



BEFORE / AFTER TRAFFIC STUDY

June 2021



Executive Summary

On Thursday, January 10, 2019, following more than 30 years of planning, the new alignment of US 301, a 14-mile toll road in Delaware between the Delaware/Maryland state line and the Roth Bridge (SR 1), opened. The new US 301 Toll Road is Delaware's first roadway with All Electronic Tolling (AET). The new toll road was expected to provide a significant time savings for motorists traveling from Southern New Castle County/Cecil County to areas north of the C&D Canal, and remove through traffic – particularly through truck traffic – from the local roadway network in and around the Town of Middletown.

This “US 301 Before/After Traffic Study” was conducted to determine the impacts that the US 301 Toll Road has had on travel patterns in the Middletown-Odessa-Townsend area after nearly a full year of operation. Specifically, in November 2019, after the US 301 Toll Road had been opened to traffic for almost a full year, DelDOT replicated the same data collection effort that had taken place exactly one (1) year previously in November 2018.

Total Traffic Volumes

After almost a full year of operation and motorists having had time to adjust to their new travel patterns, the total traffic volume decreased for many of the local roads around Middletown. As of November 2019, the following roadways within Delaware saw a decrease in total traffic volumes (all values below are rounded to the nearest 5%):

- 5% decrease in traffic (1,600 fewer vehicles/day) on Summit Bridge
- 10% decrease in traffic (2,740 fewer vehicles/day) on Summit Bridge Road, north of Armstrong Corner Road
- 20% decrease in traffic (4,150 fewer vehicles/day) on Middletown Warwick Road through Middletown
- 85% decrease in traffic (9,920 fewer vehicles/day) on Middletown Warwick Road, south of Levels Road
- 20% decrease in traffic (4,830 fewer vehicles/day) on Main Street (SR 299) in Middletown
- 20% decrease in traffic (4,330 fewer vehicles/day) on Boyd's Corner Road (SR 896)
- 20% decrease in traffic (1,680 fewer vehicles/day) on Cedar Lane Road
- 20% decrease in traffic (1,400 fewer vehicles/day) on Choptank Road
- 30% decrease in traffic (2,480 fewer vehicles/day) on Lorewood Grove Road

Several roadways in Maryland and Delaware, particularly those near the Maryland/Delaware state line, have experienced increases in traffic from vehicles that opt to travel on local roads rather than paying the mainline toll on US 301 near the Maryland/Delaware state line [*Note: A detailed discussion of traffic diversions is provided in the body of the report*]. As of November 2019, the following roadways saw an increase in total traffic volumes (all values below are rounded to the nearest 5%):

- 730% increase in traffic (4,100 additional vehicles/day) on Sassafras Road between US 301 and MD 282, which previously carried 560 vehicles/day
- 145% increase in traffic (4,190 additional vehicles/day) on Cecilton Warwick Road (MD 282) within the Town of Warwick, which previously carried 2,920 vehicles/day
- 95% increase in traffic (260 additional vehicles/day) on Edgar Price Road/Levels Road, which previously carried 280 vehicles/day

- 35% increase in traffic (210 additional vehicles/day) on Sassafras Caldwell Road, east of US 301, which previously carried 600 vehicles/day
- 25% increase in traffic (1,170 additional vehicles/day) on MD 213, north of Galena, which previously carried 5,050 vehicles/day

Truck Volumes

One of the main goals of the US 301 Toll Road was to reduce the truck volumes using local roadways in the Middletown area. Prior to the opening of the US 301 Toll Road, DelDOT and Maryland State Highway Administration (SHA) made a concerted effort to inform and educate trucking companies about the US 301 Toll Road. Additionally, prior to the opening of the new toll road, new truck restrictions were implemented (signed) on many of the local roads in the vicinity of the US 301 Toll Road, and the Delaware State Police (DSP) continue to conduct extensive truck restriction enforcement on local roads near the Delaware/Maryland state line. As a result, the majority (94%) of the 1,910 trucks that previously used Middletown Warwick Road each day in 2018 are now using the US 301 Toll Road. This has resulted in lower truck volumes on Middletown Warwick Road, Summit Bridge Road and other local roads in the region (all values below are rounded to the nearest 5%):

- 25% decrease in trucks (390 fewer trucks/day) on Summit Bridge
- 35% decrease in trucks (480 fewer trucks/day) on Summit Bridge Road, north of Boyd's Corner Road
- 55% decrease in trucks (1,070 fewer trucks/day) on Summit Bridge Road, north of Armstrong Corner Road
- 95% decrease in trucks (1,860 fewer trucks/day) on Middletown Warwick Road, south of Levels Road
- 25% decrease in trucks (60 fewer trucks/day) on Main Street (SR 299) in Middletown
- 55% decrease in trucks (720 fewer trucks/day) on Boyd's Corner Road (SR 896)
- 30% decrease in trucks (30 fewer trucks/day) on Cedar Lane Road
- 25% decrease in trucks (20 fewer trucks/day) on Choptank Road
- 20% decrease in trucks (20 fewer trucks/day) on Marl Pit Road
- 45% decrease in trucks (80 fewer trucks/day) on SR 71, south of SR 299

The actions taken by DelDOT, Maryland SHA, and the Delaware State Police have helped reduce truck traffic on Delaware and Maryland roadways, but there have still been noticeable increases in truck traffic on some roadways in Maryland and Delaware near the Maryland/Delaware state line (all values below are rounded to the nearest 5%) [*Note: A detailed discussion of traffic diversions is provided in the body of the report*]:

- 180% increase in trucks (180 additional trucks/day) on MD 282 within the Town of Warwick, which previously carried 100 trucks/day
- 35% increase in trucks (20 additional trucks/day) on Sassafras Road between US 301 and MD 282, which previously carried 60 trucks/day
- 50% increase in trucks (20 additional trucks/day) on MD 310 at the Delaware/Maryland state line, which previously carried 40 trucks/day
- 40% increase in trucks (20 additional trucks/day) on SR 6 between SR 42 and the Town of Clayton in Delaware, which previously carried 50 trucks/day

Travel Times

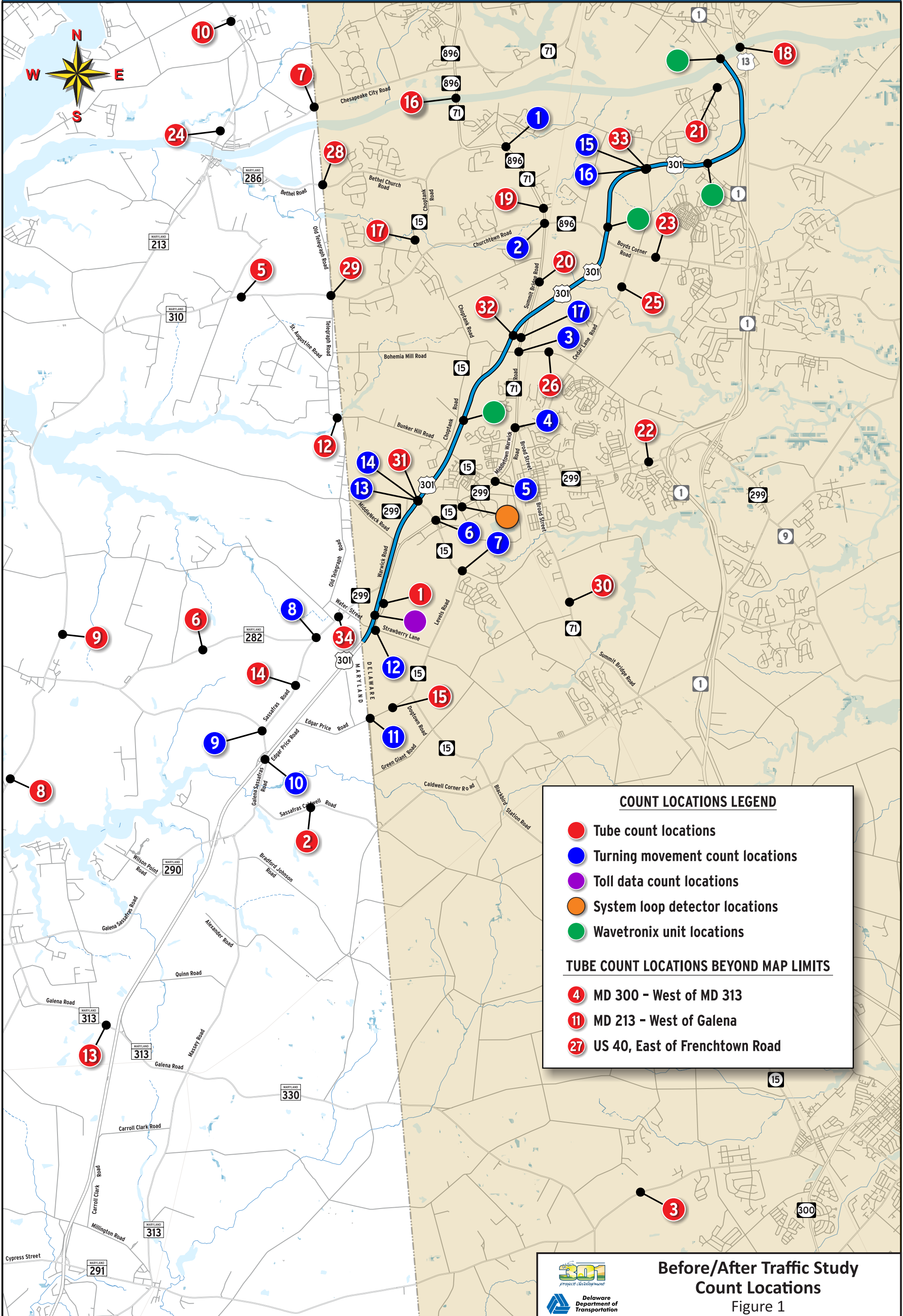
All motorists using the US 301 Toll Road benefit from substantial savings in travel time compared to the time it took previously to travel between the Delaware/Maryland state line and the Roth Bridge (SR 1) using the “old” route (Middletown Warwick Road, Summit Bridge Road, Boyd’s Corner Road, and US 13). Using the old route, on average it took approximately 24 minutes to travel northbound between the Maryland state line and the Roth Bridge during the AM and PM peak travel periods. In comparison, it only takes half of that time (approximately 12 minutes) for motorists traveling northbound on the US 301 Toll Road from the Maryland state line to the Roth Bridge, resulting in a 12 minute savings in travel time. In the southbound direction, particularly in the PM peak hour, the savings in travel time is even greater: previously, using the “old” route, it took an average of 32 minutes to travel between the Roth Bridge and the Maryland state line. In comparison, it only takes approximately 12 minutes for motorists traveling southbound on the US 301 Toll Road from the Roth Bridge to the Maryland state line, resulting in a 20 minute savings in travel time.

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**Before/After Traffic Study
Count Locations**
Figure 1

I. Introduction

New US 301 is a 14-mile toll road that extends from the Delaware/Maryland state line to Delaware State Route 1 (N082) just south of the Roth Bridge that crosses over the C&D Canal. The New US 301 alignment, which bypasses the Town of Middletown to the west and north, has an estimated total cost of approximately \$636 million. US 301 is Delaware’s first roadway with All Electronic Tolling (AET). Vehicles passing through the toll have the option to pay via E-ZPass or by having their toll billed to them by mail based on their license plate registration. The purpose of constructing the New US 301 Toll Road was to improve safety and reduce congestion on local roadways in and around the Town of Middletown by reducing the volume of traffic, particularly heavy truck traffic, that was using the old US 301 alignment (Middletown Warwick Road and Summit Bridge Road) and other local roads in the area.

Prior to the opening of the US 301 Toll Road on January 10, 2019, DelDOT collected extensive traffic data (volumes and travel times) to establish a baseline, or “Before” condition in November 2018. In March 2019, approximately 2-months after the opening of the toll road, DelDOT collected a reduced-scale traffic data to assess the initial impacts of the toll road. The findings of that study were previously documented in the “Summer 2019 Interim Before/After Traffic Study.”

In November 2019, after the toll road had been opened to traffic for almost a full year and motorists having had time to adjust to their new travel patterns, DelDOT replicated the same traffic data collection effort that had taken place exactly one (1) year previously in November 2018. Since the traffic data was collected during the same months (November) for both the before and after periods, there should be little or no influence from seasonal variation in the data comparison.

The intent of this study, henceforth known as the “US 301 Before/After Traffic Study”, is to document how the opening of the US 301 Toll Road in Delaware has impacted travel patterns on the local roadways in the Middletown-Odessa-Townsend (MOT) area after a full year of operation.

II. Traffic Data Collection

Traffic data was collected at several locations within the project area in November 2018 to establish baseline traffic conditions prior to the opening of the new US 301 Toll Road. In November 2019, almost a full year after US 301 opened, and exactly a full year after the initial (“Before”) data was collected, the November 2018 traffic data collection plan was replicated. Specifically, data was collected at thirty-four (34) tube count locations, six (6) permanent count stations (including toll plazas), and sixteen (16) turning movement count locations in the US 301 project area (**See Figure 1**). Additionally, vehicle travel times were also documented on the US 301 Toll Road, as well as local roadways in Delaware using Bluetooth devices.

Automatic Traffic Recorder (ATR) devices, commonly known as “tube counters”, were used to record volumes in both directions, counting vehicles separately by vehicle type, in accordance with FHWA’s vehicle classification system. FHWA’s vehicle classification system categorizes vehicles by the number of axles. Data was collected during a non-holiday 7-day period while schools were in session. The ATR count data was supplemented by data collected by DeIDOT’s Wavetronix SmartSensors, which are traffic sensors that also measure traffic volume, but classify vehicles by vehicle length. The ATR data was used to determine the seasonally unadjusted Average Daily Traffic (ADT) and truck percentages traveling on each roadway segment monitored (**See Figures 2, 3, 4, 5, and 6**). The changes in total daily traffic volume from November 2018 to November 2019 are illustrated in **Figures 7, 8, 9, 10, and 11**.

