	250
October	-
November	-
December	-
AAWT	-

Month	AWT
January	2,780
February	2,850
March	3,050
April	3,130
May	3,120
June	3,250
July	3,010
August	3,200
September	3,360
October	-
November	-
December	-
AAWT	-

Month	AWT
January	2,160
February	2,220
March	2,210
April	2,300
May	2,380
June	2,370
July	2,330
August	2,500
September	2,610
October	-
November	-
December	-
AAWT	-

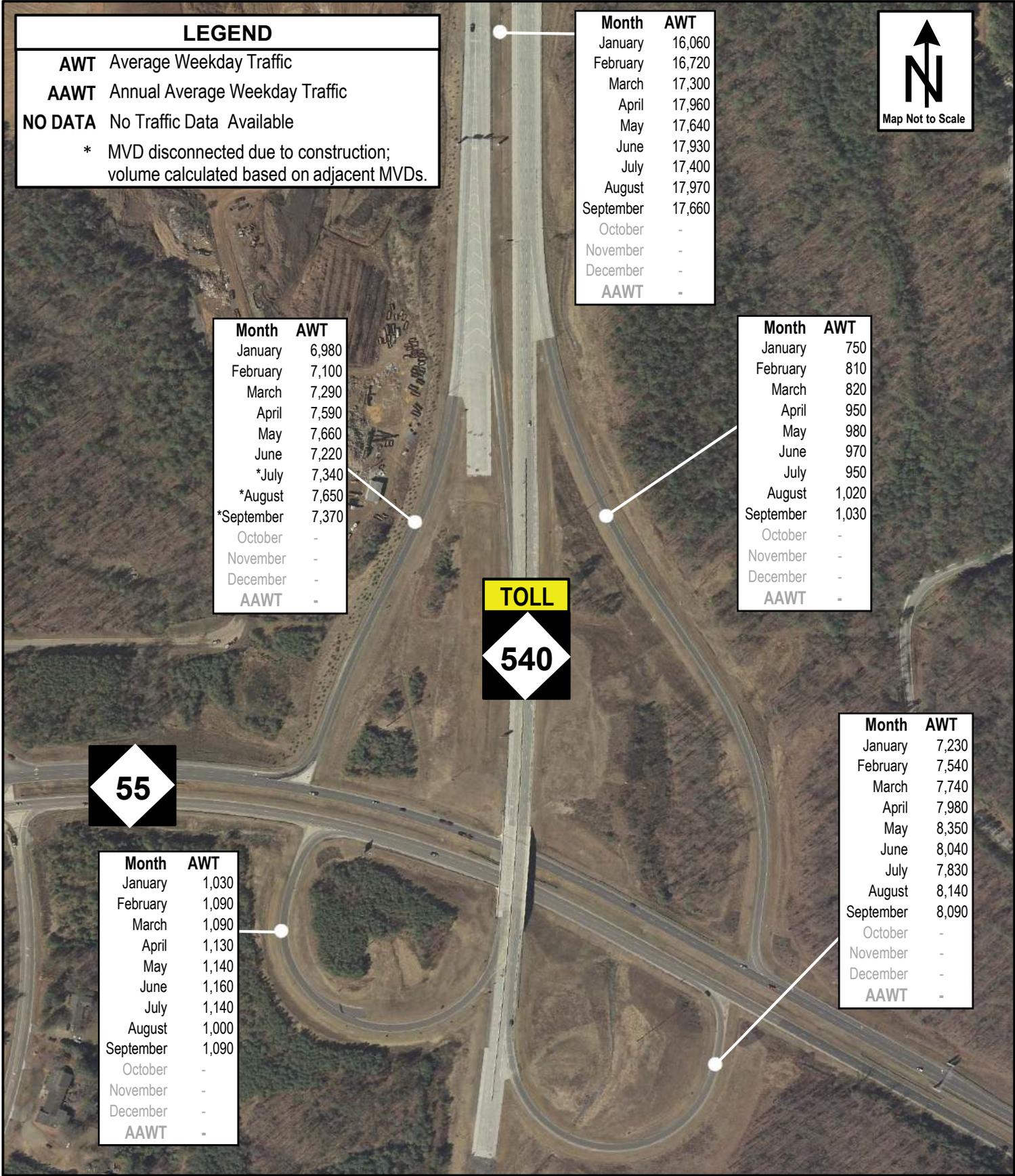
Month	AWT
January	340
February	350
March	370
April	380
May	390
June	330
July	310
August	350
September	330
October	-
November	-
December	-
AAWT	-

Month	AWT
January	16,060
February	16,720
March	17,300
April	17,960
May	17,640
June	17,930
July	17,400
August	17,970
September	17,660
October	-
November	-
December	-
AAWT	-

LEGEND	
<b>AWT</b>	Average Weekday Traffic
<b>AAWT</b>	Annual Average Weekday Traffic
<b>NO DATA</b>	No Traffic Data Available

**NC-540 at US-1 Interchange**  
2016 Average Weekday Traffic

**Figure**  
**12**



**NC-540 at NC-55 Bypass Interchange**  
 2016 Average Weekday Traffic

**Figure**  
**13**

# **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 Peach Pass®.

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 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**

**Third Quarter, July – September 2016**

**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, Vehicle/Account Information Update, and License Plate Mismatch Dispute. The Other category encompasses calling reasons other than the pre-determined categories.

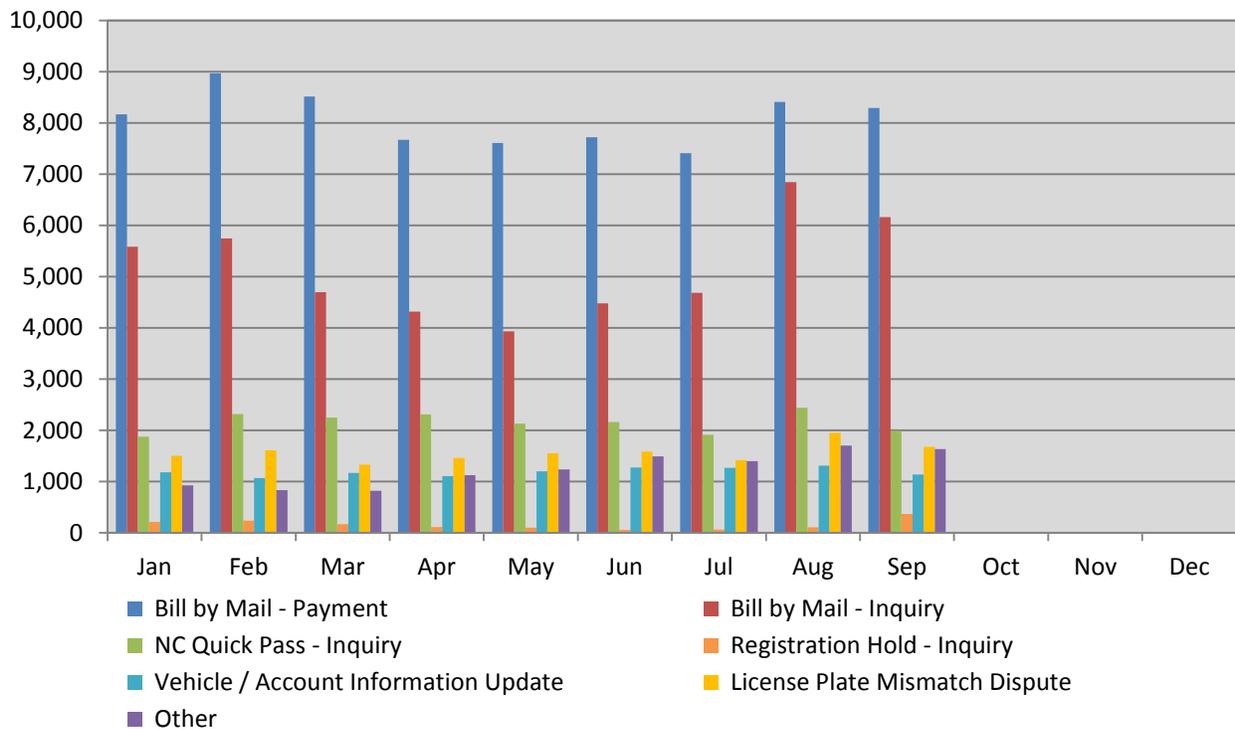
Table 1 presents a summary of the total monthly number of customer calls handled by CSRs, by reason.

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

Month	Bill by Mail - Payment	Bill by Mail - Inquiry	NC Quick Pass® - Inquiry	Registration Hold - Inquiry	Vehicle / Account Information Update	License Plate Mismatch Dispute	Other	Total
July	7,407	4,683	1,914	59	1,263	1,417	1,396	<b>18,139</b>
August	8,405	6,842	2,440	105	1,309	1,946	1,700	<b>22,747</b>
September	8,288	6,159	1,989	366	1,137	1,677	1,633	<b>21,249</b>

Figure 14 presents the total monthly number of customer calls handled by CSRs during 2016, by reason.

