



NORTH CAROLINA
Turnpike Authority

Operations Statistics Report

Triangle Expressway

2017 Fourth Quarter Report

October - December

1 S. Wilmington Street
Raleigh, NC 27601



Last Updated:
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INTRODUCTION

Purpose

The North Carolina Turnpike Authority (NCTA) presents the operations statistics for the Triangle Expressway during the year 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

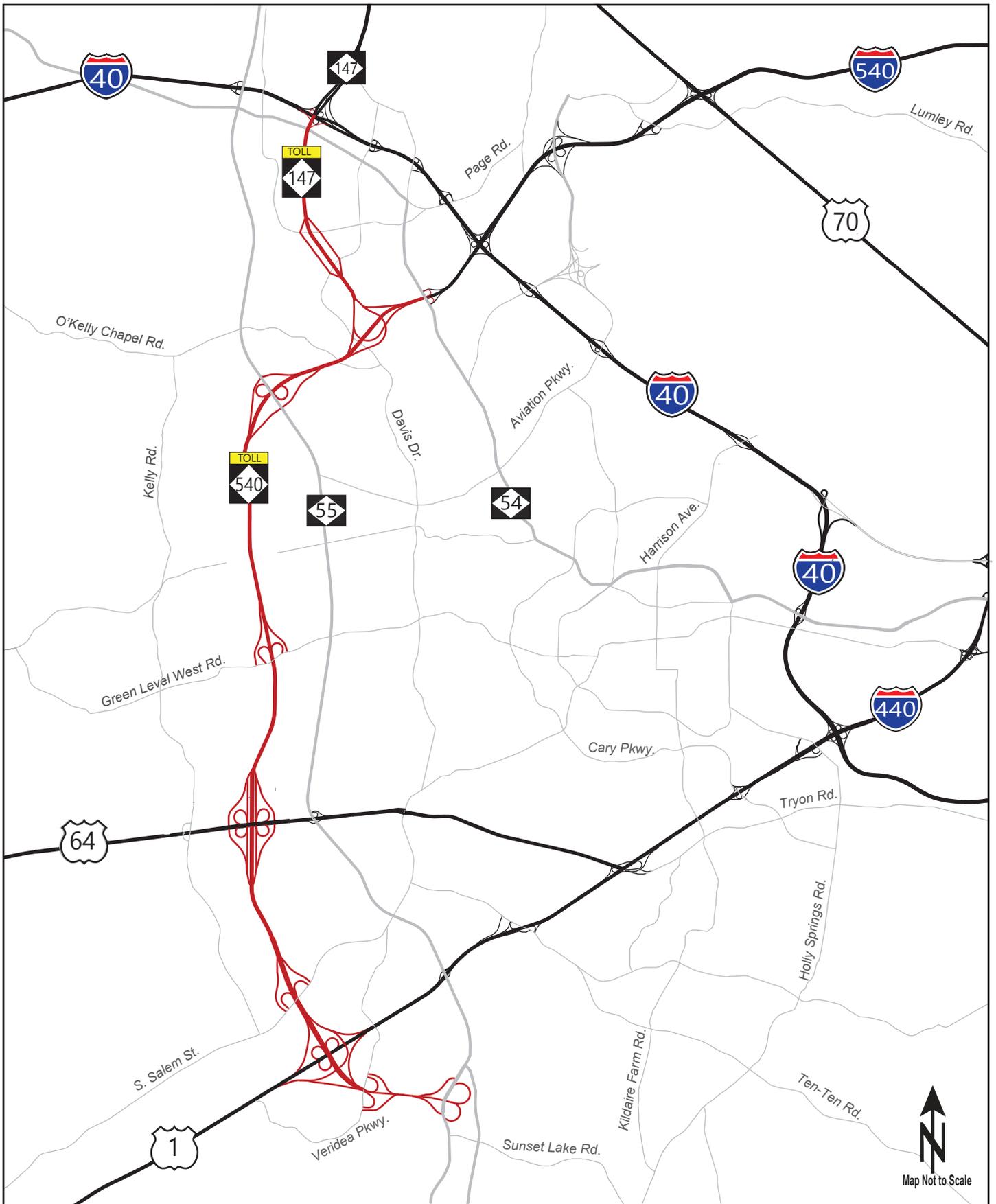
The Triangle Expressway is an 18.8-mile toll road that extends the partially completed “Outer Loop” around the greater Raleigh, North Carolina area from I-40 to NC-55 Bypass. The six-lane, controlled-access toll facility relieves congestion on NC-55 while improving access to the Research Triangle Park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

NC-147 includes 3.4 miles of toll road between I-40 and 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.

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 of 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 (MVDs) 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 some segments throughout the Triangle Expressway continue 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 2018.

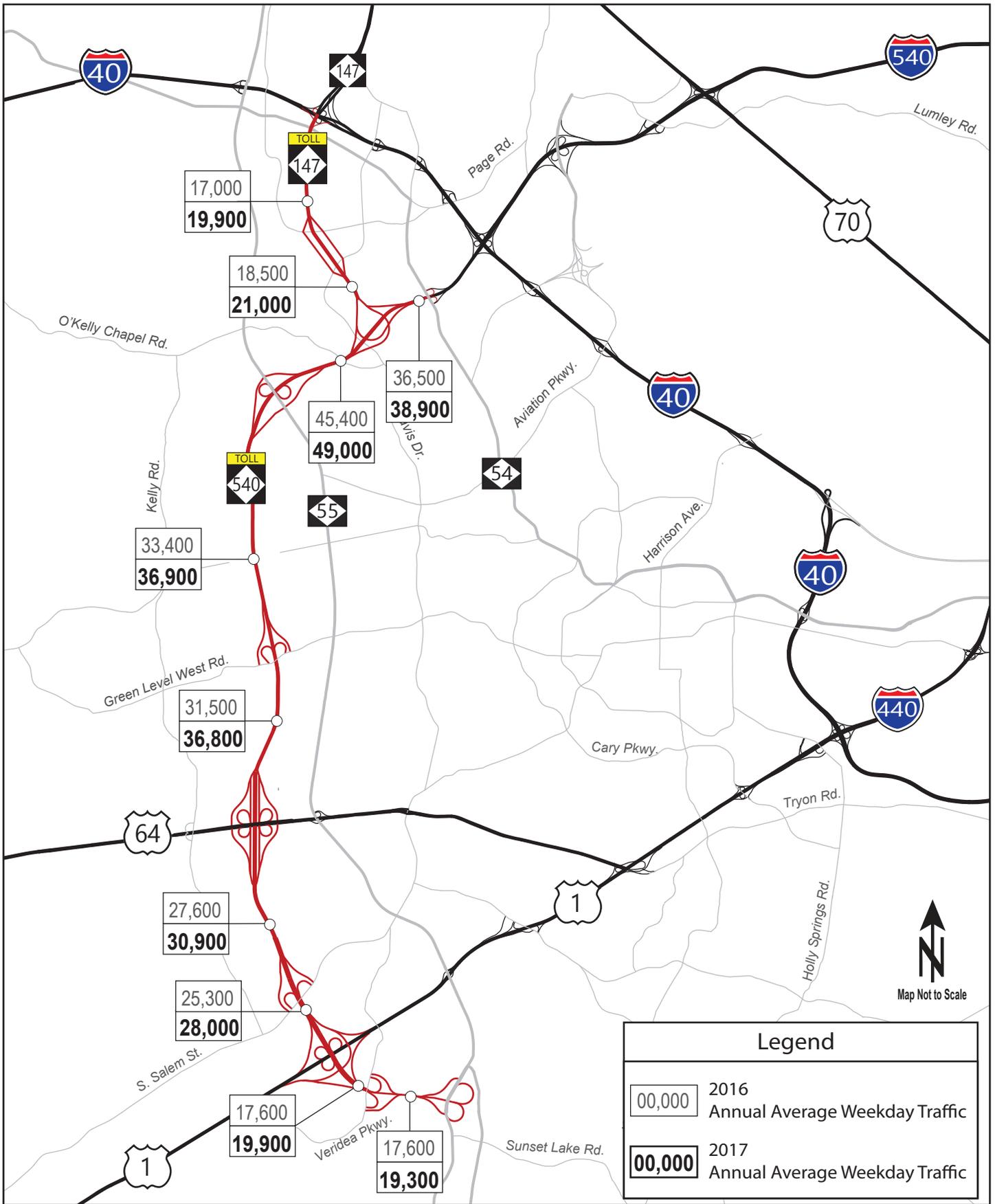
Average Weekday Traffic (AWT)

Traffic volume data is collected at all ramps and mainline segments between interchanges. 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 period.

Annual Average Weekday Traffic (AAWT)

Annual Average Weekday Traffic (AAWT) is a measure of the average daily volumes collected on a typical Monday through Friday over an entire year. Adjustment factors for raw AWT data were calculated monthly based on the ratio of weekday to weekend traffic. These factors were then applied to the monthly averages to calculate the AAWT. It is necessary to normalize the variations in monthly traffic to allow for a valid comparison between counts taken at different times of the year; this allows the normalized monthly values to be combined to form a single AAWT for each location.

Figure 2 contains a visual representation of AAWT recorded during the years 2016 and 2017 at all mainline segments along the Triangle Expressway.



Legend

00,000 2016 Annual Average Weekday Traffic

00,000 2017 Annual Average Weekday Traffic

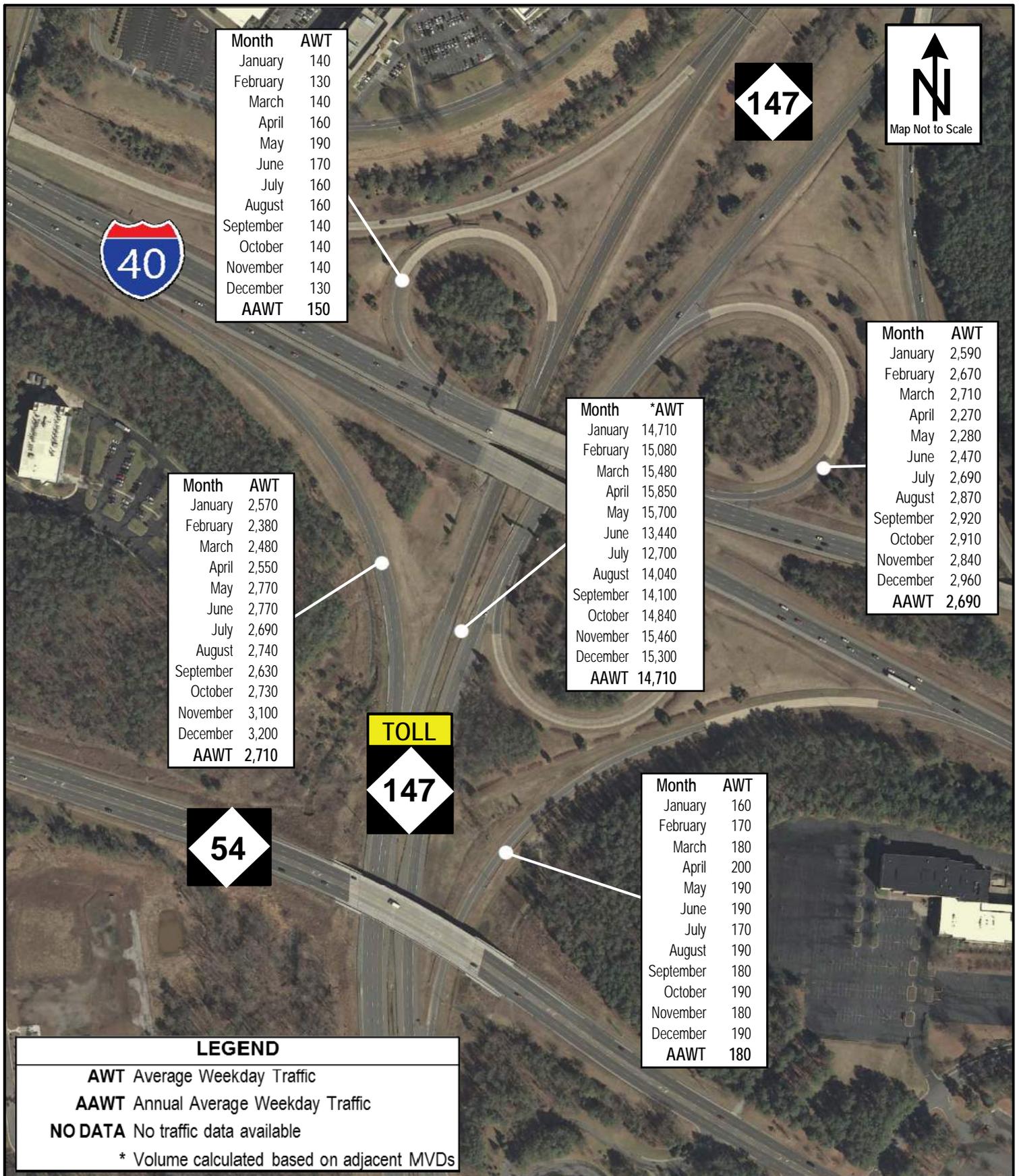


Triangle Expressway AAWT Map

Figure 2

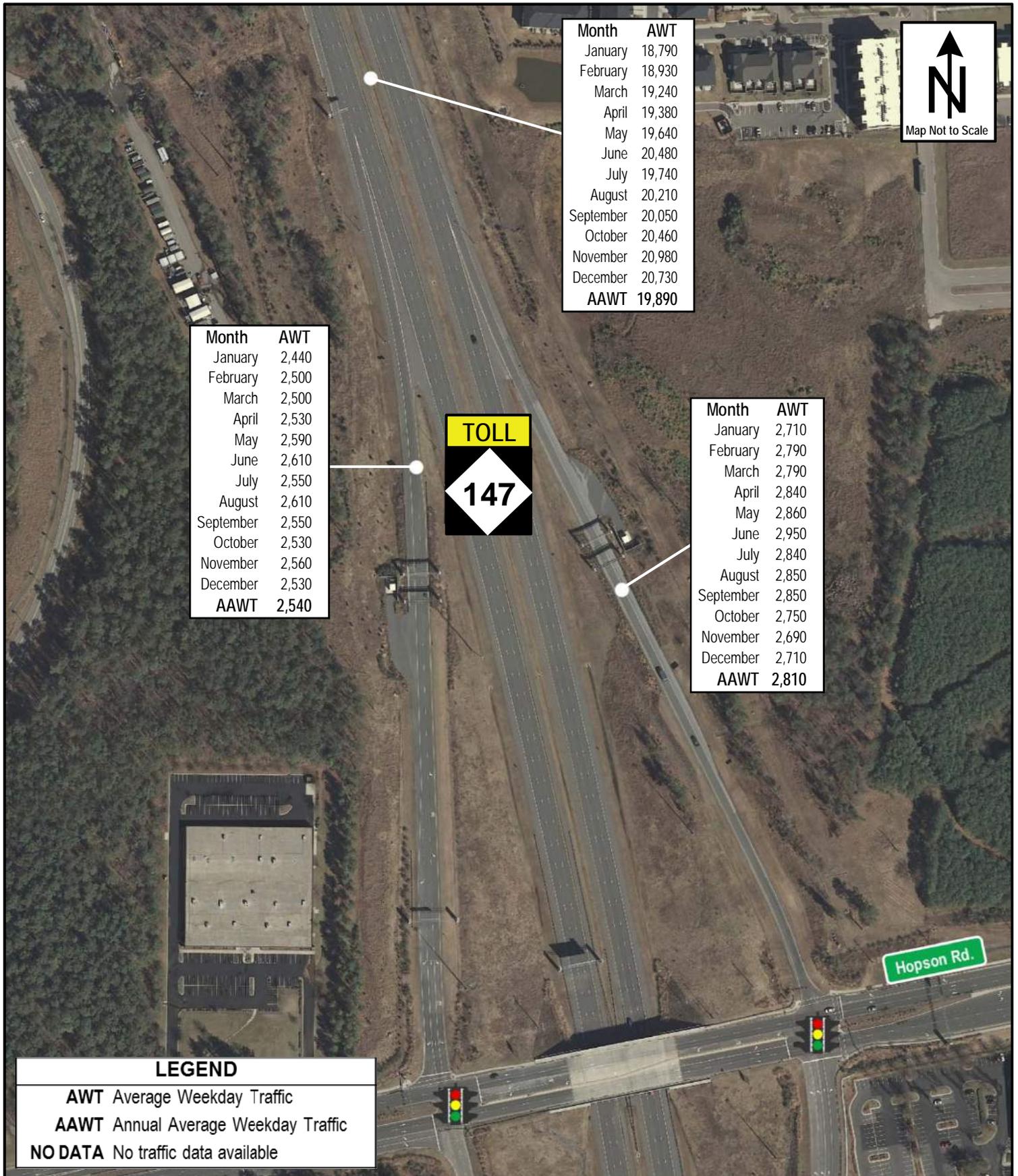
Interchange Statistics

Figures 3 to 14 contain visual representations of AWT and AAWT along the facility which are representative of NCTA's 2017 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.