Permanent count stations are traffic data collection devices that operate on a continuous basis throughout the year. The two (2) types of permanent count stations that were utilized to assist with data collection were system loop detectors and toll plazas. System loop detectors consist of an induction loop of wire and an electronic detection unit that is installed within the pavement. These detectors were used to record hourly volumes in various directions. The toll plaza data provides traffic volumes and vehicle classification by the number of axles present. The system loop detector data was used to illustrate the total daily traffic volume changes, while the toll plaza data was used to determine the seasonally unadjusted Average Daily Traffic (ADT) and truck percentages (**See Figures 2-11**).

Turning Movement Counters (TMCs) were utilized to record various approach movements (left, through, right, and u-turn), counting vehicles separately that pass through an intersection over a given period of time. Data was collected during the hours of 6:30 AM – 9:00 AM and 4:00 PM – 6:00 PM on either Tuesday, Wednesday, or Thursday while schools were in session and during non-holiday days. The TMC data was used to determine the change (increase or decrease) in volume at specific intersections that may have been impacted by the US 301 Toll Road. The AM peak hour traffic volume comparisons are shown in **Figures 12, 13, and 14**. The PM peak hour traffic volume comparisons are shown in **Figures 15, 16, and 17**.

DeIDOT’s Bluetooth Travel Time System was used to record peak hour travel times in both directions of travel on several Delaware roads in the study area. By tracking signals emitted from vehicles containing Bluetooth Devices, these roadside sensors are able to match unique signals at different locations and different times, enabling the calculation of travel times. Specifically, the Travel Time System records unique Bluetooth signals from passing devices, time stamps those readings and locations, and then compares them with signals recorded at other locations. When matches are found, travel times can be calculated. DeIDOT installed Bluetooth Devices along many key roadways within the US 301 project area in recent years and additional Bluetooth and Wavetronix Devices were installed on the US 301 Toll Road. This allowed DeIDOT to compare the average travel time for motorists traveling between the Delaware/Maryland state line and the Roth Bridge (SR 1) using Middletown Warwick Road, Summit Bridge Road, Boyd’s Corner Road, and US 13 vs. the US 301 Toll Road. The before and after travel time data can be found in **Figure 18**.

III. Before/After Traffic Data Summary

Total Traffic Volumes

After almost a full year of operation (and prior to the national decline in vehicle miles traveled resulting from the COVID-19 pandemic), the average daily traffic volume (ADT) using the US 301 Toll Road has exceeded the opening year ADT projections. As motorists became more accustomed to the US 301 Toll Road, the total traffic volume using many of the local roads, including Summit Bridge Road and Middletown Warwick Road has decreased. As of November 2019, the biggest decreases in traffic volume occurred on the south side of Middletown (85% fewer total vehicles per day on Middletown Warwick Road near Strawberry Lane compared to November 2018), but volumes have also decreased within and north of Middletown on several roads (all values below are rounded to the nearest 5%):

- 5% decrease in traffic (1,600 fewer vehicles/day) on Summit Bridge
- 10% decrease in traffic (2,740 fewer vehicles/day) on Summit Bridge Road, north of Armstrong Corner Road
- 20% decrease in traffic (4,150 fewer vehicles/day) on Middletown Warwick Road through Middletown
- 85% decrease in traffic (9,920 fewer vehicles/day) on Middletown Warwick Road, south of Levels Road
- 20% decrease in traffic (4,830 fewer vehicles/day) on Main Street (SR 299) in Middletown
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- 30% decrease in traffic (2,480 fewer vehicles/day) on Lorewood Grove Road

Several roadways in Maryland and Delaware, particularly those near the Maryland/Delaware state line, have experienced increases in traffic from vehicles that opt to travel on local roads rather than paying the mainline toll on US 301 near the Maryland/Delaware state line. A detailed discussion of traffic diversions is provided in the next section. As of November 2019, the following roadways saw an increase in total traffic volumes (all values below are rounded to the nearest 5%):

- 730% increase in traffic (4,100 additional vehicles/day) on Sassafras Road between US 301 and MD 282, which previously carried 560 vehicles/day
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- 25% increase in traffic (1,170 additional vehicles/day) on MD 213, north of Galena, which previously carried 5,050 vehicles/day

It should be noted that on Thursday, October 10, 2019, Cecil County's Department of Public Works closed Edgar Price Road to through traffic, which is expected to remain closed until further notice. The roadway closure was deemed necessary by Cecil County due to roadway damage that they identified along Edgar Price Road after the US 301 Toll Road was opened. Prior to the opening of the US 301 Toll Road, Edgar Price Road carried approximately 280 vehicles per day. In March 2019, two months after the new road opened, the volume of traffic on Edgar Price Road had increased to 2,020 vehicles per day. The closure of Edgar Price Road may have resulted in minor volume impacts to some of the count sites located south of Middletown, near the Delaware/Maryland state line. Specifically, count sites located on Edgar Price Road, Sassafras Road, Sassafras Caldwell Road, Middletown Warwick Road, near the Delaware/Maryland state line, and Levels Road may have captured some of the detoured traffic from the Edgar Price Road Closure.

Truck Volumes

One of the main goals of the US 301 Toll Road was to reduce the truck volumes using local roadways in the Middletown area. Prior to the opening of the US 301 Toll Road, DelDOT and Maryland State Highway Administration (SHA) made a concerted effort to inform and educate trucking companies about the US 301 Toll Road. Additionally, and as discussed in greater detail in the next section, prior to the opening of the new toll road, new truck restrictions were implemented (signed) on many of the local roads in the vicinity of the US 301 Toll Road, and the Delaware State Police (DSP) continue to conduct extensive truck restriction enforcement on local roads near the Delaware/Maryland state line. As a result, the majority (94%) of the 1,910 trucks that previously used Middletown Warwick Road each day in 2018 are now using the US 301 Toll Road. This has resulted in lower truck volumes on Middletown Warwick Road, Summit Bridge Road and other local roads in the region (all values below are rounded to the nearest 5%):

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- 20% decrease in trucks (20 fewer trucks/day) on Marl Pit Road
- 45% decrease in trucks (80 fewer trucks/day) on SR 71, south of SR 299

The actions taken by DelDOT, Maryland SHA, and the Delaware State Police have helped reduce truck traffic on Delaware and Maryland roadways, but there have still been noticeable increases in truck traffic on the following roadways in Maryland and Delaware near the Maryland/Delaware state line (all values below are rounded to the nearest 5%):

- 180% increase in trucks (180 additional trucks/day) on MD 282 within the Town of Warwick, which previously carried 100 trucks/day
- 35% increase in trucks (20 additional trucks/day) on Sassafras Road between US 301 and MD 282, which previously carried 60 trucks/day
- 50% increase in trucks (20 additional trucks/day) on MD 310 at the Delaware/Maryland state line, which previously carried 40 trucks/day
- 40% increase in trucks (20 additional trucks/day) on SR 6 between SR 42 and the Town of Clayton in Delaware, which previously carried 50 trucks/day

Travel Times

Motorists using the US 301 Toll Road benefit from substantial savings in travel time compared to the time it took previously to travel between the Delaware/Maryland state line and the Roth Bridge (SR 1) using the “old” route (Middletown Warwick Road, Summit Bridge Road, Boyd’s Corner Road, and US 13). Using the old route, on average it took approximately 24 minutes to travel northbound between the Maryland state line and the Roth Bridge during the AM and PM peak travel periods. In comparison, it only takes half of that time (approximately 12 minutes) for motorists traveling northbound on the US 301 Toll Road from the Maryland state line to the Roth Bridge, resulting in a 12 minute savings in travel time. In the southbound direction, particularly in the PM peak hour, the savings in travel time is even greater: previously, using the “old” route, it took an average of 32 minutes to travel between the Roth Bridge and the Maryland state line. In comparison, it only takes approximately 12 minutes for motorists traveling southbound on the US 301 Toll Road from the Roth Bridge to the Maryland state line, resulting in a 20 minute savings in travel time.

IV. Toll Diversions

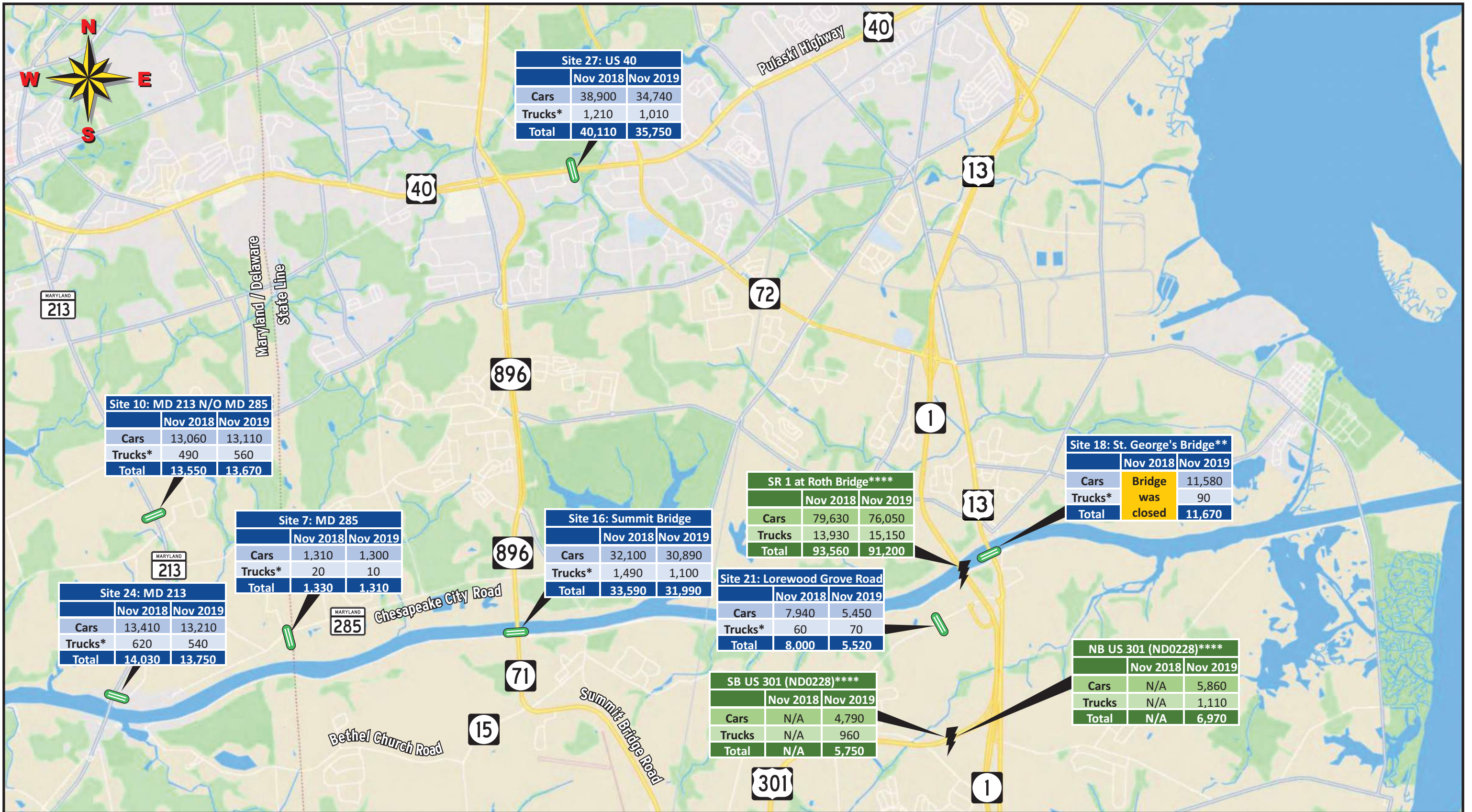
During the initial planning phase of the US 301 project, DelDOT established a Toll Diversion Working Group that consisted of representatives from DelDOT and the Delaware State Police, and several stakeholders from Maryland, including MDSHA, MDTA, MD State Police (Commercial Vehicle Enforcement Division), the mayors of Galena, Cecilton, and Chesapeake City, the Sheriffs from Cecil and Kent Counties, and the Cecilton and Galena Fire Companies. This group was assembled to discuss potential traffic impacts resulting from the construction of a new US 301 Toll Road, particularly potential toll diversions onto local roads near the Maryland/Delaware state line. The group developed a list of eight (8) recommendations and five (5) considerations that were intended to address potential traffic diversions onto local roads in Delaware and Maryland. Five (5) of the recommendations were directed in whole or in part towards DelDOT as they related to the opening of US 301:

- **Recommendation #1: Conduct a Traffic Monitoring Program.** The Working Group recommended that traffic counts be conducted before and after the opening of weigh and inspection stations along US 301 and before and after the US 301 Toll Road opened. DelDOT completed this traffic monitoring program.
- **Recommendation #2: Truck Restriction Signage.** The Working Group recommended that truck restrictions should be implemented on a network of local roads in the vicinity of the Maryland/Delaware state line that could serve as potential toll diversion routes. DelDOT established truck restrictions on all the recommended roads and installed truck restriction signs on all of them prior to US 301 opening.
- **Recommendation #3: Virtual Weigh Stations.** The Working Group recommended that Virtual Weigh Stations (VWS) be installed on multiple roads that could have significant truck diversions due to either the weigh and inspection stations on US 301 or the opening of the US 301 Toll Road. Maryland SHA installed a VWS on MD 213 and DelDOT installed a VWS on Warwick Road in the northbound direction (none was installed in the southbound direction because Delaware State Police can only enforce and issue tickets in the northbound direction due to the proximity of the Maryland/Delaware state line).
- **Recommendation #4: Enhanced Truck Enforcement Efforts.** The Working Group recommended that both Maryland and Delaware provide sufficient dedicated enforcement (officers) to adequately monitor and enforce the Virtual Weigh Stations (VWS) and the truck restrictions on local roads, thereby discouraging diversion. Since US 301 opened, DelDOT has been paying the Delaware State Police (DSP) for extensive truck restriction enforcement on the local roads near the Delaware/Maryland state line. DelDOT recently renewed their agreement with the DSP to continue these enforcement activities through the end of the next fiscal year (FY 21).
- **Recommendation #5: Sassafras Road @ US 301.** The Working Group recommended careful consideration of the full closure of the median along US 301 at the intersection with Sassafras Road in Maryland. Prior to the opening of US 301, DelDOT funded a traffic study of vehicles using Sassafras Road and developed conceptual designs for multiple median closure options that were provided to Maryland State Highway Administration.

