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Watson Tract

Traffic Impact Analysis

December 2020

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Executive Summary

Project Location and Description

A residential development consisting of 97 single-family homes and 32 townhomes is being proposed on the east side of Old Knight Road, between Bryan Chalk Lane and Forestville Road, in Knightdale, NC. Per the site plan, two accesses are proposed along the future Forestville Road Extension – one right-in/right-out (RIRO) and one full. The development is anticipated to be fully constructed by 2022. **Figure ES-1** shows the study area, while the site plan is provided in **Figure ES-2**.

Background Information

A virtual scoping meeting was held between staff from Mott MacDonald, Curry Engineering, NCDOT and the Town of Knightdale on August 28, 2020 to discuss the proposed development. It was agreed that the following existing and future intersections would be included in the study area:

- US 64 Business (Knightdale Boulevard) and N 1st Avenue/Old Knight Road (SR 2049)
- Old Knight Road (SR 2049/SR 2232) and Forestville Road (SR 2049)/Future Forestville Road Extension
- Old Knight Road (SR 2232) and Bryan Chalk Lane
- Future Forestville Road Extension and Access #1 (RIRO)
- Future Forestville Road Extension and Access #2 (FULL)

Traffic analyses were performed for the study area intersections listed above for seven scenarios, as follows:

- **Existing (2020)** – analyzes current conditions (traffic data from turning movement counts, aerial photography, site visit and existing traffic control information). Due to the effects of the Covid-19 pandemic on travel in North Carolina, turning movement counts were not collected. The turning movement counts provided in the recently completed Forestville Village TIA will be used as the Existing (2020) traffic volumes in this TIA.
- **Background (2023)** – estimates future conditions (build year + 1 years) based on an average annual growth rate (AAGR) of 3% and traffic from nearby developments that have not yet been fully constructed.
- **Background (2032)** – estimates future conditions (build year + 10 years) based on an AAGR of 3% and traffic from nearby developments that have not yet been fully constructed.
- **Build (2023)** – combines the anticipated traffic from the proposed development and the Background (2023) volumes
- **Build (2032)** – combines the anticipated traffic from the proposed development and the Background (2032) volumes
- **Improved (2023)** – if necessary, analyzes potential improvements to provide acceptable levels of service
- **Improved (2032)** – if necessary, analyzes potential improvements to provide acceptable levels of service

Background (2023/2032) Analysis

Based on input from the Town of Knightdale, future year traffic estimates were developed by applying an overall annual growth rate (AAGR) of 3% to the 2020 traffic volumes. In addition, site trips from the following developments were included in the Background (2023/2032) scenario analysis:

- Forestville Village TIA
- Haywood Glen
- 7630 Knightdale Boulevard Development

Trip Generation

The development is proposed to consist of 97 single-family homes and 32 townhomes. Based on NCDOT guidance, the development is anticipated to generate 1,212 daily trips, 90 AM peak hour trips (22 entering, 68 exiting) and 120 PM peak hour trips (75 entering, 45 exiting).

Findings

As reported, the proposed development is not anticipated to significantly affect delay at the study area intersections. The following intersection improvements and driveway configurations should be considered.

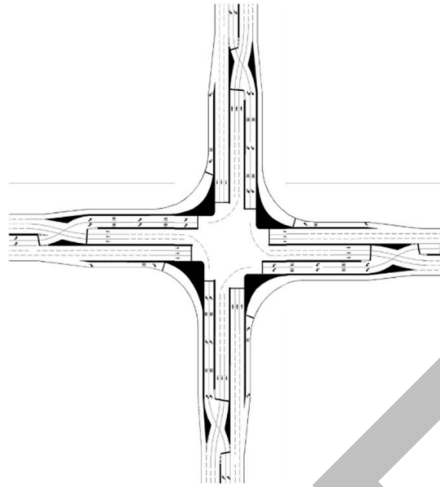
Knightdale Boulevard & Old Knight Road/N 1st Avenue

The analysis indicates that this intersection is projected to operate at LOS F and LOS E in the Build (2023) AM and PM peak hours, respectively. In the Build (2032) scenario, both the AM and PM peak hours are projected to operate as LOS F.

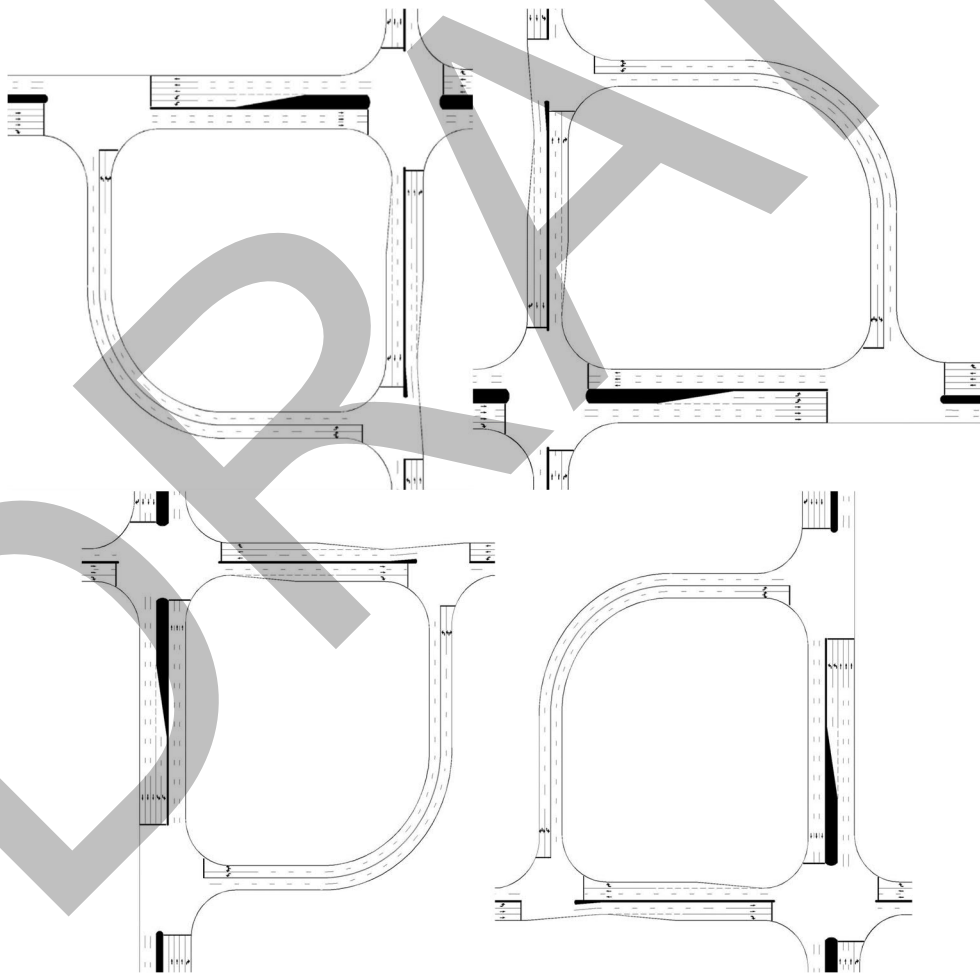
The intersection is currently signalized and has exclusive left and right-turn lanes on each approach. It is part of a closed loop signal system along Knightdale Boulevard; therefore, Existing (2020) splits and cycles were maintained for all scenarios. For the intersection to operate an acceptable level of service and conform to the Town's *Unified Development Ordinance (UDO)*, several geometric improvements would be needed.

In the Build (2023) scenario, these improvements would include dual turn lanes on several approaches. In the Build (2032) scenario, conventional improvements would include dual turn lanes on several approaches and additional lanes along Knightdale Boulevard. As mentioned in the Forestville Village TIA, an alternative intersection design (or interchange) will likely be needed at this intersection in the future. The Federal Highway Administration's (FHWA) *Capacity Analysis for Planning of Junctions (CAP-X)* software indicates that a Displaced Left-Turn (DLT) intersection should be investigated at this intersection if it were to remain an at-grade intersection. Other highly rated options include a Quadrant Roadway and Restricted Crossing U-Turn.

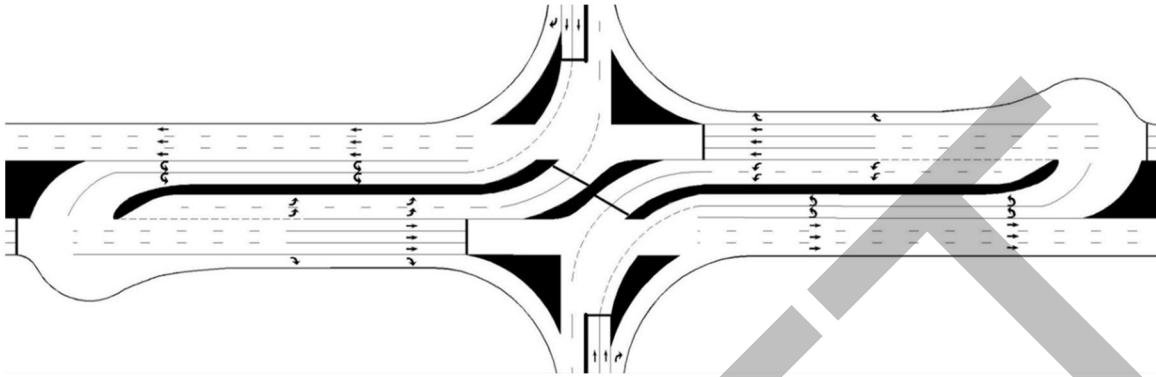
Displaced Left-Turn (Source: CAP-X)



Quadrant Roadway (Source: CAP-X)



Restricted Crossing U-Turn (Source: CAP-X)



The Watson Tract development is anticipated to account for 2.2% of the total traffic at this intersection in 2023 and 1.6% in 2032. Given the development's low impact on the intersection and the intersection already having exclusive turn lanes and being signalized, no improvements are recommended at this location.

Old Knight Road & Forestville Road/Forestville Road Extension

The analysis indicates that the eastbound and westbound approaches are projected to operate at LOS F in both the AM and PM peak hours for the Build (2023) and Build (2032) scenarios.

Per the CAMPO 2045 MTP Project ID A589a, the Forestville Road Extension is proposed to be a 2-lane major thoroughfare that will connect Old Knight Road to Knightdale Boulevard (and eventually Mailman Road). Additionally, the Town's Functional Classification Plan shows the Forestville Road Extension between Old Knight Road and Knightdale Road as a boulevard with a 100-foot right-of-way. That corresponds with the Town's Standard Details for a Boulevard Section (Standard #3.06), which shows a four-lane, median-divided facility.

Based on the volumes analyzed in the Build (2023) and Build (2032) scenarios, a 2-lane cross-section is anticipated to be adequate for the roadway.

As a result, Watson Tract will construct the portion of the Forestville Road Extension along their frontage based on the requirements set forth by the Town of Knightdale or NCDOT.

For the intersection to operate an acceptable level of service and conform to the Town's *Unified Development Ordinance (UDO)*, several geometric improvements would be needed.

In the Build (2023) and Build (2032) scenarios, these improvements would include exclusive turn lanes and signalization. Based on the projected traffic volumes, a signal would likely not be warranted; however, the intersection should be monitored for signalization in the future. It should be noted that the peak hour warrants are anticipated to be met due to the volumes on the eastbound approach. These recommendations are consistent with the findings in the Forestville Village TIA.

The Watson Tract development is not anticipated to account for any of the traffic on the exclusive turn lanes recommended in the Forestville Village TIA. As a result, the following improvements should be considered at this intersection:

- Construct Forestville Road Extension based on the requirements of the Town and of Knightdale and/or NCDOT. A two-lane cross-section is anticipated to be adequate based on the projected traffic volumes.
- Construct the westbound approach at Old Knight Road to consist of a shared thru/right-turn lane and an exclusive left-turn lane that provides at least 125 feet of full storage and an appropriate taper.

Old Knight Road & Bryan Chalk Lane

The analysis indicates that the eastbound approach is projected to operate at LOS F in the AM peak hour. The proposed development is only anticipated to add through trips along Old Knight Road at this intersection and is anticipated to account for less than 1% of the traffic in both the Build (2023) and Build (2032) scenarios. Therefore, no improvements are recommended at this intersection.

Forestville Road Extension & Access #1

The analysis indicates that the southbound approach is projected to operate at LOS A during the AM and PM peak hours. The following driveway configuration should be considered:

- Construct the southbound Access #1 approach to provide one right-in only ingress lane and one right-out only egress lane.

Forestville Road Extension & Access #2

The analysis indicates that the southbound approach is projected to operate at LOS A during the AM and PM peak hours. The following driveway configuration should be considered:

- Construct the southbound Access #2 approach to provide one ingress lane and one egress lane.

When the Forestville Road Extension is eventually extended to Knightdale Boulevard, an exclusive left-turn lane into the site may be needed; however, at the time the development is constructed, it will not be needed.

Table ES-1 provides a summary of the intersection levels of service across all scenarios and the proposed laneage is shown in **Figure ES-3**.

Other Considerations

During the scoping meeting, the Town expressed a desire for the Old Knight Road and Forestville Road intersection to be a roundabout in the future. Additionally, there was discussion regarding the Forestville Road Extension and how that may affect travel patterns in the future. A high-level analysis of each of these issues is provided below.

Old Knight Road and Forestville Road Roundabout

Based on the volumes developed for the Build (2023) and Build (2032) scenarios, a single-lane roundabout would be sufficient to accommodate the projected future volumes. Old Knight Road and Forestville Road are both NCDOT-maintained roads; therefore, constructing a roundabout at this location would require input and approval from NCDOT. Constructing a roundabout at this location is not recommended as part of this developer's responsibility given the development's size, minimal effect on operations at the intersection, and cost of constructing a roundabout.

Forestville Road Extension

There are plans to extend Forestville Road from its current terminus at Old Knight Road to Knightdale Boulevard. This development will extend Forestville Road along the extents of its frontage leaving a small gap between that point and Knightdale Road. As previously mentioned, there is a discrepancy between the Town's plans for the Forestville Road Extension and CAMPO's plans. Based on the volume projections from the TIA, it is likely that a two-lane cross-section would be adequate. A high-level model was developed in TransModeler to determine how travel patterns may be affected in the future if the full extension were constructed between Old Knight Road and Knightdale Boulevard. Based on that preliminary analysis, travel pattern diversions along Old Knight Road and Forestville Road may be in the 30% - 40% range. Further analysis should be undertaken using the Triangle Regional Model.

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Table ES-1: Overall LOS Results

Intersection	Approach	Existing (2020)		Background (2023)		Background (2032)		Build (2023)		Build (2032)		Improved (2023)		Improved (2032)	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Knightdale Boulevard & Old Knight Road/N 1 st Avenue [1]	Overall	E - 60.9	D - 44.2	F - 84.2	E - 60.6	F - 240.4	F - 160.8	F - 92.7	E - 69.9	F - 256.1	F - 173.3				
	Eastbound	D - 54.7	D - 38.7	E - 79.5	E - 77.6	F - 166.3	F - 251.5	F - 90.5	F - 98.0	F - 179.8	F - 277.7				
	Westbound	E - 64.5	D - 44.8	F - 89.7	D - 44.9	F - 201.8	E - 67.4	F - 89.6	D - 44.8	F - 201.6	E - 67.3				
	Northbound	D - 54.2	E - 60.2	E - 70.1	E - 55.3	F - 252.7	F - 182.0	E - 72.4	E - 55.6	F - 262.4	F - 184.9				
	Southbound	E - 65.4	D - 47.2	F - 88.5	D - 44.4	F - 372.3	E - 62.5	F - 112.8	D - 45.9	F - 412.6	E - 68.0				
Old Knight Road & Forestville Road/Forestville Road Extension [2]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	F - 416.4	E - 40.7	F - 893.7	F - 121.7	F - 29179.2	F - 2079.3	F - 1884.3	F - 315.7	*	F - 5527.6				
	Westbound	-	-	-	-	-	-	F - 1547.9	F - 194.3	*	F - 28862.0	F - 1037.8	F - 150.7	*	F - 15906.6
	Northbound	A - 2.4	A - 3.0	A - 2.5	A - 2.9	A - 4.6	A - 3.9	A - 2.4	A - 2.6	A - 4.5	A - 3.6				
	Southbound	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.1	A - 0.0	A - 0.1				
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	E - 41.5	B - 12.0	F - 98.3	B - 13.5	F - 1859.2	C - 21.4	F - 98.8	B - 13.6	F - 1860.8	C - 21.7				
	Northbound	A - 9.7	A - 3.2	B - 11.1	A - 2.9	D - 32.5	A - 2.9	B - 11.0	A - 2.9	D - 32.5	A - 2.9				
	Southbound	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
Forestville Road Extension & Access #1 [4]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	-	-	-	-	-	-	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
	Westbound	-	-	-	-	-	-	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
	Southbound	-	-	-	-	-	-	A - 8.6	A - 8.5	A - 8.6	A - 8.5				
Forestville Road Extension & Access #2 [5]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	-	-	-	-	-	-	A - 7.3	A - 7.3	A - 7.3	A - 7.3				
	Westbound	-	-	-	-	-	-	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
	Southbound	-	-	-	-	-	-	A - 8.4	A - 8.4	A - 8.4	A - 8.4				

LEGEND: LOS - Delay (seconds/vehicle); * - Calculation Error

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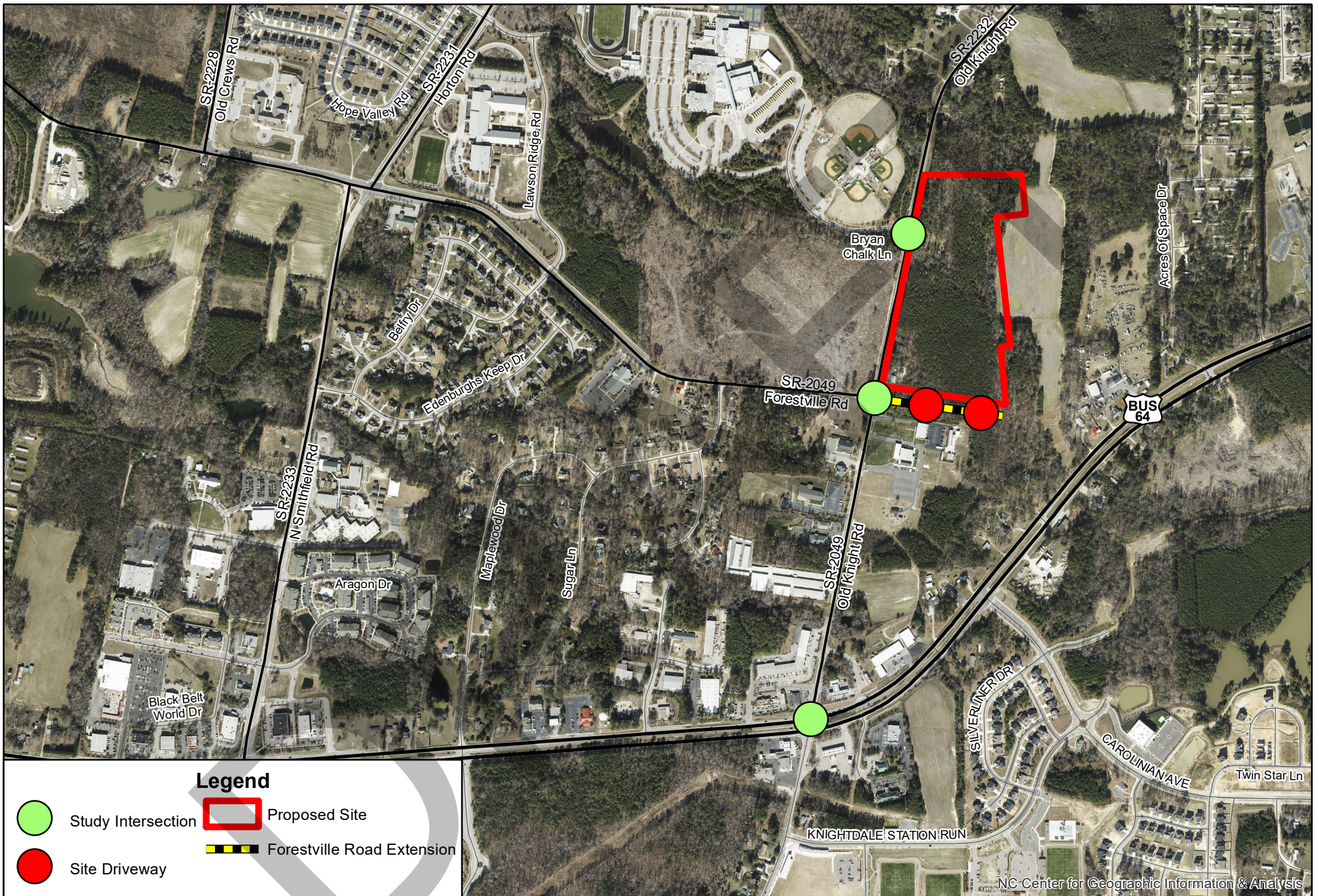


Figure ES-1: Vicinity Map

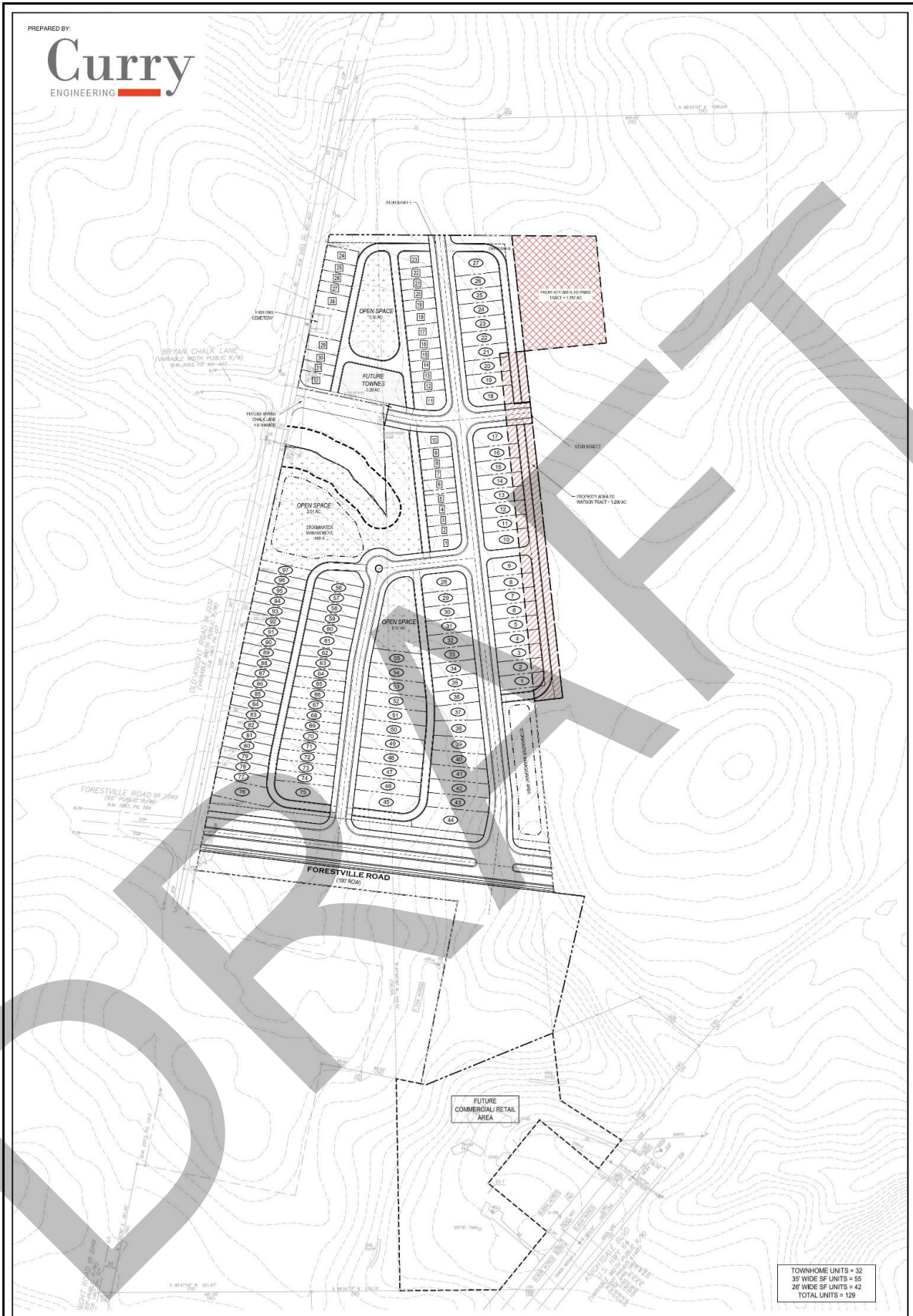
Watson Tract



0 0.15 0.3 Miles

PREPARED BY:

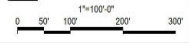
Curry
ENGINEERING



TOWNHOME UNITS = 32
36' WIDE SF UNITS = 55
28' WIDE SF UNITS = 42
TOTAL UNITS = 129

WATSON TRACT ASSEMBLAGE

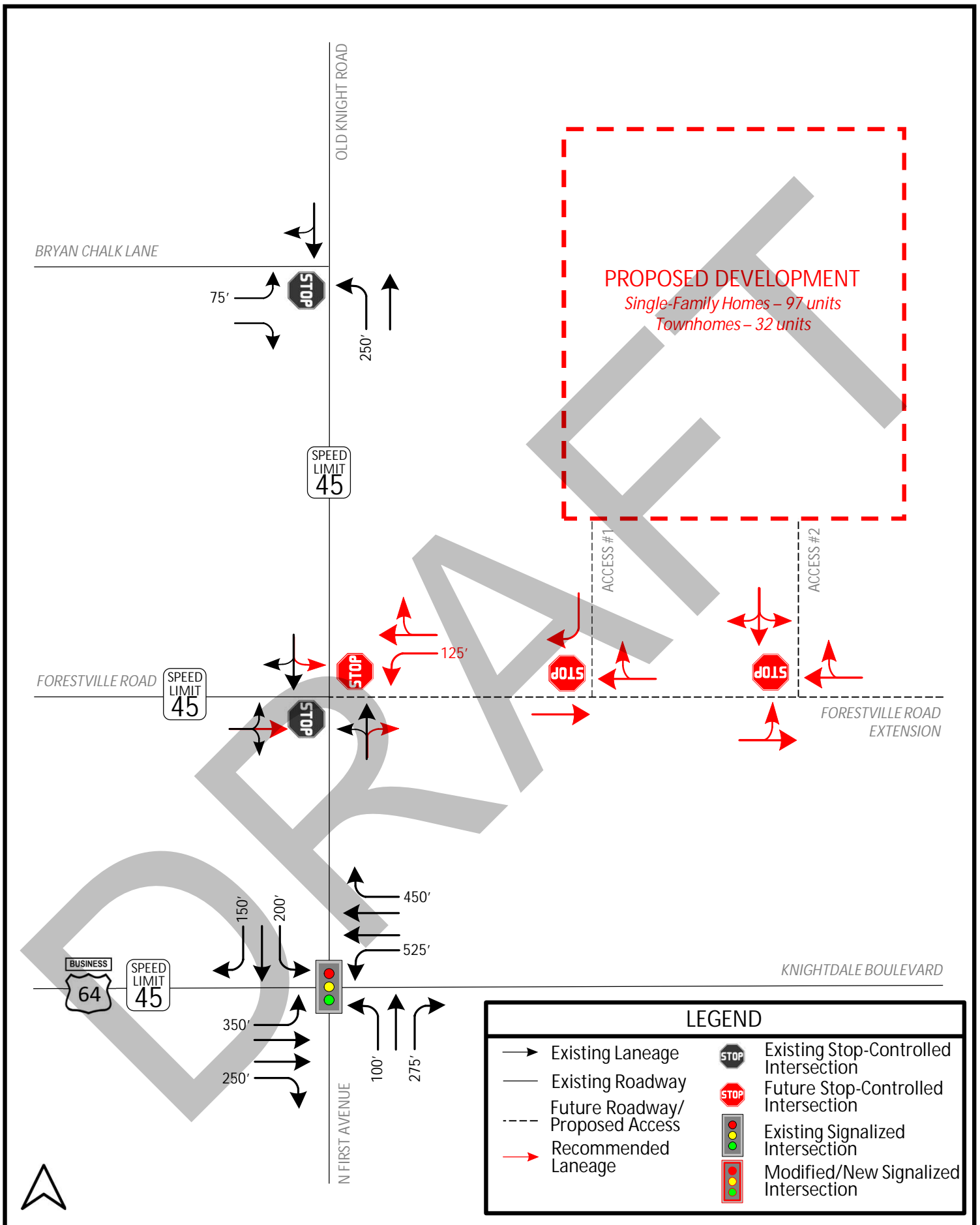
KNIGHTDALE, NORTH CAROLINA



Watson Tract
Knightdale, NC

Figure ES-2
Site Plan





1 Introduction

A residential development consisting of 97 single-family homes and 32 townhomes is being proposed on the east side of Old Knight Road, between Bryan Chalk Lane and Forestville Road, in Knightdale, NC. Per the site plan, two accesses are proposed along the future Forestville Road Extension – right-in/right-out (RIRO) and one full. The development is anticipated to be fully constructed by 2022. **Figure 1** shows the study area, while the site plan is provided in **Figure 2**. All figures are located in **Appendix A**.

A virtual scoping meeting was held between staff from Mott MacDonald, Curry Engineering, NCDOT and the Town of Knightdale on August 28, 2020 to discuss the proposed development. It was agreed that the following existing and future intersections would be included in the study area:

- US 64 Business (Knightdale Boulevard) and N 1st Avenue/Old Knight Road (SR 2049)
- Old Knight Road (SR 2049/SR 2232) and Forestville Road (SR 2049)/Future Forestville Road Extension
- Old Knight Road (SR 2232) and Bryan Chalk Lane
- Future Forestville Road Extension and Access #1 (RIRO)
- Future Forestville Road Extension and Access #2 (FULL)

2 Existing (2020) Conditions

2.1 Existing Roadways

This section describes the existing roadways within the study area.

2.1.1 US 64 Business (Knightdale Boulevard)

Knightdale Boulevard is a four-lane, median-divided arterial with a posted speed limit of 45 miles per hour (mph). that extends from I-440 in Raleigh to NC 96 in Zebulon. Within the study area, the land uses along Knightdale Boulevard are primarily commercial and open space. Per the NCDOT, the Average Annual Daily Traffic (AADT) along Knightdale Boulevard in 2019 was 24,000 vehicles per day (vpd) west of the study area and 19,500 east of it.

2.1.2 Old Knight Road (SR 2049/SR 2232)

Old Knight Road is a local, two-lane roadway with a posted speed limit of 45 mph that extends from Knightdale Boulevard to Horton Road. The land uses along Old Knight Road are a mix of commercial, residential, institutional, recreational and open space. Per the NCDOT, the AADT along Old Knight Road in 2015 was 6,800 vpd between Knightdale Boulevard and Forestville Road.

There are plans to widen Old Knight Road to four lanes between Knightdale Boulevard and Horton Road as part of Capital Area Metropolitan Planning Organization (CAMPO) 2045 Metropolitan Transportation Plan (MTP) Project ID A592, which has a horizon year of 2045. Given the horizon year, this project was not included in the Background (2023/2032) analysis.

2.1.3 Forestville Road (SR 2049)

Forestville Road is a local, two-lane roadway with a posted speed limit of 45 mph that extends from Old Knight Road to Rogers Road. Within the study area, the land uses along Forestville Road are primarily a mix of residential, institutional and open space. Per the NCDOT, the AADT along Forestville Road in 2015 was 2,500 vpd west of Old Knight Road.

There are plans to extend Forestville Road as a two-lane roadway between Old Knight Road and Knightdale Boulevard as part of the CAMPO 2045 MTP Project ID A589a, which has a horizon year of 2035. Given the horizon year, this project was not included in the Background (2023/2032) analysis.

2.1.4 Bryan Chalk Lane

Bryan Chalk Lane is a local, two-lane roadway with no posted speed limit. It provides access to the Knightdale Community Park and Knightdale High School. The NCDOT does not provide AADT information along Bryan Chalk Lane.

2.2 Existing Intersections

The following existing intersections were analyzed as part of this study:

- US 64 Business (Knightdale Boulevard) and N 1st Avenue/Old Knight Road (SR 2049)

- Old Knight Road (SR 2049/SR 2232) and Forestville Road (SR 2049)
- Old Knight Road (SR 2232) and Bryan Chalk Lane

Intersection geometrics along with intersection operation controls are provided in **Figure 3**.

2.3 Turning Movement Counts

Due to the effects of the Covid-19 pandemic on travel in North Carolina, turning movement counts were not collected. The turning movement counts provided in the recently completed Forestville Village TIA will be used as the Existing (2020) traffic volumes in this TIA.

The turning movement counts from the Forestville Village TIA were collected for the AM (7:00 AM – 9:00 AM), School PM (2:00 PM – 4:00 PM) and PM (4:00 PM – 6:00 PM) peak periods in September 2019 while local schools were in session. The count data is located in **Appendix B**. The volumes used in the Existing (2020) analyses are shown in **Figure 4**. **Table 1** shows the schedule for the turning movement data collection.

Table 1: Turning Movement Data Collection Schedule

Intersection	Time Period	Date
Knightdale Boulevard and Old Knight Road	7:00 AM – 9:00 AM	Tuesday September 10, 2019
	2:00 PM – 4:00 PM	
	4:00 PM – 6:00 PM	
Old Knight Road and Forestville Road	7:00 AM – 9:00 AM	Tuesday September 10, 2019
	2:00 PM – 4:00 PM	
	4:00 PM – 6:00 PM	
Old Knight Road and Bryan Chalk Lane	7:00 AM – 9:00 AM	Tuesday September 10, 2019
	2:00 PM – 4:00 PM	
	4:00 PM – 6:00 PM	

2.4 Level of Service Criteria

Exhibit 19-8 in the Highway Capacity Manual 6th Edition provides the level of service (LOS) criteria for signalized intersections, while Exhibit 20-2 provides the level of service criteria for unsignalized intersections, as summarized in **Table 2**.

Table 2: Intersection Level of Service Criteria

Level of Service	Signalized Intersection	Unsignalized Intersection
A	0-10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Average Control Delay – seconds/vehicle

2.5 Existing (2020) Level of Service Analysis

The existing roadway network features and turning movement data were coded into *Synchro 10* and analyzed for the AM and PM peak hour conditions.

Signal plans for the Knightdale Boulevard and Old Knight Road intersection were obtained from NCDOT. These plans do not show the correct laneage configuration the north leg’s southbound

approach; however, the phasing is consistent with the phasing observed during the field visit. Signal timings were also requested from NCDOT; however, they were not provided. The Forestville Village TIA included signal timings information and other parameters that are not typically included in the analysis, primarily detector and loop information as well as the actual peak hour factors from the turning movement counts. To be consistent, the analysis in this TIA will generally match the assumptions and parameters used in the Forestville Village TIA. The signal plans and timings are included in **Appendix B**.

As shown in **Table 3** below, the signalized Knightdale Boulevard and Old Knight Road/N 1st Avenue intersection is currently operating at LOS E in the AM And LOS D in the PM peak hour. The stop-controlled intersections each have movements that are operating at LOS E and LOS F.

The Existing (2020) analysis results are located in **Appendix C**.

Table 3: Existing (2020) LOS Results

Intersection	Approach	Existing (2020)	
		AM	PM
Knightdale Boulevard & Old Knight Road/N 1 st Avenue [1]	Overall	E – 60.9	D – 44.2
	Eastbound	D – 54.7	D – 38.7
	Westbound	E – 64.5	D – 44.8
	Northbound	D – 54.2	E – 60.2
	Southbound	E – 65.4	D – 47.2
Old Knight Road & Forestville Road [2]	Overall	-	-
	Eastbound	F – 416.4	E – 40.7
	Westbound	-	-
	Northbound	A – 2.4	A – 3.0
	Southbound	A – 0.0	A – 0.0
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-
	Eastbound	E – 41.5	B – 12.0
	Westbound	-	-
	Northbound	A – 9.7	A – 3.2
	Southbound	A – 0.0	A – 0.0

LEGEND: LOS – Delay (seconds/vehicle)

3 Background (2023/2032) Conditions

3.1 Background Growth and Development

Based on input from the Town of Knightdale, future year traffic estimates were developed by applying an overall annual growth rate (AAGR) of 3% to the 2020 traffic volumes. In addition, site trips from the following developments were included in the Background (2023/2032) scenario analysis:

- Forestville Village TIA
- Haywood Glen
- 7630 Knightdale Boulevard

There are no NCDOT State Transportation Improvement Program (STIP) projects currently programmed in the area; however, there are several regional projects planned in the Capital Area Metropolitan Planning Organization (CAMPO) 2045 Metropolitan Transportation Plan (MTP) as shown in **Table 4**.

Table 4: 2045 CAMPO MTP

Project ID	Road	From	To	Proposed Improvement	Horizon Year
A589a	Forestville Road Extension	US 64	Old Knight Road	New Location	2035
A592	First Street/Old Knight Road	Smithfield Road	Horton Road	Widening	2045

Source: <https://ral.maps.arcgis.com/apps/webappviewer/index.html?id=a576ec0ce8a34d1991e3c383a285971e>

Based on discussions with the Town of Knightdale, the following developments were included in the Background (2023/2032) scenario analysis:

3.1.1 Forestville Village TIA

Forestville Village will be located in the northwest quadrant of the Old Knight Road and Forestville Road intersection. A sealed TIA was prepared by Ramey Kemp & Associate (RKA) in February 2020. Per the TIA, the development is proposed to be a mixed-use development consisting of 92 single-family homes, 177 townhomes and a 40,000-square-foot shopping center. As a result, the development is projected to generate 5,500 daily site trips, 324 AM peak hour site trips (144 entering, 180 exiting) and 468 PM peak hour site trips (253 entering, 215 exiting). The build year for the development is anticipated to be 2025.

Based on coordination with the Town of Knightdale, a portion of Forestville Village is anticipated to be constructed by 2023; however, nothing substantial. As a result, no trips from Forestville Village will be included in the Background (2023) analysis. By 2032, Forestville Village is anticipated to be fully constructed; therefore, 100% of the trips from Forestville Village will be included in the Background (2032) analysis. These trips were distributed to the study area roadways and intersections based on the patterns in the TIA.

Within the study area, the TIA recommended that the developer provide improvements at the Old Knight Road and Forestville Road intersection and monitor the locations for signalization;

however, the Town would prefer a roundabout at this location. Additionally, the Town has indicated that this development may move forward with some changes and a new TIA will likely be needed. As a result, the recommendations from the TIA will not be included in the Background analysis of the Watson Tract TIA.

3.1.2 Haywood Glen

Haywood Glen is a residential development consisting of 129 single-family homes that is located on the east side of Old Knight Road, just north of the Emerald Pointe subdivision and south of Horton Road. No TIA was required of the development. Per the Forestville Village TIA, Haywood Glen is anticipated to generate 96 AM peak hour site trips (24 entering, 72 exiting) and 130 PM peak hour site trips (82 entering, 48 exiting).

Based on coordination with the Town of Knightdale, a portion of Haywood Glen is anticipated to be constructed by 2023; therefore, 50% of the trips from Haywood Glen will be included in the Background (2023) analysis. These trips were distributed to the study area roadways and intersections based on the patterns in the Forestville Village TIA. By 2032, Haywood Glen is anticipated to be fully constructed; therefore, 100% of the trips from Haywood Glen will be included in the Background (2032) analysis. These trips were distributed to the study area roadways and intersections based on the patterns in the Forestville Village TIA.

3.1.3 7630 Knightdale Boulevard

7630 Knightdale Boulevard will be located on a parcel of land bounded by Knightdale Boulevard and north of Knightdale Station Run, just east of Money Court and east of the Penn Station subdivision. A sealed TIA was prepared by DAVENPORT in June 2020. Per the TIA, the development is proposed to be a mixed-use development consisting of 195 multi-family housing units, 6,200 square feet of retail space and 6,200 square feet of office space. As a result, the development is projected to generate 2,040 daily site trips, 253 AM peak hour site trips (141 entering, 112 exiting) and 161 PM peak hour site trips (85 entering, 76 exiting). The TIA indicates that the build year is 2023; however, the analysis is also done for the 2023 year (instead of 2024), so it's unclear if the build year is 2023 or 2022.

Based on coordination with the Town of Knightdale, a portion of 7630 Knightdale Boulevard is anticipated to be constructed by 2023; therefore, 50% of the trips from 7630 Knightdale Boulevard will be included in the Background (2023) analysis. These trips were distributed to the study area roadways and intersections based on the patterns in the TIA. By 2032, 7630 Knightdale Boulevard is anticipated to be fully constructed; therefore, 100% of the trips from 7630 Knightdale Boulevard will be included in the Background (2032) analysis. These trips were distributed to the study area roadways and intersections based on the patterns in the TIA.

Table 5 shows the inclusion percentages for the approved development traffic in the Background (2023) and Background (2032) scenarios.

Table 5: Approved Development Inclusion Percentages

Approved Development	Background (2023)	Background (2032)
Forestville Village	0%	100%
Haywood Glen	50%	100%
730 Knightdale Boulevard	50%	100%

Information pertaining to the CAMPO 2045 MTP projects are in **Appendix B** and the approved developments projects included in the Background (2023/2032) scenario analysis are located in

Appendix D The Background (2023) and Background (2032) traffic volumes are shown in **Figure 5** and **Figure 6**, respectively.

3.2 Background (2023) Level of Service Analysis

Level of service analyses were conducted for all the study area intersections for the Background (2023) AM and PM peak hours. The volumes used in the Background (2023) analysis are shown in **Figure 5** and the summary level of service results are shown in **Table 6**.

As shown in **Table 6**, the signalized Knightdale Boulevard and Old Knight Road/N 1st Avenue intersection is anticipated to degrade from LOS E to LOS F in the AM peak hour and LOS D to LOS E in the PM peak hour. The stop-controlled intersections are anticipated to have movements that are operating at LOS E and LOS F.

The Background (2023) analysis results are located in **Appendix E**.

Table 6: Background (2023) LOS Results

Intersection	Approach	Background (2023)	
		AM	PM
Knightdale Boulevard & Old Knight Road/N 1 st Avenue [1]	Overall	F – 84.2	E – 60.6
	Eastbound	E – 79.5	E – 77.6
	Westbound	F – 89.7	D – 44.9
	Northbound	E – 70.1	E – 55.3
	Southbound	F – 88.5	D – 44.4
Old Knight Road & Forestville Road [2]	Overall	-	-
	Eastbound	F – 893.7	F – 121.7
	Northbound	A – 2.5	A – 2.9
	Southbound	A – 0.0	A – 0.0
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-
	Eastbound	F – 98.3	B – 13.5
	Northbound	B – 11.1	A – 2.9
	Southbound	A – 0.0	A – 0.0

LEGEND: LOS – Delay (seconds/vehicle)

3.3 Background (2032) Level of Service Analysis

Level of service analyses were conducted for all the study area intersections for the Background (2032) AM and PM peak hours. The volumes used in the Background (2032) analysis are shown in **Figure 6** and the summary level of service results are shown in **Table 7**.

As shown in **Table 7**, the signalized Knightdale Boulevard and Old Knight Road/N 1st Avenue intersection is anticipated to degrade from LOS E to LOS F in the AM peak hour and LOS D to LOS F in the PM peak hour. The stop-controlled intersections are anticipated to have movements that are operating at LOS C and LOS F.

The Background (2032) analysis results are located in **Appendix F**.

Table 7: Background (2032) LOS Results

Intersection	Approach	Background (2032)	
		AM	PM
Knightdale Boulevard & Old Knight Road/N 1 st Avenue [1]	Overall	F – 240.4	F – 160.8
	Eastbound	F – 166.3	F – 251.5
	Westbound	F – 201.8	E – 67.4
	Northbound	F – 252.7	F – 182.0
	Southbound	F – 372.3	E – 62.5
Old Knight Road & Forestville Road [2]	Overall	-	-
	Eastbound	F – 29179.2	F – 2079.3
	Northbound	A – 4.6	A – 3.9
	Southbound	A – 0.0	A – 0.0
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-
	Eastbound	F – 1859.2	C – 21.4
	Northbound	D – 32.5	A – 2.9
	Southbound	A – 0.0	A – 0.0

LEGEND: LOS – Delay (seconds/vehicle)

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4 Build (2023/2032) Conditions

As previously described, a residential development consisting of 97 single-family homes and 32 townhomes is being proposed on the east side of Old Knight Road, between Bryan Chalk Lane and Forestville Road, in Knightdale, NC. Per the site plan, two accesses are proposed along the future Forestville Road Extension – one right-in/right-out (RIRO) and one full. The development is anticipated to be fully constructed by 2022.

4.1 Trip Generation and Distribution

Trip generation was estimated based on the *ITE Trip Generation Manual, 10th Edition* and NCDOT Congestion Management guidelines. As shown in **Table 8**, the development is anticipated to generate 1,212 daily trips, 90 AM peak hour trips (22 entering, 68 exiting) and 120 PM peak hour trips (75 entering, 45 exiting).

Table 8: Trip Generation Results

Land Use (ITE Land Use Code)	Units	Daily	AM Peak		PM Peak	
			Enter	Exit	Enter	Exit
Single Family Detached (210)	97	1,011	18	56	62	37
Townhomes (220)	32	201	4	12	13	8
Total	129	1,212	22	68	75	45

Source: *ITE Trip Generation Manual, 10th Edition*

Most of the projected site trips are anticipated travel south along Old Knight Road to Knightdale Boulevard. The site trip distribution percentages for the proposed development are shown in **Figure 7**, with the resulting site trips shown in **Figure 8**.

4.2 Build (2023) Level of Service Analysis

The Build (2023) scenario consists of the Background (2023) traffic as discussed previously with the addition of site generated trips from the proposed development. The volumes that are used in the Build (2023) analysis are shown in **Figure 9**. The laneage and traffic control used for the Build (2023) scenario is based on the existing conditions shown in **Figure 3**. The summary level of service results are shown in **Table 9**.

As shown in **Table 9**, the signalized Knightdale Boulevard and Old Knight Road/N 1st Avenue intersection is anticipated to continue operating at LOS F in the AM peak hour and LOS E in the PM peak hour, with increased delays. The stop-controlled intersections are primarily anticipated to have movements that are operating at LOS F; however, the eastbound approach along Bryan Chalk Lane is anticipated to operate at LOS C in the PM peak hour.

The newly constructed accesses along the Forestville Road Extension are anticipated to operate at LOS A in both the AM and PM peak hours.

The Build (2023) analysis results are located in **Appendix G**.

Table 9: Build (2023) LOS Results

Intersection	Approach	Build (2023)	
		AM	PM
Knightdale Boulevard & Old Knight Road/N 1 st Avenue [1]	Overall	F – 92.7	E – 69.9
	Eastbound	F – 90.5	F – 98.0
	Westbound	F – 89.6	D – 44.8
	Northbound	E – 72.4	E – 55.6
	Southbound	F – 112.8	D – 45.9
Old Knight Road & Forestville Road/Forestville Road Extension [2]	Overall	-	-
	Eastbound	F – 1884.3	F – 315.7
	Westbound	F – 1547.9	F – 194.3
	Northbound	A – 2.4	A – 2.6
	Southbound	A – 0.0	A – 0.1
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-
	Eastbound	F – 98.8	B – 13.6
	Northbound	B – 11.0	A – 2.9
	Southbound	A – 0.0	A – 0.0
Forestville Road Extension & Access #1 [4]	Overall	-	-
	Eastbound	A – 0.0	A – 0.0
	Westbound	A – 0.0	A – 0.0
	Southbound	A – 8.6	A – 8.5
Forestville Road Extension & Access #2 [5]	Overall	-	-
	Eastbound	A – 7.3	A – 7.3
	Westbound	A – 0.0	A – 0.0
	Southbound	A – 8.4	A – 8.4

LEGEND: LOS – Delay (seconds/vehicle)

4.3 Build (2032) Level of Service Analysis

The Build (2032) scenario consists of the Background (2025) traffic as discussed previously with the addition of site generated trips from the proposed development. The volumes that are used in the Build (2032) analysis are shown in **Figure 10**. The laneage and traffic control used for the Build (2032) scenario is based on the existing conditions shown in **Figure 3**. The summary level of service results are shown in **Table 10**.

As shown in **Table 10**, the signalized Knightdale Boulevard and Old Knight Road/N 1st Avenue intersection is anticipated to continue operating at LOS F in the AM peak hour and LOS E in the PM peak hour, with increased delays. The stop-controlled intersections are primarily anticipated to have movements that are operating at LOS F; however, the eastbound approach along Bryan Chalk Lane is anticipated to operate at LOS C in the PM peak hour.

The newly constructed accesses along the Forestville Road Extension are anticipated to operate at LOS A in both the AM and PM peak hours.

The Build (2032) analysis results are located in **Appendix H**.

Table 10: Build (2032) LOS Results

	Approach	Build (2032)	
		AM	PM
Knightdale Boulevard & Old Knight Road/N 1st Avenue [1]	Overall	F – 256.1	F – 173.3
	Eastbound	F – 179.8	F – 277.7
	Westbound	F – 201.6	E – 67.3
	Northbound	F – 262.4	F – 184.9
	Southbound	F – 412.2	E – 68.0
Old Knight Road & Forestville Road/Forestville Road Extension [2]	Overall	-	-
	Eastbound	*	F – 5527.6
	Westbound	*	F – 28862.0
	Northbound	A – 4.5	A – 3.6
	Southbound	A – 0.0	A – 0.0
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-
	Eastbound	F – 1860.8	C – 21.7
	Northbound	D – 32.5	A – 2.9
	Southbound	A – 0.0	A – 0.0
Forestville Road Extension & Access #1 [4]	Overall	-	-
	Eastbound	A – 0.0	A – 0.0
	Westbound	A – 0.0	A – 0.0
	Southbound	A – 8.6	A – 8.5
Forestville Road Extension & Access #2 [5]	Overall	-	-
	Eastbound	A – 7.3	A – 7.3
	Westbound	A – 0.0	A – 0.0
	Southbound	A – 8.4	A – 8.4

LEGEND: LOS – Delay (seconds/vehicle)

5 Conclusions

As reported, the proposed development is not anticipated to significantly affect delay at the study area intersections. The following intersection improvements and driveway configurations should be considered.

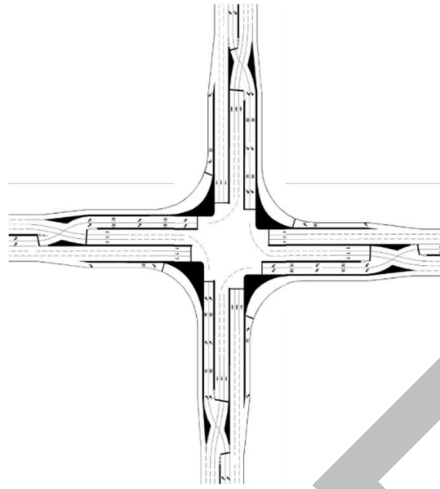
Knightsdale Boulevard & Old Knight Road/N 1st Avenue

The analysis indicates that this intersection is projected to operate at LOS F and LOS E in the Build (2023) AM and PM peak hours, respectively. In the Build (2032) scenario, both the AM and PM peak hours are projected to operate as LOS F.

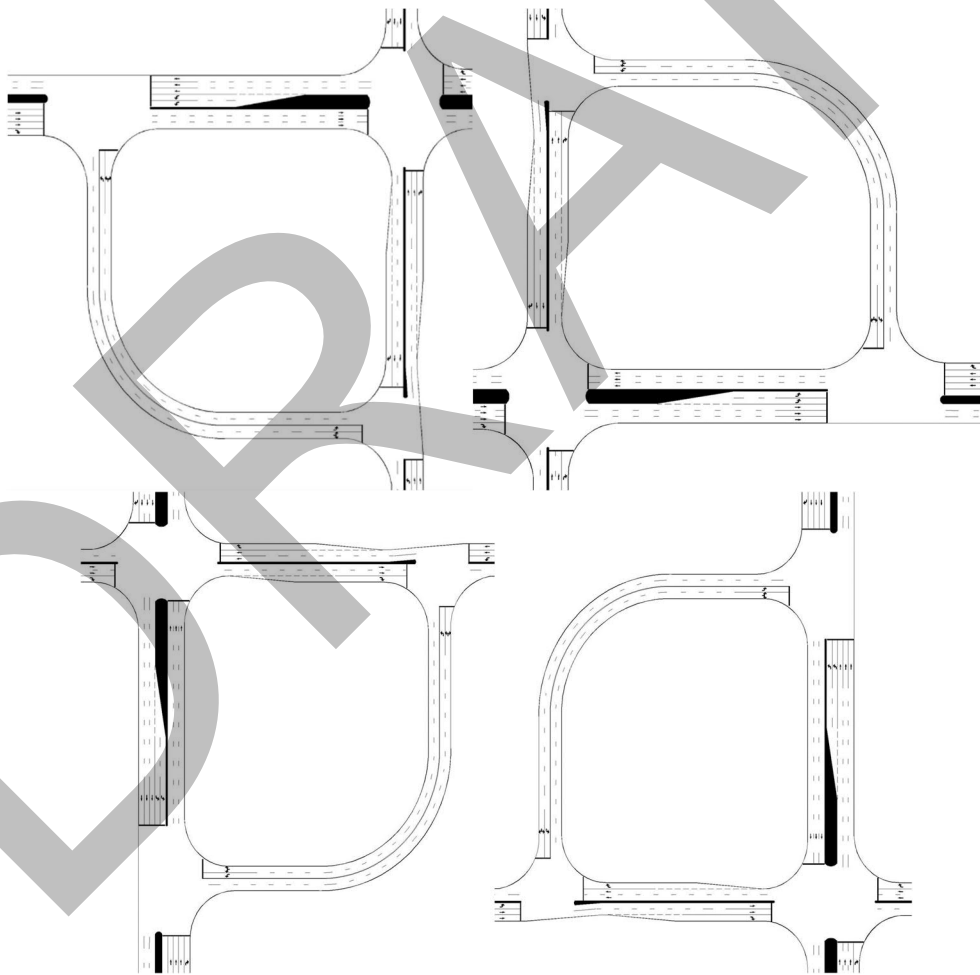
The intersection is currently signalized and has exclusive left and right-turn lanes on each approach. It is part of a closed loop signal system along Knightsdale Boulevard; therefore, Existing (2020) splits and cycles were maintained for all scenarios. For the intersection to operate an acceptable level of service and conform to the Town's *Unified Development Ordinance (UDO)*, several geometric improvements would be needed.

In the Build (2023) scenario, these improvements would include dual turn lanes on several approaches. In the Build (2032) scenario, conventional improvements would include dual turn lanes on several approaches and additional lanes along Knightsdale Boulevard. As mentioned in the Forestville Village TIA, an alternative intersection design (or interchange) will likely be needed at this intersection in the future. The Federal Highway Administration's (FHWA) *Capacity Analysis for Planning of Junctions (CAP-X)* software indicates that a Displaced Left-Turn (DLT) intersection should be investigated at this intersection if it were to remain an at-grade intersection. Other highly rated options include a Quadrant Roadway and Restricted Crossing U-Turn.

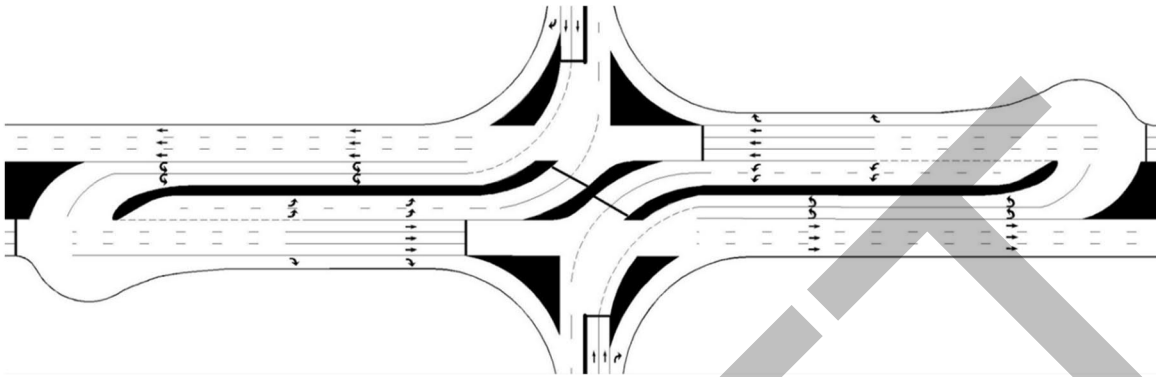
Displaced Left-Turn (Source: CAP-X)



Quadrant Roadway (Source: CAP-X)



Restricted Crossing U-Turn (Source: CAP-X)



The Watson Tract development is anticipated to account for 2.2% of the total traffic at this intersection in 2023 and 1.6% in 2032. Given the development's low impact on the intersection and the intersection already having exclusive turn lanes and being signalized, no improvements are recommended at this location.

Old Knight Road & Forestville Road/Forestville Road Extension

The analysis indicates that the eastbound and westbound approaches are projected to operate at LOS F in both the AM and PM peak hours for the Build (2023) and Build (2032) scenarios.

Per the CAMPO 2045 MTP Project ID A589a, the Forestville Road Extension is proposed to be a 2-lane major thoroughfare that will connect Old Knight Road to Knightdale Boulevard (and eventually Mailman Road). Additionally, the Town's Functional Classification Plan shows the Forestville Road Extension between Old Knight Road and Knightdale Road as a boulevard with a 100-foot right-of-way. That corresponds with the Town's Standard Details for a Boulevard Section (Standard #3.06), which shows a four-lane, median-divided facility.

Based on the volumes analyzed in the Build (2023) and Build (2032) scenarios, a 2-lane cross-section is anticipated to be adequate for the roadway.

As a result, Watson Tract will construct the portion of the Forestville Road Extension along their frontage based on the requirements set forth by the Town of Knightdale or NCDOT.

For the intersection to operate an acceptable level of service and conform to the Town's *Unified Development Ordinance (UDO)*, several geometric improvements would be needed.

In the Build (2023) and Build (2032) scenarios, these improvements would include exclusive turn lanes and signalization. Based on the projected traffic volumes, a signal would likely not be warranted; however, the intersection should be monitored for signalization in the future. It should be noted that the peak hour warrants are anticipated to be met due to the volumes on the eastbound approach. These recommendations are consistent with the findings in the Forestville Village TIA.

The Watson Tract development is not anticipated to account for any of the traffic on the exclusive turn lanes recommended in the Forestville Village TIA. As a result, the following improvements should be considered at this intersection:

- Construct Forestville Road Extension based on the requirements of the Town and of Knightdale and/or NCDOT. A two-lane cross-section is anticipated to be adequate based on the projected traffic volumes.
- Construct the westbound approach at Old Knight Road to consist of a shared thru/right-turn lane and an exclusive left-turn lane that provides at least 125 feet of full storage and an appropriate taper.

Old Knight Road & Bryan Chalk Lane

The analysis indicates that the eastbound approach is projected to operate at LOS F in the AM peak hour. The proposed development is only anticipated to add through trips along Old Knight Road at this intersection and is anticipated to account for less than 1% of the traffic in both the Build (2023) and Build (2032) scenarios. Therefore, no improvements are recommended at this intersection.

Forestville Road Extension & Access #1

The analysis indicates that the southbound approach is projected to operate at LOS A during the AM and PM peak hours. The following driveway configuration should be considered:

- Construct the southbound Access #1 approach to provide one right-in only ingress lane and one right-out only egress lane.

Forestville Road Extension & Access #2

The analysis indicates that the southbound approach is projected to operate at LOS A during the AM and PM peak hours. The following driveway configuration should be considered:

- Construct the southbound Access #2 approach to provide one ingress lane and one egress lane.

When the Forestville Road Extension is eventually extended to Knightdale Boulevard, an exclusive left-turn lane into the site may be needed; however, at the time the development is constructed, it will not be needed.

Table 11 provides a summary of the intersection levels of service across all scenarios and the proposed laneage is shown in **Figure 11**.

Other Considerations

During the scoping meeting, the Town expressed a desire for the Old Knight Road and Forestville Road intersection to be a roundabout in the future. Additionally, there was discussion regarding the Forestville Road Extension and how that may affect travel patterns in the future. A high-level analysis of each of these issues is provided below.

Old Knight Road and Forestville Road Roundabout

Based on the volumes developed for the Build (2023) and Build (2032) scenarios, a single-lane roundabout would be sufficient to accommodate the projected future volumes. Old Knight Road and Forestville Road are both NCDOT-maintained roads; therefore, constructing a roundabout at this location would require input and approval from NCDOT. Constructing a roundabout at this location is not recommended as part of this developer's responsibility given the development's size, minimal effect on operations at the intersection, and cost of constructing a roundabout.

Forestville Road Extension

There are plans to extend Forestville Road from its current terminus at Old Knight Road to Knightdale Boulevard. This development will extend Forestville Road along the extents of its frontage leaving a small gap between that point and Knightdale Road. As previously mentioned, there is a discrepancy between the Town's plans for the Forestville Road Extension and CAMPO's plans. Based on the volume projections from the TIA, it is likely that a two-lane cross-section would be adequate. A high-level model was developed in TransModeler to determine how travel patterns may be affected in the future if the full extension were constructed between Old Knight Road and Knightdale Boulevard. Based on that preliminary analysis, travel pattern diversions along Old Knight Road and Forestville Road may be in the 30% - 40% range. Further analysis should be undertaken using the Triangle Regional Model.