**Figure 14: 2016 NC Quick Pass® CSC Calls by Reason, YTD**



**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**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.

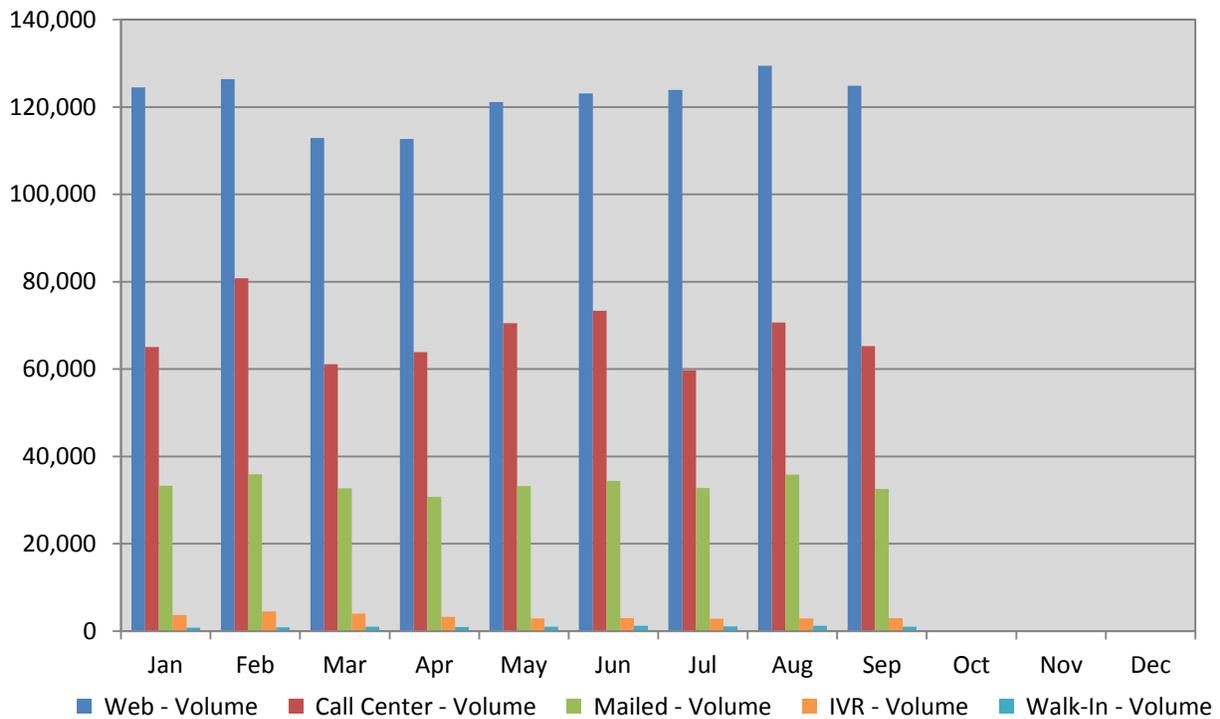
Table 2 presents a summary of the total monthly payments processed by the NC Quick Pass® CSC, by payment channel.

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

Month	Web Volume	Call Center Volume	Mailed Volume	IVR Volume	Walk-In Volume	Total
July	123,917	59,735	32,741	2,856	1,077	<b>220,326</b>
August	129,450	70,664	35,818	2,911	1,188	<b>240,031</b>
September	124,858	65,218	32,523	2,950	1,022	<b>226,571</b>

Figure 15 presents the total monthly payments processed by the NC Quick Pass® CSC during 2016, by payment channel.

**Figure 15: 2016 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.

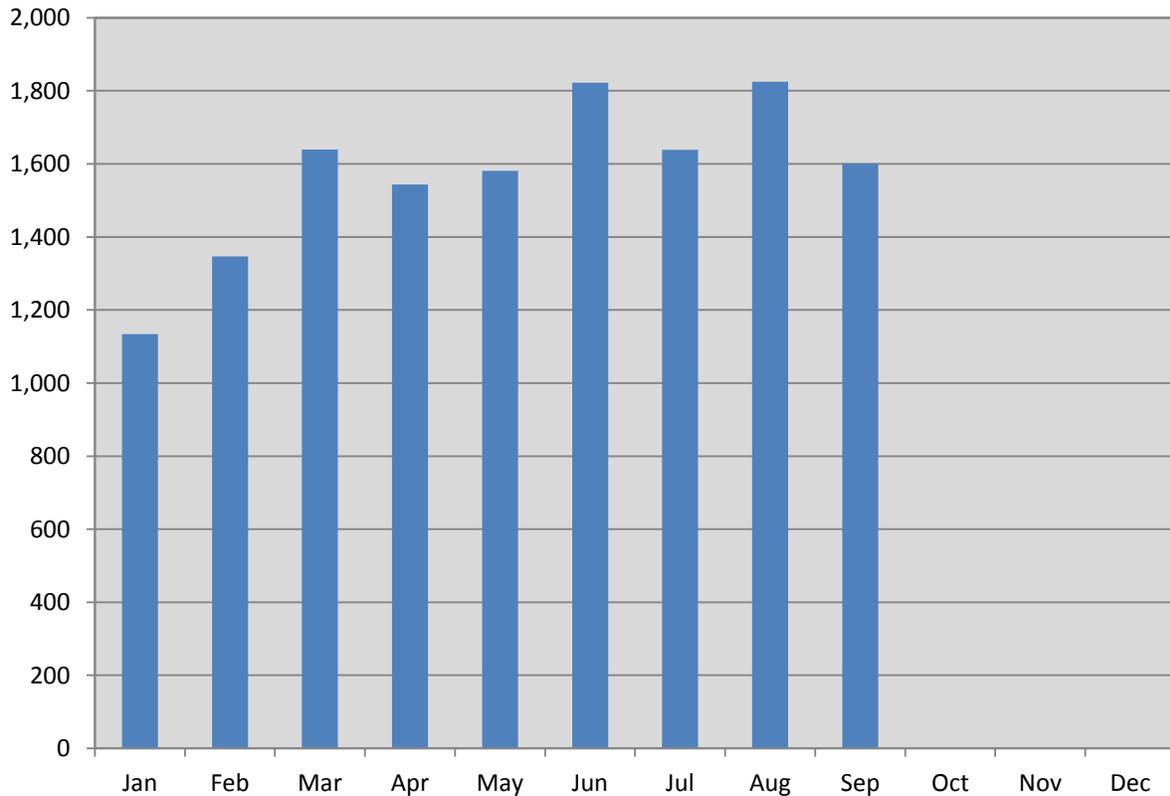
Table 3 presents a summary of the total monthly number of walk-in customers serviced in the NC Quick Pass® CSC Walk-In Center.

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

Month	Number of Walk-In Customers
July	1,638
August	1,825
September	1,601

Figure 16 depicts the number of walk-in customers that were serviced in the NC Quick Pass® CSC Walk-In Center during 2016.

**Figure 16: 2016 NC Quick Pass® CSC Walk-in Customers, YTD**



**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**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, Third Quarter by Week**

Week Ending	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
7/3/2016 <sup>1</sup>	136,642	52.1%	125,736	47.9%	<b>262,378</b>
7/10/2016 <sup>2</sup>	417,253	55.9%	329,471	44.1%	<b>746,724</b>
7/17/2016	512,021	57.6%	376,735	42.4%	<b>888,756</b>
7/24/2016	509,314	57.6%	374,292	42.4%	<b>883,606</b>
7/31/2016	517,226	57.9%	375,525	42.1%	<b>892,751</b>
8/7/2016	512,739	58.2%	368,545	41.8%	<b>881,284</b>
8/14/2016	521,215	58.0%	376,912	42.0%	<b>898,127</b>
8/21/2016	535,391	58.2%	385,256	41.8%	<b>920,647</b>
8/28/2016	542,701	58.5%	384,805	41.5%	<b>927,506</b>
9/4/2016	518,221	59.3%	355,914	40.7%	<b>874,135</b>
9/11/2016 <sup>3</sup>	483,577	57.7%	354,996	42.3%	<b>838,573</b>
9/18/2016	548,850	58.6%	387,327	41.4%	<b>936,177</b>
9/25/2016	514,868	59.3%	352,973	40.7%	<b>867,841</b>
9/30/2016 <sup>4</sup>	457,585	60.9%	294,012	39.1%	<b>751,597</b>

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

<sup>2</sup> Week ending includes Independence Day

<sup>3</sup> Week ending includes Labor 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 transactions.

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

Month	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
July	2,092,456	56.9%	1,581,759	43.1%	<b>3,674,215</b>
August	2,391,583	58.6%	1,689,559	41.4%	<b>4,081,142</b>
September	2,243,564	58.8%	1,571,181	41.2%	<b>3,814,745</b>

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

Figure 17 presents the total monthly transactions and NC Quick Pass® utilization during 2016.

**Figure 17: 2016 Transactions, YTD**

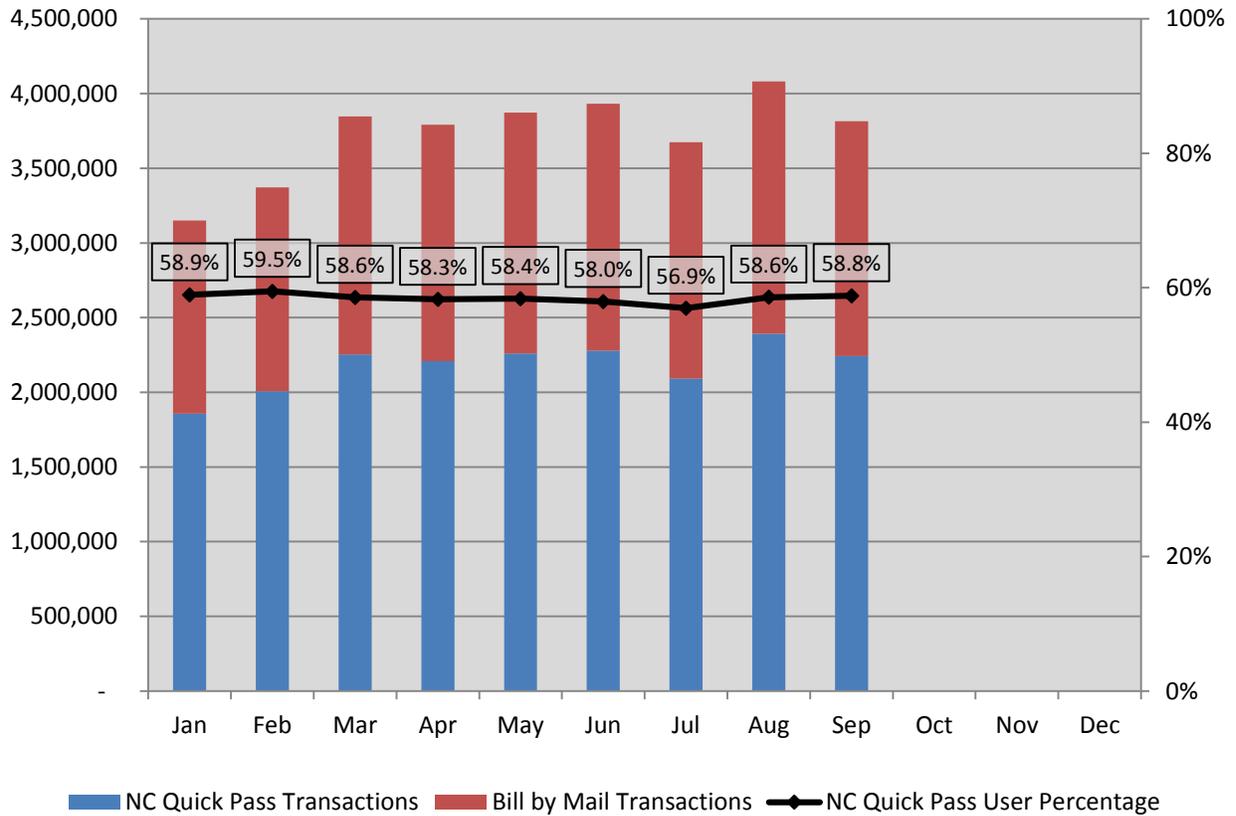


Table 6 presents a summary of the total NC Quick Pass® and Bill by Mail transactions, by year. Project to date is the total number of transactions since opening the facility to toll traffic.