In addition to addressing these Working Group recommendations, during the design of US 301, DelDOT coordinated with Maryland State Highway Administration and modified the signing plans so that all signs installed on US 301 in Maryland, including signs related to the toll in Delaware, met all of Maryland's standards and preferences in terms of sign messaging and design details. Additionally, in the weeks leading up to the opening of the new toll road, to encourage local motorists to use US 301, DelDOT offered free E-ZPass transponders to motorists that opened a new E-ZPass account, heavily advertising this cost-saving program in the project area with billboards, on local radio, and via DelDOT's website and social media accounts.

After US 301 opened to traffic on January 10th 2019, DelDOT closely monitored traffic conditions on roads throughout the project area. To respond to initial concerns about traffic diversions near the Maryland/Delaware state line, DelDOT took the following actions:

- Within weeks of the road opening, DelDOT replaced several of the truck restriction signs near the Maryland/Delaware state line with oversized signs to increase their conspicuity.
- In April 2019, approximately 3 months after the road opened, DelDOT again offered free E-ZPass transponders to motorists that opened a new E-ZPass account.
- DelDOT studied and then implemented a frequent user discount program providing a discount for all vehicles with Delaware E-ZPass transponders (50% reduction for 2-axle vehicles and a 25% reduction for 3 or more axle vehicles) to be applied to the tolls paid on US 301 for motorists who make 30 or more trips on US 301 within a 30-day period.
- DelDOT studied and then on July 1, 2019 implemented a program that allows vehicles with an E-ZPass transponder that use US 301 to exit the road and re-enter it within 60 minutes without paying an additional toll. This program was intended to allow motorists using US 301 to patronize local businesses without incurring multiple toll transactions.
- DelDOT has provided over \$1M to Cecil County, Maryland so the county can make pavement repairs and improvements to three local roads in Maryland: Edgar Price Road, Sassafra Road, and Wilson Road.



Site 27: US 40		
	Nov 2018	Nov 2019
Cars	38,900	34,740
Trucks*	1,210	1,010
Total	40,110	35,750

Site 10: MD 213 N/O MD 285		
	Nov 2018	Nov 2019
Cars	13,060	13,110
Trucks*	490	560
Total	13,550	13,670

Site 7: MD 285		
	Nov 2018	Nov 2019
Cars	1,310	1,300
Trucks*	20	10
Total	1,330	1,310

Site 24: MD 213		
	Nov 2018	Nov 2019
Cars	13,410	13,210
Trucks*	620	540
Total	14,030	13,750

Site 16: Summit Bridge		
	Nov 2018	Nov 2019
Cars	32,100	30,890
Trucks*	1,490	1,100
Total	33,590	31,990

SR 1 at Roth Bridge****		
	Nov 2018	Nov 2019
Cars	79,630	76,050
Trucks	13,930	15,150
Total	93,560	91,200

Site 21: Lorewood Grove Road		
	Nov 2018	Nov 2019
Cars	7,940	5,450
Trucks*	60	70
Total	8,000	5,520

SB US 301 (ND0228)****		
	Nov 2018	Nov 2019
Cars	N/A	4,790
Trucks	N/A	960
Total	N/A	5,750

Site 18: St. George's Bridge**		
	Nov 2018	Nov 2019
Cars	Bridge was closed	11,580
Trucks*	Bridge was closed	90
Total	Bridge was closed	11,670

NB US 301 (ND0228)****		
	Nov 2018	Nov 2019
Cars	N/A	5,860
Trucks	N/A	1,110
Total	N/A	6,970

LEGEND

TRAFFIC DATA SOURCE

- Road Tube Counter
- Toll Plaza
- System Loop Detector
- Wavetronix Unit

Notes:

Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019

* Trucks with 3 or more axles

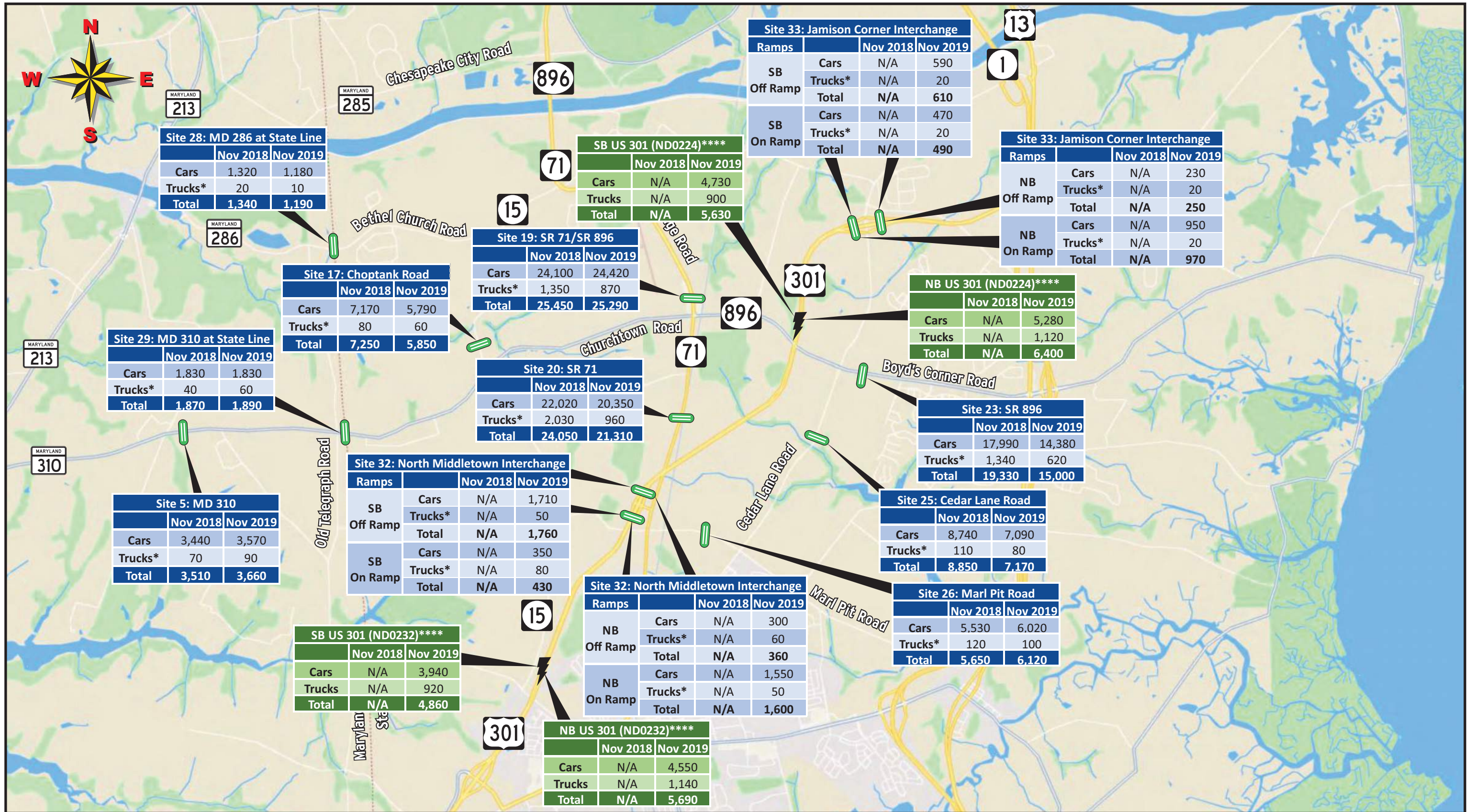
** St. George's Bridge was closed for repairs during November 2018 data collection efforts

**** Volumes were calculated using Wavetronix data. Trucks represent vehicles greater than 25 feet in length.

Delaware Department of Transportation

**Before and After Study
Daily Traffic Comparisons**

Figure 2



LEGEND

TRAFFIC DATA SOURCE

- Road Tube Counter
- Toll Plaza
- System Loop Detector
- Wavetronix Unit

Notes:

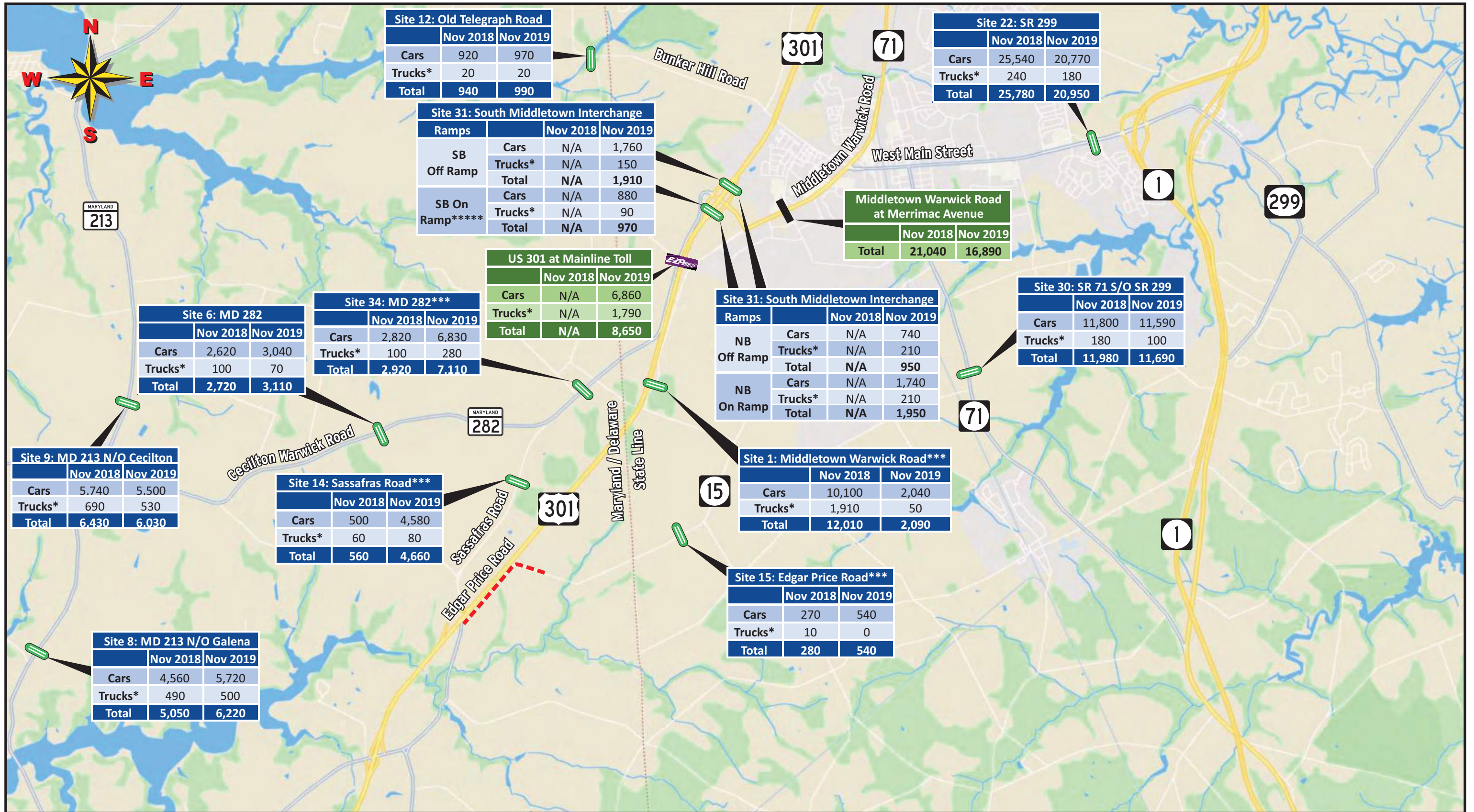
Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019

* Trucks with 3 or more axles

**** Volumes were calculated using Wavetronix data. Trucks represent vehicles greater than 25 feet in length.

**Before and After Study
Daily Traffic Comparisons**

Figure 3



Site 12: Old Telegraph Road		
	Nov 2018	Nov 2019
Cars	920	970
Trucks*	20	20
Total	940	990

Site 22: SR 299		
	Nov 2018	Nov 2019
Cars	25,540	20,770
Trucks*	240	180
Total	25,780	20,950

Site 31: South Middletown Interchange			
Ramps		Nov 2018	Nov 2019
SB Off Ramp	Cars	N/A	1,760
	Trucks*	N/A	150
	Total	N/A	1,910
SB On Ramp****	Cars	N/A	880
	Trucks*	N/A	90
	Total	N/A	970

Middletown Warwick Road at Merrimac Avenue		
	Nov 2018	Nov 2019
Total	21,040	16,890

US 301 at Mainline Toll		
	Nov 2018	Nov 2019
Cars	N/A	6,860
Trucks*	N/A	1,790
Total	N/A	8,650

Site 31: South Middletown Interchange			
Ramps		Nov 2018	Nov 2019
NB Off Ramp	Cars	N/A	740
	Trucks*	N/A	210
	Total	N/A	950
NB On Ramp	Cars	N/A	1,740
	Trucks*	N/A	210
	Total	N/A	1,950

Site 30: SR 71 S/O SR 299		
	Nov 2018	Nov 2019
Cars	11,800	11,590
Trucks*	180	100
Total	11,980	11,690

Site 6: MD 282		
	Nov 2018	Nov 2019
Cars	2,620	3,040
Trucks*	100	70
Total	2,720	3,110

Site 34: MD 282***		
	Nov 2018	Nov 2019
Cars	2,820	6,830
Trucks*	100	280
Total	2,920	7,110