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Table 11: Overall LOS Results

Intersection	Approach	Existing (2020)		Background (2023)		Background (2032)		Build (2023)		Build (2032)		Improved (2023)		Improved (2032)	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Knightdale Boulevard & Old Knight Road/N 1 st Avenue [1]	Overall	E - 60.9	D - 44.2	F - 84.2	E - 60.6	F - 240.4	F - 160.8	F - 92.7	E - 69.9	F - 256.1	F - 173.3				
	Eastbound	D - 54.7	D - 38.7	E - 79.5	E - 77.6	F - 166.3	F - 251.5	F - 90.5	F - 98.0	F - 179.8	F - 277.7				
	Westbound	E - 64.5	D - 44.8	F - 89.7	D - 44.9	F - 201.8	E - 67.4	F - 89.6	D - 44.8	F - 201.6	E - 67.3				
	Northbound	D - 54.2	E - 60.2	E - 70.1	E - 55.3	F - 252.7	F - 182.0	E - 72.4	E - 55.6	F - 262.4	F - 184.9				
	Southbound	E - 65.4	D - 47.2	F - 88.5	D - 44.4	F - 372.3	E - 62.5	F - 112.8	D - 45.9	F - 412.6	E - 68.0				
Old Knight Road & Forestville Road/Forestville Road Extension [2]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	F - 416.4	E - 40.7	F - 893.7	F - 121.7	F - 29179.2	F - 2079.3	F - 1884.3	F - 315.7	*	F - 5527.6				
	Westbound	-	-	-	-	-	-	F - 1547.9	F - 194.3	*	F - 28862.0	F - 1037.8	F - 150.7	*	F - 15906.6
	Northbound	A - 2.4	A - 3.0	A - 2.5	A - 2.9	A - 4.6	A - 3.9	A - 2.4	A - 2.6	A - 4.5	A - 3.6				
	Southbound	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.1	A - 0.0	A - 0.1				
Old Knight Road & Bryan Chalk Lane [3]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	E - 41.5	B - 12.0	F - 98.3	B - 13.5	F - 1859.2	C - 21.4	F - 98.8	B - 13.6	F - 1860.8	C - 21.7				
	Northbound	A - 9.7	A - 3.2	B - 11.1	A - 2.9	D - 32.5	A - 2.9	B - 11.0	A - 2.9	D - 32.5	A - 2.9				
	Southbound	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
Forestville Road Extension & Access #1 [4]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	-	-	-	-	-	-	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
	Westbound	-	-	-	-	-	-	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
	Southbound	-	-	-	-	-	-	A - 8.6	A - 8.5	A - 8.6	A - 8.5				
Forestville Road Extension & Access #2 [5]	Overall	-	-	-	-	-	-	-	-	-	-				
	Eastbound	-	-	-	-	-	-	A - 7.3	A - 7.3	A - 7.3	A - 7.3				
	Westbound	-	-	-	-	-	-	A - 0.0	A - 0.0	A - 0.0	A - 0.0				
	Southbound	-	-	-	-	-	-	A - 8.4	A - 8.4	A - 8.4	A - 8.4				

LEGEND: LOS - Delay (seconds/vehicle)

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Appendices

- A. **Figures**
- B. **Count Data**
- C. **Existing (2020) Analyses**
- D. **Background Projects**
- E. **Background (2023) Analyses**
- F. **Background (2032) Analyses**
- G. **Build (2023) Analyses**
- H. **Build (2032) Analyses**
- I. **Improved (2023) Analyses**
- J. **Improved (2032) Analyses**

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Appendix A
Figures

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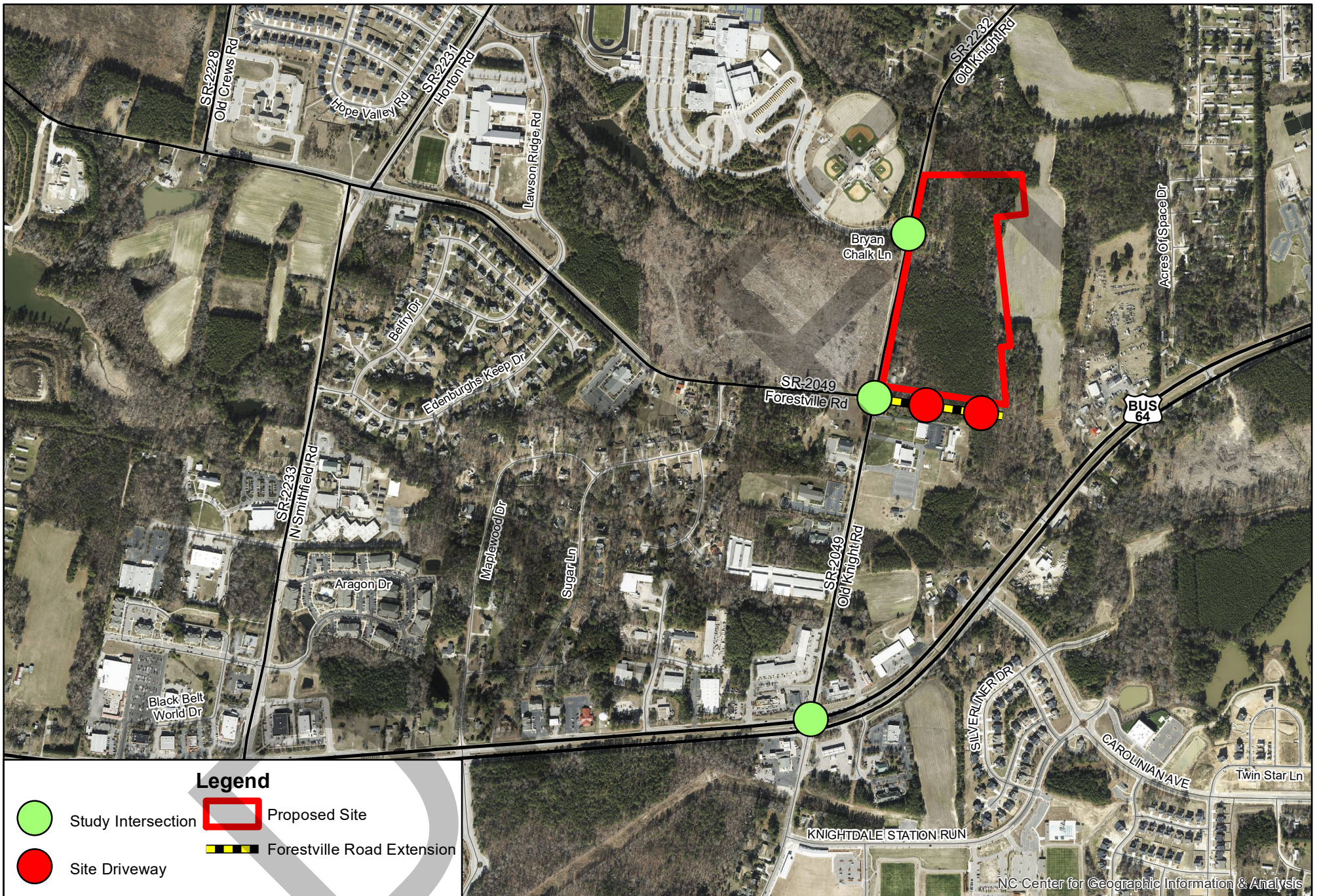


Figure 1: Vicinity Map

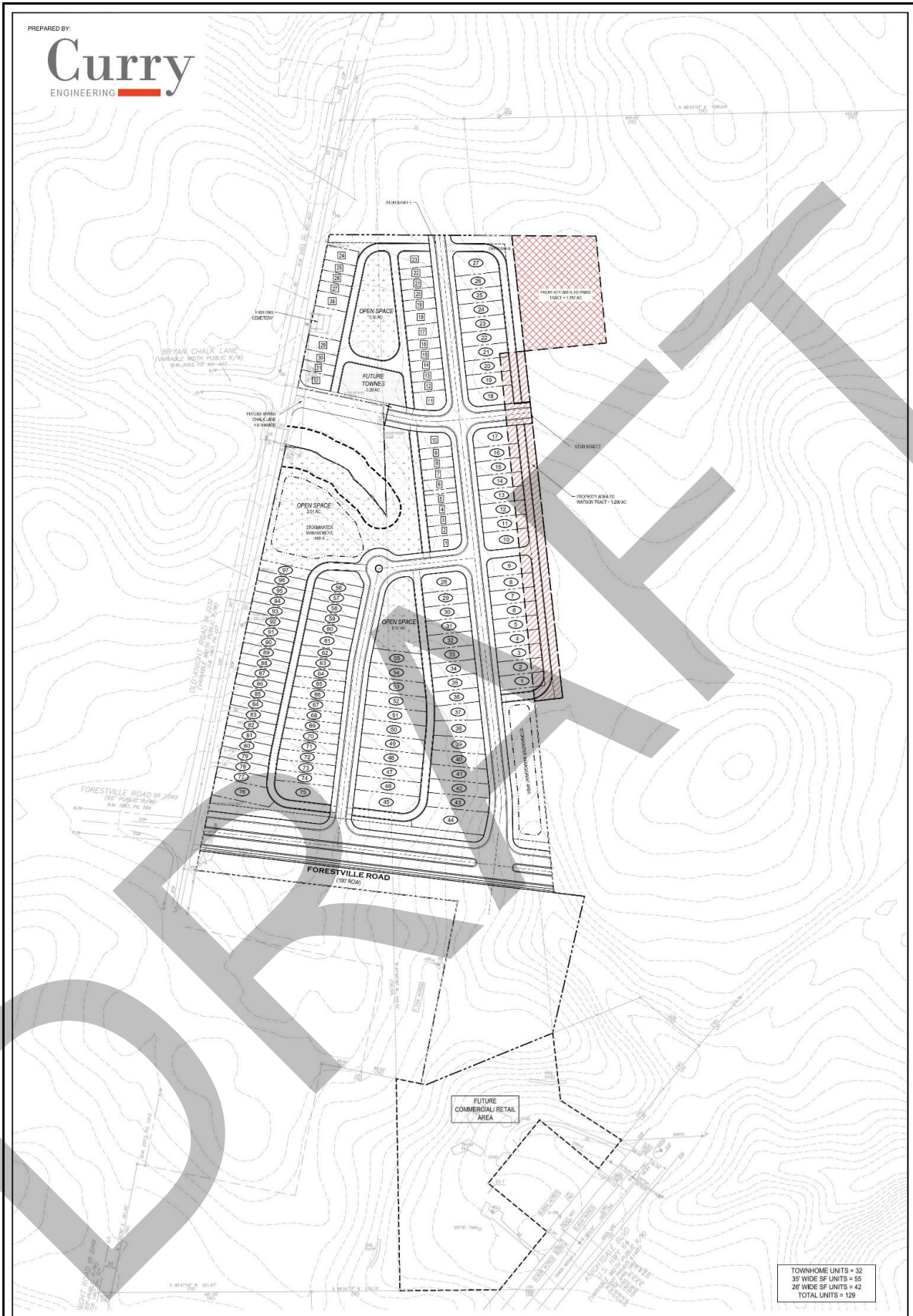
Watson Tract



0 0.15 0.3 Miles

PREPARED BY:

Curry
ENGINEERING



WATSON TRACT ASSEMBLAGE

KNIGHTDALE, NORTH CAROLINA

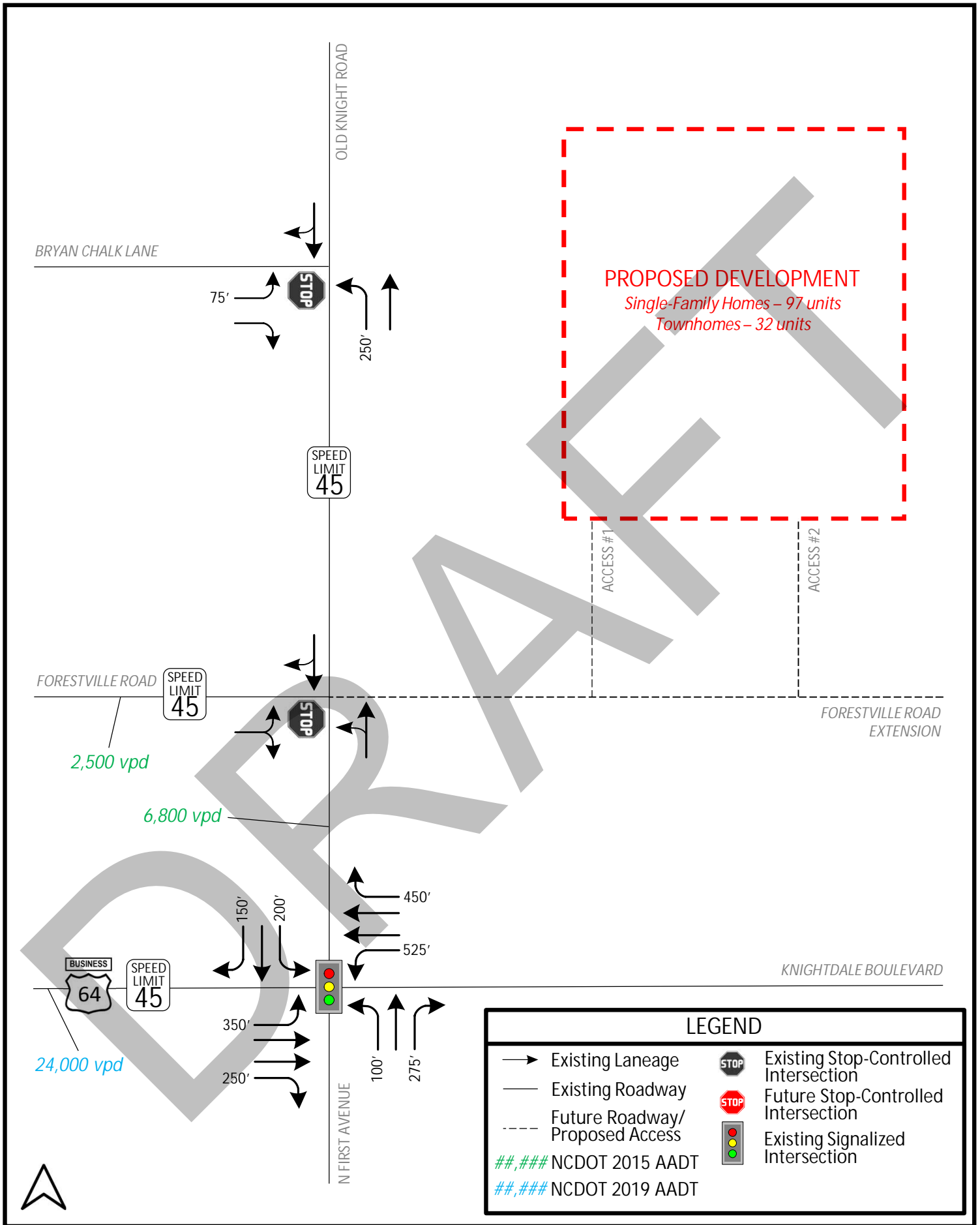


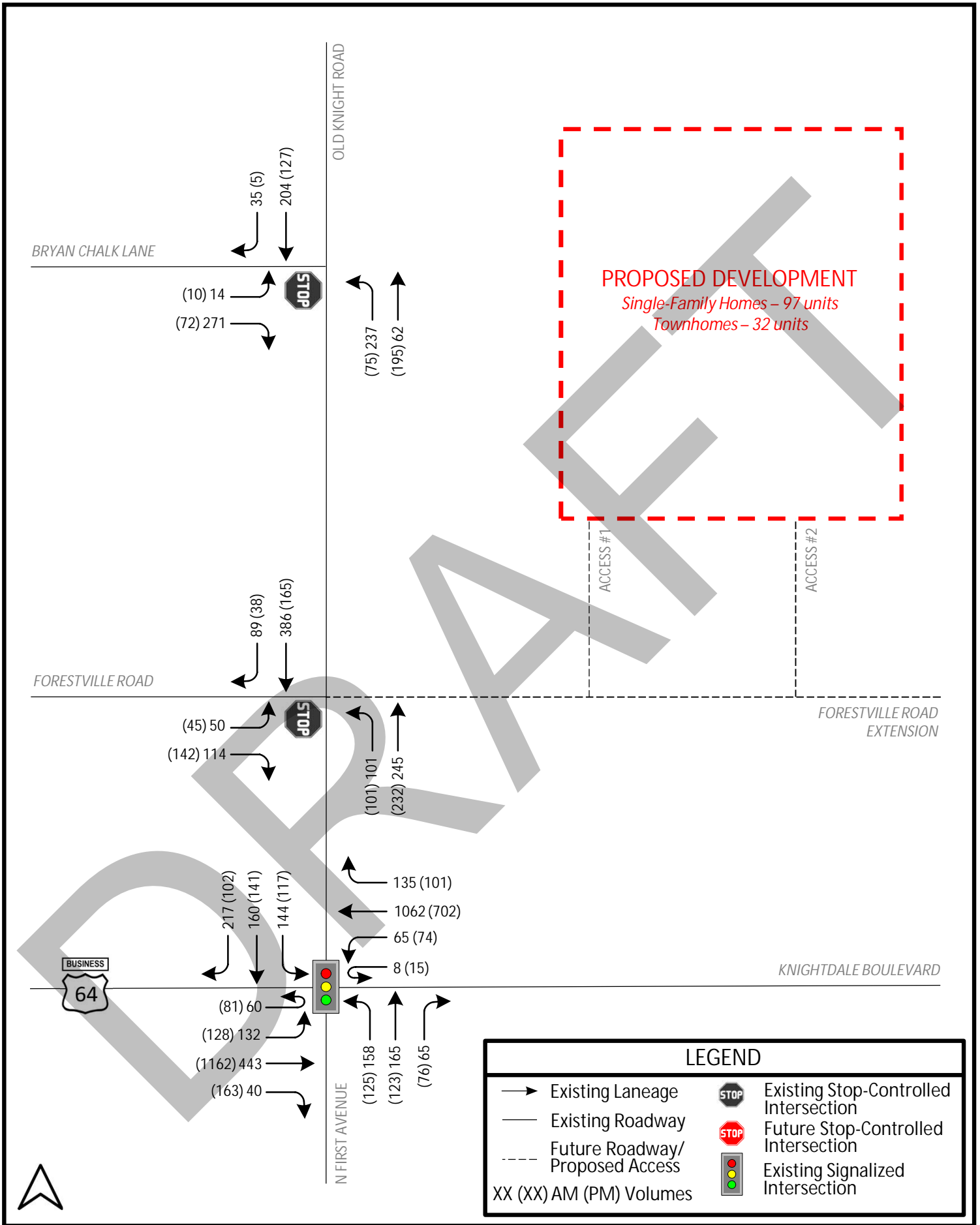
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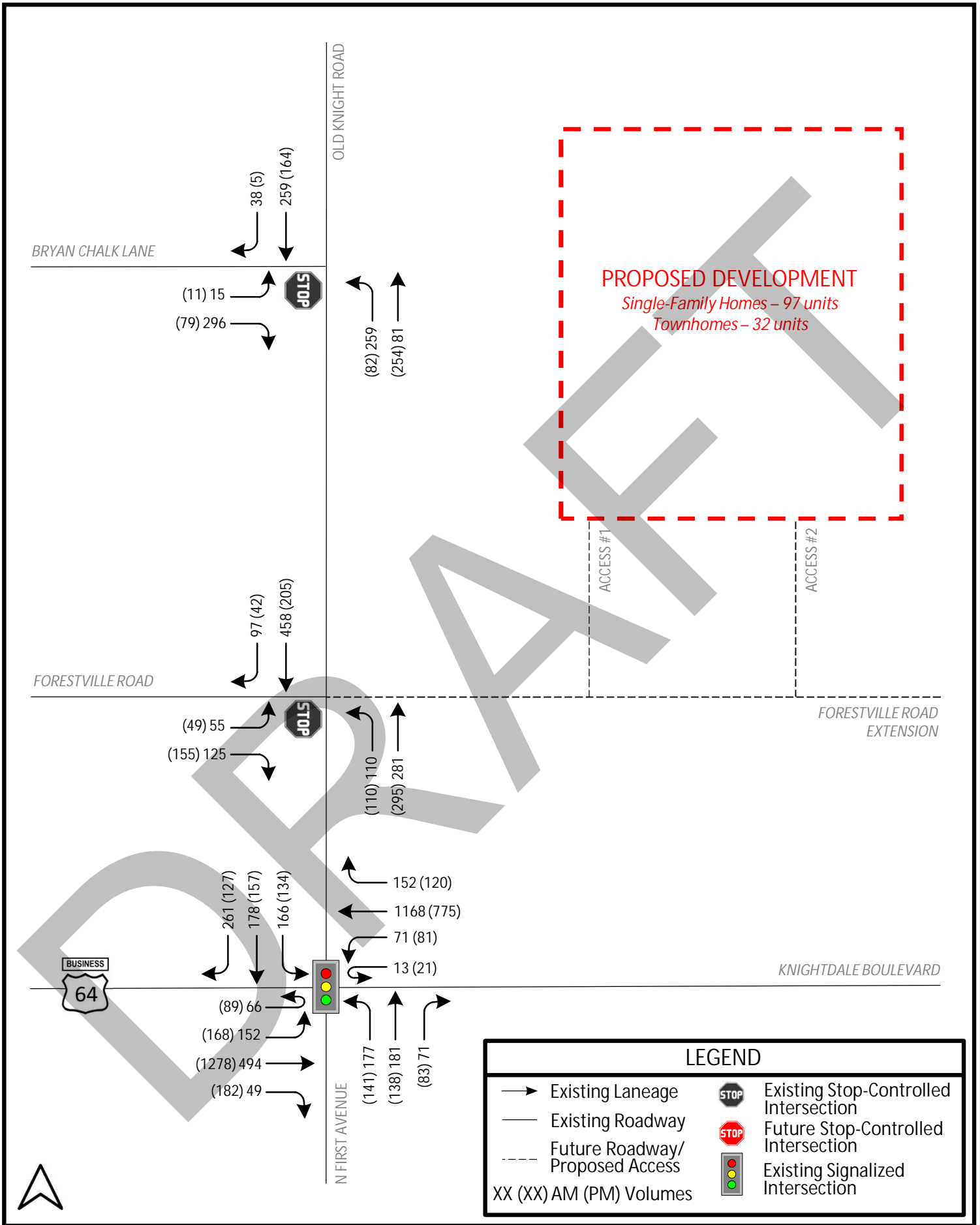
Watson Tract
Knightdale, NC

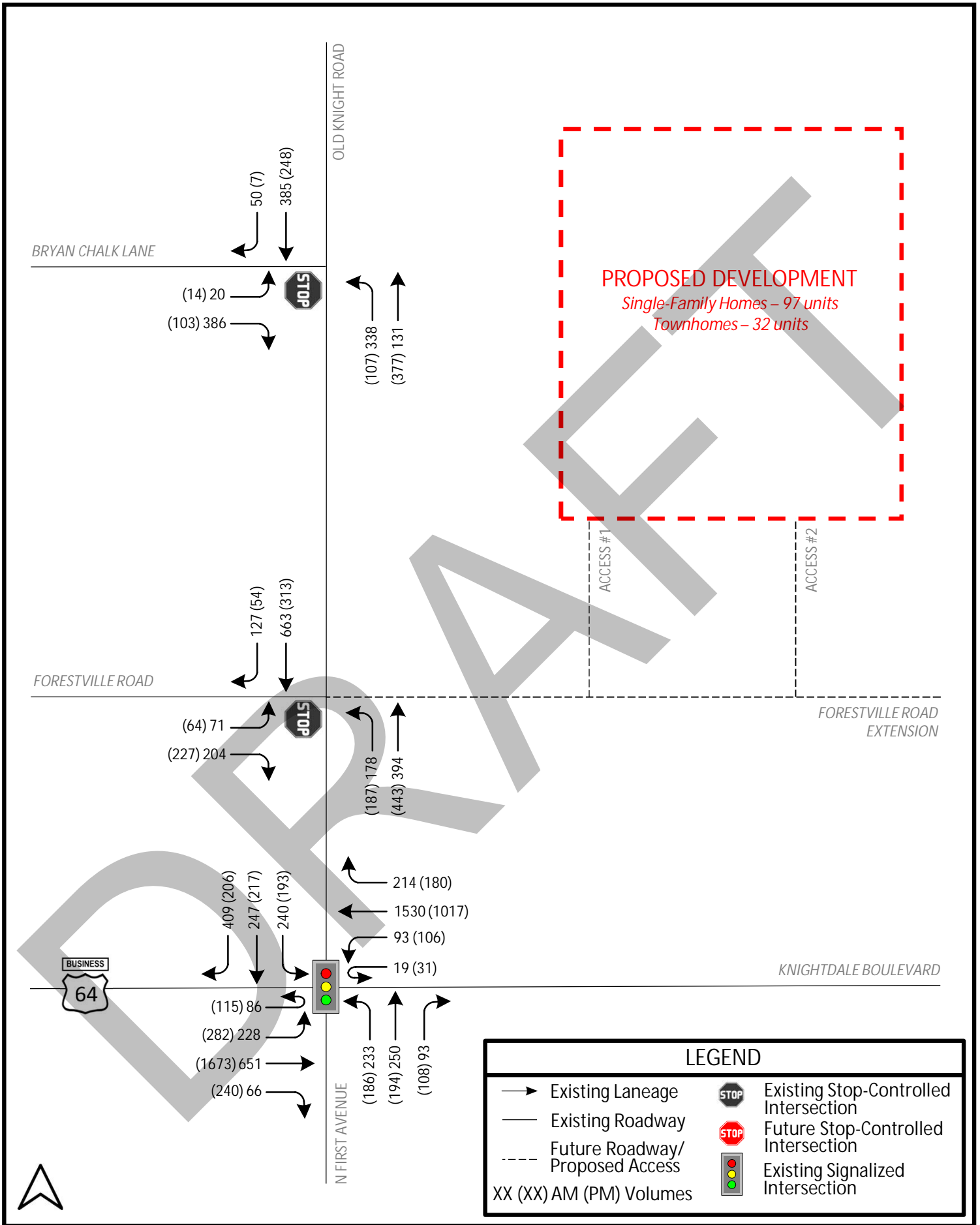
Figure 2
Site Plan

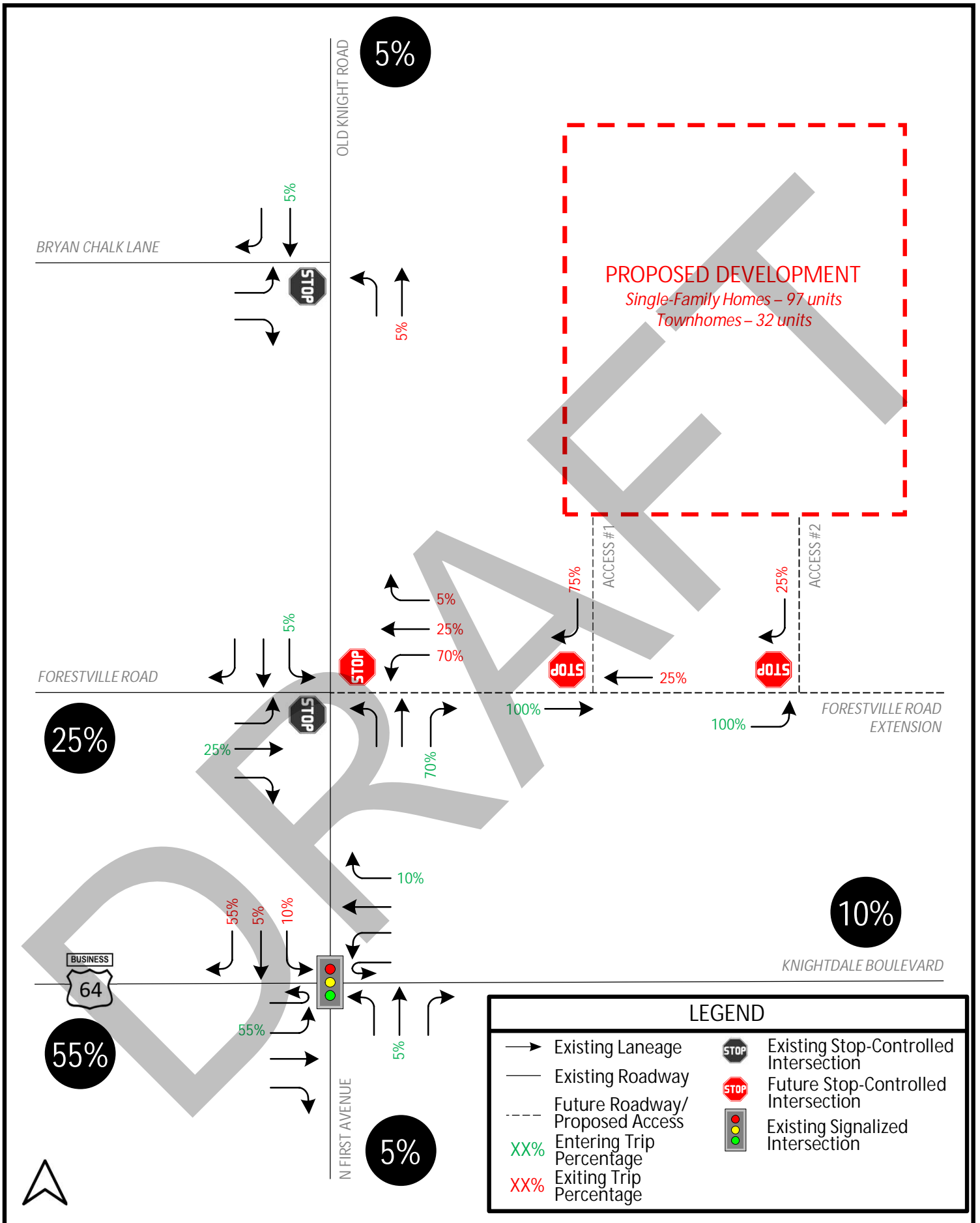
M
M
MOTT
MACDONALD







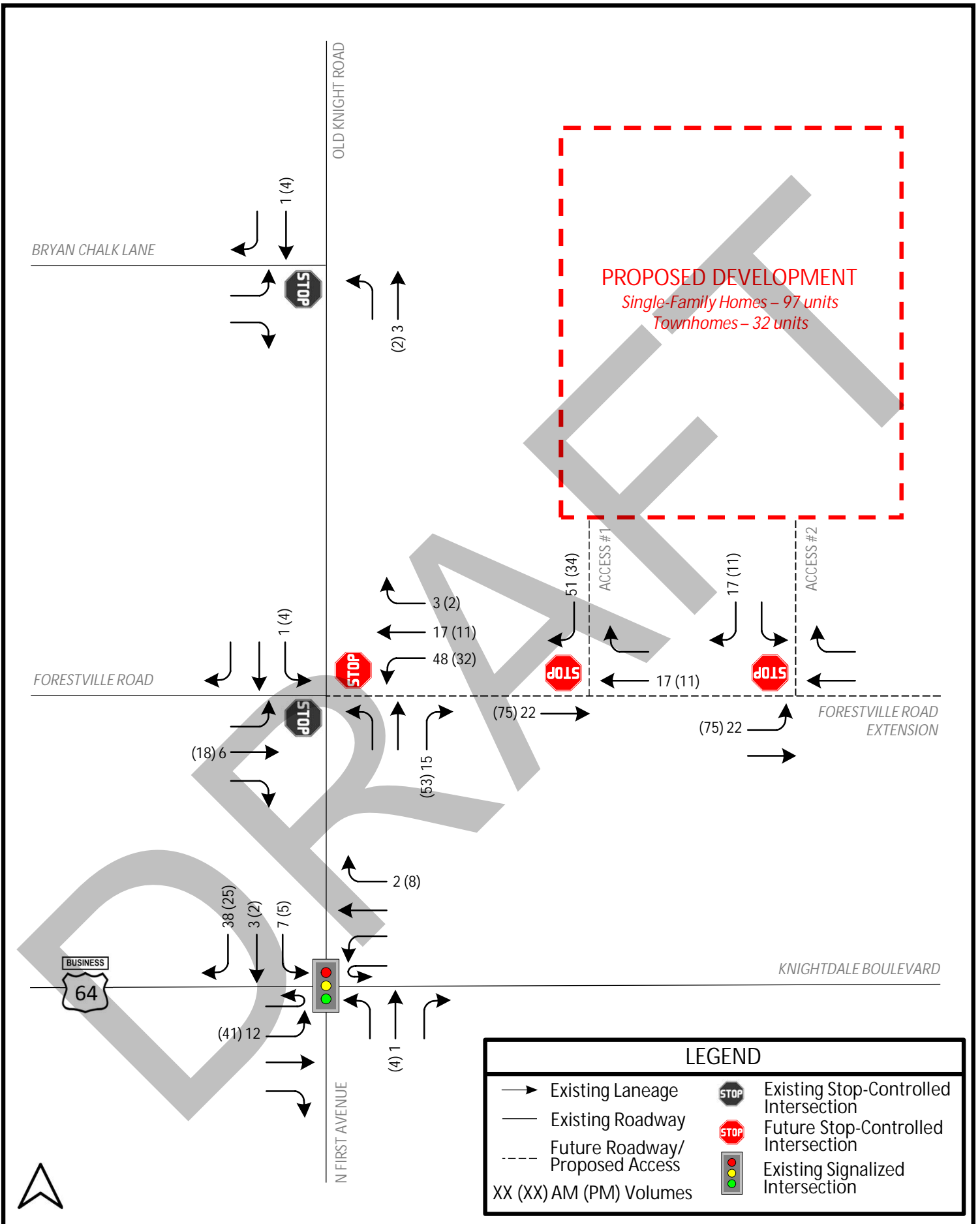


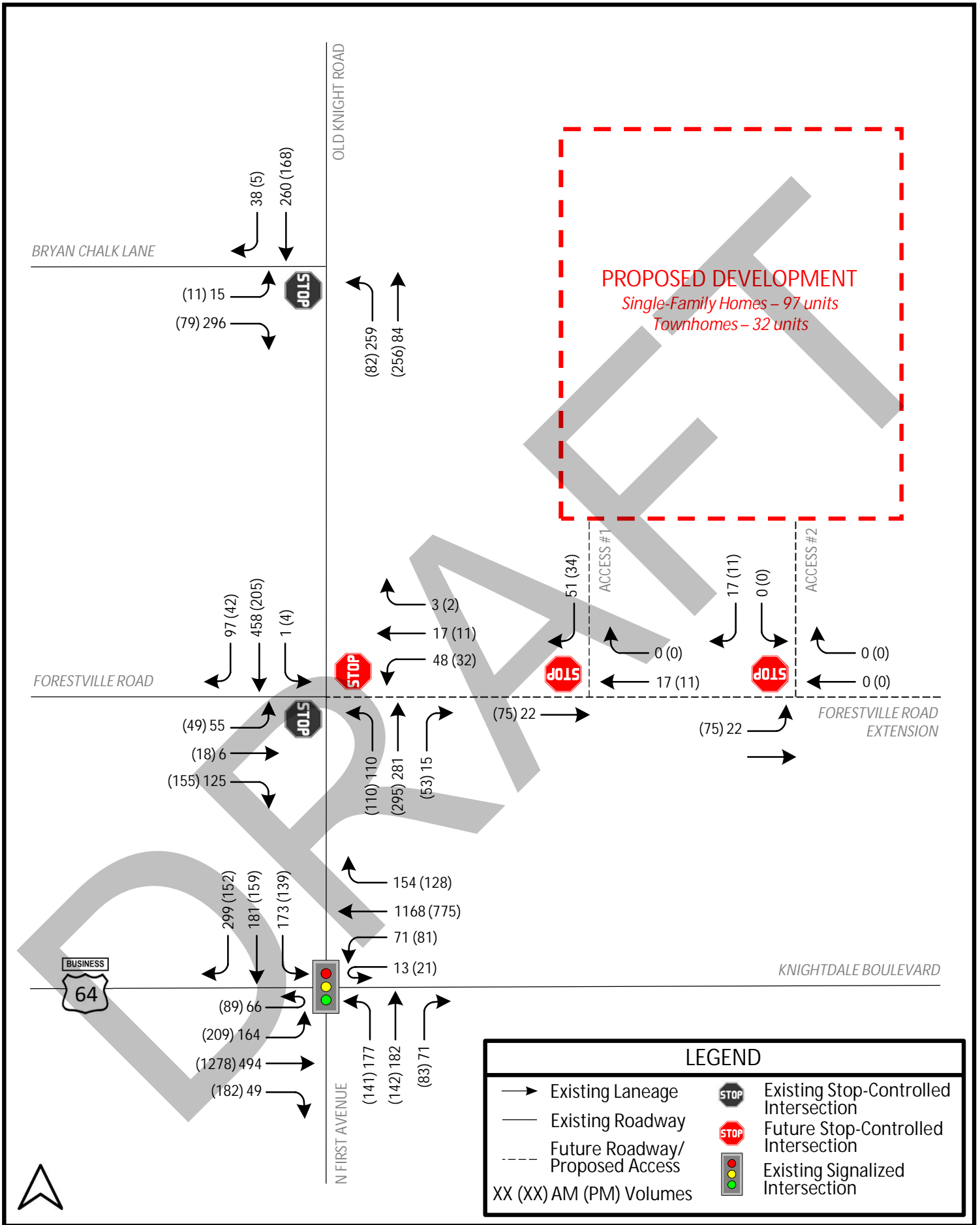


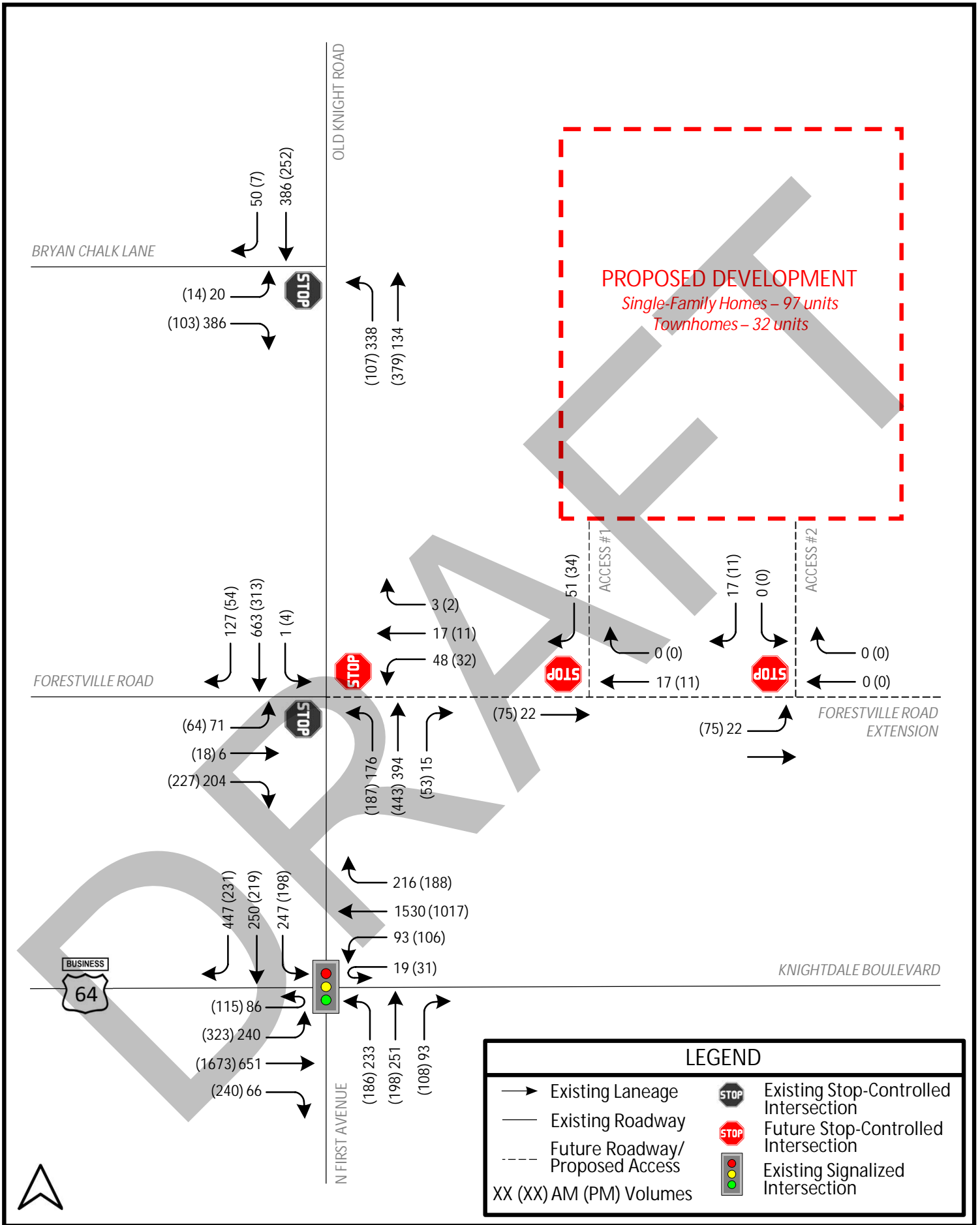
Watson Tract
 Knightdale, NC

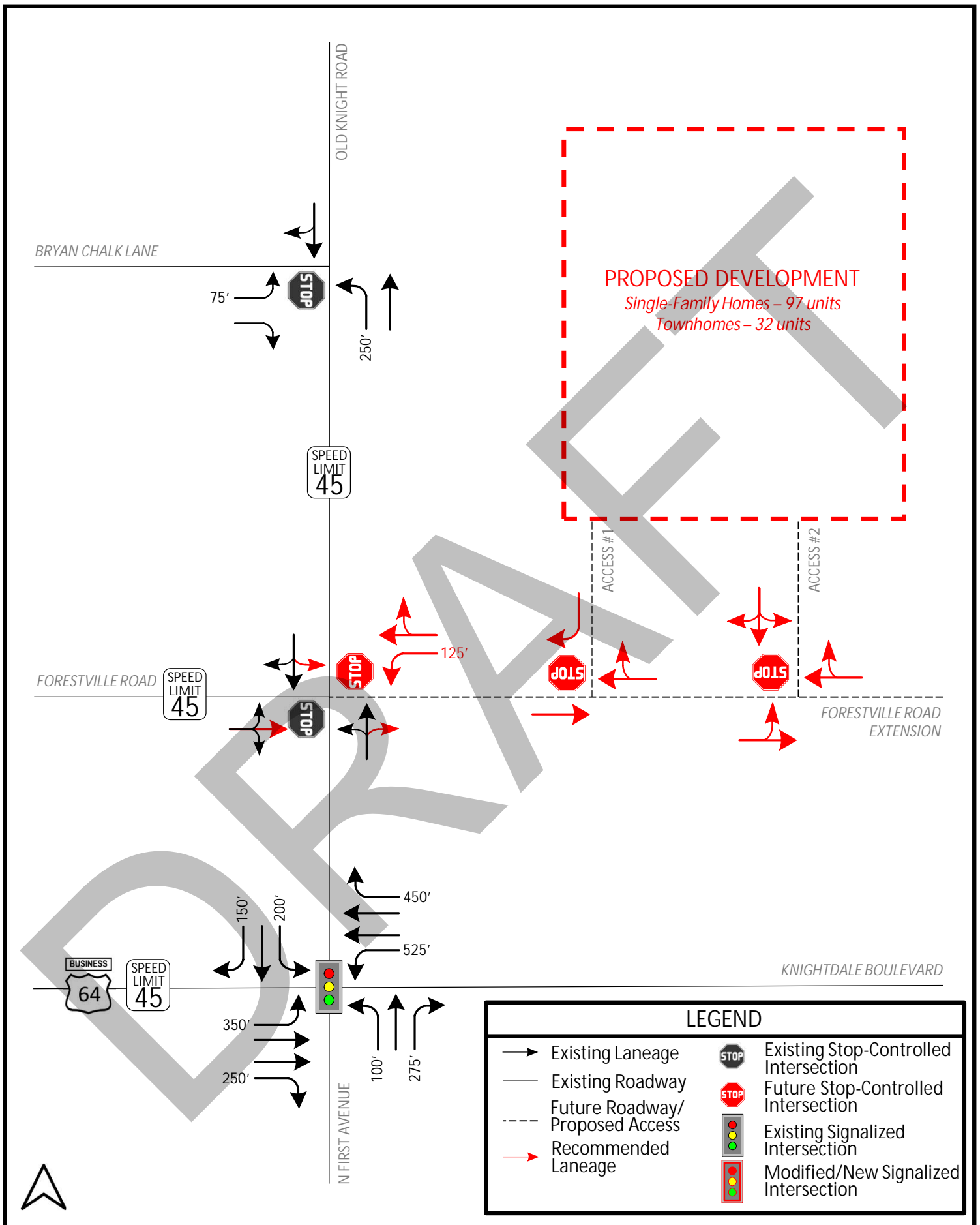
Figure 7
 Trip Distribution Percentages





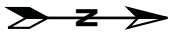






Appendix B
Count Data

DRAFT

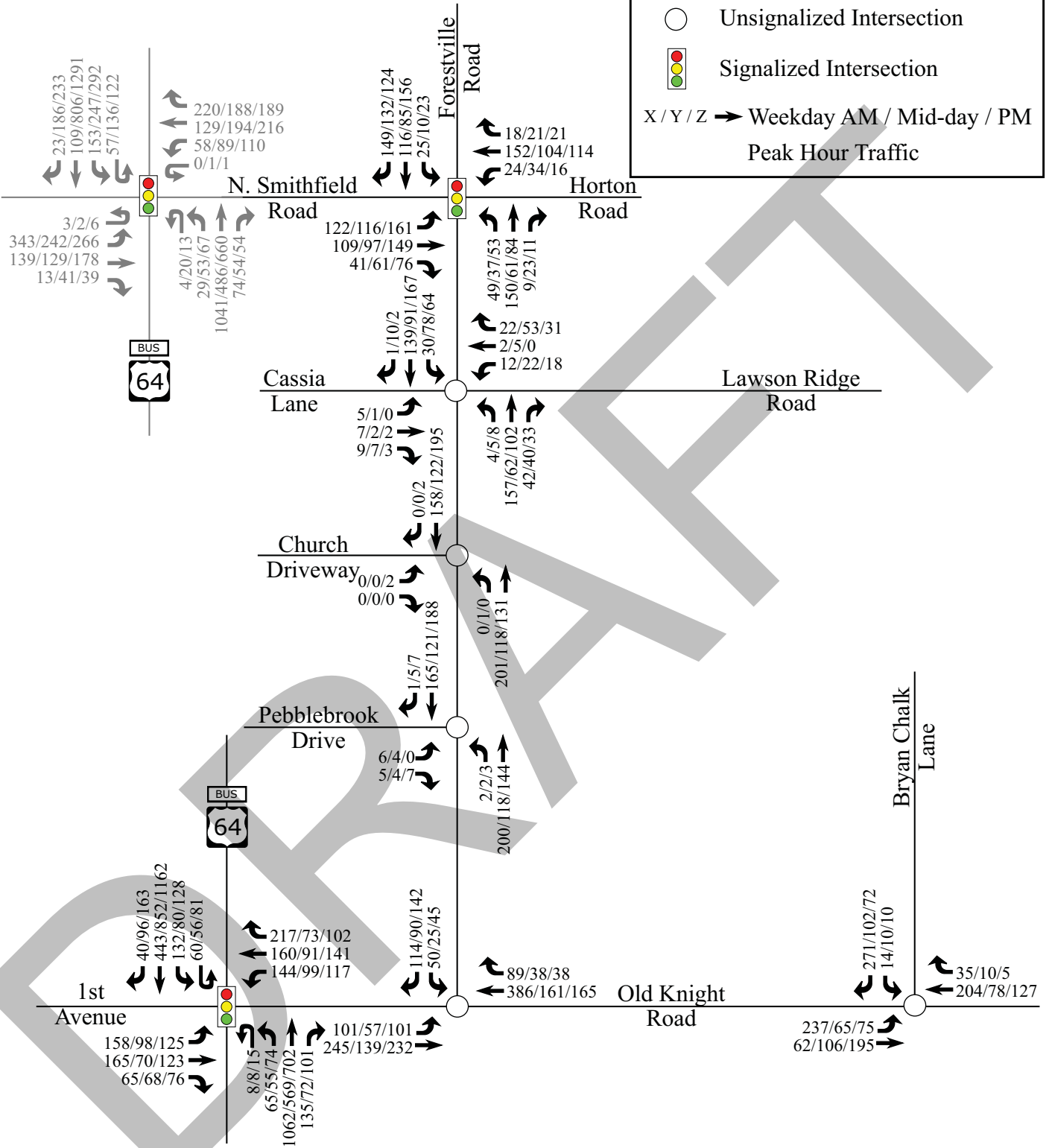


LEGEND

○ Unsignalized Intersection

⬆️⬆️⬆️ Signalized Intersection

X/Y/Z → Weekday AM / Mid-day / PM
Peak Hour Traffic



Forestville Village
Knightdale, NC

Existing (2019)
Peak Hour Traffic

Scale: Not to Scale

Figure 4



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Cassia)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Lawson Ridge Road Southbound				Forestville Road Westbound				Cassia Lane Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	3	0	0	3	2	13	0	15	1	0	1	2	1	10	3	14	34
07:05 AM	3	0	0	3	8	22	0	30	1	2	0	3	0	17	1	18	54
07:10 AM	4	0	0	4	3	16	0	19	1	3	0	4	0	7	3	10	37
07:15 AM	1	0	0	1	6	14	0	20	1	0	1	2	0	12	6	18	41
07:20 AM	0	0	4	4	2	17	0	19	1	1	0	2	1	14	5	20	45
07:25 AM	4	1	0	5	5	19	0	24	1	0	1	2	0	9	1	10	41
07:30 AM	2	0	2	4	1	8	1	10	0	0	0	0	0	13	1	14	28
07:35 AM	1	0	1	2	1	10	1	12	0	0	0	0	0	12	1	13	27
07:40 AM	1	0	0	1	2	13	0	15	1	0	0	1	0	9	4	13	30
07:45 AM	1	0	1	2	2	12	1	15	1	0	0	1	0	9	2	11	29
07:50 AM	2	0	0	2	4	8	0	12	0	1	0	1	0	10	3	13	28
07:55 AM	2	1	3	6	2	9	1	12	1	0	2	3	0	13	1	14	35
Total	24	2	11	37	38	161	4	203	9	7	5	21	2	135	31	168	429
08:00 AM	1	0	1	2	6	9	0	15	1	0	1	2	0	14	2	16	35
08:05 AM	5	0	2	7	3	11	0	14	0	0	1	1	1	11	0	12	34
08:10 AM	1	0	0	1	1	6	0	7	0	0	0	0	1	16	1	18	26
08:15 AM	0	0	0	0	2	14	0	16	2	0	0	2	0	14	1	15	33
08:20 AM	0	0	0	0	2	4	1	7	1	0	0	1	0	6	2	8	16
08:25 AM	1	0	1	2	2	6	1	9	0	0	1	1	0	9	3	12	24
08:30 AM	0	0	1	1	2	4	0	6	2	0	0	2	0	9	3	12	21
08:35 AM	1	0	0	1	9	4	0	13	1	0	0	1	0	8	4	12	27
08:40 AM	0	0	1	1	11	6	1	18	0	0	0	0	0	7	6	13	32
08:45 AM	11	0	10	21	4	9	0	13	0	0	0	0	0	3	9	12	46
08:50 AM	15	0	13	28	7	7	1	15	1	0	0	1	1	8	5	14	58
08:55 AM	11	0	8	19	5	5	0	10	0	1	0	1	0	8	9	17	47
Total	46	0	37	83	54	85	4	143	8	1	3	12	3	113	45	161	399
Grand Total	70	2	48	120	92	246	8	346	17	8	8	33	5	248	76	329	828
Apprch %	58.3	1.7	40		26.6	71.1	2.3		51.5	24.2	24.2		1.5	75.4	23.1		
Total %	8.5	0.2	5.8	14.5	11.1	29.7	1	41.8	2.1	1	1	4	0.6	30	9.2	39.7	
Cars +	70	2	48	120	92	245	8	345	16	8	8	32	5	245	76	326	823
% Cars +	100	100	100	100	100	99.6	100	99.7	94.1	100	100	97	100	98.8	100	99.1	99.4
Trucks	0	0	0	0	0	1	0	1	1	0	0	1	0	3	0	3	5
% Trucks	0	0	0	0	0	0.4	0	0.3	5.9	0	0	3	0	1.2	0	0.9	0.6



TRAFFIC DATA COLLECTION

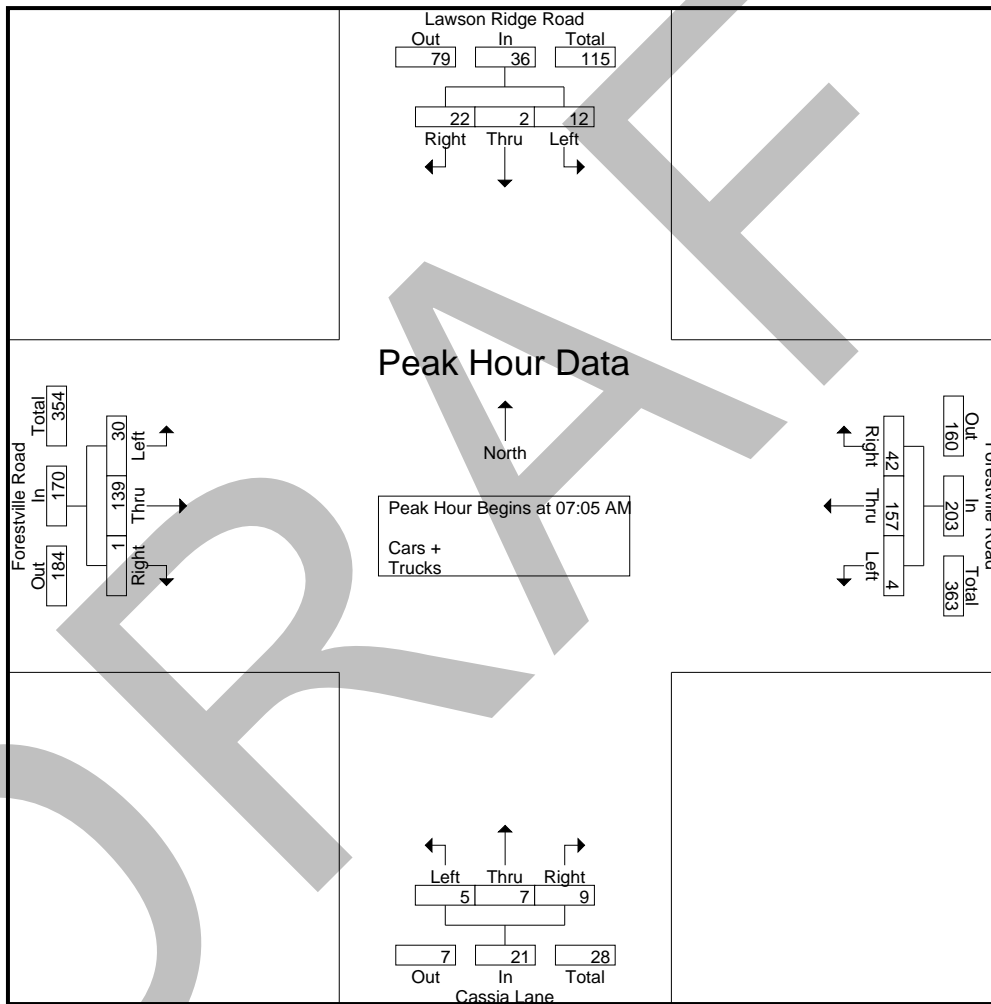
File Name : Knightdale(Forestville and Cassia)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Lawson Ridge Road Southbound				Forestville Road Westbound				Cassia Lane Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:05 AM																	
07:05 AM	3	0	0	3	8	22	0	30	1	2	0	3	0	17	1	18	54
07:10 AM	4	0	0	4	3	16	0	19	1	3	0	4	0	7	3	10	37
07:15 AM	1	0	0	1	6	14	0	20	1	0	1	2	0	12	6	18	41
07:20 AM	0	0	4	4	2	17	0	19	1	1	0	2	1	14	5	20	45
07:25 AM	4	1	0	5	5	19	0	24	1	0	1	2	0	9	1	10	41
07:30 AM	2	0	2	4	1	8	1	10	0	0	0	0	0	13	1	14	28
07:35 AM	1	0	1	2	1	10	1	12	0	0	0	0	0	12	1	13	27
07:40 AM	1	0	0	1	2	13	0	15	1	0	0	1	0	9	4	13	30
07:45 AM	1	0	1	2	2	12	1	15	1	0	0	1	0	9	2	11	29
07:50 AM	2	0	0	2	4	8	0	12	0	1	0	1	0	10	3	13	28
07:55 AM	2	1	3	6	2	9	1	12	1	0	2	3	0	13	1	14	35
08:00 AM	1	0	1	2	6	9	0	15	1	0	1	2	0	14	2	16	35
Total Volume	22	2	12	36	42	157	4	203	9	7	5	21	1	139	30	170	430
% App. Total	61.1	5.6	33.3		20.7	77.3	2		42.9	33.3	23.8		0.6	81.8	17.6		
PHF	.458	.167	.250	.500	.438	.595	.333	.564	.750	.194	.208	.438	.083	.681	.417	.708	.664



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Cassia)AM
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Cassia) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Lawson Ridge Road Southbound				Forestville Road Westbound				Cassia Lane Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
02:00 PM	0	0	2	2	1	2	0	3	0	0	0	0	0	7	1	8	13
02:05 PM	1	0	0	1	2	3	0	5	0	0	0	0	1	11	2	14	20
02:10 PM	0	0	0	0	1	8	1	10	0	1	0	1	1	8	1	10	21
02:15 PM	1	0	0	1	2	0	0	2	0	0	0	0	0	5	0	5	8
02:20 PM	0	1	1	2	1	10	0	11	1	0	0	1	1	5	2	8	22
02:25 PM	5	1	7	13	2	11	0	13	1	0	0	1	0	8	0	8	35
02:30 PM	5	0	5	10	1	8	0	9	0	0	0	0	0	10	0	10	29
02:35 PM	2	0	4	6	2	3	0	5	0	1	1	2	0	8	0	8	21
02:40 PM	0	0	0	0	2	2	0	4	0	0	1	1	0	7	3	10	15
02:45 PM	2	0	0	2	0	8	0	8	0	0	1	1	0	10	1	11	22
02:50 PM	1	0	1	2	1	6	0	7	0	0	0	0	0	9	0	9	18
02:55 PM	1	0	0	1	2	5	1	8	0	0	0	0	0	5	0	5	14
Total	18	2	20	40	17	66	2	85	2	2	3	7	3	93	10	106	238
03:00 PM	2	1	1	4	2	8	0	10	0	0	0	0	0	3	4	7	21
03:05 PM	1	0	0	1	0	10	0	10	0	0	0	0	0	9	1	10	21
03:10 PM	1	1	0	2	3	4	0	7	1	0	0	1	0	4	8	12	22
03:15 PM	0	0	0	0	3	9	1	13	0	0	0	0	1	8	5	14	27
03:20 PM	2	1	1	4	4	4	1	9	1	0	0	1	1	10	3	14	28
03:25 PM	4	2	2	8	3	3	0	6	1	1	0	2	1	10	6	17	33
03:30 PM	3	0	1	4	5	6	1	12	2	0	0	2	1	9	5	15	33
03:35 PM	3	0	1	4	6	5	0	11	0	0	0	0	0	6	6	12	27
03:40 PM	2	0	0	2	5	7	0	12	0	1	1	2	3	10	14	27	43
03:45 PM	6	0	3	9	4	2	0	6	0	0	0	0	0	5	8	13	28
03:50 PM	13	0	7	20	2	3	0	5	1	0	0	1	1	10	9	20	46
03:55 PM	16	0	6	22	3	1	2	6	1	0	0	1	2	7	9	18	47
Total	53	5	22	80	40	62	5	107	7	2	1	10	10	91	78	179	376
Grand Total	71	7	42	120	57	128	7	192	9	4	4	17	13	184	88	285	614
Apprch %	59.2	5.8	35		29.7	66.7	3.6		52.9	23.5	23.5		4.6	64.6	30.9		
Total %	11.6	1.1	6.8	19.5	9.3	20.8	1.1	31.3	1.5	0.7	0.7	2.8	2.1	30	14.3	46.4	
Cars +	71	7	42	120	57	123	7	187	9	4	4	17	13	180	88	281	605
% Cars +	100	100	100	100	100	96.1	100	97.4	100	100	100	100	100	97.8	100	98.6	98.5
Trucks	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
% Trucks	0	0	0	0	0	3.9	0	2.6	0	0	0	0	0	2.2	0	1.4	1.5



TRAFFIC DATA COLLECTION

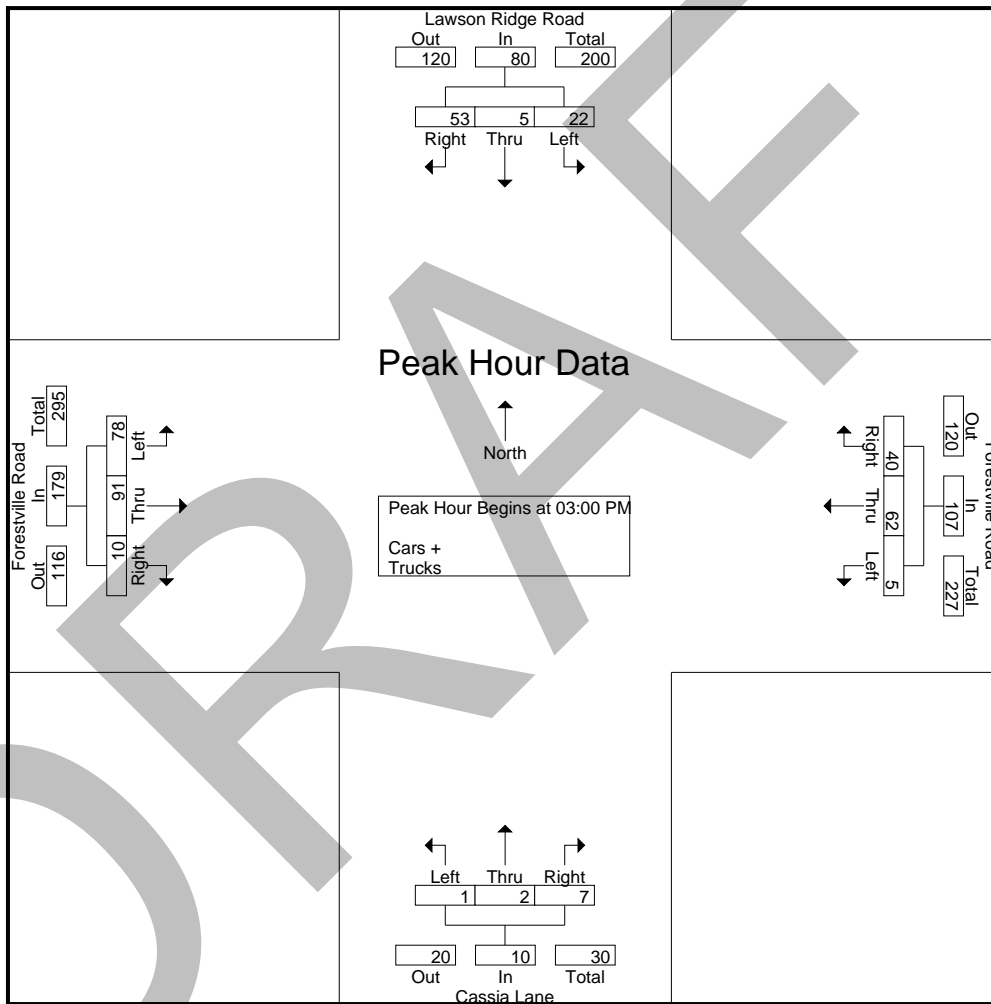
File Name : Knightdale(Forestville and Cassia) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Lawson Ridge Road Southbound				Forestville Road Westbound				Cassia Lane Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	2	1	1	4	2	8	0	10	0	0	0	0	0	3	4	7	21
03:05 PM	1	0	0	1	0	10	0	10	0	0	0	0	0	9	1	10	21
03:10 PM	1	1	0	2	3	4	0	7	1	0	0	1	0	4	8	12	22
03:15 PM	0	0	0	0	3	9	1	13	0	0	0	0	1	8	5	14	27
03:20 PM	2	1	1	4	4	4	1	9	1	0	0	1	1	10	3	14	28
03:25 PM	4	2	2	8	3	3	0	6	1	1	0	2	1	10	6	17	33
03:30 PM	3	0	1	4	5	6	1	12	2	0	0	2	1	9	5	15	33
03:35 PM	3	0	1	4	6	5	0	11	0	0	0	0	0	6	6	12	27
03:40 PM	2	0	0	2	5	7	0	12	0	1	1	2	3	10	14	27	43
03:45 PM	6	0	3	9	4	2	0	6	0	0	0	0	0	5	8	13	28
03:50 PM	13	0	7	20	2	3	0	5	1	0	0	1	1	10	9	20	46
03:55 PM	16	0	6	22	3	1	2	6	1	0	0	1	2	7	9	18	47
Total Volume	53	5	22	80	40	62	5	107	7	2	1	10	10	91	78	179	376
% App. Total	66.2	6.2	27.5		37.4	57.9	4.7		70	20	10		5.6	50.8	43.6		
PHF	.276	.208	.262	.303	.556	.517	.208	.686	.292	.167	.083	.417	.278	.758	.464	.552	.667



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Cassia) Mid
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Cassia)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Lawson Ridge Road Southbound				Forestville Road Westbound				Cassia Lane Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	22	0	7	29	2	7	0	9	1	1	0	2	0	8	11	19	59
04:05 PM	19	0	5	24	0	9	2	11	0	0	0	0	0	7	6	13	48
04:10 PM	16	0	0	16	2	8	1	11	2	0	1	3	0	7	6	13	43
04:15 PM	10	0	2	12	0	7	0	7	0	0	0	0	0	8	2	10	29
04:20 PM	3	0	2	5	0	11	1	12	1	0	0	1	0	15	4	19	37
04:25 PM	2	0	3	5	0	8	2	10	0	0	0	0	0	10	1	11	26
04:30 PM	3	0	0	3	0	10	1	11	0	0	0	0	3	9	0	12	26
04:35 PM	0	0	2	2	0	9	1	10	1	0	0	1	0	15	0	15	28
04:40 PM	1	0	1	2	1	9	0	10	0	0	0	0	0	16	1	17	29
04:45 PM	2	0	1	3	0	5	0	5	1	0	0	1	1	12	0	13	22
04:50 PM	2	0	1	3	4	8	0	12	0	0	0	0	0	25	2	27	42
04:55 PM	2	0	0	2	1	4	1	6	1	0	0	1	0	11	4	15	24
Total	82	0	24	106	10	95	9	114	7	1	1	9	4	143	37	184	413
05:00 PM	2	0	2	4	0	8	1	9	0	0	0	0	0	8	4	12	25
05:05 PM	3	0	2	5	0	5	0	5	1	0	0	1	0	17	3	20	31
05:10 PM	1	0	1	2	1	6	0	7	0	0	0	0	0	23	9	32	41
05:15 PM	1	0	1	2	1	10	0	11	0	1	0	1	0	22	3	25	39
05:20 PM	4	0	0	4	3	9	2	14	1	0	0	1	1	7	6	14	33
05:25 PM	2	0	3	5	9	10	0	19	0	0	0	0	1	10	7	18	42
05:30 PM	1	0	1	2	4	11	2	17	0	0	0	0	0	12	4	16	35
05:35 PM	2	0	1	3	6	7	1	14	0	0	0	0	0	14	10	24	41
05:40 PM	7	0	2	9	2	8	0	10	0	0	0	0	0	19	3	22	41
05:45 PM	3	0	0	3	3	5	0	8	1	0	0	1	0	9	4	13	25
05:50 PM	2	0	3	5	3	14	1	18	0	1	0	1	0	15	3	18	42
05:55 PM	3	0	2	5	1	9	1	11	0	0	0	0	0	11	8	19	35
Total	31	0	18	49	33	102	8	143	3	2	0	5	2	167	64	233	430
Grand Total	113	0	42	155	43	197	17	257	10	3	1	14	6	310	101	417	843
Apprch %	72.9	0	27.1		16.7	76.7	6.6		71.4	21.4	7.1		1.4	74.3	24.2		
Total %	13.4	0	5	18.4	5.1	23.4	2	30.5	1.2	0.4	0.1	1.7	0.7	36.8	12	49.5	
Cars +	113	0	42	155	43	192	17	252	10	3	1	14	6	305	101	412	833
% Cars +	100	0	100	100	100	97.5	100	98.1	100	100	100	100	100	98.4	100	98.8	98.8
Trucks	0	0	0	0	0	5	0	5	0	0	0	0	0	5	0	5	10
% Trucks	0	0	0	0	0	2.5	0	1.9	0	0	0	0	0	1.6	0	1.2	1.2



TRAFFIC DATA COLLECTION

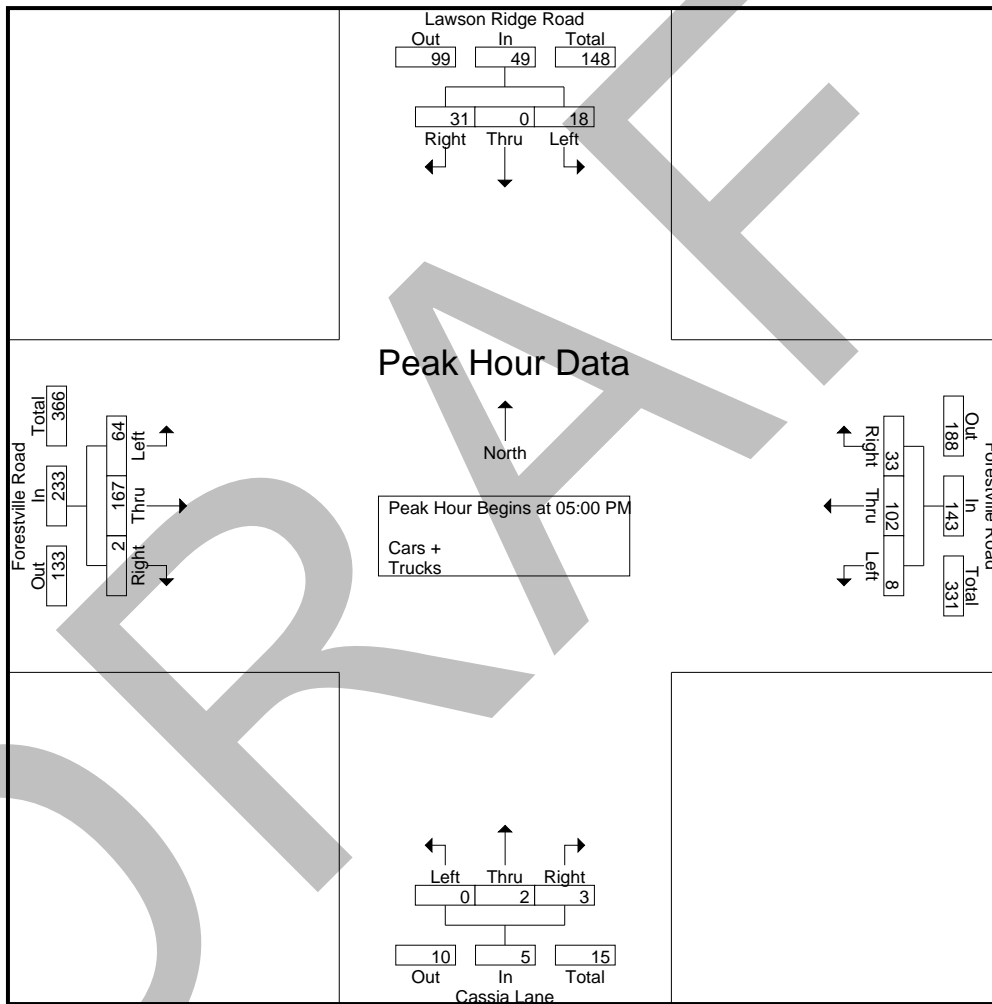
File Name : Knightdale(Forestville and Cassia)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Lawson Ridge Road Southbound				Forestville Road Westbound				Cassia Lane Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	0	2	4	0	8	1	9	0	0	0	0	0	8	4	12	25
05:05 PM	3	0	2	5	0	5	0	5	1	0	0	1	0	17	3	20	31
05:10 PM	1	0	1	2	1	6	0	7	0	0	0	0	0	23	9	32	41
05:15 PM	1	0	1	2	1	10	0	11	0	1	0	1	0	22	3	25	39
05:20 PM	4	0	0	4	3	9	2	14	1	0	0	1	1	7	6	14	33
05:25 PM	2	0	3	5	9	10	0	19	0	0	0	0	1	10	7	18	42
05:30 PM	1	0	1	2	4	11	2	17	0	0	0	0	0	12	4	16	35
05:35 PM	2	0	1	3	6	7	1	14	0	0	0	0	0	14	10	24	41
05:40 PM	7	0	2	9	2	8	0	10	0	0	0	0	0	19	3	22	41
05:45 PM	3	0	0	3	3	5	0	8	1	0	0	1	0	9	4	13	25
05:50 PM	2	0	3	5	3	14	1	18	0	1	0	1	0	15	3	18	42
05:55 PM	3	0	2	5	1	9	1	11	0	0	0	0	0	11	8	19	35
Total Volume	31	0	18	49	33	102	8	143	3	2	0	5	2	167	64	233	430
% App. Total	63.3	0	36.7		23.1	71.3	5.6		60	40	0		0.9	71.7	27.5		
PHF	.369	.000	.500	.454	.306	.607	.333	.627	.250	.167	.000	.417	.167	.605	.533	.607	.853



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Cassia)PM
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Old Knight)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Road Southbound			Old Knight Road Northbound			Forestville Road Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
07:00 AM	5	40	45	38	7	45	10	8	18	108
07:05 AM	13	35	48	42	12	54	5	4	9	111
07:10 AM	14	42	56	36	6	42	10	11	21	119
07:15 AM	7	53	60	37	8	45	5	5	10	115
07:20 AM	12	53	65	24	7	31	15	7	22	118
07:25 AM	17	50	67	9	11	20	9	2	11	98
07:30 AM	4	26	30	8	5	13	13	3	16	59
07:35 AM	4	28	32	9	9	18	6	2	8	58
07:40 AM	5	20	25	14	9	23	12	2	14	62
07:45 AM	2	12	14	8	8	16	9	0	9	39
07:50 AM	3	10	13	10	10	20	8	3	11	44
07:55 AM	3	17	20	10	9	19	12	3	15	54
Total	89	386	475	245	101	346	114	50	164	985
08:00 AM	4	7	11	7	10	17	17	2	19	47
08:05 AM	2	8	10	5	9	14	13	8	21	45
08:10 AM	4	11	15	8	3	11	7	3	10	36
08:15 AM	3	7	10	7	12	19	16	2	18	47
08:20 AM	4	12	16	3	2	5	11	2	13	34
08:25 AM	1	7	8	8	4	12	4	3	7	27
08:30 AM	1	9	10	6	4	10	9	3	12	32
08:35 AM	4	11	15	3	11	14	9	3	12	41
08:40 AM	7	8	15	6	12	18	5	0	5	38
08:45 AM	4	5	9	7	7	14	13	6	19	42
08:50 AM	3	7	10	6	11	17	11	2	13	40
08:55 AM	2	10	12	13	6	19	7	5	12	43
Total	39	102	141	79	91	170	122	39	161	472
Grand Total	128	488	616	324	192	516	236	89	325	1457
Apprch %	20.8	79.2		62.8	37.2		72.6	27.4		
Total %	8.8	33.5	42.3	22.2	13.2	35.4	16.2	6.1	22.3	
Cars +	125	481	606	314	191	505	232	89	321	1432
% Cars +	97.7	98.6	98.4	96.9	99.5	97.9	98.3	100	98.8	98.3
Trucks	3	7	10	10	1	11	4	0	4	25
% Trucks	2.3	1.4	1.6	3.1	0.5	2.1	1.7	0	1.2	1.7



TRAFFIC DATA COLLECTION

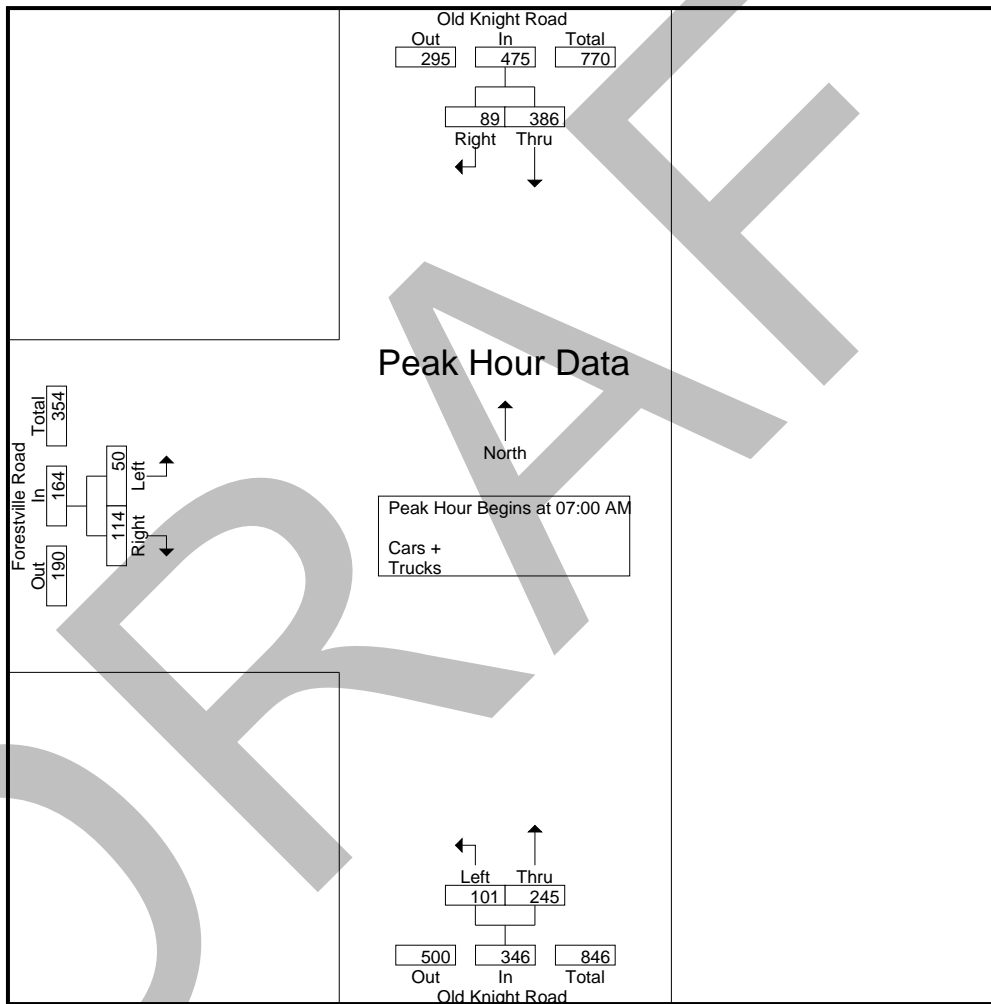
File Name : Knightdale(Forestville and Old Knight)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Old Knight Road Southbound			Old Knight Road Northbound			Forestville Road Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	5	40	45	38	7	45	10	8	18	108
07:05 AM	13	35	48	42	12	54	5	4	9	111
07:10 AM	14	42	56	36	6	42	10	11	21	119
07:15 AM	7	53	60	37	8	45	5	5	10	115
07:20 AM	12	53	65	24	7	31	15	7	22	118
07:25 AM	17	50	67	9	11	20	9	2	11	98
07:30 AM	4	26	30	8	5	13	13	3	16	59
07:35 AM	4	28	32	9	9	18	6	2	8	58
07:40 AM	5	20	25	14	9	23	12	2	14	62
07:45 AM	2	12	14	8	8	16	9	0	9	39
07:50 AM	3	10	13	10	10	20	8	3	11	44
07:55 AM	3	17	20	10	9	19	12	3	15	54
Total Volume	89	386	475	245	101	346	114	50	164	985
% App. Total	18.7	81.3		70.8	29.2		69.5	30.5		
PHF	.436	.607	.591	.486	.701	.534	.633	.379	.621	.690