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

Figure
3



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

Figure
4



Davis Dr.



Month	AWT
January	3,390
February	3,410
March	3,310
April	3,140
May	3,330
June	3,250
July	3,230
August	3,240
September	3,270
October	3,230
November	3,150
December	3,140
AAWT	3,260

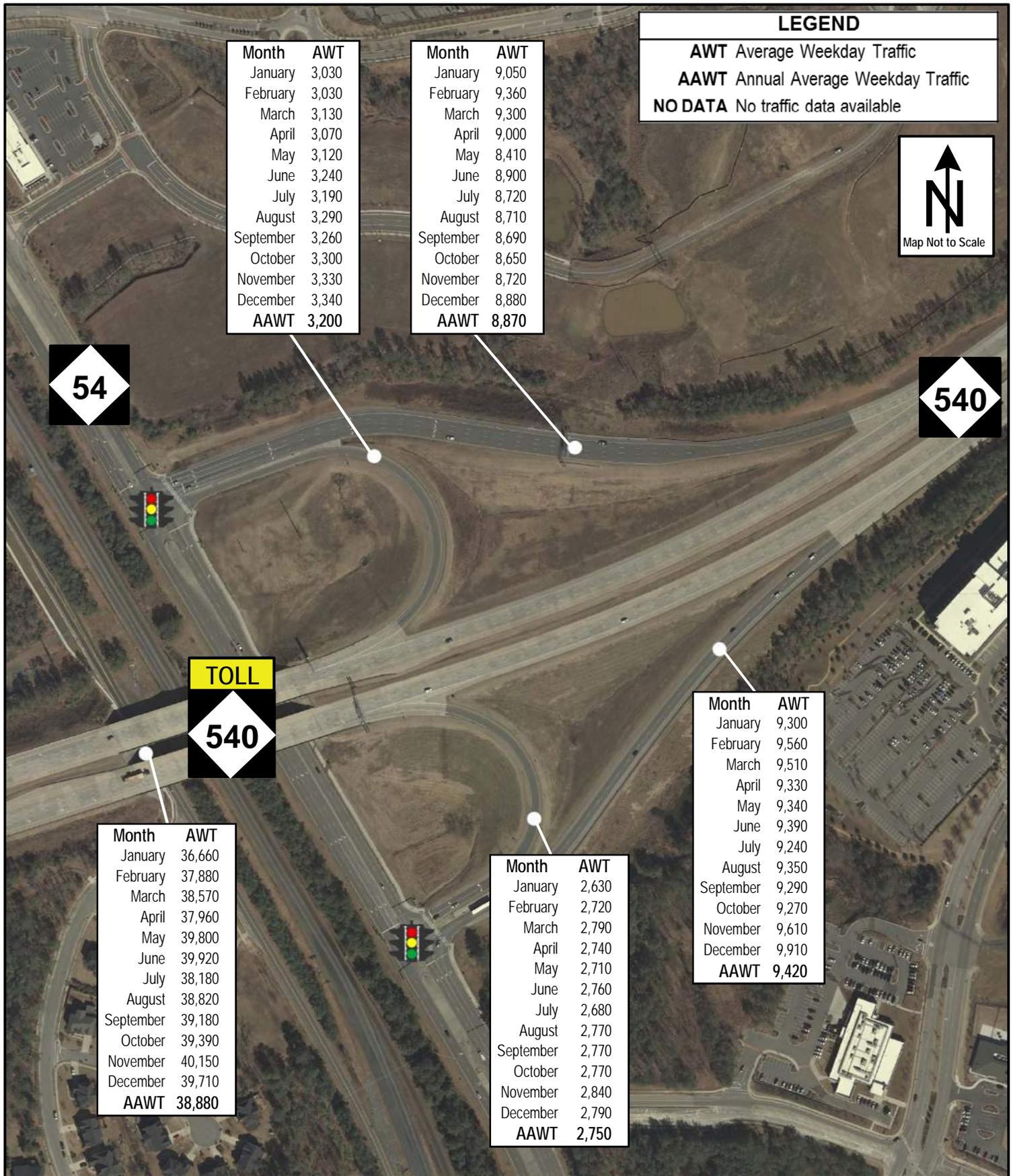
Month	AWT
January	2,760
February	2,840
March	2,790
April	2,730
May	2,890
June	2,760
July	2,750
August	2,780
September	2,760
October	2,810
November	2,880
December	2,710
AAWT	2,790

Month	AWT
January	20,010
February	20,250
March	20,340
April	20,350
May	21,280
June	21,440
July	20,880
August	21,250
September	21,230
October	21,630
November	21,980
December	21,400
AAWT	21,010

LEGEND	
AWT	Average Weekday Traffic
AAWT	Annual Average Weekday Traffic
NO DATA	No traffic data available

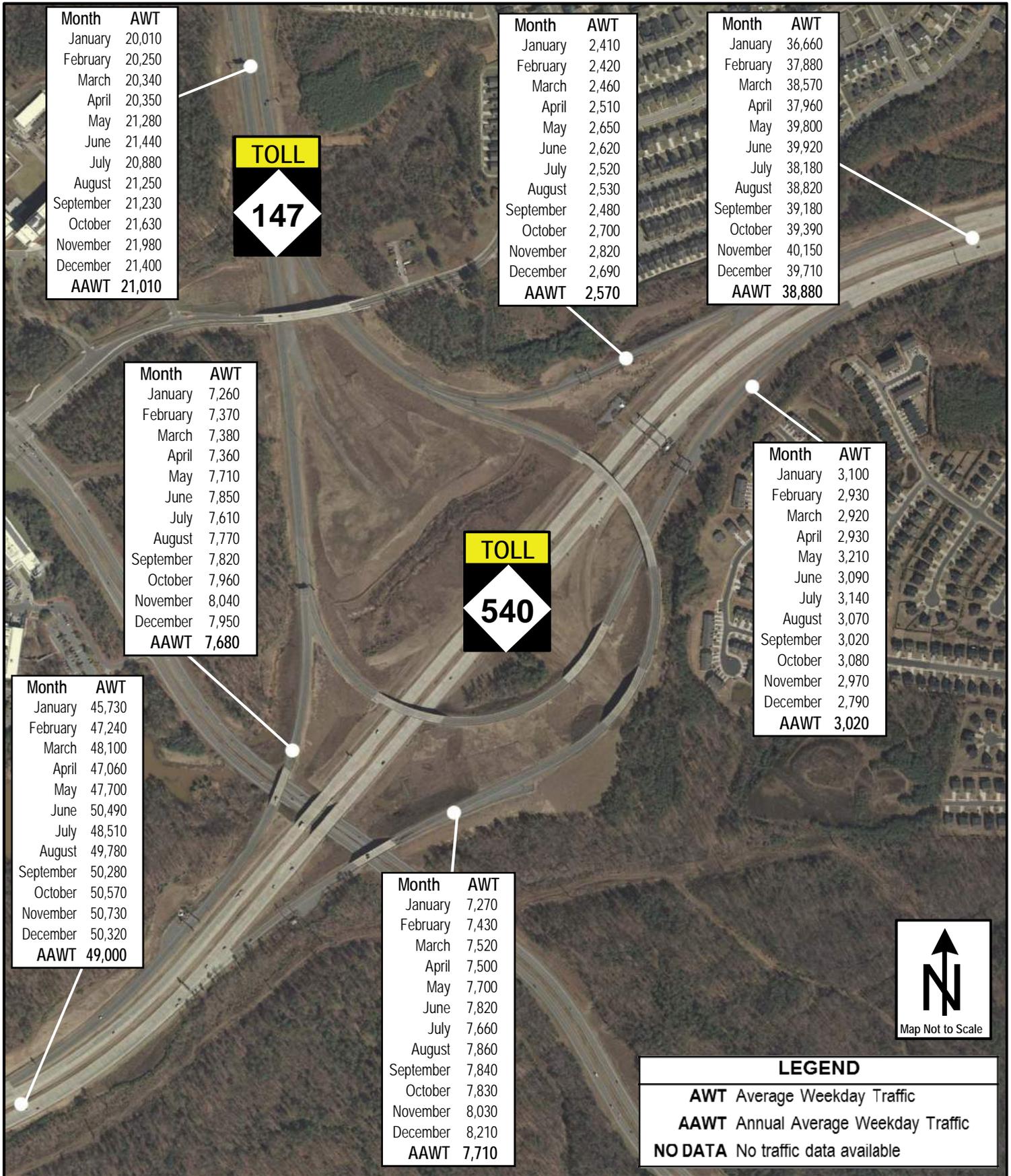
NC-147 at Davis Dr. Interchange
2017 Annual Average Weekday Traffic

Figure
5



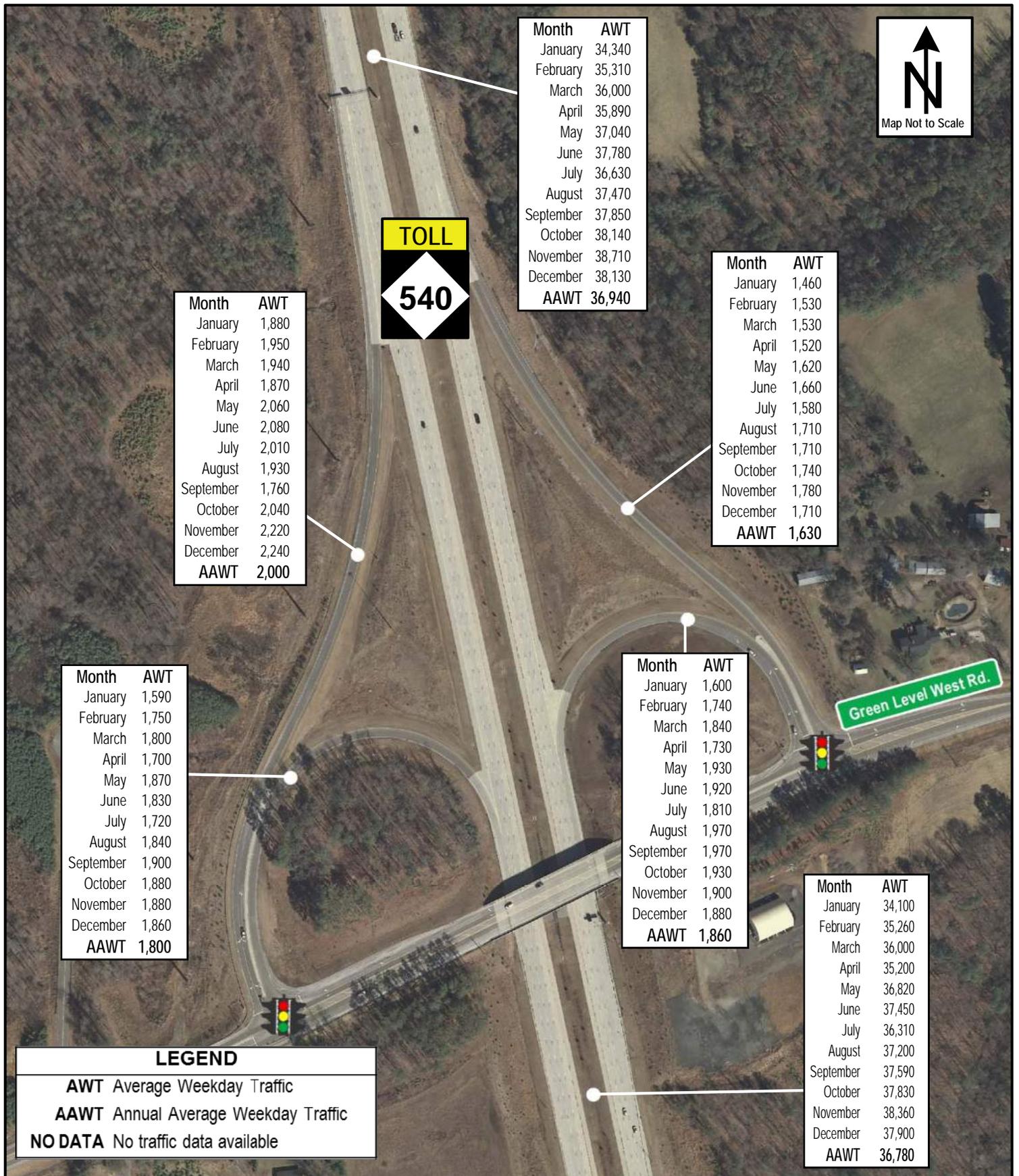
NC-540 at NC-54 Interchange
 2017 Annual Average Weekday Traffic