Site 9: MD 213 N/O Cecilton		
	Nov 2018	Nov 2019
Cars	5,740	5,500
Trucks*	690	530
Total	6,430	6,030

Site 14: Sassafras Road***		
	Nov 2018	Nov 2019
Cars	500	4,580
Trucks*	60	80
Total	560	4,660

Site 1: Middletown Warwick Road***		
	Nov 2018	Nov 2019
Cars	10,100	2,040
Trucks*	1,910	50
Total	12,010	2,090

Site 15: Edgar Price Road***		
	Nov 2018	Nov 2019
Cars	270	540
Trucks*	10	0
Total	280	540

Site 8: MD 213 N/O Galena		
	Nov 2018	Nov 2019
Cars	4,560	5,720
Trucks*	490	500
Total	5,050	6,220

LEGEND

--- Edgar Price Road Closure

TRAFFIC DATA SOURCE

— Road Tube Counter Toll Plaza

— System Loop Detector Wavetronix Unit

Notes:

Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019

* Trucks with 3 or more axles

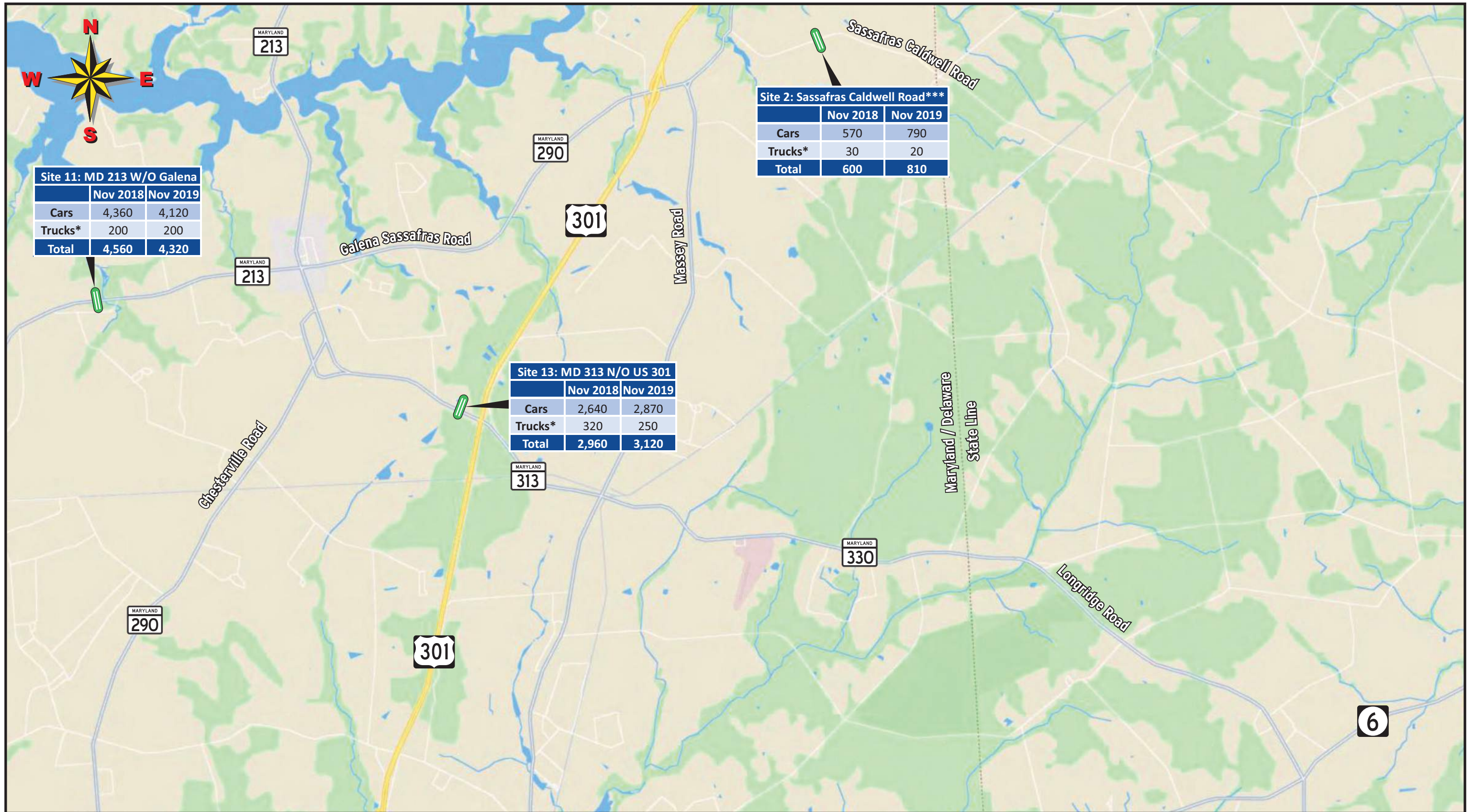
*** Count site may have been impacted by the closure of Edgar Price Road that began on 10/10/2019

**** Volumes were calculated using Wavetronix data. Trucks represent vehicles greater than 25 feet in length.

***** Volumes were calculated using Wavetronix data (ND232) and US 301 Mainline Toll data

Before and After Study Daily Traffic Comparisons

Figure 4



Site 11: MD 213 W/O Galena

	Nov 2018	Nov 2019
Cars	4,360	4,120
Trucks*	200	200
Total	4,560	4,320

Site 2: Sassafras Caldwell Road***

	Nov 2018	Nov 2019
Cars	570	790
Trucks*	30	20
Total	600	810

Site 13: MD 313 N/O US 301

	Nov 2018	Nov 2019
Cars	2,640	2,870
Trucks*	320	250
Total	2,960	3,120

LEGEND

TRAFFIC DATA SOURCE

- Road Tube Counter
- Toll Plaza
- System Loop Detector
- Wavetronix Unit

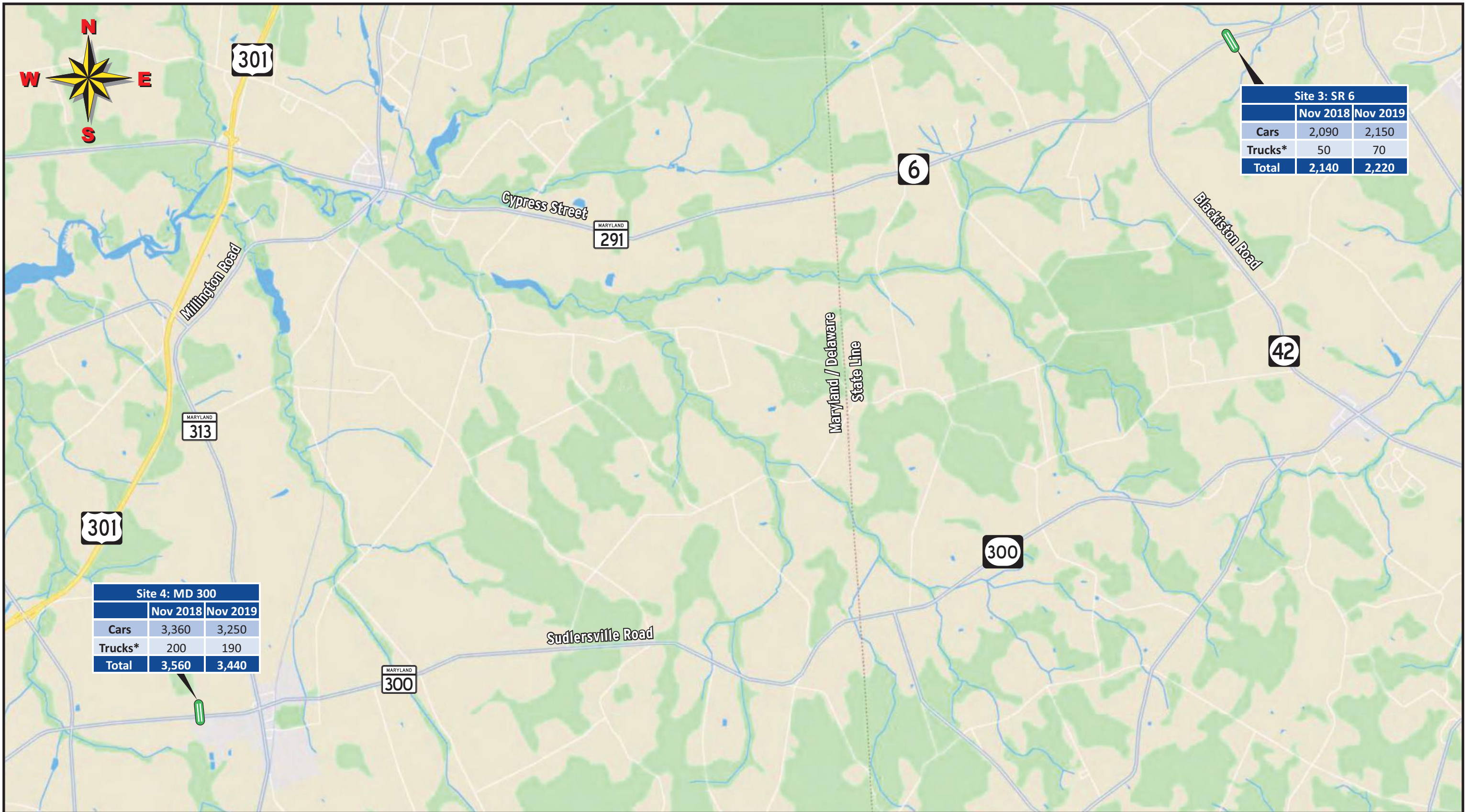
Notes:

- Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019
- * Trucks with 3 or more axles
- *** Count site may have been impacted by the closure of Edgar Price Road that began on 10/10/2019



**Before and After Study
Daily Traffic Comparisons**





Figure 5





Site 3: SR 6		
	Nov 2018	Nov 2019
Cars	2,090	2,150
Trucks*	50	70
Total	2,140	2,220

Site 4: MD 300		
	Nov 2018	Nov 2019
Cars	3,360	3,250
Trucks*	200	190
Total	3,560	3,440

LEGEND
TRAFFIC DATA SOURCE

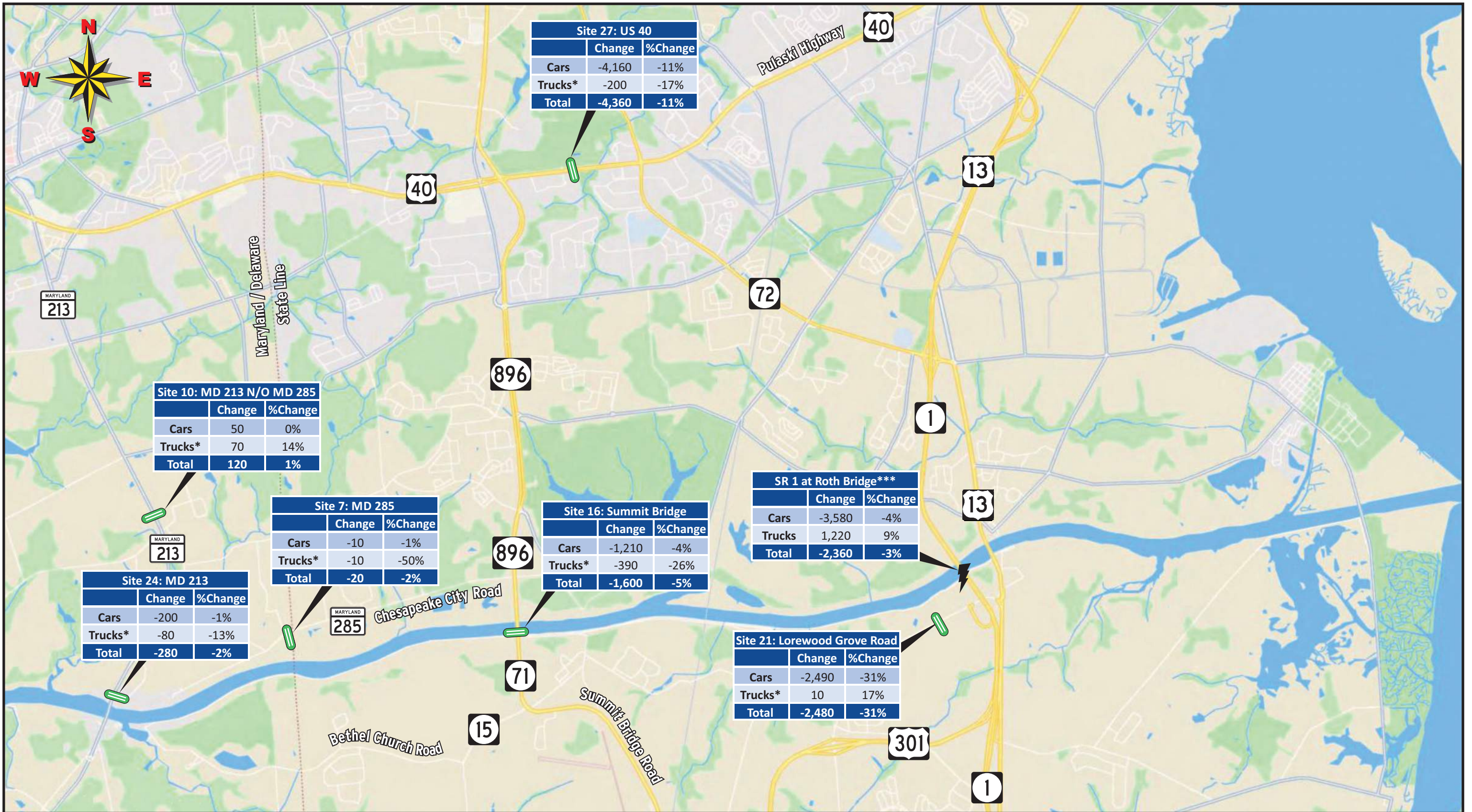
 Road Tube Counter
  Toll Plaza
 System Loop Detector
  Wavetronix Unit

Notes:
 Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019
 * Trucks with 3 or more axles