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Old Knight)AM
Site Code :
Start Date : 9/10/2019
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Old Knight) Mid
 Site Code :
 Start Date : 9/19/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	old knight rd Southbound			old knight rd Northbound			forestville road Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
02:00 PM	0	6	6	8	2	10	3	4	7	23
02:05 PM	0	9	9	15	5	20	7	4	11	40
02:10 PM	1	6	7	11	8	19	6	2	8	34
02:15 PM	1	2	3	17	2	19	6	2	8	30
02:20 PM	8	23	31	12	4	16	5	1	6	53
02:25 PM	13	37	50	9	3	12	9	2	11	73
02:30 PM	5	23	28	13	2	15	15	3	18	61
02:35 PM	2	11	13	12	4	16	9	3	12	41
02:40 PM	1	14	15	12	5	17	9	1	10	42
02:45 PM	1	11	12	11	5	16	7	1	8	36
02:50 PM	3	9	12	9	4	13	7	5	12	37
02:55 PM	1	8	9	9	7	16	6	1	7	32
Total	36	159	195	138	51	189	89	29	118	502
03:00 PM	2	8	10	9	8	17	4	0	4	31
03:05 PM	1	13	14	6	9	15	7	2	9	38
03:10 PM	1	8	9	6	6	12	6	0	6	27
03:15 PM	5	9	14	11	8	19	5	0	5	38
03:20 PM	2	9	11	12	7	19	6	2	8	38
03:25 PM	2	12	14	7	4	11	13	5	18	43
03:30 PM	7	14	21	7	8	15	10	1	11	47
03:35 PM	6	6	12	10	7	17	9	2	11	40
03:40 PM	2	8	10	18	8	26	10	2	12	48
03:45 PM	1	14	15	9	3	12	4	1	5	32
03:50 PM	3	6	9	11	5	16	13	7	20	45
03:55 PM	5	10	15	17	5	22	11	8	19	56
Total	37	117	154	123	78	201	98	30	128	483
Grand Total	73	276	349	261	129	390	187	59	246	985
Apprch %	20.9	79.1		66.9	33.1		76	24		
Total %	7.4	28	35.4	26.5	13.1	39.6	19	6	25	
Cars +	72	274	346	258	126	384	184	58	242	972
% Cars +	98.6	99.3	99.1	98.9	97.7	98.5	98.4	98.3	98.4	98.7
Trucks	1	2	3	3	3	6	3	1	4	13
% Trucks	1.4	0.7	0.9	1.1	2.3	1.5	1.6	1.7	1.6	1.3



TRAFFIC DATA COLLECTION

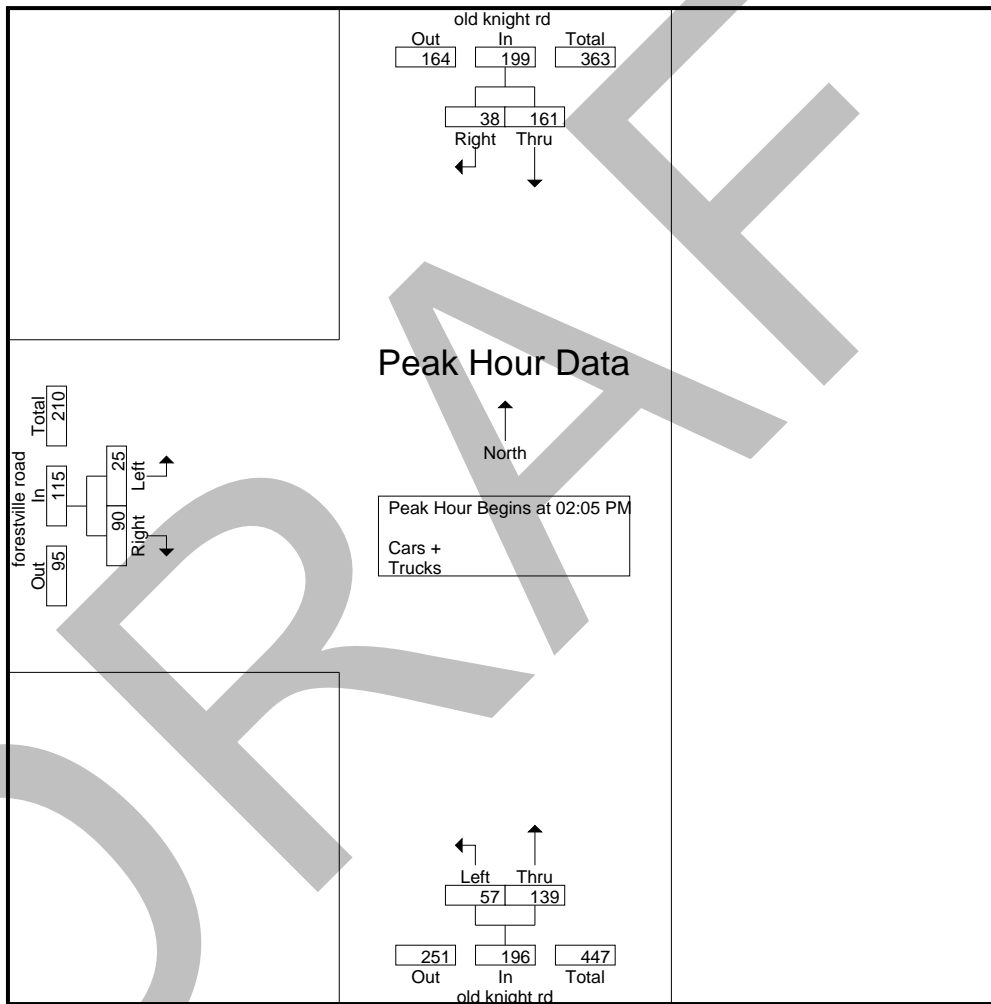
File Name : Knightdale(Forestville and Old Knight) Mid
 Site Code :
 Start Date : 9/19/2019
 Page No : 2

Start Time	old knight rd Southbound			old knight rd Northbound			forestville road Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:05 PM										
02:05 PM	0	9	9	15	5	20	7	4	11	40
02:10 PM	1	6	7	11	8	19	6	2	8	34
02:15 PM	1	2	3	17	2	19	6	2	8	30
02:20 PM	8	23	31	12	4	16	5	1	6	53
02:25 PM	13	37	50	9	3	12	9	2	11	73
02:30 PM	5	23	28	13	2	15	15	3	18	61
02:35 PM	2	11	13	12	4	16	9	3	12	41
02:40 PM	1	14	15	12	5	17	9	1	10	42
02:45 PM	1	11	12	11	5	16	7	1	8	36
02:50 PM	3	9	12	9	4	13	7	5	12	37
02:55 PM	1	8	9	9	7	16	6	1	7	32
03:00 PM	2	8	10	9	8	17	4	0	4	31
Total Volume	38	161	199	139	57	196	90	25	115	510
% App. Total	19.1	80.9		70.9	29.1		78.3	21.7		
PHF	.244	.363	.332	.681	.594	.817	.500	.417	.532	.582



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Old Knight) Mid
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Old Knight)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Road Southbound			Old Knight Road Northbound			Forestville Road Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
04:00 PM	2	7	9	13	7	20	8	8	16	45
04:05 PM	1	14	15	13	11	24	7	4	11	50
04:10 PM	2	17	19	18	4	22	7	5	12	53
04:15 PM	0	17	17	12	6	18	7	4	11	46
04:20 PM	1	10	11	17	10	27	10	3	13	51
04:25 PM	3	5	8	15	8	23	14	3	17	48
04:30 PM	2	19	21	15	5	20	7	1	8	49
04:35 PM	5	17	22	14	4	18	12	6	18	58
04:40 PM	1	19	20	14	9	23	12	5	17	60
04:45 PM	0	17	17	22	2	24	10	2	12	53
04:50 PM	3	17	20	20	10	30	15	6	21	71
04:55 PM	1	14	15	19	8	27	10	4	14	56
Total	21	173	194	192	84	276	119	51	170	640
05:00 PM	6	20	26	17	2	19	8	4	12	57
05:05 PM	1	22	23	16	5	21	16	2	18	62
05:10 PM	1	7	8	12	7	19	14	8	22	49
05:15 PM	2	5	7	15	10	25	20	2	22	54
05:20 PM	3	16	19	18	12	30	9	3	12	61
05:25 PM	3	10	13	16	16	32	8	3	11	56
05:30 PM	1	14	15	29	9	38	13	3	16	69
05:35 PM	7	23	30	14	7	21	7	3	10	61
05:40 PM	2	14	16	14	8	22	18	5	23	61
05:45 PM	6	7	13	24	6	30	9	4	13	56
05:50 PM	5	11	16	28	14	42	8	4	12	70
05:55 PM	1	16	17	29	5	34	12	4	16	67
Total	38	165	203	232	101	333	142	45	187	723
Grand Total	59	338	397	424	185	609	261	96	357	1363
Apprch %	14.9	85.1		69.6	30.4		73.1	26.9		
Total %	4.3	24.8	29.1	31.1	13.6	44.7	19.1	7	26.2	
Cars +	59	335	394	421	179	600	255	96	351	1345
% Cars +	100	99.1	99.2	99.3	96.8	98.5	97.7	100	98.3	98.7
Trucks	0	3	3	3	6	9	6	0	6	18
% Trucks	0	0.9	0.8	0.7	3.2	1.5	2.3	0	1.7	1.3



TRAFFIC DATA COLLECTION

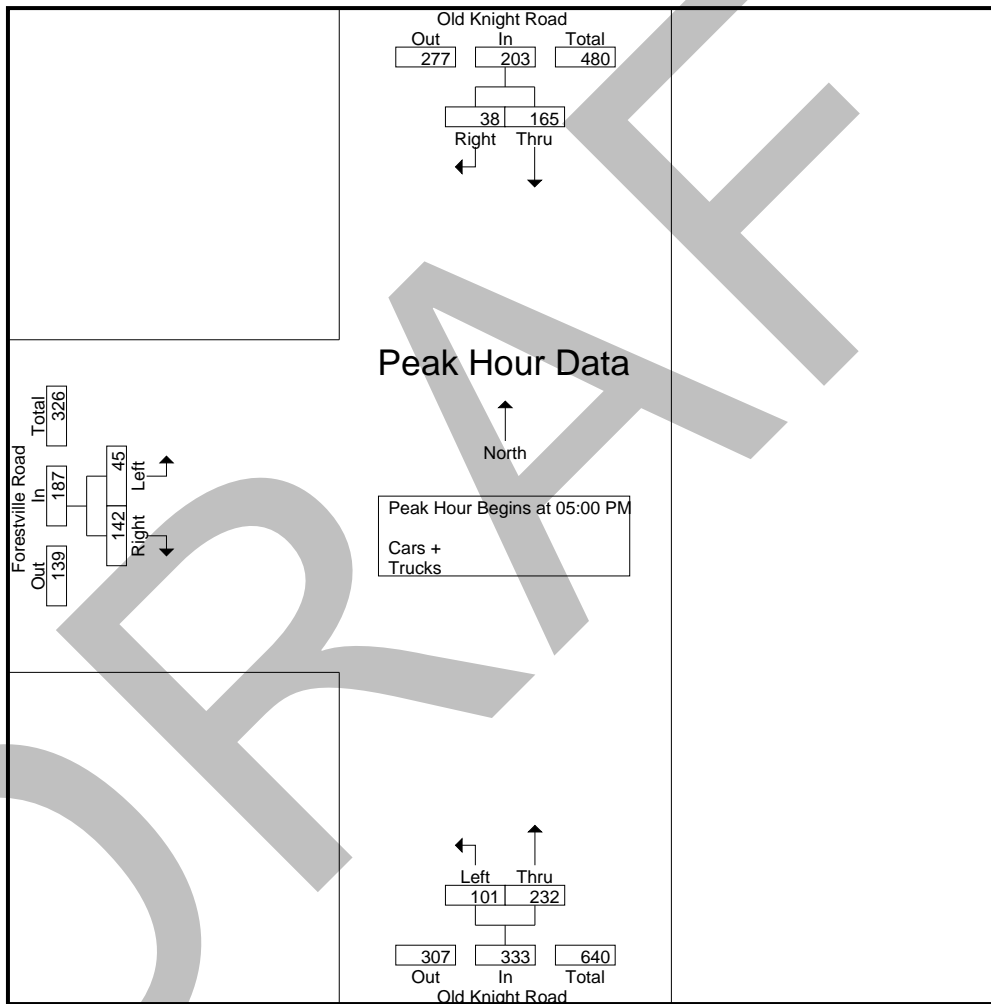
File Name : Knightdale(Forestville and Old Knight)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Old Knight Road Southbound			Old Knight Road Northbound			Forestville Road Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	6	20	26	17	2	19	8	4	12	57
05:05 PM	1	22	23	16	5	21	16	2	18	62
05:10 PM	1	7	8	12	7	19	14	8	22	49
05:15 PM	2	5	7	15	10	25	20	2	22	54
05:20 PM	3	16	19	18	12	30	9	3	12	61
05:25 PM	3	10	13	16	16	32	8	3	11	56
05:30 PM	1	14	15	29	9	38	13	3	16	69
05:35 PM	7	23	30	14	7	21	7	3	10	61
05:40 PM	2	14	16	14	8	22	18	5	23	61
05:45 PM	6	7	13	24	6	30	9	4	13	56
05:50 PM	5	11	16	28	14	42	8	4	12	70
05:55 PM	1	16	17	29	5	34	12	4	16	67
Total Volume	38	165	203	232	101	333	142	45	187	723
% App. Total	18.7	81.3		69.7	30.3		75.9	24.1		
PHF	.452	.598	.564	.667	.526	.661	.592	.469	.678	.861



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Old Knight)PM
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Pebble Brook)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Forestville Road Westbound			Pebblebrook Drive Northbound			Forestville Road Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
07:00 AM	18	0	18	0	0	0	0	14	14	32
07:05 AM	29	0	29	0	0	0	0	19	19	48
07:10 AM	21	0	21	0	0	0	1	7	8	29
07:15 AM	20	0	20	1	1	2	0	12	12	34
07:20 AM	21	0	21	0	0	0	0	25	25	46
07:25 AM	25	0	25	1	0	1	0	9	9	35
07:30 AM	9	1	10	1	0	1	0	16	16	27
07:35 AM	12	0	12	0	1	1	0	13	13	26
07:40 AM	16	1	17	1	0	1	0	9	9	27
07:45 AM	10	0	10	0	3	3	0	10	10	23
07:50 AM	12	0	12	0	0	0	0	11	11	23
07:55 AM	11	0	11	0	1	1	0	16	16	28
Total	204	2	206	4	6	10	1	161	162	378
08:00 AM	14	0	14	1	0	1	0	18	18	33
08:05 AM	13	0	13	0	0	0	0	15	15	28
08:10 AM	7	0	7	1	0	1	1	11	12	20
08:15 AM	19	0	19	0	0	0	1	19	20	39
08:20 AM	5	0	5	0	1	1	0	10	10	16
08:25 AM	7	0	7	0	3	3	1	7	8	18
08:30 AM	4	0	4	0	0	0	1	12	13	17
08:35 AM	13	1	14	1	0	1	0	9	9	24
08:40 AM	20	0	20	0	0	0	0	6	6	26
08:45 AM	13	1	14	0	1	1	0	17	17	32
08:50 AM	14	0	14	1	1	2	0	15	15	31
08:55 AM	8	0	8	0	0	0	0	15	15	23
Total	137	2	139	4	6	10	4	154	158	307
Grand Total	341	4	345	8	12	20	5	315	320	685
Apprch %	98.8	1.2		40	60		1.6	98.4		
Total %	49.8	0.6	50.4	1.2	1.8	2.9	0.7	46	46.7	
Cars +	331	4	335	7	12	19	4	300	304	658
% Cars +	97.1	100	97.1	87.5	100	95	80	95.2	95	96.1
Trucks	10	0	10	1	0	1	1	15	16	27
% Trucks	2.9	0	2.9	12.5	0	5	20	4.8	5	3.9



TRAFFIC DATA COLLECTION

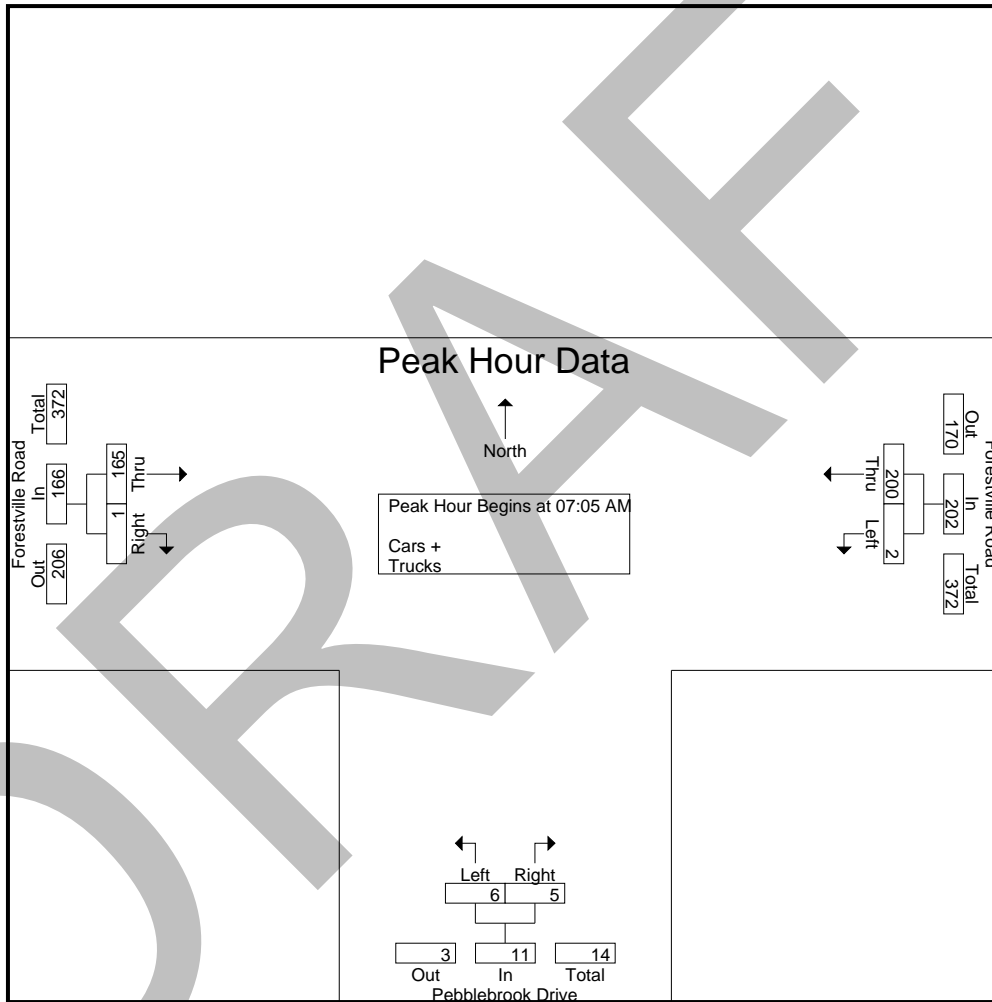
File Name : Knightdale(Forestville and Pebble Brook)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Forestville Road Westbound			Pebblebrook Drive Northbound			Forestville Road Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:05 AM										
07:05 AM	29	0	29	0	0	0	0	19	19	48
07:10 AM	21	0	21	0	0	0	1	7	8	29
07:15 AM	20	0	20	1	1	2	0	12	12	34
07:20 AM	21	0	21	0	0	0	0	25	25	46
07:25 AM	25	0	25	1	0	1	0	9	9	35
07:30 AM	9	1	10	1	0	1	0	16	16	27
07:35 AM	12	0	12	0	1	1	0	13	13	26
07:40 AM	16	1	17	1	0	1	0	9	9	27
07:45 AM	10	0	10	0	3	3	0	10	10	23
07:50 AM	12	0	12	0	0	0	0	11	11	23
07:55 AM	11	0	11	0	1	1	0	16	16	28
08:00 AM	14	0	14	1	0	1	0	18	18	33
Total Volume	200	2	202	5	6	11	1	165	166	379
% App. Total	99	1		45.5	54.5		0.6	99.4		
PHF	.575	.167	.580	.417	.167	.306	.083	.550	.553	.658



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Pebble Brook)AM
Site Code :
Start Date : 9/10/2019
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Pebble Brook) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Forestville Road Westbound			Pebblebrook Drive Northbound			Forestville Road Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
02:00 PM	3	0	3	1	0	1	0	7	7	11
02:05 PM	4	0	4	0	1	1	1	12	13	18
02:10 PM	10	0	10	0	0	0	1	6	7	17
02:15 PM	1	0	1	1	0	1	0	6	6	8
02:20 PM	12	0	12	0	0	0	0	6	6	18
02:25 PM	14	0	14	0	0	0	0	15	15	29
02:30 PM	9	0	9	0	0	0	1	14	15	24
02:35 PM	6	0	6	0	0	0	0	12	12	18
02:40 PM	5	0	5	1	0	1	0	6	6	12
02:45 PM	6	0	6	0	2	2	0	10	10	18
02:50 PM	7	0	7	0	0	0	0	11	11	18
02:55 PM	9	0	9	1	0	1	0	6	6	16
Total	86	0	86	4	3	7	3	111	114	207
03:00 PM	11	0	11	1	0	1	0	4	4	16
03:05 PM	9	0	9	1	0	1	0	8	8	18
03:10 PM	7	0	7	0	0	0	0	6	6	13
03:15 PM	13	0	13	0	0	0	0	7	7	20
03:20 PM	9	0	9	0	0	0	1	10	11	20
03:25 PM	6	0	6	0	0	0	0	12	12	18
03:30 PM	14	1	15	0	1	1	0	12	12	28
03:35 PM	14	0	14	1	0	1	0	9	9	24
03:40 PM	10	1	11	0	0	0	0	11	11	22
03:45 PM	5	0	5	0	0	0	1	7	8	13
03:50 PM	9	0	9	0	1	1	3	16	19	29
03:55 PM	11	0	11	1	2	3	0	19	19	33
Total	118	2	120	4	4	8	5	121	126	254
Grand Total	204	2	206	8	7	15	8	232	240	461
Apprch %	99	1		53.3	46.7		3.3	96.7		
Total %	44.3	0.4	44.7	1.7	1.5	3.3	1.7	50.3	52.1	
Cars +	189	2	191	7	7	14	8	226	234	439
% Cars +	92.6	100	92.7	87.5	100	93.3	100	97.4	97.5	95.2
Trucks	15	0	15	1	0	1	0	6	6	22
% Trucks	7.4	0	7.3	12.5	0	6.7	0	2.6	2.5	4.8



TRAFFIC DATA COLLECTION

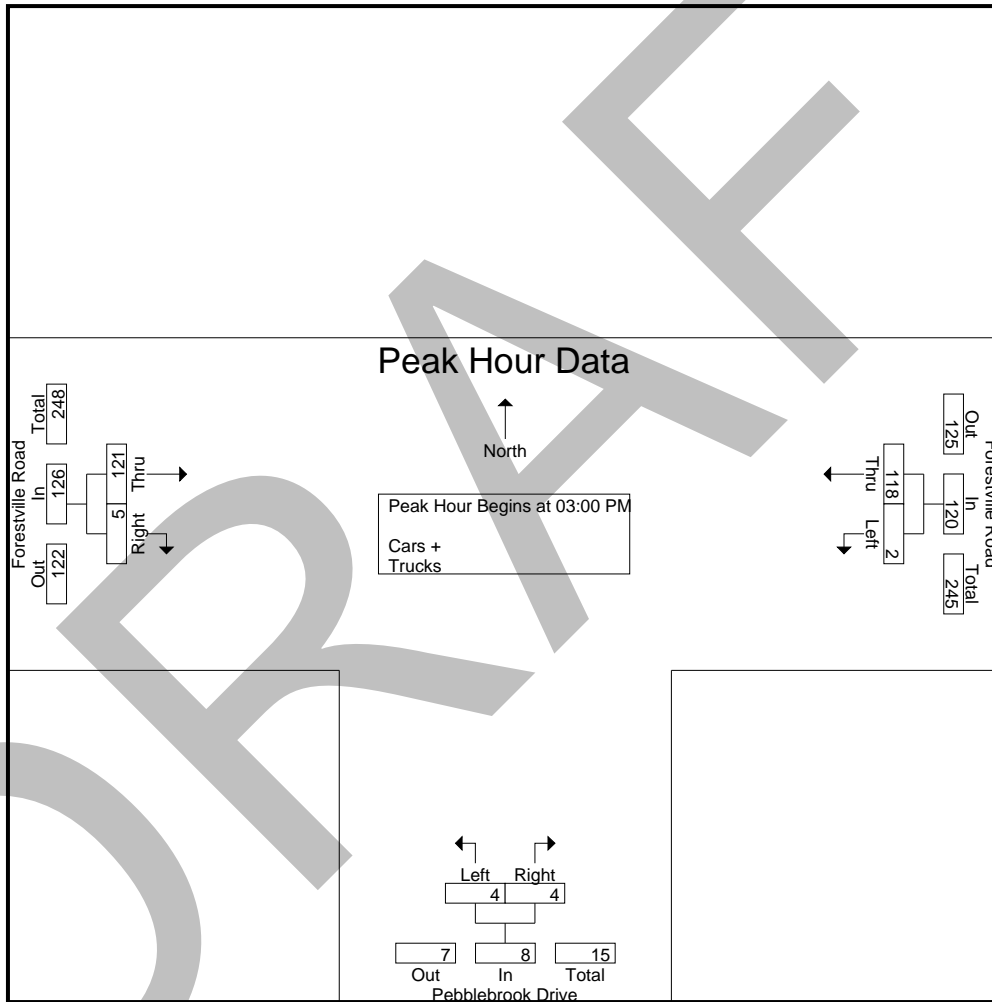
File Name : Knightdale(Forestville and Pebble Brook) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Forestville Road Westbound			Pebblebrook Drive Northbound			Forestville Road Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	11	0	11	1	0	1	0	4	4	16
03:05 PM	9	0	9	1	0	1	0	8	8	18
03:10 PM	7	0	7	0	0	0	0	6	6	13
03:15 PM	13	0	13	0	0	0	0	7	7	20
03:20 PM	9	0	9	0	0	0	1	10	11	20
03:25 PM	6	0	6	0	0	0	0	12	12	18
03:30 PM	14	1	15	0	1	1	0	12	12	28
03:35 PM	14	0	14	1	0	1	0	9	9	24
03:40 PM	10	1	11	0	0	0	0	11	11	22
03:45 PM	5	0	5	0	0	0	1	7	8	13
03:50 PM	9	0	9	0	1	1	3	16	19	29
03:55 PM	11	0	11	1	2	3	0	19	19	33
Total Volume	118	2	120	4	4	8	5	121	126	254
% App. Total	98.3	1.7		50	50		4	96		
PHF	.702	.167	.667	.333	.167	.222	.139	.531	.553	.641



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Pebble Brook) Mid
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Pebble Brook)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Forestville Road Westbound			Pebblebrook Drive Northbound			Forestville Road Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
04:00 PM	9	0	9	0	0	0	0	16	16	25
04:05 PM	9	0	9	0	1	1	0	14	14	24
04:10 PM	11	0	11	1	0	1	0	9	9	21
04:15 PM	7	0	7	1	0	1	0	10	10	18
04:20 PM	12	1	13	0	1	1	0	19	19	33
04:25 PM	12	0	12	0	0	0	0	13	13	25
04:30 PM	9	0	9	0	0	0	1	6	7	16
04:35 PM	10	0	10	0	0	0	0	20	20	30
04:40 PM	11	0	11	0	0	0	1	15	16	27
04:45 PM	3	0	3	0	0	0	1	13	14	17
04:50 PM	12	1	13	0	0	0	1	22	23	36
04:55 PM	7	0	7	0	0	0	0	16	16	23
Total	112	2	114	2	2	4	4	173	177	295
05:00 PM	11	0	11	2	0	2	1	8	9	22
05:05 PM	7	0	7	0	0	0	0	21	21	28
05:10 PM	7	0	7	1	0	1	2	19	21	29
05:15 PM	11	0	11	2	0	2	2	24	26	39
05:20 PM	15	0	15	0	0	0	0	13	13	28
05:25 PM	19	0	19	0	0	0	0	13	13	32
05:30 PM	13	0	13	1	0	1	0	14	14	28
05:35 PM	14	1	15	0	0	0	2	11	13	28
05:40 PM	10	0	10	0	0	0	0	21	21	31
05:45 PM	9	1	10	0	0	0	0	12	12	22
05:50 PM	19	1	20	0	0	0	0	15	15	35
05:55 PM	9	0	9	1	0	1	0	17	17	27
Total	144	3	147	7	0	7	7	188	195	349
Grand Total	256	5	261	9	2	11	11	361	372	644
Apprch %	98.1	1.9		81.8	18.2		3	97		
Total %	39.8	0.8	40.5	1.4	0.3	1.7	1.7	56.1	57.8	
Cars +	250	5	255	9	2	11	11	350	361	627
% Cars +	97.7	100	97.7	100	100	100	100	97	97	97.4
Trucks	6	0	6	0	0	0	0	11	11	17
% Trucks	2.3	0	2.3	0	0	0	0	3	3	2.6



TRAFFIC DATA COLLECTION

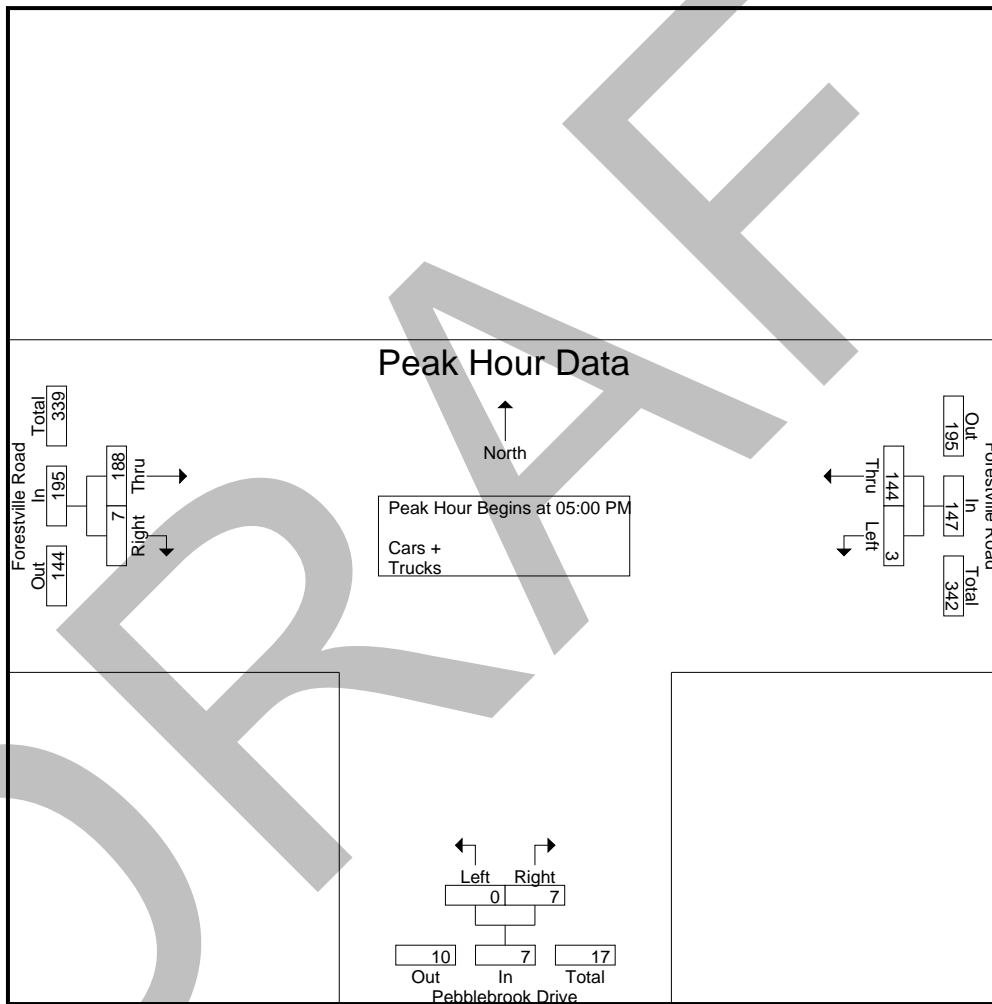
File Name : Knightdale(Forestville and Pebble Brook)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Forestville Road Westbound			Pebblebrook Drive Northbound			Forestville Road Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	11	0	11	2	0	2	1	8	9	22
05:05 PM	7	0	7	0	0	0	0	21	21	28
05:10 PM	7	0	7	1	0	1	2	19	21	29
05:15 PM	11	0	11	2	0	2	2	24	26	39
05:20 PM	15	0	15	0	0	0	0	13	13	28
05:25 PM	19	0	19	0	0	0	0	13	13	32
05:30 PM	13	0	13	1	0	1	0	14	14	28
05:35 PM	14	1	15	0	0	0	2	11	13	28
05:40 PM	10	0	10	0	0	0	0	21	21	31
05:45 PM	9	1	10	0	0	0	0	12	12	22
05:50 PM	19	1	20	0	0	0	0	15	15	35
05:55 PM	9	0	9	1	0	1	0	17	17	27
Total Volume	144	3	147	7	0	7	7	188	195	349
% App. Total	98	2		100	0		3.6	96.4		
PHF	.632	.250	.613	.292	.000	.292	.292	.653	.625	.746



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Pebble Brook)PM
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Smithfeild)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Horton Road Southbound				Forestville Road Westbound				Smithfield Road Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	2	14	2	18	1	13	3	17	6	13	9	28	10	7	5	22	85
07:05 AM	1	12	2	15	1	18	5	24	5	18	13	36	10	15	8	33	108
07:10 AM	2	17	1	20	1	26	3	30	2	16	10	28	12	9	2	23	101
07:15 AM	2	13	0	15	2	13	2	17	6	23	20	49	3	10	1	14	95
07:20 AM	2	8	3	13	0	13	4	17	0	5	7	12	17	18	1	36	78
07:25 AM	0	23	1	24	0	15	6	21	4	8	8	20	15	4	1	20	85
07:30 AM	3	14	1	18	1	10	7	18	4	5	7	16	23	12	4	39	91
07:35 AM	0	8	3	11	0	9	3	12	0	5	11	16	22	7	0	29	68
07:40 AM	2	13	3	18	0	4	4	8	3	3	11	17	9	7	1	17	60
07:45 AM	3	8	1	12	0	16	3	19	3	3	7	13	11	10	1	22	66
07:50 AM	1	10	3	14	0	7	4	11	5	6	10	21	7	8	1	16	62
07:55 AM	0	12	4	16	3	6	5	14	3	4	9	16	10	9	0	19	65
Total	18	152	24	194	9	150	49	208	41	109	122	272	149	116	25	290	964
08:00 AM	2	14	0	16	1	8	1	10	9	4	3	16	10	8	1	19	61
08:05 AM	1	10	0	11	0	10	7	17	6	4	10	20	7	7	0	14	62
08:10 AM	0	13	1	14	0	2	8	10	11	6	11	28	12	8	0	20	72
08:15 AM	0	6	2	8	2	6	2	10	10	5	6	21	13	4	2	19	58
08:20 AM	3	6	0	9	1	9	1	11	7	8	7	22	11	0	2	13	55
08:25 AM	1	6	0	7	0	4	5	9	7	8	5	20	8	6	2	16	52
08:30 AM	2	6	1	9	1	3	2	6	2	3	3	8	5	10	3	18	41
08:35 AM	1	11	1	13	0	5	0	5	7	6	12	25	5	5	0	10	53
08:40 AM	1	9	3	13	0	3	1	4	3	1	9	13	8	5	2	15	45
08:45 AM	4	18	2	24	0	9	12	21	5	8	5	18	6	8	1	15	78
08:50 AM	3	13	2	18	1	8	16	25	4	5	13	22	6	9	1	16	81
08:55 AM	1	13	1	15	0	3	12	15	5	11	9	25	6	11	5	22	77
Total	19	125	13	157	6	70	67	143	76	69	93	238	97	81	19	197	735
Grand Total	37	277	37	351	15	220	116	351	117	178	215	510	246	197	44	487	1699
Apprch %	10.5	78.9	10.5		4.3	62.7	33		22.9	34.9	42.2		50.5	40.5	9		
Total %	2.2	16.3	2.2	20.7	0.9	12.9	6.8	20.7	6.9	10.5	12.7	30	14.5	11.6	2.6	28.7	
Cars +	36	275	37	348	15	219	116	350	116	178	206	500	242	193	44	479	1677
% Cars +	97.3	99.3	100	99.1	100	99.5	100	99.7	99.1	100	95.8	98	98.4	98	100	98.4	98.7
Trucks	1	2	0	3	0	1	0	1	1	0	9	10	4	4	0	8	22
% Trucks	2.7	0.7	0	0.9	0	0.5	0	0.3	0.9	0	4.2	2	1.6	2	0	1.6	1.3



TRAFFIC DATA COLLECTION

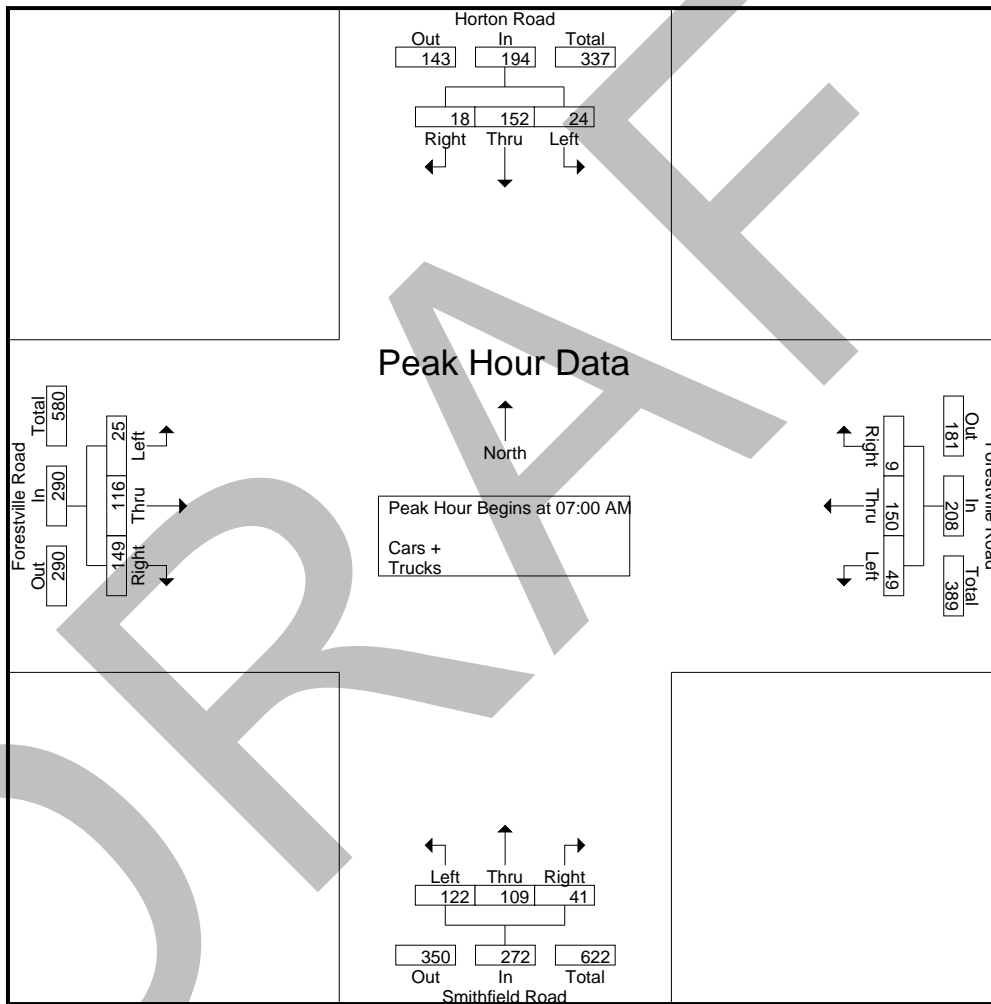
File Name : Knightdale(Forestville and Smithfeild)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Horton Road Southbound				Forestville Road Westbound				Smithfield Road Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	14	2	18	1	13	3	17	6	13	9	28	10	7	5	22	85
07:05 AM	1	12	2	15	1	18	5	24	5	18	13	36	10	15	8	33	108
07:10 AM	2	17	1	20	1	26	3	30	2	16	10	28	12	9	2	23	101
07:15 AM	2	13	0	15	2	13	2	17	6	23	20	49	3	10	1	14	95
07:20 AM	2	8	3	13	0	13	4	17	0	5	7	12	17	18	1	36	78
07:25 AM	0	23	1	24	0	15	6	21	4	8	8	20	15	4	1	20	85
07:30 AM	3	14	1	18	1	10	7	18	4	5	7	16	23	12	4	39	91
07:35 AM	0	8	3	11	0	9	3	12	0	5	11	16	22	7	0	29	68
07:40 AM	2	13	3	18	0	4	4	8	3	3	11	17	9	7	1	17	60
07:45 AM	3	8	1	12	0	16	3	19	3	3	7	13	11	10	1	22	66
07:50 AM	1	10	3	14	0	7	4	11	5	6	10	21	7	8	1	16	62
07:55 AM	0	12	4	16	3	6	5	14	3	4	9	16	10	9	0	19	65
Total Volume	18	152	24	194	9	150	49	208	41	109	122	272	149	116	25	290	964
% App. Total	9.3	78.4	12.4		4.3	72.1	23.6		15.1	40.1	44.9		51.4	40	8.6		
PHF	.500	.551	.500	.674	.250	.481	.583	.578	.569	.395	.508	.463	.540	.537	.260	.620	.744



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Smithfeild)AM
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Smithfield) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Horton Road Southbound				Forestville Road Westbound				Smithfield Road Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
02:00 PM	1	2	1	4	1	3	3	7	5	6	10	21	8	1	0	9	41
02:05 PM	0	4	1	5	0	1	1	2	5	11	9	25	21	10	1	32	64
02:10 PM	0	5	2	7	0	4	1	5	3	7	10	20	8	3	2	13	45
02:15 PM	0	4	0	4	0	3	2	5	0	10	13	23	7	4	1	12	44
02:20 PM	1	18	0	19	0	5	4	9	2	6	10	18	7	8	4	19	65
02:25 PM	6	32	1	39	3	8	3	14	0	6	8	14	17	8	1	26	93
02:30 PM	6	10	1	17	2	7	6	15	0	7	8	15	17	9	6	32	79
02:35 PM	4	13	1	18	0	3	4	7	1	7	13	21	12	5	0	17	63
02:40 PM	2	10	0	12	0	4	0	4	3	9	10	22	6	8	2	16	54
02:45 PM	4	13	2	19	2	6	3	11	1	6	4	11	11	7	3	21	62
02:50 PM	5	14	1	20	0	5	3	8	2	5	10	17	14	5	1	20	65
02:55 PM	0	6	2	8	1	7	0	8	2	8	4	14	10	3	0	13	43
Total	29	131	12	172	9	56	30	95	24	88	109	221	138	71	21	230	718
03:00 PM	0	8	0	8	1	7	2	10	2	9	6	17	10	5	1	16	51
03:05 PM	0	10	1	11	3	5	1	9	3	13	9	25	7	7	0	14	59
03:10 PM	2	8	4	14	2	3	1	6	5	9	6	20	13	2	1	16	56
03:15 PM	1	5	1	7	0	7	0	7	5	5	11	21	11	4	0	15	50
03:20 PM	1	10	2	13	0	4	2	6	4	6	7	17	20	10	1	31	67
03:25 PM	2	9	1	12	2	3	3	8	9	12	12	33	7	7	3	17	70
03:30 PM	0	11	6	17	1	5	6	12	4	8	10	22	10	5	0	15	66
03:35 PM	4	6	2	12	1	4	2	7	5	9	12	26	9	7	1	17	62
03:40 PM	2	8	2	12	1	7	2	10	9	6	13	28	11	14	1	26	76
03:45 PM	2	7	4	13	2	5	1	8	5	10	10	25	12	7	0	19	65
03:50 PM	2	9	7	18	4	6	9	19	7	5	6	18	6	10	0	16	71
03:55 PM	5	13	4	22	6	5	8	19	3	5	14	22	16	7	2	25	88
Total	21	104	34	159	23	61	37	121	61	97	116	274	132	85	10	227	781
Grand Total	50	235	46	331	32	117	67	216	85	185	225	495	270	156	31	457	1499
Apprch %	15.1	71	13.9		14.8	54.2	31		17.2	37.4	45.5		59.1	34.1	6.8		
Total %	3.3	15.7	3.1	22.1	2.1	7.8	4.5	14.4	5.7	12.3	15	33	18	10.4	2.1	30.5	
Cars +	50	235	45	330	32	113	67	212	85	185	222	492	268	153	29	450	1484
% Cars +	100	100	97.8	99.7	100	96.6	100	98.1	100	100	98.7	99.4	99.3	98.1	93.5	98.5	99
Trucks	0	0	1	1	0	4	0	4	0	0	3	3	2	3	2	7	15
% Trucks	0	0	2.2	0.3	0	3.4	0	1.9	0	0	1.3	0.6	0.7	1.9	6.5	1.5	1



TRAFFIC DATA COLLECTION

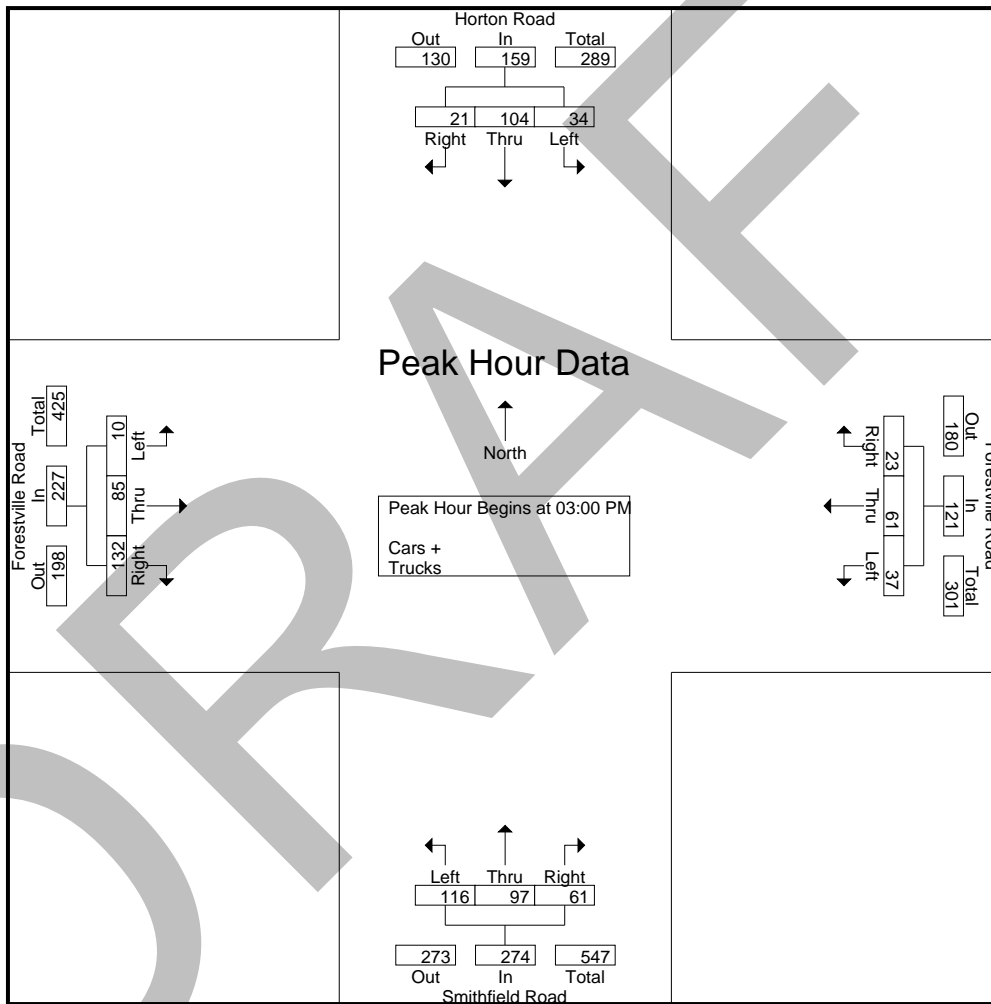
File Name : Knightdale(Forestville and Smithfield) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Horton Road Southbound				Forestville Road Westbound				Smithfield Road Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	0	8	0	8	1	7	2	10	2	9	6	17	10	5	1	16	51
03:05 PM	0	10	1	11	3	5	1	9	3	13	9	25	7	7	0	14	59
03:10 PM	2	8	4	14	2	3	1	6	5	9	6	20	13	2	1	16	56
03:15 PM	1	5	1	7	0	7	0	7	5	5	11	21	11	4	0	15	50
03:20 PM	1	10	2	13	0	4	2	6	4	6	7	17	20	10	1	31	67
03:25 PM	2	9	1	12	2	3	3	8	9	12	12	33	7	7	3	17	70
03:30 PM	0	11	6	17	1	5	6	12	4	8	10	22	10	5	0	15	66
03:35 PM	4	6	2	12	1	4	2	7	5	9	12	26	9	7	1	17	62
03:40 PM	2	8	2	12	1	7	2	10	9	6	13	28	11	14	1	26	76
03:45 PM	2	7	4	13	2	5	1	8	5	10	10	25	12	7	0	19	65
03:50 PM	2	9	7	18	4	6	9	19	7	5	6	18	6	10	0	16	71
03:55 PM	5	13	4	22	6	5	8	19	3	5	14	22	16	7	2	25	88
Total Volume	21	104	34	159	23	61	37	121	61	97	116	274	132	85	10	227	781
% App. Total	13.2	65.4	21.4		19	50.4	30.6		22.3	35.4	42.3		58.1	37.4	4.4		
PHF	.350	.667	.405	.602	.319	.726	.343	.531	.565	.622	.690	.692	.550	.506	.278	.610	.740



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Smithfield) Mid
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Smithfeild)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Horton Road Southbound				Forestville Road Westbound				Smothfield Road Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
04:00 PM	1	5	3	9	5	8	8	21	5	7	9	21	9	8	1	18	69
04:05 PM	1	7	1	9	6	12	14	32	5	8	8	21	9	5	0	14	76
04:10 PM	6	13	0	19	1	10	13	24	6	11	3	20	9	5	0	14	77
04:15 PM	3	11	1	15	0	7	9	16	3	13	12	28	12	6	0	18	77
04:20 PM	1	15	0	16	4	8	3	15	7	11	9	27	6	11	2	19	77
04:25 PM	0	17	0	17	1	6	1	8	3	14	14	31	6	13	3	22	78
04:30 PM	1	9	1	11	2	7	4	13	3	13	22	38	11	9	5	25	87
04:35 PM	4	16	0	20	0	6	4	10	4	9	10	23	10	3	1	14	67
04:40 PM	2	4	0	6	2	5	1	8	4	12	22	38	15	19	3	37	89
04:45 PM	2	7	0	9	0	7	2	9	3	16	7	26	8	10	0	18	62
04:50 PM	3	7	3	13	3	7	1	11	10	7	9	26	18	16	2	36	86
04:55 PM	2	9	0	11	1	5	4	10	5	16	8	29	5	6	2	13	63
Total	26	120	9	155	25	88	64	177	58	137	133	328	118	111	19	248	908
05:00 PM	2	12	1	15	0	6	4	10	3	7	21	31	9	9	1	19	75
05:05 PM	1	11	2	14	0	5	4	9	4	9	9	22	14	11	3	28	73
05:10 PM	2	10	1	13	0	11	2	13	6	14	15	35	13	20	2	35	96
05:15 PM	2	13	3	18	1	3	4	8	3	7	20	30	7	21	1	29	85
05:20 PM	0	10	0	10	1	6	5	12	4	13	12	29	9	17	1	27	78
05:25 PM	1	14	1	16	1	8	8	17	9	13	17	39	9	15	0	24	96
05:30 PM	1	5	0	6	1	12	6	19	8	12	14	34	11	8	3	22	81
05:35 PM	3	8	4	15	2	5	6	13	9	15	8	32	7	14	4	25	85
05:40 PM	2	11	0	13	0	7	4	11	9	20	16	45	12	12	3	27	96
05:45 PM	2	4	1	7	1	9	5	15	6	16	12	34	10	7	1	18	74
05:50 PM	3	7	1	11	1	7	3	11	7	7	10	24	14	8	1	23	69
05:55 PM	0	10	1	11	2	6	4	12	5	11	11	27	12	6	2	20	70
Total	19	115	15	149	10	85	55	150	73	144	165	382	127	148	22	297	978
Grand Total	45	235	24	304	35	173	119	327	131	281	298	710	245	259	41	545	1886
Apprch %	14.8	77.3	7.9		10.7	52.9	36.4		18.5	39.6	42		45	47.5	7.5		
Total %	2.4	12.5	1.3	16.1	1.9	9.2	6.3	17.3	6.9	14.9	15.8	37.6	13	13.7	2.2	28.9	
Cars +	45	235	24	304	35	169	119	323	131	281	298	710	245	255	41	541	1878
% Cars +	100	100	100	100	100	97.7	100	98.8	100	100	100	100	100	98.5	100	99.3	99.6
Trucks	0	0	0	0	0	4	0	4	0	0	0	0	0	4	0	4	8
% Trucks	0	0	0	0	0	2.3	0	1.2	0	0	0	0	0	1.5	0	0.7	0.4



TRAFFIC DATA COLLECTION

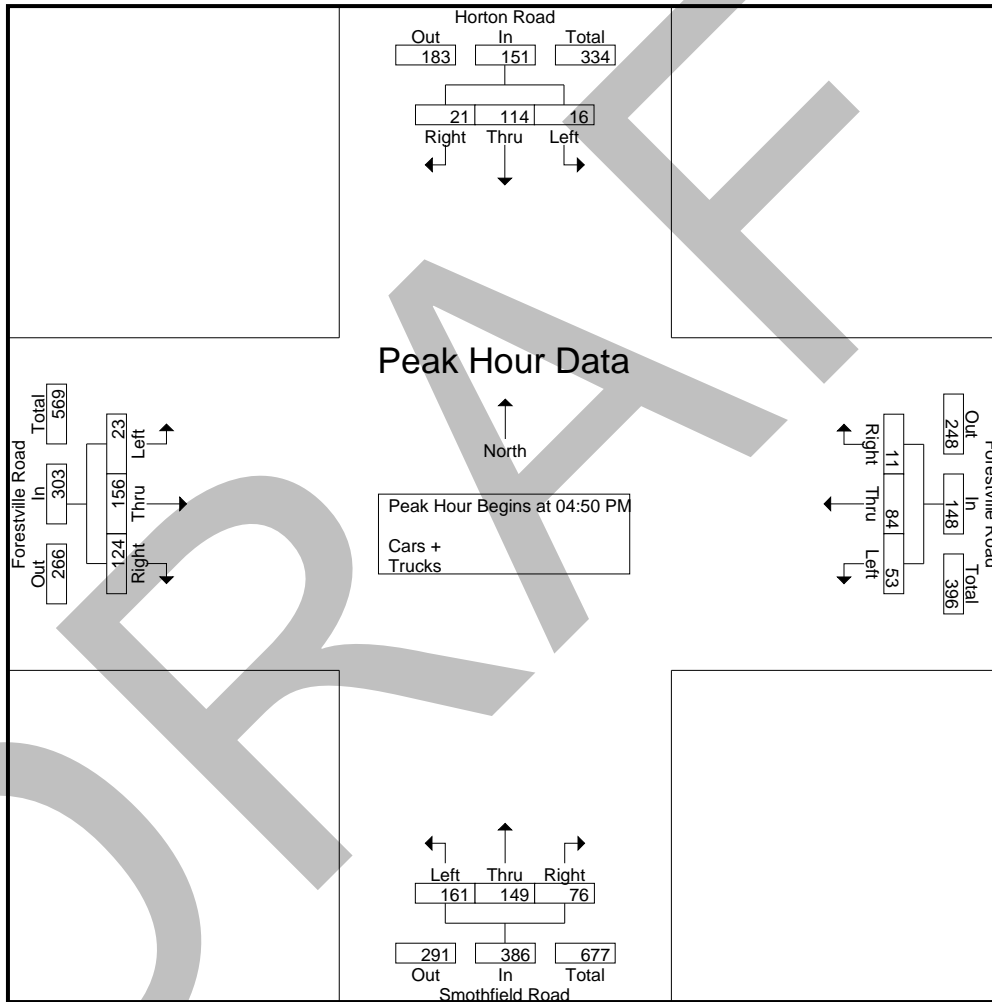
File Name : Knightdale(Forestville and Smithfeild)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Horton Road Southbound				Forestville Road Westbound				Smothfield Road Northbound				Forestville Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:50 PM																	
04:50 PM	3	7	3	13	3	7	1	11	10	7	9	26	18	16	2	36	86
04:55 PM	2	9	0	11	1	5	4	10	5	16	8	29	5	6	2	13	63
05:00 PM	2	12	1	15	0	6	4	10	3	7	21	31	9	9	1	19	75
05:05 PM	1	11	2	14	0	5	4	9	4	9	9	22	14	11	3	28	73
05:10 PM	2	10	1	13	0	11	2	13	6	14	15	35	13	20	2	35	96
05:15 PM	2	13	3	18	1	3	4	8	3	7	20	30	7	21	1	29	85
05:20 PM	0	10	0	10	1	6	5	12	4	13	12	29	9	17	1	27	78
05:25 PM	1	14	1	16	1	8	8	17	9	13	17	39	9	15	0	24	96
05:30 PM	1	5	0	6	1	12	6	19	8	12	14	34	11	8	3	22	81
05:35 PM	3	8	4	15	2	5	6	13	9	15	8	32	7	14	4	25	85
05:40 PM	2	11	0	13	0	7	4	11	9	20	16	45	12	12	3	27	96
05:45 PM	2	4	1	7	1	9	5	15	6	16	12	34	10	7	1	18	74
Total Volume	21	114	16	151	11	84	53	148	76	149	161	386	124	156	23	303	988
% App. Total	13.9	75.5	10.6		7.4	56.8	35.8		19.7	38.6	41.7		40.9	51.5	7.6		
PHF	.583	.679	.333	.699	.306	.583	.552	.649	.633	.621	.639	.715	.574	.619	.479	.701	.858



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Smithfeild)PM
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Western)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Forestville Rd Westbound			Western Church Driveway Northbound			Forestville Rd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
07:00 AM	17	0	17	0	0	0	0	15	15	32
07:05 AM	25	0	25	0	0	0	0	17	17	42
07:10 AM	20	0	20	0	0	0	0	7	7	27
07:15 AM	20	0	20	0	0	0	0	14	14	34
07:20 AM	21	0	21	0	0	0	0	23	23	44
07:25 AM	24	0	24	0	0	0	0	9	9	33
07:30 AM	10	0	10	0	0	0	0	15	15	25
07:35 AM	12	0	12	0	0	0	0	13	13	25
07:40 AM	16	0	16	0	0	0	0	9	9	25
07:45 AM	12	0	12	0	0	0	0	10	10	22
07:50 AM	12	0	12	0	0	0	0	10	10	22
07:55 AM	12	0	12	0	0	0	0	16	16	28
Total	201	0	201	0	0	0	0	158	158	359
08:00 AM	14	0	14	0	0	0	0	18	18	32
08:05 AM	13	0	13	0	0	0	0	14	14	27
08:10 AM	7	0	7	0	0	0	0	12	12	19
08:15 AM	16	0	16	0	0	0	0	20	20	36
08:20 AM	6	0	6	0	0	0	0	8	8	14
08:25 AM	9	0	9	0	0	0	0	9	9	18
08:30 AM	5	0	5	0	0	0	0	12	12	17
08:35 AM	13	0	13	0	0	0	0	9	9	22
08:40 AM	19	0	19	0	0	0	0	6	6	25
08:45 AM	14	0	14	0	0	0	0	16	16	30
08:50 AM	16	0	16	0	0	0	0	15	15	31
08:55 AM	7	0	7	0	0	0	0	16	16	23
Total	139	0	139	0	0	0	0	155	155	294
Grand Total	340	0	340	0	0	0	0	313	313	653
Apprch %	100	0		0	0		0	100		
Total %	52.1	0	52.1	0	0	0	0	47.9	47.9	
Cars +	340	0	340	0	0	0	0	307	307	647
% Cars +	100	0	100	0	0	0	0	98.1	98.1	99.1
Trucks	0	0	0	0	0	0	0	6	6	6
% Trucks	0	0	0	0	0	0	0	1.9	1.9	0.9



TRAFFIC DATA COLLECTION

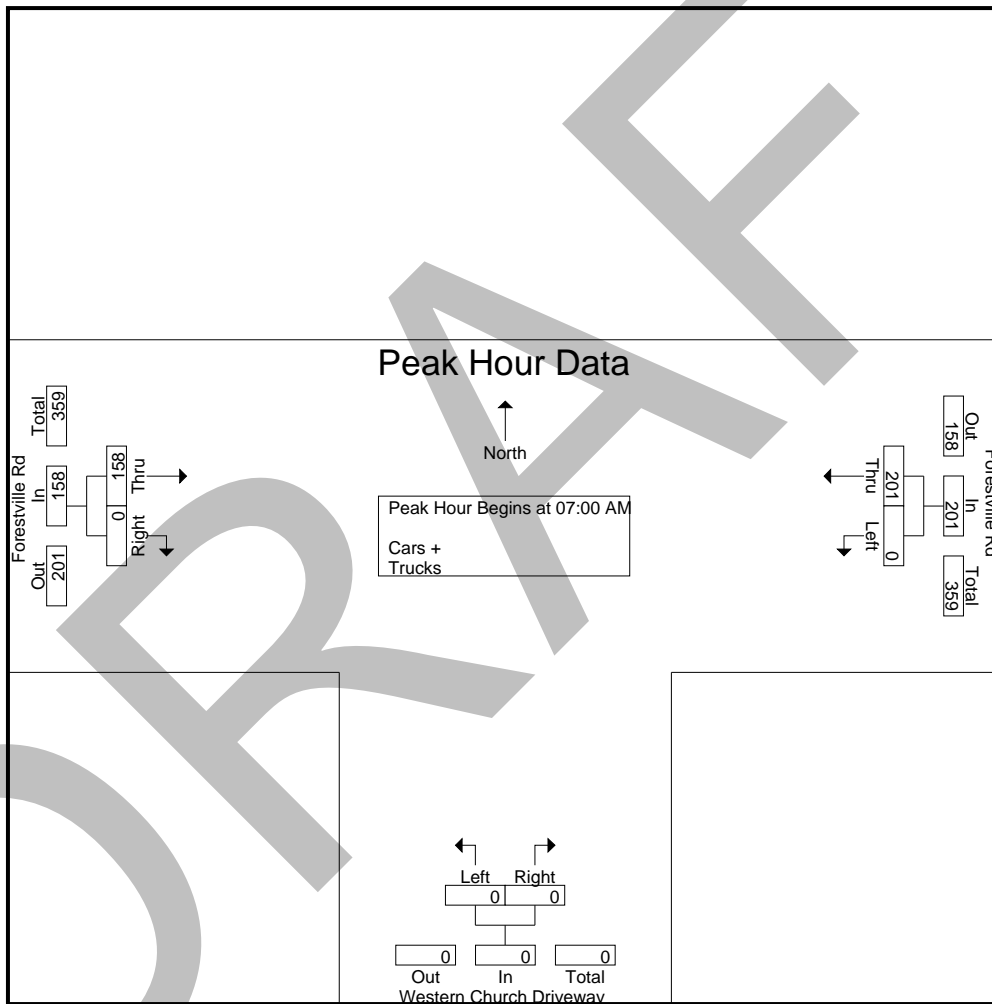
File Name : Knightdale(Forestville and Western)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Forestville Rd Westbound			Western Church Driveway Northbound			Forestville Rd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	17	0	17	0	0	0	0	15	15	32
07:05 AM	25	0	25	0	0	0	0	17	17	42
07:10 AM	20	0	20	0	0	0	0	7	7	27
07:15 AM	20	0	20	0	0	0	0	14	14	34
07:20 AM	21	0	21	0	0	0	0	23	23	44
07:25 AM	24	0	24	0	0	0	0	9	9	33
07:30 AM	10	0	10	0	0	0	0	15	15	25
07:35 AM	12	0	12	0	0	0	0	13	13	25
07:40 AM	16	0	16	0	0	0	0	9	9	25
07:45 AM	12	0	12	0	0	0	0	10	10	22
07:50 AM	12	0	12	0	0	0	0	10	10	22
07:55 AM	12	0	12	0	0	0	0	16	16	28
Total Volume	201	0	201	0	0	0	0	158	158	359
% App. Total	100	0		0	0		0	100		
PHF	.670	.000	.670	.000	.000	.000	.000	.572	.572	.680



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Western)AM
Site Code :
Start Date : 9/10/2019
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Western) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Forestville Rd Westbound			Western Church Driveway Northbound			Forestville Rd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
02:00 PM	3	0	3	0	0	0	0	7	7	10
02:05 PM	5	0	5	0	0	0	0	13	13	18
02:10 PM	9	0	9	0	0	0	0	8	8	17
02:15 PM	2	0	2	0	0	0	0	5	5	7
02:20 PM	12	0	12	0	0	0	0	7	7	19
02:25 PM	13	0	13	0	0	0	0	15	15	28
02:30 PM	9	0	9	0	0	0	0	16	16	25
02:35 PM	7	0	7	0	0	0	0	11	11	18
02:40 PM	4	0	4	0	0	0	0	6	6	10
02:45 PM	8	0	8	0	0	0	0	11	11	19
02:50 PM	7	0	7	0	0	0	0	11	11	18
02:55 PM	9	0	9	0	0	0	0	5	5	14
Total	88	0	88	0	0	0	0	115	115	203
03:00 PM	10	0	10	0	0	0	0	4	4	14
03:05 PM	9	0	9	0	0	0	0	9	9	18
03:10 PM	7	0	7	0	0	0	0	5	5	12
03:15 PM	13	0	13	0	0	0	0	7	7	20
03:20 PM	10	0	10	0	0	0	0	11	11	21
03:25 PM	6	0	6	0	0	0	0	13	13	19
03:30 PM	14	0	14	0	0	0	0	11	11	25
03:35 PM	13	0	13	0	0	0	0	8	8	21
03:40 PM	9	0	9	0	0	0	0	13	13	22
03:45 PM	5	0	5	0	0	0	0	8	8	13
03:50 PM	8	1	9	0	0	0	0	17	17	26
03:55 PM	14	0	14	0	0	0	0	16	16	30
Total	118	1	119	0	0	0	0	122	122	241
Grand Total	206	1	207	0	0	0	0	237	237	444
Apprch %	99.5	0.5		0	0		0	100		
Total %	46.4	0.2	46.6	0	0	0	0	53.4	53.4	
Cars +	202	1	203	0	0	0	0	233	233	436
% Cars +	98.1	100	98.1	0	0	0	0	98.3	98.3	98.2
Trucks	4	0	4	0	0	0	0	4	4	8
% Trucks	1.9	0	1.9	0	0	0	0	1.7	1.7	1.8



TRAFFIC DATA COLLECTION

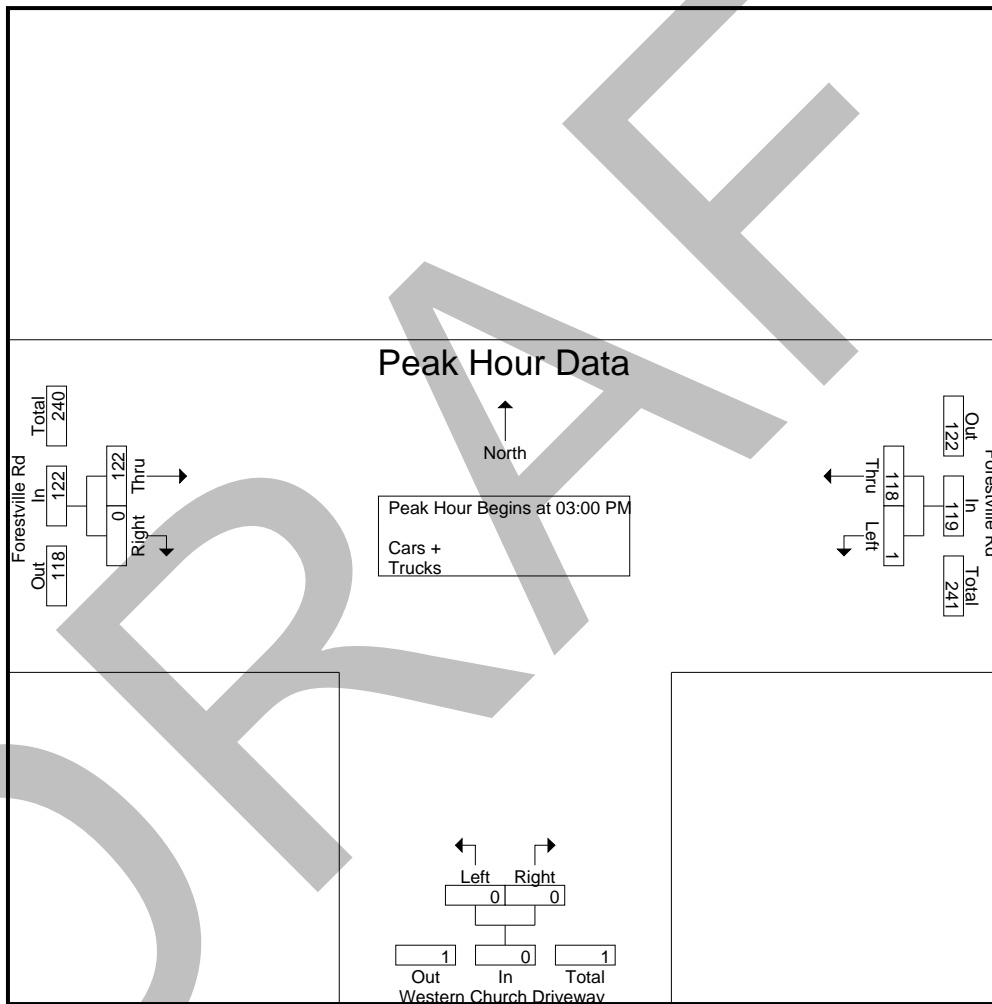
File Name : Knightdale(Forestville and Western) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Forestville Rd Westbound			Western Church Driveway Northbound			Forestville Rd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	10	0	10	0	0	0	0	4	4	14
03:05 PM	9	0	9	0	0	0	0	9	9	18
03:10 PM	7	0	7	0	0	0	0	5	5	12
03:15 PM	13	0	13	0	0	0	0	7	7	20
03:20 PM	10	0	10	0	0	0	0	11	11	21
03:25 PM	6	0	6	0	0	0	0	13	13	19
03:30 PM	14	0	14	0	0	0	0	11	11	25
03:35 PM	13	0	13	0	0	0	0	8	8	21
03:40 PM	9	0	9	0	0	0	0	13	13	22
03:45 PM	5	0	5	0	0	0	0	8	8	13
03:50 PM	8	1	9	0	0	0	0	17	17	26
03:55 PM	14	0	14	0	0	0	0	16	16	30
Total Volume	118	1	119	0	0	0	0	122	122	241
% App. Total	99.2	0.8		0	0		0	100		
PHF	.702	.083	.708	.000	.000	.000	.000	.598	.598	.669