Figure
6



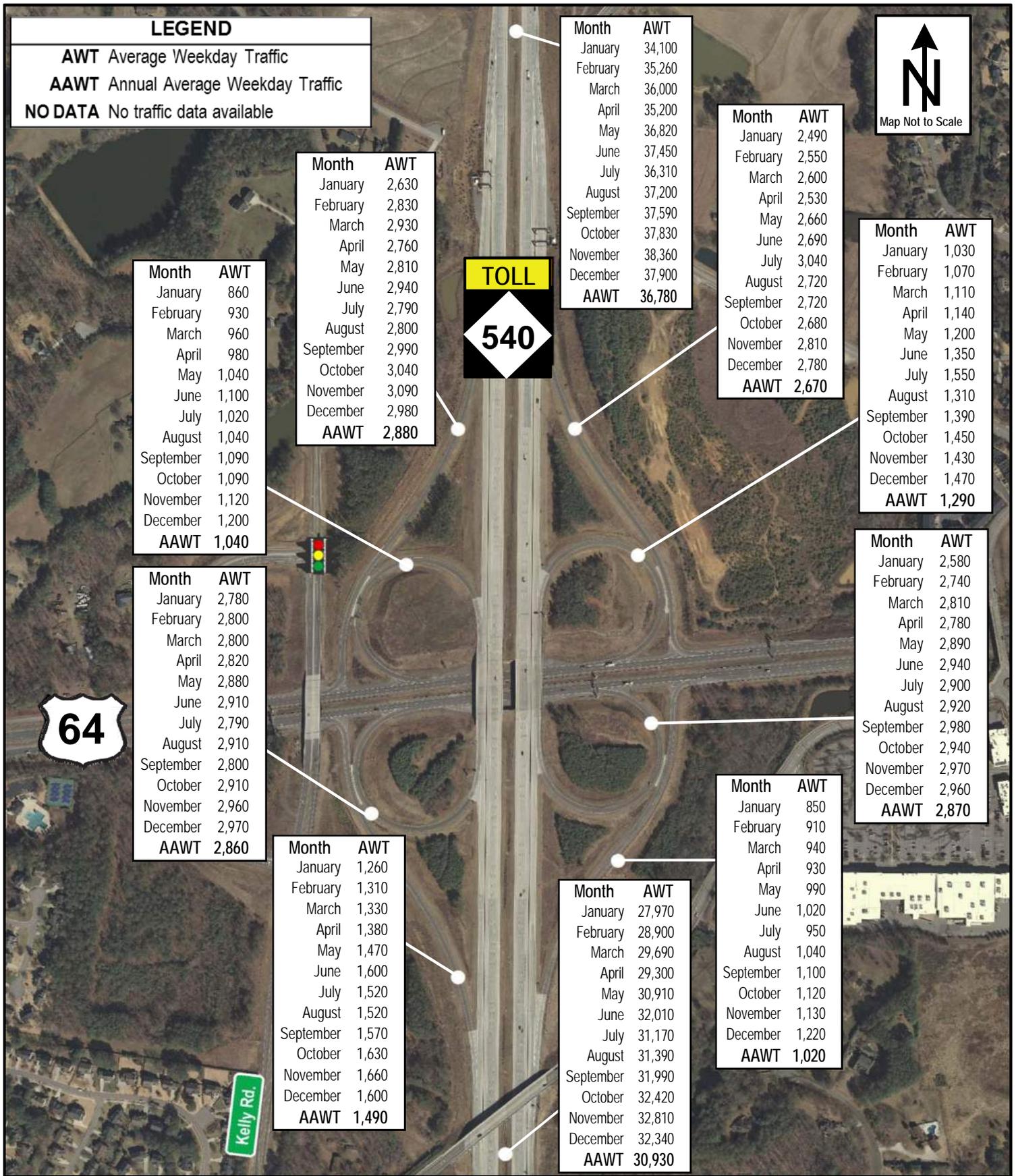
NC-540 at NC-147 Interchange
2017 Annual Average Weekday Traffic

Figure
7



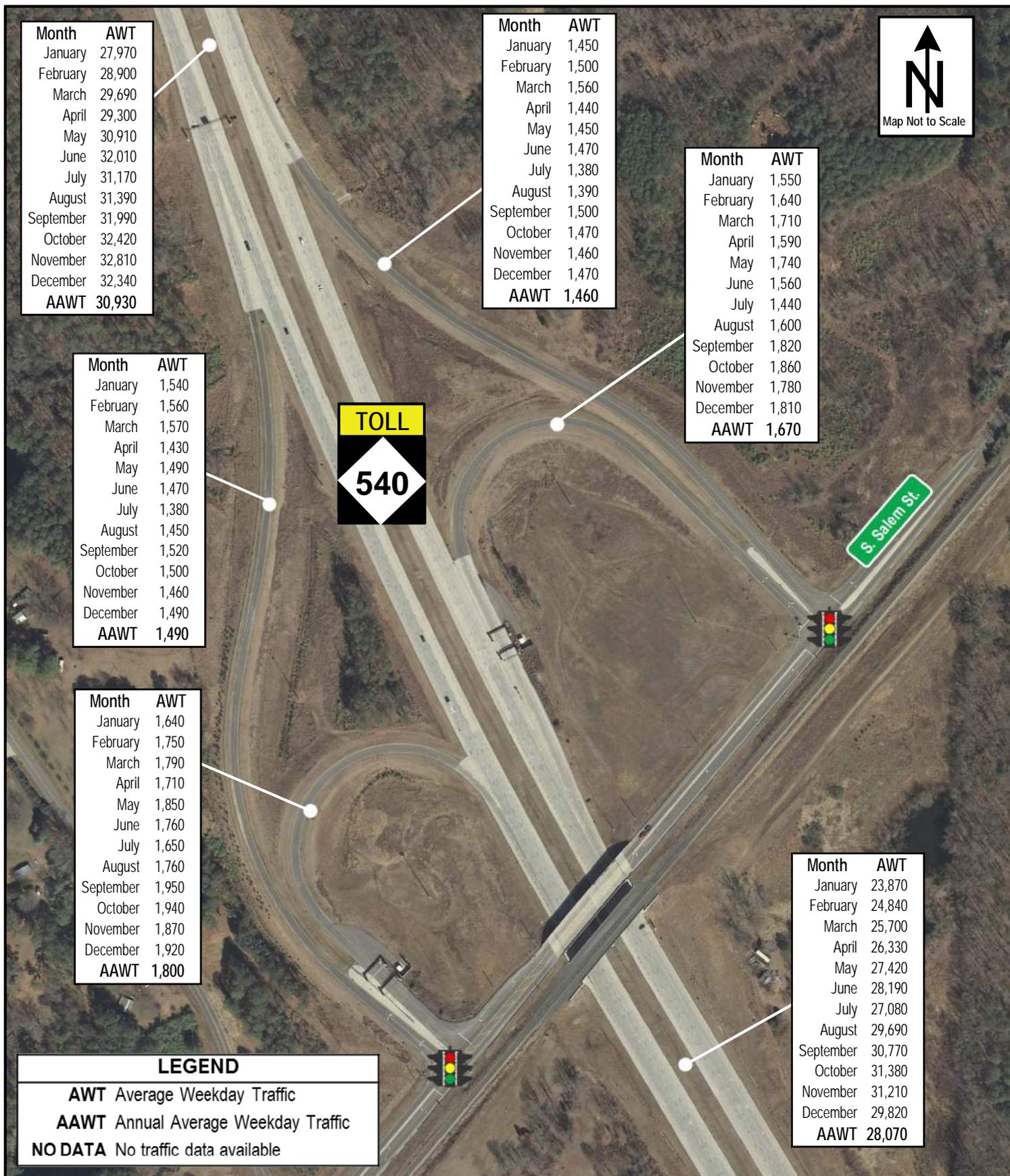
NC-540 at Green Level West Rd. Interchange
 2017 Annual Average Weekday Traffic

Figure
9



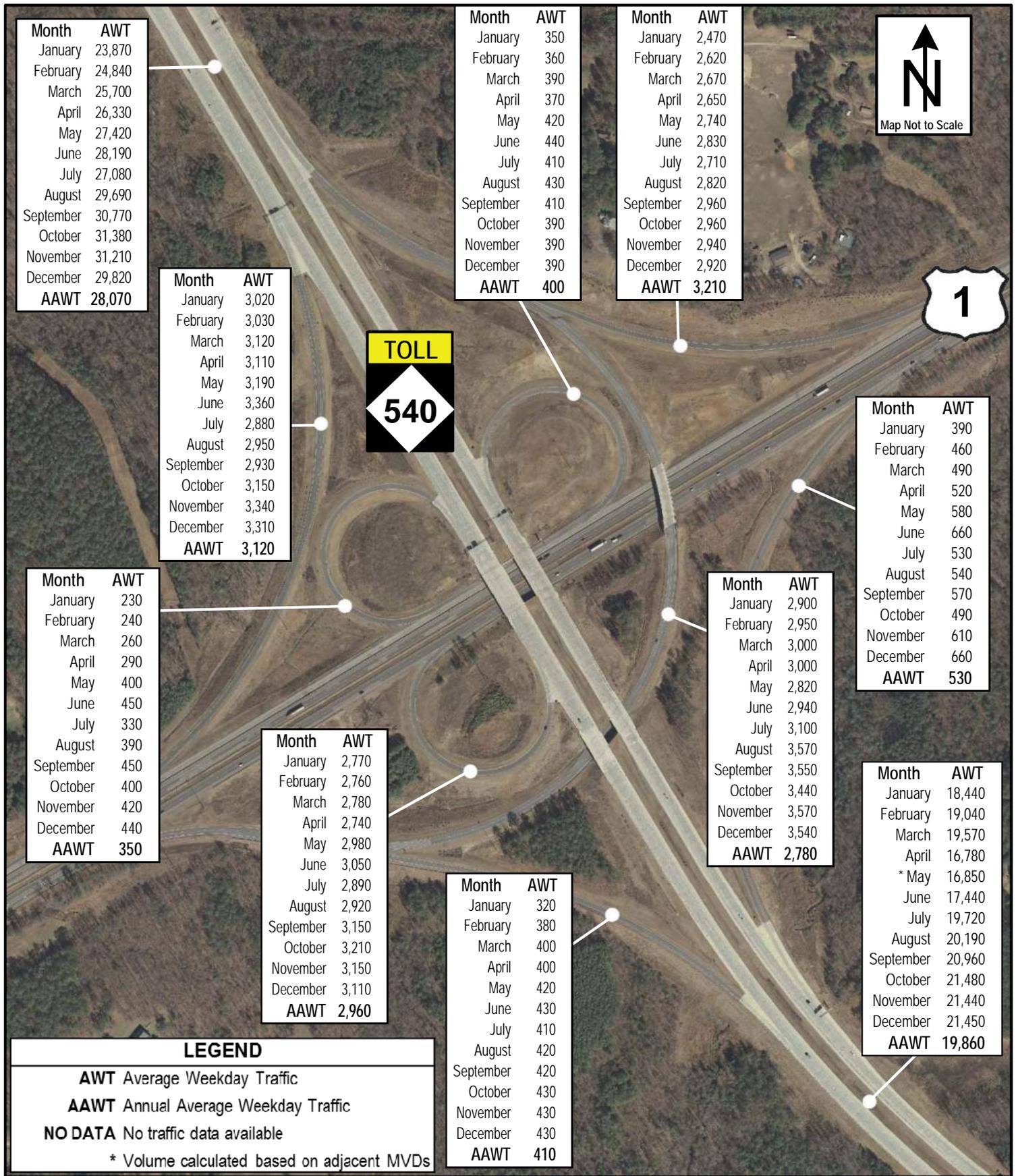
NC-540 at US-64 Interchange
 2017 Annual Average Weekday Traffic

Figure 10



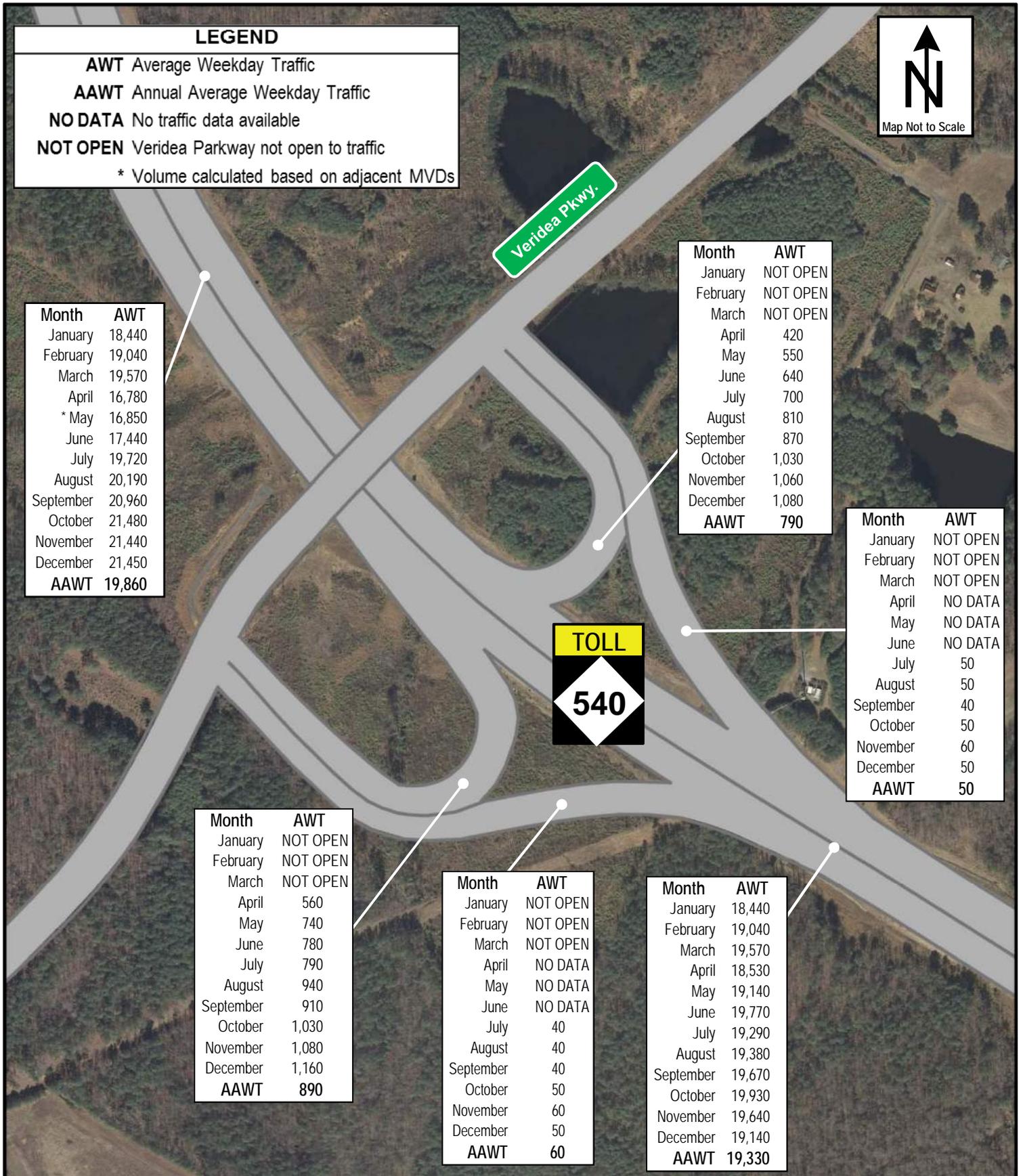
NC-540 at S. Salem St. Interchange
 2017 Annual Average Weekday Traffic