**Before and After Study
Daily Traffic Comparisons**

Figure 6



Site 27: US 40		
	Change	%Change
Cars	-4,160	-11%
Trucks*	-200	-17%
Total	-4,360	-11%

Site 10: MD 213 N/O MD 285		
	Change	%Change
Cars	50	0%
Trucks*	70	14%
Total	120	1%

Site 7: MD 285		
	Change	%Change
Cars	-10	-1%
Trucks*	-10	-50%
Total	-20	-2%

Site 16: Summit Bridge		
	Change	%Change
Cars	-1,210	-4%
Trucks*	-390	-26%
Total	-1,600	-5%

SR 1 at Roth Bridge***		
	Change	%Change
Cars	-3,580	-4%
Trucks	1,220	9%
Total	-2,360	-3%

Site 24: MD 213		
	Change	%Change
Cars	-200	-1%
Trucks*	-80	-13%
Total	-280	-2%

Site 21: Lorewood Grove Road		
	Change	%Change
Cars	-2,490	-31%
Trucks*	10	17%
Total	-2,480	-31%

LEGEND
TRAFFIC DATA SOURCE

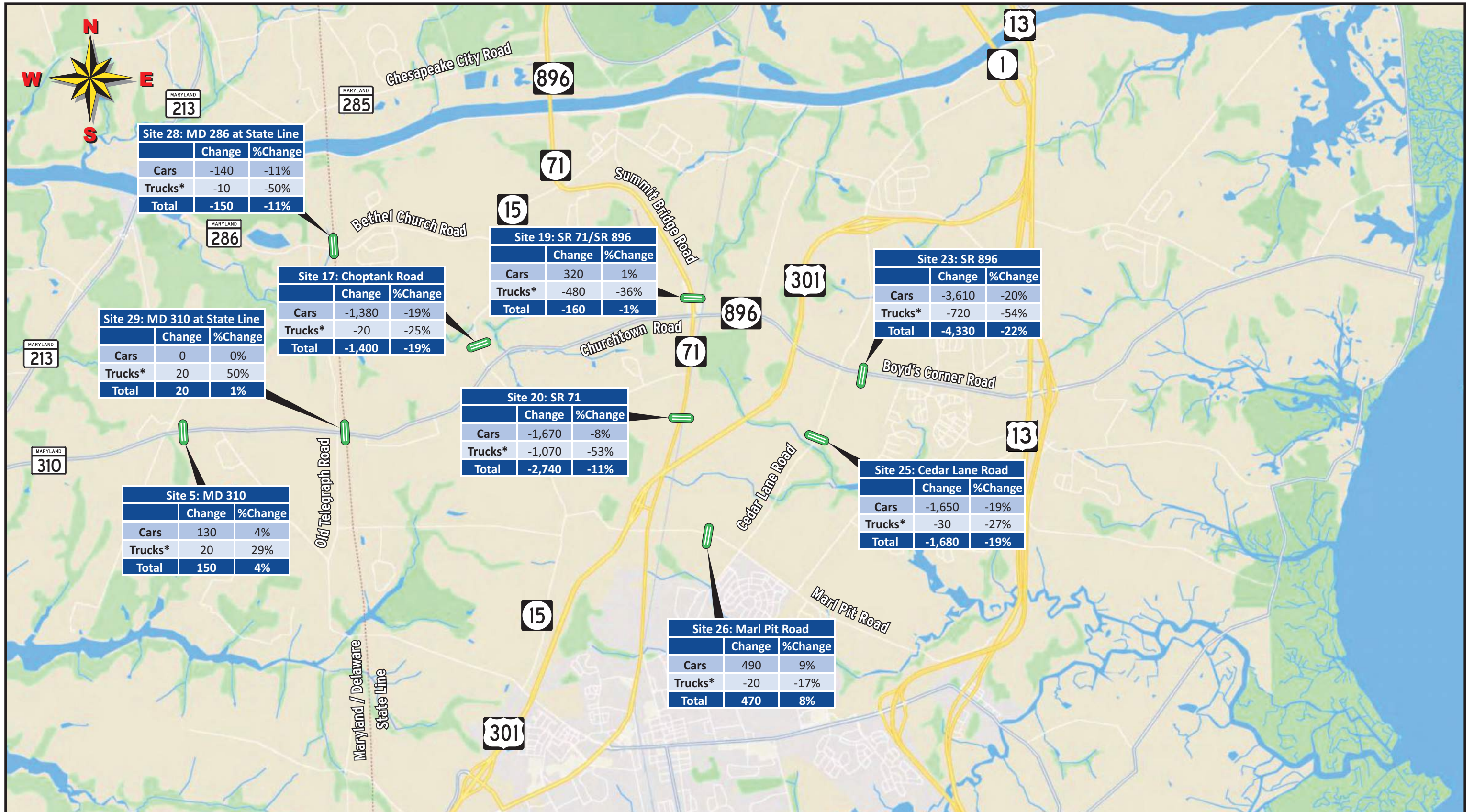
Road Tube Counter
 System Loop Detector
 Wavetronix Unit

Notes:
 Change: Represents a comparison of the November 2019 data (After) and November 2018 data (Before)
 * Trucks with 3 or more axles
 *** The SR 1 volume on the Roth Bridge was calculated using Wavetronix data. Trucks represent vehicles greater than 25 feet in length.



**Before and After Study
 Total Daily
 Traffic Volume Changes**

Figure 7



LEGEND

TRAFFIC DATA SOURCE

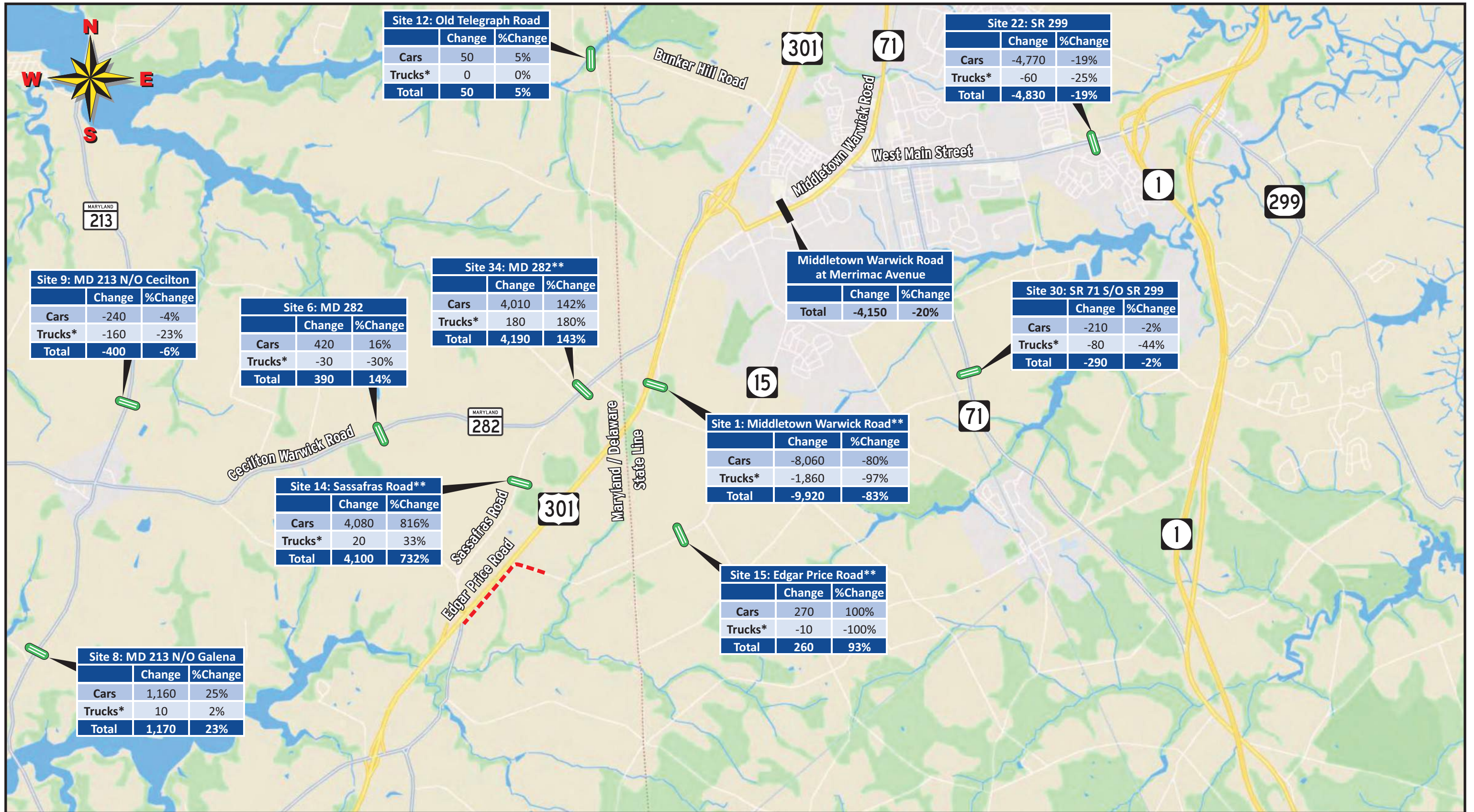
- Road Tube Counter
- System Loop Detector
- Wavetronix Unit

Notes:
 Change: Represents a comparison of the November 2019 data (After) and November 2018 data (Before)
 * Trucks with 3 or more axles

**Before and After Study
 Total Daily
 Traffic Volume Changes**

Delaware Department of Transportation

Figure 8



LEGEND

--- Edgar Price Road Closure

TRAFFIC DATA SOURCE

🟢 Road Tube Counter ⚡ Wavetronix Unit

🟩 System Loop Detector

Notes:

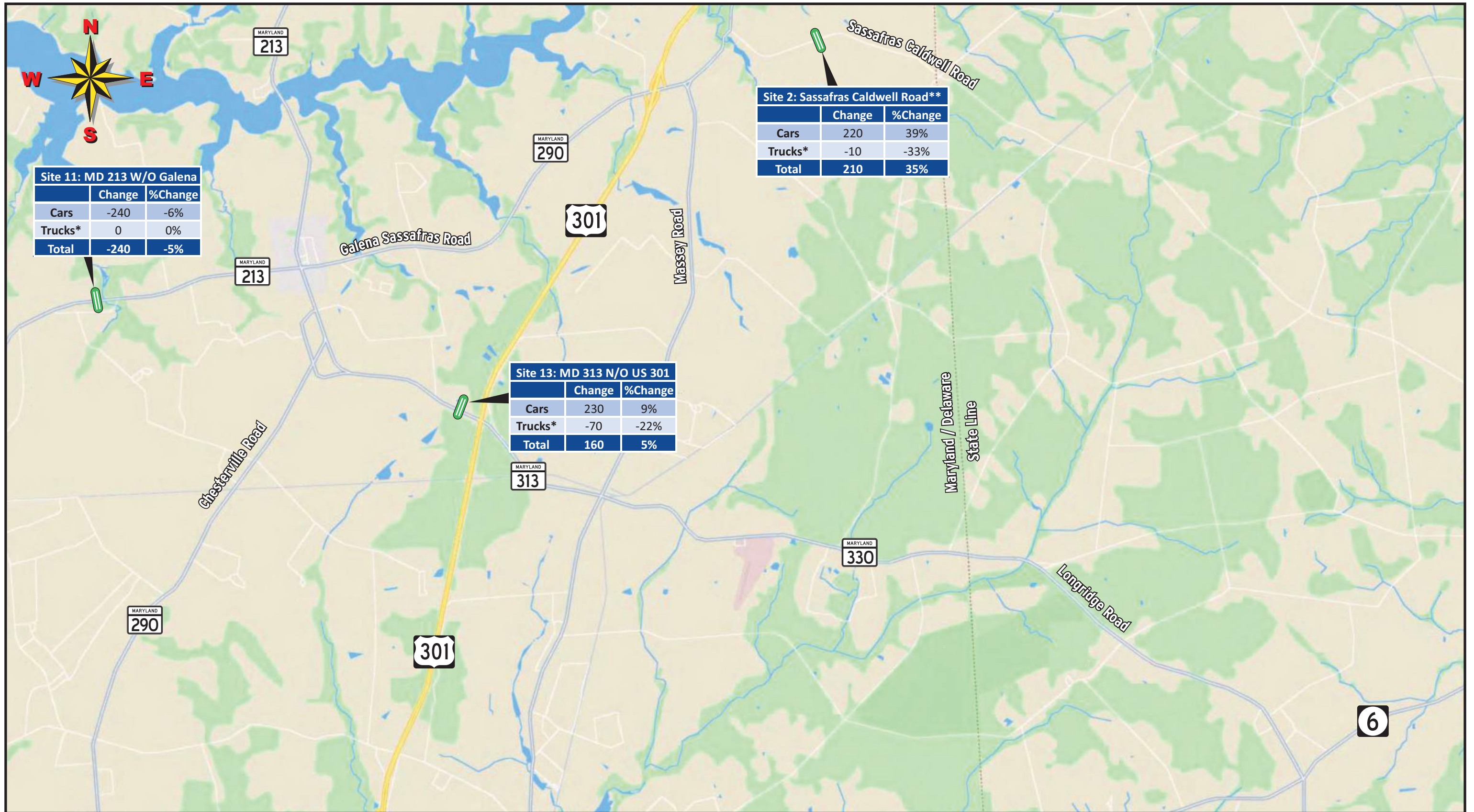
Change: Represents a comparison of the November 2019 data (After) and November 2018 data (Before)