**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*	19,592,972	58.4%	13,944,054	41.6%	33,537,026
<b>Project to Date</b>	<b>75,462,346</b>	<b>57.5%</b>	<b>55,667,122</b>	<b>42.5%</b>	<b>131,129,468</b>

\*2016 transactions reported include nine months of data (January - September).

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**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, Third 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
7/3/2016 <sup>1</sup>	254,424	97.0%	3,055	1.2%	4,899	1.9%
7/10/2016 <sup>2</sup>	718,665	96.2%	9,922	1.3%	18,137	2.4%
7/17/2016	853,460	96.0%	12,222	1.4%	23,074	2.6%
7/24/2016	849,260	96.1%	11,882	1.3%	22,464	2.5%
7/31/2016	856,294	95.9%	12,710	1.4%	23,747	2.7%
8/7/2016	846,065	96.0%	12,702	1.4%	22,517	2.6%
8/14/2016	862,804	96.1%	12,224	1.4%	23,099	2.6%
8/21/2016	880,158	95.6%	14,993	1.6%	25,496	2.8%
8/28/2016	888,370	95.8%	13,711	1.5%	25,425	2.7%
9/4/2016	842,059	96.3%	10,674	1.2%	21,402	2.4%
9/11/2016 <sup>3</sup>	806,478	96.2%	11,200	1.3%	20,895	2.5%
9/18/2016	899,899	96.1%	12,194	1.3%	24,084	2.6%
9/25/2016	840,435	96.8%	8,699	1.0%	18,707	2.2%
9/30/2016 <sup>4</sup>	721,581	96.0%	9,553	1.3%	20,463	2.7%

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

<sup>2</sup> Week ending includes Independence Day

<sup>3</sup> Week ending includes Labor 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, Third 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
July	3,532,103	96.1%	49,791	1.4%	92,321	2.5%
August	3,912,171	95.9%	59,699	1.5%	109,272	2.7%
September	3,675,678	96.4%	46,251	1.2%	92,816	2.4%

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

Figure 18 presents the total monthly percentage of transactions during 2016 for Class 1 (2-axle), Class 2 (3-axle), and Class 3 (4+axle) vehicles.

**Figure 18: 2016 Classification, Percentage YTD**

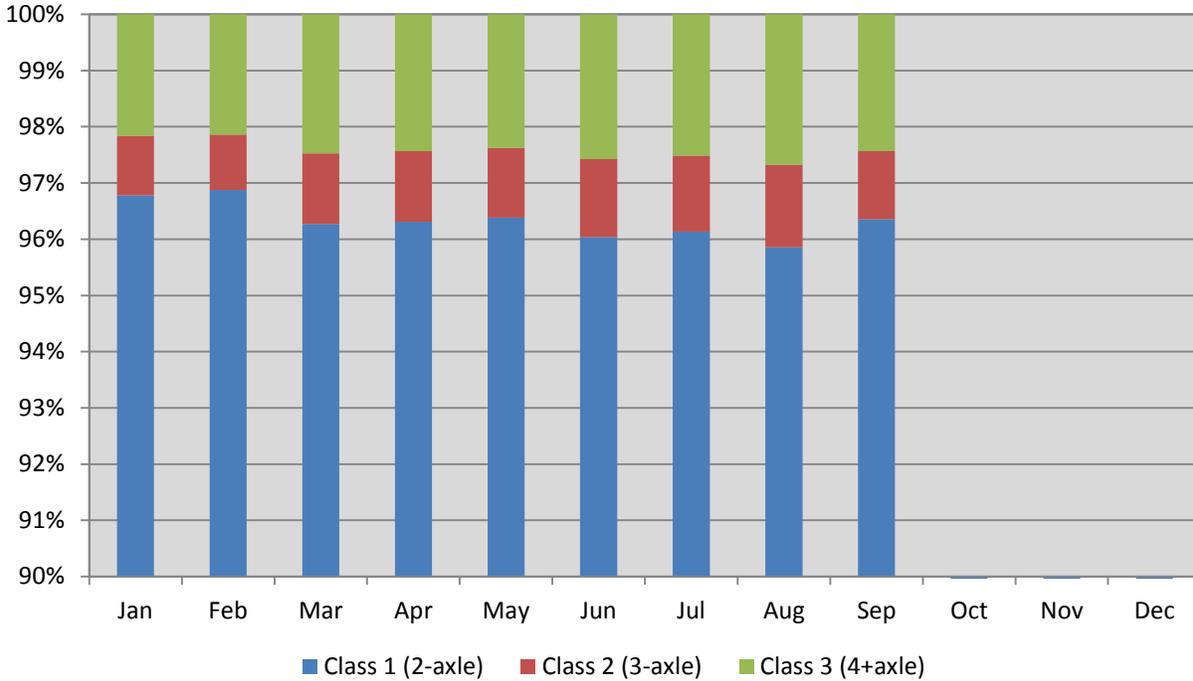


Table 9 presents a summary of the total transactions for Class 1 (2-axle), Class 2 (3-axle), and Class 3 (4+axle) vehicles, by year. Project to date is the total number of transactions since opening the facility to toll traffic.

**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*	32,300,714	96.3%	421,009	1.3%	815,304	2.4%
<b>Project to Date</b>	<b>126,725,578</b>	<b>96.6%</b>	<b>1,517,879</b>	<b>1.2%</b>	<b>2,886,012</b>	<b>2.2%</b>

\*2016 classification reported includes nine months of data (January - September).

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**Accounts**

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

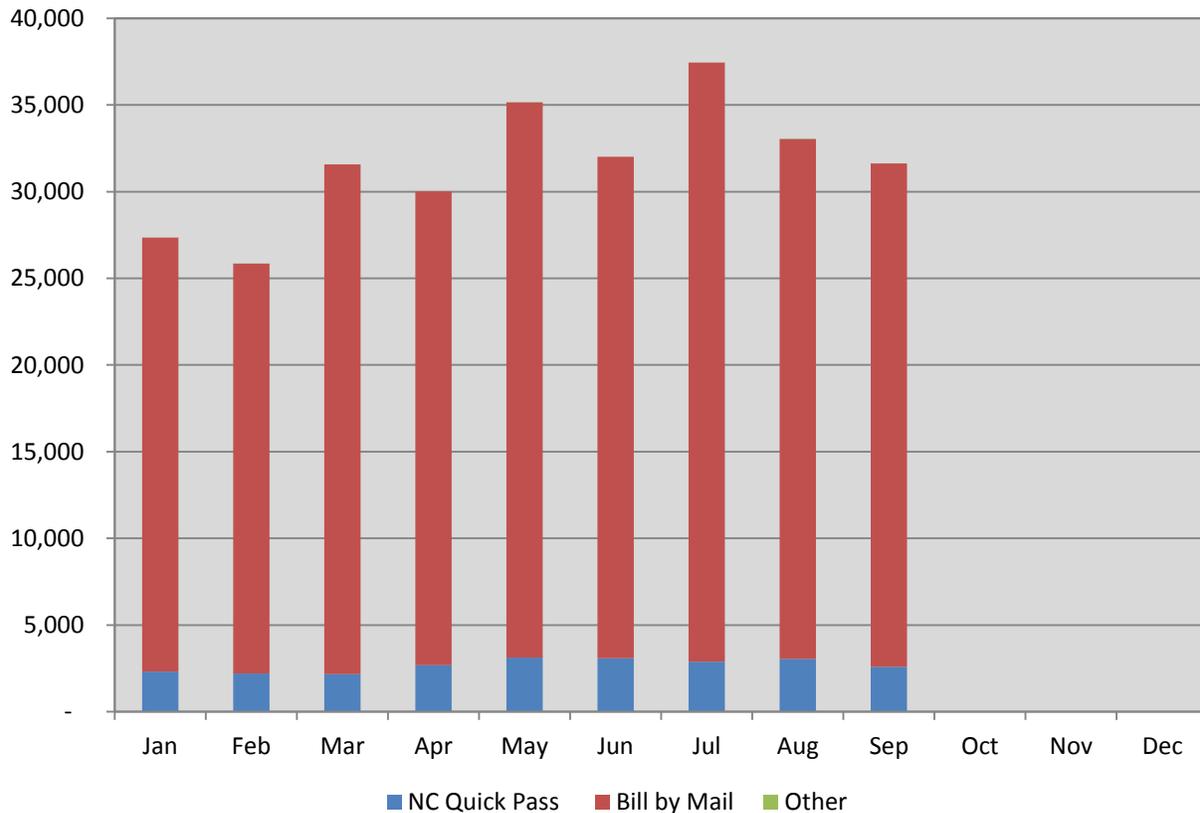
Table 10 presents a summary of the monthly established accounts being managed by the NC Quick Pass® CSC. Numbers presented in parentheses represent a reduction in accounts.