Figure
11



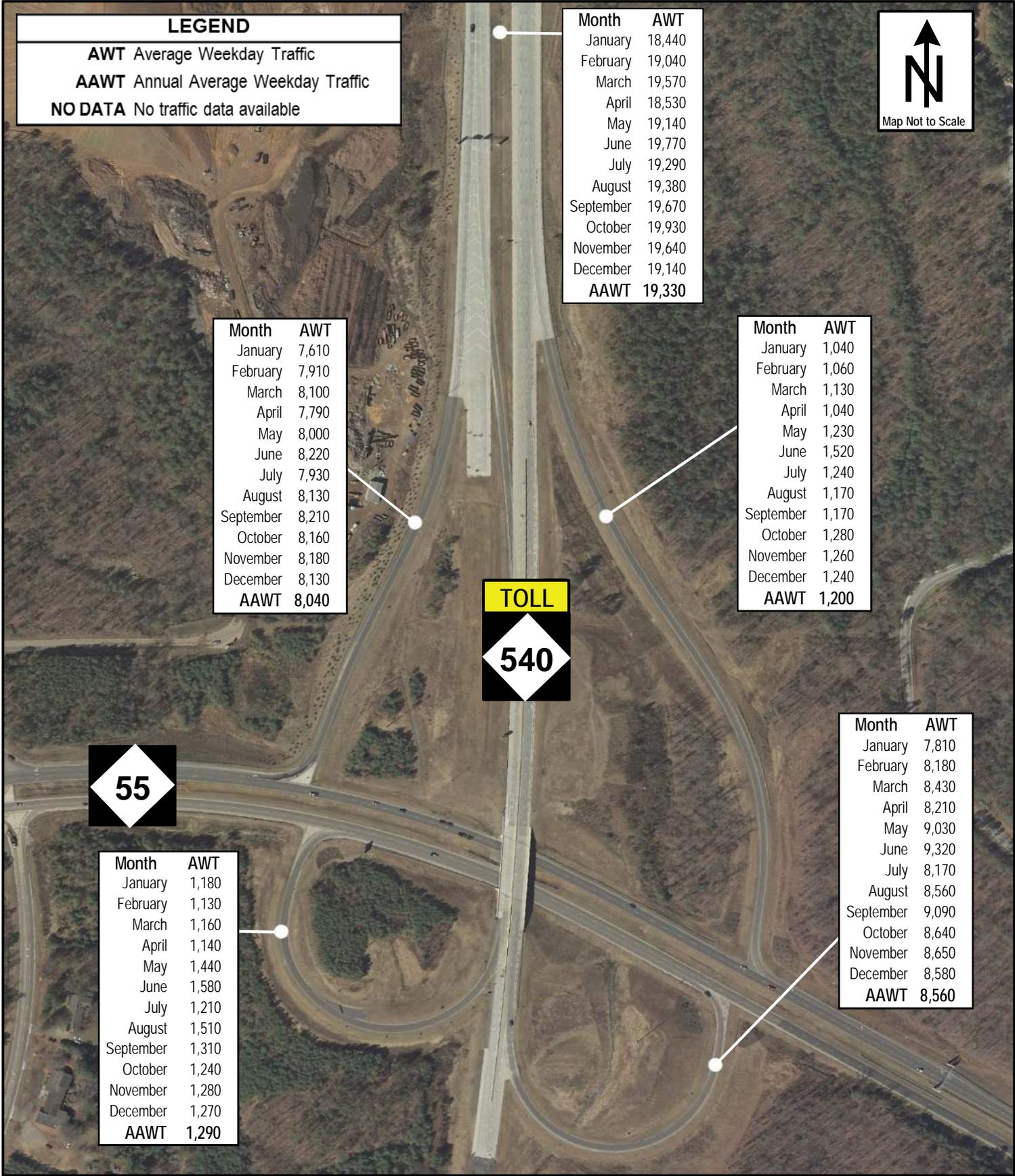
NC-540 at US-1 Interchange
 2017 Annual Average Weekday Traffic

Figure
12



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

Figure 13



NC-540 at NC-55 Bypass Interchange
 2017 Annual 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, customer calls, and walk-in services. The CSC also provides support services such as a 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.

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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.

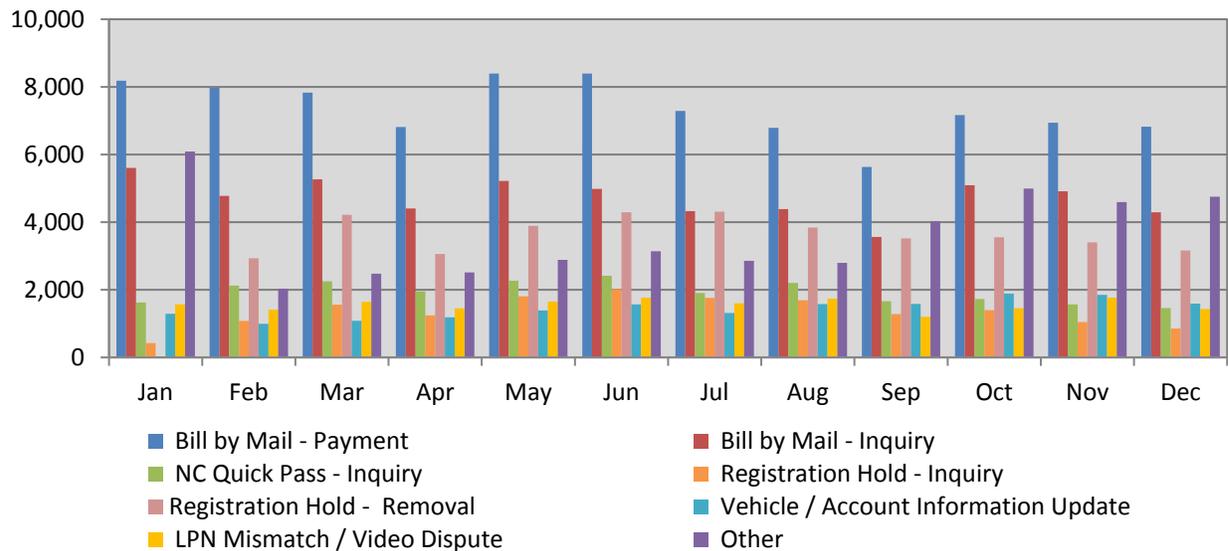
Table 1 presents a summary of the total monthly number of customer calls handled by CSRs, by reason.

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

Month	October	November	December
Bill by Mail - Payment	7,166	6,939	6,822
Bill by Mail - Inquiry	5,092	4,911	4,293
NC Quick Pass® - Inquiry	1,727	1,568	1,460
Registration Hold - Inquiry	1,399	1,046	851
Registration Hold - Removal	3,554	3,402	3,162
Vehicle / Account Information Update	1,890	1,849	1,590
License Plate Mismatch Dispute	1,456	1,766	1,432
Other	4,992	4,591	4,755
Total	27,276	26,072	24,365

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



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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. It should be noted that the Back Office System (BOS) records web, call center and IVR 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.

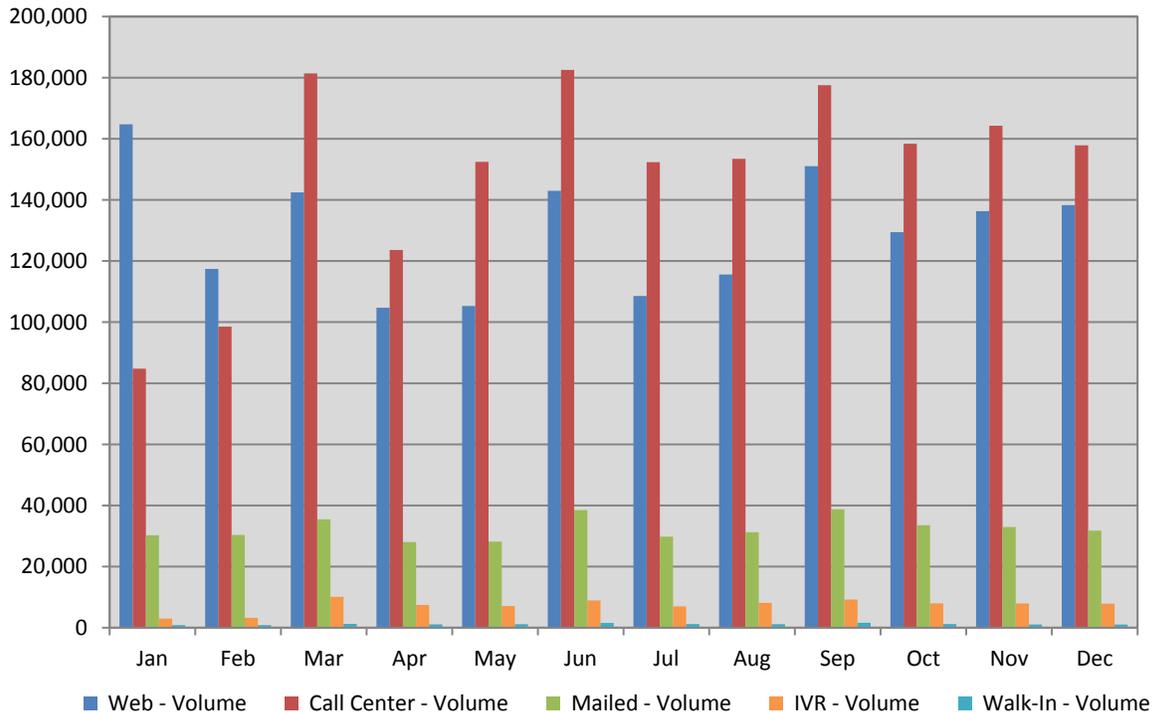
Table 2 presents a summary of the total monthly payments processed by the NC Quick Pass® CSC, by payment channel.

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

Month	Web Volume	Call Center Volume	Mailed Volume	IVR Volume	Walk-In Volume	Total
October	129,420	158,380	33,545	7,988	1,179	330,512
November	136,327	164,281	32,968	7,932	1,052	342,560
December	138,278	157,853	31,741	7,866	1,062	336,800

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



Walk-in Customers

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

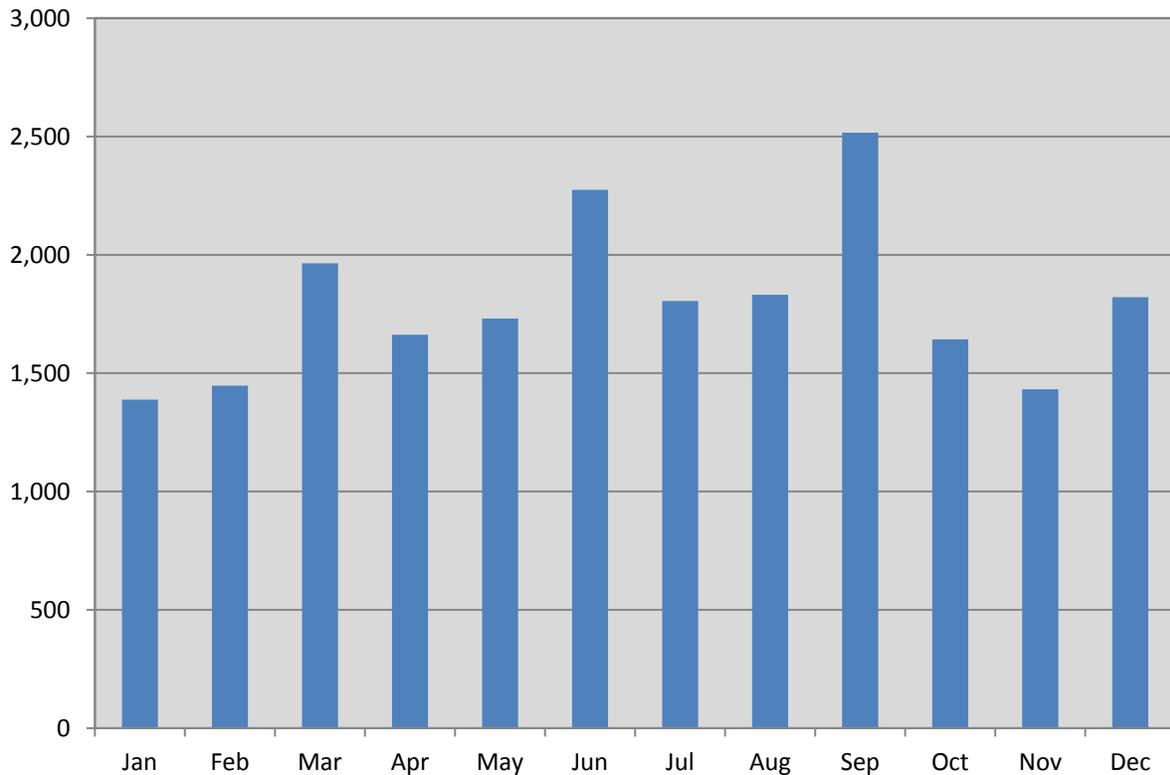
Table 3 presents a summary of the total monthly number of walk-in customers serviced in the NC Quick Pass® CSC Walk-In Center.

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

Month	Number of Walk-In Customers
October	1,643
November	1,432
December	1,821

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



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Transactions

This section presents the transaction 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, Fourth Quarter by Week

Week Ending	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
10/1/2017 ¹	39,663	52.1%	36,442	47.9%	76,105
10/8/2017	598,877	58.9%	417,581	41.1%	1,016,458
10/15/2017	605,623	59.0%	419,996	41.0%	1,025,619
10/22/2017	616,809	59.0%	428,148	41.0%	1,044,957
10/29/2017	600,291	59.0%	418,001	41.0%	1,018,292
11/5/2017	602,254	58.5%	428,111	41.5%	1,030,365
11/12/2017 ²	592,849	58.8%	415,967	41.2%	1,008,816
11/19/2017	600,906	57.4%	446,711	42.6%	1,047,617
11/26/2017 ³	420,747	54.1%	357,351	45.9%	778,098
12/3/2017	599,377	57.7%	439,332	42.3%	1,038,709
12/10/2017	581,761	59.4%	398,228	40.6%	979,989
12/17/2017	612,181	58.7%	429,892	41.3%	1,042,073
12/24/2017 ⁴	548,553	58.3%	391,903	41.7%	940,456
12/31/2017 ⁵	329,845	54.2%	279,256	45.8%	609,101

¹ Week ending consists of one day of data

² Week ending includes Veterans Day

³ Week ending includes Thanksgiving Day and Black Friday

⁴ Week ending includes Christmas Eve

⁵ Week ending includes Christmas Day and New Year’s Eve

Table 5 presents a summary of the total monthly transactions for NC Quick Pass® and Bill by Mail users. This monthly transaction data was compiled 6 business days after the end of each month.