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Western) Mid
Site Code :
Start Date : 9/10/2019
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Western)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Forestville Rd Westbound			Western Church Rd Northbound			Forestville Rd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
04:00 PM	10	0	10	0	0	0	0	17	17	27
04:05 PM	9	0	9	0	0	0	0	13	13	22
04:10 PM	12	0	12	0	0	0	0	9	9	21
04:15 PM	6	0	6	0	0	0	0	9	9	15
04:20 PM	11	0	11	0	0	0	0	19	19	30
04:25 PM	10	0	10	0	0	0	0	13	13	23
04:30 PM	10	0	10	0	0	0	0	7	7	17
04:35 PM	11	0	11	0	0	0	0	20	20	31
04:40 PM	10	0	10	0	0	0	0	16	16	26
04:45 PM	4	0	4	0	0	0	0	14	14	18
04:50 PM	12	0	12	0	0	0	0	24	24	36
04:55 PM	7	0	7	0	0	0	0	14	14	21
Total	112	0	112	0	0	0	0	175	175	287
05:00 PM	9	0	9	0	0	0	0	9	9	18
05:05 PM	6	0	6	0	0	0	0	21	21	27
05:10 PM	7	0	7	0	0	0	1	24	25	32
05:15 PM	10	0	10	0	0	0	0	20	20	30
05:20 PM	15	0	15	0	0	0	0	11	11	26
05:25 PM	20	0	20	0	1	1	0	12	12	33
05:30 PM	13	0	13	0	1	1	0	14	14	28
05:35 PM	13	0	13	0	0	0	1	14	15	28
05:40 PM	10	0	10	0	0	0	0	21	21	31
05:45 PM	9	0	9	0	0	0	0	11	11	20
05:50 PM	16	0	16	0	0	0	0	17	17	33
05:55 PM	11	0	11	0	0	0	0	13	13	24
Total	139	0	139	0	2	2	2	187	189	330
Grand Total	251	0	251	0	2	2	2	362	364	617
Apprch %	100	0		0	100		0.5	99.5		
Total %	40.7	0	40.7	0	0.3	0.3	0.3	58.7	59	
Cars +	246	0	246	0	2	2	2	357	359	607
% Cars +	98	0	98	0	100	100	100	98.6	98.6	98.4
Trucks	5	0	5	0	0	0	0	5	5	10
% Trucks	2	0	2	0	0	0	0	1.4	1.4	1.6



TRAFFIC DATA COLLECTION

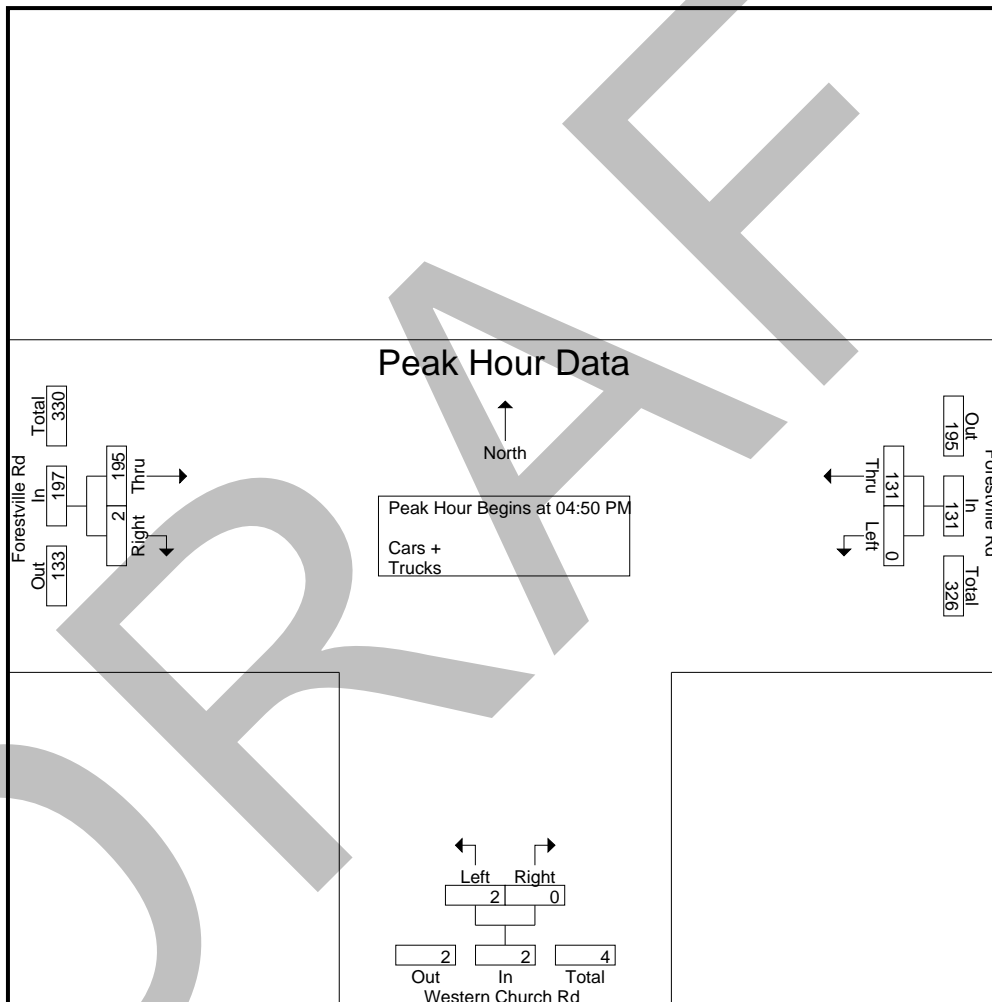
File Name : Knightdale(Forestville and Western)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Forestville Rd Westbound			Western Church Rd Northbound			Forestville Rd Eastbound			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:50 PM										
04:50 PM	12	0	12	0	0	0	0	24	24	36
04:55 PM	7	0	7	0	0	0	0	14	14	21
05:00 PM	9	0	9	0	0	0	0	9	9	18
05:05 PM	6	0	6	0	0	0	0	21	21	27
05:10 PM	7	0	7	0	0	0	1	24	25	32
05:15 PM	10	0	10	0	0	0	0	20	20	30
05:20 PM	15	0	15	0	0	0	0	11	11	26
05:25 PM	20	0	20	0	1	1	0	12	12	33
05:30 PM	13	0	13	0	1	1	0	14	14	28
05:35 PM	13	0	13	0	0	0	1	14	15	28
05:40 PM	10	0	10	0	0	0	0	21	21	31
05:45 PM	9	0	9	0	0	0	0	11	11	20
Total Volume	131	0	131	0	2	2	2	195	197	330
% App. Total	100	0		0	100		1	99		
PHF	.546	.000	.546	.000	.167	.167	.167	.677	.657	.764



TRAFFIC DATA COLLECTION

File Name : Knightdale(Forestville and Western)PM
Site Code :
Start Date : 9/10/2019
Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Road Southbound			Old Knight Road Northbound			Bryan Chalk lane Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
07:00 AM	5	27	32	0	42	42	24	0	24	98
07:05 AM	7	14	21	2	46	48	41	2	43	112
07:10 AM	10	15	25	4	42	46	41	2	43	114
07:15 AM	4	19	23	4	39	43	45	4	49	115
07:20 AM	6	18	24	6	26	32	45	3	48	104
07:25 AM	1	18	19	4	15	19	40	2	42	80
07:30 AM	0	17	17	3	8	11	11	0	11	39
07:35 AM	0	23	23	8	3	11	7	1	8	42
07:40 AM	0	18	18	7	7	14	5	0	5	37
07:45 AM	0	12	12	8	2	10	4	0	4	26
07:50 AM	2	9	11	8	4	12	4	0	4	27
07:55 AM	0	14	14	8	3	11	4	0	4	29
Total	35	204	239	62	237	299	271	14	285	823
08:00 AM	0	11	11	7	1	8	0	0	0	19
08:05 AM	1	6	7	8	2	10	2	0	2	19
08:10 AM	0	12	12	12	1	13	3	0	3	28
08:15 AM	0	9	9	5	3	8	1	0	1	18
08:20 AM	1	13	14	3	2	5	3	0	3	22
08:25 AM	1	6	7	5	6	11	1	0	1	19
08:30 AM	1	9	10	5	3	8	3	0	3	21
08:35 AM	0	13	13	6	2	8	2	1	3	24
08:40 AM	2	16	18	5	1	6	7	0	7	31
08:45 AM	1	10	11	8	3	11	0	2	2	24
08:50 AM	1	13	14	7	1	8	0	1	1	23
08:55 AM	0	12	12	7	10	17	3	0	3	32
Total	8	130	138	78	35	113	25	4	29	280
Grand Total	43	334	377	140	272	412	296	18	314	1103
Apprch %	11.4	88.6		34	66		94.3	5.7		
Total %	3.9	30.3	34.2	12.7	24.7	37.4	26.8	1.6	28.5	
Cars +	43	329	372	132	271	403	295	18	313	1088
% Cars +	100	98.5	98.7	94.3	99.6	97.8	99.7	100	99.7	98.6
Trucks	0	5	5	8	1	9	1	0	1	15
% Trucks	0	1.5	1.3	5.7	0.4	2.2	0.3	0	0.3	1.4



TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Old Knight Road Southbound			Old Knight Road Northbound			Bryan Chalk lane Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	5	27	32	0	42	42	24	0	24	98
07:05 AM	7	14	21	2	46	48	41	2	43	112
07:10 AM	10	15	25	4	42	46	41	2	43	114
07:15 AM	4	19	23	4	39	43	45	4	49	115
07:20 AM	6	18	24	6	26	32	45	3	48	104
07:25 AM	1	18	19	4	15	19	40	2	42	80
07:30 AM	0	17	17	3	8	11	11	0	11	39
07:35 AM	0	23	23	8	3	11	7	1	8	42
07:40 AM	0	18	18	7	7	14	5	0	5	37
07:45 AM	0	12	12	8	2	10	4	0	4	26
07:50 AM	2	9	11	8	4	12	4	0	4	27
07:55 AM	0	14	14	8	3	11	4	0	4	29
Total Volume	35	204	239	62	237	299	271	14	285	823
% App. Total	14.6	85.4		20.7	79.3		95.1	4.9		
PHF	.292	.630	.622	.646	.429	.519	.502	.292	.485	.596



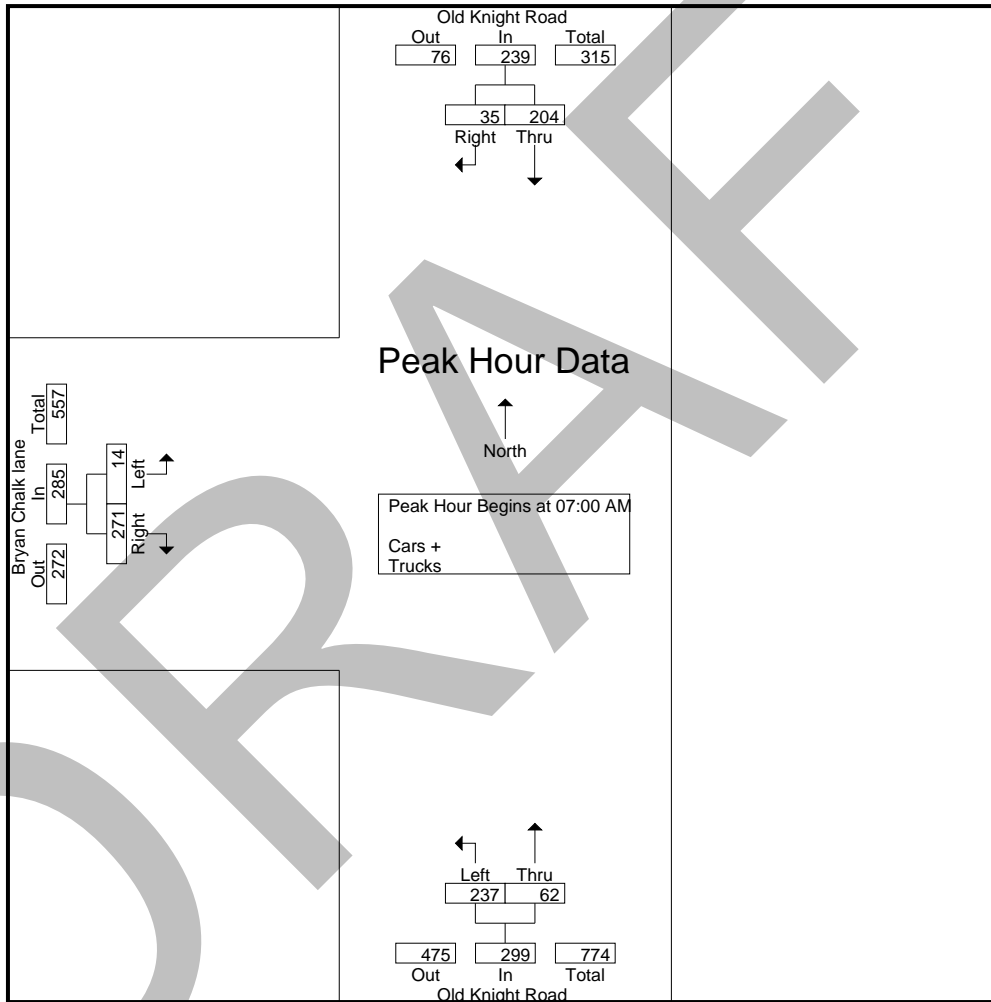
TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk)AM

Site Code :

Start Date : 9/10/2019

Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Rd Southbound			Old Knight Rd Northbound			Bryan Chalk Lane Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
02:00 PM	0	5	5	11	5	16	1	0	1	22
02:05 PM	0	9	9	7	10	17	0	0	0	26
02:10 PM	2	7	9	7	7	14	0	1	1	24
02:15 PM	2	1	3	9	9	18	2	0	2	23
02:20 PM	2	10	12	7	4	11	18	5	23	46
02:25 PM	1	11	12	8	3	11	34	2	36	59
02:30 PM	2	8	10	6	10	16	12	1	13	39
02:35 PM	1	3	4	11	5	16	9	0	9	29
02:40 PM	0	7	7	8	5	13	9	0	9	29
02:45 PM	0	7	7	10	2	12	5	0	5	24
02:50 PM	0	3	3	13	4	17	9	0	9	29
02:55 PM	0	7	7	9	1	10	3	1	4	21
Total	10	78	88	106	65	171	102	10	112	371
03:00 PM	2	7	9	7	2	9	4	0	4	22
03:05 PM	0	10	10	9	1	10	2	1	3	23
03:10 PM	0	8	8	6	0	6	2	1	3	17
03:15 PM	1	10	11	9	2	11	4	0	4	26
03:20 PM	0	9	9	10	3	13	2	1	3	25
03:25 PM	0	8	8	8	2	10	5	1	6	24
03:30 PM	1	19	20	6	3	9	3	1	4	33
03:35 PM	0	9	9	12	0	12	2	0	2	23
03:40 PM	0	8	8	16	2	18	3	0	3	29
03:45 PM	0	13	13	8	4	12	3	0	3	28
03:50 PM	0	8	8	14	4	18	5	0	5	31
03:55 PM	3	8	11	19	7	26	4	0	4	41
Total	7	117	124	124	30	154	39	5	44	322
Grand Total	17	195	212	230	95	325	141	15	156	693
Apprch %	8	92		70.8	29.2		90.4	9.6		
Total %	2.5	28.1	30.6	33.2	13.7	46.9	20.3	2.2	22.5	
Cars +	15	193	208	227	95	322	141	15	156	686
% Cars +	88.2	99	98.1	98.7	100	99.1	100	100	100	99
Trucks	2	2	4	3	0	3	0	0	0	7
% Trucks	11.8	1	1.9	1.3	0	0.9	0	0	0	1



TRAFFIC DATA COLLECTION

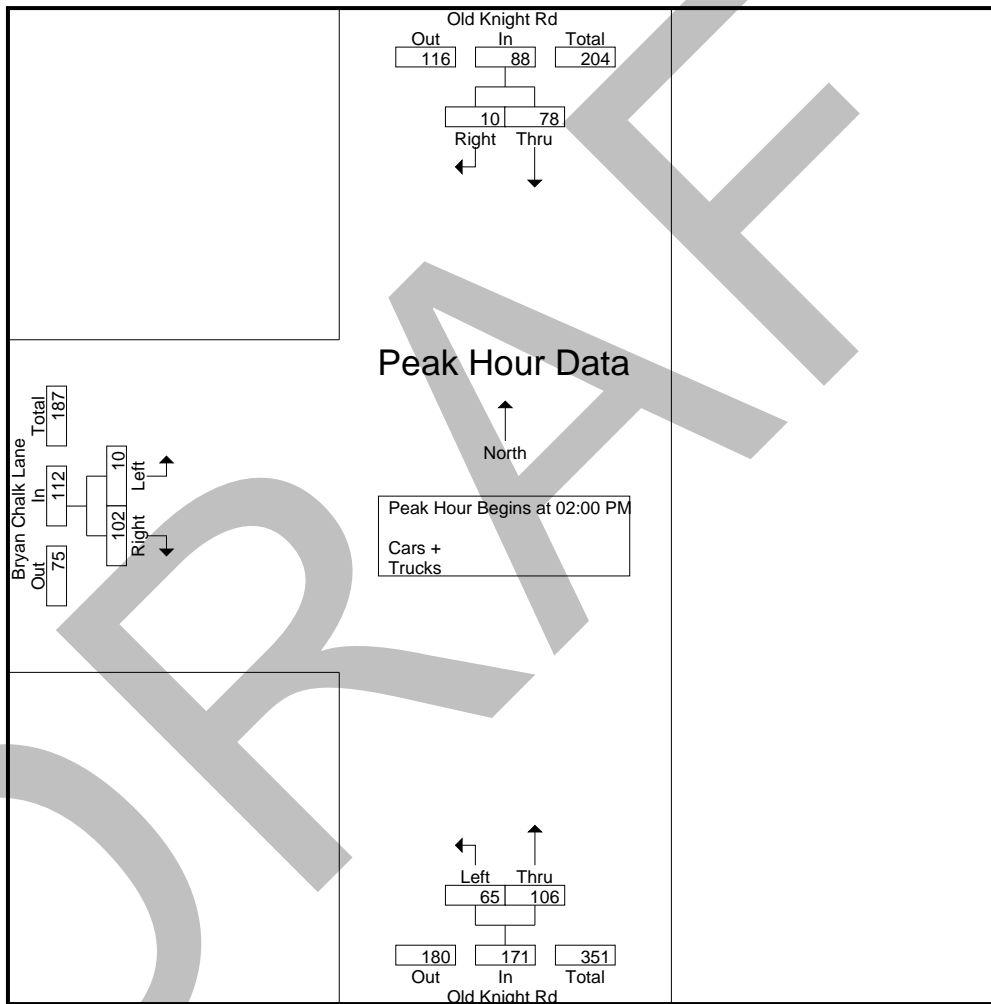
File Name : Knightdale(Old Knight and Bryan Chalk) Mid
 Site Code :
 Start Date : 9/10/2019
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Start Time	Old Knight Rd Southbound			Old Knight Rd Northbound			Bryan Chalk Lane Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	5	5	11	5	16	1	0	1	22
02:05 PM	0	9	9	7	10	17	0	0	0	26
02:10 PM	2	7	9	7	7	14	0	1	1	24
02:15 PM	2	1	3	9	9	18	2	0	2	23
02:20 PM	2	10	12	7	4	11	18	5	23	46
02:25 PM	1	11	12	8	3	11	34	2	36	59
02:30 PM	2	8	10	6	10	16	12	1	13	39
02:35 PM	1	3	4	11	5	16	9	0	9	29
02:40 PM	0	7	7	8	5	13	9	0	9	29
02:45 PM	0	7	7	10	2	12	5	0	5	24
02:50 PM	0	3	3	13	4	17	9	0	9	29
02:55 PM	0	7	7	9	1	10	3	1	4	21
Total Volume	10	78	88	106	65	171	102	10	112	371
% App. Total	11.4	88.6		62	38		91.1	8.9		
PHF	.417	.591	.611	.679	.542	.792	.250	.167	.259	.524



TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk) Mid
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old knight road Southbound			Old Knight road Northbound			Bryan Chalk lane Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
04:00 PM	0	6	6	14	6	20	4	0	4	30
04:05 PM	1	7	8	14	5	19	3	0	3	30
04:10 PM	1	9	10	15	5	20	9	2	11	41
04:15 PM	0	7	7	12	5	17	8	1	9	33
04:20 PM	1	7	8	16	4	20	3	1	4	32
04:25 PM	1	7	8	15	8	23	2	0	2	33
04:30 PM	0	19	19	12	5	17	5	2	7	43
04:35 PM	0	10	10	10	5	15	6	1	7	32
04:40 PM	0	8	8	15	5	20	10	0	10	38
04:45 PM	0	11	11	20	3	23	7	0	7	41
04:50 PM	0	18	18	16	4	20	2	0	2	40
04:55 PM	0	10	10	17	9	26	5	0	5	41
Total	4	119	123	176	64	240	64	7	71	434
05:00 PM	0	16	16	19	3	22	8	0	8	46
05:05 PM	0	11	11	14	4	18	8	3	11	40
05:10 PM	1	6	7	14	4	18	2	1	3	28
05:15 PM	0	7	7	15	5	20	1	0	1	28
05:20 PM	1	12	13	11	6	17	6	1	7	37
05:25 PM	1	12	13	17	4	21	2	2	4	38
05:30 PM	0	8	8	17	15	32	8	0	8	48
05:35 PM	0	12	12	13	2	15	20	0	20	47
05:40 PM	0	10	10	15	3	18	5	1	6	34
05:45 PM	1	8	9	17	6	23	4	0	4	36
05:50 PM	1	12	13	23	13	36	4	2	6	55
05:55 PM	0	13	13	20	10	30	4	0	4	47
Total	5	127	132	195	75	270	72	10	82	484
Grand Total	9	246	255	371	139	510	136	17	153	918
Apprch %	3.5	96.5		72.7	27.3		88.9	11.1		
Total %	1	26.8	27.8	40.4	15.1	55.6	14.8	1.9	16.7	
Cars +	9	243	252	367	139	506	136	17	153	911
% Cars +	100	98.8	98.8	98.9	100	99.2	100	100	100	99.2
Trucks	0	3	3	4	0	4	0	0	0	7
% Trucks	0	1.2	1.2	1.1	0	0.8	0	0	0	0.8



TRAFFIC DATA COLLECTION

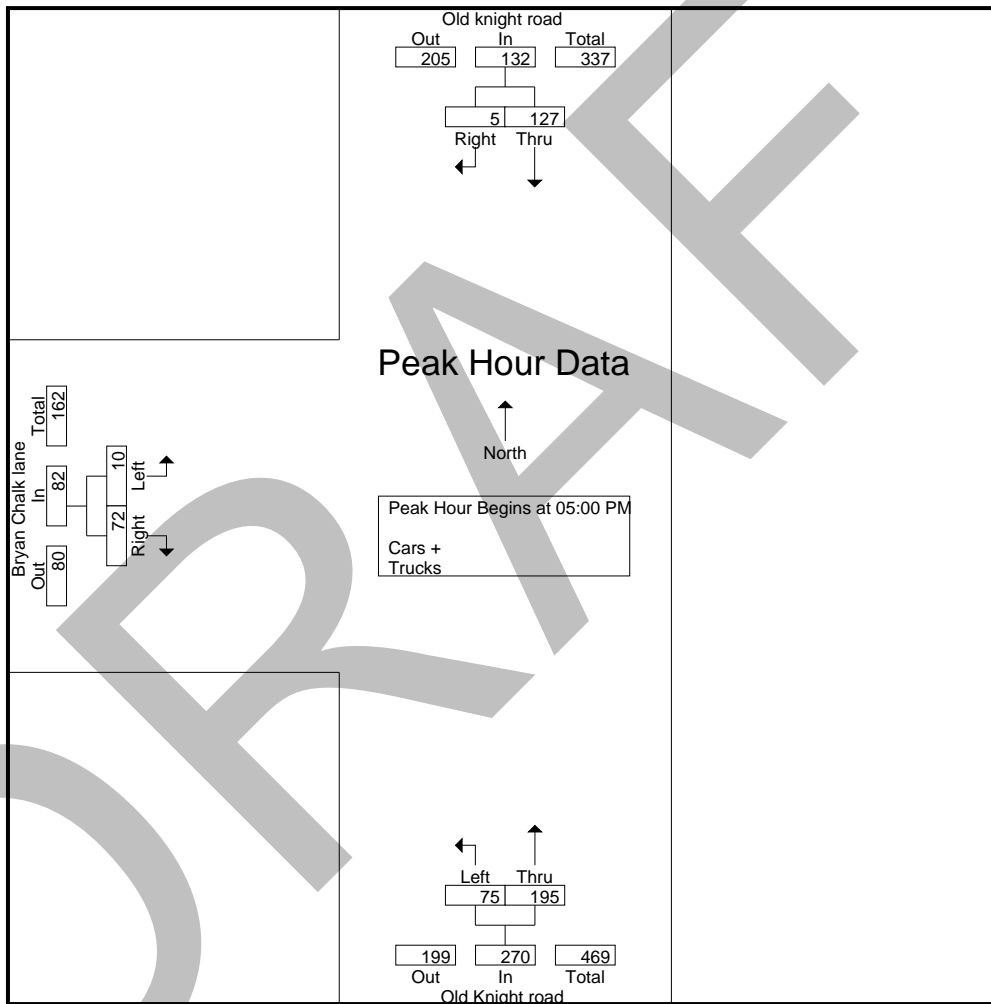
File Name : Knightdale(Old Knight and Bryan Chalk)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Old knight road Southbound			Old Knight road Northbound			Bryan Chalk lane Eastbound			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	16	16	19	3	22	8	0	8	46
05:05 PM	0	11	11	14	4	18	8	3	11	40
05:10 PM	1	6	7	14	4	18	2	1	3	28
05:15 PM	0	7	7	15	5	20	1	0	1	28
05:20 PM	1	12	13	11	6	17	6	1	7	37
05:25 PM	1	12	13	17	4	21	2	2	4	38
05:30 PM	0	8	8	17	15	32	8	0	8	48
05:35 PM	0	12	12	13	2	15	20	0	20	47
05:40 PM	0	10	10	15	3	18	5	1	6	34
05:45 PM	1	8	9	17	6	23	4	0	4	36
05:50 PM	1	12	13	23	13	36	4	2	6	55
05:55 PM	0	13	13	20	10	30	4	0	4	47
Total Volume	5	127	132	195	75	270	72	10	82	484
% App. Total	3.8	96.2		72.2	27.8		87.8	12.2		
PHF	.417	.661	.688	.707	.417	.625	.300	.278	.342	.733



TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and Bryan Chalk)PM
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and US 64)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Road Southbound					US 64 Westbound					First Avenue Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
07:00 AM	19	12	3	0	34	15	71	4	0	90	5	24	5	0	34	2	25	17	9	53	211
07:05 AM	16	14	12	0	42	17	86	6	2	111	6	18	8	0	32	4	30	19	3	56	241
07:10 AM	22	10	8	0	40	13	65	5	0	83	3	18	9	0	30	3	42	20	5	70	223
07:15 AM	31	22	8	0	61	13	79	5	0	97	5	23	13	0	41	4	31	12	4	51	250
07:20 AM	34	15	19	0	68	6	70	4	0	80	6	15	13	0	34	1	32	9	3	45	227
07:25 AM	20	21	12	0	53	12	118	1	0	131	5	16	11	0	32	4	44	13	7	68	284
07:30 AM	19	13	16	0	48	8	92	4	2	106	6	8	10	0	24	2	34	4	7	47	225
07:35 AM	11	9	17	0	37	10	114	9	2	135	4	5	15	0	24	4	41	7	5	57	253
07:40 AM	14	8	12	0	34	9	89	7	1	106	8	6	20	0	34	3	51	11	7	72	246
07:45 AM	10	12	12	0	34	8	100	4	0	112	6	12	18	0	36	4	32	5	2	43	225
07:50 AM	6	11	13	0	30	10	90	8	1	109	9	9	16	0	34	6	48	7	3	64	237
07:55 AM	15	13	12	0	40	14	88	8	0	110	2	11	20	0	33	3	33	8	5	49	232
Total	217	160	144	0	521	135	1062	65	8	1270	65	165	158	0	388	40	443	132	60	675	2854
08:00 AM	5	7	10	0	22	9	73	1	1	84	5	8	10	0	23	6	37	5	6	54	183
08:05 AM	11	5	7	0	23	8	90	7	0	105	8	11	6	0	25	2	33	6	1	42	195
08:10 AM	7	8	9	0	24	8	75	4	0	87	7	4	6	0	17	3	23	4	9	39	167
08:15 AM	8	5	8	0	21	6	82	9	2	99	3	8	15	0	26	1	35	3	2	41	187
08:20 AM	11	10	5	0	26	5	65	12	5	87	6	5	8	0	19	3	26	2	6	37	169
08:25 AM	8	10	7	0	25	5	55	9	4	73	6	5	10	0	21	2	33	4	5	44	163
08:30 AM	9	6	3	0	18	9	63	5	1	78	2	2	7	1	12	4	39	3	12	58	166
08:35 AM	7	4	9	0	20	7	59	4	0	70	5	8	6	0	19	1	31	4	6	42	151
08:40 AM	9	6	7	0	22	4	62	5	0	71	5	9	6	0	20	7	22	3	11	43	156
08:45 AM	4	7	3	0	14	6	56	4	0	66	7	8	9	0	24	1	35	2	3	41	145
08:50 AM	9	15	6	0	30	6	52	6	0	64	14	11	8	0	33	2	30	1	3	36	163
08:55 AM	6	6	8	0	20	5	45	5	2	57	6	8	11	0	25	2	26	10	6	44	146
Total	94	89	82	0	265	78	777	71	15	941	74	87	102	1	264	34	370	47	70	521	1991
Grand Total	311	249	226	0	786	213	1839	136	23	2211	139	252	260	1	652	74	813	179	130	1196	4845
Apprch %	39.6	31.7	28.8	0		9.6	83.2	6.2	1		21.3	38.7	39.9	0.2		6.2	68	15	10.9		
Total %	6.4	5.1	4.7	0	16.2	4.4	38	2.8	0.5	45.6	2.9	5.2	5.4	0	13.5	1.5	16.8	3.7	2.7	24.7	
Cars +	309	246	223	0	778	211	1782	133	23	2149	130	252	255	1	638	71	765	172	130	1138	4703
% Cars +	99.4	98.8	98.7	0	99	99.1	96.9	97.8	100	97.2	93.5	100	98.1	100	97.9	95.9	94.1	96.1	100	95.2	97.1
Trucks	2	3	3	0	8	2	57	3	0	62	9	0	5	0	14	3	48	7	0	58	142
% Trucks	0.6	1.2	1.3	0	1	0.9	3.1	2.2	0	2.8	6.5	0	1.9	0	2.1	4.1	5.9	3.9	0	4.8	2.9



TRAFFIC DATA COLLECTION

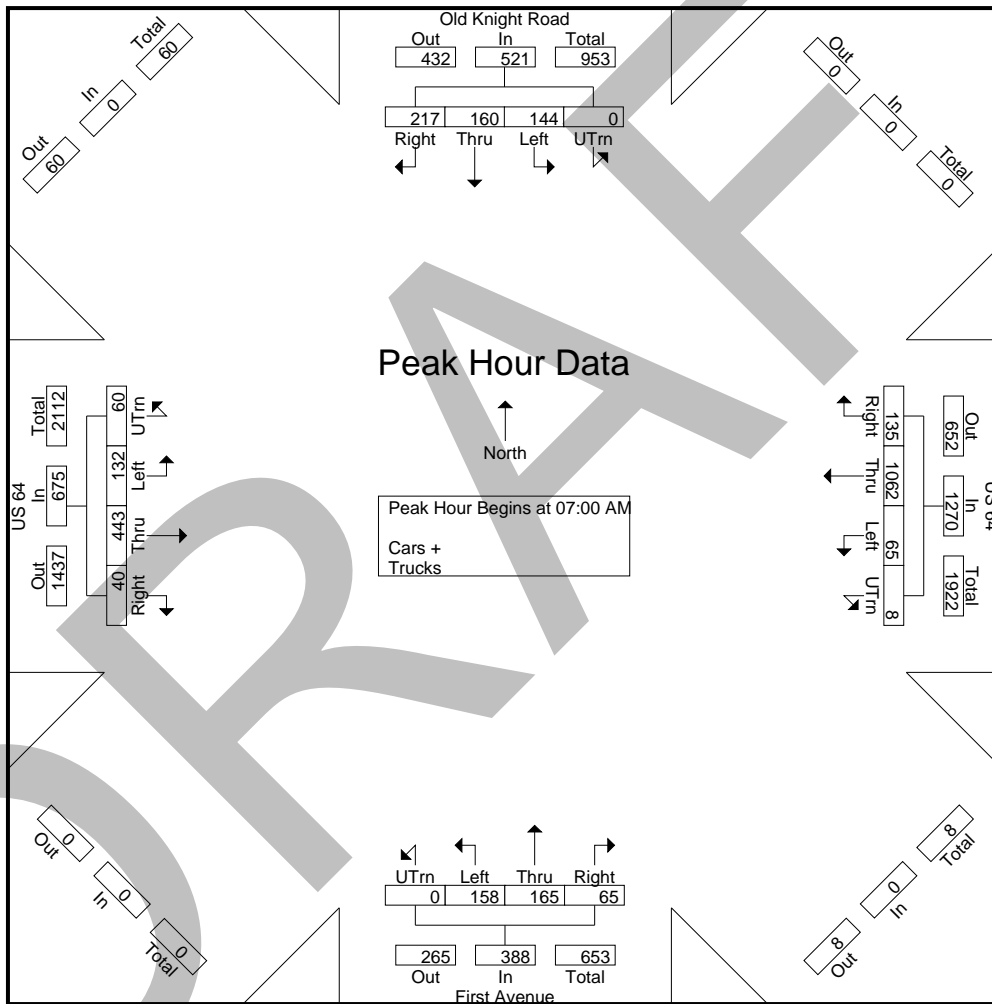
File Name : Knightdale(Old Knight and US 64)AM
 Site Code :
 Start Date : 9/10/2019
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Start Time	Old Knight Road Southbound					US 64 Westbound					First Avenue Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	19	12	3	0	34	15	71	4	0	90	5	24	5	0	34	2	25	17	9	53	211
07:05 AM	16	14	12	0	42	17	86	6	2	111	6	18	8	0	32	4	30	19	3	56	241
07:10 AM	22	10	8	0	40	13	65	5	0	83	3	18	9	0	30	3	42	20	5	70	223
07:15 AM	31	22	8	0	61	13	79	5	0	97	5	23	13	0	41	4	31	12	4	51	250
07:20 AM	34	15	19	0	68	6	70	4	0	80	6	15	13	0	34	1	32	9	3	45	227
07:25 AM	20	21	12	0	53	12	118	1	0	131	5	16	11	0	32	4	44	13	7	68	284
07:30 AM	19	13	16	0	48	8	92	4	2	106	6	8	10	0	24	2	34	4	7	47	225
07:35 AM	11	9	17	0	37	10	114	9	2	135	4	5	15	0	24	4	41	7	5	57	253
07:40 AM	14	8	12	0	34	9	89	7	1	106	8	6	20	0	34	3	51	11	7	72	246
07:45 AM	10	12	12	0	34	8	100	4	0	112	6	12	18	0	36	4	32	5	2	43	225
07:50 AM	6	11	13	0	30	10	90	8	1	109	9	9	16	0	34	6	48	7	3	64	237
07:55 AM	15	13	12	0	40	14	88	8	0	110	2	11	20	0	33	3	33	8	5	49	232
Total Volume	217	160	144	0	521	135	1062	65	8	1270	65	165	158	0	388	40	443	132	60	675	2854
% App. Total	41.7	30.7	27.6	0		10.6	83.6	5.1	0.6		16.8	42.5	40.7	0		5.9	65.6	19.6	8.9		
PHF	.532	.606	.632	.000	.638	.662	.750	.602	.333	.784	.602	.573	.658	.000	.789	.556	.724	.550	.556	.781	.837



TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and US 64)AM
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TRAFFIC DATA COLLECTION

File Name : Knightdale(US 64 and Old Knight) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Road Southbound					US 64 Westbound					First Avenue Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
02:00 PM	3	5	3	0	11	3	35	0	0	38	3	6	9	0	18	3	45	7	2	57	124
02:05 PM	5	4	5	0	14	4	31	6	1	42	2	6	3	0	11	6	57	9	4	76	143
02:10 PM	5	9	4	0	18	5	35	2	0	42	4	14	6	0	24	6	59	4	6	75	159
02:15 PM	11	6	6	0	23	5	35	0	0	40	4	6	5	0	15	3	51	6	3	63	141
02:20 PM	12	8	10	0	30	4	44	2	0	50	3	6	5	0	14	7	60	7	4	78	172
02:25 PM	13	16	13	0	42	2	38	4	0	44	3	7	4	0	14	8	66	13	5	92	192
02:30 PM	16	11	11	0	38	3	48	6	0	57	3	10	7	0	20	1	57	6	2	66	181
02:35 PM	9	10	17	0	36	4	51	5	0	60	4	4	4	0	12	7	66	7	2	82	190
02:40 PM	14	4	3	0	21	5	52	7	0	64	4	6	11	0	21	4	42	8	1	55	161
02:45 PM	5	11	8	0	24	4	44	6	0	54	7	10	8	0	25	6	69	3	1	79	182
02:50 PM	5	8	11	0	24	7	46	4	0	57	6	4	6	0	16	14	66	8	3	91	188
02:55 PM	3	6	6	0	15	9	42	2	0	53	3	9	14	0	26	8	90	8	6	112	206
Total	101	98	97	0	296	55	501	44	1	601	46	88	82	0	216	73	728	86	39	926	2039
03:00 PM	6	6	10	0	22	5	51	3	0	59	5	4	11	0	20	9	63	7	1	80	181
03:05 PM	3	6	7	0	16	5	46	2	0	53	6	6	7	0	19	9	68	4	3	84	172
03:10 PM	4	6	6	0	16	6	43	5	2	56	7	2	6	0	15	6	73	3	5	87	174
03:15 PM	5	6	6	0	17	5	35	2	0	42	4	10	5	0	19	7	70	8	6	91	169
03:20 PM	14	9	7	0	30	7	52	7	2	68	4	6	12	0	22	8	63	7	6	84	204
03:25 PM	8	7	9	0	24	4	46	5	0	55	3	3	8	0	14	9	64	7	9	89	182
03:30 PM	9	15	7	0	31	6	45	6	3	60	5	3	7	0	15	5	78	6	4	93	199
03:35 PM	7	7	8	0	22	2	57	5	1	65	12	7	6	0	25	7	66	10	7	90	202
03:40 PM	4	4	14	0	22	12	62	8	0	82	6	6	8	0	20	8	82	9	5	104	228
03:45 PM	9	10	7	0	26	1	55	10	1	67	5	7	1	0	13	4	50	5	3	62	168
03:50 PM	8	9	4	0	21	4	37	7	0	48	3	8	7	0	18	6	71	5	3	85	172
03:55 PM	10	9	12	0	31	5	40	4	1	50	5	7	7	0	19	7	82	14	5	108	208
Total	87	94	97	0	278	62	569	64	10	705	65	69	85	0	219	85	830	85	57	1057	2259
Grand Total	188	192	194	0	574	117	1070	108	11	1306	111	157	167	0	435	158	1558	171	96	1983	4298
Apprch %	32.8	33.4	33.8	0		9	81.9	8.3	0.8		25.5	36.1	38.4	0		8	78.6	8.6	4.8		
Total %	4.4	4.5	4.5	0	13.4	2.7	24.9	2.5	0.3	30.4	2.6	3.7	3.9	0	10.1	3.7	36.2	4	2.2	46.1	
Cars +	187	190	190	0	567	115	1025	98	9	1247	104	154	162	0	420	152	1505	167	94	1918	4152
% Cars +	99.5	99	97.9	0	98.8	98.3	95.8	90.7	81.8	95.5	93.7	98.1	97	0	96.6	96.2	96.6	97.7	97.9	96.7	96.6
Trucks	1	2	4	0	7	2	45	10	2	59	7	3	5	0	15	6	53	4	2	65	146
% Trucks	0.5	1	2.1	0	1.2	1.7	4.2	9.3	18.2	4.5	6.3	1.9	3	0	3.4	3.8	3.4	2.3	2.1	3.3	3.4



TRAFFIC DATA COLLECTION

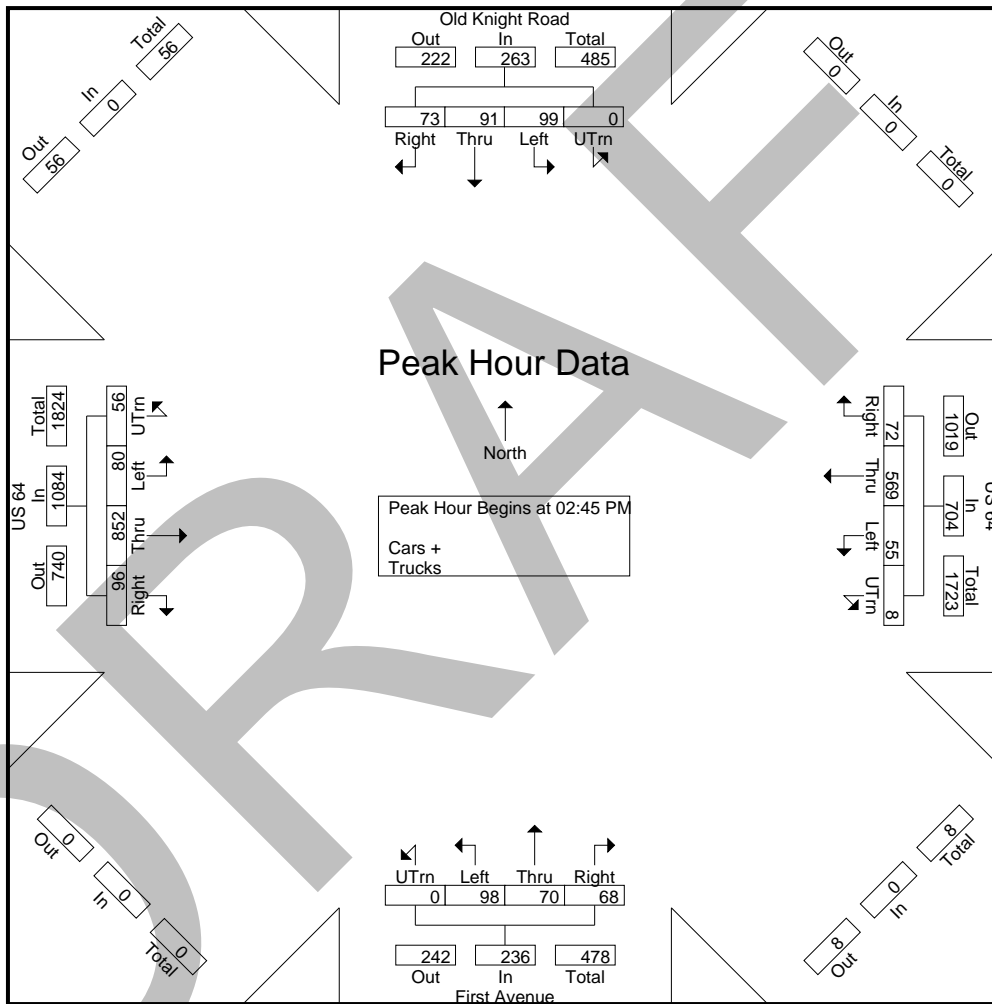
File Name : Knightdale(US 64 and Old Knight) Mid
 Site Code :
 Start Date : 9/10/2019
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Start Time	Old Knight Road Southbound					US 64 Westbound					First Avenue Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	5	11	8	0	24	4	44	6	0	54	7	10	8	0	25	6	69	3	1	79	182
02:50 PM	5	8	11	0	24	7	46	4	0	57	6	4	6	0	16	14	66	8	3	91	188
02:55 PM	3	6	6	0	15	9	42	2	0	53	3	9	14	0	26	8	90	8	6	112	206
03:00 PM	6	6	10	0	22	5	51	3	0	59	5	4	11	0	20	9	63	7	1	80	181
03:05 PM	3	6	7	0	16	5	46	2	0	53	6	6	7	0	19	9	68	4	3	84	172
03:10 PM	4	6	6	0	16	6	43	5	2	56	7	2	6	0	15	6	73	3	5	87	174
03:15 PM	5	6	6	0	17	5	35	2	0	42	4	10	5	0	19	7	70	8	6	91	169
03:20 PM	14	9	7	0	30	7	52	7	2	68	4	6	12	0	22	8	63	7	6	84	204
03:25 PM	8	7	9	0	24	4	46	5	0	55	3	3	8	0	14	9	64	7	9	89	182
03:30 PM	9	15	7	0	31	6	45	6	3	60	5	3	7	0	15	5	78	6	4	93	199
03:35 PM	7	7	8	0	22	2	57	5	1	65	12	7	6	0	25	7	66	10	7	90	202
03:40 PM	4	4	14	0	22	12	62	8	0	82	6	6	8	0	20	8	82	9	5	104	228
Total Volume	73	91	99	0	263	72	569	55	8	704	68	70	98	0	236	96	852	80	56	1084	2287
% App. Total	27.8	34.6	37.6	0		10.2	80.8	7.8	1.1		28.8	29.7	41.5	0		8.9	78.6	7.4	5.2		
PHF	.435	.506	.589	.000	.707	.500	.765	.573	.222	.715	.472	.583	.583	.000	.756	.571	.789	.667	.519	.807	.836



TRAFFIC DATA COLLECTION

File Name : Knightdale(US 64 and Old Knight) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 3





TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and US 64)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Old Knight Road Southbound					US 64 Westbound					First Avenue Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
04:00 PM	6	9	7	0	22	5	44	3	2	54	11	5	6	0	22	6	54	13	11	84	182
04:05 PM	8	11	11	0	30	10	47	2	1	60	7	9	11	0	27	10	76	13	5	104	221
04:10 PM	11	10	11	0	32	8	39	8	0	55	7	7	10	0	24	17	83	10	6	116	227
04:15 PM	14	8	9	0	31	7	46	9	0	62	8	5	13	0	26	5	74	12	5	96	215
04:20 PM	3	11	8	0	22	5	46	12	5	68	6	12	12	0	30	13	76	9	7	105	225
04:25 PM	5	12	6	0	23	4	42	4	2	52	7	12	4	0	23	6	58	13	3	80	178
04:30 PM	9	13	12	0	34	5	39	5	0	49	3	11	9	0	23	11	83	6	5	105	211
04:35 PM	9	12	15	0	36	1	55	7	3	66	2	9	4	0	15	8	86	8	3	105	222
04:40 PM	11	9	12	0	32	7	45	3	1	56	5	4	6	0	15	19	93	14	7	133	236
04:45 PM	10	12	12	0	34	7	69	10	2	88	8	7	9	0	24	12	90	10	5	117	263
04:50 PM	12	7	16	0	35	11	56	8	1	76	5	9	10	0	24	10	90	14	9	123	258
04:55 PM	8	13	11	0	32	7	48	4	1	60	10	11	6	0	27	13	81	7	3	104	223
Total	106	127	130	0	363	77	576	75	18	746	79	101	100	0	280	130	944	129	69	1272	2661
05:00 PM	4	15	10	0	29	4	55	7	2	68	6	9	13	0	28	12	84	6	5	107	232
05:05 PM	16	21	13	0	50	7	49	4	1	61	12	10	4	0	26	9	85	9	8	111	248
05:10 PM	9	14	12	0	35	6	49	4	3	62	4	5	17	0	26	16	100	12	6	134	257
05:15 PM	3	9	11	0	23	8	42	6	2	58	4	7	9	0	20	19	102	13	9	143	244
05:20 PM	7	13	12	0	32	10	74	3	2	89	10	10	9	0	29	8	109	8	9	134	284
05:25 PM	5	5	9	0	19	12	80	10	0	102	4	13	11	0	28	20	111	10	5	146	295
05:30 PM	12	7	10	0	29	7	70	6	0	83	4	13	10	0	27	17	99	15	5	136	275
05:35 PM	15	12	4	0	31	8	57	7	2	74	7	10	12	0	29	14	84	4	5	107	241
05:40 PM	13	17	14	0	44	11	53	8	1	73	6	9	4	0	19	13	88	9	3	113	249
05:45 PM	4	12	8	0	24	8	45	10	0	63	9	12	17	0	38	10	108	16	15	149	274
05:50 PM	4	7	6	0	17	12	45	6	1	64	7	12	7	0	26	15	91	14	7	127	234
05:55 PM	10	9	8	0	27	8	83	3	1	95	3	13	12	0	28	10	101	12	4	127	277
Total	102	141	117	0	360	101	702	74	15	892	76	123	125	0	324	163	1162	128	81	1534	3110
Grand Total	208	268	247	0	723	178	1278	149	33	1638	155	224	225	0	604	293	2106	257	150	2806	5771
Apprch %	28.8	37.1	34.2	0		10.9	78	9.1	2		25.7	37.1	37.3	0		10.4	75.1	9.2	5.3		
Total %	3.6	4.6	4.3	0	12.5	3.1	22.1	2.6	0.6	28.4	2.7	3.9	3.9	0	10.5	5.1	36.5	4.5	2.6	48.6	
Cars +	206	267	243	0	716	176	1255	147	32	1610	153	221	224	0	598	288	2076	255	150	2769	5693
% Cars +	99	99.6	98.4	0	99	98.9	98.2	98.7	97	98.3	98.7	98.7	99.6	0	99	98.3	98.6	99.2	100	98.7	98.6
Trucks	2	1	4	0	7	2	23	2	1	28	2	3	1	0	6	5	30	2	0	37	78
% Trucks	1	0.4	1.6	0	1	1.1	1.8	1.3	3	1.7	1.3	1.3	0.4	0	1	1.7	1.4	0.8	0	1.3	1.4



TRAFFIC DATA COLLECTION

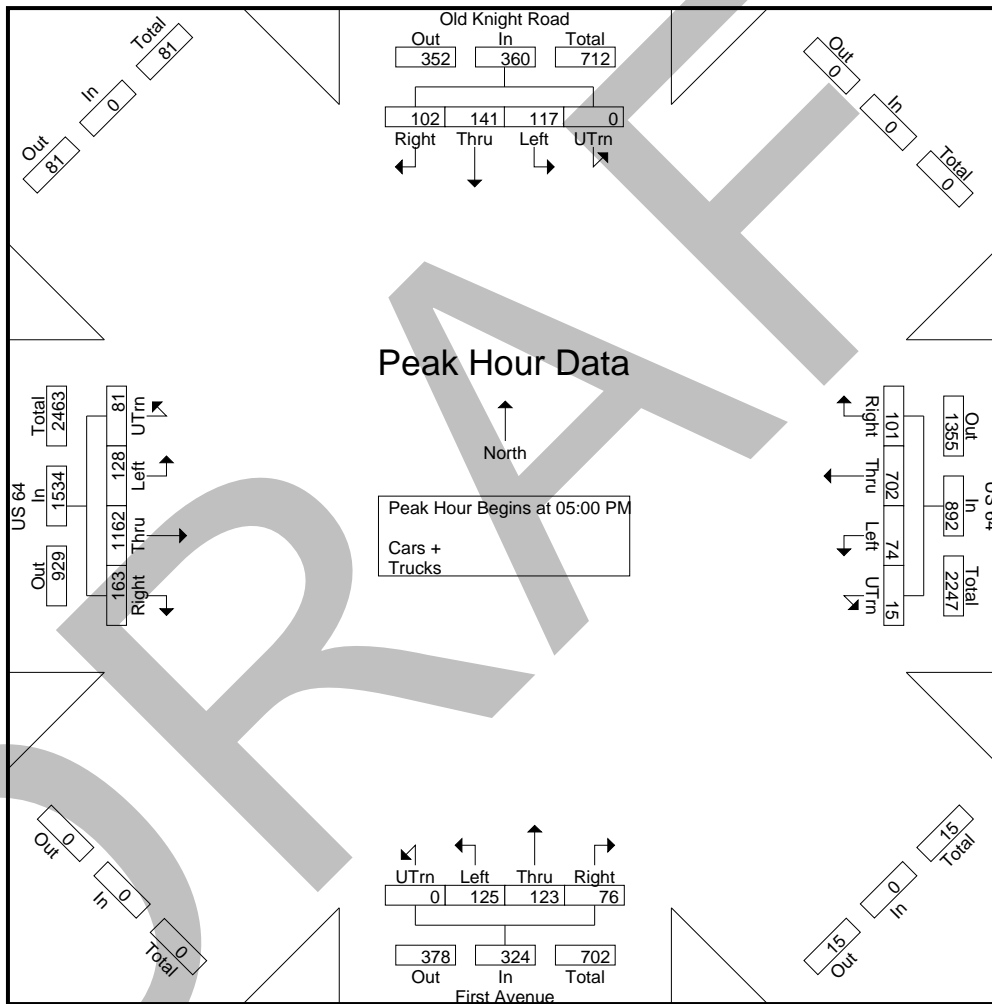
File Name : Knightdale(Old Knight and US 64)PM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Old Knight Road Southbound					US 64 Westbound					First Avenue Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	4	15	10	0	29	4	55	7	2	68	6	9	13	0	28	12	84	6	5	107	232
05:05 PM	16	21	13	0	50	7	49	4	1	61	12	10	4	0	26	9	85	9	8	111	248
05:10 PM	9	14	12	0	35	6	49	4	3	62	4	5	17	0	26	16	100	12	6	134	257
05:15 PM	3	9	11	0	23	8	42	6	2	58	4	7	9	0	20	19	102	13	9	143	244
05:20 PM	7	13	12	0	32	10	74	3	2	89	10	10	9	0	29	8	109	8	9	134	284
05:25 PM	5	5	9	0	19	12	80	10	0	102	4	13	11	0	28	20	111	10	5	146	295
05:30 PM	12	7	10	0	29	7	70	6	0	83	4	13	10	0	27	17	99	15	5	136	275
05:35 PM	15	12	4	0	31	8	57	7	2	74	7	10	12	0	29	14	84	4	5	107	241
05:40 PM	13	17	14	0	44	11	53	8	1	73	6	9	4	0	19	13	88	9	3	113	249
05:45 PM	4	12	8	0	24	8	45	10	0	63	9	12	17	0	38	10	108	16	15	149	274
05:50 PM	4	7	6	0	17	12	45	6	1	64	7	12	7	0	26	15	91	14	7	127	234
05:55 PM	10	9	8	0	27	8	83	3	1	95	3	13	12	0	28	10	101	12	4	127	277
Total Volume	102	141	117	0	360	101	702	74	15	892	76	123	125	0	324	163	1162	128	81	1534	3110
% App. Total	28.3	39.2	32.5	0		11.3	78.7	8.3	1.7		23.5	38	38.6	0		10.6	75.7	8.3	5.3		
PHF	.531	.560	.696	.000	.600	.701	.705	.617	.417	.729	.528	.788	.613	.000	.711	.679	.872	.667	.450	.858	.879



TRAFFIC DATA COLLECTION

File Name : Knightdale(Old Knight and US 64)PM
 Site Code :
 Start Date : 9/10/2019
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TRAFFIC DATA COLLECTION

File Name : Knightdale(Smithfield and US 64)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Smithfield Road Southbound					US 64 Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
07:00 AM	25	3	3	0	31	1	80	1	0	82	1	9	23	0	33	0	2	29	13	44	190
07:05 AM	19	6	14	0	39	4	76	6	1	87	0	13	31	0	44	0	0	8	5	13	183
07:10 AM	19	5	5	0	29	0	80	2	0	82	1	27	20	0	48	0	0	27	0	27	186
07:15 AM	18	8	5	0	31	3	87	1	0	91	2	15	20	0	37	0	0	13	4	17	176
07:20 AM	11	10	3	0	24	4	94	4	0	102	1	3	43	0	47	0	0	8	5	13	186
07:25 AM	15	15	11	0	41	3	109	3	0	115	0	15	37	0	52	0	0	6	2	8	216
07:30 AM	22	15	3	0	40	3	99	0	0	102	1	11	36	0	48	0	0	13	6	19	209
07:35 AM	17	16	4	0	37	5	103	3	0	111	3	13	22	2	40	0	0	6	7	13	201
07:40 AM	21	9	8	0	38	8	86	2	1	97	1	9	38	0	48	0	0	15	4	19	202
07:45 AM	15	4	0	0	19	2	111	6	0	119	2	19	42	0	63	0	0	5	1	6	207
07:50 AM	15	6	1	0	22	12	94	1	0	107	0	5	28	0	33	0	0	12	6	18	180
07:55 AM	17	11	4	0	32	3	93	5	1	102	2	14	17	0	33	0	0	12	7	19	186
Total	214	108	61	0	383	48	1112	34	3	1197	14	153	357	2	526	0	2	154	60	216	2322
08:00 AM	15	6	5	0	26	7	63	0	0	70	2	6	33	0	41	0	0	14	6	20	157
08:05 AM	19	15	6	0	40	11	67	4	0	82	0	9	17	1	27	3	21	13	2	39	188
08:10 AM	24	11	3	0	38	8	71	1	0	80	0	9	23	0	32	3	32	20	7	62	212
08:15 AM	16	10	8	0	34	5	70	3	2	80	2	17	22	0	41	11	26	15	4	56	211
08:20 AM	24	11	5	0	40	7	75	1	0	83	0	12	28	0	40	6	30	22	5	63	226
08:25 AM	21	15	6	0	42	7	68	1	0	76	0	8	24	0	32	8	34	12	4	58	208
08:30 AM	15	7	4	0	26	4	64	3	0	71	2	9	22	0	33	7	40	14	10	71	201
08:35 AM	10	11	4	0	25	1	80	7	1	89	0	8	12	0	20	6	30	6	7	49	183
08:40 AM	13	8	2	0	23	2	57	1	1	61	4	12	25	0	41	7	36	16	6	65	190
08:45 AM	17	9	7	0	33	0	61	11	0	72	1	10	11	0	22	14	31	8	8	61	188
08:50 AM	16	11	4	0	31	5	56	3	0	64	3	15	24	0	42	7	36	16	11	70	207
08:55 AM	22	15	7	0	44	3	53	5	1	62	7	12	30	0	49	12	36	12	9	69	224
Total	212	129	61	0	402	60	785	40	5	890	21	127	271	1	420	84	352	168	79	683	2395
Grand Total	426	237	122	0	785	108	1897	74	8	2087	35	280	628	3	946	84	354	322	139	899	4717
Apprch %	54.3	30.2	15.5	0		5.2	90.9	3.5	0.4		3.7	29.6	66.4	0.3		9.3	39.4	35.8	15.5		
Total %	9	5	2.6	0	16.6	2.3	40.2	1.6	0.2	44.2	0.7	5.9	13.3	0.1	20.1	1.8	7.5	6.8	2.9	19.1	
Cars +	422	234	121	0	777	107	1827	74	8	2016	32	276	619	3	930	83	348	308	138	877	4600
% Cars +	99.1	98.7	99.2	0	99	99.1	96.3	100	100	96.6	91.4	98.6	98.6	100	98.3	98.8	98.3	95.7	99.3	97.6	97.5
Trucks	4	3	1	0	8	1	70	0	0	71	3	4	9	0	16	1	6	14	1	22	117
% Trucks	0.9	1.3	0.8	0	1	0.9	3.7	0	0	3.4	8.6	1.4	1.4	0	1.7	1.2	1.7	4.3	0.7	2.4	2.5



TRAFFIC DATA COLLECTION

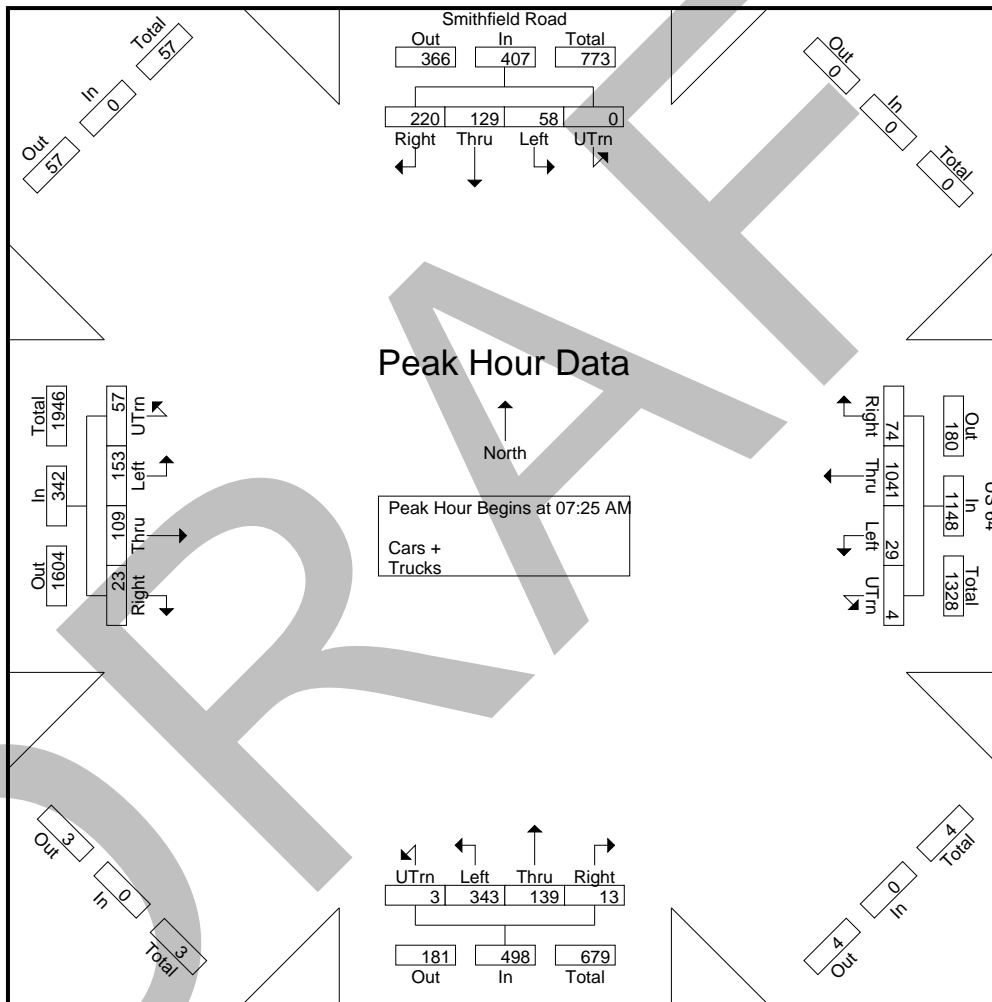
File Name : Knightdale(Smithfield and US 64)AM
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Smithfield Road Southbound					US 64 Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:25 AM																					
07:25 AM	15	15	11	0	41	3	109	3	0	115	0	15	37	0	52	0	0	6	2	8	216
07:30 AM	22	15	3	0	40	3	99	0	0	102	1	11	36	0	48	0	0	13	6	19	209
07:35 AM	17	16	4	0	37	5	103	3	0	111	3	13	22	2	40	0	0	6	7	13	201
07:40 AM	21	9	8	0	38	8	86	2	1	97	1	9	38	0	48	0	0	15	4	19	202
07:45 AM	15	4	0	0	19	2	111	6	0	119	2	19	42	0	63	0	0	5	1	6	207
07:50 AM	15	6	1	0	22	12	94	1	0	107	0	5	28	0	33	0	0	12	6	18	180
07:55 AM	17	11	4	0	32	3	93	5	1	102	2	14	17	0	33	0	0	12	7	19	186
08:00 AM	15	6	5	0	26	7	63	0	0	70	2	6	33	0	41	0	0	14	6	20	157
08:05 AM	19	15	6	0	40	11	67	4	0	82	0	9	17	1	27	3	21	13	2	39	188
08:10 AM	24	11	3	0	38	8	71	1	0	80	0	9	23	0	32	3	32	20	7	62	212
08:15 AM	16	10	8	0	34	5	70	3	2	80	2	17	22	0	41	11	26	15	4	56	211
08:20 AM	24	11	5	0	40	7	75	1	0	83	0	12	28	0	40	6	30	22	5	63	226
Total Volume	220	129	58	0	407	74	1041	29	4	1148	13	139	343	3	498	23	109	153	57	342	2395
% App. Total	54.1	31.7	14.3	0		6.4	90.7	2.5	0.3		2.6	27.9	68.9	0.6		6.7	31.9	44.7	16.7		
PHF	.764	.672	.439	.000	.827	.514	.782	.403	.167	.804	.361	.610	.681	.125	.659	.174	.284	.580	.679	.452	.883



TRAFFIC DATA COLLECTION

File Name : Knightdale(Smithfield and US 64)AM
Site Code :
Start Date : 9/10/2019
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TRAFFIC DATA COLLECTION

File Name : Knightdale(US 64 and Smithfeild) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Smithfield Road Southbound					US 64 Westbound					Smithfield Road Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
02:00 PM	10	19	3	0	32	3	46	4	0	53	1	10	17	0	28	12	66	16	6	100	213
02:05 PM	14	7	5	0	26	2	31	7	1	41	1	10	29	0	40	14	56	17	7	94	201
02:10 PM	12	20	7	0	39	2	33	2	0	37	3	10	20	0	33	19	64	18	11	112	221
02:15 PM	8	9	10	0	27	3	47	4	1	55	8	14	27	1	50	12	42	9	5	68	200
02:20 PM	15	10	7	0	32	5	39	1	0	45	4	12	15	0	31	16	69	28	10	123	231
02:25 PM	14	12	7	0	33	1	58	8	2	69	4	9	23	1	37	11	47	7	8	73	212
02:30 PM	34	15	7	0	56	9	40	6	0	55	2	9	17	0	28	4	67	12	10	93	232
02:35 PM	19	11	7	0	37	4	39	7	0	50	4	11	25	0	40	9	46	15	11	81	208
02:40 PM	14	23	8	0	45	2	56	5	0	63	4	10	12	0	26	20	60	24	8	112	246
02:45 PM	14	14	14	0	42	3	41	4	1	49	4	9	21	0	34	10	51	9	6	76	201
02:50 PM	17	14	6	0	37	5	43	7	1	56	1	16	19	0	36	23	84	21	13	141	270
02:55 PM	14	12	11	0	37	2	46	4	2	54	4	6	25	0	35	11	59	11	13	94	220
Total	185	166	92	0	443	41	519	59	8	627	40	126	250	2	418	161	711	187	108	1167	2655
03:00 PM	13	14	6	0	33	4	41	5	0	50	2	12	14	0	28	14	65	31	10	120	231
03:05 PM	16	19	12	0	47	5	29	5	1	40	6	13	29	0	48	14	51	26	8	99	234
03:10 PM	19	21	4	1	45	3	30	2	3	38	4	8	24	0	36	16	64	14	10	104	223
03:15 PM	16	13	9	0	38	11	44	2	3	60	2	10	23	0	35	11	81	22	10	124	257
03:20 PM	16	15	9	0	40	9	54	7	0	70	0	9	13	0	22	15	67	10	10	102	234
03:25 PM	18	16	6	0	40	4	37	3	2	46	7	11	19	0	37	12	71	30	10	123	246
03:30 PM	18	22	3	0	43	3	39	2	2	46	4	8	16	0	28	23	74	28	12	137	254
03:35 PM	12	25	7	0	44	3	40	6	2	51	3	13	12	2	30	16	65	13	19	113	238
03:40 PM	16	11	8	0	35	4	42	4	2	52	6	13	28	0	47	14	72	14	10	110	244
03:45 PM	13	12	8	0	33	1	41	6	2	50	2	10	20	0	32	17	53	27	11	108	223
03:50 PM	16	13	5	0	34	7	56	6	3	72	2	16	17	0	35	10	76	15	4	105	246
03:55 PM	0	0	0	0	0	0	0	0	0	0	3	13	24	0	40	17	100	19	9	145	185
Total	173	181	77	1	432	54	453	48	20	575	41	136	239	2	418	179	839	249	123	1390	2815
Grand Total	358	347	169	1	875	95	972	107	28	1202	81	262	489	4	836	340	1550	436	231	2557	5470
Apprch %	40.9	39.7	19.3	0.1		7.9	80.9	8.9	2.3		9.7	31.3	58.5	0.5		13.3	60.6	17.1	9		
Total %	6.5	6.3	3.1	0	16	1.7	17.8	2	0.5	22	1.5	4.8	8.9	0.1	15.3	6.2	28.3	8	4.2	46.7	
Cars +	358	345	169	1	873	93	919	105	28	1145	81	262	486	4	833	339	1525	434	231	2529	5380
% Cars +	100	99.4	100	100	99.8	97.9	94.5	98.1	100	95.3	100	100	99.4	100	99.6	99.7	98.4	99.5	100	98.9	98.4
Trucks	0	2	0	0	2	2	53	2	0	57	0	0	3	0	3	1	25	2	0	28	90
% Trucks	0	0.6	0	0	0.2	2.1	5.5	1.9	0	4.7	0	0	0.6	0	0.4	0.3	1.6	0.5	0	1.1	1.6



TRAFFIC DATA COLLECTION

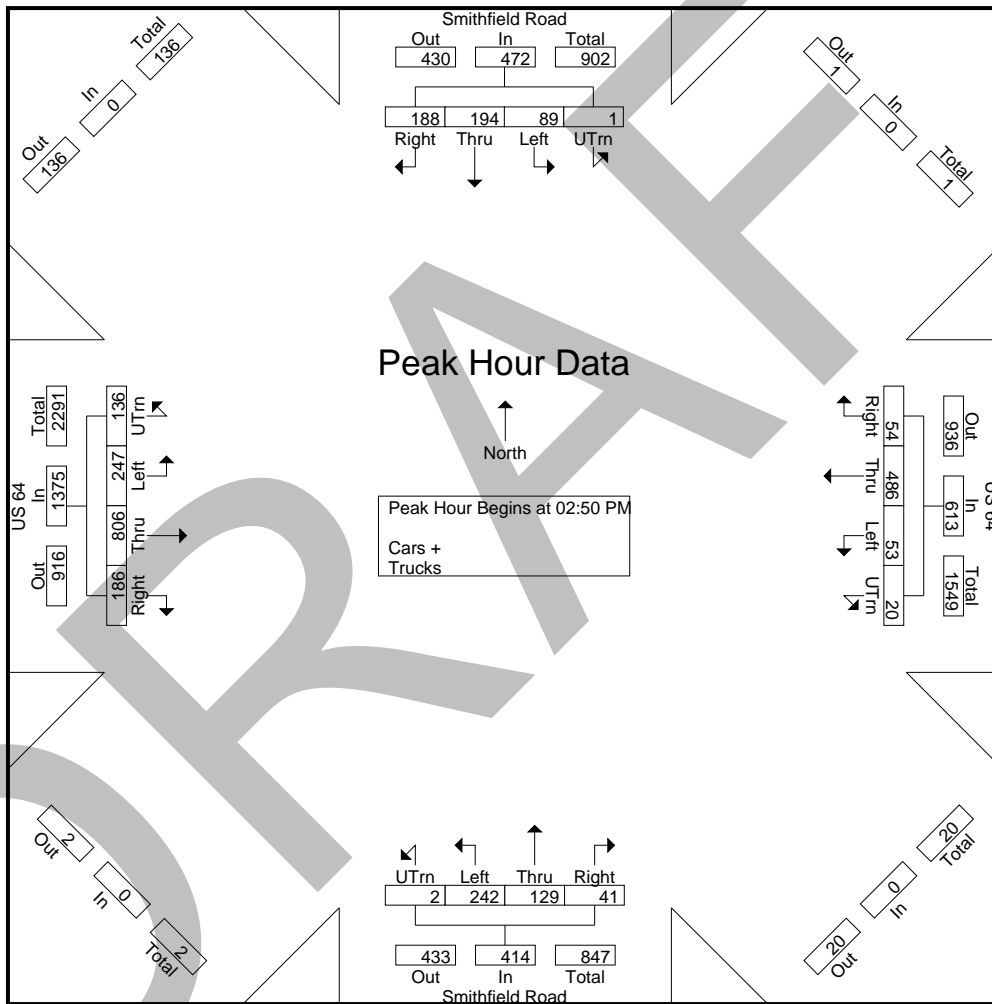
File Name : Knightdale(US 64 and Smithfeild) Mid
 Site Code :
 Start Date : 9/10/2019
 Page No : 2