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

Month	NC Quick Pass®	Bill by Mail	Registered Video	Non-Revenue	Government	Total
July	2,882	34,563	0	0	0	37,445
August	3,040	30,005	0	1	0	33,045
September	2,585	29,031	0	0	0	31,616

Figure 19 presents the monthly established accounts managed by the NC Quick Pass® CSC during 2016. The “Other” category includes registered video, non-revenue, and government accounts.

**Figure 19: 2016 Established Accounts, YTD**



**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

*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**

<b>Year</b>	<b>NC Quick Pass®</b>	<b>Bill by Mail</b>	<b>Registered Video</b>	<b>Non-Revenue</b>	<b>Government</b>	<b>Total</b>
2012	27,179	359,431	5	38	18	386,610
2013	24,268	306,581	(1)	19	9	330,849
2014	18,652	342,476	2	13	3	361,128
2015	24,222	380,897	0	4	0	405,119
2016*	24,083	259,953	1	4	0	284,036
<b>Project to Date</b>	<b>118,404</b>	<b>1,649,338</b>	<b>7</b>	<b>78</b>	<b>30</b>	<b>1,767,742</b>

\*2016 established accounts reported include nine months of data (January - September).

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**Transponders**

This section presents the volume of transponders sold.

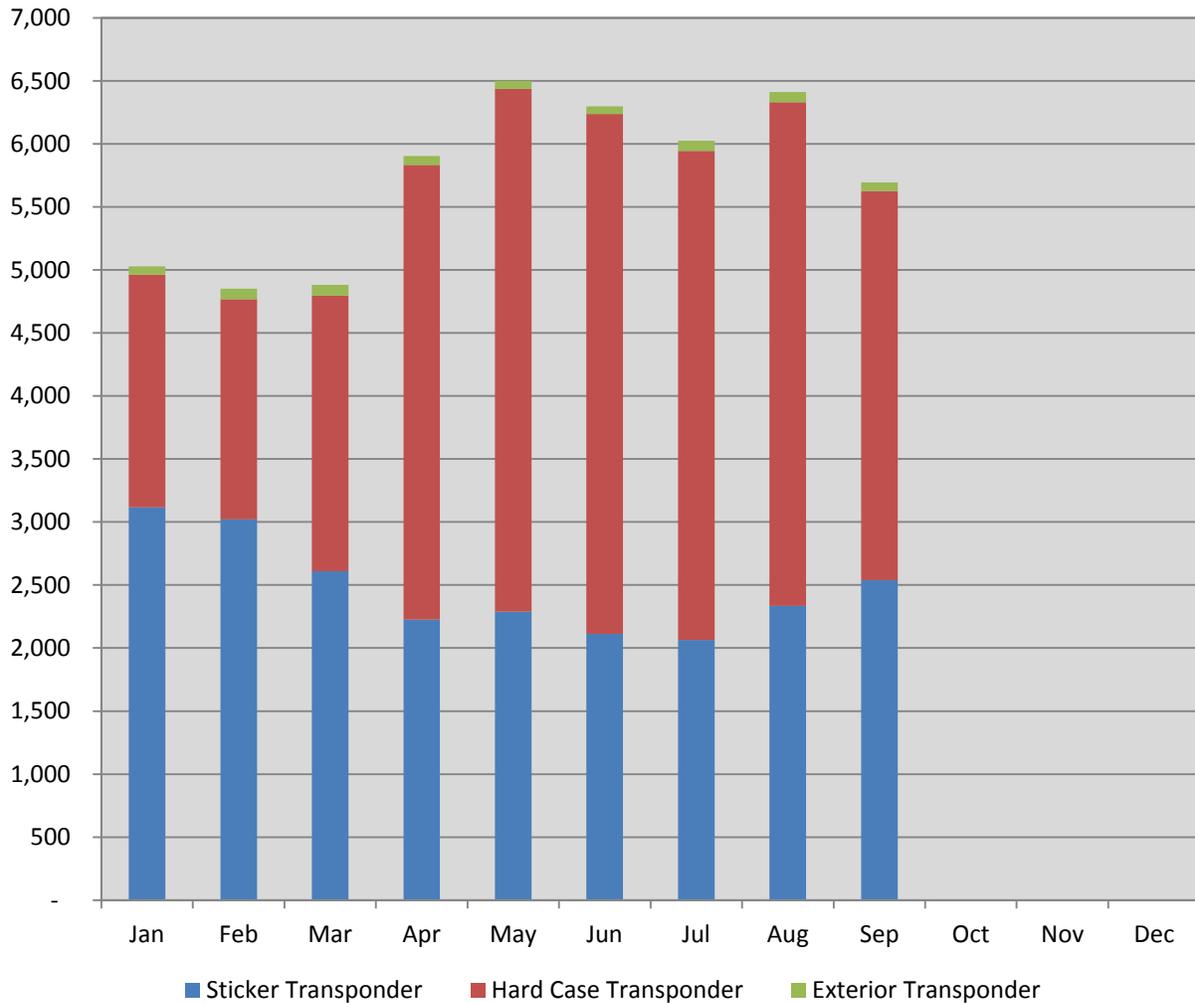
Table 12 presents a summary of the total transponders sold, by month.

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

Month	Sticker Tag	Hard Case Tag	Exterior Tag	Total
July	2,065	3,878	82	<b>6,025</b>
August	2,335	3,995	82	<b>6,412</b>
September	2,540	3,087	66	<b>5,693</b>

Figure 20 presents monthly transponders sold during 2016.

**Figure 20: 2016 Transponders Sold, YTD**



Operations Statistics Report for the Triangle Expressway

Third Quarter, July – September 2016

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.

Table 13: Transponders Sold, by Year

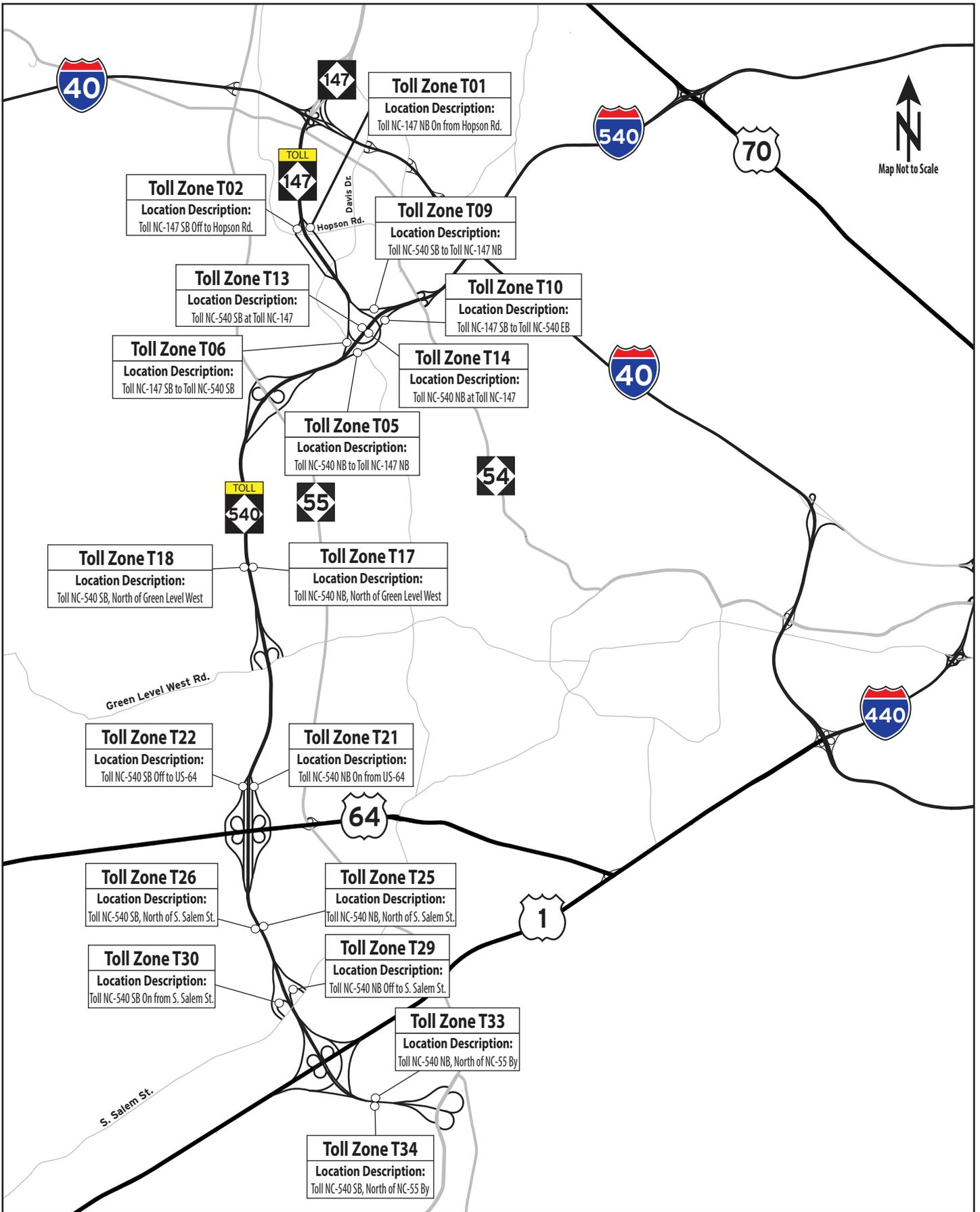
Year	Sticker Tag	Hard Case Tag	Exterior Tag	Total
2011	7,315	2,806	200	10,321
2012	35,338	6,861	250	42,449
2013	34,784	13,980	257	49,021
2014	26,066	14,778	221	41,065
2015	31,866	20,047	588	52,501
2016*	22,315	28,617	656	51,588
<b>Project to Date</b>	<b>157,684</b>	<b>87,089</b>	<b>2,172</b>	<b>246,945</b>

\*2016 transponders sale reported include nine months of data (January - September).