Table 5: Transactions, Fourth Quarter by Month

Month	Transponder (NC Quick Pass®)		Video (Bill by Mail)		Total
	Transactions	% of Total	Transactions	% of Total	
October	2,660,685	59.0%	1,851,820	41.0%	4,512,505
November	2,427,507	57.5%	1,796,874	42.5%	4,224,381
December	2,261,544	57.7%	1,658,225	42.3%	3,919,769

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

Figure 18: 2017 Transactions

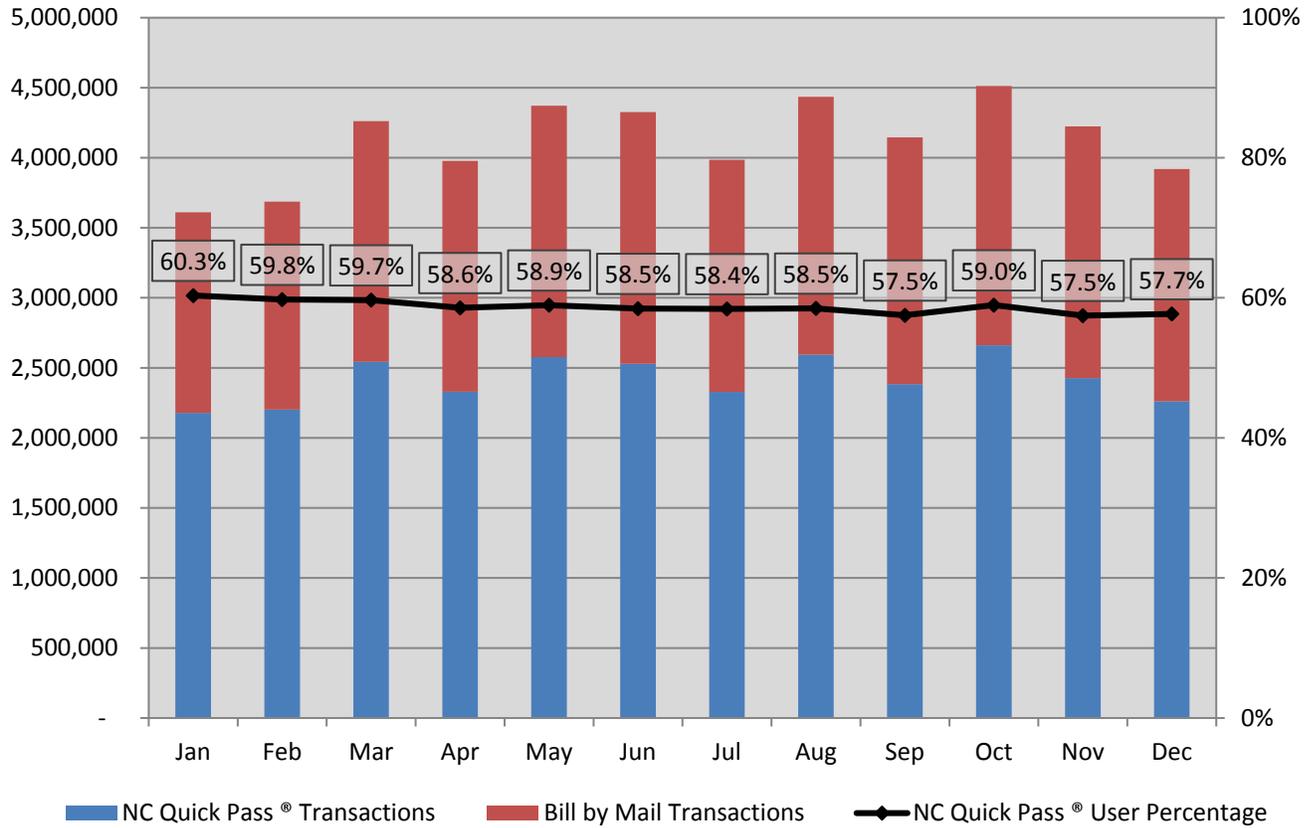


Table 6 presents a summary of the total NC Quick Pass® and Bill by Mail transactions, by year. Project to date is the total number of transactions since opening the facility to toll traffic. It should be noted that total annual transaction is calculated by adding the total monthly transactions recorded throughout the year which are compiled 6 business days after the end of each month.

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	29,015,941	58.7%	20,440,241	41.3%	49,456,182
Project to Date	111,245,987	57.9%	81,046,504	42.1%	192,292,491

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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, Fourth 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
10/1/2017 ¹	75,244	98.9%	356	0.5%	505	0.7%
10/8/2017	978,348	96.3%	11,551	1.1%	26,559	2.6%
10/15/2017	987,356	96.3%	12,250	1.2%	26,013	2.5%
10/22/2017	1,007,257	96.4%	11,752	1.1%	25,948	2.5%
10/29/2017	980,534	96.3%	11,815	1.2%	25,943	2.5%
11/5/2017	991,147	96.2%	12,581	1.2%	26,637	2.6%
11/12/2017 ²	975,585	96.7%	10,330	1.0%	22,901	2.3%
11/19/2017	1,009,747	96.4%	12,013	1.1%	25,857	2.5%
11/26/2017 ³	752,227	96.7%	8,446	1.1%	17,425	2.2%
12/3/2017	1,001,235	96.4%	11,755	1.1%	25,719	2.5%
12/10/2017	947,907	96.7%	9,464	1.0%	22,618	2.3%
12/17/2017	1,007,020	96.6%	10,850	1.0%	24,203	2.3%
12/24/2017 ⁴	909,493	96.7%	9,310	1.0%	21,653	2.3%
12/31/2017 ⁵	590,004	96.9%	5,905	1.0%	13,192	2.2%

¹ Week ending consists of one day of data

² Week ending includes Veterans Day

³ Week ending includes Thanksgiving Day and Black Friday

⁴ Week ending includes Christmas Eve

⁵ Week ending includes Christmas Day and New Year’s Eve

Table 8 presents a summary of the total monthly transactions by classification. This monthly transaction data was compiled 6 business days after the end of each month.

Table 8: Classification, Fourth 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
October	4,346,059	96.3%	51,910	1.2%	114,536	2.5%
November	4,074,191	96.4%	47,802	1.1%	102,388	2.4%
December	3,792,854	96.8%	38,666	1.0%	88,249	2.3%

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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

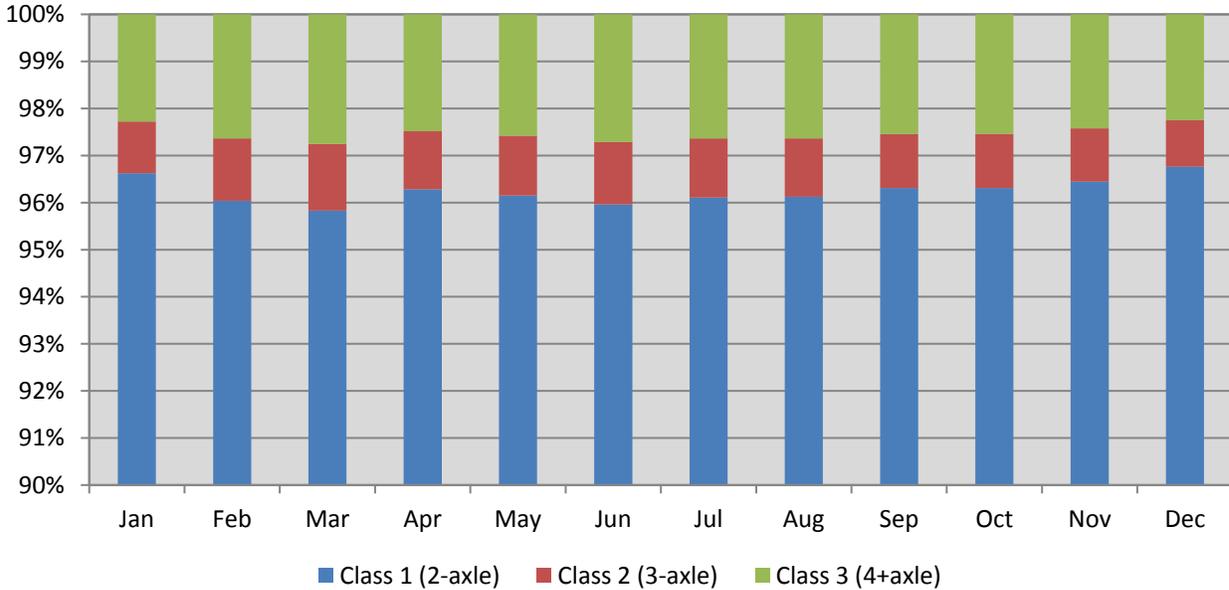


Table 9 presents a summary of the total transactions for Class 1 (2-axle), Class 2 (3-axle), and Class 3 (4+axle) vehicles, by year. Project to date is the total number of transactions since opening the facility to toll traffic. It should be noted that total annual transaction is calculated by adding the total monthly transactions recorded throughout the year which is compiled 6 business days after the end of each month.

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	47,596,172	96.2%	601,957	1.2%	1,258,053	2.5%
Project to Date	185,588,880	96.5%	2,265,048	1.2%	4,438,564	2.3%

Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 2017

Accounts

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

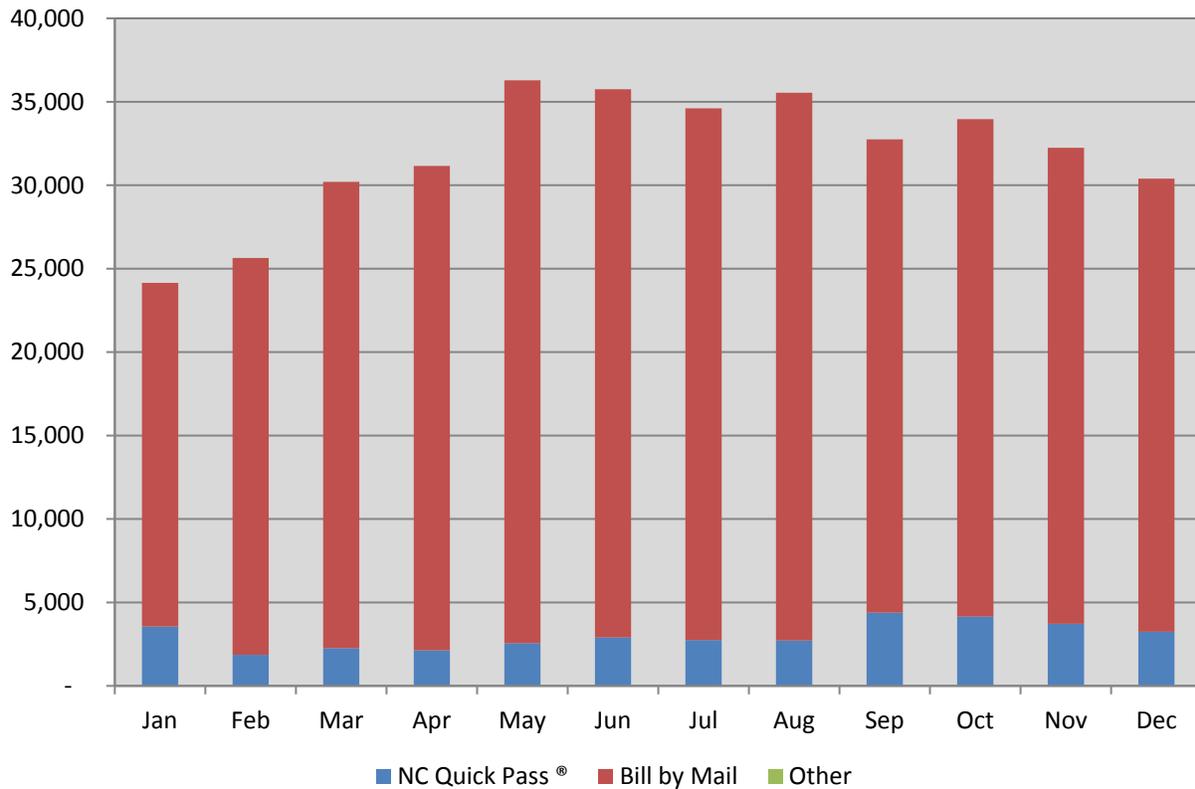
Table 10 presents a summary of the monthly established accounts being managed by the NC Quick Pass® CSC. Numbers presented in parentheses represent a reduction in accounts.

Table 10: Established Accounts, Fourth Quarter by Month

Month	NC Quick Pass®	Bill by Mail	Registered Video	Non-Revenue	Government	Total
October	4,148	29,807	0	0	0	33,955
November	3,721	28,519	0	0	0	32,240
December	3,242	27,148	0	0	0	30,390

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



Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 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	36,240	346,421	3	4	(1)	382,667
Project to Date	161,919	2,084,460	10	82	29	2,246,500

Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 2017

Transponders

This section presents the volume of transponders sold. It should be noted that on August 30th, 2017 transponder prices were reduced. Sticker Transponders are now free and Hard Case Transponders are now \$7.40 plus tax.

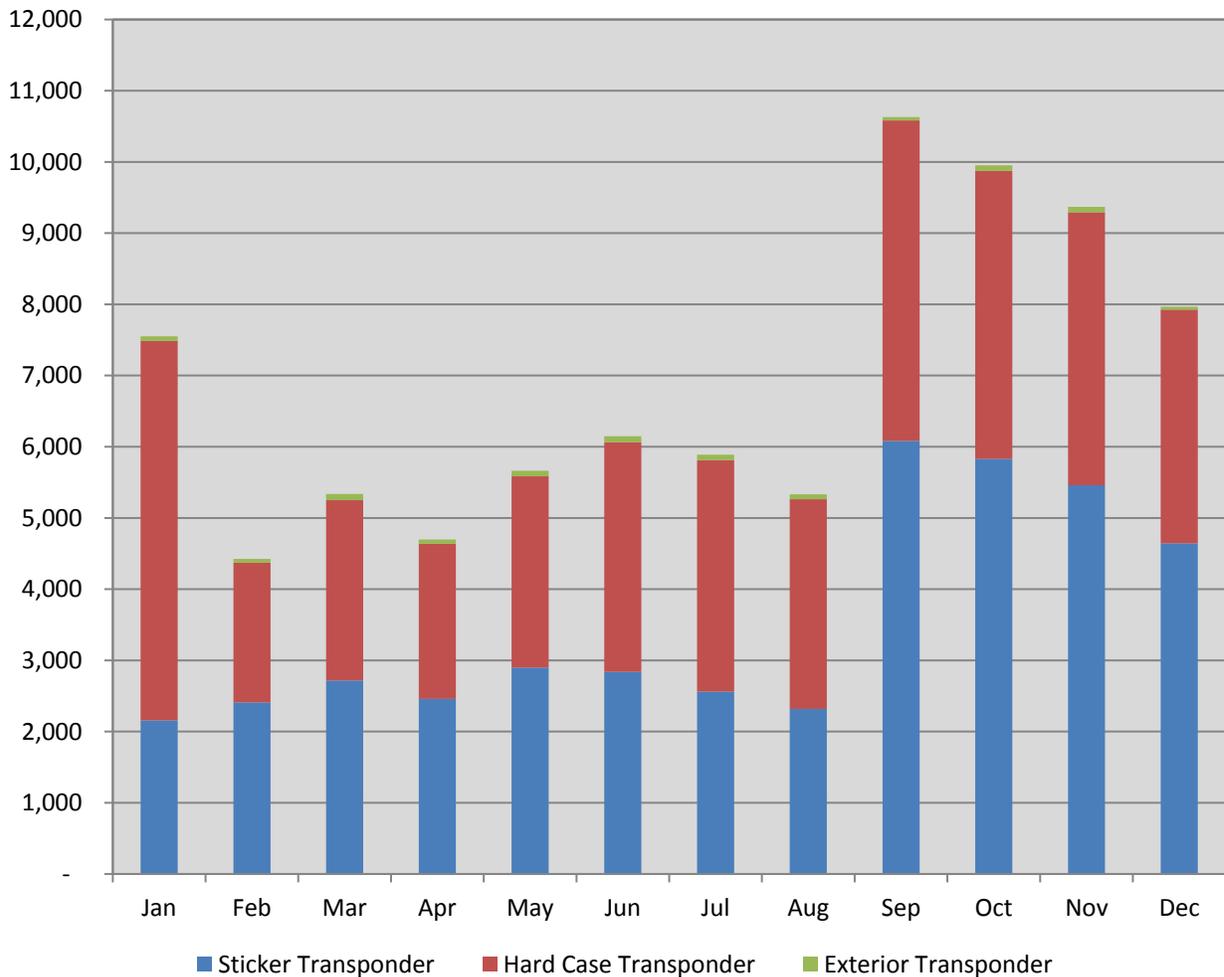
Table 12 presents a summary of the total transponders sold, by month.