Start Time	Smithfield Road Southbound					US 64 Westbound					Smithfield Road Northbound					US 64 Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 02:00 PM to 03:55 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:50 PM																					
02:50 PM	17	14	6	0	37	5	43	7	1	56	1	16	19	0	36	23	84	21	13	141	270
02:55 PM	14	12	11	0	37	2	46	4	2	54	4	6	25	0	35	11	59	11	13	94	220
03:00 PM	13	14	6	0	33	4	41	5	0	50	2	12	14	0	28	14	65	31	10	120	231
03:05 PM	16	19	12	0	47	5	29	5	1	40	6	13	29	0	48	14	51	26	8	99	234
03:10 PM	19	21	4	1	45	3	30	2	3	38	4	8	24	0	36	16	64	14	10	104	223
03:15 PM	16	13	9	0	38	11	44	2	3	60	2	10	23	0	35	11	81	22	10	124	257
03:20 PM	16	15	9	0	40	9	54	7	0	70	0	9	13	0	22	15	67	10	10	102	234
03:25 PM	18	16	6	0	40	4	37	3	2	46	7	11	19	0	37	12	71	30	10	123	246
03:30 PM	18	22	3	0	43	3	39	2	2	46	4	8	16	0	28	23	74	28	12	137	254
03:35 PM	12	25	7	0	44	3	40	6	2	51	3	13	12	2	30	16	65	13	19	113	238
03:40 PM	16	11	8	0	35	4	42	4	2	52	6	13	28	0	47	14	72	14	10	110	244
03:45 PM	13	12	8	0	33	1	41	6	2	50	2	10	20	0	32	17	53	27	11	108	223
Total Volume	188	194	89	1	472	54	486	53	20	613	41	129	242	2	414	186	806	247	136	1375	2874
% App. Total	39.8	41.1	18.9	0.2		8.8	79.3	8.6	3.3		9.9	31.2	58.5	0.5		13.5	58.6	18	9.9		
PHF	.825	.647	.618	.083	.837	.409	.750	.631	.556	.730	.488	.672	.695	.083	.719	.674	.800	.664	.596	.813	.887



TRAFFIC DATA COLLECTION

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TRAFFIC DATA COLLECTION

File Name : Knightdale(Smithfield and US 64)PM
 Site Code :
 Start Date : 9/10/2019
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Groups Printed- Cars + - Trucks

Start Time	Smithfield Road Southbound					US 64 Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
04:00 PM	11	10	6	0	27	1	48	3	2	54	1	10	27	0	38	19	91	23	13	146	265
04:05 PM	21	19	8	0	48	4	49	3	1	57	5	5	18	1	29	15	86	18	11	130	264
04:10 PM	18	19	10	0	47	9	40	6	1	56	6	13	19	0	38	17	72	9	7	105	246
04:15 PM	21	19	6	0	46	4	53	3	1	61	9	12	31	0	52	15	80	11	13	119	278
04:20 PM	25	15	8	0	48	5	44	3	1	53	6	7	19	0	32	16	109	22	8	155	288
04:25 PM	25	12	3	0	40	5	54	7	2	68	5	10	28	0	43	12	93	22	11	138	289
04:30 PM	18	12	13	0	43	6	38	8	1	53	4	10	15	1	30	16	77	23	15	131	257
04:35 PM	21	15	10	0	46	7	46	3	1	57	4	12	27	0	43	20	106	32	8	166	312
04:40 PM	11	13	10	0	34	1	53	3	0	57	1	13	24	0	38	17	94	20	10	141	270
04:45 PM	13	22	15	0	50	4	38	7	1	50	8	14	15	0	37	16	109	27	7	159	296
04:50 PM	13	20	6	0	39	4	58	2	0	64	3	12	33	1	49	13	105	20	13	151	303
04:55 PM	15	11	5	0	31	9	59	3	0	71	2	12	24	0	38	25	102	23	13	163	303
Total	212	187	100	0	499	59	580	51	11	701	54	130	280	3	467	201	1124	250	129	1704	3371
05:00 PM	10	21	7	0	38	3	47	7	2	59	7	17	30	1	55	16	109	18	5	148	300
05:05 PM	14	16	12	0	42	1	53	8	1	63	1	13	15	0	29	24	120	16	14	174	308
05:10 PM	17	14	11	0	42	6	42	7	3	58	5	16	19	1	41	22	118	19	12	171	312
05:15 PM	15	17	4	0	36	5	42	6	2	55	7	14	20	1	42	9	101	19	7	136	269
05:20 PM	14	25	16	0	55	5	41	1	1	48	4	15	23	0	42	19	87	20	12	138	283
05:25 PM	25	16	7	0	48	6	54	9	1	70	4	20	26	0	50	26	88	28	12	154	322
05:30 PM	19	19	5	0	43	5	64	7	0	76	2	12	23	0	37	22	103	27	11	163	319
05:35 PM	14	18	8	0	40	8	76	9	0	93	1	15	18	0	34	18	106	34	8	166	333
05:40 PM	18	14	12	0	44	5	80	3	0	88	2	14	19	1	36	18	136	28	5	187	355
05:45 PM	14	14	13	0	41	3	53	5	2	63	2	17	25	0	44	20	117	29	15	181	329
05:50 PM	13	15	10	1	39	4	49	3	0	56	1	9	24	1	35	20	108	23	11	162	292
05:55 PM	16	27	5	0	48	3	59	2	1	65	3	16	24	1	44	19	98	31	10	158	315
Total	189	216	110	1	516	54	660	67	13	794	39	178	266	6	489	233	1291	292	122	1938	3737
Grand Total	401	403	210	1	1015	113	1240	118	24	1495	93	308	546	9	956	434	2415	542	251	3642	7108
Apprch %	39.5	39.7	20.7	0.1		7.6	82.9	7.9	1.6		9.7	32.2	57.1	0.9		11.9	66.3	14.9	6.9		
Total %	5.6	5.7	3	0	14.3	1.6	17.4	1.7	0.3	21	1.3	4.3	7.7	0.1	13.4	6.1	34	7.6	3.5	51.2	
Cars +	401	403	210	1	1015	113	1211	116	24	1464	93	308	545	9	955	430	2406	540	251	3627	7061
% Cars +	100	100	100	100	100	100	97.7	98.3	100	97.9	100	100	99.8	100	99.9	99.1	99.6	99.6	100	99.6	99.3
Trucks	0	0	0	0	0	0	29	2	0	31	0	0	1	0	1	4	9	2	0	15	47
% Trucks	0	0	0	0	0	0	2.3	1.7	0	2.1	0	0	0.2	0	0.1	0.9	0.4	0.4	0	0.4	0.7



TRAFFIC DATA COLLECTION

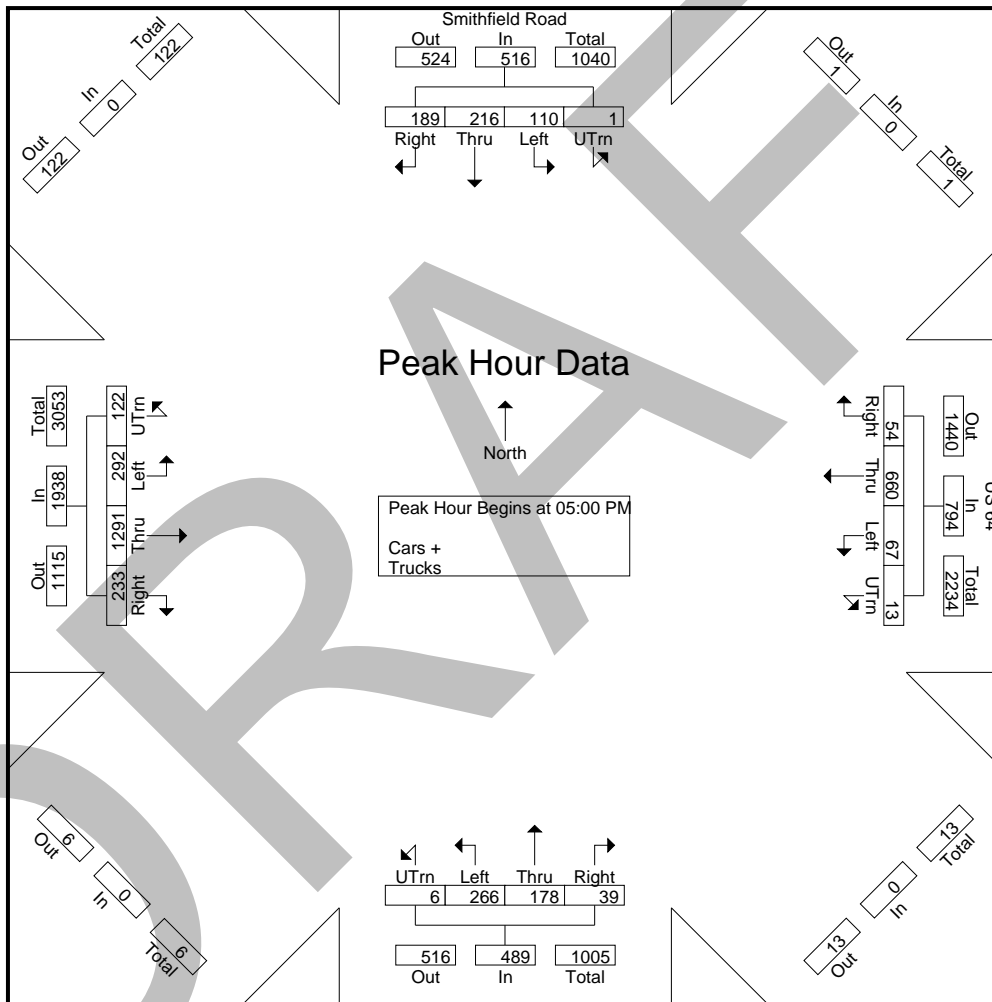
File Name : Knightdale(Smithfield and US 64)PM
 Site Code :
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Start Time	Smithfield Road Southbound					US 64 Westbound					Northbound					Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	10	21	7	0	38	3	47	7	2	59	7	17	30	1	55	16	109	18	5	148	300
05:05 PM	14	16	12	0	42	1	53	8	1	63	1	13	15	0	29	24	120	16	14	174	308
05:10 PM	17	14	11	0	42	6	42	7	3	58	5	16	19	1	41	22	118	19	12	171	312
05:15 PM	15	17	4	0	36	5	42	6	2	55	7	14	20	1	42	9	101	19	7	136	269
05:20 PM	14	25	16	0	55	5	41	1	1	48	4	15	23	0	42	19	87	20	12	138	283
05:25 PM	25	16	7	0	48	6	54	9	1	70	4	20	26	0	50	26	88	28	12	154	322
05:30 PM	19	19	5	0	43	5	64	7	0	76	2	12	23	0	37	22	103	27	11	163	319
05:35 PM	14	18	8	0	40	8	76	9	0	93	1	15	18	0	34	18	106	34	8	166	333
05:40 PM	18	14	12	0	44	5	80	3	0	88	2	14	19	1	36	18	136	28	5	187	355
05:45 PM	14	14	13	0	41	3	53	5	2	63	2	17	25	0	44	20	117	29	15	181	329
05:50 PM	13	15	10	1	39	4	49	3	0	56	1	9	24	1	35	20	108	23	11	162	292
05:55 PM	16	27	5	0	48	3	59	2	1	65	3	16	24	1	44	19	98	31	10	158	315
Total Volume	189	216	110	1	516	54	660	67	13	794	39	178	266	6	489	233	1291	292	122	1938	3737
% App. Total	36.6	41.9	21.3	0.2		6.8	83.1	8.4	1.6		8	36.4	54.4	1.2		12	66.6	15.1	6.3		
PHF	.630	.667	.573	.083	.782	.563	.688	.620	.361	.711	.464	.742	.739	.500	.741	.747	.791	.716	.678	.864	.877



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RKA Signal Timing Data Collection

Intersection: *US 64 Business (Knightdale Blvd) at SR 2049 (Old Knight Rd/N First Ave)* ¹⁹²⁹⁶⁻⁰⁰⁰

Timing Plans

05-0885

Nothing

Event #	Run Time	Plan #	Offset #
Event 1	1/1-12/31 11:00-17:00	Sunday 1	1
Event 2	06:30-15:00	M-F 1	1
Event 3			
Event 4	1500-1900	M-F 2	1
Event 5	-		
Event 6	0700-1900	Saturday 1	1
Event 7	-		
Event 8	-		
Event 9	-		
Event 10	-		

Splits

Phase #	Cycle Length	Offset	Phase Sequence	Timing splits - Phase #								
				1	2	3	4	5	6	7	8	9
Plan 1	140	85		30	60	0	50	30	60	0	50	
Plan 2	140	65		30	60	0	50	30	60	0	50	
Plan 3	0											
Plan 4	0											
Plan 5	0											
Plan 6	0											
Plan 7	0											
Plan 8	0											
Plan 9	0											
Plan 10	0											

Plan 11 140 ~~70~~ 85 30 60 0 50 30 60 0 50
 12 140 65 30 60 0 50 30 60 0 50

Appendix 1. Roadway Project List – CAMPO and DCHC MPO

Each row in the table is a separate highway project. Projects are color-coded by MPO (green for DCHC MPO and yellow for CAMPO) and separated by time period. The three time periods, 2025, 2035 and 2045, are used in the financial plan. The attribute information for each project is presented by columns, and includes the following:

- MTP ID – This unique number facilitates the tracking and mapping of projects in the plan.
- Highway Project – The highway project is the name of the road.
- From/To – This usually identifies the name of the two road intersections between which the project is to be constructed.
- Existing Lanes – This identifies the number of current travel lanes. “-” indicates an interchange or a new road alignment – in other words, there is no existing road.
- Proposed Lanes – This identifies the number of travel lanes proposed in the plan; if the number of lanes does not increase from the existing lanes, the project does not propose to add through lanes but instead will make safety, intersection, multimodal s or other improvements.
- Improvement Type –
 - Widening is the addition of travel lanes.
 - Modernization can include safety, intersection (e.g., turn lanes), multimodal or other improvements, but does not include the addition of travel lanes.
 - Upgrade refers to capacity and safety improvements to interchanges.
 - New Location is a new roadway.
 - New is the conversion of an intersection to an interchange.
 - Freeway is the conversion of an existing road to a limited access highway (which is a roadway type often referred to as interstate).
 - Expressway is the conversion of an existing road to a highway that is mostly limited access.
- Length – The centerline mileage of the project.
- Estimated Cost – The total costs are costs to be incurred from 2018 through 2045. Cost estimates come from feasibility studies, current and past Transportation Improvement Programs (TIP), NCDOT’s SPOT prioritization process, and the NCDOT Contract Standards and Development Unit project cost workbook.
- STI – The project’s STI (Strategic Transportation Investment) funding tier: statewide, regional or division.
- Regionally Significant – Regionally Significant projects provide access to and from the region, or to major destinations in the region. The FHWA functional classifications serve a different purpose than the local functional classification used by the MPOs, so the two classification systems are significantly different. Generally, the regionally significant designation includes interstate highways, U.S. highways, freeways, and North Carolina signed roads that are the primary road in a corridor. Rail transit facilities, which are described in a separate section, are considered regionally significant. The Regionally Significant designation is important for the Air Quality Conformity Determination for the MTP. Under AQ Conformity, if a Regionally Significant project is changed (e.g., completion year, capacity) after the 2045 MTP has been adopted, then the Conformity Determination process might have to be redone.
- Exempt – whether the project is exempt under air quality conformity requirements. If so, the section under which it is exempt is listed.
- TIP# -- The project reference number for those projects which are contained in the 2018-27 Transportation Improvement Program (TIP).

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
2025 MTP												
F10	I-440 Widening	US 1/64	Wade Avenue	4	6	Widening	3.5	\$348,002,000.00	St	Yes		U-2719
F11-1a	US 1 North - Upgrade to Freeway	I-540	Thornton Road	4	8	Widening	1.62	\$124,700,000.00	St	Yes		U-5307A
F11-1b	US 1 North - Upgrade to Freeway	Thornton Rd	Burlington Mills Rd	4	8	Widening	1.55	\$120,100,000.00	St	Yes		U-5307B
F11-1c	US 1 North - Upgrade to Freeway	Burlington Mills Rd	New Falls of Neuse Blvd	4	6	Widening	1.96	\$64,050,000.00	St	Yes		U-5307C
F11-1d	US 1 North - Upgrade to Freeway	New Fall of Neuse Blvd	NC 98 (Durham Rd)	4	6	Widening	2.32	\$64,050,000.00	St	Yes		U-5307C
F13	NC 147 Toll Extension (CAMPO Portion)	NC 540	McCrimmon Pkwy / Little Drive	0	4	New Location	1.6	\$23,880,000.00	St	Yes		U-5966
F15a1	US 64 / Laura Duncan Interchange (New)	US 64	Laura Duncan Rd	-	-	Interchange	0	\$38,200,000.00	St	Yes		U-5301A
F15a2	US 64 / Lake Pine Interchange (New)	Lake Pine Drive	Lake Pine Drive	-	-	Interchange	0	\$38,200,000.00	St	No		U-5301B
F15a3	US 64 (superstreet)	US 1	Lake Pine Dr	4	6	Superstreet	2.49	\$36,400,000.00	St	Yes		U-5301C
F16	I-40	US 1-64	Wade Avenue	4	6	Widening	3.89	\$81,058,666.94	St	Yes		I-4744
F43	I-40	US 1/64	Lake Wheeler Rd	6	8	Widening	4.43	\$27,250,000.00	St	Yes		I-5701
F43b	I-40 / US 1 / US 64 Interchange	I-40 / US 1 / US 64	I-40 / US 1 / US 64	-	-	Interchange	-	\$151,750,000.00	St	Yes		I-5703
F44a	I-40 (East)	I-440	US 70 Business (Garner)	6	8	Widening	4.4	\$106,600,000.00	St	Yes		I-5111A
F44b	I-40 (East)	US 70 Business (Garner)	NC 42	4	8	Widening	6.3	\$153,400,000.00	St	Yes		I-5111BA and BB
F44b1	Cleveland Road / I-40 Interchange	-	-	-	-	Interchange	-	\$35,945,500.00	St	No		I-4739
F44b2	NC-42 / I-40 Diverging Diamond Interchange	-	-	-	-	Interchange	-	\$35,945,500.00	St	No		I-4739
F4c1	NC 540 TriEx / Veridea Parkway Interchange	-	-	-	-	Interchange	-	\$13,202,805.00	St	No		R-2635
F5	NC 540 Tri-Ex (Phase IV)	NC 55 Bypass	US 401 (South)	0	6	New Location	7.8	\$172,519,000.00	St	Yes		R-2721
F6	NC 540 Tri-Ex (Phase V)	US 401 (South)	I-40 (South)	0	6	New Location	8.7	\$425,527,000.00	St	Yes		R-2828
F82	I-40/NC 54 DDI	NC 54	NC 54	-	-	Interchange	2	\$8,004,000.00	St	No		I-5873
F83	I-440 Interchange Improvements	Wake Forest Road (SR 2000)	Wake Forest Road (SR 2000)	-	-	Interchange	2	\$10,632,000.00	St	No		I-5708

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A10	Old Wake Forest Rd	Litchford Rd / Atlantic Blvd	Capital Blvd	2	4	Widening	1.2	\$8,600,000.00	Div	No		N/A
A104a	Morrisville Parkway	Green Level Ch Rd	NC 55	0	2	New Location	1.83	\$24,802,000.00	Div	Yes		U-5315 A B
A111	Reedy Creek Turn Lane	N.E. Maynard Rd	Harrison Avenue	2	3	Turn Lane	1.17	\$13,390,000.00	Div	No		U-5501
A114a	Ten Ten Rd	US 1	US 1	-	-	Interchange	0.4	\$26,392,087.00	St	No		U-5825 A
A114b	Ten Ten Rd	Kildaire Farm Road	US 1	2	4	Widening	2.1	\$15,259,000.00	Div	No		U-5825B
A118b	NC 55	Jicarilla Rd	Kennebec Church Rd	2	4	Widening	1.6	\$27,514,000.00	Reg	Yes		R-5705 C
A118c	NC 55	Kennebec Church Road	North Broad St	2	4	Widening	0.94	\$9,706,000.00	Reg	Yes		R-5705 B
A119	McCrimmon Parkway	Airport Blvd	NC 54	2	4	Widening	0.83	\$20,702,000.00	Div	No		U-5747 B
A124c1	Northside Loop (east)	N. White St / Flaherty Ave	West of undeveloped section of Royal Mill Avenue / Oak Grove Church Rd	0	3	New Location	1	\$8,768,623.50	Div	No		N/A
A124c2	Northside Loop (east)	Flaherty Ave	Eastern portion of existing Royal Mill Avenue	0	3	New Location	0.1	\$8,768,623.50	Div	No		N/A
A127a	Ligon Mill Rd Connector	US 1A	NC 98 Bypass	2	4	Widening	0.61	\$5,576,756.64	Div	Yes		N/A
A127b2	Ligon Mill Rd Connector	Richland Creek	NC 98	0	2	New Location	0.75	\$5,851,243.13	Div	No		N/A
A130a	Mitchell Mill Rd (West)	US 401	Watkins Rd	2	4	Widening	1.37	\$13,650,975.00	Div	No		N/A
A130c	US 401/Mitchell Mill Rd Interchange (New)	-	-	-	-	Interchange	2	\$64,620,000.00	Reg	Yes		U-5748
A139	US 70 / Timber Drive Interchange (New)	Hammond Road	Timber Drive	-	-	Interchange	2	\$18,938,000.00	Reg	No		U-5744
A13c	Falls of Neuse Blvd	I-540	Durant Rd	4	6	Widening	1.54	\$11,798,000.00	Div	No		U-5826
A16	Rock Quarry Rd	Old Birch Dr	Sunnybrook Rd	3	5	Widening	1.2	\$10,200,000.00	Div	No		N/A
A160a	Ralph Stephens Rd (Part NL)	Ralph Stevens Rd Ext	NC 55	2	4	Widening	0.59	\$4,843,512.96	Div	No		U-5318
A160b	Ralph Stephens Rd (Part NL)	Ralph Stevens Rd	NC 55	0	4	New Location	0.38	\$3,285,316.32	Div	No		U-5318
A160d	Ralph Stephens Rd (Part NL)	Piney Grove Wilbon	Ralph Stevens Rd	0	4	New Location	0.34	\$3,260,846.16	Div	No		U-5318
A160e	Ralph Stephens Rd (Part NL)	Avent Ferry	Ralph Stevens Rd	0	4	New Location	0.48	\$4,437,781.92	Div	No		U-5318

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A164a2	Green Level Church Rd	O'Kelly Chapel Rd	McCrimmon Parkway	2	4	Widening	0.91	\$8,319,423.84	Div	No		N/A
A164b	Green Level Ch Rd	Carpenter Fire Station Rd	Morrisville Parkway	2	4	Widening	1.21	\$11,062,091.04	Div	No		N/A
A164c1	Green Level Church Rd	Folklore Way	O'Kelly Chapel Rd	2	4	Widening	0.4	\$3,656,889.60	Div	No		NOT IN TIP
A166	Center St/1010	US 1	Apex Peakway	2	4	Widening	1.04	\$9,507,913.00	Div	No		U-5825A
A171	Green Level West Rd	NC 55	I-540	2	4	Widening	0.9	\$8,228,001.60	Div	No		U-5500
A174c	Martin Pond Road Widening	Wendell Falls Parkway	Poole Road	2	4	Widening	0.5	\$4,104,672.00	Div	No		N/A
A187b1	Apex Peakway (East)	Center St / Ten Ten Rd	NC 55	0	4	New Location	0.8	\$8,800,000.00	Div	No		N/A
A187c1	Apex Peakway (South)	Tingen Rd	Old US 1	0	2	New Location	0.65	\$3,971,153.55	Div	No		N/A
A199	Pullen Rd	Western Blvd	Centennial Pkwy	0	2	New Location	0.4	\$3,451,895.34	Div	No		N/A
A207a3	Judd Parkway NE	Products Road (future ext)	Old Honeycutt Road	2	4	Widening	0.6	\$1,350,000.00	Div	No		U-5927
A207c	Judd Parkway W	Wilbon Rd	NC 42	0	4	New Location	1.2	\$26,200,000.00	Div	No		U-5317
A20b	Hillsborough St Safety & Enhancement (Road Diet)	Gardner St	Gormat St	4	4	TSM	0.84	\$1,000,000.00	Div	Yes		U-4447
A215a	Jones Dairy Rd	NC 98 (Wake Forest Bypass)	Chalk Rd	2	4	Widening	0.8	\$7,313,779.20	Div	No		N/A
A218e	Jessie Dr (part NL)	NC 55	Ten Ten Rd	0	2	New Location	1.58	\$10,417,520.30	Div	No		N/A
A219a1	McCrimmon Parkway Ext	NC 54	Davis Dr	2	4	Widening	1.1	\$13,000,000.00	Div	No		U-5747A
A220a	Morrisville Carpenter Rd	Page St	Davis Dr	2	4	Widening	0.6	\$9,000,000.00	Div	No		U-5618
A220b	Morrisville Carpenter Rd	Davis Dr	Louis Stephens Dr	2	4	Widening	0.7	\$6,399,556.80	Div	No		N/A
A220c	Morrisville Carpenter Rd	Louis Stephens Dr	Good Hope Ch Rd	2	4	Widening	0.28	\$2,559,822.72	Div	No		N/A
A222c	NC 54	Perimeter Park Dr	Northern Twn Limits	2	6	Widening	1.8	\$25,336,000.00	Reg	Yes		U-5750
A236a	Chapel Hill Rd	NW Maynard Rd	Academy St	2	4	Widening	1	\$11,310,000.00	Div	Yes		N/A
A236b	Chapel Hill Rd	Academy St	NE Maynard Rd	2	4	Widening	1	\$11,500,000.00	Div	Yes		N/A
A240c	South Harrison Avenue	Dry Rd	Kildaire Farm Rd	0	2	New Location	0.23	\$1,794,381.23	Div	No		N/A
A26a	McCrimmon Parkway	Airport Blvd	Aviation Parkway	0	2	New Location	1.43	\$11,487,602.57	Div	No		U-3620
A26b	McCrimmon Parkway	Airport Blvd	Aviation Parkway	2	4	Widening	1.43	\$11,870,000.00	Div	No		U-5828
A27c1	Louis Stephens Dr Ext (NL)	Little Drive	Poplar Pike Lane	0	4	New Location	0.72	\$3,036,000.00	Div	No		U-5827

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A28b	Davis Dr	Farm Pond Rd	US 64	2	4	Widening	1.1	\$10,056,446.40	Div	No		N/A
A2b	Southall Rd	Southall Rd (Existing)	Hedingham Blvd	0	4	New Location	0.28	\$3,800,000.00	Div	No		N/A
A407b3	NC 42	NC 50	I-40	2	4	Widening	2.17	\$12,713,033.00	Reg	Yes		R-3410B
A412	US 70 - Upgrade to Freeway	Durham / Wake County Line	Lumley/Westgate Rd	4	6	Widening	2.69	\$47,500,000.00	St	Yes		U-5518 A
A414	Kildaire Farm Connector	Sunset Lake Rd	Holly Springs Rd	0	4	New Location	0.9	\$9,612,521.10	Div	No		R-2721
A427a	Avent Ferry Rd	Piney Grove Wilbon	Elm St	2	4	Widening	0.6	\$5,485,334.40	Div	No		U-5889
A427b	Avent Ferry Rd	Cass Holt	Piney Grove Wilbon	2	4	Widening	0.72	\$5,399,222.40	Div	No		U-5889
A439	Buck Jones Rd	Farmgate Rd	Xebec Way	2	3	Turn Lane	1.05	\$6,500,000.00	Div	No		N/A
A440a1	Carpenter Fire Station Rd	Cameron Pond Drive	NC-55	2	4	Widening	0.94	\$7,850,005.80	Div	No		N/A
A440b	Carpenter Fire Station Ext	NC 55	Morrisville Carpenter Rd	0	4	New Location	0.3	\$3,204,173.70	Div	No		U-5502
A448	Six Forks Rd	Ramblewood Road	Lynn Road	4	6	Widening	2.4	\$45,000,000.00	Div	No		N/A
A450	RTP Access Routes	Internal RTP access points	External access points	2	4	New Location	0.84	\$6,299,092.80	Div	No		U-4410
A46a	Tryon Rd	Lake Wheeler Rd	Par Drive	2	4	Widening	1.3	\$6,800,000.00	Div	No		U-4432
A46b	Tryon Rd	Norfolk Southern Rail	Existing Tryon Rd Alignment	0	4	Widening	0.5	\$14,273,729.00	Div	No		U-4432
A46c	Tryon Rd	New Tryon Rd Alignment	S. Wilmington St	2	4	Widening	0.09	\$2,569,271.00	Div	No		U-4432
A480b	US 401(South)	Ten Ten Rd	NC 540	4	6	Widening	1.07	\$21,985,000.00	Reg	Yes		U-5746
A486	NC 54-Blue Ridge Grade Separation	Blue Ridge Rd	Beryl Rd	4	4	Grade Separation	1	\$28,634,000.00	Reg	No		U-4437
A49a	Poole Rd	Maybrook Dr	Barwell Rd	2	4	Widening	1	\$9,800,000.00	Div	No		N/A
A521	O'Kelley Chapel Rd	Louis Stephens Dr	NC 55	0	4	New Location	0.62	\$5,946,248.88	Div	No		N/A
A54	Pleasant Valley Rd	Duraleigh Rd	Glenwood Avenue	2	3	Widening	0.34	\$1,367,377.83	Div	No		N/A
A557	Green Lvl W Rd Widening	NC 540	Green Level Ch Rd	2	4	Widening	0.95	\$12,923,000.00	Div	No		U-5500
A562	Wade Ave Widening	I-40	I-440	4	6	Widening	2.91	\$39,565,000.00	St	Yes		U-5936
A57	Sandy Forks Rd	Falls of Neuse	Six Forks Rd	2	3	Turn Lane	1.31	\$9,850,000.00	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A605a	High Speed Rail - Rogers Rd Intersection	Rogers Rd	Rogers Rd	2	4	Grade Separation	-	\$10,890,000.00	Div	No		N/A
A608b	NC 98 Widening	Hampton Way	Tyler Run Dr	2	3	Widening	1.23	\$2,547,625.00	Reg	Yes		U-5118BB
A610	Stadium Dr Widening	US 1	US 1A	2	3	Widening	1.29	\$893,000.00	Div	No		U-5515
A615	Marsh Creek/ Trawick Rd Median	Capital Blvd	New Hope Rd	2	3	Turn Lane	1.41	\$10,700,000.00	Div	No		N/A
A619c	US 401 Median	NC 55/42 (FV)	Judd Parkway	4	4	Median	1.18	\$9,120,000.00	Reg	Yes		U-5980
A622	NC 55 Widening	Apex Peakway (South)	Salem St	2	4	Widening	0.89	\$5,581,930.00	Reg	Yes		U-2901 B
A623d2	Hilltop Needmore Extension	Herbert Atkins Road	Basal Creek (East Fork)	0	2	New Location	0.3	\$1,938,327.30	Div	No		N/A
A630	Judd Parkway NW	NC 55	Judd Pkwy (NL)	2	4	Widening	0.57	\$4,949,287.20	Div	No		N/A
A634	US 70 / Brier Creek Interchange	-	-	-	-	Interchange	0	\$13,400,000.00	St	Yes		U-5518C
A635b	US 401 Superstreet	Legend Rd	Purser Dr	4	4	Superstreet	1	\$3,245,000.00	Reg	No		U-5302
A637	401/55/42 Interchange	East of Fuquay-Varina	-	-	-	Interchange	2	\$54,684,000.00	Reg	No		U-5751
A638	US 70 / Jones Sausage Int. Improvements	-	-	4	6	Widening	1.74	\$7,000,000.00	Reg	Yes		U-5520
A640	Aviation Parkway Interchange (Impr)	National Guard Dr	I-40	-	-	Interchange	0.42	\$24,853,000.00	St	Yes		I-5506
A641	Airport Blvd Interchange (Impr)	-	-	-	-	Interchange	0.82	\$34,720,000.00	St	Yes		I-5700
A642	N Harrison Ave HSR Grade Sep	Adams St	W Chatham St	4	4	Grade Separation	0	\$22,600,000.00	St	No		P-5708
A644	Chatham / Maynard Grade Separation	-	-	2	2	Grade Separation	0	\$38,000,000.00	St	No		P-5718
A645	US 70 / TW Alexander Interchange	-	-	-	-	Interchange	2	\$29,300,000.00	St	No		U-5518B
A646	Tarboro St Road Diet	New Bern Ave	Martin Luther King Jr	4	3	TSM	0.88	\$1,000,000.00	Div	No		N/A
A647	West St Extension	Martin St	Cabarrus St	0	2	New Location	0.28	\$10,000,000.00	St	No		U-5521
A648	US 1 / Friendship / Richardson Interchange	Old US 1 Highway	Friendship Road	-	-	Interchange	0	\$13,946,625.00	St	Yes		
A64a	Aviation Parkway	Gateway Centre Blvd	Dominion Dr	2	4	Widening	0.58	\$6,957,000.00	Div	No		U-5811
A64b	Aviation Parkway	Evans Rd	NC 54	2	4	Widening	0.9	\$10,795,000.00	Div	Yes		U-5811
A64d	Aviation Parkway	I-40	Gateway Centre Blvd	4	6	Widening	0.92	\$11,035,000.00	Div	Yes		U-5811

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A650	Kipling Realign	US 401	Harnett Central Rd	0	2	New Location	0.49	\$1,625,000.00	Div	No		R-5523
A651	Apex Peakway / Salem St Interchange	-	-	-	-	Interchange	0	\$12,500,000.00	St	No		U-5928
A656	New Hope Road Grade Separation	-	-	-	-	Grade Separation	-	\$15,346,000.00	St	No		P-5715
A659	Durant Rd Grade Separation	-	-	-	-	Grade Separation	-	\$12,525,000.00	St	No		P-5720
A681	Dixie Forest Road	Spring Forest Road	Atlantic Ave / Litchford Road	2	3	Widening	0.25	\$1,600,000.00	Div	No		N/A
A682	Blue Ridge Rd	Duraleigh	Crabtree Valley Avenue	2	3	Turn Lane	2	\$10,500,000.00	Div	No		N/A
A683a	Barwell Rd	Rock Quarry Rd	Berkley Lake Drive	2	3	Turn Lane	1.15	\$10,800,000.00	Div	No		N/A
A684	Blount/Person Streets Two Way Conversion	Blount St / Person St / Sasser St	Blount St / Person St / Hoke St	-	-	TSM	4.1	\$6,100,000.00	Div	No		N/A
A685	Wake Forest Rd / Brookside Drive Roundabout	-	-	-	-	TSM	-	\$2,300,000.00	Div	No		N/A
A686	Atlantic Avenue Widening	Highwoods Blvd	New Hope Church Rd	4	4	Widening	1	\$11,600,000.00	Div	No		N/A
A696	New Hope Church Rd	Green Rd	Deana Ln	2	3	Widening	0.4	\$2,637,180.00	Div	No		N/A
A82a	Trinity Rd Ext	Walnut Creek	Cary Towne Blvd	2	4	Widening	0.34	\$8,938,045.41	Div	No		N/A
A82b	Trinity Rd Ext	Walnut Creek	Chatham St	0	2	New Location	0.44	\$2,688,165.48	Div	No		N/A
A85b1	Leesville Rd	Westgate Rd	O'Neal Rd (@ Leesville Road Campus)	2	4	Widening	1	\$11,600,000.00	Div	No		N/A
A86a	Leesville Rd	I-540 Interchange	New Leesville Blvd	2	4	Widening	1.17	\$10,696,402.08	Div	No		N/A
A90b	US 401 Rolesville Bypass	US 401	US 401	0	4	New Location	4.5	\$42,625,440.00	Reg	Yes		R-2814b
A90c	US 401 Widening	US 401 Rolesville Bypass	Flat Rock Church Rd	2	4	Widening	6.64	\$27,950,000.00	Reg	Yes		R-2814C
A96b	NC 55	Salem St	Bryan Dr	2	4	Turn Lane	0.53	\$3,324,070.00	Reg	Yes		U-2901 B
Grnv108	NC 56 Realignment	NC 50	US 15	2	2	Intersection Realignment	0.5	\$4,480,000.00	Reg	No		R-5707
Hrnt4a	NC 55	North Broad Street	Church St	2	3	Turn Lane	1.78	\$12,400,000.00	Reg	Yes		R-5705A
Jhns11	Front St Ext	Front St	NC 42	0	2	New Location	0.92	\$4,901,925.60	Div	No		U-3605
Jhns1b	NC 42 East Widening	Glen Laurel Rd	Buffaloe Rd	2	4	Widening	4.35	\$43,100,000.00	Reg	Yes		R-3825

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
Jhns2a	NC 42 West	US 70 Business	US 70 Bypass	2	4	Widening	3.1	\$27,430,000.00	Reg	Yes		R-3410A
Jhns2b	NC 42 West Widening	US 70 Bypass	I-40	2	4	Widening	4.27	\$25,015,967.00	Reg	Yes		R-3410B
2035 MTP												
F110	US 1	US 64	NC 540	4	6	Widening	5.3	\$200,716,129.00	St	Yes		U-6066
F110a	US 1 / NC 55 Diverging Diamond Interchange	-	-	-	-	Interchange	-	\$22,300,000.00	St	No		N/A
F11-1e1	US 1 North - Upgrade to Freeway	NC 98 (Durham Road)	Harris Road	4	6	Widening	1.85	\$90,112,000.00	St	Yes		U-5307 D
F11-1e2	US 1 North - Upgrade to Freeway	Harris Road	US 1A (Youngsville)	4	6	Widening	3.91	\$43,981,165.80	St	Yes		N/A
F14	Clayton Bypass Widening	I-40	US 70	4	6	Widening	8.69	\$97,748,422.20	St	Yes		N/A
F15a	US 64 West Conversion to Expressway	Laura Duncan Road	I-540	4	6	Widening	5.7	\$51,193,039.59	St	Yes		N/A
F15b	US 64 West Conversion to Freeway	NC-540 Tri-Ex Turnpike	NC 751	4	6	Widening	3.2	\$67,978,386.00	St	Yes		N/A
F17	Aviation Parkway Ext	Brier Creek Parkway	US 70	0	4	New Location	1.79	\$33,160,066.14	Div	Yes		U-4721[A]
F3	NC 540 Tri-Ex (Phase VI)	I-40 (South)	US 64 East Bypass	0	6	New Location	10.8	\$315,430,000.00	St	Yes		R-2829
F40	I-40 Managed Lanes	Durham County Line	Wade Avenue	0	2	Widening	9.2	\$579,090,000.00	St	Yes		I-5702
F41	I-40 Managed Lanes	Wade Avenue	Johnston County	0	2	Widening	21.29	\$211,274,569.00	St	Yes		N/A
F41b	I-40 Managed Lanes	Johnston County	Cornwallis Rd	0	2	Widening	2.88	\$20,462,870.00	St	Yes		N/A
F42b	I-540 Managed Lanes	I-40	US-64 Bypass	0	2	Widening	25.82	\$367,809,456.96	St	Yes		N/A
F44c	I-40 (East)	NC 42	NC 210	4	6	Widening	6.78	\$89,679,815.78	St	Yes		N/A
F44d	I-40 (East)	NC 210	CAMPO MAB	4	6	Widening	6.78	\$94,574,375.28	St	Yes		N/A
F45	I-40 Managed Lanes	Cornwallis Rd	NC 210	0	2	Widening	4.47	\$26,920,480.00	St	Yes		N/A
F46	I-40 Managed Lanes	NC 210	CAMPO MAB	0	2	Widening	6.75	\$36,179,936.00	St	Yes		N/A
F7a	US 64 East	US 64 Bypass (Wendell)	US 64/US 264 (Zebulon)	4	6	Widening	7.35	\$92,070,546.75	St	Yes		N/A
F81a	I-40 Widening	Wade Avenue	US 1/64	6	8	Widening	4.18	\$37,734,000.00	St	No		I-5704
F81b	I-40 / Wade Avenue Interchange Improvement	-	-	-	-	Interchange	-	\$30,000,000.00	St	No		N/A
F86	Capital Blvd - Corridor Upgrades	I-440	I-540	0	0	New Location	5.25	\$54,227,013.75	St	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A1	Perry Creek Rd Ext (Widening)	US 401	Fox Road	2	4	Widening	0.53	\$4,350,952.32	Div	No		N/A
A101	US 70	Lumley/Westgate Rd	Duraleigh/Millbrook Rd	4	6	Widening	3.3	\$105,548,000.00	Reg	Yes		U-2823
A104b	Morrisville Parkway	Green Level Ch Rd	NC 55	2	4	Widening	1.83	\$15,000,000.00	Div	Yes		N/A
A112a	Smithfield Rd	US 64 Bypass	Major Slade Rd	2	4	Widening	2.6	\$23,769,782.40	Div	No		N/A
A113	Ten Ten Rd	Holly Springs Rd	Bells Lake Rd	2	4	Widening	1.95	\$17,827,336.80	Div	No		N/A
A114c	Ten Ten Rd	Holly Springs Rd	Kildaire Farm Road	2	4	Widening	1.3	\$11,884,891.20	Div	No		N/A
A120	Tryon Rd Ext	Garner Rd	Rock Quarry Rd	0	4	Widening	2.15	\$26,310,434.85	Div	No		U-3111
A124a	Northside Loop (Harris Rd)	US 1A	White St	0	3	New Location	0.44	\$7,205,384.34	Div	No		N/A
A133	Burlington Mills Rd	US 1	US 401	2	4	Widening	4.77	\$35,769,848.40	Div	No		N/A
A134	Litchford Rd	Old Wake Forest Rd	Falls of Neuse Rd	3	4	Widening	2.99	\$27,335,249.76	Div	No		N/A
A135a	Lead Mine Rd	Town & Country Rd	Millbrook Rd	3	4	Widening	0.54	\$4,936,800.96	Div	No		N/A
A135c	Lead Mine Rd	Lynn Rd	Sawmill Rd	2	4	Widening	0.99	\$9,050,801.76	Div	No		N/A
A136a	Lake Wheeler Rd	Tryon Rd	Penny Rd	2	4	Widening	1.79	\$13,423,066.80	Div	No		N/A
A136b	Lake Wheeler Rd	Penny Rd	Ten Ten Rd	2	4	Widening	3.55	\$29,143,171.20	Div	No		N/A
A136c	Lake Wheeler Rd	Ten Ten Rd	Hilltop-Needmore Rd	2	4	Widening	3.4	\$27,911,769.60	Div	No		N/A
A137a	Old Stage Rd	US 401	Ten Ten Rd	2	4	Widening	4.2	\$31,495,464.00	Div	No		N/A
A137b	Old Stage Rd	Ten Ten Rd	Rock Service Statoin	2	4	Widening	1.49	\$11,470,823.93	Div	No		N/A
A137c	Old Stage Rd	Rock Service Station	NC 42	2	4	Widening	3.27	\$24,521,468.40	Div	No		N/A
A138a	Timber Dr/Jones Sausage Connector	US 70	Timber Dr Ext	0	4	New Location	0.72	\$7,690,016.88	Div	No		N/A
A138b	Timber Dr/Jones Sausage Connector	Jones Sausage Rd	US 70	0	4	New Location	0.28	\$10,400,000.00	St	No		N/A
A138c	Timber Dr/Jones Sausage Connector	White Oak Rd	I-40 (South)	2	4	Widening	1.68	\$15,358,936.32	Div	No		N/A
A138d	White Oak-Guy Rd Connector	White Oak Rd	Guy Rd	0	4	New Location	1.92	\$18,186,854.40	Div	No		N/A
A13d	Falls of Neuse Blvd	Durant Rd	Old Falls of Neuse Blvd	4	6	Widening	2.06	\$20,372,215.50	Div	No		N/A
A140a	Vandora Springs Rd & Ext	Timber Dr	Old Stage Rd	2	4	Widening	1.02	\$9,325,068.48	Div	No		N/A
A140b	Vandora Springs Rd & Ext	Old Stage Rd	US 401	2	4	Widening	1.62	\$14,810,402.88	Div	No		N/A
A142a	Timber Dr East	Waterfield Rd	White Oak Rd	0	4	New Location	1.17	\$12,496,277.43	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A143a	White Oak Rd	US 70	I-540	2	4	Widening	4.46	\$40,774,319.04	Div	Yes		N/A
A143a1	I-40 / White Oak Interchange	-	-	-	-	Interchange	-	\$13,946,625.00	St	No		N/A
A143b	White Oak Rd	I-540	NC 42 (Johnston Co.)	2	4	Widening	2.53	\$23,129,826.72	Div	No		N/A
A148a1	Eagle Rock Rd	Kioti Dr	Old Tarboro Rd	2	4	Widening	0.7	\$5,845,749.00	Div	No		N/A
A148a2	Eagle Rock Rd	Old Tarboro Road	Martin Pond Rd	2	4	Widening	0.75	\$6,263,302.50	Div	No		N/A
A149b2	Poole Rd	Richardson Road	Jake May Drive	2	4	Widening	1	\$7,498,920.00	Div	No		N/A
A150	NC 98	Durham County Line	NC 98 Bypass	2	4	Widening	8.86	\$81,000,104.64	Reg	Yes		N/A
A155c	T.W. Alexander Dr Ext	Brier Creek Parkway	Leesville Rd	0	4	New Location	1.8	\$17,050,176.00	Div	No		N/A
A161	Skycrest Dr Ext	New Hope Rd	Forestville Rd	0	4	Widening	3.4	\$50,923,058.29	Div	No		N/A
A162	Buffaloe Rd	Southall Rd	Stone Station Drive	2	4	Widening	1.5	\$13,713,336.00	Div	No		N/A
A163a	Holly Springs Rd	Old Holly Springs Rd	N. of 540 Interchange	2	4	Widening	4.44	\$40,591,474.56	Div	No		N/A
A163c	Friendship Rd Widening	Richardson Rd	Old Holly Springs Apex	2	4	Widening	3.58	\$31,084,996.80	Div	No		N/A
A164c2	Green Level Church Rd	Kit Creek Road	Precept Way	2	4	Widening	0.95	\$8,685,112.80	Div	No		N/A
A165a2	Airport Blvd Ext	Garden Square Ln	NC 54	0	4	New Location	0.84	\$15,852,021.36	Div	Yes		N/A
A165b	Airport Blvd Ext	Davis Dr	Louis Stephens Rd	0	2	New Location	0.36	\$3,139,829.04	Div	No		N/A
A167	Wendell Northern Bypass	US 64 BUS (west)	Old Zebulon Road	0	2	New Location	2.4	\$14,240,772.00	Div	No		N/A
A168a	Green Level Ch Widening	Green Level West	Jenks Rd	2	4	Widening	1.76	\$13,198,099.20	Div	No		N/A
A168b	Green Level Church Rd	Green Level West	Morrisville Parkway	2	4	New Location	1.86	\$13,947,991.20	Div	No		N/A
A169c	Richardson Rd (East)	Poole Rd	Knightdale-Eagle Rock Rd	0	4	New Location	0.5	\$4,736,160.00	Div	No		N/A
A173	New Hill Olive Chapel Rd	Old US 1	Chatham Co.	2	3	Widening	4.46	\$16,106,496.12	Div	No		N/A
A174b	Old Battle Bridge / Tarboro Rd	Knightdale-Eagle Rock Rd	Wendell Blvd	0	4	New Location	0.8	\$7,577,856.00	Div	No		N/A
A181b	Old US 1	Humie Olive Rd	Apex Peakway	2	4	Widening	2.53	\$18,972,267.60	Div	No		N/A
A186c	Holland Rd Turn Lane	Old US 1	Kelly Rd	2	3	Turn Lane	1.49	\$5,380,869.78	Div	No		N/A
A187b2	Apex Peakway (East)	Laura Duncan	Old Raleigh Road	2	4	New Location	0.3	\$2,742,667.20	Div	No		N/A
A187b3	Apex Peakway (East)	Old Raleigh Rd	Center Street	2	4	New Location	0.75	\$6,856,668.00	Div	No		N/A
A190	New Hill Holleman Rd Widening	Old US 1	Avent Ferry Rd	2	4	Widening	4.85	\$39,377,514.30	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A193a	Sunset Lake Rd	US 401	Hilltop-Needmore Rd	2	4	Widening	2.65	\$19,872,138.00	Div	No		N/A
A193b	Sunset Lake Rd	Hilltop-Needmore Rd	Optimist Farm Rd	2	4	Widening	2.55	\$23,312,671.20	Div	No		N/A
A195	Creedmoor Rd	Glenwood Ave	Strickland Rd	4	6	Widening	4.11	\$40,645,536.75	Reg	Yes		N/A
A2	Perry Creek Rd Ext (Part NL)	Fox Rd	Buffaloe Road	0	4	New Location	1.77	\$22,251,814.83	Div	No		N/A
A200	Creech/Jones Sausage Connector	Creech Rd	Jones Sausage Rd	0	4	Widening	1.09	\$10,324,828.80	Div	No		N/A
A201a	Rock Quarry Rd	New Hope Rd	Battle Bridge Rd	2	4	Widening	1.4	\$20,350,000.00	Div	No		N/A
A201b	Rock Quarry Rd	Battle Bridge Rd	East Garner Rd	2	4	Widening	3.3	\$30,169,339.20	Div	No		N/A
A202	East Garner Rd	Rock Quarry Rd	Shotwell Rd	2	4	Widening	3.22	\$24,146,522.40	Div	No		N/A
A203	Auburn-Knightdale Rd	Grasshopper Rd	Raynor Rd	2	4	Widening	7.58	\$56,841,813.60	Div	No		N/A
A205	Six Forks Ext	Atlantic Avenue	Capital Blvd	0	4	New Location	0.56	\$25,981,124.00	Div	Yes		N/A
A207a2	Judd Parkway NE	NC 55	Products Road (future ext)	2	4	Widening	1.5	\$11,248,380.00	Div	No		N/A
A21	Lake Boone Trail Ext	Blue Ridge Rd	Edwards Mill Ext	0	4	Widening	0.28	\$2,990,562.12	Div	No		N/A
A217a	Sunset Lake Rd	Main St	Optimist Farm Rd	2	4	Widening	3.4	\$31,083,561.60	Div	No		N/A
A217b	Sunset Lake Rd Ext	Old Holly Springs Apex	Main St	0	4	New Location	1.7	\$18,156,984.30	Div	No		N/A
A217c	Sunset Lake Rd Ext	Woodfield Deadend Rd	Main St	2	4	Widening	0.99	\$7,423,930.80	Div	No		N/A
A218a	Old Holly Springs Apex Rd	Holly Springs Rd	Jessie Dr	2	4	Widening	2.52	\$23,592,212.28	Div	No		N/A
A218b	Jessie Dr (part NL)	Veridea Parkway	NC 55	0	4	New Location	1.64	\$17,516,149.56	Div	No		N/A
A218c	Veridea Parkway	Tingen Rd	Jessie Dr	2	3	Turn Lane	1.06	\$3,828,001.32	Div	No		N/A
A218d	Tingen Rd	Apex Peakway	Old Holly Springs Apex Rd	2	3	Turn Lane	0.55	\$3,598,001.55	Div	No		N/A
A219a2	McCrimmon Parkway Ext	Davis Dr	Louis Stephens Rd	2	4	Widening	0.82	\$4,727,273.00	Div	No		N/A
A219b	McCrimmon Parkway Ext	Louis Stephens Rd	NC 55	0	4	New Location	0.94	\$8,903,980.80	Div	No		N/A
A221	NC 54	N.W. Maynard Rd	Wilson Rd	2	6	Widening	0.93	\$8,502,268.32	Reg	Yes		N/A
A222b	NC 54	Weston Parkway	McCrimmon Pkwy Grade Sep	2	4	Widening	2.4	\$59,132,337.60	Reg	Yes		N/A
A223a	Kit Creek Rd	Wake Rd	Green Level Ch Rd	0	4	New Location	0.42	\$3,978,374.40	Div	No		N/A
A224a	Johnson Pond Rd	Optimist Farm Rd	Hilltop-Needmore Rd	2	4	Widening	2.05	\$18,741,559.20	Div	No		N/A
A228a	NC 50	Timber Dr	I-540	2	4	Widening	4.91	\$36,819,697.20	Reg	Yes		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A228c	NC 50	NC 42	NC 210	2	4	Widening	5.63	\$42,516,352.73	Reg	Yes		N/A
A230	S.E. Maynard Rd	Cary Towne Blvd	Walnut St	4	6	Widening	0.26	\$2,571,250.50	Div	No		N/A
A231	Trinity Rd	Edwards Mill Rd Ext	Trenton Rd /Arrington Rd	2	4	Widening	1.1	\$10,056,446.40	Div	No		N/A
A233a	NC 54	Reedy Creek Rd	Chapel Hill Rd	4	6	Widening	0.4	\$3,955,770.00	Reg	No		N/A
A237a	Old Apex Rd	West Chatham St	Cary Parkway	2	4	Widening	1.55	\$14,170,447.20	Div	No		N/A
A27d	Louis Stephens Dr Ext (part existing)	Poplar Pike Lane	Airport Blvd	2	4	Widening	1.22	\$10,188,305.40	Div	No		N/A
A3	Spring Forest Rd Ext	US 401	Buffaloe Rd	0	4	New Location	1.52	\$31,389,472.00	Div	No		N/A
A300	US 70	US 401	I-40	4	6	Widening	4.3	\$70,417,777.50	Reg	Yes		N/A
A301	US 70	I-40	NC 42	4	6	Widening	7.21	\$71,302,754.25	Reg	Yes		N/A
A302b	Eastern Angier Bypass	Benson Rd	NC 210	0	4	New Location	0.5	\$4,104,672.00	Div	No		N/A
A302f	Eastern Angier Bypass	Kennebec Rd	NC 55	0	4	New Location	0.35	\$3,356,753.40	Div	No		N/A
A37	Walnut St	Maynard Rd	Macedonia Rd	4	6	Widening	1.29	\$12,757,358.25	Div	No		N/A
A39	Alston Avenue	Kit Creek Rd	NC 55	2	4	Widening	2.12	\$15,897,710.40	Div	No		N/A
A402a	Buffaloe Rd	Spring Forest Rd Extension	Forestville Rd	2	4	Widening	0.95	\$19,247,948.00	Div	No		N/A
A403a	Hodge Rd (Widening)	Poole Rd	US 64	2	4	Widening	3.15	\$30,180,781.13	Div	No		N/A
A404	South Franklin St (part NL)	NC 98 (Wake Forest Bypass)	Rogers Rd	2	4	Widening	1.1	\$10,056,446.40	Div	No		N/A
A406a	Shotwell Rd	East Garner Rd	US 70	2	4	Widening	0.86	\$7,862,312.64	Div	No		N/A
A406c	Shotwell Rd Widening	Main St	Old Baucom Rd	2	4	Widening	2.12	\$15,897,710.40	Div	No		N/A
A407a	NC 42	NC 401	Old Stage Rd	2	4	Widening	4.1	\$30,745,572.00	Reg	Yes		N/A
A407b2	NC 42	John Adams Rd	NC 50	2	4	Widening	4.39	\$32,920,258.80	Reg	Yes		N/A
A41	Kildaire Farm Rd	Ten Ten Rd	Kildaire Farm Connector	2	4	Widening	2.03	\$18,558,714.72	Div	No		N/A
A415	Milburnie Rd	Hodge Rd Ext	Forestville Rd	2	4	Widening	1.5	\$14,044,568.34	Div	No		N/A
A416	Fox Rd	Old Wake Forest Rd	US 401	2	4	Widening	2.06	\$18,832,981.44	Div	No		N/A
A417	Spring Forest Rd	Fox Rd	US 401	3	4	Widening	0.67	\$8,125,290.00	Div	No		N/A
A422	New Pearl Rd	Barwell Rd	Auburn Church Rd	0	3	New Location	1.77	\$15,520,463.60	Div	No		N/A
A423	Woods Creek Rd	Friendship Rd	Old Holly Springs Apex Rd	2	4	Widening	1.46	\$14,002,457.04	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A429a	Leesville-Westgate Connector	Westgate Rd	Leesville Rd	0	4	New Location	1.18	\$26,880,940.56	Div	No		N/A
A432	Skycrest Dr	Brentwood Rd	New Hope Rd	2	4	Widening	1.6	\$14,627,558.40	Div	No		N/A
A434	Sunnybrook Rd	Rock Quarry Rd	Poole Rd	3	4	Widening	1.81	\$16,547,425.44	Div	No		N/A
A435	Battle Bridge Rd	Rock Quarry Rd	Auburn-Knightdale Rd	2	3	Turn Lane	1.85	\$6,680,945.70	Div	No		N/A
A440c	NC-55/Carpenter Fire Station Road DDI	NC-55	Carpenter Fire Station Road	-	-	Interchange	-	\$14,876,400.00	Reg	No		N/A
A444	NC 50	I 540	NC 98	2	4	Widening	5.06	\$82,016,000.00	Reg	Yes		U-5891
A446	Glenwood Avenue	Womans Club Dr	Oberlin Rd	4	6	Widening	1.07	\$10,581,684.75	St	Yes		N/A
A449	Perry Rd Ext	Apex Peakway	NC 55 Bypass	0	4	New Location	2.01	\$35,414,588.79	Div	No		N/A
A457	Westgate Rd	Leesville Rd	US 70	2	4	Widening	1.4	\$12,799,113.60	Div	No		U-2918
A480a	US 401(South)	US 70	Ten Ten Rd	4	6	Widening	5.59	\$77,328,266.79	Reg	Yes		N/A
A49b	Poole Rd	Barwell Rd	I-540	2	4	Widening	1.57	\$14,353,291.68	Div	Yes		N/A
A51	Smithfield Rd	Forestville Rd	Bethlehem Rd	2	4	Widening	1.57	\$14,353,291.68	Div	No		U-3441
A511	Piney Grove Wilbon Rd	Brayton Park Rd	Southern FV Bypass	2	4	Widening	6.5	\$48,742,980.00	Div	No		N/A
A530	Evans Rd	Aviation Parkway	Weston Parkway	4	6	Widening	0.5	\$4,944,712.50	Div	No		N/A
A531a	Purfoy Rd Widening	US 401	Holland Rd	2	4	Widening	1.41	\$12,242,973.60	Div	No		N/A
A534b	US 401 Widening	Judd Pkwy	Eastern Parkway	2	4	Widening	1.53	\$11,473,347.60	Reg	Yes		N/A
A535c	NC 42 Widening	Christian Light Rd	Cass Holt Rd	2	4	Median	2.94	\$22,046,824.80	Reg	Yes		N/A
A543b	Rex Rd Realignment	Avent Ferry Connector (NL)	Cass Holt Rd	0	4	New Location	0.31	\$3,119,945.40	Div	No		N/A
A544a	Avent Ferry Cnctr	Old Holly Springs Apex	Holly Springs Rd	0	4	New Location	0.99	\$9,377,596.80	Div	No		N/A
A544b	Avent Ferry Cnctr Widening	Holly Springs Rd	Rex Rd	0	4	New Location	3.33	\$31,542,825.60	Div	No		N/A
A545	Arthur Pierce Rd	Kildaire Farm	Holly Springs Rd	2	3	Turn Lane	1.03	\$6,097,806.00	Div	No		N/A
A547	Stephenson Rd	Ten Ten Rd	Sunset Lake Rd	2	4	Widening	2.03	\$13,279,896.63	Div	No		N/A
A559	Sweet Springs Ext.	Rex Rd	Cass Holt	0	2	New Location	1.31	\$7,600,352.76	Div	No		N/A
A560a	Jones Franklin Widening	Western Blvd	I-440	2	3	Turn Lane	1.09	\$6,750,451.13	Div	Yes		N/A
A560b	Jones Franklin Widening	I-440	Dillard Dr	2	4	Widening	1.22	\$10,015,399.68	Div	Yes		N/A
A564	Hillsborough St Widening	Western Blvd	Bashford Rd	2	4	Widening	1.09	\$9,965,024.16	Div	No		N/A
A577	Ackerman Road	NC 50	White Oak Rd	0	2	New Location	1.64	\$11,710,846.29	Div	No		N/A
A579	Old Faison Rd Widening	Hodge Rd	Bethlehem Rd	2	4	Widening	2.06	\$19,164,213.78	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A580	Old Faison Rd Ext	Bethlehem Rd	Smithfield Rd	0	4	New Location	0.76	\$7,198,963.20	Div	No		N/A
A584	Western Wendell Loop	Wendell Blvd	Poole Rd	0	4	New Location	1.69	\$12,673,174.80	Div	No		N/A
A589	Forestville Rd Ext	Mailman Rd	Old Knight Rd	0	2	New Location	3.52	\$24,659,606.40	Div	No		N/A
A591	Mailman Rd Widening	Smithfield Rd	Knightdale-Eagle Rock Rd	2	4	Widening	1.45	\$11,800,932.00	Div	No		N/A
A59a	N.E. Regional Center	Gresham Lake Rd	I 540	0	4	Widening	0.59	\$9,979,963.95	Div	No		N/A
A59b	Sumner Blvd Ext	Old Wake Forest Rd	Capital Blvd	0	4	New Location	0.38	\$14,058,620.00	Div	No		N/A
A59c	N.W. Regional Center	Ruritania	Gresham Lake Rd	0	4	Widening	0.99	\$10,905,005.55	Div	No		N/A
A613	Harris Rd Widening	US 1	US 1A	2	4	Widening	1.42	\$23,171,966.40	Div	No		N/A
A616a	New Hill Place	NC 55 (Bus)	NC 55 Bypass	0	3	New Location	1.08	\$8,503,775.28	Div	No		N/A
A616b	New Hill Place	NC 55 Bypass	Old Holly Springs Apex	0	4	New Location	0.71	\$6,389,079.84	Div	No		N/A
A617a	US 401 Bypass	US 401 (E of FV)	NC 55	0	6	New Location	6.41	\$145,979,684.40	Reg	Yes		N/A
A619a	US 401 Widening	NC 540	US 401 Bypass	4	6	Widening	1.58	\$17,772,440.40	Reg	Yes		N/A
A619b	US 401 Widening	US 401 Bypass	NC 55/42 (FV)	4	6	Widening	3.32	\$37,344,621.60	Reg	Yes		N/A
A623b	Hilltop Needmore Widening	Johnson Pond Rd	Sunset Lake Rd	2	4	Widening	2.09	\$15,672,742.80	Div	No		N/A
A623c	Hilltop Needmore Widening	Sunset Lake Rd	Keith Hills St	2	4	Widening	0.68	\$5,099,265.60	Div	No		N/A
A624a	Honeycutt Connector	Avent Ferry Rd	Cass Holt Rd	0	4	New Location	0.82	\$7,767,302.40	Div	No		N/A
A624b	Honeycutt Connector	Cass Holt Rd	Piney Grove Wilbon	0	4	Widening	0.87	\$8,240,918.40	Div	No		N/A
A625	James Slaughter Rd Widening	Stewart Rd	Bass Lake Rd	2	3	Turn Lane	0.55	\$3,256,110.00	Div	No		N/A
A629	Stewart Rd	James Slaughter Pkwy	Judd Pkwy	2	3	Turn Lane	1.3	\$7,696,260.00	Div	No		N/A
A639	I-87 / I-495 Bypass Widening	I-440	US-64	6	8	Widening	9.73	\$115,124,664.60	St	Yes		N/A
A643	Chatham / Trinity Grade Separation	-	-	2	2	Grade Separation	0	\$50,410,000.00	St	No		N/A
A64c	Aviation Parkway	I-40	Airport Blvd	4	6	Widening	1.6	\$30,818,341.13	Div	No		N/A
A652	NC 55	Morrisville Carpenter Rd	NC 540	4	6	Widening	1.55	\$17,434,989.00	Reg	Yes		N/A
A664	Hilltop Road Relocation	Hilltop Road	Lake Wheeler Road	0	2	New Location	0.53	\$2,350,000.00	Div	No		N/A
A669	Lucas & Old Crews Connector / Mama's Way & Hinton Oaks Ext	Hinton Oaks Avenue	Marks Creek Road	0	2	New Location	4.66	\$28,470,116.22	Div	No		N/A
A66a	O'Kelley Chapel Rd	Alston Avenue	NC 55	2	4	Widening	1.21	\$9,073,693.20	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A66b	O'Kelley Chapel Rd	Alston Avenue	NC 751	2	4	Widening	1.13	\$8,473,779.60	Div	No		N/A
A672	Unicon Drive Ext	Height Lane	Unicon Drive	0	2	New Location	0.15	\$1,187,576.25	Div	No		N/A
A675b	Southport Drive Connector	Southport Drive	Southport Drive	0	2	New Location	0.5	\$2,966,827.50	Div	No		N/A
A678	Square Loop Interchange	US 401 South	Ten Ten Road	-	-	Interchange	-	\$18,753,676.70	Reg	No		N/A
A679a	Northern Judd Parkway	NC 55 / Broad St	Old Honeycutt Road	0	2	New Location	2.74	\$53,449,214.70	Div	No		N/A
A679b	Northern Judd Parkway	NC 55 / Broad St	Old Honeycutt Road	2	4	Widening	2.74	\$25,049,693.76	Div	No		N/A
A683b	Barwell Rd	Berkley Lake Drive	Poole Rd	2	3	Turn Lane	1.2	\$7,911,540.00	Div	No		N/A
A687	Corporate Center Extension	Corporate Center Dr	Bashford Rd	0	2	Grade Separation	0.5	\$22,000,000.00	St	No		N/A
A689	Beryl Road Realignment	Beryl Road	Royal St	2	2	Intersection Realignment	0.24	\$5,000,000.00	St	No		N/A
A69	Holly Springs Rd	Cary Parkway	Penny Rd	2	4	Widening	2.22	\$18,224,743.68	Div	No		N/A
A70	Holly Springs Rd	Penny Rd	Ten Ten Rd	2	4	Widening	1.22	\$10,015,399.68	Div	No		N/A
A71	Holly Springs Rd	Ten Ten Rd	Kildaire Farm Rd Connector	2	4	Widening	0.84	\$7,679,468.16	Div	No		N/A
A75b	Yates Store Rd	Yates Store Rd	Morrisville Parkway	0	4	New Location	1.09	\$10,453,889.16	Div	No		N/A
A75c	Wimberley Rd	Morrisville Parkway	Green Level West Rd	0	4	New Location	1.46	\$14,002,457.04	Div	No		N/A
A77b2	West Lake Rd	Ten Ten Rd	Middle Creek Park Avenue	2	4	Widening	1.23	\$11,244,935.52	Div	No		N/A
A79a	Crabtree Valley Ave / I-440 Connector	I-440	Blue Ridge Rd	0	2	New Location	0.15	\$72,568,194.00	St	No		I-5870
A79b	Crabtree Valley Ave Widening/Realign	Blue Ridge Rd	Creedmoor Rd	3	4	New Location	0.61	\$18,096,806.00	St	No		I-5870
A82c	Trinity Rd Ext	Walnut Creek	Chatam St	2	4	Widening	0.44	\$4,022,578.56	Div	No		N/A
A85b2	Leesville Rd	O'Neal Road (A Leesville Road Campus)	Lynn Rd	2	4	Widening	1.75	\$15,998,892.00	Div	No		N/A
A86b	Leesville Rd	New Leesville Blvd	TW Alexander Dr Ext	2	4	Widening	0.97	\$8,867,957.28	Div	No		N/A
A87	New Leesville Blvd Ext	Terminus	Carpenter Pond Rd	0	4	New Location	0.47	\$9,500,000.00	Div	No		N/A
A88	New Rand Rd	NC 50	Old Garner Rd	2	3	Turn Lane	1.63	\$10,746,508.50	Div	No		U-3607
A90c1	US 401 & NC 98 Interchange	-	-	-	-	Interchange	-	\$12,523,500.00	St	No		N/A
A90d	US 401 Widening	Flat Rock Church Rd	Fox Park Rd	2	4	Widening	5.32	\$16,333,091.00	Reg	Yes		R-2814D

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A94	NC 55	NC 540	Kit Creek Rd	4	6	Widening	1.58	\$11,907,535.07	Reg	Yes		N/A
A98	NC 55 Bypass	North Main St	Honeycutt Connector	4	6	Widening	5.95	\$66,927,861.00	Reg	Yes		N/A
A98a	Holly Springs Road Interchange	Holly Springs Road	NC-55 Bypass	-	-	Interchange	-	\$19,897,185.00	Reg	No		N/A
A98b	South Main Street Interchange	South Main Street	NC-55 Bypass	-	-	Interchange	0	\$19,897,185.00	Reg	No		N/A
Frnk1	US 1	Extend frwy project from US-1A	CAMPO MAB	4	6	Widening	8.28	\$131,004,519.53	St	Yes		N/A
Frnk11	Lane Store Extension	Oak Park Blvd	Lane Store Rd	0	2	New Location	1.39	\$8,064,496.44	Div	No		N/A
Frnk13	Western Service Rd	Bert Winston Rd	Pocomoke Rd	0	2	New Location	2.7	\$14,812,340.40	St	No		N/A
Grnv35	Woodland Church Rd	Wake Co. line	Bruce Garner Rd	2	3	Turn Lane	4.41	\$15,925,930.02	Div	No		N/A
Grnv94	I-85 / Brogden Interchange (New)	-	-	-	-	Interchange	3.94	\$13,946,625.00	St	Yes		N/A
Grnv951	26th Street Extension	26th Street	East Lyon Station Rd	0	2	New Location	0.72	\$8,219,000.00	Div	No		U-5829
Jhns13a	Ranch Road Extension	US 70 BUS / NC 42	Ranch Road	0	2	New Location	0.4	\$2,556,411.00	Div	No		N/A
Jhns4a1	North Connector	NC 42 East	Covered Bridge Rd	0	2	New Location	2.33	\$12,782,501.16	Div	No		N/A
2045 MTP												
F7b	US 64 East	US 64 Bypass (Wendell)	US 64/US 264 (Zebulon)	6	8	Widening	7.35	\$85,609,455.75	St	Yes		N/A
F84	I-540 Managed Shoulder	US 1	I-495 (Kinightdale Bypass)	0	1	TSM	18.1	\$77,089,736.00	St	No		N/A
F85	I-540 Managed Shoulder	I-40	US 1	0	1	TSM	7.72	\$32,880,263.00	St	No		N/A
A102	Edwards Mill Rd Ext - part III	Chapel Hill Rd	Western Blvd Ext	0	4	New Location	0.7	\$46,425,000.00	Div	Yes		U-3817
A112b	Smithfield Rd	Major Slade Rd	Johnston Co. line	2	4	Widening	1.4	\$12,799,113.60	Div	No		N/A
A117	New Hope Rd	Old Poole Rd	Rock Quarry Rd	2	4	Widening	1.8	\$16,456,003.20	Div	No		N/A
A118a	NC 55	Old Honeycutt Road	Jicarilla Rd	2	4	Widening	2.69	\$29,055,000.00	Reg	Yes		R-5705D
A125a2	Forestville Rd	Buffaloe Rd	Rogers Rd	2	4	Widening	7.5	\$68,566,680.00	Div	No		N/A
A125b	Heritage Lake Rd	Rogers Rd	End of Existing Heritage Lake Rd	2	4	Widening	0.93	\$8,502,268.32	Div	No		N/A
A126a	Ligon Mill Rd	Burlington Mills Rd	US 1A	2	3	Turn Lane	2.32	\$9,330,342.84	Div	No		N/A
A126b	Ligon Mill Rd	US 401	Burlington Mills Rd	2	3	Turn Lane	2.57	\$16,943,881.50	Div	No		N/A
A127b1	Ligon Mill Rd Connector	NC 98 Bypass	Richland Creek	0	4	New Location	0.25	\$8,499,834.00	Div	No		N/A
A127b3	Ligon Mill Rd Connector	Richland Creek	NC 98	2	4	Widening	0.75	\$6,856,668.00	Div	No		N/A