# Toll Zone Statistics

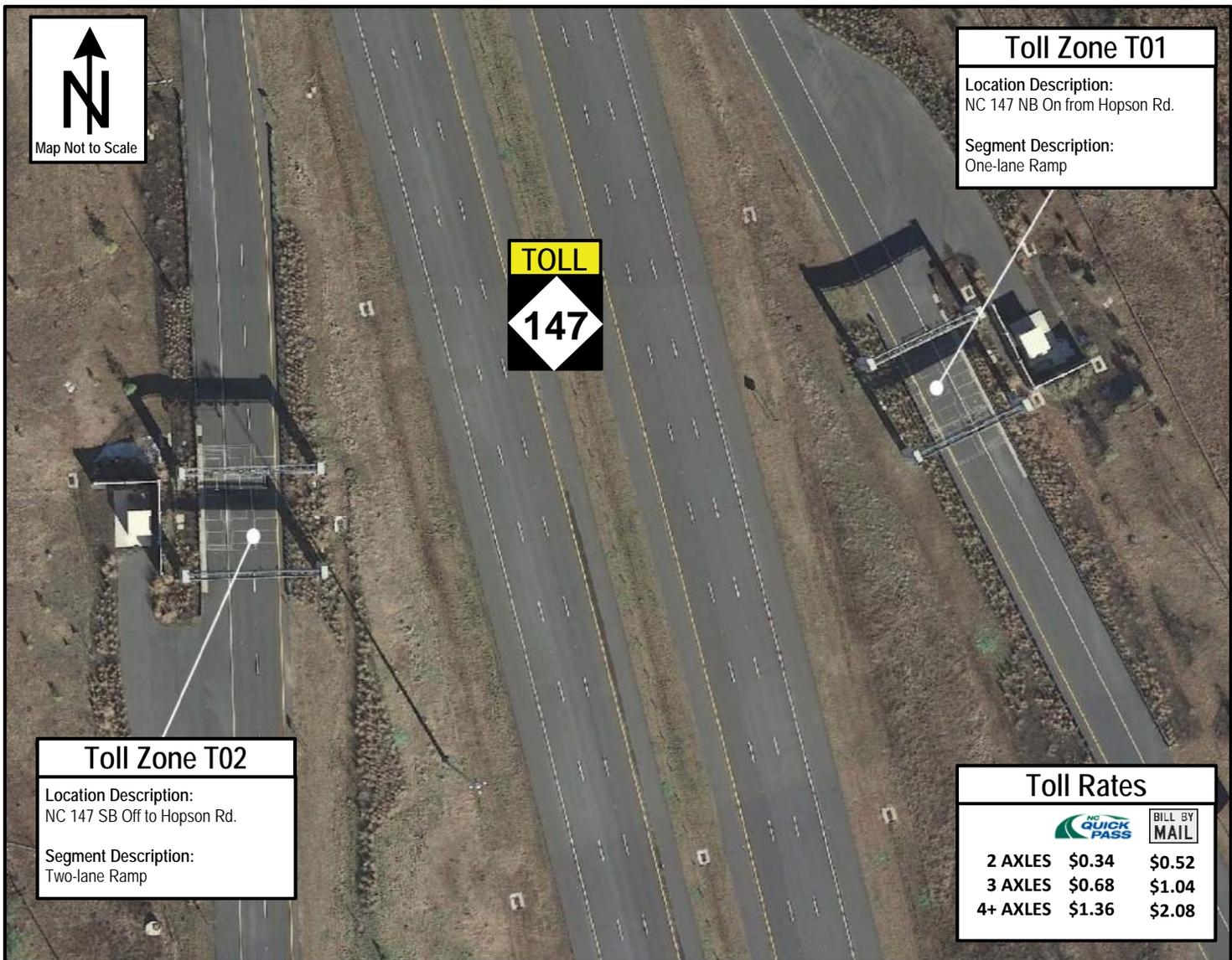
## TOLL ZONE STATISTICS

The location of the toll zones along the Triangle Expressway can be seen in *Figure 21*. *Figures 22 - 30* present the average weekday transactions (excludes holidays and days of inclement weather conditions) recorded at toll zones along the facility.



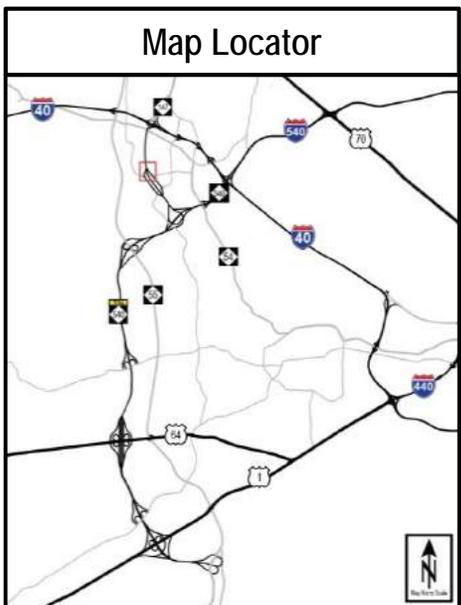
**Triangle Expressway Toll Zone Map**

**Figure 21**



Transactions by Direction		
Month	T01	T02
January	2,480	2,210
February	2,510	2,210
March	2,530	2,260
April	2,590	2,360
May	2,570	2,320
June	2,680	2,370
July	2,580	2,310
August	2,640	2,420
September	2,620	2,430
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T01	T02
January	60%	61%
February	60%	62%
March	60%	61%
April	59%	61%
May	59%	61%
June	59%	60%
July	58%	59%
August	59%	60%
September	60%	61%
October	-	-
November	-	-
December	-	-



Hopson Road Ramp Toll Zones

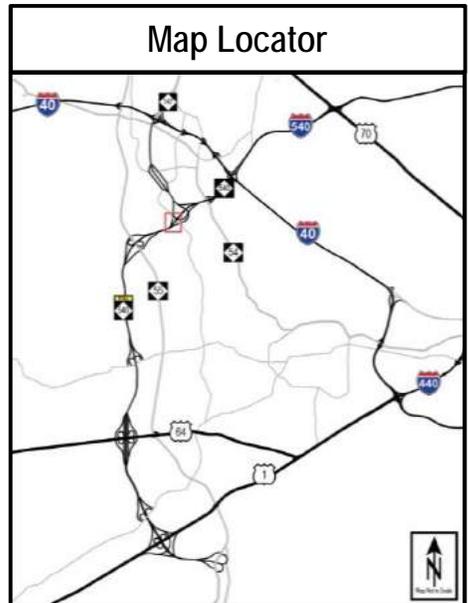
2016 Average Weekday Toll Transactions

Figure  
22



Transactions by Direction		
Month	T05	T06
January	6,480	6,380
February	6,630	6,420
March	6,780	6,470
April	6,940	6,660
May	6,820	6,500
June	7,100	6,810
July	6,970	6,680
August	7,200	7,000
September	7,080	6,940
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T05	T06
January	62%	64%
February	62%	64%
March	61%	63%
April	61%	63%
May	61%	63%
June	61%	62%
July	60%	61%
August	61%	62%
September	62%	63%
October	-	-
November	-	-
December	-	-



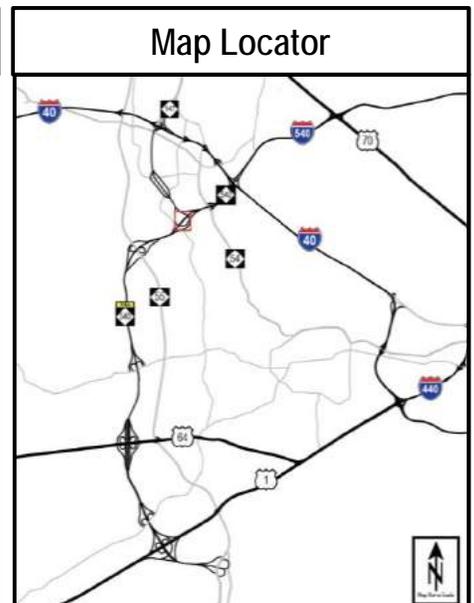
**NC-147 South Ramp Toll Zones**  
 2016 Average Weekday Toll Transactions

**Figure 23**



Transactions by Direction		
Month	T13	T14
January	14,400	14,270
February	14,920	14,950
March	15,390	15,470
April	15,840	16,030
May	15,840	16,040
June	16,450	16,540
July	15,810	15,800
August	16,250	16,300
September	15,980	16,160
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T13	T14
January	60%	62%
February	61%	62%
March	59%	61%
April	60%	61%
May	59%	61%
June	59%	60%
July	58%	59%
August	59%	60%
September	60%	61%
October	-	-
November	-	-
December	-	-



**NC-540 Morrisville Mainline Toll Zones**  
 2016 Average Weekday Toll Transactions

**Figure 24**



**Toll Zone T09**  
 Location Description:  
 NC 147 NB On from NC 540 SB  
 Segment Description:  
 One-lane Ramp



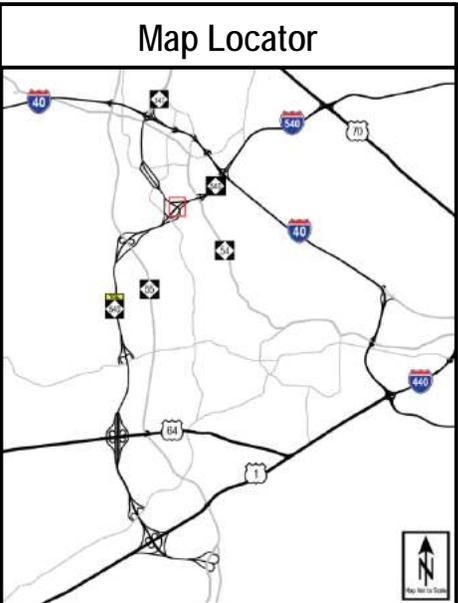
Toll Rates		
	NC QUICK PASS	BILL BY MAIL
2 AXLES	\$0.76	\$1.16
3 AXLES	\$1.52	\$2.32
4+ AXLES	\$3.04	\$4.64