Table 12: Transponders Sold, Fourth Quarter by Month

Month	Sticker Transponder	Hard Case Transponder	Exterior Transponder	Total
October	5,831	4,044	78	9,953
November	5,459	3,833	76	9,368
December	4,643	3,283	39	7,965

Figure 21 presents monthly transponders sold during 2017.

Figure 21: 2017 Transponders Sold



Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 2017

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.

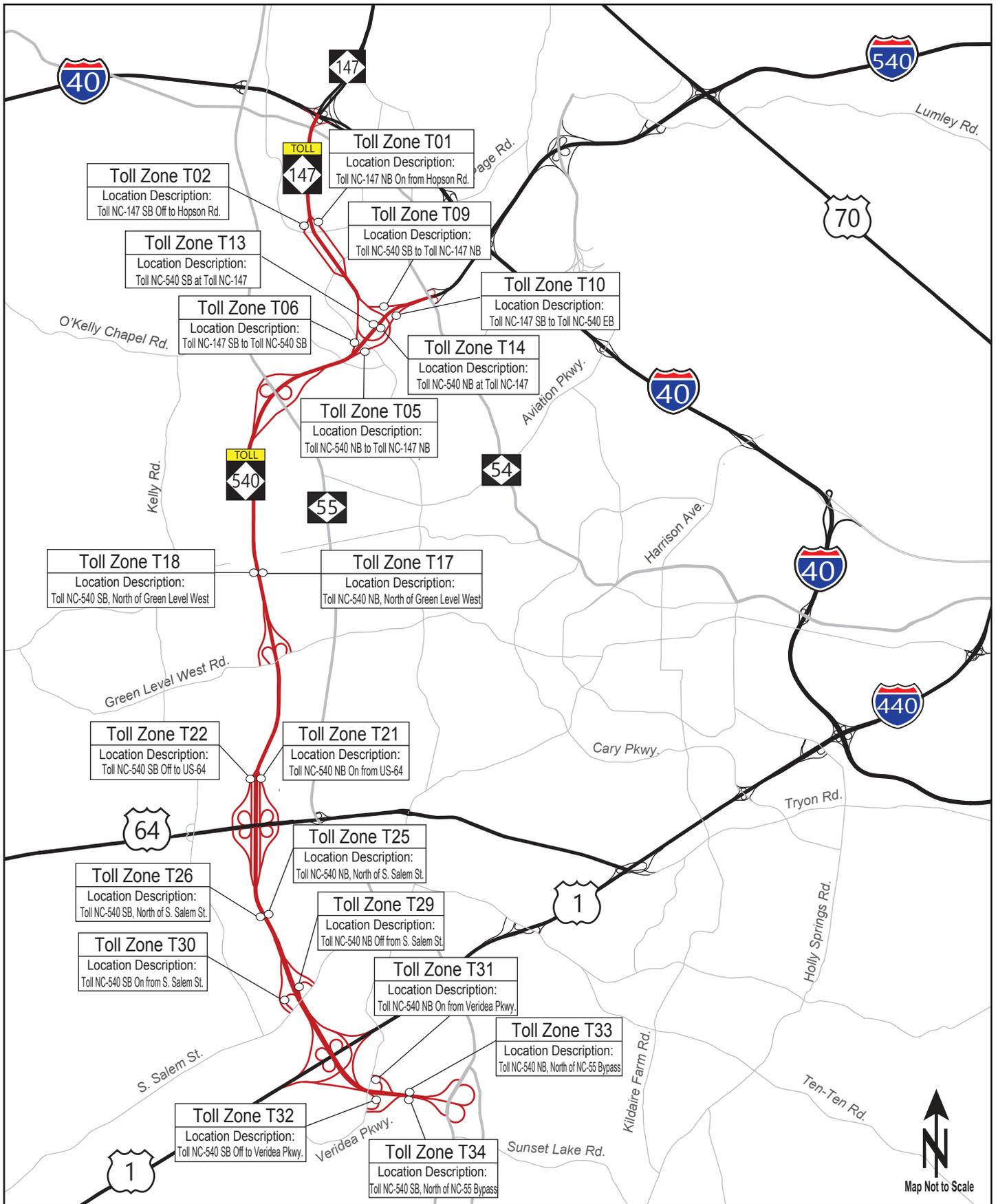
Table 13: Transponders Sold, by Year

Year	Sticker Transponder	Hard Case Transponder	Exterior Transponder	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	42,375	39,771	808	82,954
Project to Date	207,031	135,212	3,146	345,389

Toll Zone Statistics

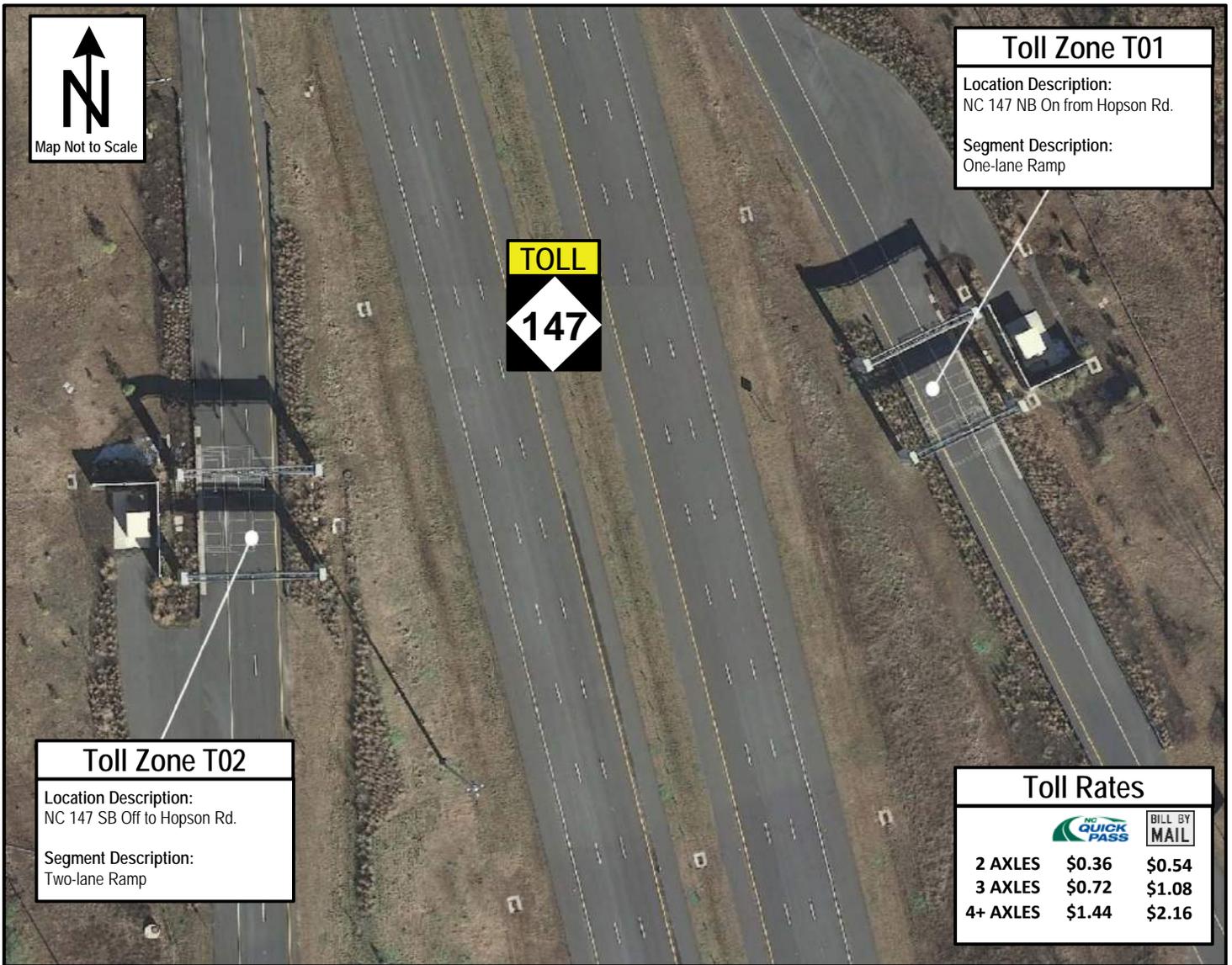
TOLL ZONE STATISTICS

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.



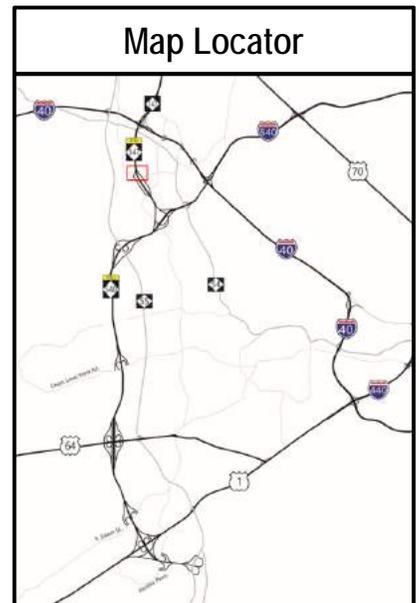
Triangle Expressway Toll Zone Map

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	2,770	2,570
August	2,810	2,620
September	2,780	2,550
October	2,780	2,570
November	2,800	2,580
December	2,760	2,540

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	60%	60%
August	58%	58%
September	59%	60%
October	60%	61%
November	60%	61%
December	60%	61%



Hopson Road Ramp Toll Zones
2017 Average Weekday Toll Transactions

Figure 23



Toll Zone T06
 Location Description:
 NC 540 SB On from NC 147 SB
 Segment Description:
 Two-lane Ramp

Toll Zone T05
 Location Description:
 NC 147 NB On from NC 540 NB
 Segment Description:
 Two-lane Ramp

Toll Rates

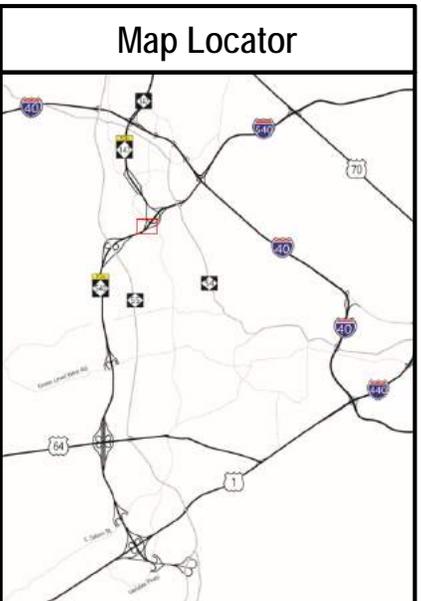
	NC QUICK PASS	BILL BY MAIL
2 AXLES	\$0.98	\$1.50
3 AXLES	\$1.96	\$3.00
4+ AXLES	\$3.92	\$6.00

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	7,680	7,710
August	7,880	7,860
September	7,890	7,930
October	7,960	8,110
November	8,120	8,200
December	7,960	8,020

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	61%	62%
August	60%	61%
September	60%	61%
October	61%	59%
November	61%	39%
December	61%	49%



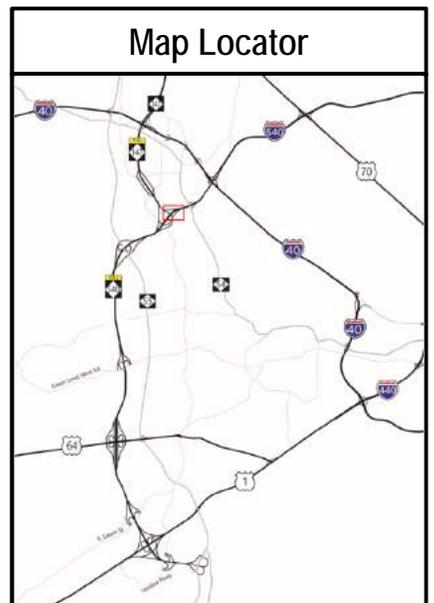
NC-147 South Ramp Toll Zones
 2017 Average Weekday Toll Transactions

Figure 24



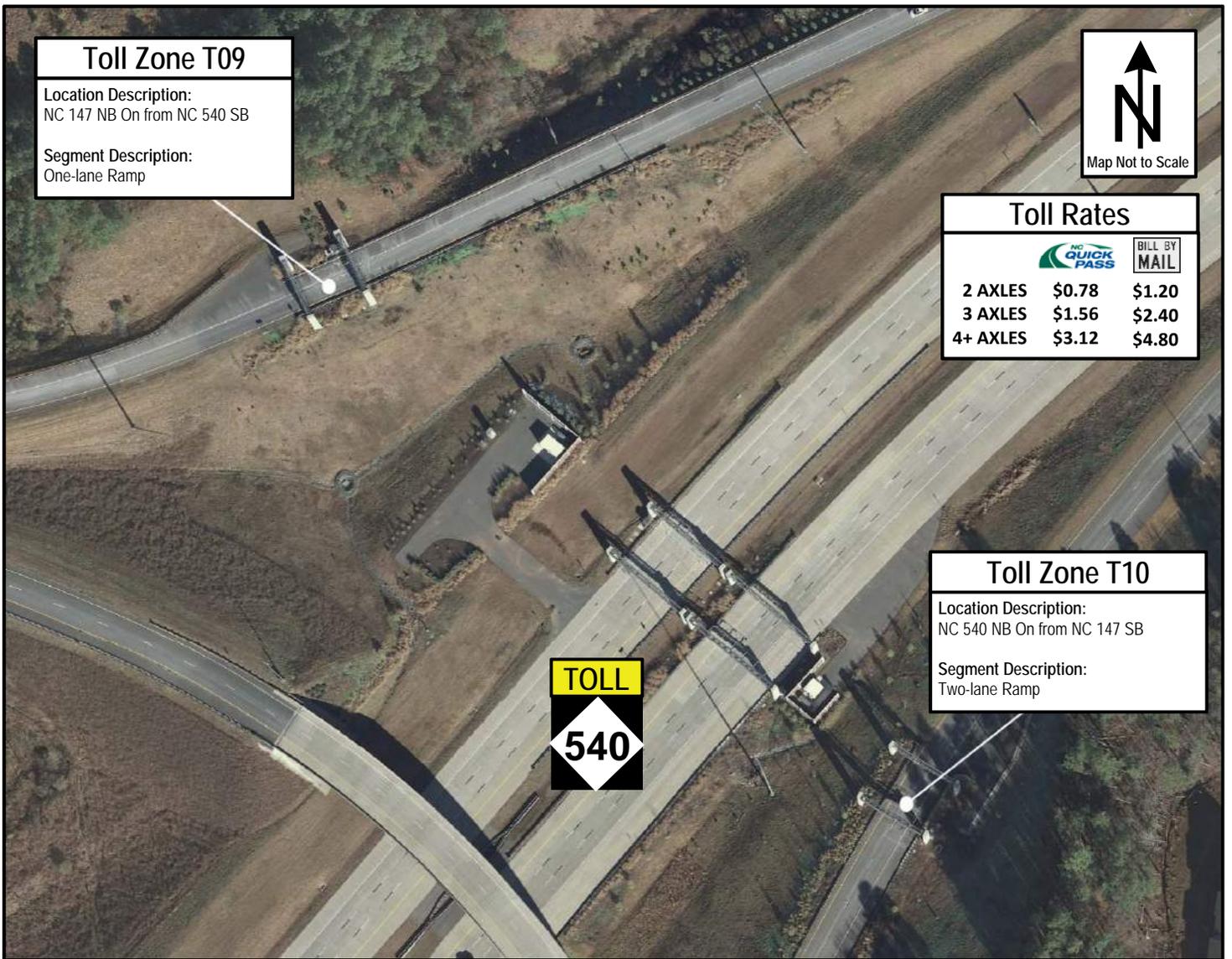
Transactions by Direction		
Month	T13	T14
January	15,800	15,510
February	16,310	16,110
March	16,650	16,470
April	16,610	16,160
May	17,290	16,960
June	17,320	16,810
July	16,580	16,170
August	16,980	16,670
September	17,080	16,920
October	17,460	17,070
November	17,470	17,060
December	17,120	16,880