* Trucks with 3 or more axles

** Count site may have been impacted by the closure by Edgar Price Road that began on 10/10/2019

**Before and After Study
Total Daily
Traffic Volume Changes**

Figure 9



Site 11: MD 213 W/O Galena

	Change	%Change
Cars	-240	-6%
Trucks*	0	0%
Total	-240	-5%

Site 2: Sassafras Caldwell Road**

	Change	%Change
Cars	220	39%
Trucks*	-10	-33%
Total	210	35%

Site 13: MD 313 N/O US 301

	Change	%Change
Cars	230	9%
Trucks*	-70	-22%
Total	160	5%

LEGEND

TRAFFIC DATA SOURCE

- Road Tube Counter
- System Loop Detector
- Wavetronix Unit

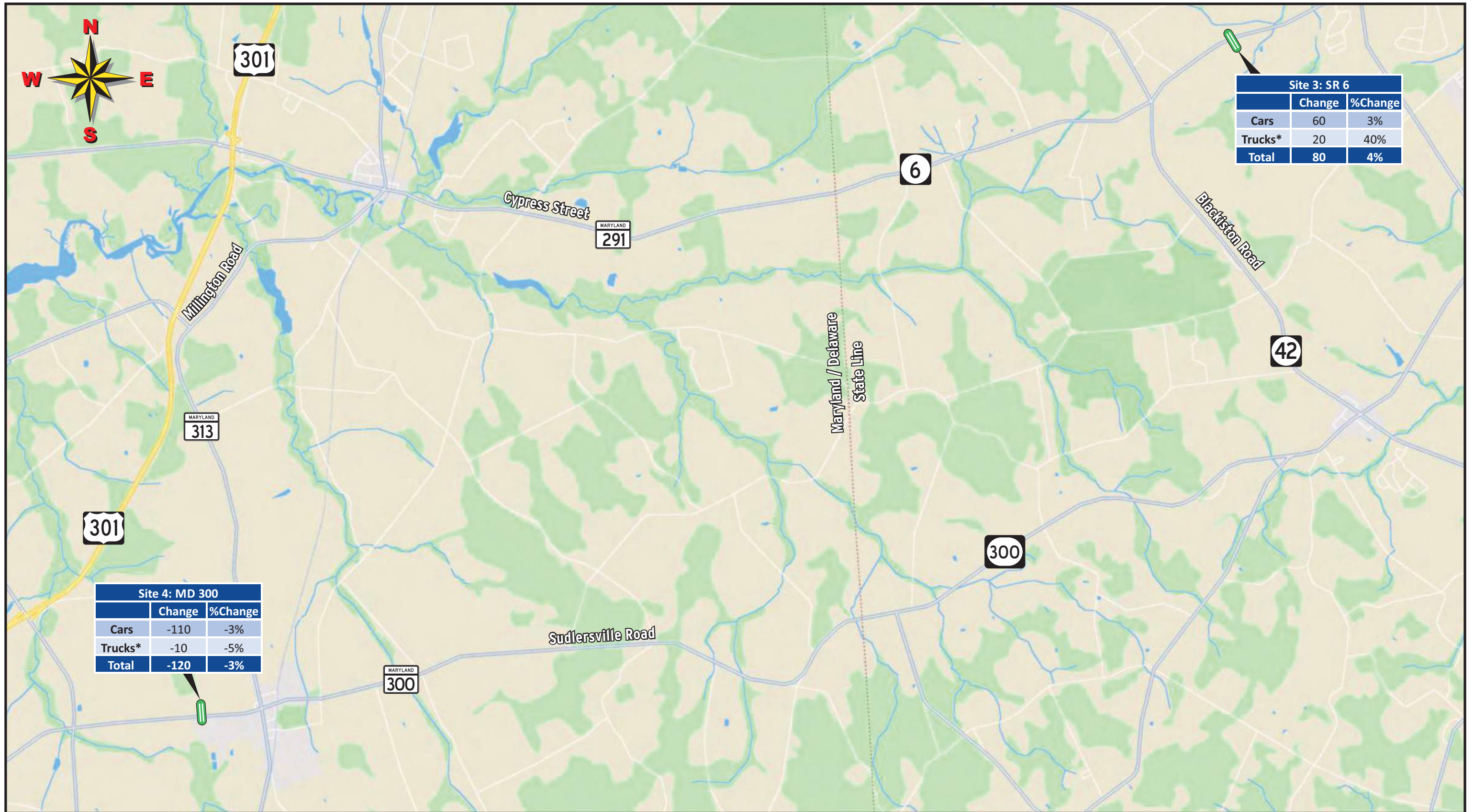
Notes:

- Change: Represents a comparison of the November 2019 data (After) and November 2018 data (Before)
- * Trucks with 3 or more axles
- ** Count site may have been impacted by the closure of Edgar Price Road that began on 10/10/2019



**Before and After Study
Total Daily
Traffic Volume Changes**

Figure 10



Site 3: SR 6		
	Change	%Change
Cars	60	3%
Trucks*	20	40%
Total	80	4%

Site 4: MD 300		
	Change	%Change
Cars	-110	-3%
Trucks*	-10	-5%
Total	-120	-3%

LEGEND

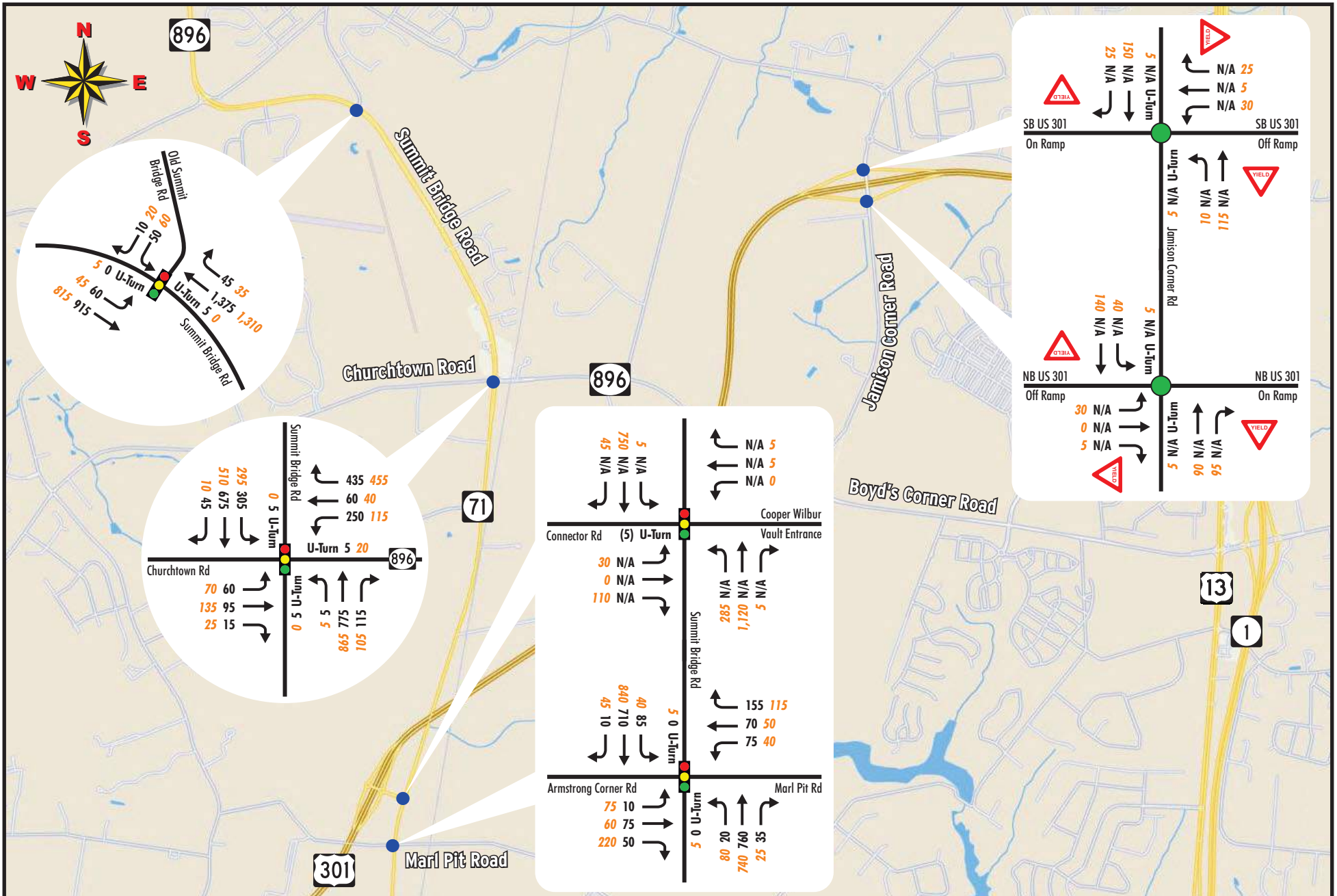
TRAFFIC DATA SOURCE

- Road Tube Counter
- System Loop Detector
- Wavetronix Unit

Notes:
 Change: Represents a comparison of the November 2019 data (After) and November 2018 data (Before)
 * Trucks with 3 or more axles



**Before and After Study
 Total Daily
 Traffic Volume Changes**
 Figure 11

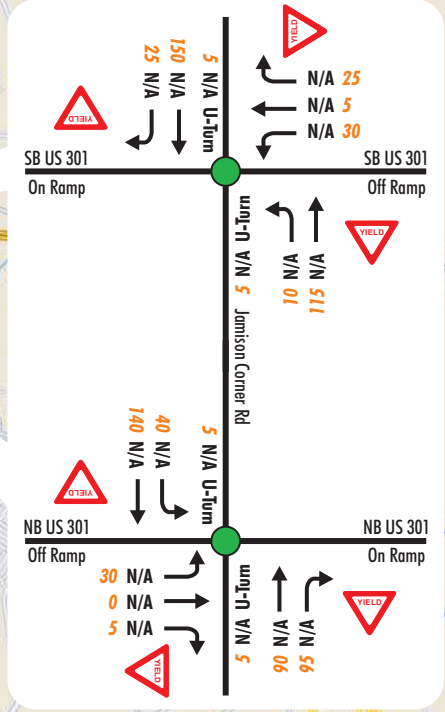
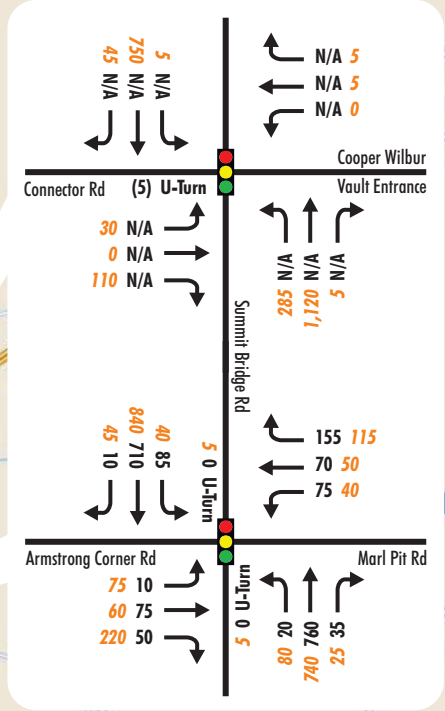
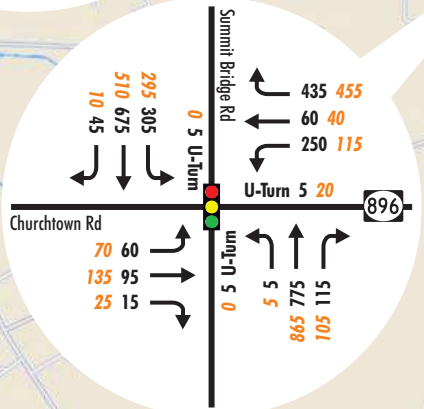
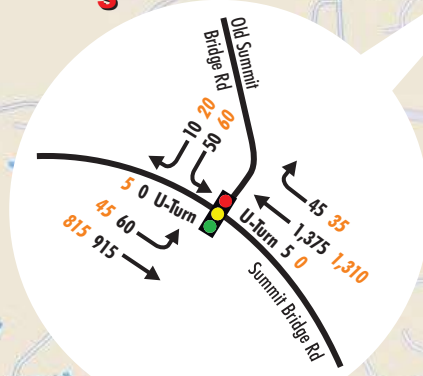