**Toll Zone T10**  
 Location Description:  
 NC 540 NB On from NC 147 SB  
 Segment Description:  
 Two-lane Ramp



Transactions by Direction		
Month	T09	T10
January	1,910	2,490
February	1,920	2,510
March	1,810	2,470
April	1,910	2,700
May	1,880	2,570
June	2,050	2,720
July	2,010	2,580
August	2,100	2,790
September	2,020	2,820
October	-	-
November	-	-
December	-	-

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



**NC-147 North Ramp Toll Zones**  
 2016 Average Weekday Toll Transactions

**Figure 25**



**Toll Zone T18**

**Location Description:**  
NC 540 SB, North of Green Level West

**Segment Description:**  
Three-lane Mainline

**Toll Zone T17**

**Location Description:**  
NC 540 NB, North of Green Level West

**Segment Description:**  
Three-lane Mainline

**Toll Rates**

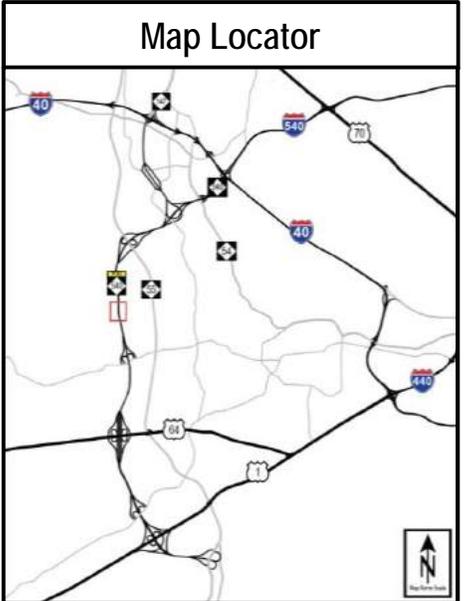
2 AXLES	\$0.76	\$1.16
3 AXLES	\$1.52	\$2.32
4+ AXLES	\$3.04	\$4.64

**Transactions by Direction**

Month	T17	T18
January	14,980	15,720
February	15,480	16,080
March	15,800	16,360
April	16,130	16,710
May	15,990	16,570
June	16,580	17,410
July	16,160	16,960
August	16,730	17,570
September	16,630	17,400
October	-	-
November	-	-
December	-	-

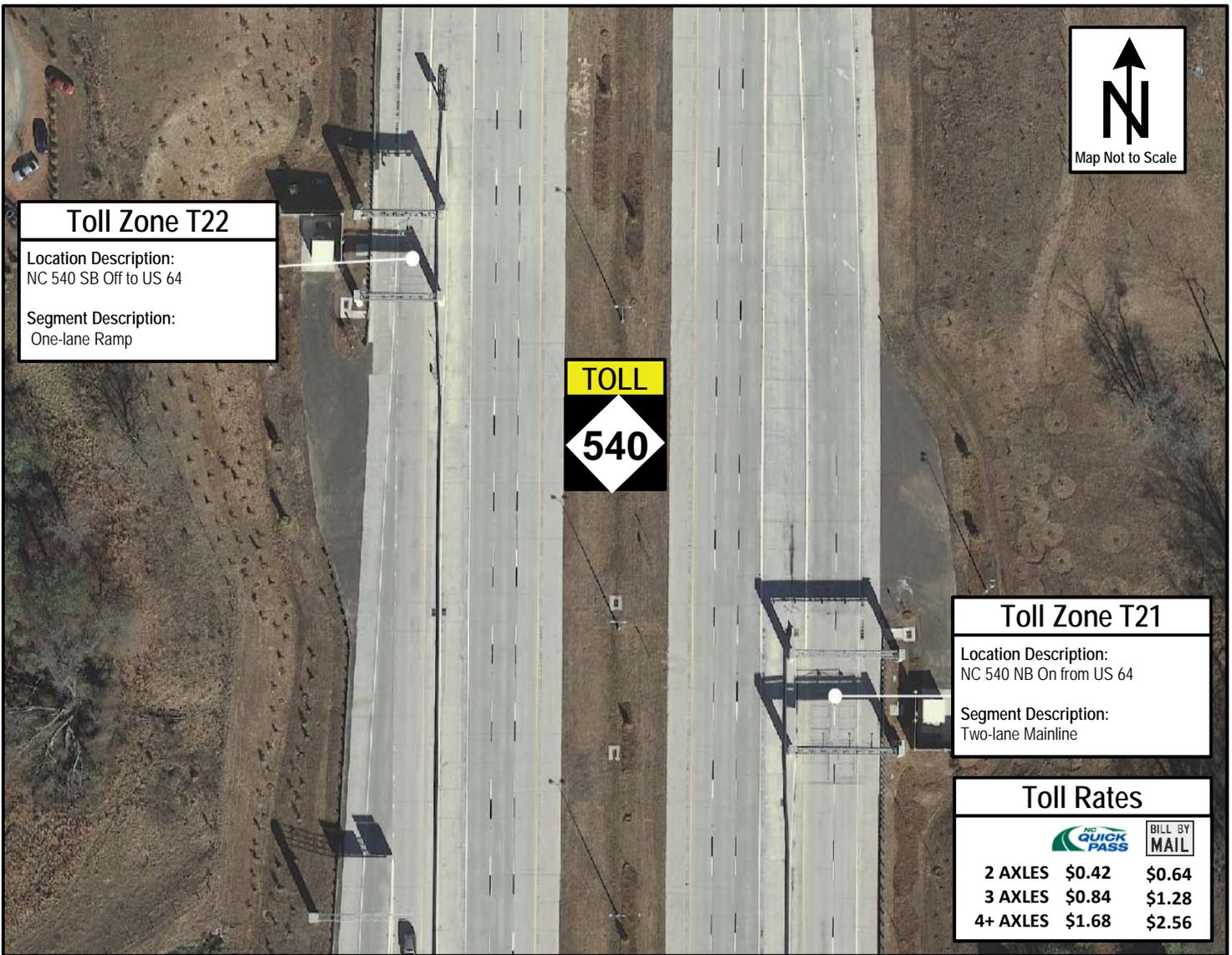
**NC Quick Pass Percentage**

Month	T17	T18
January	61%	61%
February	61%	61%
March	60%	60%
April	60%	60%
May	60%	60%
June	59%	59%
July	59%	58%
August	60%	60%
September	60%	60%
October	-	-
November	-	-
December	-	-



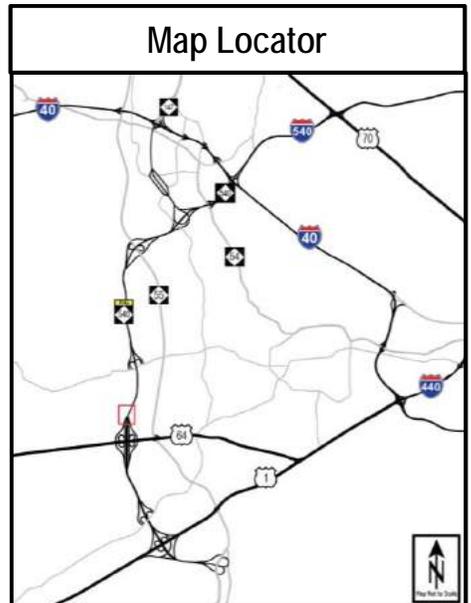
**NC-540 Cary Mainline Toll Zones**  
2016 Average Weekday Toll Transactions

**Figure 26**



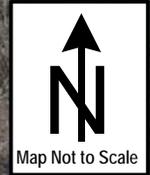
Transactions by Direction		
Month	T21	T22
January	4,680	4,860
February	4,880	5,030
March	5,020	5,250
April	5,190	5,420
May	5,160	5,400
June	5,370	5,690
July	5,220	5,500
August	5,260	5,560
September	5,190	5,460
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T21	T22
January	61%	62%
February	61%	62%
March	60%	62%
April	61%	62%
May	60%	62%
June	60%	61%
July	59%	61%
August	60%	62%
September	61%	62%
October	-	-
November	-	-
December	-	-



**US-64 Ramp Toll Zones**  
2016 Average Weekday Toll Transactions

**Figure 27**



**Toll Zone T26**

**Location Description:**  
NC 540 SB, North of S. Salem St.

**Segment Description:**  
Three-lane Mainline

**Toll Zone T25**

**Location Description:**  
NC 540 NB, North of S. Salem St.

**Segment Description:**  
Three-lane Mainline

**Toll Rates**

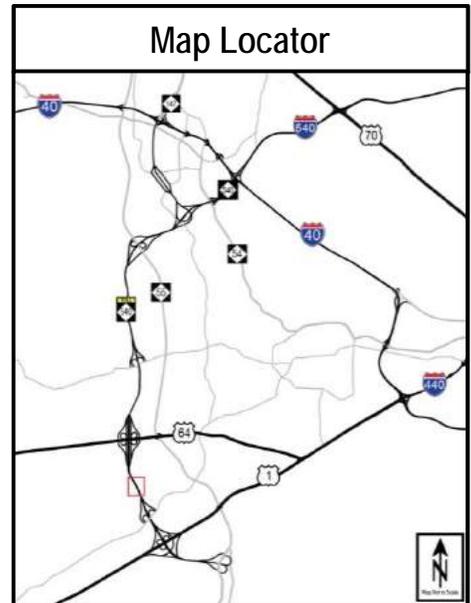
2 AXLES	\$0.94	\$1.44
3 AXLES	\$1.88	\$2.88
4+ AXLES	\$3.76	\$5.76