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	59%	61%
August	59%	61%
September	58%	60%
October	60%	61%
November	60%	60%
December	60%	61%



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

Figure 25



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



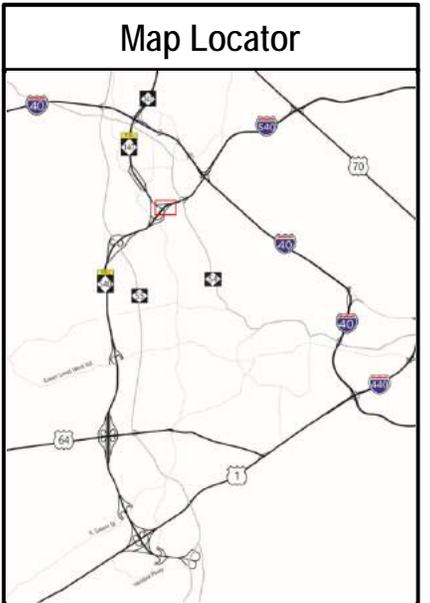
Toll Rates		
	NC QUICK PASS	BILL BY MAIL
2 AXLES	\$0.78	\$1.20
3 AXLES	\$1.56	\$2.40
4+ AXLES	\$3.12	\$4.80

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	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	2,540	3,140
August	2,550	3,040
September	2,500	3,010
October	2,770	3,120
November	2,850	2,970
December	2,720	2,780

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	57%	57%
August	57%	59%
September	57%	60%
October	56%	60%
November	54%	60%
December	53%	61%



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

Figure 26



Toll Zone T18
 Location Description:
 NC 540 SB, North of Green Level West
 Segment Description:
 Three-lane Mainline

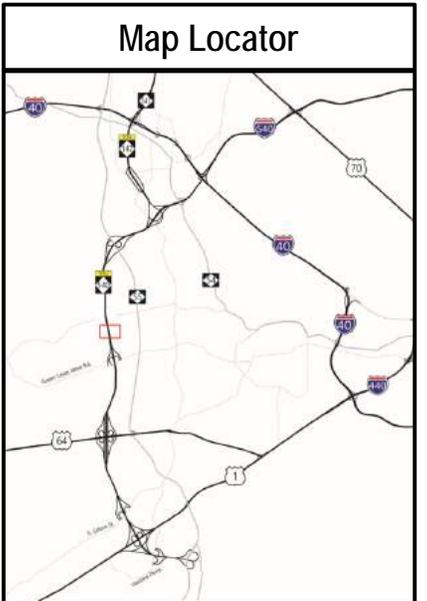
Toll Zone T17
 Location Description:
 NC 540 NB, North of Green Level West
 Segment Description:
 Three-lane Mainline

Toll Rates

2 AXLES	\$0.78	\$1.20
3 AXLES	\$1.56	\$2.40
4+ AXLES	\$3.12	\$4.80

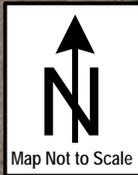
Transactions by Direction		
Month	T17	T18
January	16,760	17,820
February	17,230	18,130
March	17,670	18,420
April	17,780	18,750
May	18,200	19,320
June	18,360	19,570
July	17,850	19,000
August	18,360	19,260
September	18,530	19,490
October	18,700	19,930
November	19,000	19,980
December	18,600	19,530

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	60%	60%
August	59%	58%
September	60%	60%
October	60%	59%
November	60%	60%
December	60%	60%



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

Figure 27



Toll Zone T22
 Location Description:
 NC 540 SB Off to US 64
 Segment Description:
 One-lane Ramp



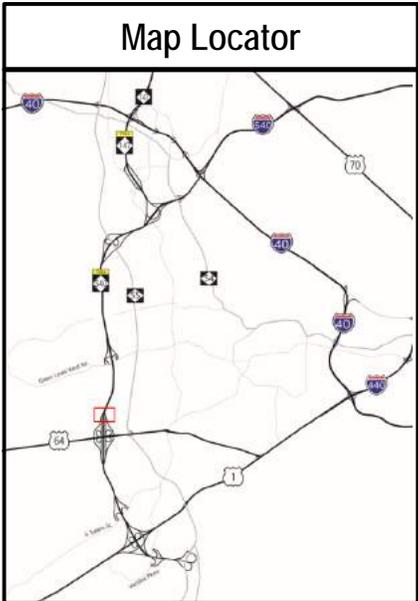
Toll Zone T21
 Location Description:
 NC 540 NB On from US 64
 Segment Description:
 Two-lane Mainline

Toll Rates

	NC QUICK PASS	BILL BY MAIL
2 AXLES	\$0.43	\$0.66
3 AXLES	\$0.86	\$1.32
4+ AXLES	\$1.72	\$2.64

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	5,520	5,860
August	5,650	6,000
September	5,710	6,040
October	5,680	6,090
November	5,800	6,170
December	5,740	6,110

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	61%	62%
August	62%	62%
September	63%	54%
October	63%	60%
November	63%	62%
December	63%	62%



US-64 Ramp Toll Zones
 2017 Average Weekday Toll Transactions

Figure 28



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

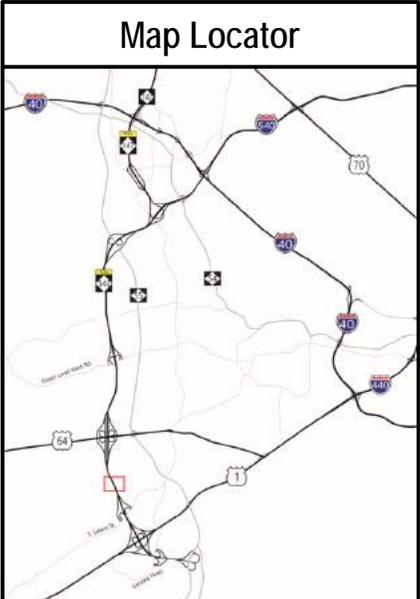
		BILL BY MAIL
2 AXLES	\$0.97	\$1.49
3 AXLES	\$1.94	\$2.98
4+ AXLES	\$3.88	\$5.96

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	15,050	15,310
August	15,570	15,500
September	15,780	15,730
October	16,030	16,100
November	16,110	16,190
December	15,910	15,720

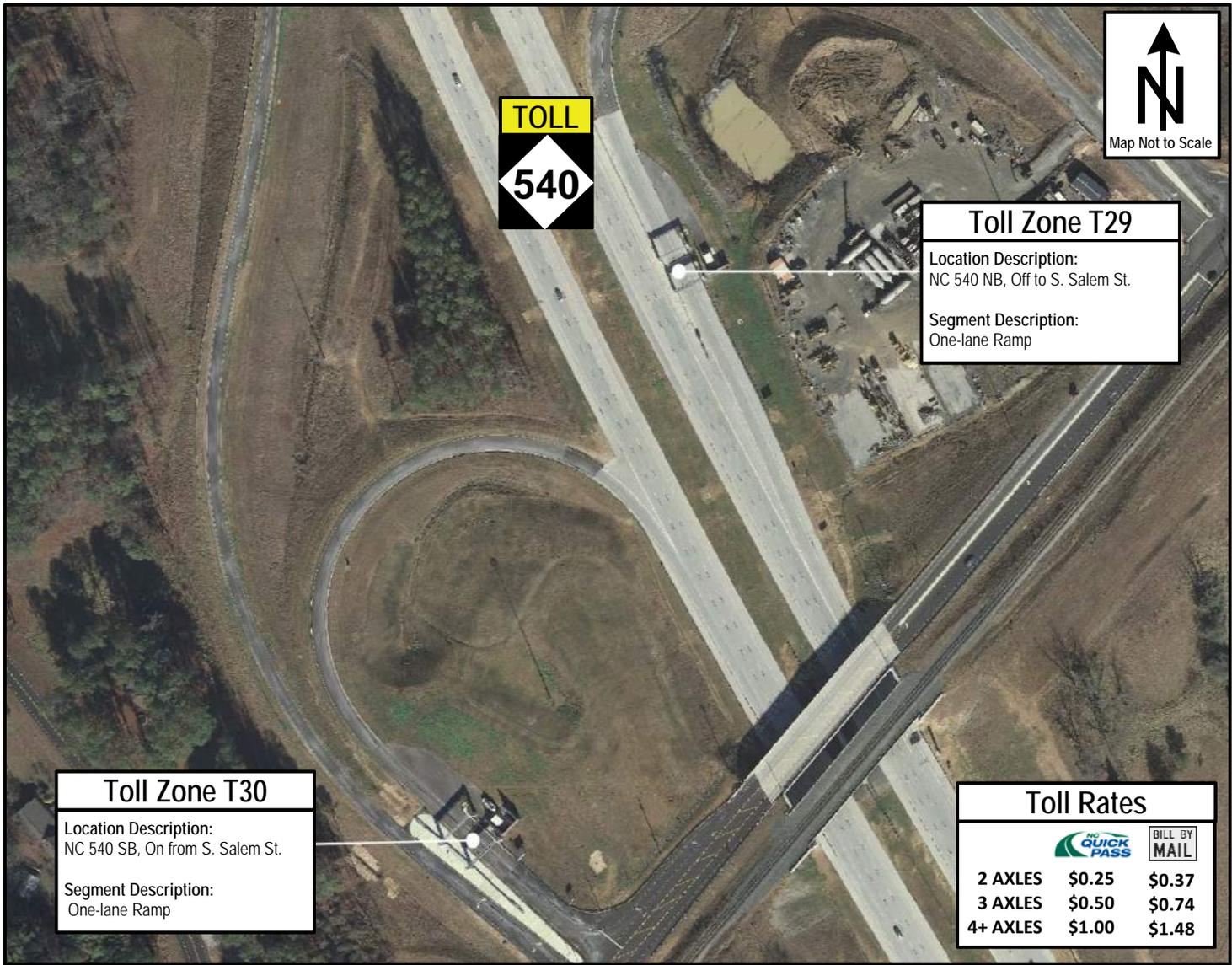
NC Quick Pass Percentage

Month	T25	T26
January	61%	60%
February	60%	59%
March	60%	59%
April	60%	58%
May	59%	58%
June	58%	58%
July	59%	58%
August	58%	59%
September	59%	56%
October	59%	59%
November	58%	59%
December	58%	58%



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

Figure 29



Toll Zone T29

Location Description:
NC 540 NB, Off to S. Salem St.

Segment Description:
One-lane Ramp

Toll Zone T30

Location Description:
NC 540 SB, On from S. Salem St.

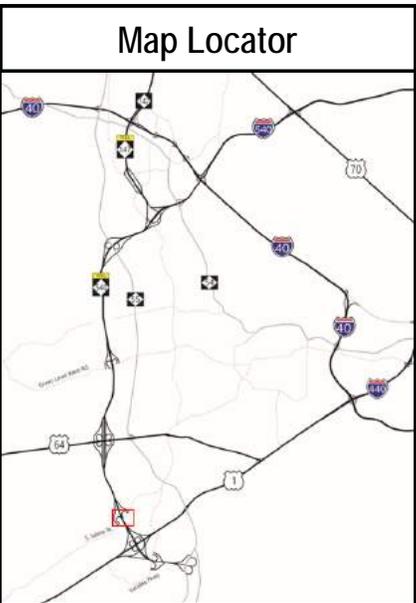
Segment Description:
One-lane Ramp

Toll Rates

2 AXLES	\$0.25	\$0.37
3 AXLES	\$0.50	\$0.74
4+ AXLES	\$1.00	\$1.48

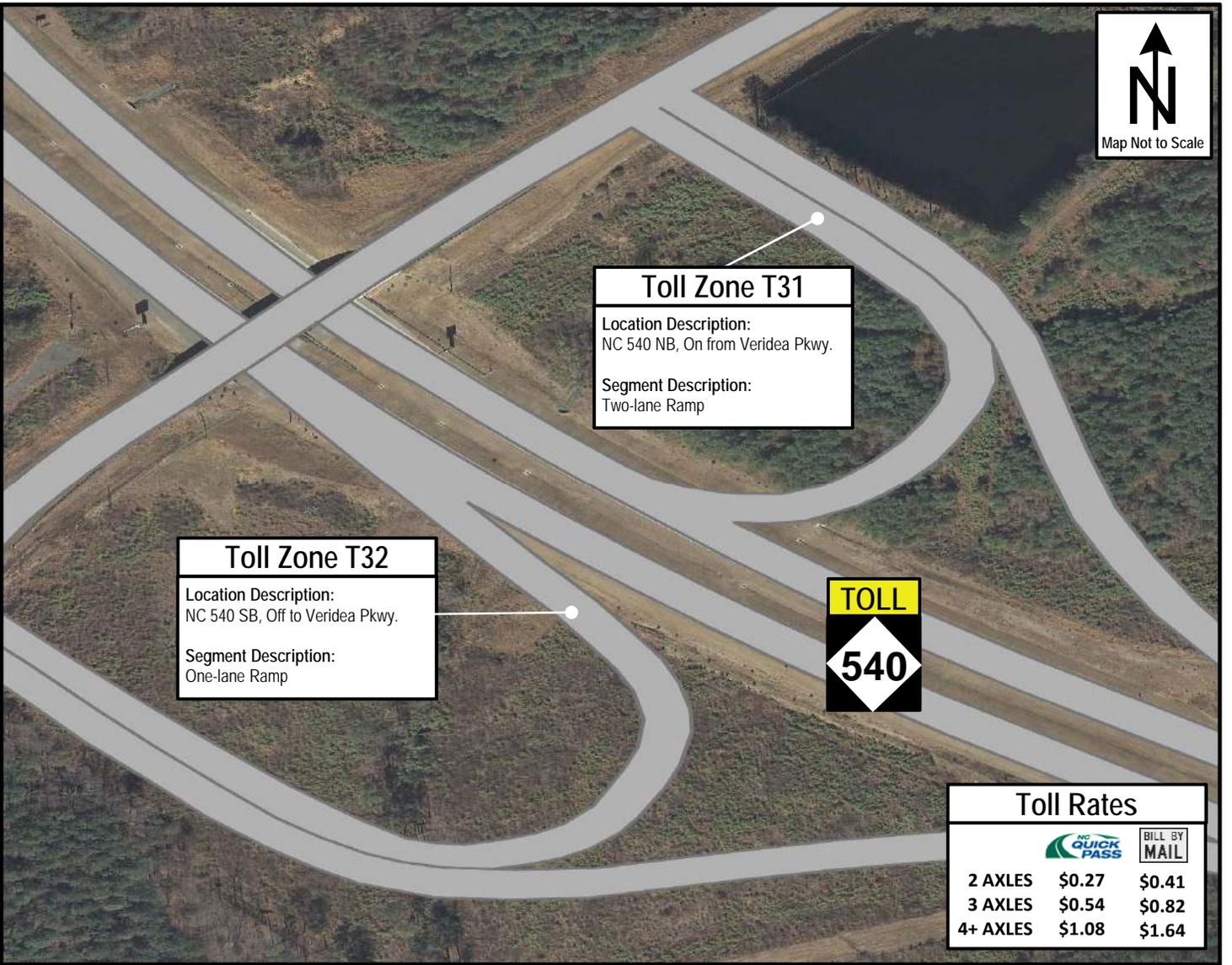
Transactions by Direction		
Month	T29	T30
January	1,590	1,650
February	1,660	1,750
March	1,740	1,800
April	1,670	1,770
May	1,800	1,890
June	1,610	1,770
July	1,480	1,660
August	1,640	1,770
September	1,850	1,960
October	1,890	1,960
November	1,800	1,890
December	1,820	1,920