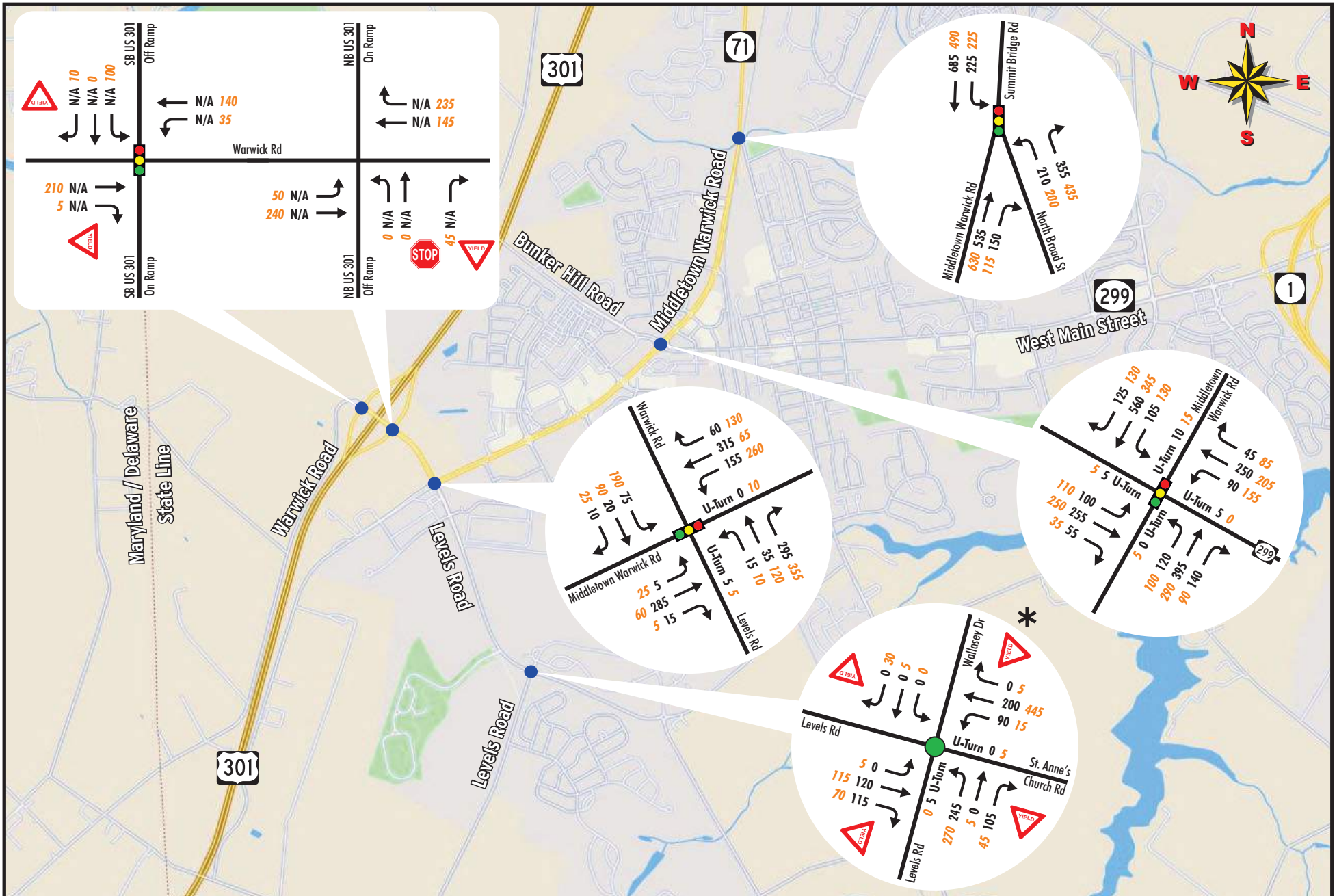
LEGEND

Nov 18 Peak Hourly Volume
 Nov 19 Peak Hourly Volume
 Edgar Price Road Closure

Notes:
 Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019

**Before and After Study
 AM Peak Hour Traffic
 Volume Comparison**
 Figure 12





LEGEND

← Nov 18 Nov 19
Peak Hourly Volume

--- Edgar Price Road Closure

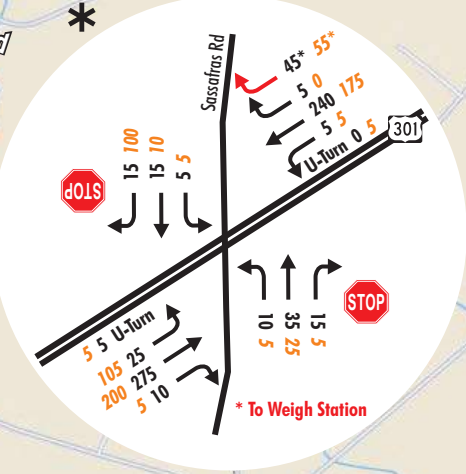
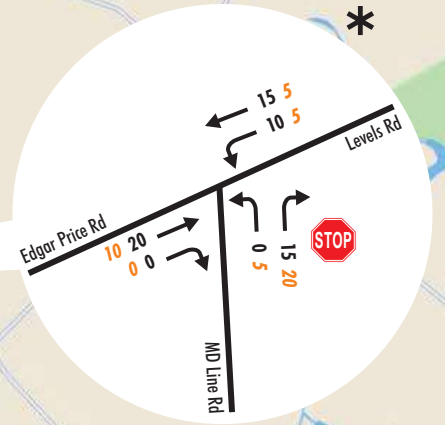
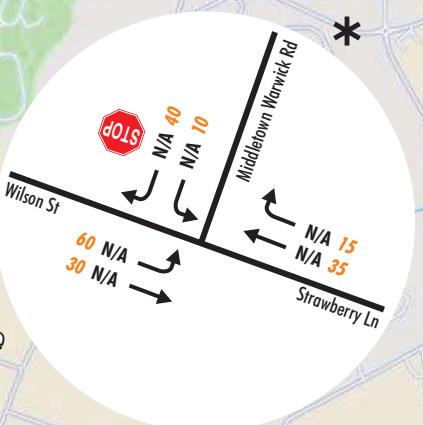
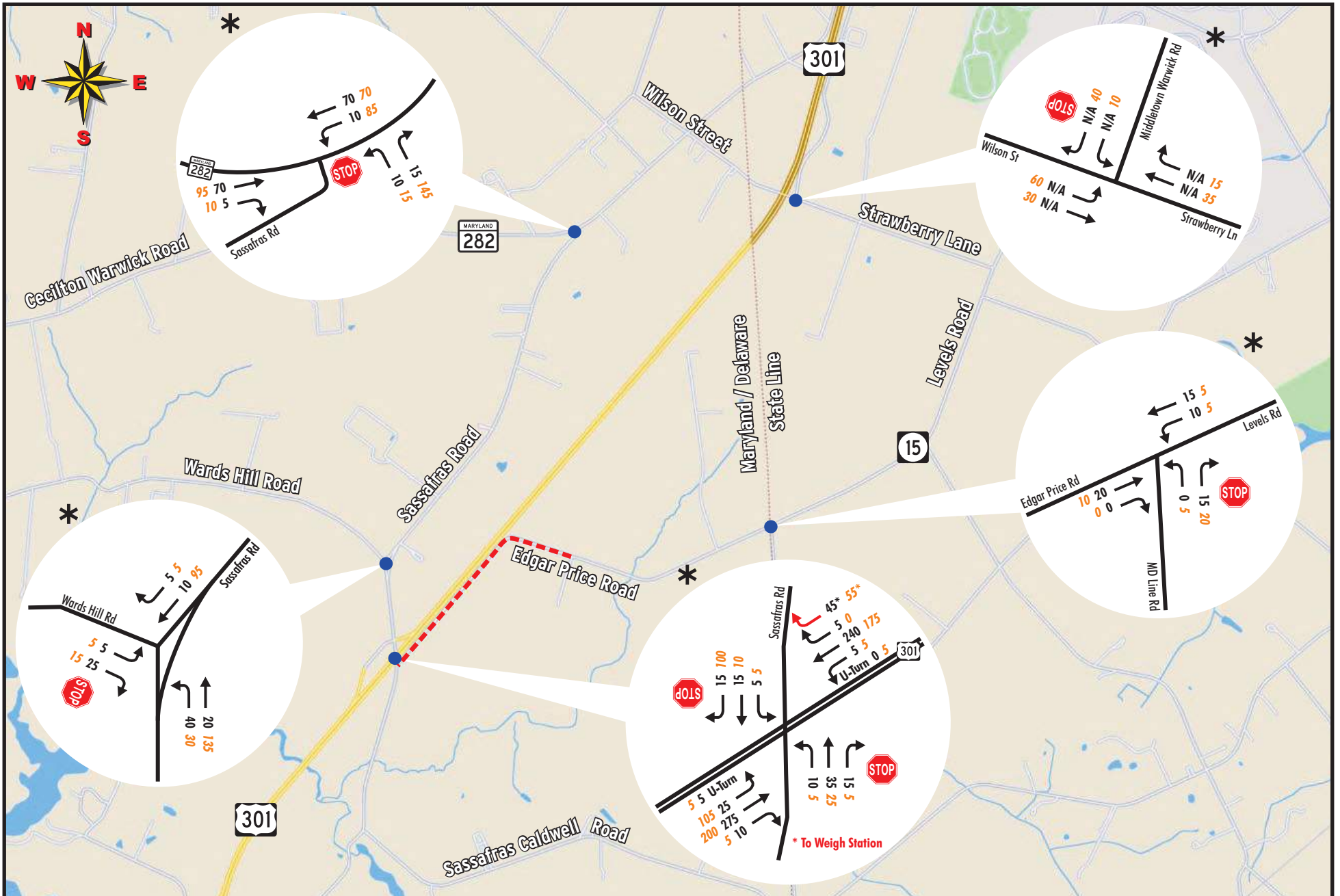
Notes:

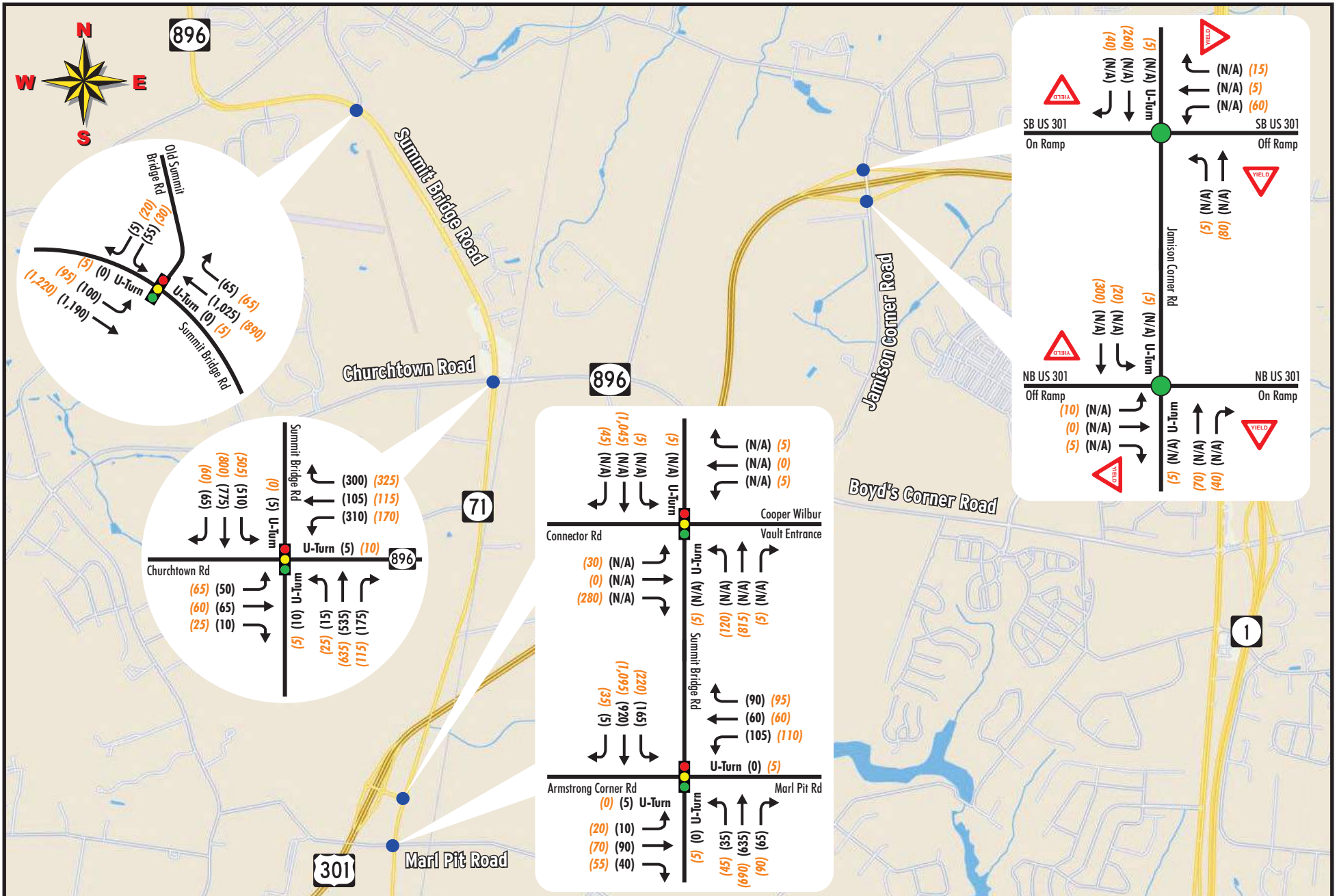
Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019

* Count site may have been impacted by the closure of Edgar Price Road that began on 10/10/2019