**Transactions by Direction**

Month	T25	T26
January	12,080	12,210
February	12,520	12,540
March	13,050	12,960
April	13,440	13,310
May	13,370	13,250
June	13,810	13,820
July	13,440	13,470
August	13,860	13,850
September	13,830	13,740
October	-	-
November	-	-
December	-	-

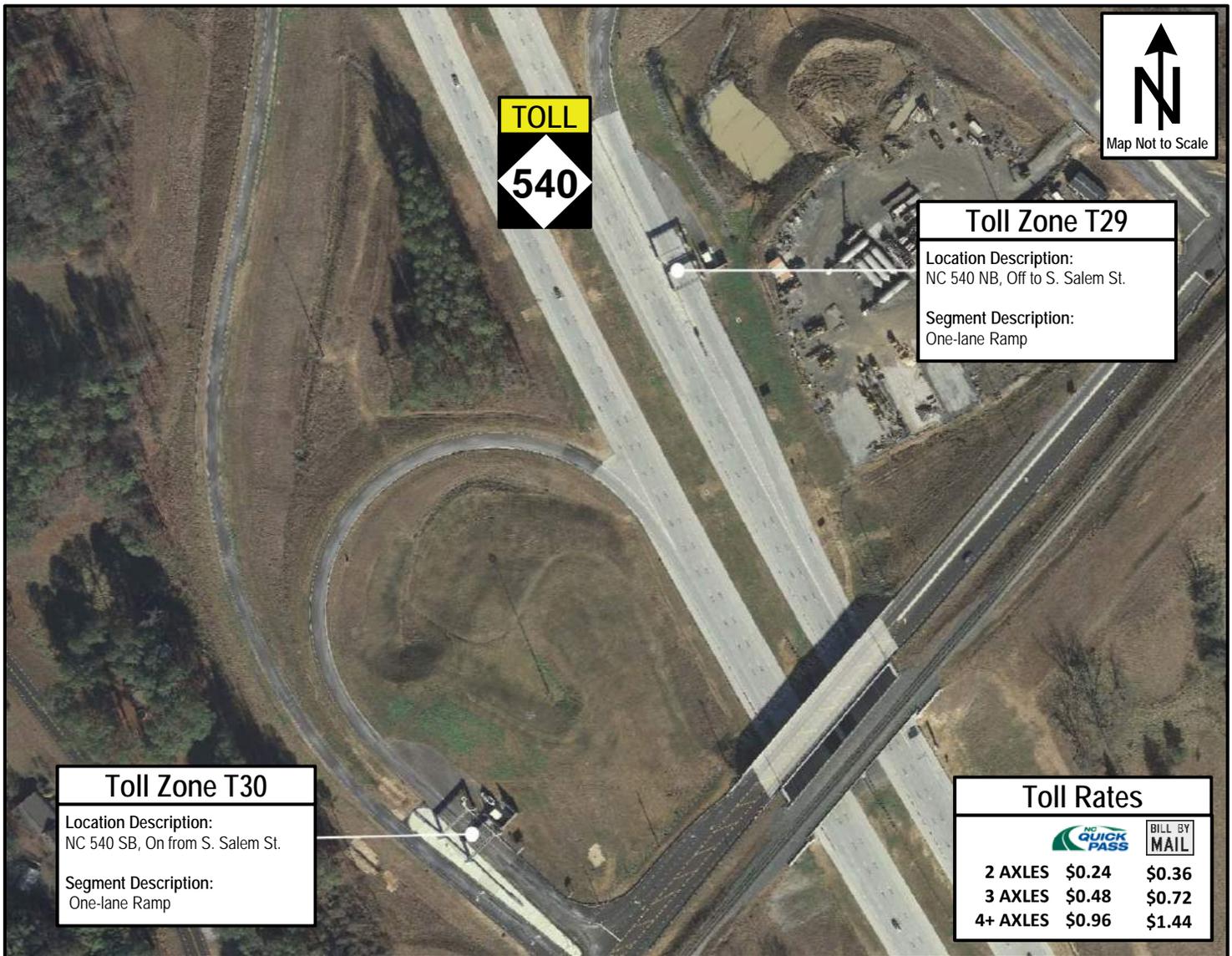
**NC Quick Pass Percentage**

Month	T25	T26
January	59%	59%
February	59%	59%
March	58%	58%
April	59%	58%
May	58%	58%
June	58%	57%
July	57%	57%
August	59%	58%
September	59%	59%
October	-	-
November	-	-
December	-	-



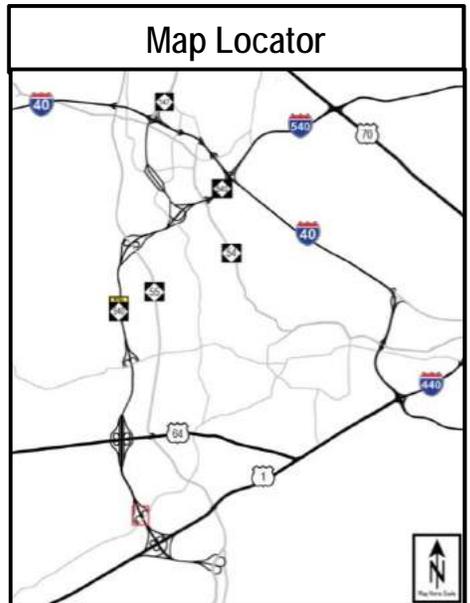
**NC-540 Apex Mainline Toll Zones**  
2016 Average Weekday Toll Transactions

**Figure 28**



Transactions by Direction		
Month	T29	T30
January	1,280	1,410
February	1,400	1,490
March	1,380	1,490
April	1,480	1,600
May	1,460	1,540
June	1,350	1,470
July	1,270	1,390
August	1,460	1,550
September	1,620	1,660
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T29	T30
January	69%	70%
February	63%	69%
March	67%	70%
April	67%	69%
May	67%	69%
June	66%	69%
July	65%	68%
August	66%	68%
September	67%	69%
October	-	-
November	-	-
December	-	-



**South Salem Street Ramp Toll Zones**  
2016 Average Weekday Toll Transactions

**Figure 29**



**Toll Zone T33**  
 Location Description:  
 NC 540 NB, North of NC 55 Bypass  
 Segment Description:  
 Three-lane Mainline

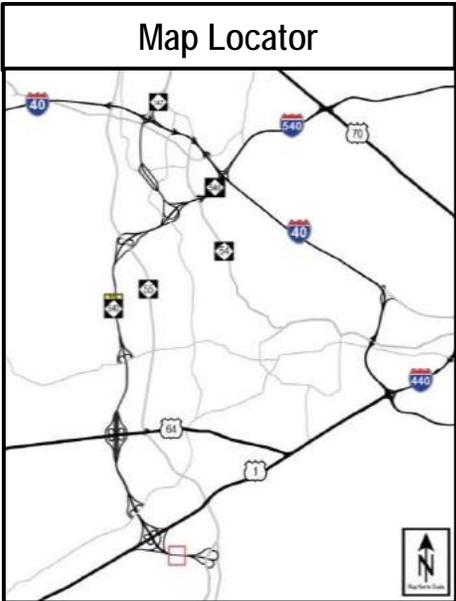


**Toll Zone T34**  
 Location Description:  
 NC 540 SB, North of NC 55 Bypass  
 Segment Description:  
 Two-lane Ramp

Toll Rates		
2 AXLES	\$0.39	\$0.60
3 AXLES	\$0.78	\$1.20
4+ AXLES	\$1.56	\$2.40

Transactions by Direction		
Month	T33	T34
January	8,240	8,170
February	8,530	8,360
March	8,840	8,660
April	9,630	9,260
May	8,950	8,730
June	9,170	9,120
July	8,920	8,740
August	9,290	8,950
September	9,210	8,790
October	-	-
November	-	-
December	-	-

NC Quick Pass Percentage		
Month	T33	T34
January	64%	62%
February	64%	63%
March	62%	61%
April	60%	59%
May	63%	61%
June	62%	60%
July	61%	60%
August	62%	61%
September	62%	62%
October	-	-
November	-	-
December	-	-



**NC-540 Holly Springs Mainline Toll Zones**  
 2016 Average Weekday Toll Transactions

**Figure 30**

# 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 the four segments selected, as well as for the entire facility. These Crash Rates can then be compared to the Critical Crash Rates.

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 third quarter, the Crash Rates of the four segments selected and the entire facility were calculated based on the roadway length, the average annual daily traffic (AADT), and the number of crashes recorded from September 2013 through August 2016 for each segment. The AADT used for this quarter analysis was collected from the NCDOT 2014 Wake County AADT Map. The Statewide Crash Rate (85.41 crashes per 100 MVMT) used for comparison purposes in this analysis was collected from the 2012-2014 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 elements of chance and randomness. They are used to determine if the rate at a particular location is significantly higher than a predetermined average rate for locations with similar characteristics (i.e. Statewide Crash Rate).

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

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**Table 14: Safety Statistics, September 2013 - August 2016**

<b>Segment</b>	<b>Length</b>	<b>AADT <sup>1</sup></b>	<b>Total Crashes</b>	<b>Vehicle Exposure (MVMT)</b>	<b>Total Crash Rate</b>	<b>Statewide Crash Rate <sup>2</sup></b>	<b>Critical Crash Rate</b>
NC 147 I 40 to NC 540	3.1	10,400	36	35.37	101.77	85.41	87.98
NC 540 I 40 to NC 55	2.8	25,600	61	78.35	77.86	85.41	87.13
NC 540 NC 55 to US 64	6.7	18,600	78	136.03	57.34	85.41	86.72
NC 540 US 64 to NC 55 Bypass	5.9	13,500	45	86.64	51.94	85.41	87.05
<b>Triangle Expressway</b>	<b>18.4</b>	<b>17,000</b>	<b>220</b>	<b>343.28</b>	<b>64.09</b>	<b>85.41</b>	<b>86.23</b>

<sup>1</sup> AADT provided from NCDOT 2014 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 speed detectors (MVD), toll zone security cameras, and Roadway Weather Information System (RWIS). Additionally, they monitor roadside 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 third quarter of 2016. It includes driver violations and warnings placed by SHP and total IMAP assistance recorded, as well as average monthly IMAP response and clearance time.