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	65%	69%
August	66%	69%
September	68%	69%
October	69%	70%
November	70%	71%
December	70%	70%



South Salem Street Ramp Toll Zones
2017 Average Weekday Toll Transactions

Figure 30



Toll Zone T31
 Location Description:
 NC 540 NB, On from Veridea Pkwy.
 Segment Description:
 Two-lane Ramp

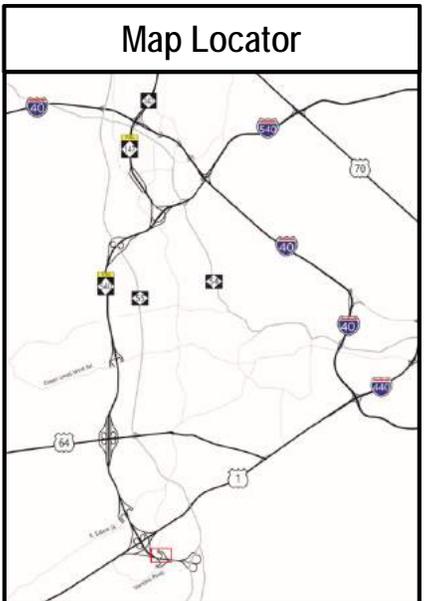
Toll Zone T32
 Location Description:
 NC 540 SB, Off to Veridea Pkwy.
 Segment Description:
 One-lane Ramp



Toll Rates		
	NC QUICK PASS	BILL BY MAIL
2 AXLES	\$0.27	\$0.41
3 AXLES	\$0.54	\$0.82
4+ AXLES	\$1.08	\$1.64

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	690	800
August	810	950
September	860	920
October	1,030	1,040
November	1,060	1,100
December	1,070	1,140

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	67%	69%
August	68%	68%
September	71%	72%
October	70%	70%
November	70%	71%
December	69%	69%



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

Figure 31

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

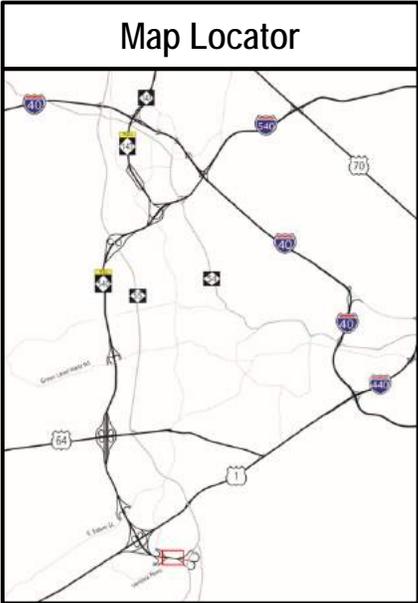
		NC QUICK PASS	BILL BY MAIL
2 AXLES	\$0.40	\$0.62	
3 AXLES	\$0.80	\$1.24	
4+ AXLES	\$1.60	\$2.48	

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	9,310	9,200
August	9,670	9,300
September	9,860	9,460
October	10,070	9,630
November	9,940	9,590
December	9,810	9,390

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	63%	61%
August	58%	62%
September	52%	59%
October	61%	61%
November	61%	54%
December	61%	58%



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 fourth 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 December 2014 through November 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 fourth quarter analysis.

Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 2017

Table 14: Safety Statistics, December 2014 - November 2017

Segment	Length	AADT ¹	Total Crashes	Vehicle Exposure (MVMT)	Total Crash Rate	Statewide Crash Rate ²	Critical Crash Rate
NC 147 I 40 to NC 540	3.1	13,000	39	44.22	88.20	97.32	122.86
NC 540 I 40 to NC 55	2.8	31,500	57	96.41	59.12	97.32	114.37
NC 540 NC 55 to US 64	6.7	23,600	83	172.60	48.09	97.32	109.96
NC 540 US 64 to NC 55 Bypass	5.9	17,400	58	111.67	51.94	97.32	113.12
Triangle Expressway	18.4	21,100	237	426.08	55.62	97.32	105.30

¹ AADT provided from NCDOT 2015 AADT Maps, Wake County

² 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 a 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 NCDOT's 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 to communicate with State Highway Patrol (SHP) and dispatch Incident Management Assistance Patrol (IMAP).

The NCTA Toll Safety Patrol program consists of dedicated SHP and IMAP services provided on the 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 fourth quarter of 2017. It includes driver violations and warnings issued 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

Fourth Quarter, October – December 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	70	54	50	81	44	44	758
Alcohol Violations	0	0	0	0	0	0	0	0	1	1	0	1	3
Seat Belt Violations	1	6	23	15	6	10	2	6	7	6	4	2	88
Child Restraint Violations	0	0	0	0	0	0	0	0	0	0	0	1	1
Reckless Driving	4	1	2	1	11	6	5	0	4	8	4	0	46
Drug Violations	0	0	0	1	0	0	0	0	0	2	0	0	3
Obstructed Plates	0	0	0	0	0	1	7	19	4	3	3	0	37
Other Violations	36	27	37	49	57	37	28	42	28	50	32	24	447
Total Charges	91	101	122	129	165	138	112	121	94	151	87	72	1,383

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	84	102	74	25	77	75	711
Vehicles Towed	0	0	0	0	0	2	0	2	3	4	3	3	17
Crashes Investigated	6	8	5	4	10	5	3	4	7	7	6	2	67
Total	58	86	53	29	58	30	87	108	84	36	86	80	795

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, transported motorist, and tagged vehicle.

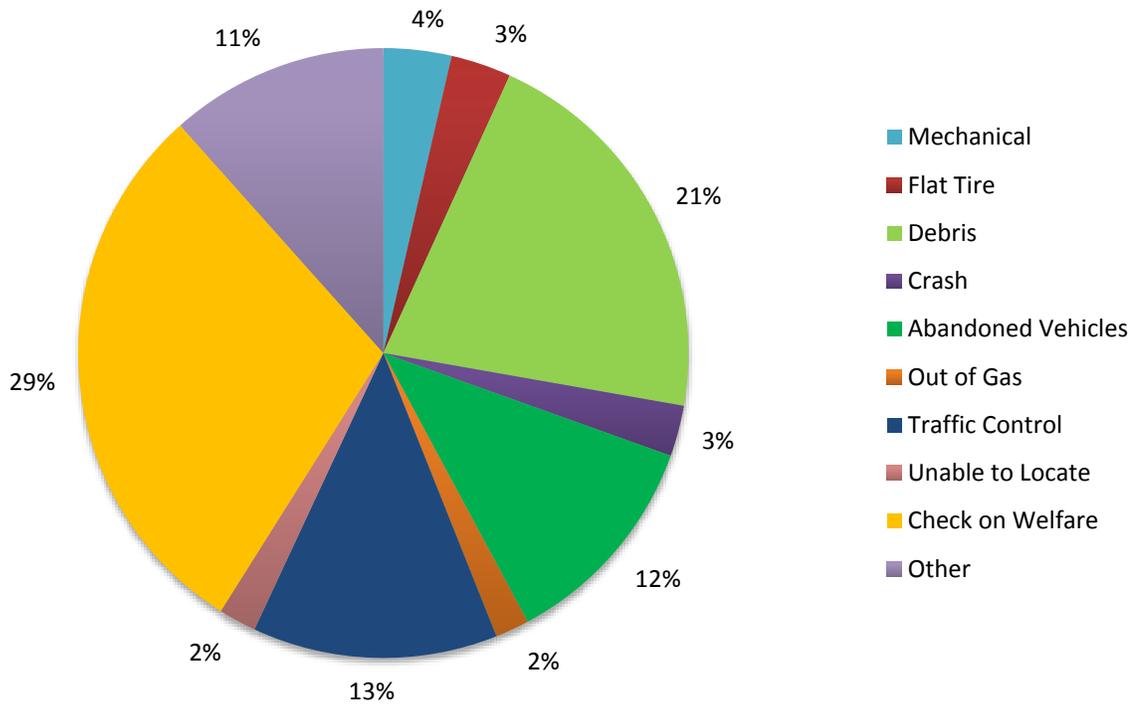
Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 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	2	9	5	1	3	1	36
Flat Tire	1	2	0	2	0	0	3	9	4	6	2	3	32
Debris	15	14	20	15	18	18	23	22	16	16	19	14	210
Crash	1	0	0	0	0	0	2	3	3	8	3	7	27
Abandoned Vehicles	14	8	11	9	9	9	7	20	4	7	11	8	117
Out of Gas	1	0	0	2	3	3	0	3	3	3	0	0	18
Traffic Control	0	2	7	4	7	7	5	7	21	20	26	24	130
Unable to Locate	1	1	0	2	0	0	4	3	2	2	1	4	20
Check on Welfare	49	38	33	24	28	19	27	27	14	12	18	6	295
Other	9	15	14	22	7	8	0	0	0	0	28	13	116
Total Assist	100	80	89	80	73	65	73	103	72	75	111	80	1001

Figure 33: 2017 IMAP Assistance by Type



Operations Statistics Report for the Triangle Expressway

Fourth Quarter, October – December 2017

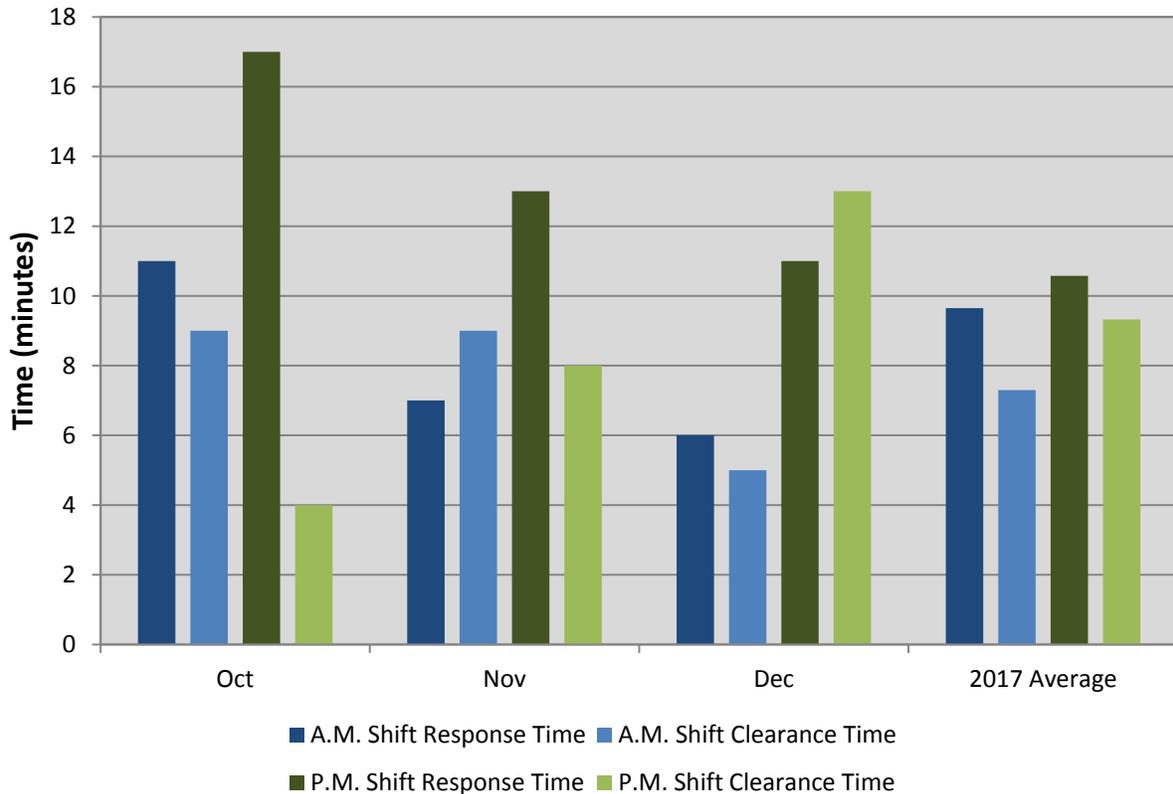
The response and clearance times for all IMAP assists are logged by IMAP and provided to the NCTA. Response time is the time from which a responder receives a call to the time they arrive on the scene. Clearance time is the time it takes the responder to clear the incident and return the roadway to normal operation. The IMAP staff’s A.M. shift occurs from 6AM to 2PM, while the P.M. shift occurs from 12PM to 8PM. 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	9	9	13	11	7	6	10
A.M. Shift Clearance	8	8	8	6	8	6	7	8	7	9	9	5	7
P.M. Shift Response	9	9	10	8	9	6	11	14	10	17	13	11	11
P.M. Shift Clearance	6	8	10	10	8	8	13	14	9	4	8	13	9

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 is currently underway and is scheduled to be completed by March 2018.

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	98.1	98.9	98.6
Unpaved Shoulders and Ditches	95.6	95.5	100.0	97.9	97.5
Drainage	86.7	92.3	83.2	87.6	87.4
Roadside	90.3	87.4	90.4	92.5	90.3
Traffic Control Devices	91.4	88.5	85.2	82.4	86.8
Overall MRP Performance Rating	92.7	92.7	90.9	91.1	91.8