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A127c	Ligon Mill Rd Connector	NC 98	Stadium Dr	0	4	Widening	0.78	\$8,330,851.62	Div	No		N/A
A130b	Mitchell Mill Rd (East)	Watkins Rd	Jonesville Rd	2	4	Widening	1.57	\$14,353,291.68	Div	No		N/A
A131c	NC 96	US 401	SE of Youngsville	2	3	Turn Lane	4.14	\$30,160,768.37	Reg	Yes		N/A
A135b	Lead Mine Rd	Millbrook Rd	Lynn Rd	2	4	Widening	1.12	\$10,239,290.88	Div	No		N/A
A136d	Lake Wheeler Rd	Hilltop-Needmore Rd	US 401	2	4	Widening	0.57	\$4,679,326.08	Div	No		N/A
A137d	Old Stage Rd	NC 42	NC 210	2	4	Widening	5.39	\$40,419,178.80	Div	No		N/A
A137e	Old Stage Rd	NC 210	NC 55	2	4	Widening	3.57	\$26,771,144.40	Div	No		N/A
A14	Ray Rd	Leesville Rd	Strickland Rd	2	3	Turn Lane	3.21	\$21,163,369.50	Div	No		N/A
A144	NC 50	Timber Dr	US 70	2	3	Turn Lane	1.5	\$9,889,425.00	Reg	Yes		N/A
A148b	Eagle Rock Rd	Martin Pond Rd	Lake Myra Rd	2	4	Widening	2.47	\$18,522,332.40	Div	No		N/A
A148c	Eagle Rock Rd	Lake Myra Rd	Covered Bridge Rd	2	4	Widening	4.97	\$37,567,065.53	Div	No		N/A
A148d	Eagle Rock Rd	-	-	2	4	Widening	3.08	\$23,096,673.60	Div	No		N/A
A149a	Poole Rd	I-540	Martin Pond Rd	2	4	Widening	5.6	\$51,196,454.40	Div	No		N/A
A155b	T.W. Alexander Dr	Aviation Parkway	US 70	4	6	Widening	1.02	\$17,722,990.69	Div	Yes		N/A
A157a	Eastern Parkway	Piney Grove Wilbon	NC 55	0	4	New Location	4.2	\$40,081,177.13	Reg	No		N/A
A157a1	Eastern Parkway / US 401 Interchange	-	-	-	-	Interchange	-	\$12,523,500.00	Reg	No		N/A
A157a2	Eastern Parkway / Angier Road Interchange	-	-	-	-	Interchange	-	\$12,523,500.00	Reg	No		N/A
A163b	Friendship Rd Widening	Old Holly Springs Apex	New Hill Holleman	2	4	Widening	1.93	\$17,075,830.20	Div	No		N/A
A169d1	NC 231 (Southern Wendell) Bypass (pc)	NC 231	Wendell Blvd	0	4	New Location	2.7	\$25,894,954.80	Div	Yes		N/A
A169d2	NC 231 (Southern Wendell) Bypass (pc)	Wendell Road at Stott's Mill Road	NC 231	0	4	New Location	0.7	\$6,713,506.80	Div	Yes		N/A
A172	Kelly Rd	Jenks Rd	Old US 1	2	4	Widening	5.23	\$47,813,831.52	Div	No		N/A
A178a	Olive Chapel Rd	Kelly Rd	NC 55	2	4	Widening	1.93	\$17,644,492.32	Div	No		N/A
A178b	Olive Chapel Rd	Richardson Rd	Kelly Rd	2	3	Turn Lane	1.81	\$11,933,239.50	Div	No		N/A
A178c	Olive Chapel Rd	New Hill Olive Chapel Rd	Richardson Rd	2	3	Turn Lane	1.31	\$8,636,764.50	Div	No		N/A
A179a	Richardson Rd	US 64 (West)	Olive Chapel Rd	0	4	New Location	1.42	\$25,974,194.40	Div	No		N/A

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A179b	Richardson Rd	Olive Chapel Rd	Humie Olive Rd	2	4	Widening	1.86	\$13,947,991.20	Div	No		N/A
A179c	Richardson Rd	Humie Olive Rd	Old US 1 Highway	0	4	New Location	2.33	\$22,070,505.60	Div	No		N/A
A184	Apex Barbecue Rd	Old US 1	Olive Chapel Rd	2	3	Turn Lane	1.32	\$8,702,694.00	Div	No		N/A
A186a	Friendship Rd Widening	Friendship Road	Winding Way	2	3	Turn Lane	1.23	\$4,921,659.60	Div	No		N/A
A186b	Friendship Rd Widening	Winding Rd	Old US 1	2	3	Turn Lane	0.5	\$4,341,480.00	Div	No		N/A
A187a	Apex Peakway Widening (North)	Olive Chapel Rd	Laura Duncan Rd	2	4	Widening	1.6	\$14,627,558.40	Div	No		N/A
A187c	Apex Peakway Widening (South)	Broadstone Way	Old US 1	2	4	Widening	1.25	\$11,427,780.00	Div	No		N/A
A187d	Apex Peakway (West)	Old US 1	Olive Chapel Rd	2	4	Widening	1.09	\$9,965,024.16	Div	No		N/A
A192	Graham Newton Rd	Penny Rd	Optimist Farm Rd	2	2	Widening	2.83	\$18,513,353.43	Div	No		N/A
A197b	Cent Campus Connector & Interchange	Main Campus Dr Connector	I-40	0	4	New Location	0.38	\$18,336,477.36	Div	Yes		N/A
A204	Bethlehem Rd	Smithfield Rd	Old Faison Rd	2	4	Widening	0.93	\$6,973,995.60	Div	No		N/A
A207d	Judd Parkway SE	US 401	US 401	2	3	Turn Lane	1.76	\$10,419,552.00	Div	No		N/A
A214	Garner Rd	Tryon Rd	Rock Quarry Rd	2	3	Turn Lane	7.16	\$47,205,522.00	Div	No		N/A
A215b	Jones Dairy Rd	Chalk Road	Averette Rd	2	4	Widening	2.1	\$19,198,670.40	Div	No		N/A
A216a	Jones Dairy Rd Ext	Averette Rd	US 401	2	4	Widening	2.87	\$26,238,182.88	Div	No		N/A
A218f	Jessie Dr (part widening)	NC 55	Ten Ten Rd	2	4	Widening	1.58	\$11,884,891.20	Div	No		N/A
A224b	Johnson Pond Rd	Hilltop-Needmore Rd	US 401 North	2	3	Turn Lane	2.56	\$16,877,952.00	Div	No		N/A
A228b	NC 50	I-540	NC 42	2	4	Widening	1.85	\$13,873,002.00	Reg	Yes		N/A
A229	NC 54	Chapel Hill Rd	Harrison Avenue	4	6	Widening	0.8	\$7,911,540.00	Reg	No		N/A
A233b	NC 54	Reedy Creek Rd	Harrison Avenue	4	6	Widening	0.99	\$9,790,530.75	Reg	No		N/A
A234	Western Blvd	Gorman St	Pullen Rd	4	6	Widening	1.21	\$11,966,204.25	Div	No		N/A
A235b	US 1A	Rogers Rd	Forbes Rd	2	4	Widening	0.26	\$2,376,978.24	Reg	No		R-3600
A237b	Old Apex Rd	Cary Parkway	Laura Duncan Rd	2	4	Widening	0.39	\$3,565,467.36	Div	No		N/A
A240a	North Harrison Avenue	Reedy Creek Rd	Weston Parkway	4	6	Widening	0.81	\$8,010,434.25	Div	No		N/A
A240b	North Harrison Avenue	Weston Parkway	I-40	6	8	Widening	0.48	\$12,564,134.10	Div	No		N/A
A27a	Louis Stephens Dr Ext (part NL)	Wake County Line	Kit Creek Rd	2	4	Widening	1.23	\$9,223,671.60	Div	No		N/A
A27b	Louis Stephens Dr Ext (part NL)	Kit Creek Rd	O'Kelly Chapel Rd	2	4	Widening	1.13	\$8,473,779.60	Div	No		N/A
A2a	Southall Rd	Skycrest Dr	Buffaloe Rd	2	4	Widening	1.54	\$15,000,000.00	Div	No		N/A

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A302c	Rawls Ch Rd Widening	US 401	Rawls Ch Rd Extension	2	4	Widening	3.32	\$27,255,022.08	Div	No		N/A
A302d	Eastern Angier Bypass	Wimberly Rd	Stratus St	0	4	New Location	0.39	\$3,740,382.36	Div	No		N/A
A302e	Eastern Angier Bypass	Stratus St	Kennebec Rd	2	4	Widening	0.96	\$7,880,970.24	Div	No		N/A
A302g	Kennebec Ch Realign	Rawls Ch Rd	NC 55	0	4	New Location	0.7	\$6,713,506.80	Div	No		N/A
A34	Cary Parkway	Evans Rd	Harrison Avenue	2	4	Widening	1.74	\$15,907,469.76	Div	No		N/A
A36c	Chatham St	N.E. Maynard Rd	I-40 bridge	2	4	Widening	0.93	\$8,502,268.32	Div	No		N/A
A38	Tryon Rd	US 64	Kildaire Farm Rd	4	6	Widening	0.8	\$7,911,540.00	Div	No		N/A
A400a	Ten-Ten Rd	Bells Lake Rd	Old Stage Rd	2	4	Widening	5.1	\$38,244,492.00	Div	No		N/A
A400b	Ten Ten Rd	Old Stage Rd	NC 50	2	4	Widening	3.43	\$25,721,295.60	Div	No		N/A
A401a	NC 97	Wendell Blvd	Hospital Rd	2	4	Widening	4.6	\$42,054,230.40	Reg	Yes		N/A
A401b	Hospital Rd	NC 97	Mack Todd Rd	2	4	Widening	0.18	\$1,645,600.32	Div	No		N/A
A401c	Hospital Rd	Mack Todd Rd	Barbee St Ext	0	4	New Location	0.42	\$4,485,843.18	Div	No		N/A
A401d	Moss Rd	Barbee St Ext	Morphus Bridge Rd	2	4	Widening	1.86	\$13,947,991.20	Div	No		N/A
A402b	Buffaloe Rd-Riley Hill Connector (part NL)	Forestville Rd	Rolesville Rd	2	4	Widening	4.44	\$35,347,540.80	Div	No		N/A
A402c	Buffaloe Rd-Riley Hill Connector (part NL)	Rolesville	Riley Hill Rd	0	3	New Location	4.4	\$28,306,449.60	Div	No		N/A
A402e	Proctor St	NC 96 (North)	Shepard School Rd	2	4	Widening	0.85	\$6,374,082.00	Div	No		N/A
A403b	Hodge Rd Ext	US 64	Old Milburnie Rd	0	4	Widening	1.31	\$12,314,016.00	Div	No		N/A
A403c	Hodge Rd	Auburn-Knightdale Rd	Poole Rd	2	4	Widening	1.9	\$14,247,948.00	Div	No		N/A
A406b	Amelia Ch Rd	US 70	East of NC 42	2	4	New Location	2	\$14,997,840.00	Div	No		N/A
A407b1	NC 42	Old Stage Rd	John Adams Rd	2	4	Widening	0.95	\$7,123,974.00	Reg	Yes		N/A
A410	Lake Pine Dr/Old Raleigh Rd	Cary Parkway	Apex Peakway	2	4	Widening	1.7	\$15,541,780.80	Div	No		N/A
A413	NC 54 (Chapel Hill Rd)	Corporate Center Dr	Hillsborough St	2	4	Widening	1.33	\$14,159,158.00	Reg	Yes		N/A
A418	NC 96 Bypass (Youngsville)	NC 96	US 1	0	4	New Location	2.99	\$30,411,959.76	Reg	Yes		N/A
A419	Knightdale Eagle Rock Rd	First Avenue	US 64/Knightdale Bypass	2	4	Widening	2.7	\$20,247,084.00	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A420	Intersection Realignment @ Mitchell Mill/Riley Hill/Old Milburnie/Rolesville	-	-	2	3	Intersection Realignment	1	\$6,592,950.00	Div	No		N/A
A426	NC 55 (Main St)	Holly Springs Rd	Technology Drive	2	4	Widening	2.79	\$25,506,804.96	Reg	Yes		N/A
A427c	Avent Ferry Rd	New Hill Holleman	Cass Holt	2	4	Widening	3.69	\$27,671,014.80	Div	No		N/A
A429b	Leesville-Westgate Connector	Leesville Rd	Carpenter Pond Rd	2	4	Widening	1.35	\$26,619,859.74	Div	No		N/A
A42a	Penny Rd	Ten Ten Rd	Kildaire Farm Rd	2	4	Widening	1.25	\$11,427,780.00	Div	No		N/A
A42b	Penny Rd	Kildaire Farm	Holly Springs Rd	2	4	Widening	1.62	\$14,810,402.88	Div	No		N/A
A43	Lake Wheeler Rd	Tryon Rd	I-40	2	4	Widening	1.3	\$17,884,891.00	Div	No		N/A
A433	Trawick Rd	Marsh Creek Rd	New Bern Avenue	2	3	Turn Lane	1.44	\$5,791,247.28	Div	No		N/A
A443a	Jenks Rd	NC55	Wimberly Rd	2	3	Turn Lane	2.17	\$7,836,568.74	Div	No		N/A
A443b	Jenks Rd	Wimberly Rd	US 64	2	4	Widening	0.51	\$1,841,774.22	Div	No		N/A
A445a	NC 50	NC 98	Beaver Creek Rec	2	4	Widening	3.9	\$32,016,441.60	Reg	Yes		N/A
A445b	NC 50	Beaver Creek Rec	Old Weaver Trail	2	4	Widening	2	\$16,418,688.00	Reg	Yes		N/A
A4c	Rogers Lane	Daleview Dr	Southall Rd	3	4	Widening	1.06	\$10,021,989.78	Div	No		N/A
A510	Cass Holt Rd Widening	Avent Ferry	NC 42	2	4	Widening	7.13	\$28,674,717.44	Div	No		N/A
A52	Smithfield Rd	Bethlehem Rd	US 64 Bypass	2	4	Widening	1.8	\$16,456,003.20	Div	No		N/A
A520a	Pleasant Grove Church Rd	Nelson Rd	Airport Blvd	2	4	Turn Lane	2.4	\$21,941,337.60	Div	No		N/A
A520b	Pleasant Grove Church Rd	Airport Blvd	Aviation Parkway	0	2	New Location	1.11	\$11,855,442.69	Div	No		N/A
A531b	Purfoy Rd Widening	Holland Rd	Chalybeate Springs Rd	2	4	Widening	4.12	\$35,773,795.20	Div	No		N/A
A532a	Holland Widening	Purfoy Rd	NC 55	2	4	Widening	2.28	\$17,413,281.60	Div	No		N/A
A532b	Holland Rd Turn Lane	NC 55	Kennebec Rd	2	3	Turn Lane	1.08	\$3,218,220.72	Div	No		N/A
A533	Old Honeycutt Turn Lane	Judd Pkwy	Kennebec Rd	2	3	Turn Lane	2.74	\$8,164,745.16	Div	No		N/A
A535a	NC 42 Widening	Christian Light Rd	Coley Farm Rd	2	4	Widening	2.98	\$22,346,781.60	Reg	Yes		N/A
A536	Wilbon Rd Widening	Judd Pkwy	Piney Grove Wilbon	2	4	Widening	1.45	\$10,873,434.00	Div	No		N/A
A538	Bass Lake Rd Widening	Holly Springs Rd	Hilltop-Needmore Rd	2	4	Widening	2.77	\$21,069,441.53	Div	No		N/A
A539	Banks Rd Turn Lane	US 401	Fanny Brown Rd	2	3	Turn Lane	1.55	\$11,292,075.11	Div	No		N/A
A540a	Rock Service Station Turn Lane	Old Stage Rd	NC 42	2	3	Turn Lane	3.68	\$24,371,334.41	Div	No		N/A
A540b	Rock Service Station Turn Lane	NC 42	Mt Pleasant Rd	2	3	Turn Lane	2.56	\$16,747,061.76	Div	No		N/A
A541	Mt Pleasant Rd Widening	NC 42	Old Fairground Rd	2	4	Median	5.31	\$43,591,616.64	Div	No		N/A

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A543a	Rex Rd Widening	New Hill Holleman	Avent Ferry Connector (NL)	2	4	Widening	2.15	\$18,668,364.00	Div	No		N/A
A549	Wimberley Rd	Jenks Rd	Green Level West Rd	2	3	Widening	1.97	\$7,114,304.34	Div	No		N/A
A554	Laura Duncan Widening	US 64	Old Apex Rd	2	4	Widening	1.04	\$7,798,876.80	Div	No		N/A
A563	Trinity Rd	NC 54	Chatham St	2	4	Widening	1	\$2,934,653.90	Div	No		N/A
A568	Kit Creek Turn Lane	Davis Dr	Green Level Ch Rd	2	3	Turn Lane	1.81	\$13,623,781.76	Div	No		N/A
A56c	NC 98	NC 98 Bypass	US 401	2	4	Widening	5.29	\$48,362,364.96	Reg	Yes		N/A
A570	Ebenezer Ch Rd Turn Lane	Ebenezer Ch Rd	Westgate Rd	2	3	Turn Lane	1.96	\$14,279,011.11	Div	No		N/A
A571	Slater Rd Turn Lane	Airport Blvd	West of NC 540	2	3	Turn Lane	1.4	\$10,530,525.99	Div	No		N/A
A574	Grovemont Rd Turn Lane	Old Stage Rd	Timber Dr	2	3	Turn Lane	0.86	\$6,265,280.39	Div	No		N/A
A575	Woodland Rd Turn Lane	Old Stage Rd	Vandora Springs Rd	2	3	Turn Lane	1.47	\$10,709,258.33	Div	No		N/A
A576	Buffaloe Rd Turn Lane	NC 50	Buffaloe Rd	2	3	Turn Lane	1.48	\$10,782,110.43	Div	No		N/A
A578	Auburn Ch Rd Turn Lane	Jones Sausage Rd	Garner Rd	2	3	Turn Lane	2.84	\$18,578,771.64	Div	No		N/A
A581	Bethlehem Rd Turn Lane	Old Faison Rd	Grasshopper Rd	2	3	Turn Lane	2.47	\$18,572,584.27	Div	No		N/A
A585	Industrial Drive	Wendell Blvd	Western Wendell Loop	2	3	Turn Lane	0.79	\$5,346,631.29	Div	No		N/A
A586	Landing View Drive Ext	Western Wendell Loop	Hollybrook Rd	0	2	New Location	1.64	\$13,121,728.62	Div	No		N/A
A588a	NC 96 Bypass	NC 96	NC 96	0	4	New Location	4.52	\$45,820,526.40	Reg	Yes		N/A
A590	Mark's Creek Widening	Knightdale-Eagle Rock Rd	Rolesville Rd	2	4	Widening	3.54	\$26,546,176.80	Div	No		N/A
A592	First St Widening	Smithfield Rd	Horton Rd	2	4	Widening	2.87	\$22,488,866.40	Div	No		N/A
A593	Horton Rd Turn Lane	Forestville Rd	Horton Rd	2	3	Turn Lane	1.79	\$11,709,859.59	Div	No		N/A
A594	Rolesville Rd	Kiotti Dr	Mark's Creek Rd	2	4	Widening	2.54	\$21,426,721.80	Div	No		N/A
A596	NC 96 Widening	US 64/264	Ferrel Road	2	4	Widening	2.88	\$24,214,301.10	Reg	Yes		N/A
A599	Old Milburnie Rd Turn Lane	US 64	Milburnie Rd	2	3	Turn Lane	1.31	\$8,569,785.51	Div	No		N/A
A601	Old Wake Forest Rd	Falls of Neuse Rd	Atlantic Ave	2	3	Turn Lane	1.43	\$10,417,849.94	Div	No		N/A
A602	Fox Rd Turn Lane	Spring Forest Rd	Old Wake Forest Rd	2	3	Turn Lane	0.84	\$6,119,576.19	Div	No		N/A
A604	Peebles Road Ext.	US 401	US 401	0	2	New Location	2.81	\$14,972,185.80	Div	No		N/A
A605	Rogers Rd Widening	US 1A	W. of Heritage Branch Rd	2	4	Widening	0.44	\$4,022,578.56	Div	No		N/A

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A607	Falls of Neuse Widening	New Falls of Neuse Blvd	NC 98 Bypass	2	4	Widening	3.14	\$26,516,575.80	Div	No		N/A
A608a	NC 98 Widening	Old NC 98	Ligon Mill Rd (future connector)	2	4	Widening	1.21	\$10,104,794.70	Reg	Yes		N/A
A611	NC 98 Turn Lane	NC 98 Bypass	Allen St.	2	3	Turn Lane	0.71	\$5,172,498.92	Reg	Yes		N/A
A612	White St Turn Lane	NC 98	Main St	2	3	Turn Lane	3.85	\$25,186,010.85	Div	No		N/A
A614	Pinecrest Dr Turn Lane	Fairbanks Dr	Tanglewild Dr	2	3	Turn Lane	1.2	\$8,742,251.70	Div	No		N/A
A617b	US 401 Bypass	NC 55	NC 210	0	6	New Location	4.25	\$113,834,820.00	Reg	Yes		N/A
A617c	US 401 Bypass	NC 210	US 401(South)	0	6	New Location	5.32	\$101,579,398.80	Reg	Yes		N/A
A618a	Gardner Rd	NC 210	Matthew Mill Pond Rd	0	3	New Location	0.48	\$3,779,455.68	Div	No		N/A
A618b	Gardner Rd	Matthew Mill Pond Rd	Old Buies Creek Rd	2	3	Turn Lane	0.81	\$4,795,362.00	Div	No		N/A
A618c	Gardner Rd	Old Buies Creek Rd	Ennis Rd	0	3	New Location	0.59	\$4,645,580.94	Div	No		N/A
A618d	Gardner Rd	Ennis Rd	NC 55	2	3	Turn Lane	0.6	\$3,552,120.00	Div	No		N/A
A618e	Gardner Rd	NC 55	Old Stage Rd	2	3	Turn Lane	1.27	\$9,999,809.82	Div	No		N/A
A623d1	Hilltop Needmore Extension	Bass Lake Road	Hilltop Needmore Road	2	4	Widening	0.75	\$6,263,302.50	Div	No		N/A
A623d4	Hilltop Needmore Extension	Hilltop Needmore Road	Wade Nash Rd	0	4	New Location	0.5	\$7,040,932.50	Div	No		N/A
A624c	Honeycutt Connector	Piney Grove Wilbon	Honeycutt Realignment	0	4	Widening	0.95	\$7,123,974.00	Div	No		N/A
A627	Old Buies Creek Rd Widening	NC 55	Matthew Mill Pond Rd	2	4	Widening	3.12	\$27,090,835.20	Div	No		N/A
A628	Piney Grove Rawls Rd Widening	Piney Grove Wilbon	US 401	2	4	Widening	1.16	\$10,072,233.60	Div	No		N/A
A631	Chalybeate Springs Widening	Future US 401 Bypass	Future Western Angier Bypass	2	4	Widening	3.51	\$33,663,441.24	Div	No		N/A
A632a	Angier Western Bypass	NC 55 (S of Angier)	Rawls Ch Rd	0	2	New Location	1.77	\$9,710,312.04	Div	No		N/A
A632b	Angier Western Bypass	Rawls Ch Rd	Kennebec Ch Realign	0	2	New Location	0.98	\$5,376,330.96	Div	No		N/A
A632c	Angier Western Bypass	NC 55 (S of Angier)	NC 210 (E of Angier)	0	2	New Location	1.14	\$6,254,099.28	Div	No		N/A
A633	Angier Rd Widening	Purfoy Rd	Rogers Rd	2	4	Widening	0.56	\$5,119,645.44	Div	No		N/A
A649	Jones Franklin Rd Extension	Hillsborough St	NC 54	0	2	New Location	0.2	\$26,000,000.00	St	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A665	Perry Curtis Rd/Wake County Line Rd Access Management	S. Arendell Ave	NC-39	2	3	Turn Lane	2.6	\$10,456,418.70	Div	No		N/A
A667	Todd Lane Extension	Marshburn Road	Wendell Blvd / US-64 BUS	0	3	New Location	1.27	\$9,098,710.53	Div	No		N/A
A668	Liles Dean Ext	Liles Dean Road	Knightdale-Eagle Rock Road	0	2	New Location	1.07	\$6,537,129.69	Div	No		N/A
A670	Western Wendell Ext	Poole Road	Lake Glad Road	0	4	New Location	1.4	\$13,261,248.00	Div	No		N/A
A673	Watkins Road Widening	NC-54	Perimeter Park Drive	2	4	Widening	0.65	\$5,942,445.60	Div	No		N/A
A675a	Morrisville East Connector	Trans Air Dr (N/S segment) / Airport Blvd (E/W segment)	International Dr (N/S segment) / Nova Dr (E/W segment)	0	2	New Location	1.48	\$8,781,809.40	Div	No		N/A
A676	East Wake Drive Ext	Existing portion of East Wake Drive	Forestville Road	0	2	New Location	0.2	\$1,186,731.00	Div	No		N/A
A677	Marcom Dr Ext	Watkins Road	Sorrell Grove Church Road	0	2	New Location	1.13	\$6,903,697.71	Div	No		N/A
A67a	Ferrell Rd	NC 96	Williams White Rd	0	3	New Location	2.82	\$18,141,860.88	Div	No		N/A
A67b	Ferrell-Dukes Lake Connector	Williams White Rd	NC 39	0	3	New Location	2.45	\$15,761,545.80	Div	No		N/A
A680a	Six Forks Road	I-540	Durant Road	2	4	Widening	0.9	\$8,228,001.60	Div	No		N/A
A688	Powell Drive Realignment	Powell Dr	Youth Center Dr	2	2	Grade Separation	0.35	\$44,000,000.00	St	No		N/A
A690	NC 231 (Southern Wendell) Bypass (pc) / Stott's Mill Road Widening	Eagle Rock Road	Wendell Road	0	4	Widening	2.5	\$20,523,360.00	Div	Yes		N/A
A691	Western Wendell Ext	Lake Glad Road	Stotts Mill Road	0	4	New Location	0.8	\$7,577,856.00	Div	No		N/A
A693	NC 231 (N. Selma Road)	Old Wilson Road	Stotts Mill Road	2	3	Widening	2.4	\$9,652,078.80	Div	No		N/A
A698	Gorman St Widening	Kaplan Drive	Western Blvd	2	3	Widening	0.95	\$3,820,614.53	Div	No		N/A
A72	Holly Springs Rd	Tryon Rd	SE Cary Parkway	2	4	Widening	0.61	\$5,576,756.64	Div	No		N/A
A73a	Jones Franklin Rd	Tryon Rd	Dillard Dr	2	4	Widening	0.67	\$6,125,290.08	Div	No		N/A
A74c	Piney Plains Rd	Dillard Dr	Walnut St	2	4	Widening	0.43	\$3,931,156.32	Div	No		N/A
A76	Optimist Farm Rd	Lake Wheeler Rd	Sunset Lake Rd	2	4	Widening	4.49	\$41,048,585.76	Div	No		N/A
A77a	West Lake Rd	Larboard Rd	Bells Lake Rd	0	2	New Location	1.25	\$7,417,068.75	Div	No		N/A
A80b	New Hope Rd	US 64 Bypass	New Bern Ave	2	4	Widening	1.19	\$19,210,479.00	Div	No		N/A
A81a	Western Blvd Ext	Existing Western Blvd	Cary Town Blvd	0	2	New Location	1.5	\$8,900,482.50	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A9	Strickland Rd	Leesville Rd	Creedmoor Rd	2	4	Widening	2.73	\$30,958,272.00	Div	No		N/A
A98c	Technology Drive Interchange	Technology Drive	NC-55 Bypass			Interchange	0	\$13,946,625.00	Reg	No		N/A
Frnk20a	Hicks Road Widening	Future Frankilinton South Bypass	Bert Winston Rd	2	4	Widening	1.1	\$9,493,002.75	Div	No		N/A
Frnk20b	Hicks Road Widening	Bert Winston Rd	Cedar Creek Rd	2	4	Widening	2.4	\$20,414,478.00	Div	No		N/A
Frnk21	Sid Mitchell Rd Ext	Holden Rd	US 1/Wall Rd	0	2	New Location	1.1	\$16,708,056.75	Div	No		N/A
Frnk4a	NC 56	W. of West Sandling Rd	US 1	2	4	Widening	3.63	\$27,221,079.60	Reg	Yes		N/A
Frnk4b	NC 56	US 1	Peach Orchard Rd	2	4	Widening	6.76	\$50,692,699.20	Reg	Yes		N/A
Frnk9	Franklinton S Bypass	NC 56 (west)	NC 56 (east)	2	4	New Location	4.13	\$36,949,941.60	Reg	Yes		N/A
Grnv1	I-85	Durham co. line	Vance Co. Line	4	6	Widening	24	\$339,614,222.11	St	Yes		N/A
Grnv110	Brogden Rd Turn Lane	NC 56	Belltown Rd	2	3	Turn Lane	5.59	\$37,964,732.19	Div	No		N/A
Grnv113	Joe Peed Rd Turn Lane	US 15	WB Clark Rd	2	3	Turn Lane	1.34	\$8,766,040.14	Div	No		N/A
Grnv18	NC 50	Old Weaver Trail	Dove Rd	2	4	Widening	2.67	\$20,022,116.40	Reg	Yes		N/A
Grnv2	US 15	I-85	Gate #2 Rd	2	4	Widening	2.42	\$24,706,569.53	Reg	Yes		N/A
Grnv20	NC 56	I-85	US-15	2	4	Widening	2.56	\$19,197,235.20	Reg	Yes		N/A
Grnv21	NC 56	NC 50	Hayes Rd	2	4	Widening	2.6	\$23,769,782.40	Reg	Yes		N/A
Grnv22b	NC 56	Hester Rd	W of Wes Sandling Rd	2	4	Widening	4.18	\$31,345,485.60	Reg	Yes		N/A
Grnv32	Brassfield Rd	Creedmoor Loop	Hayes Rd	2	4	Widening	1.8	\$13,498,056.00	Div	No		N/A
Grnv33	Brassfield Rd	Hayes Rd	NC 96	2	4	Widening	4.07	\$30,520,604.40	Div	No		N/A
Grnv47	Creedmoor Loop A	NC 56	US 15	0	4	New Location	1.59	\$15,060,988.80	Div	No		N/A
Grnv48	Creedmoor Loop B	US-15	Relocated US 15	2	4	Widening	0.66	\$4,949,287.20	Reg	No		N/A
Grnv49	Creedmoor Loop C	Relocated US 15	Brassfield Rd	0	4	New Location	2.23	\$21,123,273.60	Div	No		N/A
Grnv65	Hester Rd	NC-56	Sanders Rd	2	4	Widening	4.18	\$31,345,485.60	Div	No		N/A
Grnv66	Hester Rd	Sanders Rd	New Ext Hester Rd	2	4	Widening	2.8	\$20,996,976.00	Div	No		N/A
Grnv81	Northside Rd Ext	Northside Rd	Old Weaver Rd	0	4	New Location	0.92	\$8,714,534.40	Div	No		N/A
Grnv81a	Old Weaver Trail	From NC 50 (Wake Co)	Northside Rd Ext	2	4	Widening	1.65	\$12,373,218.00	Div	No		N/A
Grnv84c	Sanders Rd Ext (South)	US 15	Hester Rd	0	2	New Location	1.28	\$7,426,298.88	Div	No		N/A
Grnv93	Cash Rd / Gate 2 Rd	Old Weaver Trail	West B St	2	4	Widening	4.93	\$36,969,675.60	Div	No		N/A
Hrnt3a	NC 210	NC 55	Old Stage Rd	2	4	Widening	3.01	\$22,571,749.20	Reg	Yes		N/A

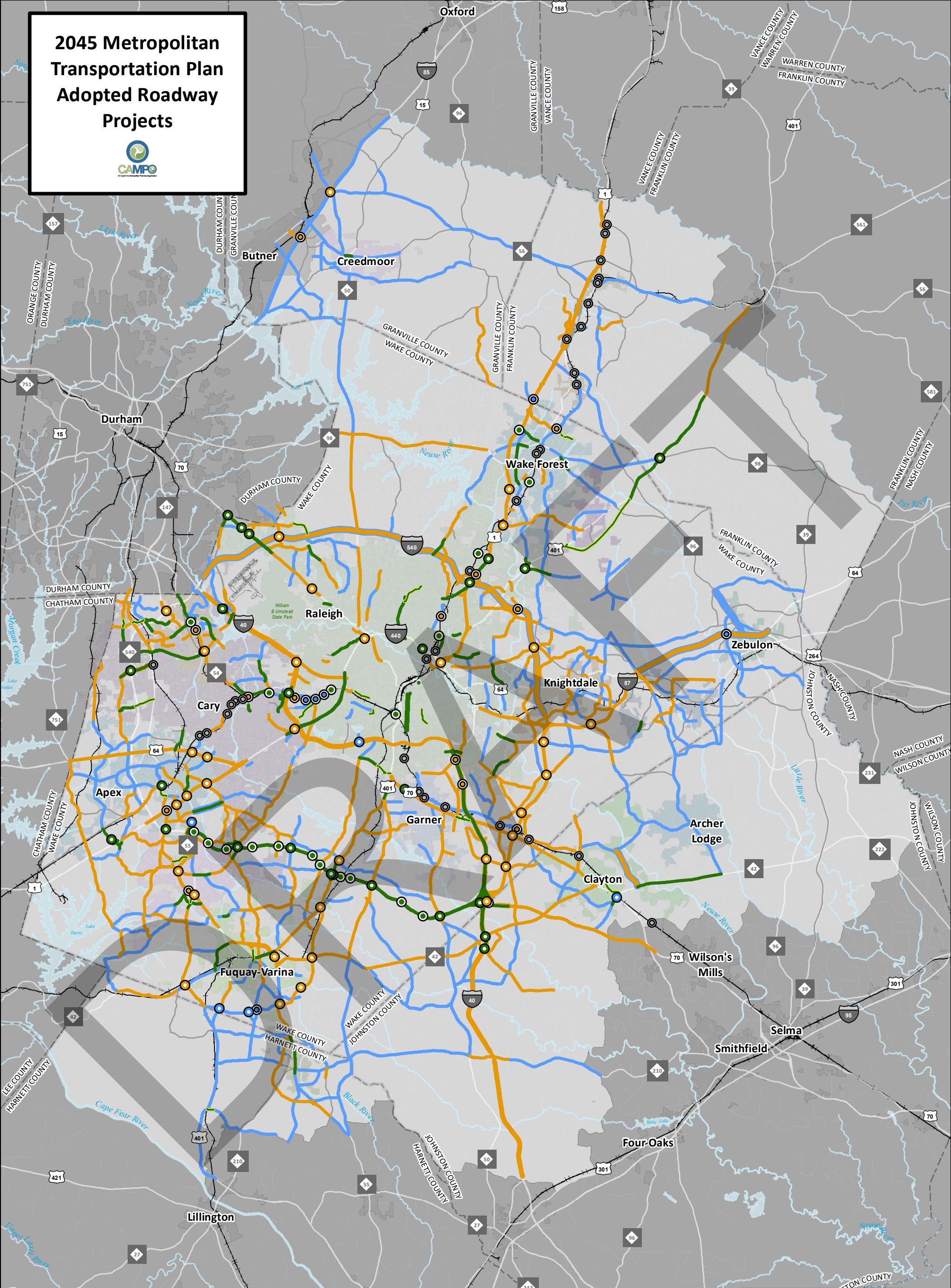
MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
2025 MTP												
316	Brier Creek Pkwy Extension	T.W. Alexander Dr	Andrew's Chapel Rd	-	4	New Location	0.4	\$3,990,000	Div	No	No	N/A
9	Carver St Ext	Armfield St	Old Oxford Rd	-	4	New Location	1.0	-	Div	No	No	N/A
15	East End Connector (EEC)	NC 147	North of NC 98 in Durham	-	4	New Location	3.2	\$35,175,000	St	Yes	No	U-0071
200	Eubanks Rd	MLK Blvd (NC 86)	Millhouse Rd	2	4	Widening	0.8	\$7,487,000	Div	No	No	N/A
23	Fayetteville Rd	Barbee Rd	Cornwallis Rd	2	4	Widening	1.0	\$3,374,000	Div	Yes	No	N/A
23.1	Fayetteville Rd	Woodcroft Pkwy	Barbee Rd	2	4	Widening	1.4	\$4,661,000	Div	Yes	No	U-6021
111	Fordham Blvd (US 15-501)	I-40	Ephesus Church Rd	4	4	Modernization	1.6	\$2,052,000	St	Yes	No	U-5304F
240	Fordham Blvd (US 15-501)	NC 54	Ephesus Church Rd	4	4	Modernization	2.1	\$45,498,000	St	Yes	No	U-5304D
73	Fordham Blvd (US 15-501)	NC 54	NC 86 (S. Columbia)	4	4	Modernization	2.3	\$49,832,000	St	Yes	No	U-5304B
204	Fordham Blvd/Raleigh Rd	Interchange	--	-	-	Upgrade	N/A	\$14,800,000	St	No	93.127	U-5774A
626	Fordham Blvd/S Columbia St	Interchange	--	-	-	Upgrade	N/A	\$35,000,000	St	Yes	No	U-5304A
379	Freeland Memorial Extension	S Churton St	New Collector Rd	-	2	New Location	0.5	\$3,203,000	Div	No	No	N/A
45.3	I-40 (westbound auxiliary lane)	NC 147	NC 55	6	7	Widening	1.2	\$3,850,000	St	No	No	I-5707
638	I-40/NC 86	Interchange	--	-	-	Upgrade	N/A	\$16,500,000	St	Yes	No	I-3306AC
223	Legion Rd Ext	Legion Rd	Fordham Blvd	-	2	New Location	0.1	\$1,500,000	Div	No	No	N/A
407	Lynn Rd/Pleasant Dr Connector	Lynn Rd	Pleasant Dr	-	2	New Location	0.6	\$3,651,000	Div	No	No	N/A
64.12	NC 147 (Operational Improvements)	Duke Street	Briggs Avenue	4	4	Modernization	1.8	\$58,400,000	St	No	No	U-5937
64.13	NC 147 (possible Managed Lanes)	East End Conn	I-40	4	8	Widening	3.9	\$179,248,000	St	Yes	No	U-5934
428	NC 54	Old Fayetteville Rd	MPO Boundary	2	2	Modernization	2.9	\$14,457,000	Reg	Yes	No	R-5821A
69.21	NC 54	Highgate Dr	Fayetteville Rd	4	4	Modernization	0.4	(see #69.2)	Reg	No	93.126	U-5774H
75.2	NC 55 (Alston Ave)	Main St	NC 98	2	2	Modernization	0.6	-	Reg	No	No	U-3308
75.1	NC 55 (Alston Ave)	NC 147	Main St	2	4	Widening	0.4	-	Reg	No	No	U-3308
437	New Collector Rd	Orange Grove Rd Extension	Becketts Ridge Rd	-	2	New Location	0.8	\$7,232,000	Div	No	No	N/A
89.3	Orange Grove Connector	Orange Grove Rd	US 70	-	2	New Location	0.4	\$5,299,000	Div	No	No	U-5848
220	Purefoy Rd Ext	Sandberg Ln	Weaver Dairy Rd	-	2	New Location	0.6	\$3,777,000	Div	No	No	N/A
221	S Elliot Rd Ext	Fordham Blvd	Ephesus Church Rd	-	2	New Location	0.3	\$4,230,000	Div	No	No	N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
87	S Churton St	Eno River in Hillsborough	I-40	2	4	Widening	2.2	\$31,825,000	Div	No	No	U-5845
113.1	US 15-501/Garrett Rd	Interchange	--	-	-	New	N/A	\$71,200,000	St	Yes	No	U-5717
485	US 70 (freeway conversion)	Lynn Rd	S Miami Blvd	4	6	Freeway	1.6	\$111,020,000	St	Yes	No	U-5720A
116.1	US 70/Miami Blvd/Sherron Rd	Interchange	--	-	-	New	N/A	\$46,621,000	St	Yes	No	U-5720B
123.11	Woodcroft Pkwy Ext	Garrett Rd	Hope Valley Rd	-	2	New Location	0.0	\$2,219,000	Div	No	No	U-5823
2035 MTP												
346	Danziger Dr Extension	Mt Moriah Rd	E Lakewood Dr	-	2	New Location	0.4	\$5,127,000	Div	No	No	N/A
367	Erwin Rd	Cameron Blvd	W Main St	4	4	Modernization	1.8	\$12,025,000	Div	No	No	N/A
373	Falconbridge Rd Connector	Falconbridge Rd	Farrington Rd	-	2	New Location	0.2	\$1,227,000	Div	No	No	N/A
201	Falconbridge Rd Extension	Farrington Rd	NC 54	-	4	New Location	0.9	\$16,685,000	Div	No	No	N/A
24.11	Garrett Rd	NC 751	Old Durham Rd	2	4	Widening	2.1	\$16,064,000	Div	No	No	N/A
36	Homestead Rd	Old NC 86	Rogers Rd	2	2	Modernization	2.1	\$10,234,000	Div	No	No	N/A
35	Homestead Rd	Rogers Rd	NC 86	2	2	Modernization	1.3	\$6,855,000	Div	No	No	N/A
77.1	Hope Valley Rd (NC 751)	S Roxboro St	Woodcroft Parkway	2	4	Widening	0.3	\$2,716,000	Reg	No	No	N/A
77.11	Hope Valley Rd (NC 751)	NC 54	Woodcroft Pkwy	4	4	Modernization	-	(see #77.1)	Reg	No	No	N/A
202	Hopson Rd	Davis Dr	S Miami Blvd (NC 54)	2	4	Widening	0.7	\$5,200,000	Div	No	No	N/A
44	I-40	NC 86	I-85	4	6	Widening	7.8	\$58,784,000	St	Yes	No	I-3306AA
43	I-40	Durham County Line	NC 86	4	6	Widening	3.9	\$29,316,000	St	Yes	No	I-3306AB
45	I-40 Managed Lanes	Wake County Line	NC 147	8	10	Widening	3.4	\$446,464,000	St	Yes	No	I-5702B
70.4	I-40/ NC 54 ramp	Farrington Rd.	I-40	-	1	New Location	0.2	\$1,600,000	St	No	No	N/A
646	I-85/NC 86	Interchange	--	-	-	Upgrade	N/A	\$16,488,000	St	No	No	I-5984
650	I-85/S Churton St	Interchange	--	-	-	Upgrade	N/A	\$20,700,000	St	No	No	I-5967
50.11	Jack Bennet Rd/Lystra Rd	US 15-501 South	Farrington Mill/Point Rd	2	2	Modernization	4.1	\$20,567,000	Div	No	No	N/A
51	Lake Hogan Farms Rd	Eubanks Rd	Legends Way	-	2	New Location	0.7	\$4,407,000	Div	No	No	N/A
410	Marriott Way	Friday Center Dr	Barbee Chapel Rd	-	2	New Location	0.2	\$682,000	Div	No	No	N/A
69.4	NC 54	Barbee	NC 55	2	4	Widening	1.3	\$46,400,000	Reg	No	No	U-5774J
69.3	NC 54	Fayetteville	Barbee	2	4	Widening	1.0	\$46,800,000	Reg	No	No	U-5774I
70.3	NC 54	Fordham Blvd (US 15-501)	Barbee Chapel Rd	6	6	Modernization	1.2	\$32,106,000	Reg	Yes	No	U-5774B

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
69.1	NC 54	I-40 Interchange	NC 751	2	4	Widening	1.2	\$32,000,000	Reg	No	No	U-5774G
69.2	NC 54	NC 751	Highgate Dr	2	4	Widening	1.5	\$21,600,000	Reg	No	No	U-5774H
70	NC 54 (widening; superstreet)	I-40	Barbee Chapel Rd	4	6	Widening	1.6	\$9,100,000	Reg	Yes	No	U-5774C
75.3	NC 55 (Alston Ave)	Main St	NC 98	2	4	Modernization	0.5	\$1,000	Reg	No	No	U-3308
440	New Hope Commons Dr Extension	Eastowne Dr	New Hope Commons Dr	-	2	New Location	0.4	\$4,588,000	Div	No	No	N/A
94	Roxboro St	Cornwallis Rd	MLK Pkwy	-	4	New Location	1.2	\$12,063,000	Div	No	No	N/A
230	Southwest Durham Dr	NC 54	I-40	-	2	New Location	2.0	\$12,402,000	Div	No	No	N/A
476	University Dr	MLK Parkway	Shannon Rd	5	4	Modernization	0.5	\$768,000	Div	No	No	N/A
113	US 15-501 (expressway conversion)	US 15-501 Bypass	I-40	6	6	Expressway	2.0	\$195,300,000	St	Yes	No	U-6067
116	US 70 (freeway conversion)	S Miami Blvd	MPO boundary	4	6	Freeway	2.5	\$173,469,000	St	Yes	No	U-5720C
2045 MTP												
304.1	Angier Av Ext	US 70	Leesville Rd	-	2	New Location	0.8	\$4,784,000	Div	No	No	N/A
244	Angier/Glover Connector	Ellis Rd	Glover Rd	-	2	New Location	1.4	\$8,625,000	Div	No	No	N/A
343	Crown Pkwy/Roche Dr	Page Rd	T.W. Alexander Dr	-	2	New Location	2.7	\$11,041,000	Div	No	No	N/A
364	Eno Mountain Rd realignment	Mayo St	Eno Mountain Rd	2	2	New Location	0.3	\$2,015,000	Div	No	93.126	N/A
24.12	Garrett Rd	Old Durham Rd	US 15-501	2	4	Widening	1.0	\$7,761,000	Div	No	No	N/A
28.11	Glover Rd	Angier	US 70	-	2	New Location	0.6	\$3,714,000	Div	No	No	N/A
382	Hebron Rd Extension	Hebron Rd	Roxboro Rd (501 N)	-	2	New Location	0.5	\$3,612,000	Div	No	No	N/A
434	Holloway St (NC 98)	Miami Blvd	Nichols Farm Dr	4	4	Modernization	3.3	\$17,705,000	Reg	No	No	N/A
394	Hopson Rd	Louis Stephens Dr	Davis Dr	2	4	Widening	1.1	\$9,195,000	Div	No	No	N/A
45.21	I-40 Managed Lanes	NC 54	US 15-501	6	8	Widening	2.9	\$85,621,000	St	Yes	No	I-5702A
45.22	I-40 Managed Lanes	NC 147	NC 54	6	10	Widening	6.4	\$250,290,000	St	Yes	No	I-5702A
48.1	I-85	Mt Herman Church Rd	Durham County Line	4	6	Widening	2.5	\$39,118,000	St	Yes	No	I-5983
48	I-85	Mt Herman Church Rd	I-40	4	6	Widening	6.0	\$197,378,000	St	Yes	No	N/A
49	I-85	US 70	Red Mill Rd	4	6	Widening	8.2	\$215,940,000	St	Yes	No	N/A
53	Leesville Rd Ext	US 70/Page Rd Ext	Leesville Rd	-	2	New Location	0.4	\$2,644,000	Div	No	No	N/A
57	Lynn Rd Extension	US 70	Existing Lynn Rd	-	2	New Location	1.1	\$6,862,000	Div	No	No	N/A
242	Mt Carmel Ch Rd	US 15-501	Bennett Rd	2	2	Modernization	0.4	\$1,997,000	Div	No	No	N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
14.1	N Duke St (501 N)	I-85	N Roxboro split	5	4	Modernization	2.5	\$13,279,000	Reg	Yes	No	N/A
76	NC 751	Martha's Chapel Rd	O'Kelly Ch. Rd	2	4	Widening	5.4	\$43,232,000	Reg	No	No	N/A
77.2	NC 751	NC 54	Renaissance Pkwy	2	4	Widening	1.2	\$5,290,000	Reg	No	No	N/A
77.3	NC 751	Renaissance Pkwy	O'Kelly Chapel Rd	2	4	Widening	2.7	\$21,697,000	Reg	No	No	N/A
80	NC 86	Old NC 10	US 70 Business	2	4	Widening	0.9	\$7,259,000	Reg	No	No	N/A
81	NC 86 (and US 70 intersection)	US 70 Bypass	NC 57	2	4	Widening	0.3	\$4,742,000	Reg	No	No	N/A
84	Northern Durham Pkwy	I 85 North	Old Oxford Hwy	-	4	New Location	2.7	\$23,291,000	Div	No	No	N/A
83.1	Northern Durham Pkwy	Sherron Rd	NC 98	-	4	New Location	4.3	\$13,600,000	Div	Yes	No	N/A
83.11	Northern Durham Pkwy	US 70 E	Sherron Rd	-	4	New Location	2.7	\$23,500,000	Div	Yes	No	N/A
502	Patriot Dr Extension	S Miami Blvd	Page Rd	-	2	New Location	1.9	\$13,086,000	Div	No	No	N/A
92	Roxboro Rd (501 N)	Duke St	Goodwin Rd	4	4	Modernization	2.7	\$14,574,000	Reg	Yes	No	N/A
96.1	Sherron Rd	S Mineral Springs Rd	Stallings Rd	2	4	Widening	3.1	\$25,003,000	Div	No	No	N/A
106.1	Southwest Durham Dr	US 15-501 Business	Mt Moriah Rd	-	4	New Location	0.4	\$3,667,000	Div	No	No	N/A
104	Southwest Durham Dr	Sawyer Dr	Old Chapel Hill Rd	2	4	Widening	0.7	\$5,432,000	Div	No	No	N/A
479	US 15-501	Smith Level Rd	MPO Boundary	4	4	Modernization	4.9	\$25,673,000	St	No	No	N/A
114	US 15-501 Bypass	MLK Parkway	I-85	4	6	Widening	4.8	\$80,734,000	St	Yes	No	N/A
81.1	Wake Forest Hwy (NC 98)	Nichols Farm Dr	Wake County Line	2	4	Widening	6.0	\$48,474,000	Reg	Yes	No	N/A
501	Yates Store Rd Extension	Yates Store Rd	Wake Rd	-	2	New Location	1.4	\$11,519,000	Div	No	No	N/A

2045 Metropolitan Transportation Plan Adopted Roadway Projects



Interchanges		Grade Separations		Roadway Improvements	
Horizon Year		Horizon Year		Horizon Year	
	2025		2025		2025
	2035		2035		2035
	2045		2045		2045
	Post-2045 CTP		Post-2045 CTP		Post-2045 CTP

*Highlighted Projects Open to Traffic

0 2.5 5 Miles

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Note: The Capital Area Metropolitan Planning Organization, in cooperation with other mapping organizations, is committed to offering its users accurate, useful, and current information about the Region. Although every effort has been made to ensure the accuracy of information, errors and conditions originating from physical sources used to develop the database may be reflected in the map and/or data supplied. The user must be aware of data conditions and bear responsibility for the appropriate use of the information with respect to possible errors, original map scale, collection methodology, currency of data, and other conditions specific to certain data.

Forestville Rd Ext

Project ID	A589a
Horizon Year	2035
From	US 64
To	Old Knight Rd
Estimated Cost (\$)	2,262,481
Toll	Non-tolled
Existing Lanes	0
Proposed Lanes	2
Distance	0.29
Proposed Improvement	New Location
Existing Facility	Not Applicable
Future Facility	Major Thoroughfare
STI Category	Division
Complete	0
Committed	0
Current Pavement Condition	Not Available
TIP Number	

DRAFT

DRAFT

First St Widening

Project ID	A592
Horizon Year	2045
From	Smithfield Rd
To	Horton Rd
Estimated Cost (\$)	22,488,866
Toll	Non-tolled
Existing Lanes	2
Proposed Lanes	4
Distance	2.87
Proposed Improvement	Widening
Existing Facility	Minor Thoroughfare
Future Facility	Boulevard
STI Category	Division
Complete	0
Committed	0
Current Pavement Condition	Good
TIP Number	

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Appendix C
Existing (2020) Analyses

DRAFT

Watson Tract TIA
1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Existing (2020) AM
10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↖		↖	↗	↖	↖	↗	↖	↖
Traffic Volume (vph)	60	132	443	40	8	65	1062	135	158	165	65	144
Future Volume (vph)	60	132	443	40	8	65	1062	135	158	165	65	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.440			0.403
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	820	1863	1583	751
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											108	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	107	240	615	71	24	108	1416	205	239	289	108	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	347	615	71	0	132	1416	205	239	289	108	229
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		26.5	66.2	66.2			15.3	55.0	55.0	43.5	43.5	43.5
Actuated g/C Ratio		0.19	0.47	0.47			0.11	0.39	0.39	0.31	0.31	0.31
v/c Ratio		1.04	0.37	0.09			0.68	1.01	0.33	0.94	0.50	0.19
Control Delay		113.4	25.3	22.9			76.7	68.2	31.5	89.8	42.5	6.7
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

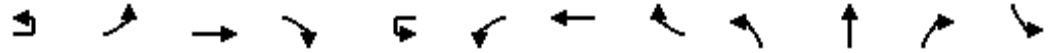
Existing (2020) AM
 10/29/2020



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	160	217
Future Volume (vph)	160	217
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	262	409
Shared Lane Traffic (%)		
Lane Group Flow (vph)	262	409
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	43.5	43.5
Actuated g/C Ratio	0.31	0.31
v/c Ratio	0.45	0.83
Control Delay	41.3	60.3
Queue Delay	0.0	0.0

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Existing (2020) AM
 10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		113.4	25.3	22.9		76.7	68.2	31.5	89.8	42.5	6.7	102.2
LOS		F	C	C		E	E	C	F	D	A	F
Approach Delay			54.7				64.5			54.2		
Approach LOS			D				E			D		
Queue Length 50th (ft)		-357	188	36		117	-686	129	209	211	0	204
Queue Length 95th (ft)		248	195	43		116	588	136	214	175	6	197
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		335	1673	748		319	1404	628	263	598	582	241
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.04	0.37	0.09		0.41	1.01	0.33	0.91	0.48	0.19	0.95

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 60.9
 Intersection Capacity Utilization 78.9%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

Intersection LOS: E
 ICU Level of Service D

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	41.3	60.3
LOS	D	E
Approach Delay	65.4	
Approach LOS	E	
Queue Length 50th (ft)	188	341
Queue Length 95th (ft)	172	235
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.44	0.81
Intersection Summary		

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Intersection						
Int Delay, s/veh	73.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	50	114	101	245	386	89
Future Vol, veh/h	50	114	101	245	386	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	63	70	49	61	44
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	181	144	500	633	202
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1522	734	835	0	0	
Stage 1	734	-	-	-	-	
Stage 2	788	-	-	-	-	
Critical Hdwy	6.42	6.22	4.12	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	2.218	-	-	
Pot Cap-1 Maneuver	~ 130	420	798	-	-	
Stage 1	475	-	-	-	-	
Stage 2	448	-	-	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 98	420	798	-	-	
Mov Cap-2 Maneuver	~ 98	-	-	-	-	
Stage 1	356	-	-	-	-	
Stage 2	448	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	416.4	2.4		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	798	-	176	-	-	
HCM Lane V/C Ratio	0.181	-	1.776	-	-	
HCM Control Delay (s)	10.5		416.4	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0.7	-	22.3	-	-	
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Intersection						
Int Delay, s/veh	18.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	14	271	237	62	204	35
Future Vol, veh/h	14	271	237	62	204	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	542	551	95	324	121

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1582	385	445	0	-	0
Stage 1	385	-	-	-	-	-
Stage 2	1197	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	120	663	1115	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	61	663	1115	-	-	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	348	-	-	-	-	-
Stage 2	286	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.5	9.7	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1115	-	61	663	-	-
HCM Lane V/C Ratio	0.494	-	0.791	0.817	-	-
HCM Control Delay (s)	11.3	-	169.5	30.1	-	-
HCM Lane LOS	B	-	F	D	-	-
HCM 95th %tile Q(veh)	2.8	-	3.5	8.6	-	-

Watson Tract TIA
1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

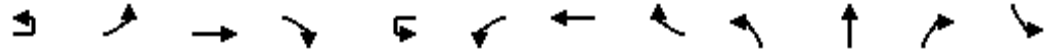
Existing (2020) PM
10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↘		↖	↗	↘	↖	↗	↘	↖
Traffic Volume (vph)	81	128	1162	163	15	74	702	101	125	123	76	117
Future Volume (vph)	81	128	1162	163	15	74	702	101	125	123	76	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Fr _t				0.850				0.850			0.850	
Fl _t Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Fl _t Permitted		0.950				0.950			0.414			0.575
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	771	1863	1583	1071
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											143	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	180	191	1336	240	36	119	989	144	205	156	143	167
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	371	1336	240	0	155	989	144	205	156	143	167
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		35.4	70.5	70.5			17.1	52.2	52.2	37.4	37.4	37.4
Actuated g/C Ratio		0.25	0.50	0.50			0.12	0.37	0.37	0.27	0.27	0.27
v/c Ratio		0.83	0.75	0.30			0.71	0.74	0.24	1.00	0.31	0.27
Control Delay		67.0	33.4	24.5			76.4	41.8	31.0	112.2	41.1	6.5
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	141	102
Future Volume (vph)	141	102
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	252	192
Shared Lane Traffic (%)		
Lane Group Flow (vph)	252	192
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	37.4	37.4
Actuated g/C Ratio	0.27	0.27
v/c Ratio	0.51	0.45
Control Delay	45.9	44.9
Queue Delay	0.0	0.0



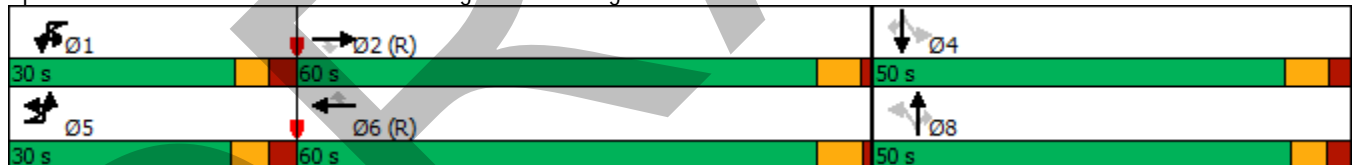
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		67.0	33.4	24.5		76.4	41.8	31.0	112.2	41.1	6.5	51.7
LOS		E	C	C		E	D	C	F	D	A	D
Approach Delay			38.7				44.8			60.2		
Approach LOS			D				D			E		
Queue Length 50th (ft)		337	514	129		138	394	87	183	112	0	130
Queue Length 95th (ft)		#374	676	160		136	341	105	165	142	0	146
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		447	1782	797		319	1404	628	247	598	605	344
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.83	0.75	0.30		0.49	0.70	0.23	0.83	0.26	0.24	0.49

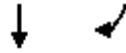
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 44.2
 Intersection Capacity Utilization 69.0%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	45.9	44.9
LOS	D	D
Approach Delay	47.2	
Approach LOS	D	
Queue Length 50th (ft)	191	143
Queue Length 95th (ft)	150	112
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.42	0.38
Intersection Summary		

DRAFT

Intersection						
Int Delay, s/veh	12.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	45	142	101	232	165	38
Future Vol, veh/h	45	142	101	232	165	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	47	59	53	67	60	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	241	191	346	275	84

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1045	317	359	0	-	0
Stage 1	317	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	253	724	1200	-	-	-
Stage 1	738	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	203	724	1200	-	-	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	593	-	-	-	-	-
Stage 2	478	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	40.7	3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1200	-	418	-	-
HCM Lane V/C Ratio	0.159	-	0.805	-	-
HCM Control Delay (s)	8.6	0	40.7	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0.6	-	7.2	-	-

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	10	72	75	195	127	5
Future Vol, veh/h	10	72	75	195	127	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	240	179	275	192	12
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	831	198	204	0	-	0
Stage 1	198	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	340	843	1368	-	-	-
Stage 1	835	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	295	843	1368	-	-	-
Mov Cap-2 Maneuver	295	-	-	-	-	-
Stage 1	726	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	12	3.2	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1368	-	295	843	-	-
HCM Lane V/C Ratio	0.131	-	0.121	0.285	-	-
HCM Control Delay (s)	8	-	18.9	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.4	1.2	-	-

Appendix D
Background Projects

DRAFT

Traffic Impact Analysis Forestville Village Knightdale, North Carolina



TRAFFIC IMPACT ANALYSIS

FOR

FORESTVILLE VILLAGE

LOCATED

IN

KNIGHTDALE, NORTH CAROLINA

Prepared For:
ESP Associates, Inc.
2200 Gateway Centre Blvd, Suite 216
Morrisville, NC 27560

Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910

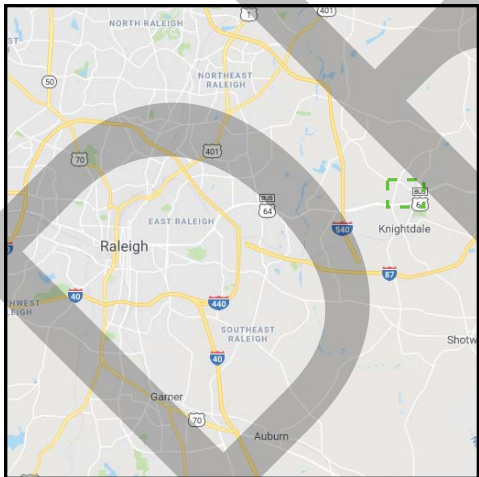
February 2020






RKA Project No. 19296

Prepared By: NAB

Reviewed By: JTR



LEGEND

-  Proposed Site Location
-  Study Intersection
-  Study Area

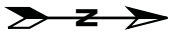


Forestville Village
Knightdale, NC

Site Location Map

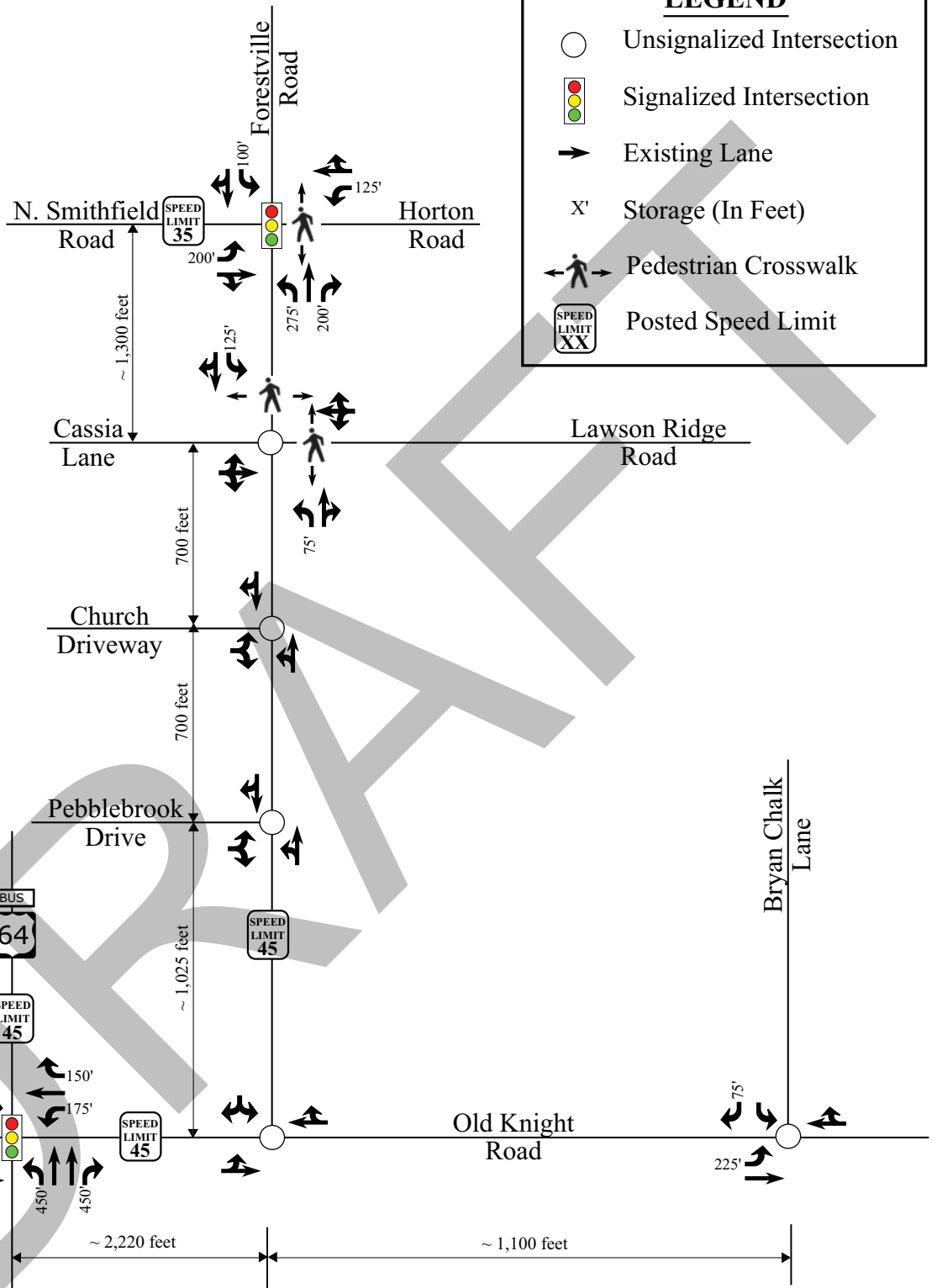
Scale: Not to Scale

Figure 1



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- X' Storage (In Feet)
- Pedestrian Crosswalk
- Posted Speed Limit

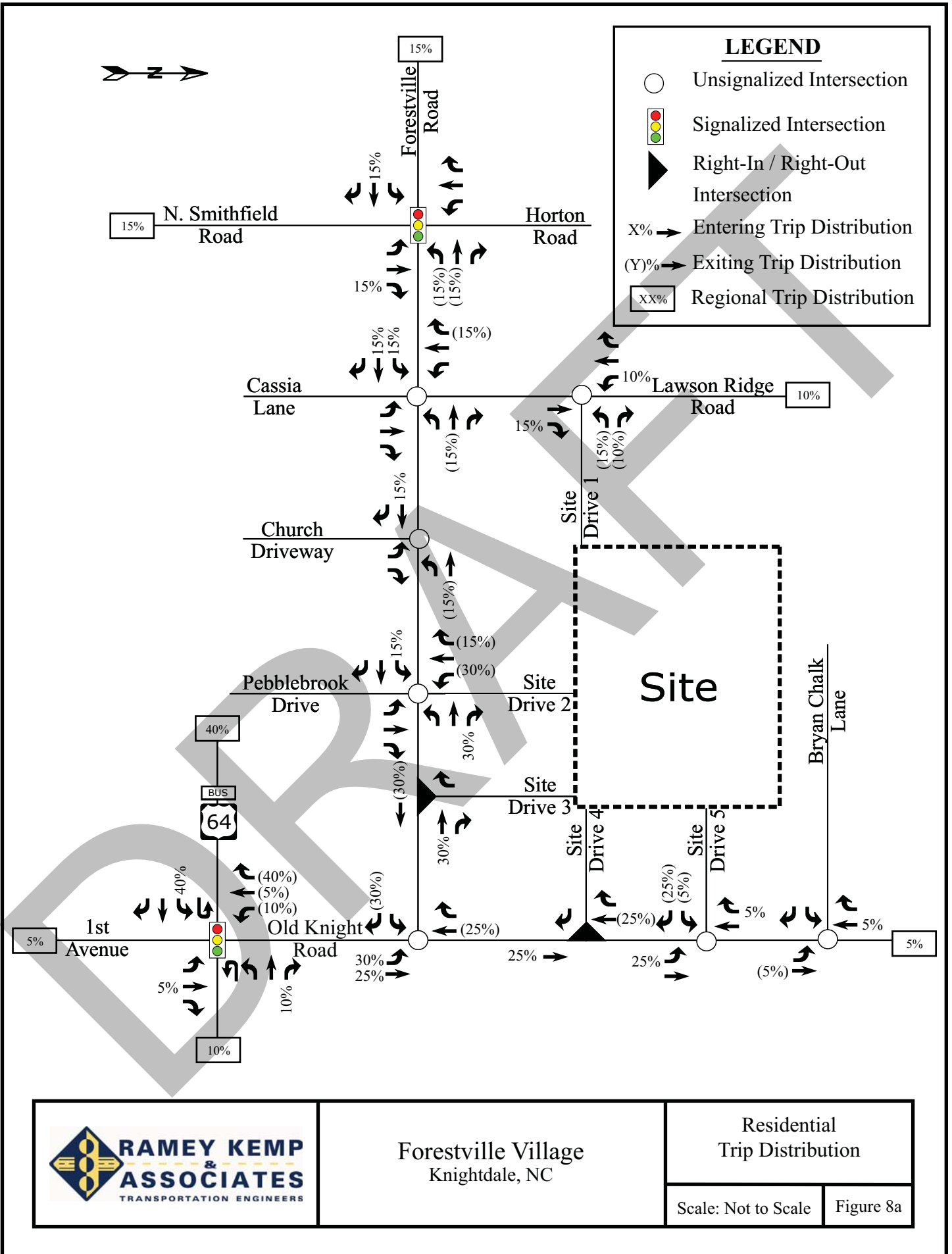


Forestville Village
Knightdale, NC

Existing
Lane Configurations

Scale: Not to Scale

Figure 3



LEGEND

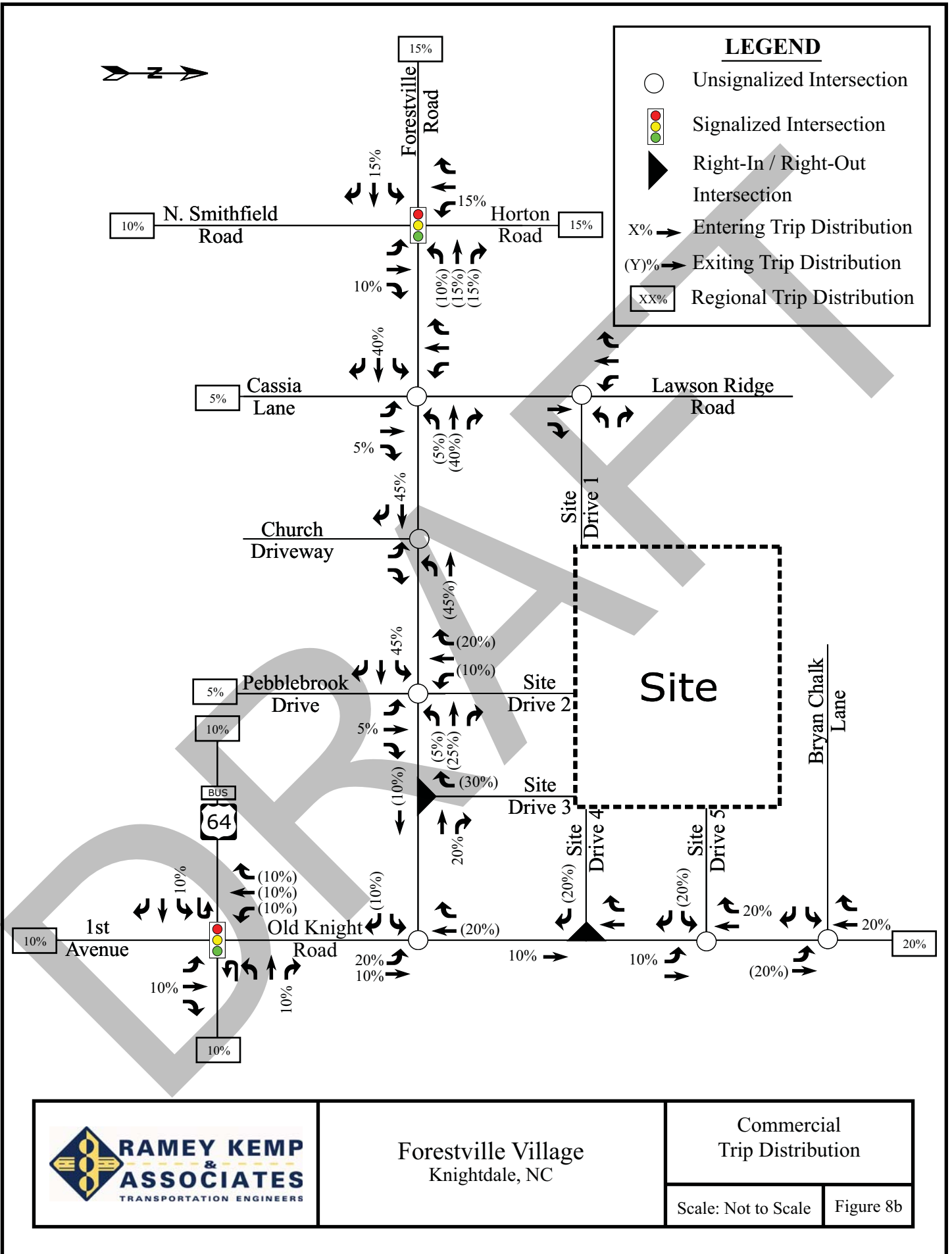
- Unsignalized Intersection
- Signalized Intersection
- ▶ Right-In / Right-Out Intersection
- X% → Entering Trip Distribution
- (Y)% → Exiting Trip Distribution
- xx% Regional Trip Distribution