**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

Table 15 and Table 16 present SHP operation statistics during 2016. “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.

**Table 15: SHP Chargeable Activities**

Chargeable Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Speed Violations	54	62	76	44	48	48	37	45	53				<b>467</b>
Alcohol Violations	0	0	0	0	0	0	1	0	0				<b>1</b>
Seat Belt Violations	5	4	4	18	12	3	7	6	4				<b>63</b>
Child Restraint Violations	0	0	0	1	0	0	0	0	0				<b>1</b>
Reckless Driving	1	1	1	4	7	2	5	2	1				<b>24</b>
Drug Violations	0	0	0	0	0	0	0	0	0				<b>0</b>
Other Violations	28	78	47	49	50	39	26	29	33				<b>379</b>
<b>Total Charges</b>	<b>88</b>	<b>145</b>	<b>128</b>	<b>116</b>	<b>117</b>	<b>92</b>	<b>76</b>	<b>82</b>	<b>91</b>				<b>935</b>

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

Non-Chargeable Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Warnings	53	40	56	90	57	97	54	74	55				<b>576</b>
Vehicles Towed	0	0	0	0	0	0	0	0	0				<b>-</b>
Crashes Investigated	4	8	5	5	16	3	10	5	4				<b>60</b>
<b>Total</b>	<b>57</b>	<b>48</b>	<b>61</b>	<b>95</b>	<b>73</b>	<b>100</b>	<b>64</b>	<b>79</b>	<b>59</b>				<b>636</b>

The IMAP assists with stranded motorists and incident clearance, thereby maintaining the flow of traffic along the roadway. Table 17 and Figure 31 present the monthly breakdown of IMAP assists, by type, for the Triangle Expressway during 2016. The “other” category includes the reporting categories of assist other unit, secured load, called for assistance, directions, and transported motorist.

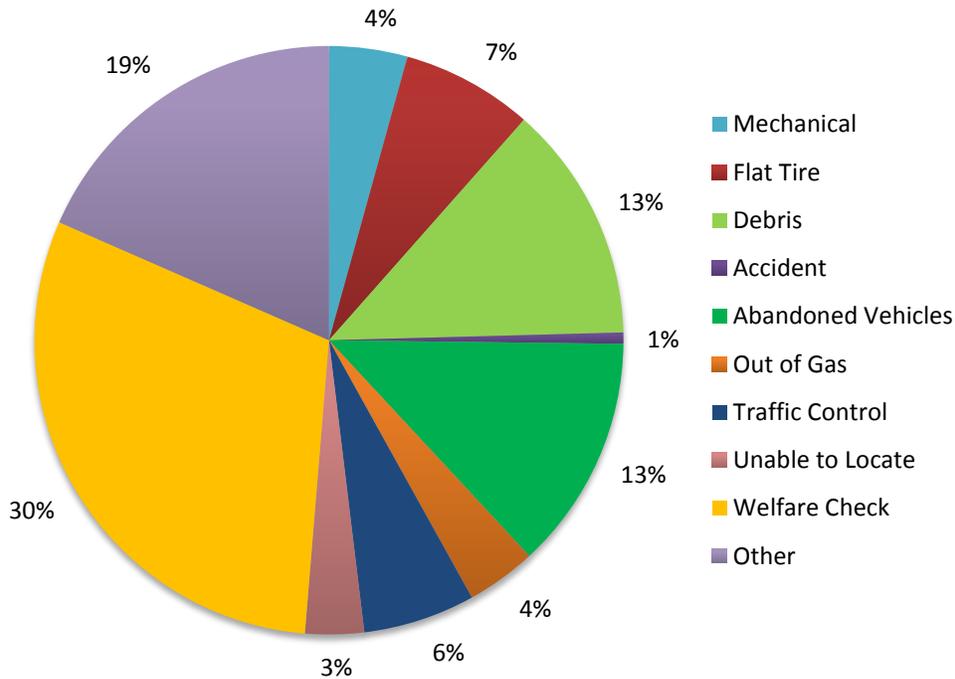
**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

**Table 17: IMAP Assistance**

Assist Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mechanical	3	2	3	5	3	3	2	5	2				28
Flat Tire	5	1	10	3	4	2	10	9	3				47
Debris	7	9	11	9	11	11	14	6	7				85
Accident	1	1	2	0	0	0	0	0	0				4
Abandoned Vehicles	12	8	7	5	5	11	8	23	5				84
Out of Gas	2	2	7	0	4	1	4	4	1				25
Traffic Control	1	2	9	6	8	4	1	1	8				40
Unable to Locate	5	2	0	8	2	1	0	3	0				21
Welfare Check	4	17	22	9	38	26	36	20	25				197
Other	13	6	14	3	28	14	18	9	15				120
<b>Total Assist</b>	<b>53</b>	<b>50</b>	<b>85</b>	<b>48</b>	<b>103</b>	<b>73</b>	<b>93</b>	<b>80</b>	<b>66</b>				<b>651</b>

**Figure 31: 2016 IMAP Assistance by Type, YTD**



**Operations Statistics Report for the Triangle Expressway**

**Third Quarter, July – September 2016**

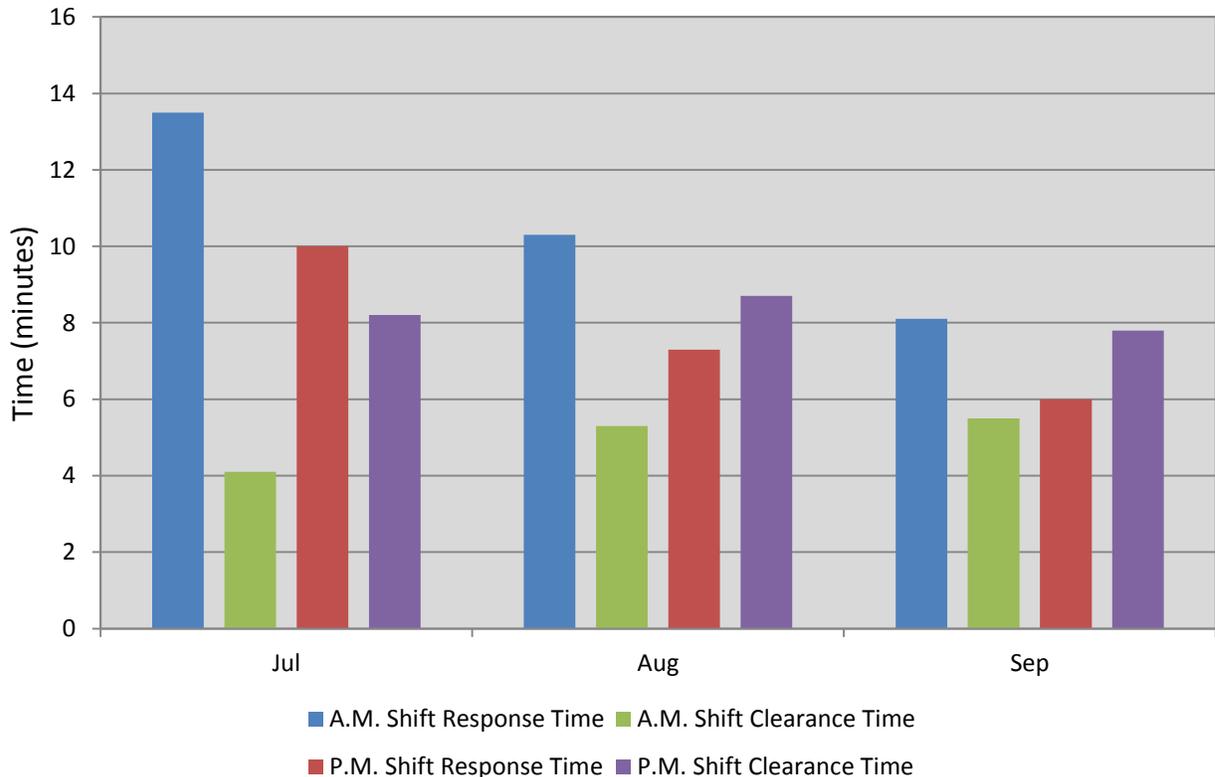
The response and clearance times for all IMAP assists are logged by IMAP and provided to the NCTA. Response time is the time from which a responder receives a call to the time they arrive on the scene. Clearance time is the time it takes the responder to clear the incident and return the roadway to normal 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 32 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	2016 Average
<b>A.M. Shift Response</b>	12	12	16	11	12	14	14	10	8				<b>12</b>
<b>A.M. Shift Clearance</b>	6	5	11	6	9	6	4	5	6				<b>6</b>
<b>P.M. Shift Response</b>	13	10	11	8	11	12	10	7	6				<b>10</b>
<b>P.M. Shift Clearance</b>	7	10	10	6	11	7	8	9	8				<b>8</b>

**Figure 32: 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 was scheduled to be completed for each newly opened roadway section, soon after opening to toll collection. The baseline assessments included complete inventory data collection and assessment on 100% of the roadway assets.

After the initial baseline assessment was completed, future assessments for that segment switched 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 2016 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 2016 Rating	Q2 2016 Rating	Q3 2016 Rating	Q4 2016 Rating	2016 Annual Rating
Road Surface	98.3	100.0	99.1	N/A	N/A
Unpaved Shoulders and Ditches	97.7	100.0	100.0	N/A	N/A
Drainage	92.6	91.0	87.9	N/A	N/A
Roadside	92.1	83.4	90.0	N/A	N/A
Traffic Control Devices	93.5	96.1	90.5	N/A	N/A
<b>Overall MRP Performance Rating</b>	<b>94.9</b>	<b>94.7</b>	<b>93.4</b>	<b>N/A</b>	<b>N/A</b>

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