Before and After Study AM Peak Hour Traffic Volume Comparison

Figure 13





LEGEND

← (Nov 18) (Nov 19)
Peak Hourly Volume

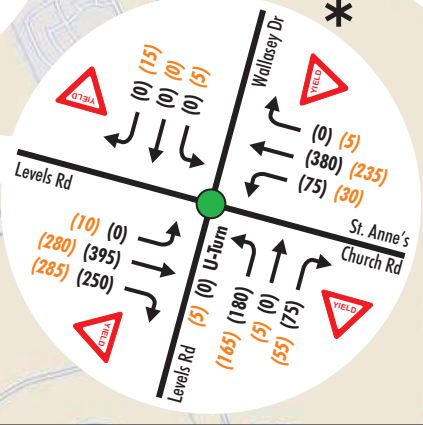
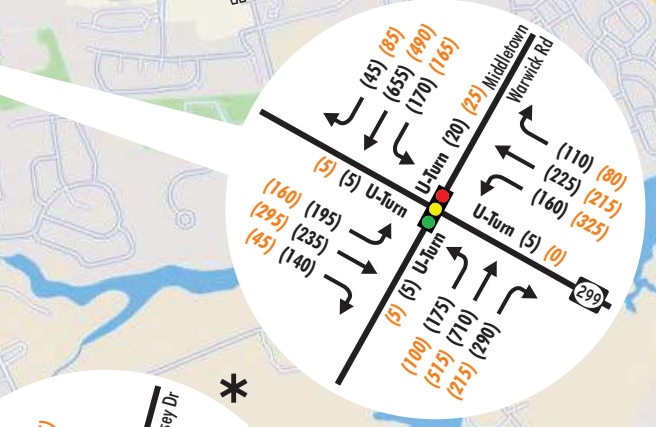
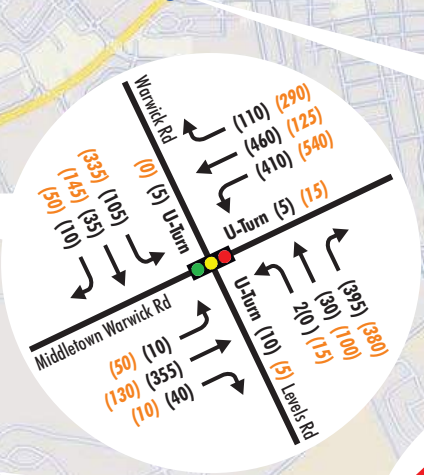
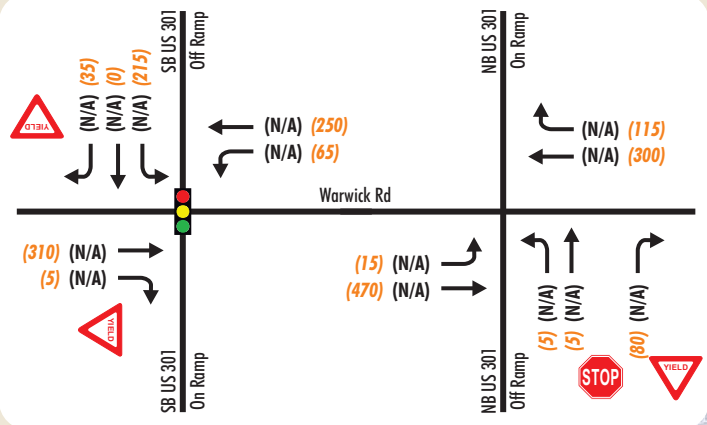
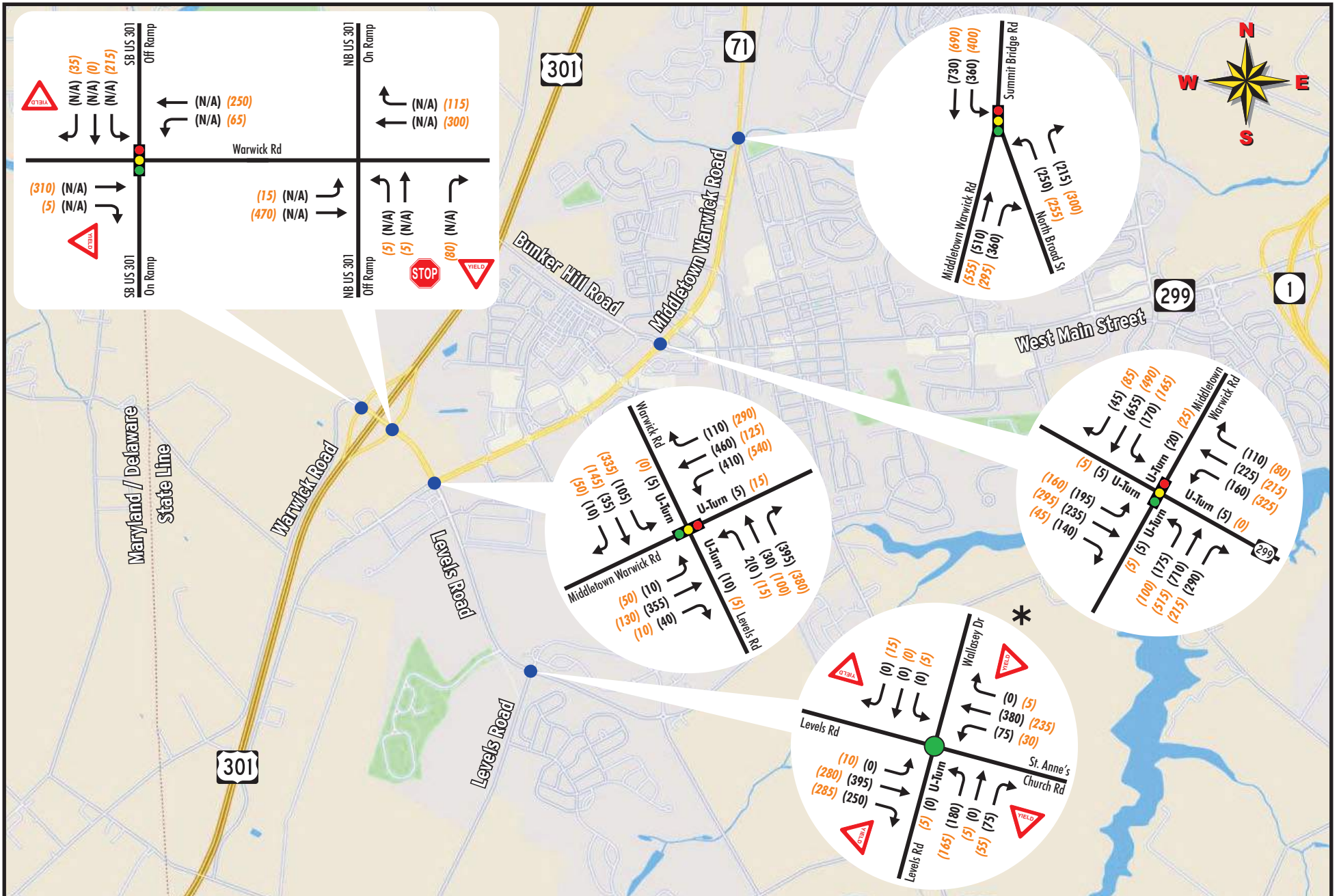
--- Edgar Price Road Closure

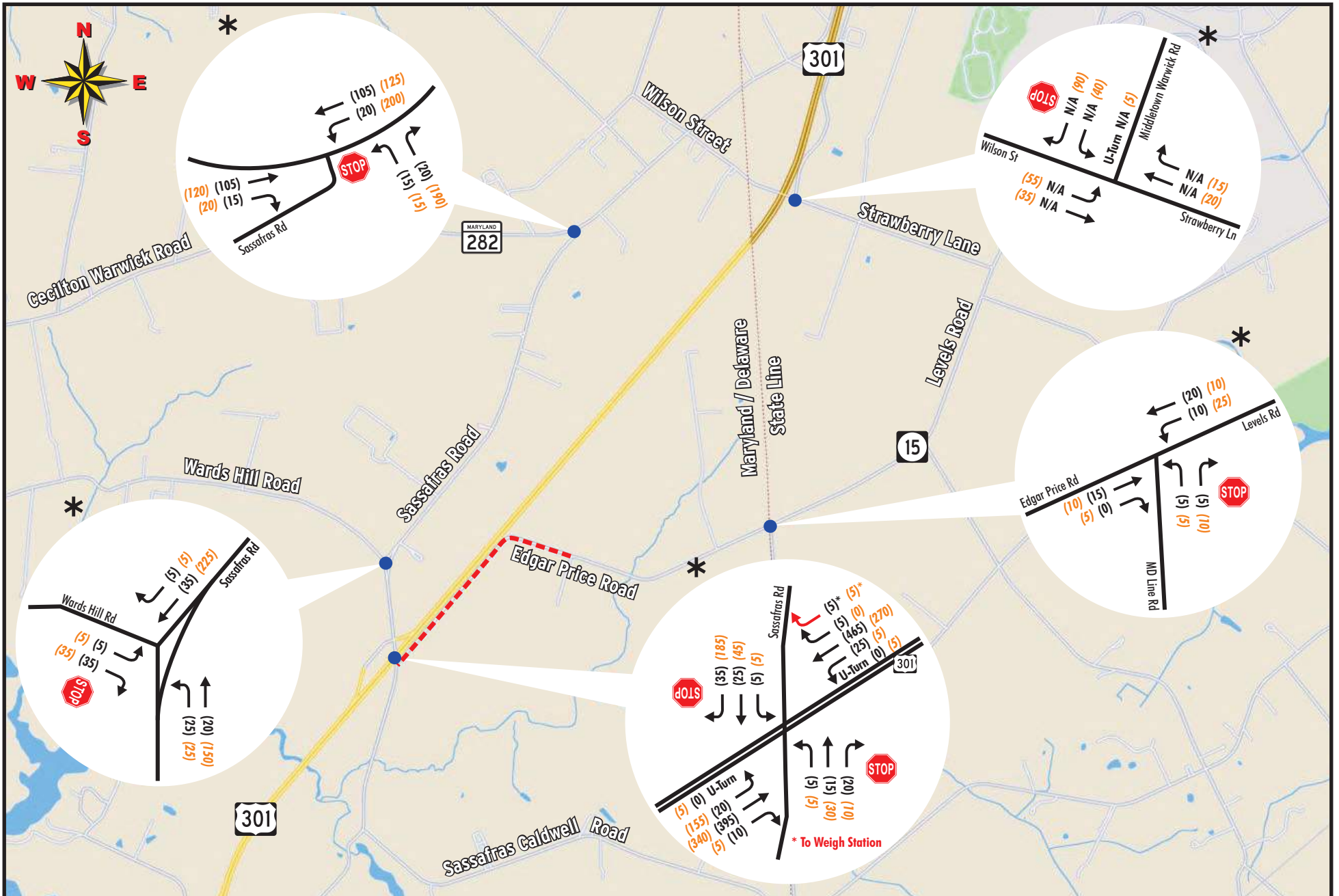
Notes:

Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019





**Before and After Study
PM Peak Hour Traffic
Volume Comparison**
Figure 15





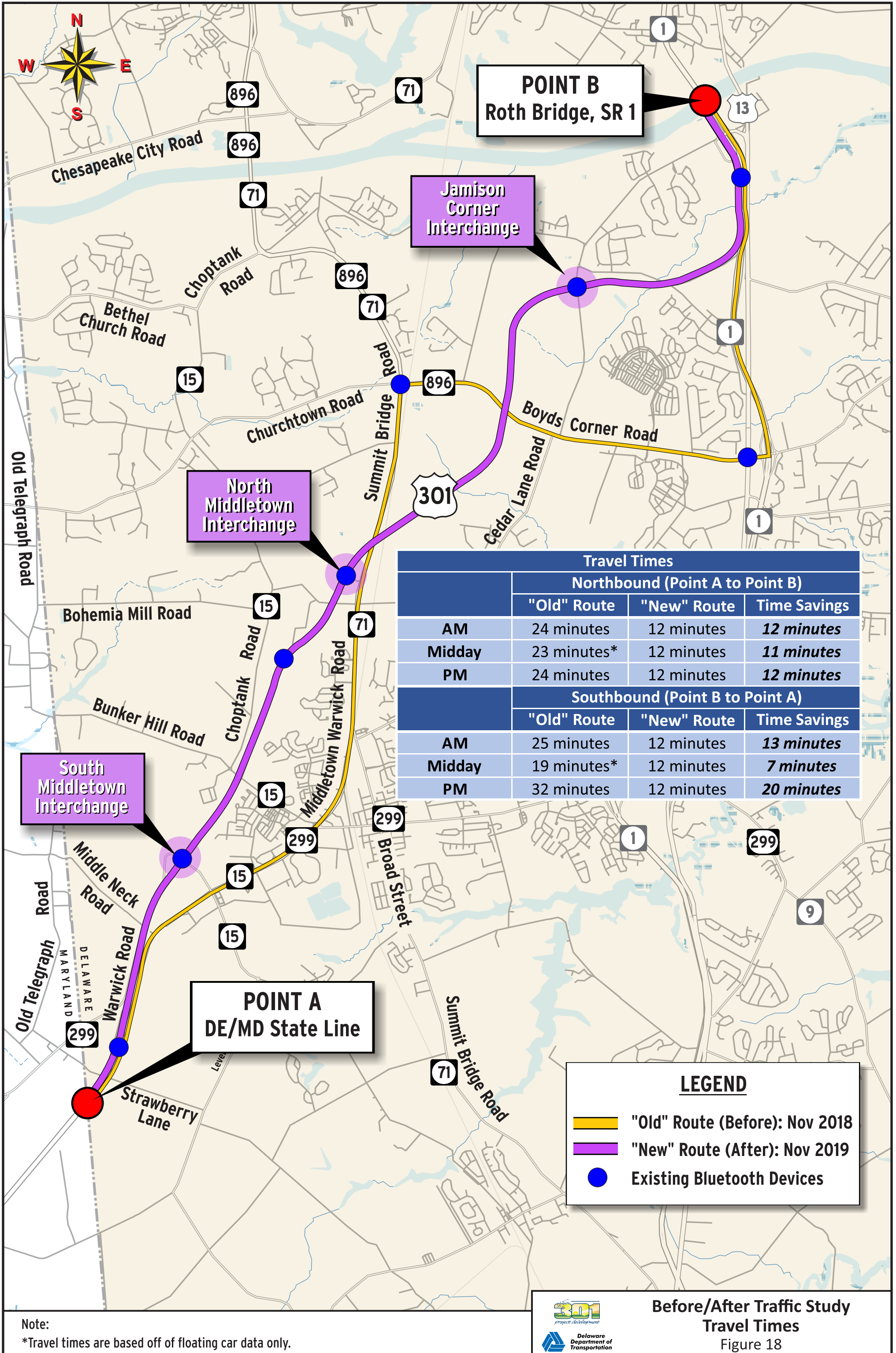
LEGEND	
←	(Nov 18) (Nov 19) Peak Hourly Volume
---	Edgar Price Road Closure

Notes:
 Before traffic volumes were collected in November 2018 and after traffic volumes were collected in November 2019
 * Count site may have been impacted by the closure of Edgar Price Road that began on 10/10/2019

**Before and After Study
PM Peak Hour Traffic
Volume Comparison**

Figure 17



POINT B
Roth Bridge, SR 1

Jamison
Corner
Interchange

North
Middletown
Interchange

South
Middletown
Interchange

POINT A
DE/MD State Line

Travel Times			
Northbound (Point A to Point B)			
	"Old" Route	"New" Route	Time Savings
AM	24 minutes	12 minutes	12 minutes
Midday	23 minutes*	12 minutes	11 minutes
PM	24 minutes	12 minutes	12 minutes
Southbound (Point B to Point A)			
	"Old" Route	"New" Route	Time Savings
AM	25 minutes	12 minutes	13 minutes
Midday	19 minutes*	12 minutes	7 minutes
PM	32 minutes	12 minutes	20 minutes

LEGEND

- "Old" Route (Before): Nov 2018
- "New" Route (After): Nov 2019
- Existing Bluetooth Devices

Note:
*Travel times are based off of floating car data only.