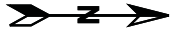


Forestville Village
Knightdale, NC

Residential
Trip Distribution

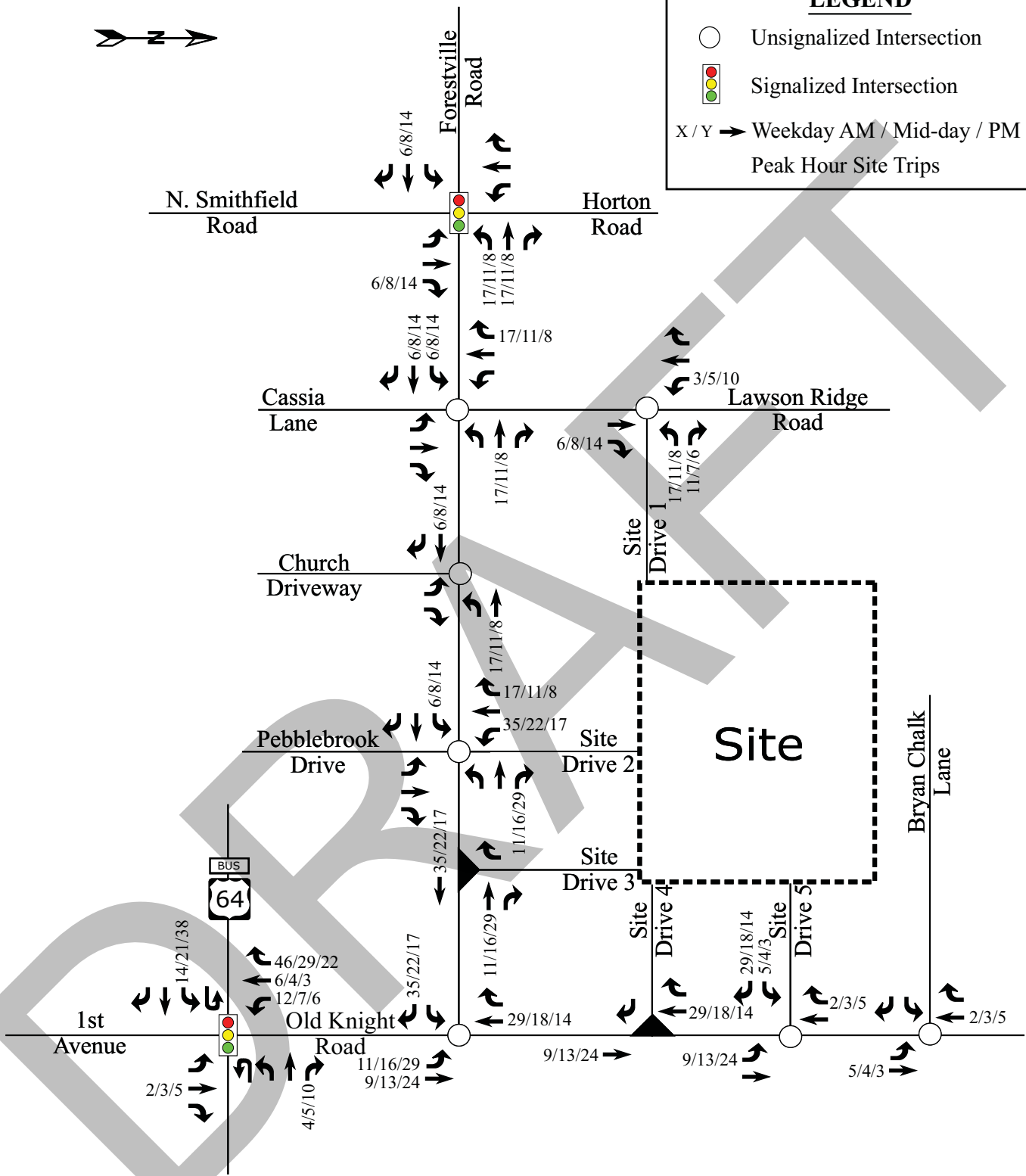
Scale: Not to Scale Figure 8a





LEGEND

- Unsignalized Intersection
- ⬆️⬆️⬆️ Signalized Intersection
- X/Y → Weekday AM / Mid-day / PM Peak Hour Site Trips

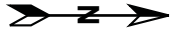


Forestville Village
Knightdale, NC

Residential
Site Trip Assignment

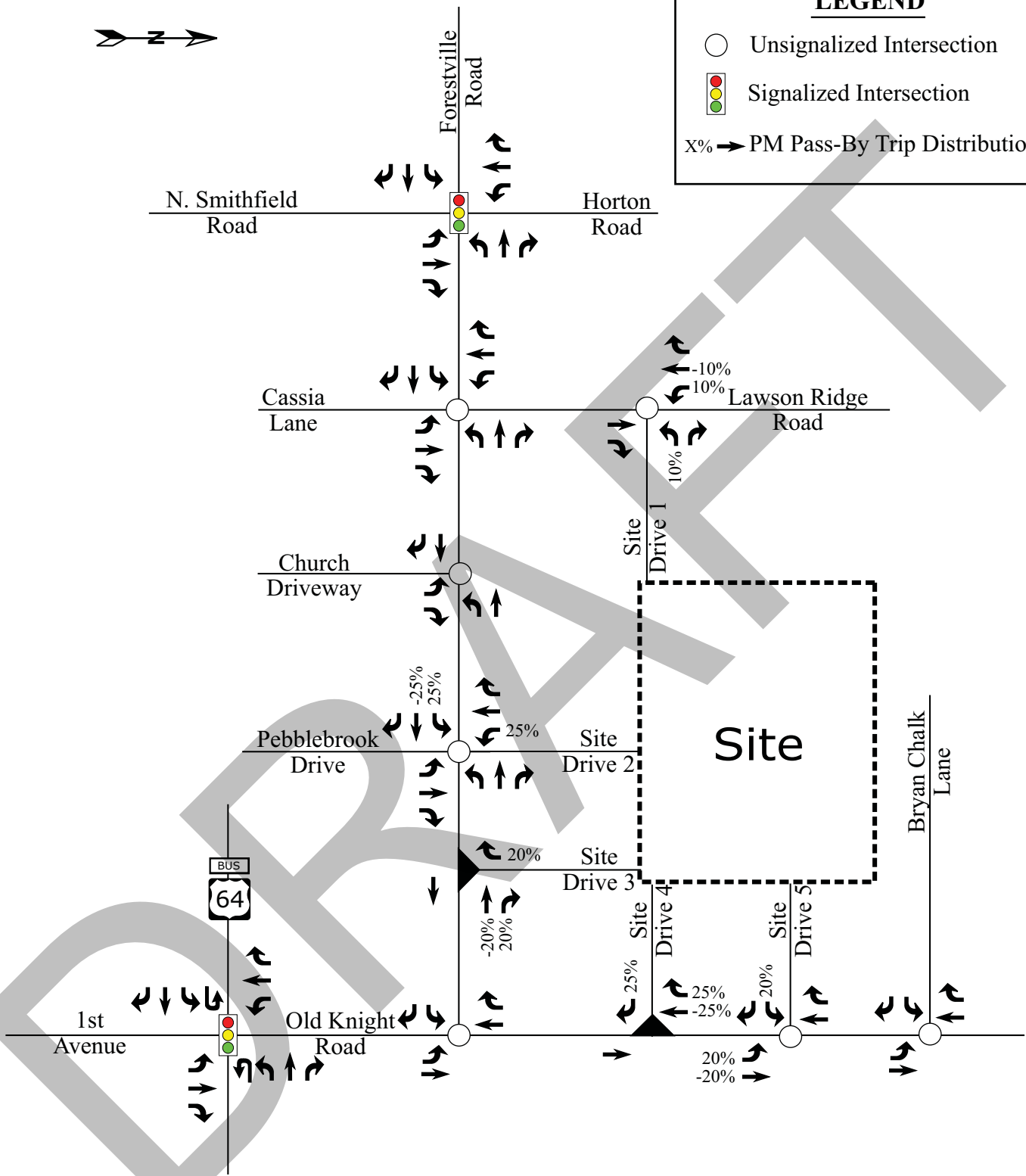
Scale: Not to Scale

Figure 9a



LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- x% → PM Pass-By Trip Distribution

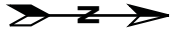


Forestville Village
Knightdale, NC

Pass-By
Trip Distribution

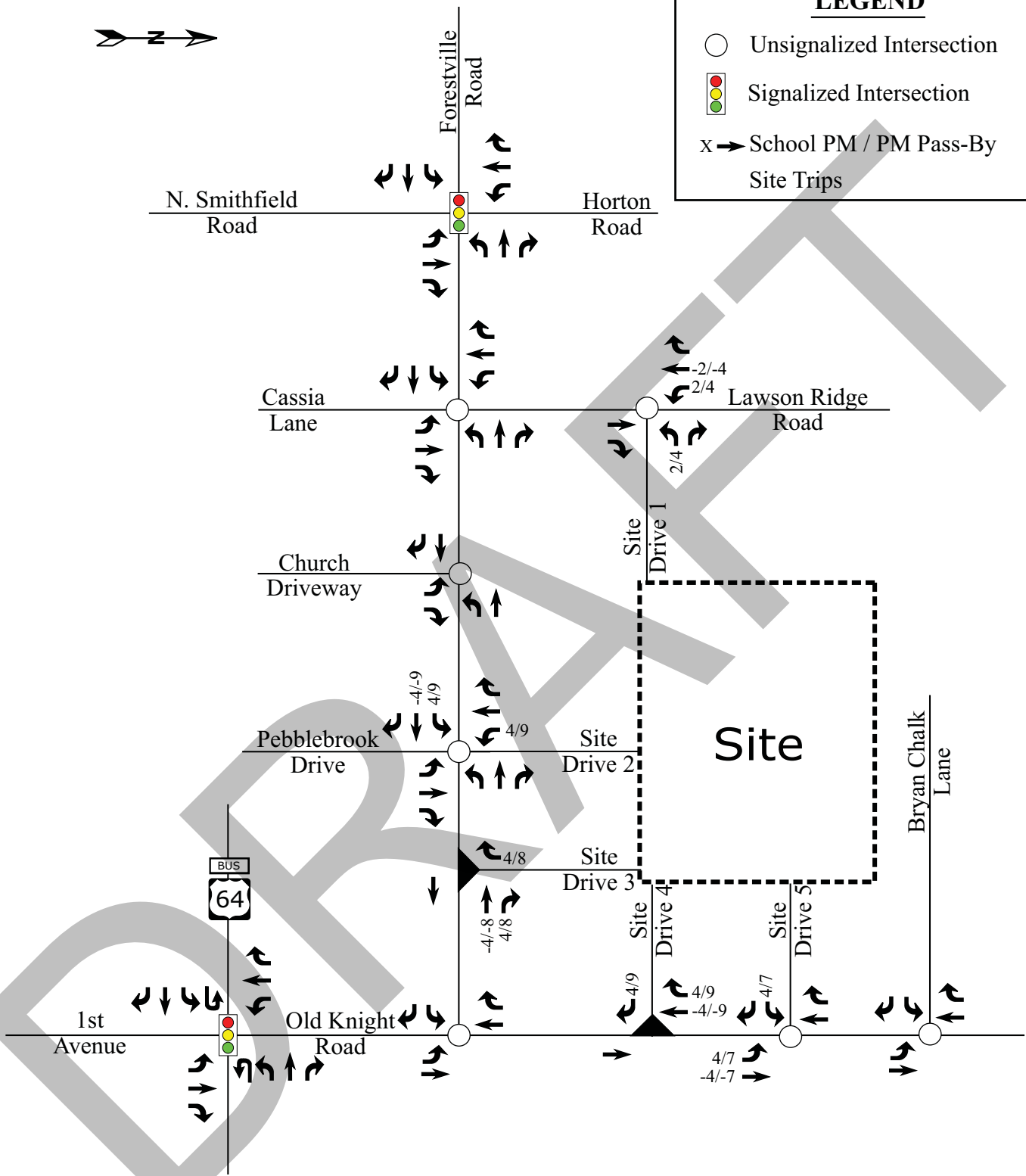
Scale: Not to Scale

Figure 10



LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- X → School PM / PM Pass-By Site Trips

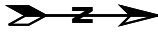


Forestville Village
Knightdale, NC

Pass-By
Trip Assignment

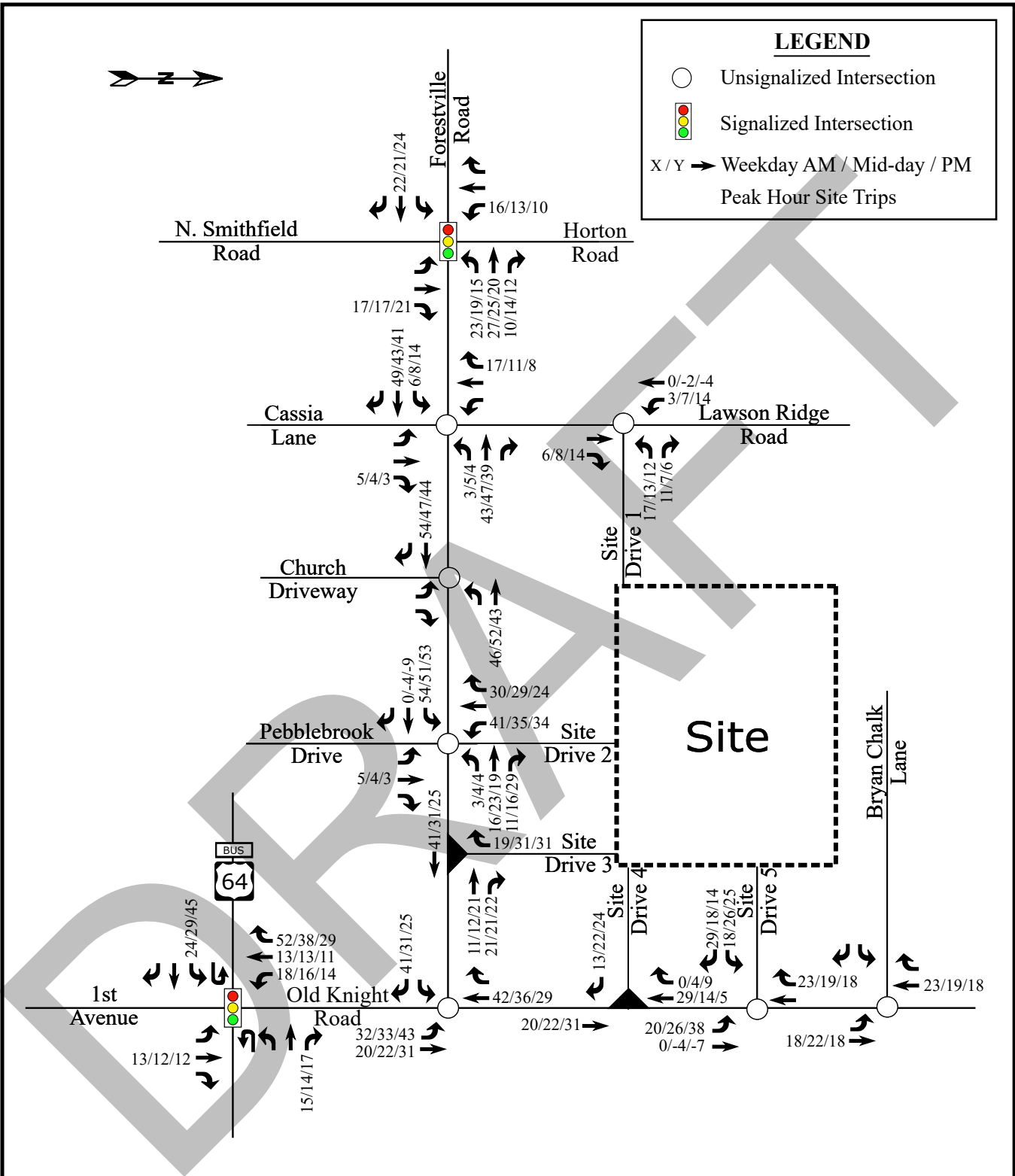
Scale: Not to Scale

Figure 11



LEGEND

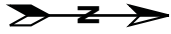
- Unsignalized Intersection
- ◫ Signalized Intersection
- X/Y → Weekday AM / Mid-day / PM Peak Hour Site Trips



Forestville Village
Knightdale, NC

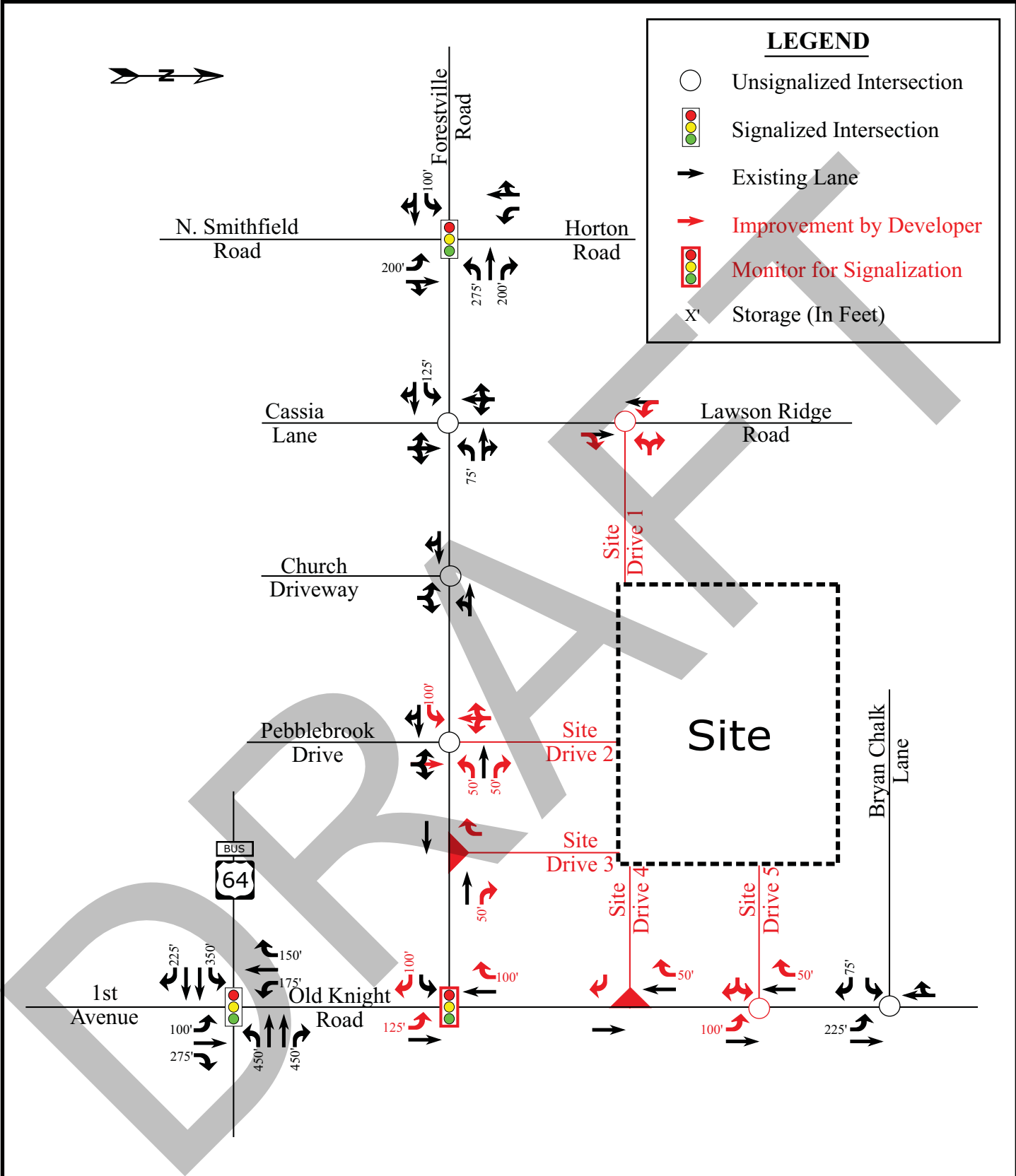
Total
Site Trip Assignment

Scale: Not to Scale Figure 12



LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- Existing Lane
- Improvement by Developer
- ◫ Monitor for Signalization
- X' Storage (In Feet)



Forestville Village
Knightdale, NC

Recommended
Lane Configurations

Scale: Not to Scale	Figure 14
---------------------	-----------

TRANSPORTATION IMPACT ANALYSIS

7630 Knightdale Boulevard Development

Knightsdale, NC

*Prepared for
Brown Investment Properties*





Transportation Impact Analysis

7630 Knightdale Boulevard Development
Knightdale, NC

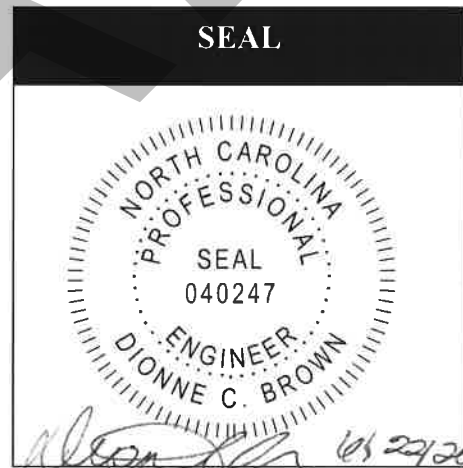
Prepared for Brown Investment Properties
June 22, 2020

Analysis by: Krupanidhi Koilada

Drafting/Graphics by: Krupanidhi Koilada

Reviewed by: Dionne C. Brown, P.E.
Vaibhavi Kamdar, P.E.

Sealed by: Dionne C. Brown, P.E.



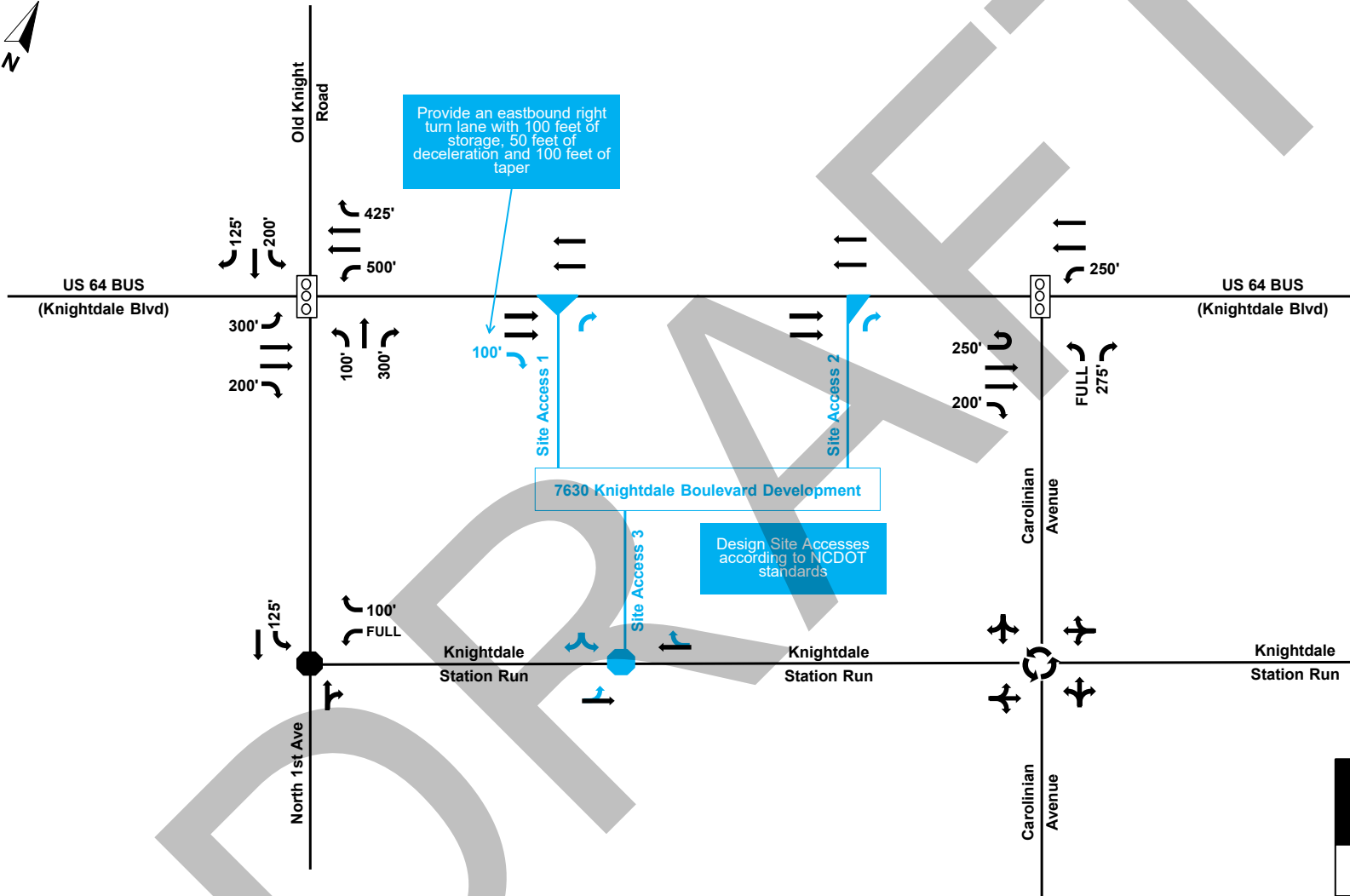
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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROUNDBOUNT
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING BLUE = PROPOSED	



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EXHIBIT A
RECOMMENDED
IMPROVEMENTS

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



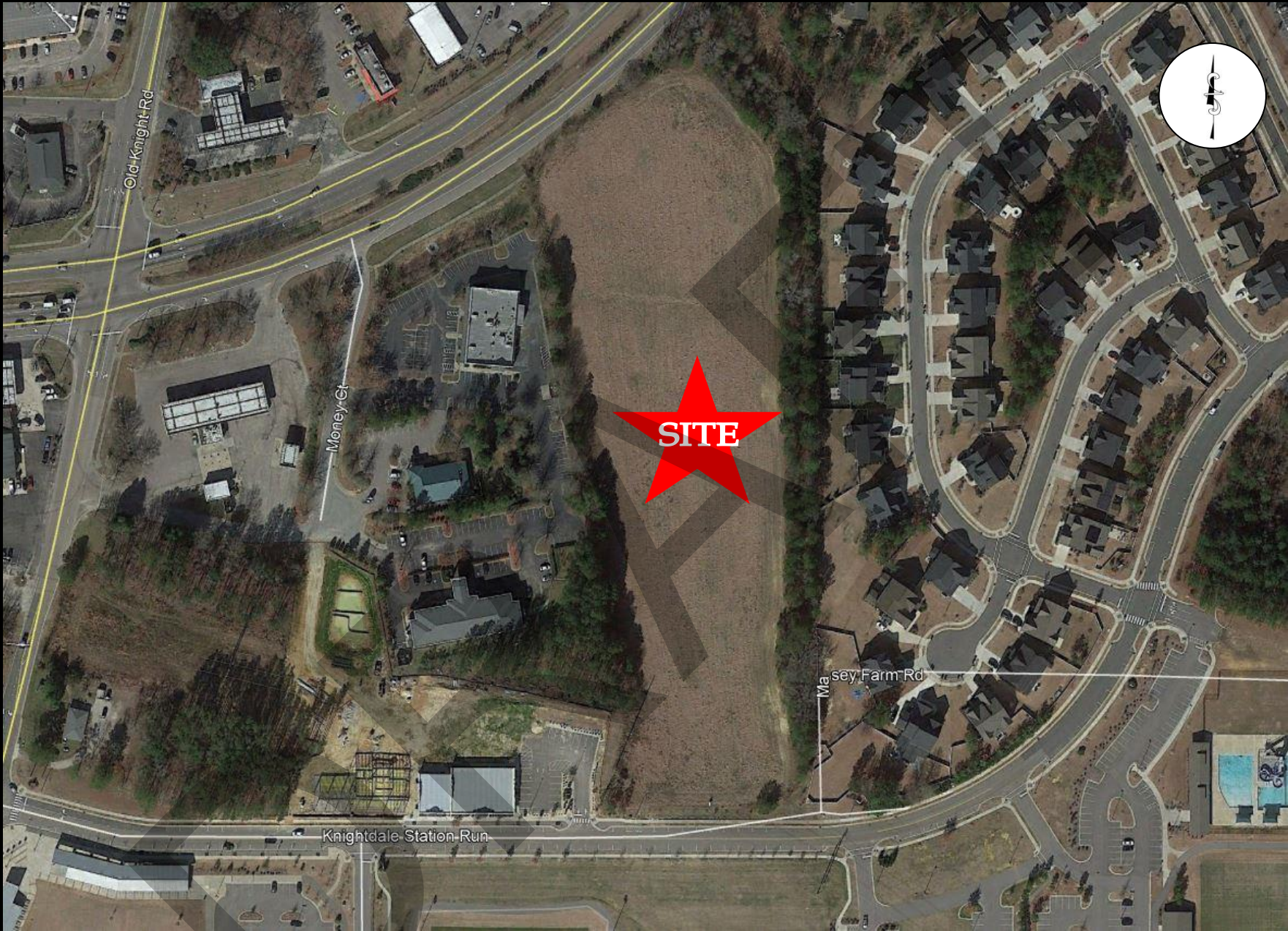


FIGURE 2A
SITE LOCATION MAP

SITE INDICATOR





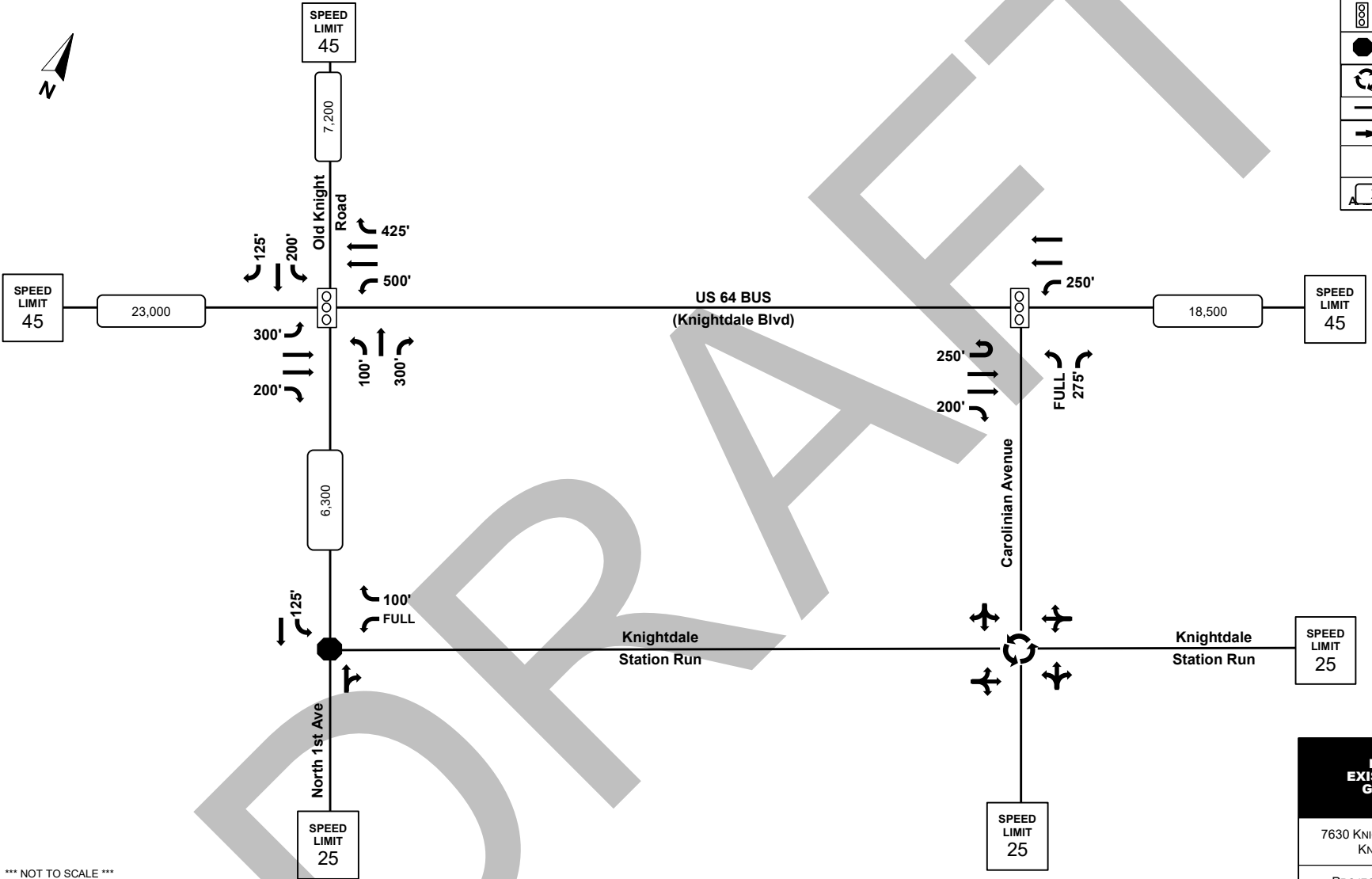
FIGURE 2B
VICINITY MAP

STUDY INTERSECTIONS
BACKGROUND
PROPOSED





LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROUNDABOUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	XXXX 2018



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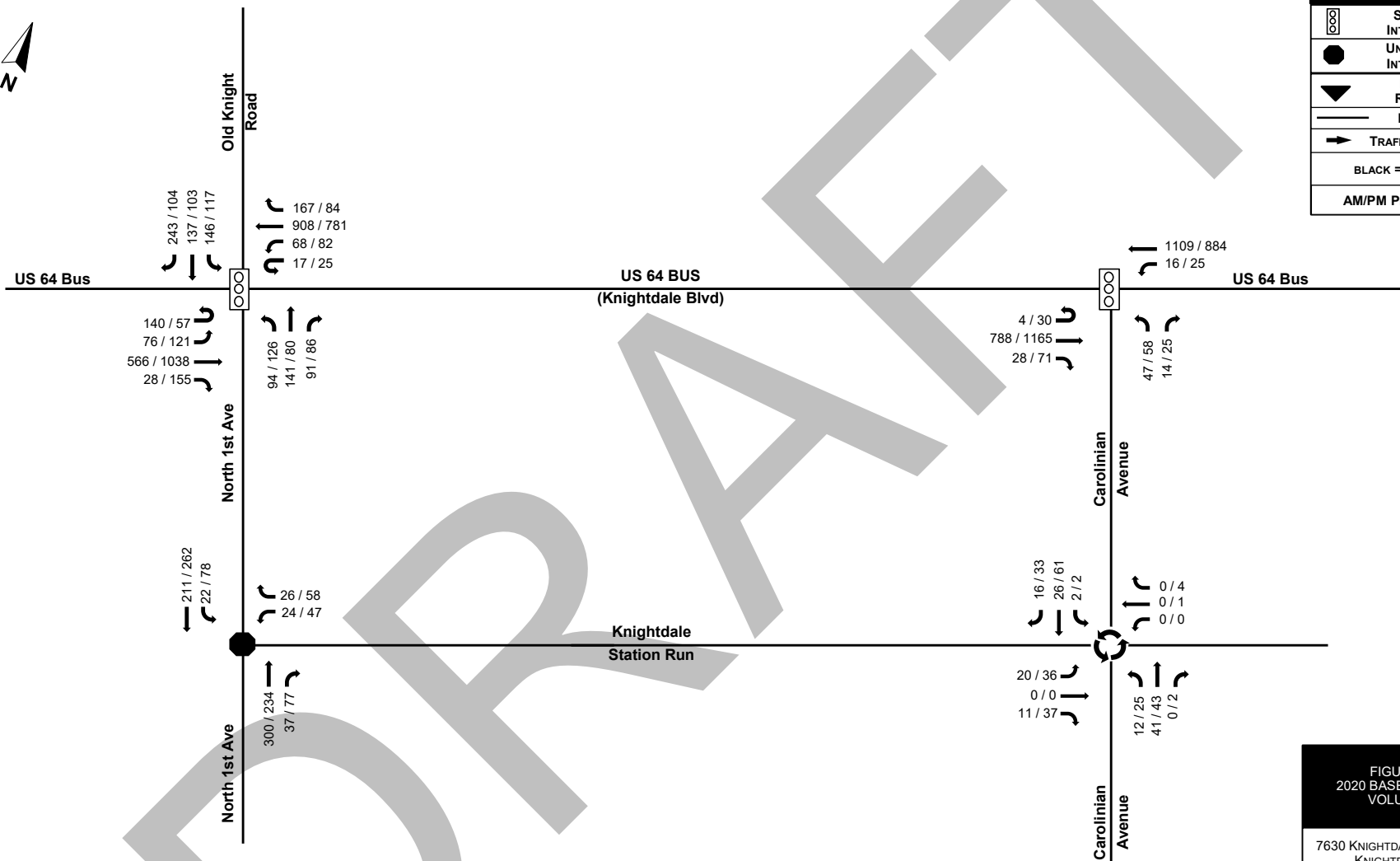
**FIGURE 3
EXISTING LANE
GEOMETRY**

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	AM/PM PEAK HOURS



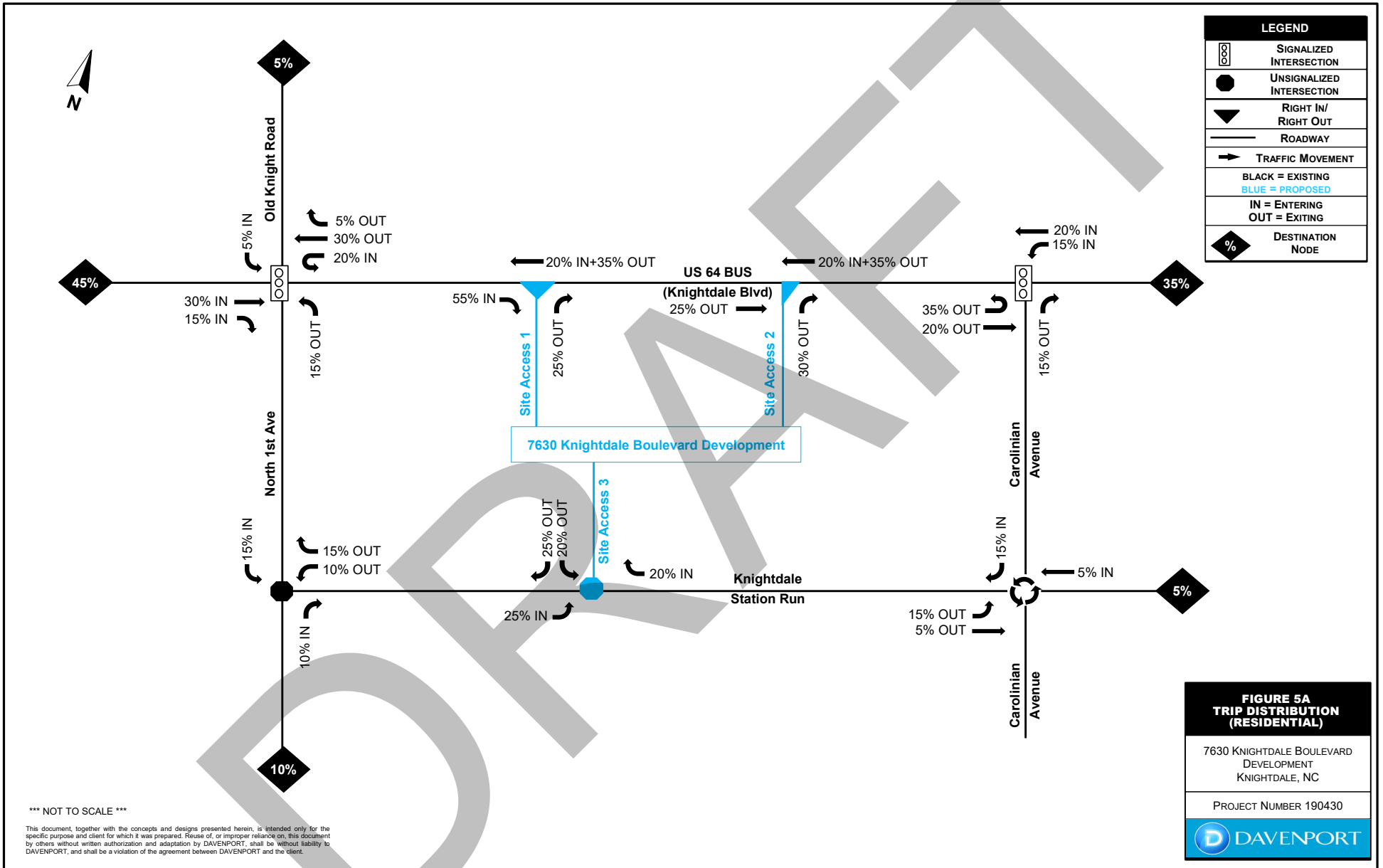
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FIGURE 4
2020 BASE TRAFFIC VOLUMES

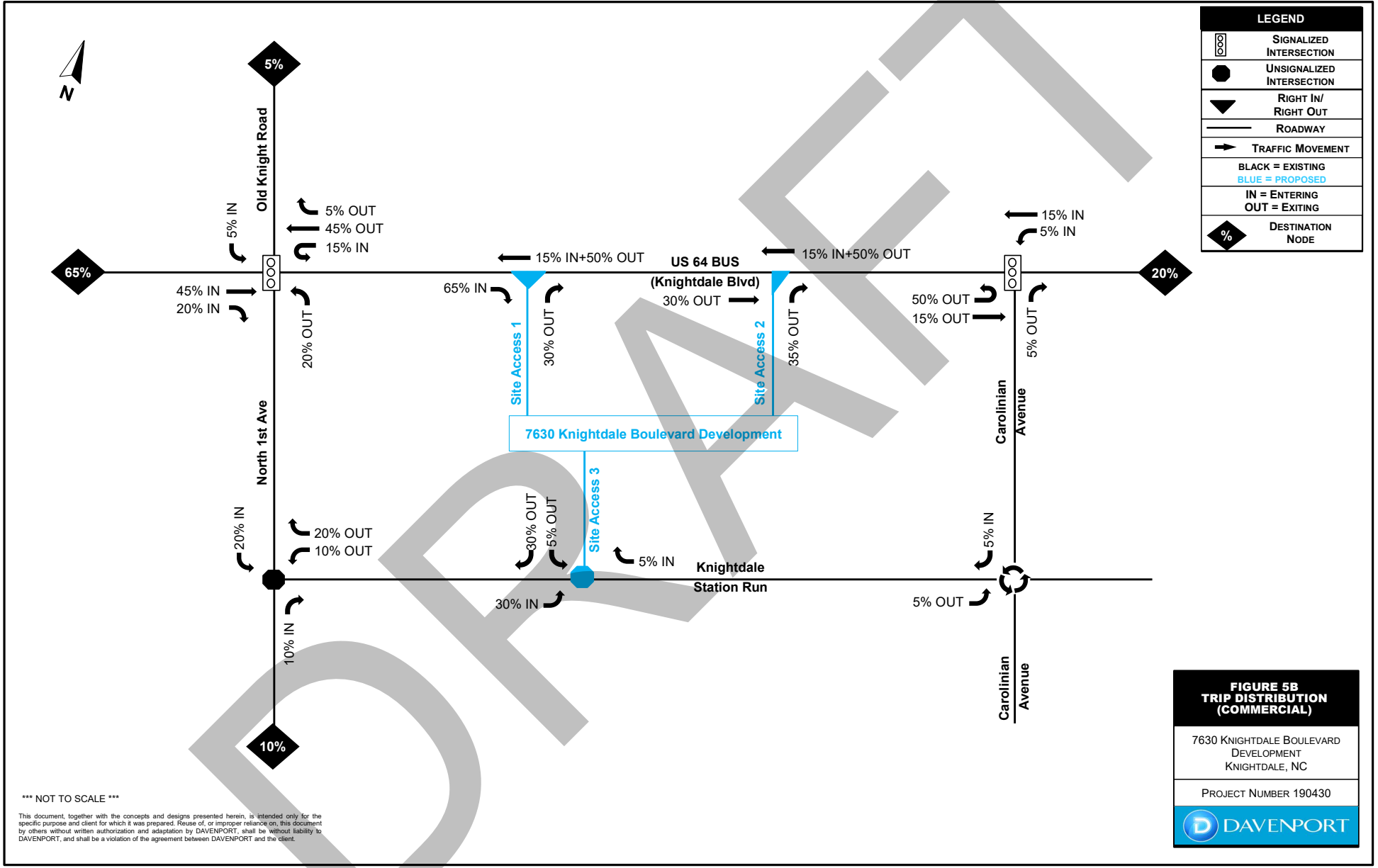
7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



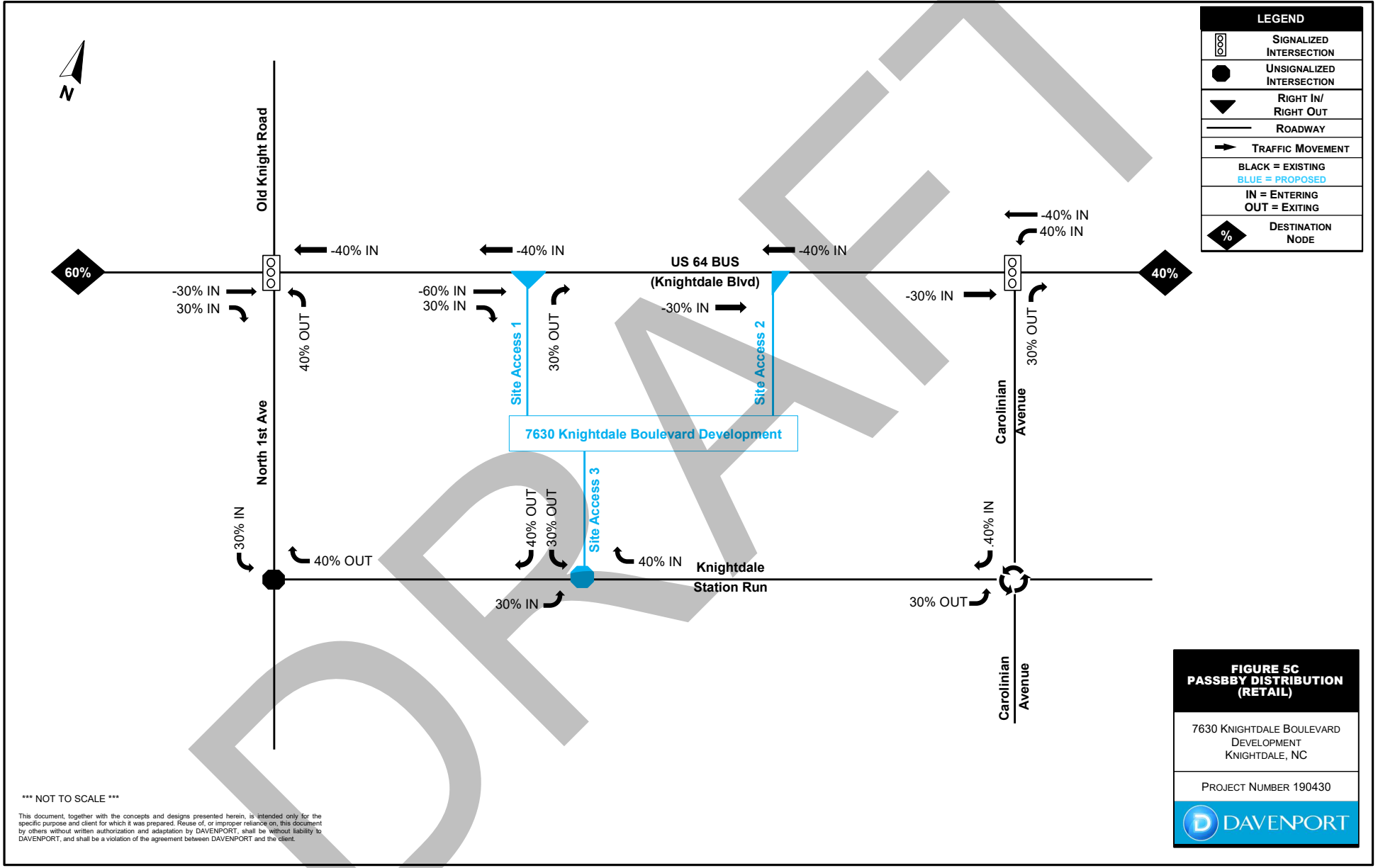
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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	BLUE = PROPOSED
	IN = ENTERING
	OUT = EXITING
	DESTINATION NODE

**FIGURE 5C
PASSBY DISTRIBUTION
(RETAIL)**

7630 KNIGHTDALE BOULEVARD
DEVELOPMENT
KNIGHTDALE, NC

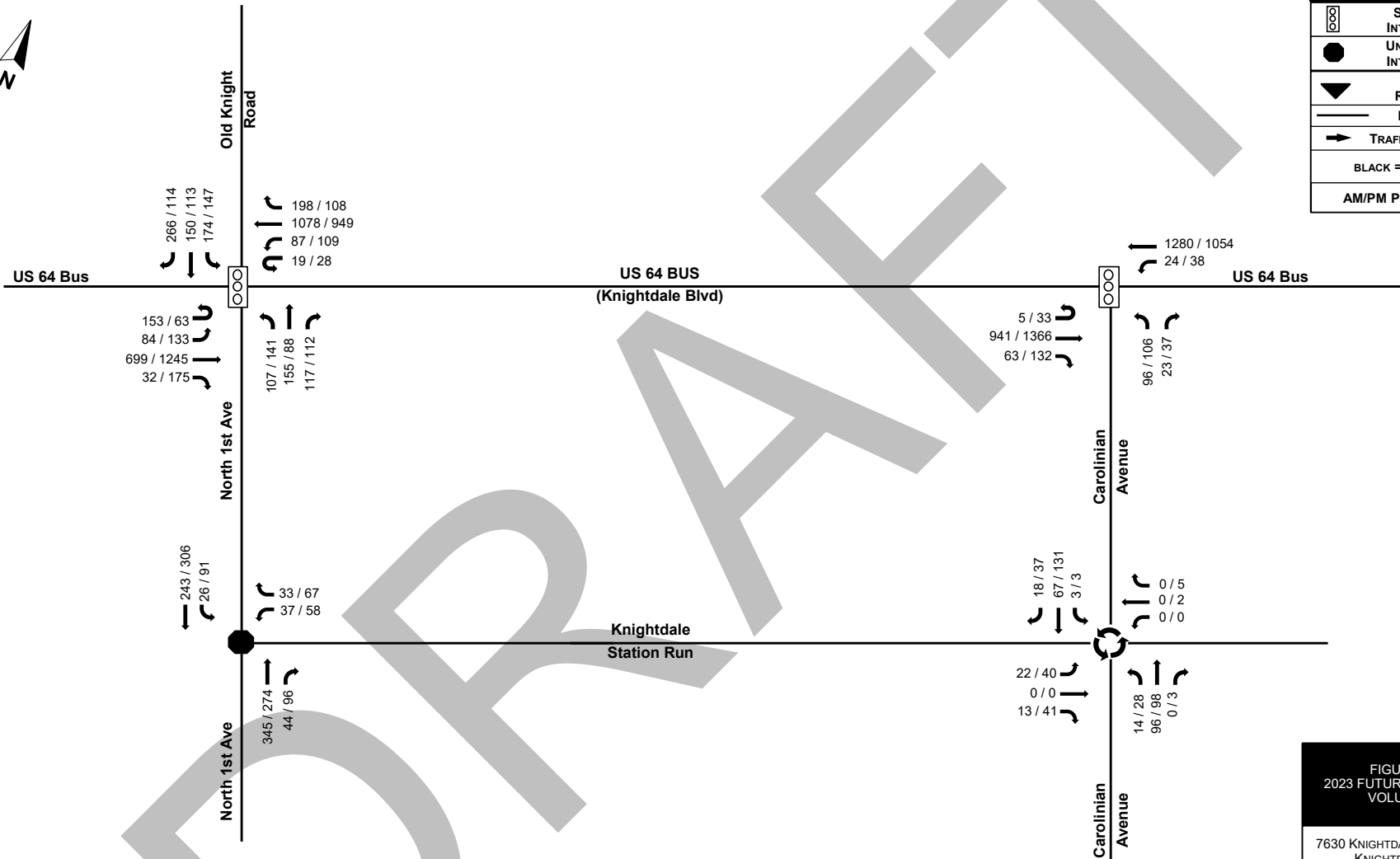
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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
AM/PM PEAK HOURS	



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FIGURE 6
2023 FUTURE NO BUILD
VOLUMES

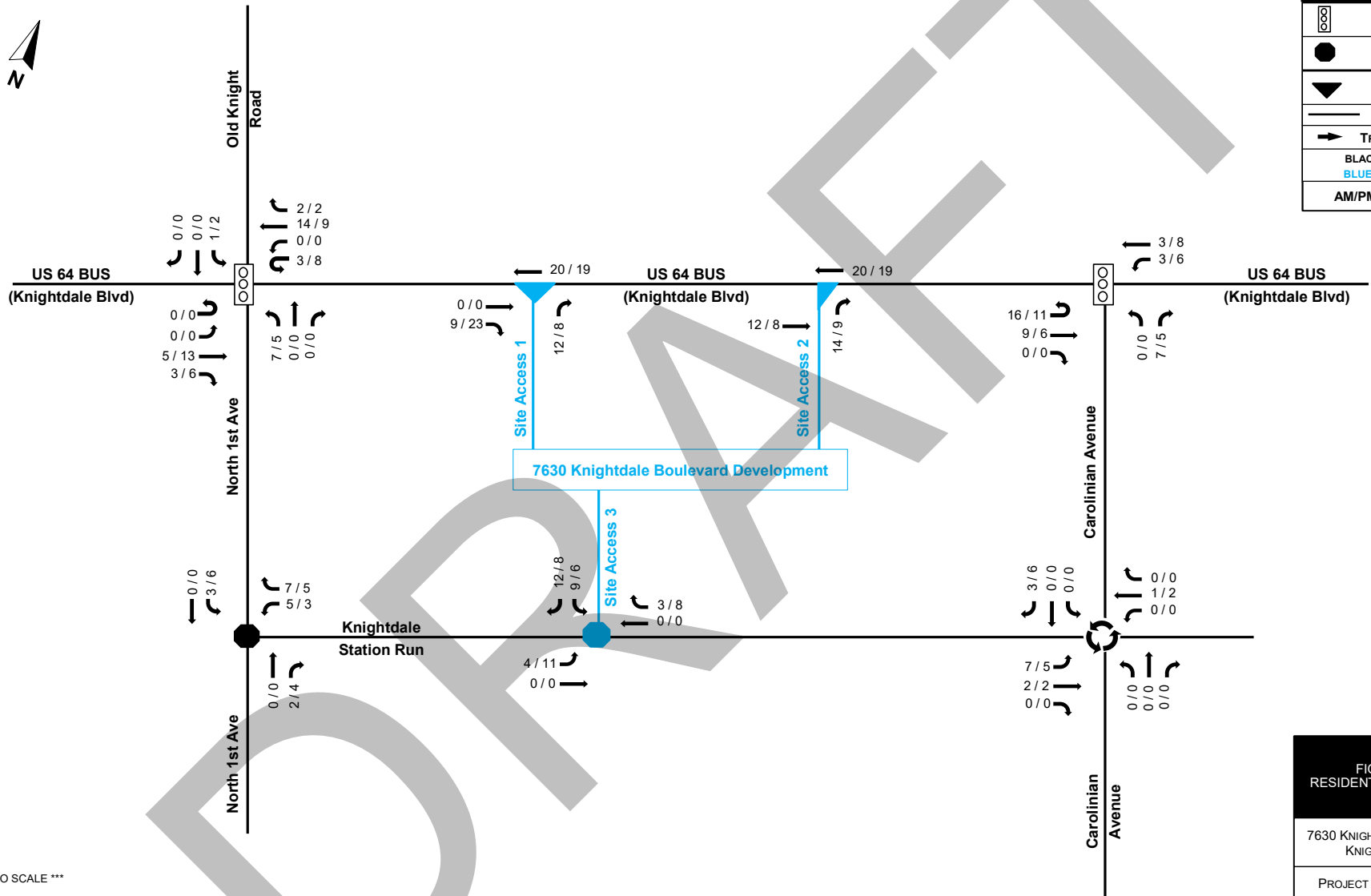
7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430





LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	BLUE = PROPOSED
AM/PM PEAK HOURS	



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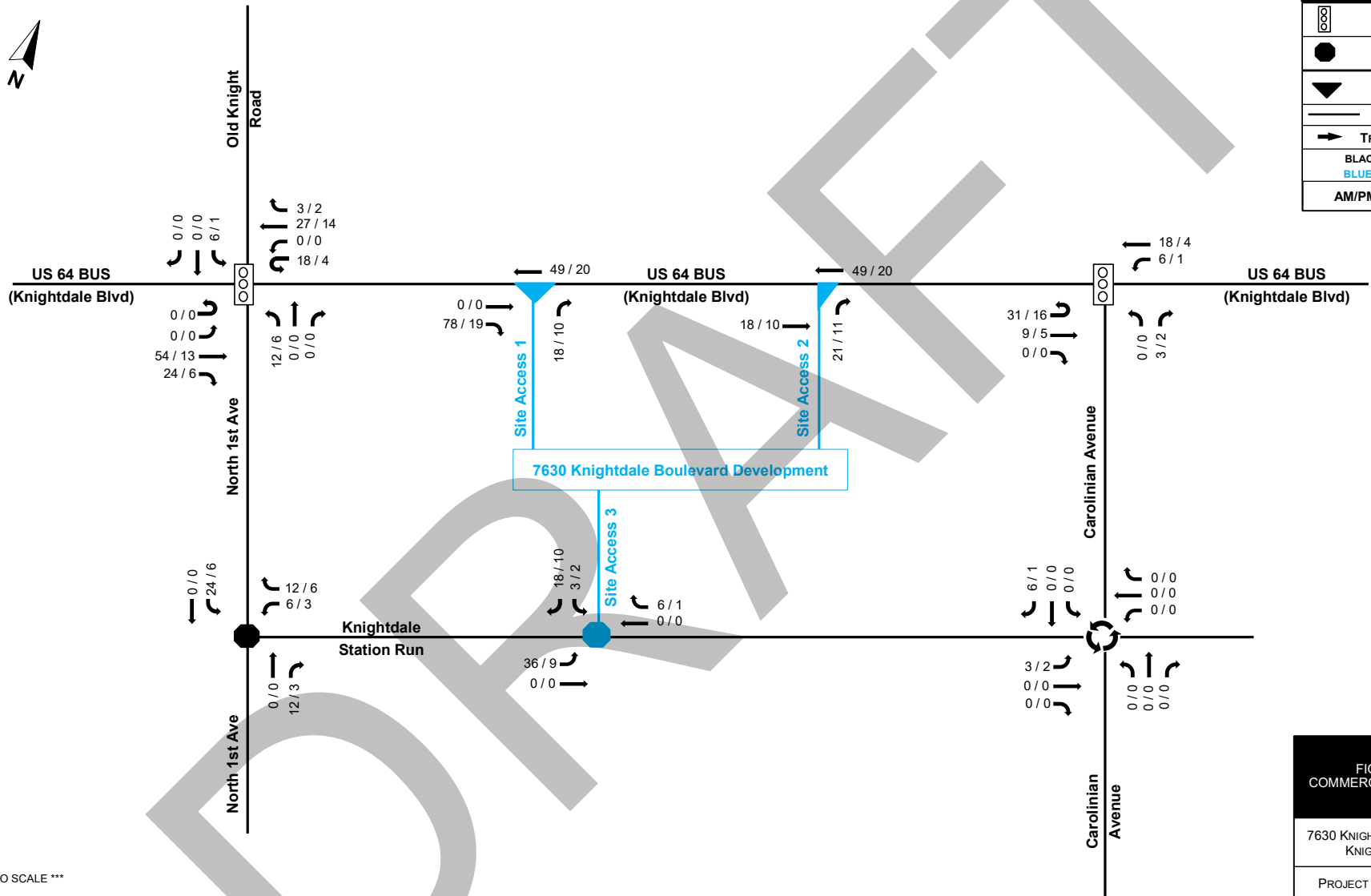
FIGURE 7A
RESIDENTIAL SITE TRIPS

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	BLUE = PROPOSED
AM/PM PEAK HOURS	



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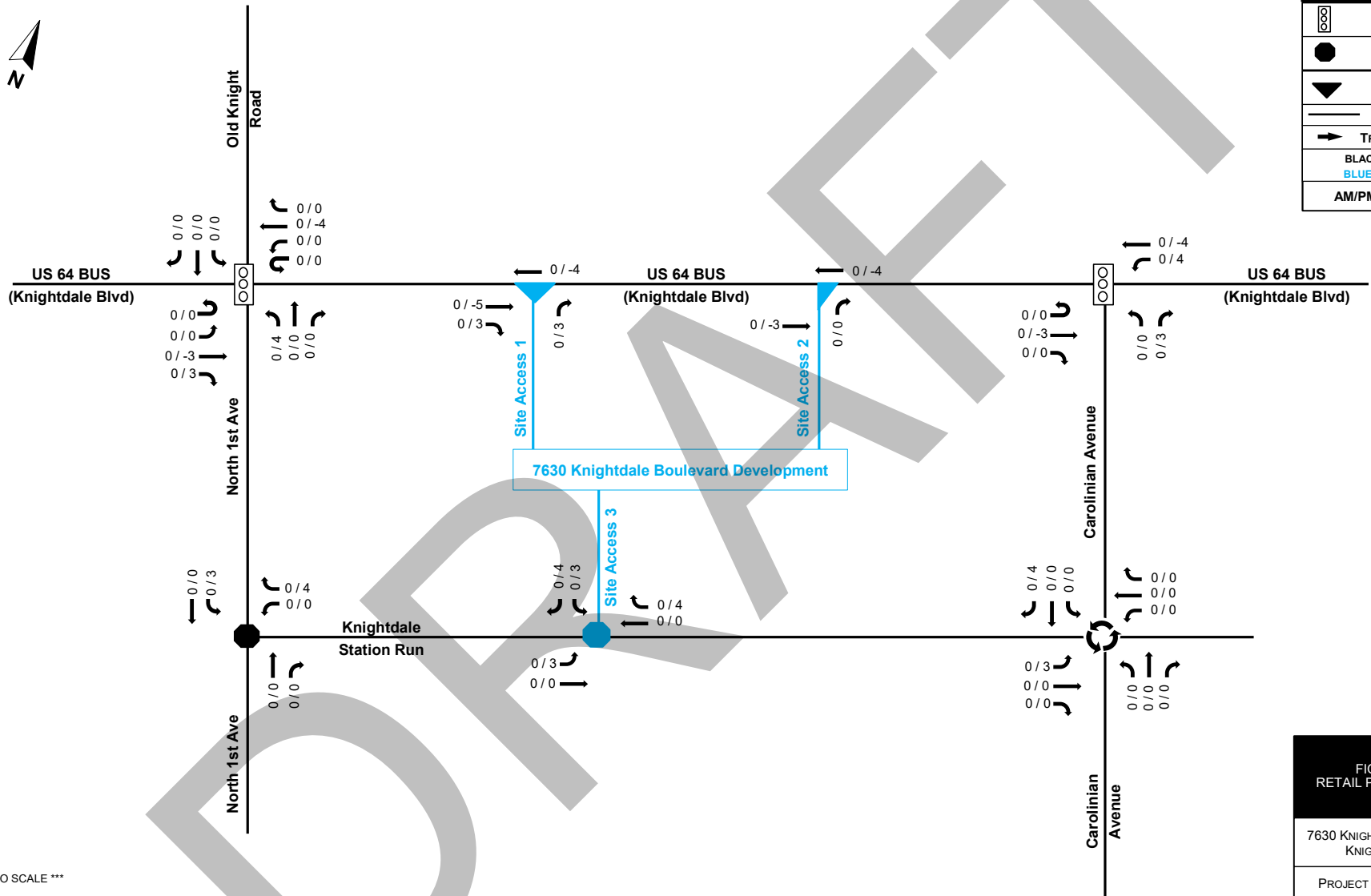
**FIGURE 7B
COMMERCIAL SITE TRIPS**

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	BLUE = PROPOSED
AM/PM PEAK HOURS	



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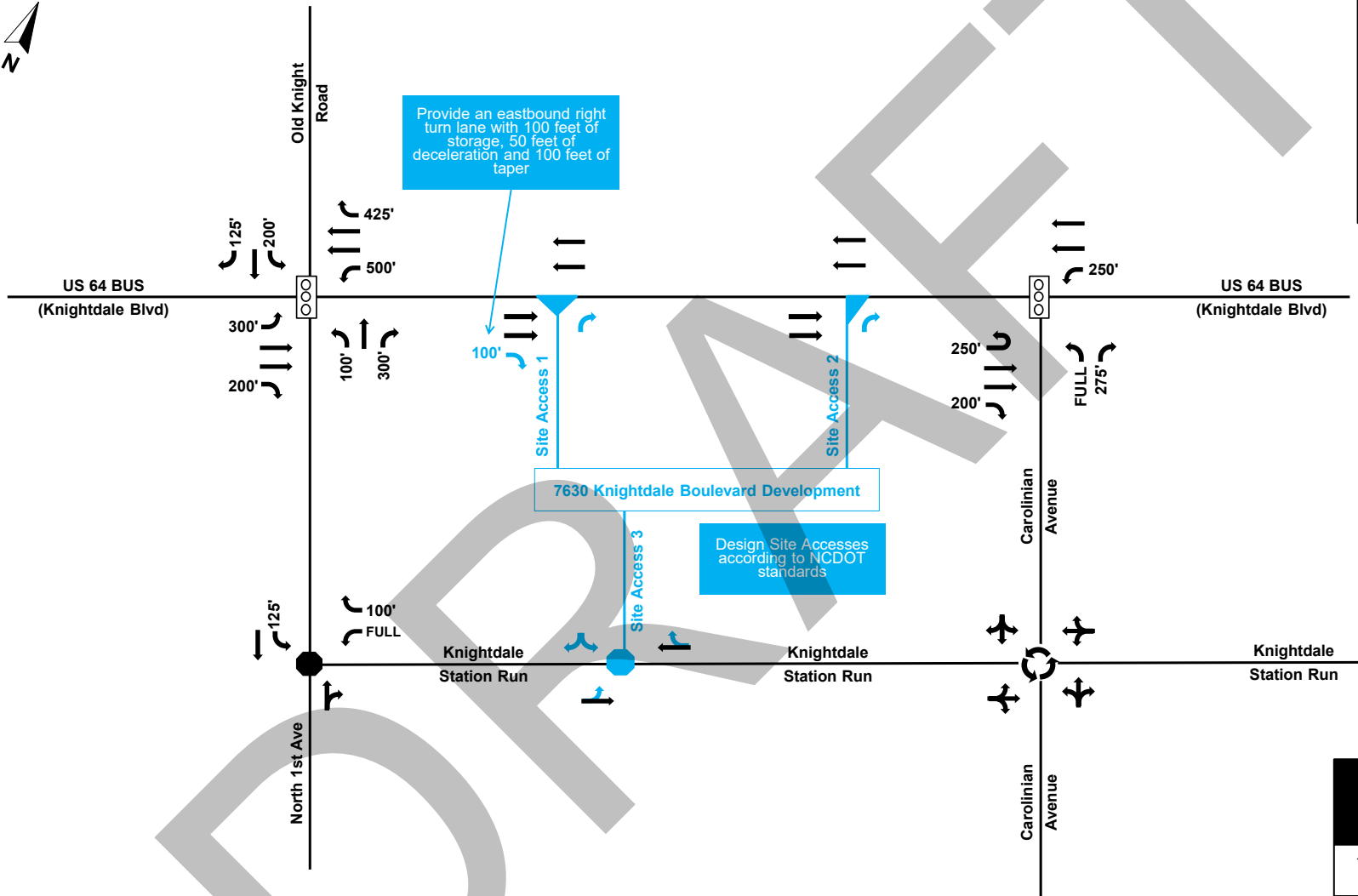
FIGURE 7C
RETAIL PASS-BY TRIPS

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROUNDABOUT
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING BLUE = PROPOSED	



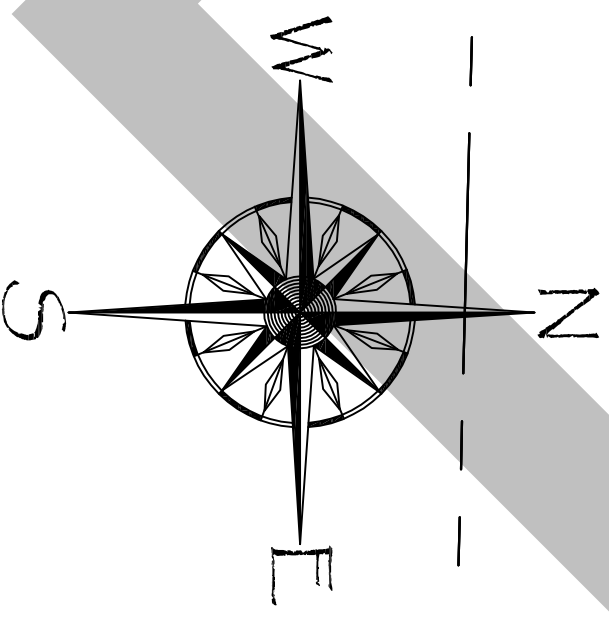
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FIGURE 11
RECOMMENDED
IMPROVEMENTS

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



- LEGEND:**
- NEUSE RIPARIAN BUFFER
 - WETLANDS
 - TREE CANOPY COVERAGE
 - ACTIVE RECREATION OPEN SPACE
 - PASSIVE RECREATION OPEN SPACE
 - PHASE LINE
1. Boundary information and topographic information provided by Camthorne, Moss & Panceria.
 2. Easement Neuse Riparian Buffer and wetland delineation by SEP Engineering & Construction.
 3. 100 year flood does not exist on this property per FEMA Flood Mapping (32070500) dated 09/30/06.
 4. Adjacent property ownership information taken from Wake County GIS.
 5. All streets shall be public and turned over to the Town of Knightdale for maintenance upon completion.
 6. All streets shall be private and maintained by a duly established homeowners association.
 7. See street section designs on detail sheets.
 8. The street layout is conceptual and subject to change. Approval by Town Staff is required.
 9. Greenway trails shall be provided in the locations depicted and are subject to relocation. Trails shall be private and maintained by the HOA and open to the public.
 10. Any signage located on the site shall be approved by the Town of Knightdale and shall be located outside of any sight triangles.
 11. Driveway access for other lots may access secondary street and shall not be required to access alley.
 12. No driveway access on collector streets.
 13. Parameters for property and adjacent properties provided by Wake County GIS.
 14. Phasing is preliminary and subject to change.
 15. All materials and methods of construction shall conform to Town of Knightdale Standards.
 16. All necessary permits shall be obtained from NCEM, DMG, The Army Corp of Engineers or other authorized agencies prior to construction drawing approval in the affected phase.
 17. All lots will be designed in accordance with section 8.9 of the Knightdale UDO.
 18. All fences shall comply with section 4.8 of the Knightdale UDO.

TOTAL GROSS SITE AREA
44.79 AC

TOTAL NET SITE AREA
44.01 AC

ZONING
SINGLE FAMILY RESIDENTIAL GRS

PROPOSED USE
SINGLE FAMILY RESIDENTIAL

PROPOSED LOTS
23

PROPOSED PERIOD
2.89 AC

PROPOSED AVERAGE DENSITY
2.89 AC

PROPOSED AVERAGE IN-PASSIVE OPEN SPACE
2.70 AC

PROPOSED AVERAGE IN-ACTIVE OPEN SPACE
2.20 AC

PROPOSED FEMAS MAP #
3720175000.dlad 05/02/06

WAKE COUNTY FN #
01755-93-1551

TOTAL SITE PERIMETER
6,341

TOTAL SITE AREA
44.78

REQUIRED TREE CANOPY AREA
6,941 L.F. X 20 = 1,388,20 S.F. OR 3.00 AC

TREE CANOPY PERCENTAGE
3.00 AC / 45 AC = 6.71% < 10% MAX

TREE CANOPY REQUIRED
3.00 AC

TOTAL TREE CANOPY PROVIDED
3.00 AC

DENSITY
2.88 UNITS/ACRE

BEDROOM ESTIMATE
128 UNITS X 3.13 BEDROOMS/UNIT = 402 TOTAL BEDROOMS

453 BEDROOMS X 539 S.F.
244,785 S.F.

TOTAL RECREATIONAL SPACE REQUIRED
234,780 S.F.

539 AC

CONNECTIVITY CALCULATIONS

CONNECTIVITY INDEX REQUIRED FOR GR 3.1.4
14

TOTAL NODES:
20

TOTAL LINKS:
143

CONNECTIVITY RATIO PROVIDED:
1.43

PASSIVE RECREATIONAL OPEN SPACE
2.70 AC

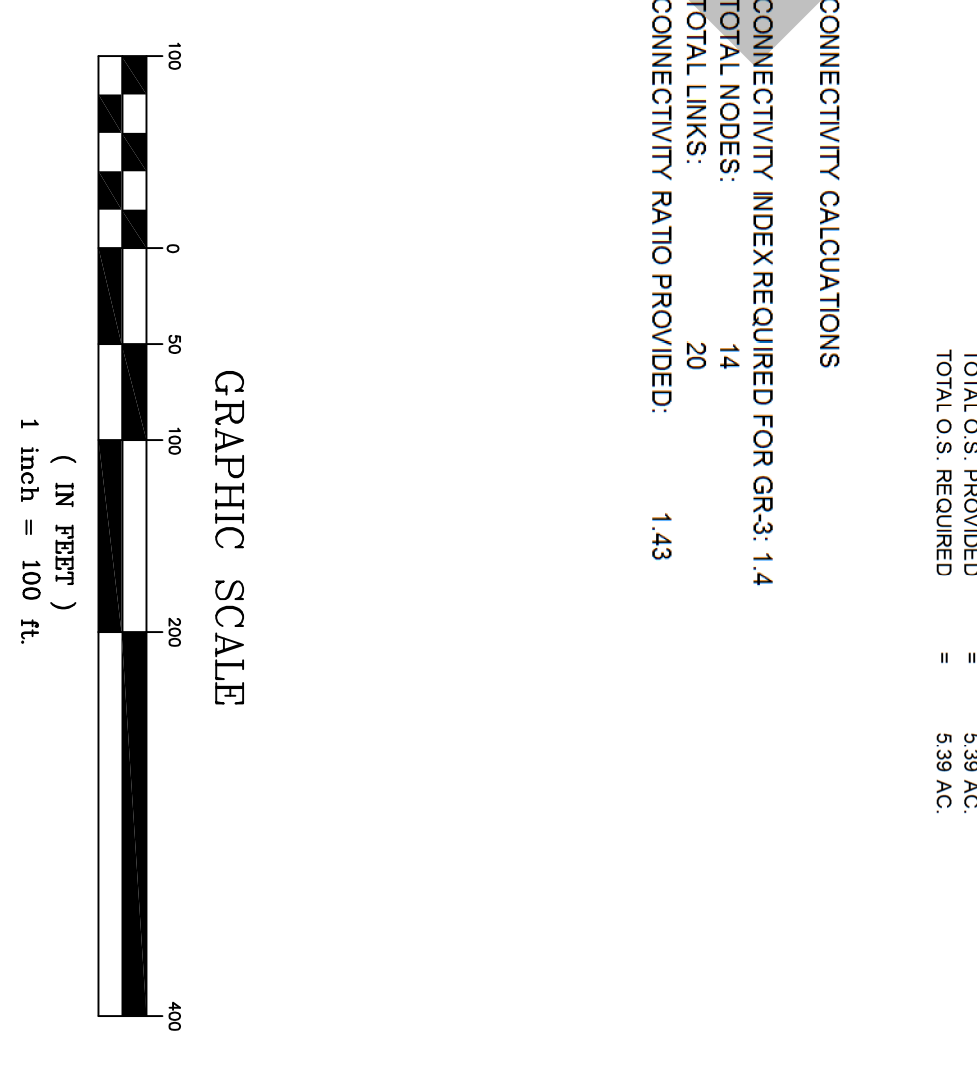
ACTIVE RECREATIONAL OPEN SPACE
2.20 AC

TOTAL PROVIDED
4.90 AC

TOTAL REQUIRED
5.39 AC

TOTAL O.S. PROVIDED
4.90 AC

TOTAL O.S. REQUIRED
5.39 AC



PROJECT NUMBER
812-15

OLD KNIGHT ROAD PROPERTY
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

PRELIMINARY MASTER PLAN

PREPARED FOR:
WYNN HOMES
2550 CAPITOL DRIVE
CREEDMOOR, NC 27522

DATE: 10/26/15

SAFI FIRM CERTIFICATION #: C-1875

PROJECT ENGINEER:
TOM J. SPAULDING

PROJECT ODD DESIGNER:
IRIS MITCHELL

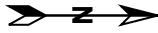
PROJECT SURVEYOR:
CANTHORNE, MOSS & PANCIERA, PC

S & N SPAULDING & NORRIS, PA
Design Consultants

972 Trinity Road
Raleigh, North Carolina 27607
Phone (919) 854-7990 Fax (919) 854-7925

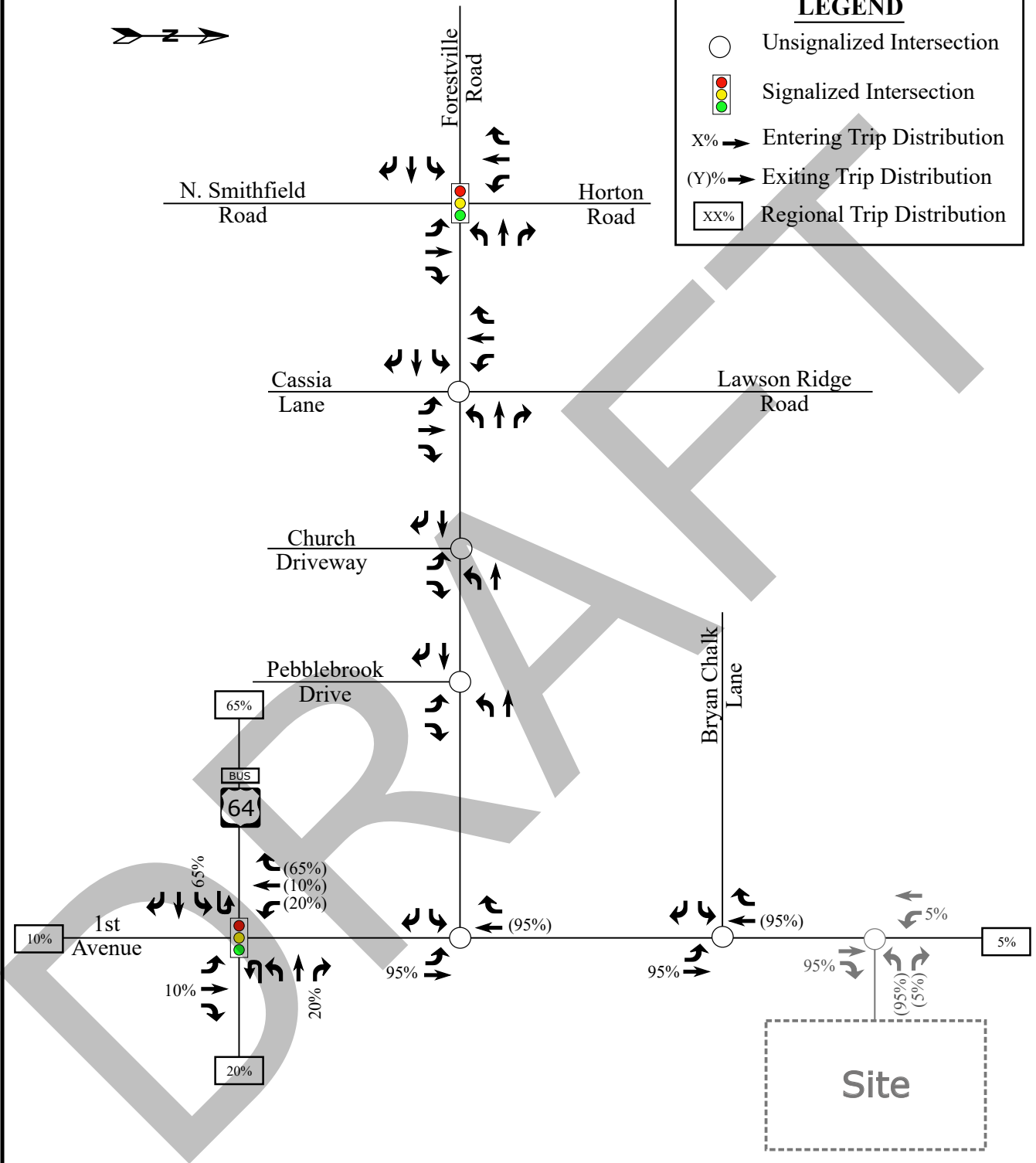
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER
TOMMASO M. SPAULDING
1726
10/26/2016

NO.	REVISION	DATE



LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- X% → Entering Trip Distribution
- (Y)% → Exiting Trip Distribution
- ◻ XX% Regional Trip Distribution

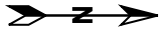


Forestville Village
Knightdale, NC

Adjacent Development
Trip Distribution

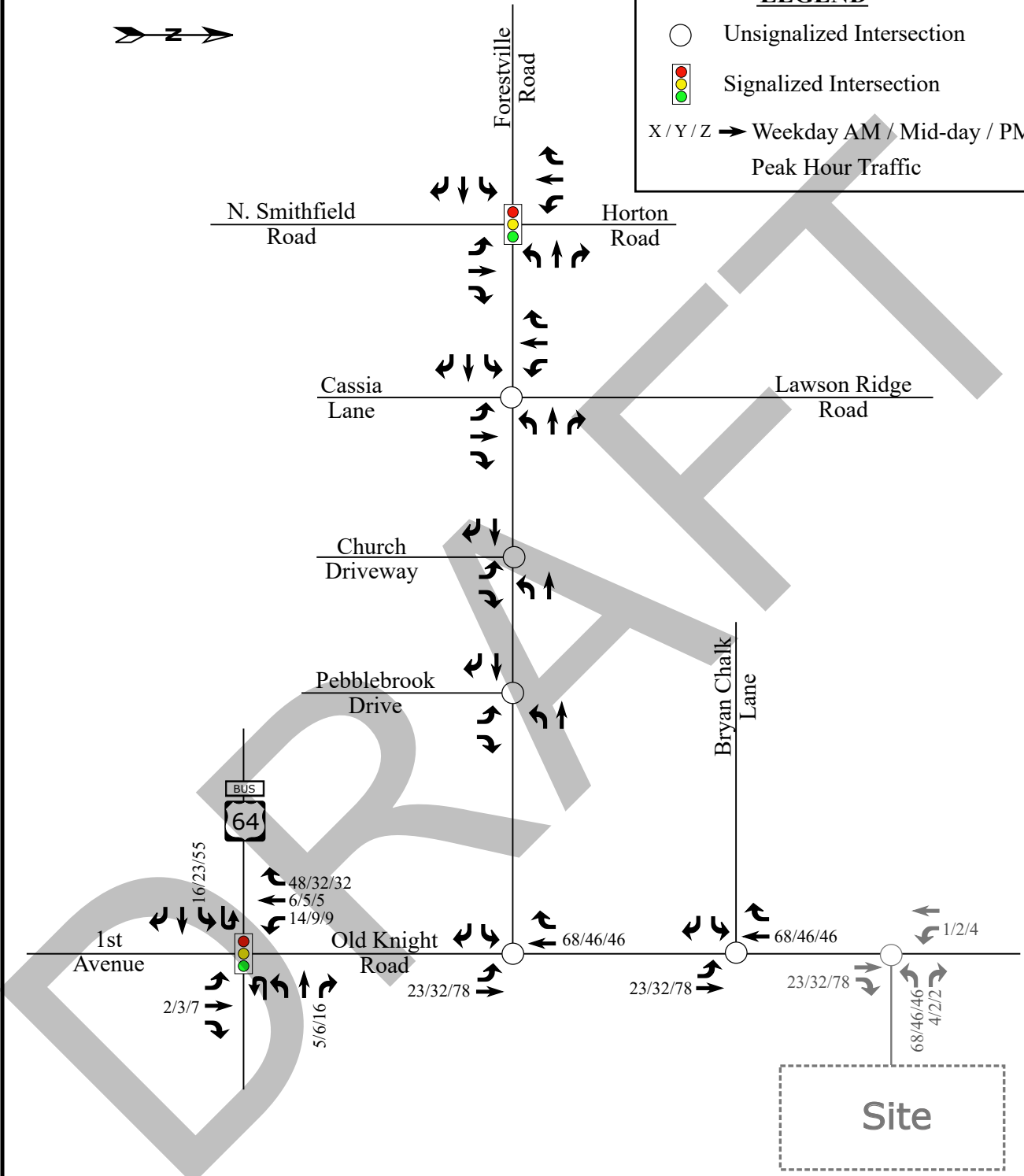
Scale: Not to Scale

Appendix



LEGEND

- Unsignalized Intersection
- ⬆️⬇️⬇️⬆️ Signalized Intersection
- X/Y/Z → Weekday AM / Mid-day / PM Peak Hour Traffic



Forestville Village
Knightdale, NC

Adjacent Development
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 6

Appendix 1. Roadway Project List – CAMPO and DCHC MPO

Each row in the table is a separate highway project. Projects are color-coded by MPO (green for DCHC MPO and yellow for CAMPO) and separated by time period. The three time periods, 2025, 2035 and 2045, are used in the financial plan. The attribute information for each project is presented by columns, and includes the following:

- MTP ID – This unique number facilitates the tracking and mapping of projects in the plan.
- Highway Project – The highway project is the name of the road.
- From/To – This usually identifies the name of the two road intersections between which the project is to be constructed.
- Existing Lanes – This identifies the number of current travel lanes. “-” indicates an interchange or a new road alignment – in other words, there is no existing road.
- Proposed Lanes – This identifies the number of travel lanes proposed in the plan; if the number of lanes does not increase from the existing lanes, the project does not propose to add through lanes but instead will make safety, intersection, multimodal s or other improvements.
- Improvement Type –
 - Widening is the addition of travel lanes.
 - Modernization can include safety, intersection (e.g., turn lanes), multimodal or other improvements, but does not include the addition of travel lanes.
 - Upgrade refers to capacity and safety improvements to interchanges.
 - New Location is a new roadway.
 - New is the conversion of an intersection to an interchange.
 - Freeway is the conversion of an existing road to a limited access highway (which is a roadway type often referred to as interstate).
 - Expressway is the conversion of an existing road to a highway that is mostly limited access.
- Length – The centerline mileage of the project.
- Estimated Cost – The total costs are costs to be incurred from 2018 through 2045. Cost estimates come from feasibility studies, current and past Transportation Improvement Programs (TIP), NCDOT’s SPOT prioritization process, and the NCDOT Contract Standards and Development Unit project cost workbook.
- STI – The project’s STI (Strategic Transportation Investment) funding tier: statewide, regional or division.
- Regionally Significant – Regionally Significant projects provide access to and from the region, or to major destinations in the region. The FHWA functional classifications serve a different purpose than the local functional classification used by the MPOs, so the two classification systems are significantly different. Generally, the regionally significant designation includes interstate highways, U.S. highways, freeways, and North Carolina signed roads that are the primary road in a corridor. Rail transit facilities, which are described in a separate section, are considered regionally significant. The Regionally Significant designation is important for the Air Quality Conformity Determination for the MTP. Under AQ Conformity, if a Regionally Significant project is changed (e.g., completion year, capacity) after the 2045 MTP has been adopted, then the Conformity Determination process might have to be redone.
- Exempt – whether the project is exempt under air quality conformity requirements. If so, the section under which it is exempt is listed.
- TIP# -- The project reference number for those projects which are contained in the 2018-27 Transportation Improvement Program (TIP).

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
2025 MTP												
F10	I-440 Widening	US 1/64	Wade Avenue	4	6	Widening	3.5	\$348,002,000.00	St	Yes		U-2719
F11-1a	US 1 North - Upgrade to Freeway	I-540	Thornton Road	4	8	Widening	1.62	\$124,700,000.00	St	Yes		U-5307A
F11-1b	US 1 North - Upgrade to Freeway	Thornton Rd	Burlington Mills Rd	4	8	Widening	1.55	\$120,100,000.00	St	Yes		U-5307B
F11-1c	US 1 North - Upgrade to Freeway	Burlington Mills Rd	New Falls of Neuse Blvd	4	6	Widening	1.96	\$64,050,000.00	St	Yes		U-5307C
F11-1d	US 1 North - Upgrade to Freeway	New Fall of Neuse Blvd	NC 98 (Durham Rd)	4	6	Widening	2.32	\$64,050,000.00	St	Yes		U-5307C
F13	NC 147 Toll Extension (CAMPO Portion)	NC 540	McCrimmon Pkwy / Little Drive	0	4	New Location	1.6	\$23,880,000.00	St	Yes		U-5966
F15a1	US 64 / Laura Duncan Interchange (New)	US 64	Laura Duncan Rd	-	-	Interchange	0	\$38,200,000.00	St	Yes		U-5301A
F15a2	US 64 / Lake Pine Interchange (New)	Lake Pine Drive	Lake Pine Drive	-	-	Interchange	0	\$38,200,000.00	St	No		U-5301B
F15a3	US 64 (superstreet)	US 1	Lake Pine Dr	4	6	Superstreet	2.49	\$36,400,000.00	St	Yes		U-5301C
F16	I-40	US 1-64	Wade Avenue	4	6	Widening	3.89	\$81,058,666.94	St	Yes		I-4744
F43	I-40	US 1/64	Lake Wheeler Rd	6	8	Widening	4.43	\$27,250,000.00	St	Yes		I-5701
F43b	I-40 / US 1 / US 64 Interchange	I-40 / US 1 / US 64	I-40 / US 1 / US 64	-	-	Interchange	-	\$151,750,000.00	St	Yes		I-5703
F44a	I-40 (East)	I-440	US 70 Business (Garner)	6	8	Widening	4.4	\$106,600,000.00	St	Yes		I-5111A
F44b	I-40 (East)	US 70 Business (Garner)	NC 42	4	8	Widening	6.3	\$153,400,000.00	St	Yes		I-5111BA and BB
F44b1	Cleveland Road / I-40 Interchange	-	-	-	-	Interchange	-	\$35,945,500.00	St	No		I-4739
F44b2	NC-42 / I-40 Diverging Diamond Interchange	-	-	-	-	Interchange	-	\$35,945,500.00	St	No		I-4739
F4c1	NC 540 TriEx / Veridea Parkway Interchange	-	-	-	-	Interchange	-	\$13,202,805.00	St	No		R-2635
F5	NC 540 Tri-Ex (Phase IV)	NC 55 Bypass	US 401 (South)	0	6	New Location	7.8	\$172,519,000.00	St	Yes		R-2721
F6	NC 540 Tri-Ex (Phase V)	US 401 (South)	I-40 (South)	0	6	New Location	8.7	\$425,527,000.00	St	Yes		R-2828
F82	I-40/NC 54 DDI	NC 54	NC 54	-	-	Interchange	2	\$8,004,000.00	St	No		I-5873
F83	I-440 Interchange Improvements	Wake Forest Road (SR 2000)	Wake Forest Road (SR 2000)	-	-	Interchange	2	\$10,632,000.00	St	No		I-5708

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A10	Old Wake Forest Rd	Litchford Rd / Atlantic Blvd	Capital Blvd	2	4	Widening	1.2	\$8,600,000.00	Div	No		N/A
A104a	Morrisville Parkway	Green Level Ch Rd	NC 55	0	2	New Location	1.83	\$24,802,000.00	Div	Yes		U-5315 A B
A111	Reedy Creek Turn Lane	N.E. Maynard Rd	Harrison Avenue	2	3	Turn Lane	1.17	\$13,390,000.00	Div	No		U-5501
A114a	Ten Ten Rd	US 1	US 1	-	-	Interchange	0.4	\$26,392,087.00	St	No		U-5825 A
A114b	Ten Ten Rd	Kildaire Farm Road	US 1	2	4	Widening	2.1	\$15,259,000.00	Div	No		U-5825B
A118b	NC 55	Jicarilla Rd	Kennebec Church Rd	2	4	Widening	1.6	\$27,514,000.00	Reg	Yes		R-5705 C
A118c	NC 55	Kennebec Church Road	North Broad St	2	4	Widening	0.94	\$9,706,000.00	Reg	Yes		R-5705 B
A119	McCrimmon Parkway	Airport Blvd	NC 54	2	4	Widening	0.83	\$20,702,000.00	Div	No		U-5747 B
A124c1	Northside Loop (east)	N. White St / Flaherty Ave	West of undeveloped section of Royal Mill Avenue / Oak Grove Church Rd	0	3	New Location	1	\$8,768,623.50	Div	No		N/A
A124c2	Northside Loop (east)	Flaherty Ave	Eastern portion of existing Royal Mill Avenue	0	3	New Location	0.1	\$8,768,623.50	Div	No		N/A
A127a	Ligon Mill Rd Connector	US 1A	NC 98 Bypass	2	4	Widening	0.61	\$5,576,756.64	Div	Yes		N/A
A127b2	Ligon Mill Rd Connector	Richland Creek	NC 98	0	2	New Location	0.75	\$5,851,243.13	Div	No		N/A
A130a	Mitchell Mill Rd (West)	US 401	Watkins Rd	2	4	Widening	1.37	\$13,650,975.00	Div	No		N/A
A130c	US 401/Mitchell Mill Rd Interchange (New)	-	-	-	-	Interchange	2	\$64,620,000.00	Reg	Yes		U-5748
A139	US 70 / Timber Drive Interchange (New)	Hammond Road	Timber Drive	-	-	Interchange	2	\$18,938,000.00	Reg	No		U-5744
A13c	Falls of Neuse Blvd	I-540	Durant Rd	4	6	Widening	1.54	\$11,798,000.00	Div	No		U-5826
A16	Rock Quarry Rd	Old Birch Dr	Sunnybrook Rd	3	5	Widening	1.2	\$10,200,000.00	Div	No		N/A
A160a	Ralph Stephens Rd (Part NL)	Ralph Stevens Rd Ext	NC 55	2	4	Widening	0.59	\$4,843,512.96	Div	No		U-5318
A160b	Ralph Stephens Rd (Part NL)	Ralph Stevens Rd	NC 55	0	4	New Location	0.38	\$3,285,316.32	Div	No		U-5318
A160d	Ralph Stephens Rd (Part NL)	Piney Grove Wilbon	Ralph Stevens Rd	0	4	New Location	0.34	\$3,260,846.16	Div	No		U-5318
A160e	Ralph Stephens Rd (Part NL)	Avent Ferry	Ralph Stevens Rd	0	4	New Location	0.48	\$4,437,781.92	Div	No		U-5318

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A164a2	Green Level Church Rd	O'Kelly Chapel Rd	McCrimmon Parkway	2	4	Widening	0.91	\$8,319,423.84	Div	No		N/A
A164b	Green Level Ch Rd	Carpenter Fire Station Rd	Morrisville Parkway	2	4	Widening	1.21	\$11,062,091.04	Div	No		N/A
A164c1	Green Level Church Rd	Folklore Way	O'Kelly Chapel Rd	2	4	Widening	0.4	\$3,656,889.60	Div	No		NOT IN TIP
A166	Center St/1010	US 1	Apex Peakway	2	4	Widening	1.04	\$9,507,913.00	Div	No		U-5825A
A171	Green Level West Rd	NC 55	I-540	2	4	Widening	0.9	\$8,228,001.60	Div	No		U-5500
A174c	Martin Pond Road Widening	Wendell Falls Parkway	Poole Road	2	4	Widening	0.5	\$4,104,672.00	Div	No		N/A
A187b1	Apex Peakway (East)	Center St / Ten Ten Rd	NC 55	0	4	New Location	0.8	\$8,800,000.00	Div	No		N/A
A187c1	Apex Peakway (South)	Tingen Rd	Old US 1	0	2	New Location	0.65	\$3,971,153.55	Div	No		N/A
A199	Pullen Rd	Western Blvd	Centennial Pkwy	0	2	New Location	0.4	\$3,451,895.34	Div	No		N/A
A207a3	Judd Parkway NE	Products Road (future ext)	Old Honeycutt Road	2	4	Widening	0.6	\$1,350,000.00	Div	No		U-5927
A207c	Judd Parkway W	Wilbon Rd	NC 42	0	4	New Location	1.2	\$26,200,000.00	Div	No		U-5317
A20b	Hillsborough St Safety & Enhancement (Road Diet)	Gardner St	Gormat St	4	4	TSM	0.84	\$1,000,000.00	Div	Yes		U-4447
A215a	Jones Dairy Rd	NC 98 (Wake Forest Bypass)	Chalk Rd	2	4	Widening	0.8	\$7,313,779.20	Div	No		N/A
A218e	Jessie Dr (part NL)	NC 55	Ten Ten Rd	0	2	New Location	1.58	\$10,417,520.30	Div	No		N/A
A219a1	McCrimmon Parkway Ext	NC 54	Davis Dr	2	4	Widening	1.1	\$13,000,000.00	Div	No		U-5747A
A220a	Morrisville Carpenter Rd	Page St	Davis Dr	2	4	Widening	0.6	\$9,000,000.00	Div	No		U-5618
A220b	Morrisville Carpenter Rd	Davis Dr	Louis Stephens Dr	2	4	Widening	0.7	\$6,399,556.80	Div	No		N/A
A220c	Morrisville Carpenter Rd	Louis Stephens Dr	Good Hope Ch Rd	2	4	Widening	0.28	\$2,559,822.72	Div	No		N/A
A222c	NC 54	Perimeter Park Dr	Northern Twn Limits	2	6	Widening	1.8	\$25,336,000.00	Reg	Yes		U-5750
A236a	Chapel Hill Rd	NW Maynard Rd	Academy St	2	4	Widening	1	\$11,310,000.00	Div	Yes		N/A
A236b	Chapel Hill Rd	Academy St	NE Maynard Rd	2	4	Widening	1	\$11,500,000.00	Div	Yes		N/A
A240c	South Harrison Avenue	Dry Rd	Kildaire Farm Rd	0	2	New Location	0.23	\$1,794,381.23	Div	No		N/A
A26a	McCrimmon Parkway	Airport Blvd	Aviation Parkway	0	2	New Location	1.43	\$11,487,602.57	Div	No		U-3620
A26b	McCrimmon Parkway	Airport Blvd	Aviation Parkway	2	4	Widening	1.43	\$11,870,000.00	Div	No		U-5828
A27c1	Louis Stephens Dr Ext (NL)	Little Drive	Poplar Pike Lane	0	4	New Location	0.72	\$3,036,000.00	Div	No		U-5827

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A28b	Davis Dr	Farm Pond Rd	US 64	2	4	Widening	1.1	\$10,056,446.40	Div	No		N/A
A2b	Southall Rd	Southall Rd (Existing)	Hedingham Blvd	0	4	New Location	0.28	\$3,800,000.00	Div	No		N/A
A407b3	NC 42	NC 50	I-40	2	4	Widening	2.17	\$12,713,033.00	Reg	Yes		R-3410B
A412	US 70 - Upgrade to Freeway	Durham / Wake County Line	Lumley/Westgate Rd	4	6	Widening	2.69	\$47,500,000.00	St	Yes		U-5518 A
A414	Kildaire Farm Connector	Sunset Lake Rd	Holly Springs Rd	0	4	New Location	0.9	\$9,612,521.10	Div	No		R-2721
A427a	Avent Ferry Rd	Piney Grove Wilbon	Elm St	2	4	Widening	0.6	\$5,485,334.40	Div	No		U-5889
A427b	Avent Ferry Rd	Cass Holt	Piney Grove Wilbon	2	4	Widening	0.72	\$5,399,222.40	Div	No		U-5889
A439	Buck Jones Rd	Farmgate Rd	Xebec Way	2	3	Turn Lane	1.05	\$6,500,000.00	Div	No		N/A
A440a1	Carpenter Fire Station Rd	Cameron Pond Drive	NC-55	2	4	Widening	0.94	\$7,850,005.80	Div	No		N/A
A440b	Carpenter Fire Station Ext	NC 55	Morrisville Carpenter Rd	0	4	New Location	0.3	\$3,204,173.70	Div	No		U-5502
A448	Six Forks Rd	Ramblewood Road	Lynn Road	4	6	Widening	2.4	\$45,000,000.00	Div	No		N/A
A450	RTP Access Routes	Internal RTP access points	External access points	2	4	New Location	0.84	\$6,299,092.80	Div	No		U-4410
A46a	Tryon Rd	Lake Wheeler Rd	Par Drive	2	4	Widening	1.3	\$6,800,000.00	Div	No		U-4432
A46b	Tryon Rd	Norfolk Southern Rail	Existing Tryon Rd Alignment	0	4	Widening	0.5	\$14,273,729.00	Div	No		U-4432
A46c	Tryon Rd	New Tryon Rd Alignment	S. Wilmington St	2	4	Widening	0.09	\$2,569,271.00	Div	No		U-4432
A480b	US 401(South)	Ten Ten Rd	NC 540	4	6	Widening	1.07	\$21,985,000.00	Reg	Yes		U-5746
A486	NC 54-Blue Ridge Grade Separation	Blue Ridge Rd	Beryl Rd	4	4	Grade Separation	1	\$28,634,000.00	Reg	No		U-4437
A49a	Poole Rd	Maybrook Dr	Barwell Rd	2	4	Widening	1	\$9,800,000.00	Div	No		N/A
A521	O'Kelley Chapel Rd	Louis Stephens Dr	NC 55	0	4	New Location	0.62	\$5,946,248.88	Div	No		N/A
A54	Pleasant Valley Rd	Duraleigh Rd	Glenwood Avenue	2	3	Widening	0.34	\$1,367,377.83	Div	No		N/A
A557	Green Lvl W Rd Widening	NC 540	Green Level Ch Rd	2	4	Widening	0.95	\$12,923,000.00	Div	No		U-5500
A562	Wade Ave Widening	I-40	I-440	4	6	Widening	2.91	\$39,565,000.00	St	Yes		U-5936
A57	Sandy Forks Rd	Falls of Neuse	Six Forks Rd	2	3	Turn Lane	1.31	\$9,850,000.00	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A605a	High Speed Rail - Rogers Rd Intersection	Rogers Rd	Rogers Rd	2	4	Grade Separation	-	\$10,890,000.00	Div	No		N/A
A608b	NC 98 Widening	Hampton Way	Tyler Run Dr	2	3	Widening	1.23	\$2,547,625.00	Reg	Yes		U-5118BB
A610	Stadium Dr Widening	US 1	US 1A	2	3	Widening	1.29	\$893,000.00	Div	No		U-5515
A615	Marsh Creek/ Trawick Rd Median	Capital Blvd	New Hope Rd	2	3	Turn Lane	1.41	\$10,700,000.00	Div	No		N/A
A619c	US 401 Median	NC 55/42 (FV)	Judd Parkway	4	4	Median	1.18	\$9,120,000.00	Reg	Yes		U-5980
A622	NC 55 Widening	Apex Peakway (South)	Salem St	2	4	Widening	0.89	\$5,581,930.00	Reg	Yes		U-2901 B
A623d2	Hilltop Needmore Extension	Herbert Atkins Road	Basal Creek (East Fork)	0	2	New Location	0.3	\$1,938,327.30	Div	No		N/A
A630	Judd Parkway NW	NC 55	Judd Pkwy (NL)	2	4	Widening	0.57	\$4,949,287.20	Div	No		N/A
A634	US 70 / Brier Creek Interchange	-	-	-	-	Interchange	0	\$13,400,000.00	St	Yes		U-5518C
A635b	US 401 Superstreet	Legend Rd	Purser Dr	4	4	Superstreet	1	\$3,245,000.00	Reg	No		U-5302
A637	401/55/42 Interchange	East of Fuquay-Varina	-	-	-	Interchange	2	\$54,684,000.00	Reg	No		U-5751
A638	US 70 / Jones Sausage Int. Improvements	-	-	4	6	Widening	1.74	\$7,000,000.00	Reg	Yes		U-5520
A640	Aviation Parkway Interchange (Impr)	National Guard Dr	I-40	-	-	Interchange	0.42	\$24,853,000.00	St	Yes		I-5506
A641	Airport Blvd Interchange (Impr)	-	-	-	-	Interchange	0.82	\$34,720,000.00	St	Yes		I-5700
A642	N Harrison Ave HSR Grade Sep	Adams St	W Chatham St	4	4	Grade Separation	0	\$22,600,000.00	St	No		P-5708
A644	Chatham / Maynard Grade Separation	-	-	2	2	Grade Separation	0	\$38,000,000.00	St	No		P-5718
A645	US 70 / TW Alexander Interchange	-	-	-	-	Interchange	2	\$29,300,000.00	St	No		U-5518B
A646	Tarboro St Road Diet	New Bern Ave	Martin Luther King Jr	4	3	TSM	0.88	\$1,000,000.00	Div	No		N/A
A647	West St Extension	Martin St	Cabarrus St	0	2	New Location	0.28	\$10,000,000.00	St	No		U-5521
A648	US 1 / Friendship / Richardson Interchange	Old US 1 Highway	Friendship Road	-	-	Interchange	0	\$13,946,625.00	St	Yes		
A64a	Aviation Parkway	Gateway Centre Blvd	Dominion Dr	2	4	Widening	0.58	\$6,957,000.00	Div	No		U-5811
A64b	Aviation Parkway	Evans Rd	NC 54	2	4	Widening	0.9	\$10,795,000.00	Div	Yes		U-5811
A64d	Aviation Parkway	I-40	Gateway Centre Blvd	4	6	Widening	0.92	\$11,035,000.00	Div	Yes		U-5811

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A650	Kipling Realign	US 401	Harnett Central Rd	0	2	New Location	0.49	\$1,625,000.00	Div	No		R-5523
A651	Apex Peakway / Salem St Interchange	-	-	-	-	Interchange	0	\$12,500,000.00	St	No		U-5928
A656	New Hope Road Grade Separation	-	-	-	-	Grade Separation	-	\$15,346,000.00	St	No		P-5715
A659	Durant Rd Grade Separation	-	-	-	-	Grade Separation	-	\$12,525,000.00	St	No		P-5720
A681	Dixie Forest Road	Spring Forest Road	Atlantic Ave / Litchford Road	2	3	Widening	0.25	\$1,600,000.00	Div	No		N/A
A682	Blue Ridge Rd	Duraleigh	Crabtree Valley Avenue	2	3	Turn Lane	2	\$10,500,000.00	Div	No		N/A
A683a	Barwell Rd	Rock Quarry Rd	Berkley Lake Drive	2	3	Turn Lane	1.15	\$10,800,000.00	Div	No		N/A
A684	Blount/Person Streets Two Way Conversion	Blount St / Person St / Sasser St	Blount St / Person St / Hoke St	-	-	TSM	4.1	\$6,100,000.00	Div	No		N/A
A685	Wake Forest Rd / Brookside Drive Roundabout	-	-	-	-	TSM	-	\$2,300,000.00	Div	No		N/A
A686	Atlantic Avenue Widening	Highwoods Blvd	New Hope Church Rd	4	4	Widening	1	\$11,600,000.00	Div	No		N/A
A696	New Hope Church Rd	Green Rd	Deana Ln	2	3	Widening	0.4	\$2,637,180.00	Div	No		N/A
A82a	Trinity Rd Ext	Walnut Creek	Cary Towne Blvd	2	4	Widening	0.34	\$8,938,045.41	Div	No		N/A
A82b	Trinity Rd Ext	Walnut Creek	Chatham St	0	2	New Location	0.44	\$2,688,165.48	Div	No		N/A
A85b1	Leesville Rd	Westgate Rd	O'Neal Rd (@ Leesville Road Campus)	2	4	Widening	1	\$11,600,000.00	Div	No		N/A
A86a	Leesville Rd	I-540 Interchange	New Leesville Blvd	2	4	Widening	1.17	\$10,696,402.08	Div	No		N/A
A90b	US 401 Rolesville Bypass	US 401	US 401	0	4	New Location	4.5	\$42,625,440.00	Reg	Yes		R-2814b
A90c	US 401 Widening	US 401 Rolesville Bypass	Flat Rock Church Rd	2	4	Widening	6.64	\$27,950,000.00	Reg	Yes		R-2814C
A96b	NC 55	Salem St	Bryan Dr	2	4	Turn Lane	0.53	\$3,324,070.00	Reg	Yes		U-2901 B
Grnv108	NC 56 Realignment	NC 50	US 15	2	2	Intersection Realignment	0.5	\$4,480,000.00	Reg	No		R-5707
Hrnt4a	NC 55	North Broad Street	Church St	2	3	Turn Lane	1.78	\$12,400,000.00	Reg	Yes		R-5705A
Jhns11	Front St Ext	Front St	NC 42	0	2	New Location	0.92	\$4,901,925.60	Div	No		U-3605
Jhns1b	NC 42 East Widening	Glen Laurel Rd	Buffaloe Rd	2	4	Widening	4.35	\$43,100,000.00	Reg	Yes		R-3825

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
Jhns2a	NC 42 West	US 70 Business	US 70 Bypass	2	4	Widening	3.1	\$27,430,000.00	Reg	Yes		R-3410A
Jhns2b	NC 42 West Widening	US 70 Bypass	I-40	2	4	Widening	4.27	\$25,015,967.00	Reg	Yes		R-3410B
2035 MTP												
F110	US 1	US 64	NC 540	4	6	Widening	5.3	\$200,716,129.00	St	Yes		U-6066
F110a	US 1 / NC 55 Diverging Diamond Interchange	-	-	-	-	Interchange	-	\$22,300,000.00	St	No		N/A
F11-1e1	US 1 North - Upgrade to Freeway	NC 98 (Durham Road)	Harris Road	4	6	Widening	1.85	\$90,112,000.00	St	Yes		U-5307 D
F11-1e2	US 1 North - Upgrade to Freeway	Harris Road	US 1A (Youngsville)	4	6	Widening	3.91	\$43,981,165.80	St	Yes		N/A
F14	Clayton Bypass Widening	I-40	US 70	4	6	Widening	8.69	\$97,748,422.20	St	Yes		N/A
F15a	US 64 West Conversion to Expressway	Laura Duncan Road	I-540	4	6	Widening	5.7	\$51,193,039.59	St	Yes		N/A
F15b	US 64 West Conversion to Freeway	NC-540 Tri-Ex Turnpike	NC 751	4	6	Widening	3.2	\$67,978,386.00	St	Yes		N/A
F17	Aviation Parkway Ext	Brier Creek Parkway	US 70	0	4	New Location	1.79	\$33,160,066.14	Div	Yes		U-4721[A]
F3	NC 540 Tri-Ex (Phase VI)	I-40 (South)	US 64 East Bypass	0	6	New Location	10.8	\$315,430,000.00	St	Yes		R-2829
F40	I-40 Managed Lanes	Durham County Line	Wade Avenue	0	2	Widening	9.2	\$579,090,000.00	St	Yes		I-5702
F41	I-40 Managed Lanes	Wade Avenue	Johnston County	0	2	Widening	21.29	\$211,274,569.00	St	Yes		N/A
F41b	I-40 Managed Lanes	Johnston County	Cornwallis Rd	0	2	Widening	2.88	\$20,462,870.00	St	Yes		N/A
F42b	I-540 Managed Lanes	I-40	US-64 Bypass	0	2	Widening	25.82	\$367,809,456.96	St	Yes		N/A
F44c	I-40 (East)	NC 42	NC 210	4	6	Widening	6.78	\$89,679,815.78	St	Yes		N/A
F44d	I-40 (East)	NC 210	CAMPO MAB	4	6	Widening	6.78	\$94,574,375.28	St	Yes		N/A
F45	I-40 Managed Lanes	Cornwallis Rd	NC 210	0	2	Widening	4.47	\$26,920,480.00	St	Yes		N/A
F46	I-40 Managed Lanes	NC 210	CAMPO MAB	0	2	Widening	6.75	\$36,179,936.00	St	Yes		N/A
F7a	US 64 East	US 64 Bypass (Wendell)	US 64/US 264 (Zebulon)	4	6	Widening	7.35	\$92,070,546.75	St	Yes		N/A
F81a	I-40 Widening	Wade Avenue	US 1/64	6	8	Widening	4.18	\$37,734,000.00	St	No		I-5704
F81b	I-40 / Wade Avenue Interchange Improvement	-	-	-	-	Interchange	-	\$30,000,000.00	St	No		N/A
F86	Capital Blvd - Corridor Upgrades	I-440	I-540	0	0	New Location	5.25	\$54,227,013.75	St	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A1	Perry Creek Rd Ext (Widening)	US 401	Fox Road	2	4	Widening	0.53	\$4,350,952.32	Div	No		N/A
A101	US 70	Lumley/Westgate Rd	Duraleigh/Millbrook Rd	4	6	Widening	3.3	\$105,548,000.00	Reg	Yes		U-2823
A104b	Morrisville Parkway	Green Level Ch Rd	NC 55	2	4	Widening	1.83	\$15,000,000.00	Div	Yes		N/A
A112a	Smithfield Rd	US 64 Bypass	Major Slade Rd	2	4	Widening	2.6	\$23,769,782.40	Div	No		N/A
A113	Ten Ten Rd	Holly Springs Rd	Bells Lake Rd	2	4	Widening	1.95	\$17,827,336.80	Div	No		N/A
A114c	Ten Ten Rd	Holly Springs Rd	Kildaire Farm Road	2	4	Widening	1.3	\$11,884,891.20	Div	No		N/A
A120	Tryon Rd Ext	Garner Rd	Rock Quarry Rd	0	4	Widening	2.15	\$26,310,434.85	Div	No		U-3111
A124a	Northside Loop (Harris Rd)	US 1A	White St	0	3	New Location	0.44	\$7,205,384.34	Div	No		N/A
A133	Burlington Mills Rd	US 1	US 401	2	4	Widening	4.77	\$35,769,848.40	Div	No		N/A
A134	Litchford Rd	Old Wake Forest Rd	Falls of Neuse Rd	3	4	Widening	2.99	\$27,335,249.76	Div	No		N/A
A135a	Lead Mine Rd	Town & Country Rd	Millbrook Rd	3	4	Widening	0.54	\$4,936,800.96	Div	No		N/A
A135c	Lead Mine Rd	Lynn Rd	Sawmill Rd	2	4	Widening	0.99	\$9,050,801.76	Div	No		N/A
A136a	Lake Wheeler Rd	Tryon Rd	Penny Rd	2	4	Widening	1.79	\$13,423,066.80	Div	No		N/A
A136b	Lake Wheeler Rd	Penny Rd	Ten Ten Rd	2	4	Widening	3.55	\$29,143,171.20	Div	No		N/A
A136c	Lake Wheeler Rd	Ten Ten Rd	Hilltop-Needmore Rd	2	4	Widening	3.4	\$27,911,769.60	Div	No		N/A
A137a	Old Stage Rd	US 401	Ten Ten Rd	2	4	Widening	4.2	\$31,495,464.00	Div	No		N/A
A137b	Old Stage Rd	Ten Ten Rd	Rock Service Statoin	2	4	Widening	1.49	\$11,470,823.93	Div	No		N/A
A137c	Old Stage Rd	Rock Service Station	NC 42	2	4	Widening	3.27	\$24,521,468.40	Div	No		N/A
A138a	Timber Dr/Jones Sausage Connector	US 70	Timber Dr Ext	0	4	New Location	0.72	\$7,690,016.88	Div	No		N/A
A138b	Timber Dr/Jones Sausage Connector	Jones Sausage Rd	US 70	0	4	New Location	0.28	\$10,400,000.00	St	No		N/A
A138c	Timber Dr/Jones Sausage Connector	White Oak Rd	I-40 (South)	2	4	Widening	1.68	\$15,358,936.32	Div	No		N/A
A138d	White Oak-Guy Rd Connector	White Oak Rd	Guy Rd	0	4	New Location	1.92	\$18,186,854.40	Div	No		N/A
A13d	Falls of Neuse Blvd	Durant Rd	Old Falls of Neuse Blvd	4	6	Widening	2.06	\$20,372,215.50	Div	No		N/A
A140a	Vandora Springs Rd & Ext	Timber Dr	Old Stage Rd	2	4	Widening	1.02	\$9,325,068.48	Div	No		N/A
A140b	Vandora Springs Rd & Ext	Old Stage Rd	US 401	2	4	Widening	1.62	\$14,810,402.88	Div	No		N/A
A142a	Timber Dr East	Waterfield Rd	White Oak Rd	0	4	New Location	1.17	\$12,496,277.43	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A143a	White Oak Rd	US 70	I-540	2	4	Widening	4.46	\$40,774,319.04	Div	Yes		N/A
A143a1	I-40 / White Oak Interchange	-	-	-	-	Interchange	-	\$13,946,625.00	St	No		N/A
A143b	White Oak Rd	I-540	NC 42 (Johnston Co.)	2	4	Widening	2.53	\$23,129,826.72	Div	No		N/A
A148a1	Eagle Rock Rd	Kioti Dr	Old Tarboro Rd	2	4	Widening	0.7	\$5,845,749.00	Div	No		N/A
A148a2	Eagle Rock Rd	Old Tarboro Road	Martin Pond Rd	2	4	Widening	0.75	\$6,263,302.50	Div	No		N/A
A149b2	Poole Rd	Richardson Road	Jake May Drive	2	4	Widening	1	\$7,498,920.00	Div	No		N/A
A150	NC 98	Durham County Line	NC 98 Bypass	2	4	Widening	8.86	\$81,000,104.64	Reg	Yes		N/A
A155c	T.W. Alexander Dr Ext	Brier Creek Parkway	Leesville Rd	0	4	New Location	1.8	\$17,050,176.00	Div	No		N/A
A161	Skycrest Dr Ext	New Hope Rd	Forestville Rd	0	4	Widening	3.4	\$50,923,058.29	Div	No		N/A
A162	Buffaloe Rd	Southall Rd	Stone Station Drive	2	4	Widening	1.5	\$13,713,336.00	Div	No		N/A
A163a	Holly Springs Rd	Old Holly Springs Rd	N. of 540 Interchange	2	4	Widening	4.44	\$40,591,474.56	Div	No		N/A
A163c	Friendship Rd Widening	Richardson Rd	Old Holly Springs Apex	2	4	Widening	3.58	\$31,084,996.80	Div	No		N/A
A164c2	Green Level Church Rd	Kit Creek Road	Precept Way	2	4	Widening	0.95	\$8,685,112.80	Div	No		N/A
A165a2	Airport Blvd Ext	Garden Square Ln	NC 54	0	4	New Location	0.84	\$15,852,021.36	Div	Yes		N/A
A165b	Airport Blvd Ext	Davis Dr	Louis Stephens Rd	0	2	New Location	0.36	\$3,139,829.04	Div	No		N/A
A167	Wendell Northern Bypass	US 64 BUS (west)	Old Zebulon Road	0	2	New Location	2.4	\$14,240,772.00	Div	No		N/A
A168a	Green Level Ch Widening	Green Level West	Jenks Rd	2	4	Widening	1.76	\$13,198,099.20	Div	No		N/A
A168b	Green Level Church Rd	Green Level West	Morrisville Parkway	2	4	New Location	1.86	\$13,947,991.20	Div	No		N/A
A169c	Richardson Rd (East)	Poole Rd	Knightdale-Eagle Rock Rd	0	4	New Location	0.5	\$4,736,160.00	Div	No		N/A
A173	New Hill Olive Chapel Rd	Old US 1	Chatham Co.	2	3	Widening	4.46	\$16,106,496.12	Div	No		N/A
A174b	Old Battle Bridge / Tarboro Rd	Knightdale-Eagle Rock Rd	Wendell Blvd	0	4	New Location	0.8	\$7,577,856.00	Div	No		N/A
A181b	Old US 1	Humie Olive Rd	Apex Peakway	2	4	Widening	2.53	\$18,972,267.60	Div	No		N/A
A186c	Holland Rd Turn Lane	Old US 1	Kelly Rd	2	3	Turn Lane	1.49	\$5,380,869.78	Div	No		N/A
A187b2	Apex Peakway (East)	Laura Duncan	Old Raleigh Road	2	4	New Location	0.3	\$2,742,667.20	Div	No		N/A
A187b3	Apex Peakway (East)	Old Raleigh Rd	Center Street	2	4	New Location	0.75	\$6,856,668.00	Div	No		N/A
A190	New Hill Holleman Rd Widening	Old US 1	Avent Ferry Rd	2	4	Widening	4.85	\$39,377,514.30	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A193a	Sunset Lake Rd	US 401	Hilltop-Needmore Rd	2	4	Widening	2.65	\$19,872,138.00	Div	No		N/A
A193b	Sunset Lake Rd	Hilltop-Needmore Rd	Optimist Farm Rd	2	4	Widening	2.55	\$23,312,671.20	Div	No		N/A
A195	Creedmoor Rd	Glenwood Ave	Strickland Rd	4	6	Widening	4.11	\$40,645,536.75	Reg	Yes		N/A
A2	Perry Creek Rd Ext (Part NL)	Fox Rd	Buffaloe Road	0	4	New Location	1.77	\$22,251,814.83	Div	No		N/A
A200	Creech/Jones Sausage Connector	Creech Rd	Jones Sausage Rd	0	4	Widening	1.09	\$10,324,828.80	Div	No		N/A
A201a	Rock Quarry Rd	New Hope Rd	Battle Bridge Rd	2	4	Widening	1.4	\$20,350,000.00	Div	No		N/A
A201b	Rock Quarry Rd	Battle Bridge Rd	East Garner Rd	2	4	Widening	3.3	\$30,169,339.20	Div	No		N/A
A202	East Garner Rd	Rock Quarry Rd	Shotwell Rd	2	4	Widening	3.22	\$24,146,522.40	Div	No		N/A
A203	Auburn-Knightdale Rd	Grasshopper Rd	Raynor Rd	2	4	Widening	7.58	\$56,841,813.60	Div	No		N/A
A205	Six Forks Ext	Atlantic Avenue	Capital Blvd	0	4	New Location	0.56	\$25,981,124.00	Div	Yes		N/A
A207a2	Judd Parkway NE	NC 55	Products Road (future ext)	2	4	Widening	1.5	\$11,248,380.00	Div	No		N/A
A21	Lake Boone Trail Ext	Blue Ridge Rd	Edwards Mill Ext	0	4	Widening	0.28	\$2,990,562.12	Div	No		N/A
A217a	Sunset Lake Rd	Main St	Optimist Farm Rd	2	4	Widening	3.4	\$31,083,561.60	Div	No		N/A
A217b	Sunset Lake Rd Ext	Old Holly Springs Apex	Main St	0	4	New Location	1.7	\$18,156,984.30	Div	No		N/A
A217c	Sunset Lake Rd Ext	Woodfield Deadend Rd	Main St	2	4	Widening	0.99	\$7,423,930.80	Div	No		N/A
A218a	Old Holly Springs Apex Rd	Holly Springs Rd	Jessie Dr	2	4	Widening	2.52	\$23,592,212.28	Div	No		N/A
A218b	Jessie Dr (part NL)	Veridea Parkway	NC 55	0	4	New Location	1.64	\$17,516,149.56	Div	No		N/A
A218c	Veridea Parkway	Tingen Rd	Jessie Dr	2	3	Turn Lane	1.06	\$3,828,001.32	Div	No		N/A
A218d	Tingen Rd	Apex Peakway	Old Holly Springs Apex Rd	2	3	Turn Lane	0.55	\$3,598,001.55	Div	No		N/A
A219a2	McCrimmon Parkway Ext	Davis Dr	Louis Stephens Rd	2	4	Widening	0.82	\$4,727,273.00	Div	No		N/A
A219b	McCrimmon Parkway Ext	Louis Stephens Rd	NC 55	0	4	New Location	0.94	\$8,903,980.80	Div	No		N/A
A221	NC 54	N.W. Maynard Rd	Wilson Rd	2	6	Widening	0.93	\$8,502,268.32	Reg	Yes		N/A
A222b	NC 54	Weston Parkway	McCrimmon Pkwy Grade Sep	2	4	Widening	2.4	\$59,132,337.60	Reg	Yes		N/A
A223a	Kit Creek Rd	Wake Rd	Green Level Ch Rd	0	4	New Location	0.42	\$3,978,374.40	Div	No		N/A
A224a	Johnson Pond Rd	Optimist Farm Rd	Hilltop-Needmore Rd	2	4	Widening	2.05	\$18,741,559.20	Div	No		N/A
A228a	NC 50	Timber Dr	I-540	2	4	Widening	4.91	\$36,819,697.20	Reg	Yes		N/A

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A228c	NC 50	NC 42	NC 210	2	4	Widening	5.63	\$42,516,352.73	Reg	Yes		N/A
A230	S.E. Maynard Rd	Cary Towne Blvd	Walnut St	4	6	Widening	0.26	\$2,571,250.50	Div	No		N/A
A231	Trinity Rd	Edwards Mill Rd Ext	Trenton Rd /Arrington Rd	2	4	Widening	1.1	\$10,056,446.40	Div	No		N/A
A233a	NC 54	Reedy Creek Rd	Chapel Hill Rd	4	6	Widening	0.4	\$3,955,770.00	Reg	No		N/A
A237a	Old Apex Rd	West Chatham St	Cary Parkway	2	4	Widening	1.55	\$14,170,447.20	Div	No		N/A
A27d	Louis Stephens Dr Ext (part existing)	Poplar Pike Lane	Airport Blvd	2	4	Widening	1.22	\$10,188,305.40	Div	No		N/A
A3	Spring Forest Rd Ext	US 401	Buffaloe Rd	0	4	New Location	1.52	\$31,389,472.00	Div	No		N/A
A300	US 70	US 401	I-40	4	6	Widening	4.3	\$70,417,777.50	Reg	Yes		N/A
A301	US 70	I-40	NC 42	4	6	Widening	7.21	\$71,302,754.25	Reg	Yes		N/A
A302b	Eastern Angier Bypass	Benson Rd	NC 210	0	4	New Location	0.5	\$4,104,672.00	Div	No		N/A
A302f	Eastern Angier Bypass	Kennebec Rd	NC 55	0	4	New Location	0.35	\$3,356,753.40	Div	No		N/A
A37	Walnut St	Maynard Rd	Macedonia Rd	4	6	Widening	1.29	\$12,757,358.25	Div	No		N/A
A39	Alston Avenue	Kit Creek Rd	NC 55	2	4	Widening	2.12	\$15,897,710.40	Div	No		N/A
A402a	Buffaloe Rd	Spring Forest Rd Extension	Forestville Rd	2	4	Widening	0.95	\$19,247,948.00	Div	No		N/A
A403a	Hodge Rd (Widening)	Poole Rd	US 64	2	4	Widening	3.15	\$30,180,781.13	Div	No		N/A
A404	South Franklin St (part NL)	NC 98 (Wake Forest Bypass)	Rogers Rd	2	4	Widening	1.1	\$10,056,446.40	Div	No		N/A
A406a	Shotwell Rd	East Garner Rd	US 70	2	4	Widening	0.86	\$7,862,312.64	Div	No		N/A
A406c	Shotwell Rd Widening	Main St	Old Baucom Rd	2	4	Widening	2.12	\$15,897,710.40	Div	No		N/A
A407a	NC 42	NC 401	Old Stage Rd	2	4	Widening	4.1	\$30,745,572.00	Reg	Yes		N/A
A407b2	NC 42	John Adams Rd	NC 50	2	4	Widening	4.39	\$32,920,258.80	Reg	Yes		N/A
A41	Kildaire Farm Rd	Ten Ten Rd	Kildaire Farm Connector	2	4	Widening	2.03	\$18,558,714.72	Div	No		N/A
A415	Milburnie Rd	Hodge Rd Ext	Forestville Rd	2	4	Widening	1.5	\$14,044,568.34	Div	No		N/A
A416	Fox Rd	Old Wake Forest Rd	US 401	2	4	Widening	2.06	\$18,832,981.44	Div	No		N/A
A417	Spring Forest Rd	Fox Rd	US 401	3	4	Widening	0.67	\$8,125,290.00	Div	No		N/A
A422	New Pearl Rd	Barwell Rd	Auburn Church Rd	0	3	New Location	1.77	\$15,520,463.60	Div	No		N/A
A423	Woods Creek Rd	Friendship Rd	Old Holly Springs Apex Rd	2	4	Widening	1.46	\$14,002,457.04	Div	No		N/A

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A429a	Leesville-Westgate Connector	Westgate Rd	Leesville Rd	0	4	New Location	1.18	\$26,880,940.56	Div	No		N/A
A432	Skycrest Dr	Brentwood Rd	New Hope Rd	2	4	Widening	1.6	\$14,627,558.40	Div	No		N/A
A434	Sunnybrook Rd	Rock Quarry Rd	Poole Rd	3	4	Widening	1.81	\$16,547,425.44	Div	No		N/A
A435	Battle Bridge Rd	Rock Quarry Rd	Auburn-Knightdale Rd	2	3	Turn Lane	1.85	\$6,680,945.70	Div	No		N/A
A440c	NC-55/Carpenter Fire Station Road DDI	NC-55	Carpenter Fire Station Road	-	-	Interchange	-	\$14,876,400.00	Reg	No		N/A
A444	NC 50	I 540	NC 98	2	4	Widening	5.06	\$82,016,000.00	Reg	Yes		U-5891
A446	Glenwood Avenue	Womans Club Dr	Oberlin Rd	4	6	Widening	1.07	\$10,581,684.75	St	Yes		N/A
A449	Perry Rd Ext	Apex Peakway	NC 55 Bypass	0	4	New Location	2.01	\$35,414,588.79	Div	No		N/A
A457	Westgate Rd	Leesville Rd	US 70	2	4	Widening	1.4	\$12,799,113.60	Div	No		U-2918
A480a	US 401(South)	US 70	Ten Ten Rd	4	6	Widening	5.59	\$77,328,266.79	Reg	Yes		N/A
A49b	Poole Rd	Barwell Rd	I-540	2	4	Widening	1.57	\$14,353,291.68	Div	Yes		N/A
A51	Smithfield Rd	Forestville Rd	Bethlehem Rd	2	4	Widening	1.57	\$14,353,291.68	Div	No		U-3441
A511	Piney Grove Wilbon Rd	Brayton Park Rd	Southern FV Bypass	2	4	Widening	6.5	\$48,742,980.00	Div	No		N/A
A530	Evans Rd	Aviation Parkway	Weston Parkway	4	6	Widening	0.5	\$4,944,712.50	Div	No		N/A
A531a	Purfoy Rd Widening	US 401	Holland Rd	2	4	Widening	1.41	\$12,242,973.60	Div	No		N/A
A534b	US 401 Widening	Judd Pkwy	Eastern Parkway	2	4	Widening	1.53	\$11,473,347.60	Reg	Yes		N/A
A535c	NC 42 Widening	Christian Light Rd	Cass Holt Rd	2	4	Median	2.94	\$22,046,824.80	Reg	Yes		N/A
A543b	Rex Rd Realignment	Avent Ferry Connector (NL)	Cass Holt Rd	0	4	New Location	0.31	\$3,119,945.40	Div	No		N/A
A544a	Avent Ferry Cnctr	Old Holly Springs Apex	Holly Springs Rd	0	4	New Location	0.99	\$9,377,596.80	Div	No		N/A
A544b	Avent Ferry Cnctr Widening	Holly Springs Rd	Rex Rd	0	4	New Location	3.33	\$31,542,825.60	Div	No		N/A
A545	Arthur Pierce Rd	Kildaire Farm	Holly Springs Rd	2	3	Turn Lane	1.03	\$6,097,806.00	Div	No		N/A
A547	Stephenson Rd	Ten Ten Rd	Sunset Lake Rd	2	4	Widening	2.03	\$13,279,896.63	Div	No		N/A
A559	Sweet Springs Ext.	Rex Rd	Cass Holt	0	2	New Location	1.31	\$7,600,352.76	Div	No		N/A
A560a	Jones Franklin Widening	Western Blvd	I-440	2	3	Turn Lane	1.09	\$6,750,451.13	Div	Yes		N/A
A560b	Jones Franklin Widening	I-440	Dillard Dr	2	4	Widening	1.22	\$10,015,399.68	Div	Yes		N/A
A564	Hillsborough St Widening	Western Blvd	Bashford Rd	2	4	Widening	1.09	\$9,965,024.16	Div	No		N/A
A577	Ackerman Road	NC 50	White Oak Rd	0	2	New Location	1.64	\$11,710,846.29	Div	No		N/A
A579	Old Faison Rd Widening	Hodge Rd	Bethlehem Rd	2	4	Widening	2.06	\$19,164,213.78	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A580	Old Faison Rd Ext	Bethlehem Rd	Smithfield Rd	0	4	New Location	0.76	\$7,198,963.20	Div	No		N/A
A584	Western Wendell Loop	Wendell Blvd	Poole Rd	0	4	New Location	1.69	\$12,673,174.80	Div	No		N/A
A589	Forestville Rd Ext	Mailman Rd	Old Knight Rd	0	2	New Location	3.52	\$24,659,606.40	Div	No		N/A
A591	Mailman Rd Widening	Smithfield Rd	Knightdale-Eagle Rock Rd	2	4	Widening	1.45	\$11,800,932.00	Div	No		N/A
A59a	N.E. Regional Center	Gresham Lake Rd	I 540	0	4	Widening	0.59	\$9,979,963.95	Div	No		N/A
A59b	Sumner Blvd Ext	Old Wake Forest Rd	Capital Blvd	0	4	New Location	0.38	\$14,058,620.00	Div	No		N/A
A59c	N.W. Regional Center	Ruritania	Gresham Lake Rd	0	4	Widening	0.99	\$10,905,005.55	Div	No		N/A
A613	Harris Rd Widening	US 1	US 1A	2	4	Widening	1.42	\$23,171,966.40	Div	No		N/A
A616a	New Hill Place	NC 55 (Bus)	NC 55 Bypass	0	3	New Location	1.08	\$8,503,775.28	Div	No		N/A
A616b	New Hill Place	NC 55 Bypass	Old Holly Springs Apex	0	4	New Location	0.71	\$6,389,079.84	Div	No		N/A
A617a	US 401 Bypass	US 401 (E of FV)	NC 55	0	6	New Location	6.41	\$145,979,684.40	Reg	Yes		N/A
A619a	US 401 Widening	NC 540	US 401 Bypass	4	6	Widening	1.58	\$17,772,440.40	Reg	Yes		N/A
A619b	US 401 Widening	US 401 Bypass	NC 55/42 (FV)	4	6	Widening	3.32	\$37,344,621.60	Reg	Yes		N/A
A623b	Hilltop Needmore Widening	Johnson Pond Rd	Sunset Lake Rd	2	4	Widening	2.09	\$15,672,742.80	Div	No		N/A
A623c	Hilltop Needmore Widening	Sunset Lake Rd	Keith Hills St	2	4	Widening	0.68	\$5,099,265.60	Div	No		N/A
A624a	Honeycutt Connector	Avent Ferry Rd	Cass Holt Rd	0	4	New Location	0.82	\$7,767,302.40	Div	No		N/A
A624b	Honeycutt Connector	Cass Holt Rd	Piney Grove Wilbon	0	4	Widening	0.87	\$8,240,918.40	Div	No		N/A
A625	James Slaughter Rd Widening	Stewart Rd	Bass Lake Rd	2	3	Turn Lane	0.55	\$3,256,110.00	Div	No		N/A
A629	Stewart Rd	James Slaughter Pkwy	Judd Pkwy	2	3	Turn Lane	1.3	\$7,696,260.00	Div	No		N/A
A639	I-87 / I-495 Bypass Widening	I-440	US-64	6	8	Widening	9.73	\$115,124,664.60	St	Yes		N/A
A643	Chatham / Trinity Grade Separation	-	-	2	2	Grade Separation	0	\$50,410,000.00	St	No		N/A
A64c	Aviation Parkway	I-40	Airport Blvd	4	6	Widening	1.6	\$30,818,341.13	Div	No		N/A
A652	NC 55	Morrisville Carpenter Rd	NC 540	4	6	Widening	1.55	\$17,434,989.00	Reg	Yes		N/A
A664	Hilltop Road Relocation	Hilltop Road	Lake Wheeler Road	0	2	New Location	0.53	\$2,350,000.00	Div	No		N/A
A669	Lucas & Old Crews Connector / Mama's Way & Hinton Oaks Ext	Hinton Oaks Avenue	Marks Creek Road	0	2	New Location	4.66	\$28,470,116.22	Div	No		N/A
A66a	O'Kelley Chapel Rd	Alston Avenue	NC 55	2	4	Widening	1.21	\$9,073,693.20	Div	No		N/A

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A66b	O'Kelley Chapel Rd	Alston Avenue	NC 751	2	4	Widening	1.13	\$8,473,779.60	Div	No		N/A
A672	Unicon Drive Ext	Height Lane	Unicon Drive	0	2	New Location	0.15	\$1,187,576.25	Div	No		N/A
A675b	Southport Drive Connector	Southport Drive	Southport Drive	0	2	New Location	0.5	\$2,966,827.50	Div	No		N/A
A678	Square Loop Interchange	US 401 South	Ten Ten Road	-	-	Interchange	-	\$18,753,676.70	Reg	No		N/A
A679a	Northern Judd Parkway	NC 55 / Broad St	Old Honeycutt Road	0	2	New Location	2.74	\$53,449,214.70	Div	No		N/A
A679b	Northern Judd Parkway	NC 55 / Broad St	Old Honeycutt Road	2	4	Widening	2.74	\$25,049,693.76	Div	No		N/A
A683b	Barwell Rd	Berkley Lake Drive	Poole Rd	2	3	Turn Lane	1.2	\$7,911,540.00	Div	No		N/A
A687	Corporate Center Extension	Corporate Center Dr	Bashford Rd	0	2	Grade Separation	0.5	\$22,000,000.00	St	No		N/A
A689	Beryl Road Realignment	Beryl Road	Royal St	2	2	Intersection Realignment	0.24	\$5,000,000.00	St	No		N/A
A69	Holly Springs Rd	Cary Parkway	Penny Rd	2	4	Widening	2.22	\$18,224,743.68	Div	No		N/A
A70	Holly Springs Rd	Penny Rd	Ten Ten Rd	2	4	Widening	1.22	\$10,015,399.68	Div	No		N/A
A71	Holly Springs Rd	Ten Ten Rd	Kildaire Farm Rd Connector	2	4	Widening	0.84	\$7,679,468.16	Div	No		N/A
A75b	Yates Store Rd	Yates Store Rd	Morrisville Parkway	0	4	New Location	1.09	\$10,453,889.16	Div	No		N/A
A75c	Wimberley Rd	Morrisville Parkway	Green Level West Rd	0	4	New Location	1.46	\$14,002,457.04	Div	No		N/A
A77b2	West Lake Rd	Ten Ten Rd	Middle Creek Park Avenue	2	4	Widening	1.23	\$11,244,935.52	Div	No		N/A
A79a	Crabtree Valley Ave / I-440 Connector	I-440	Blue Ridge Rd	0	2	New Location	0.15	\$72,568,194.00	St	No		I-5870
A79b	Crabtree Valley Ave Widening/Realign	Blue Ridge Rd	Creedmoor Rd	3	4	New Location	0.61	\$18,096,806.00	St	No		I-5870
A82c	Trinity Rd Ext	Walnut Creek	Chatam St	2	4	Widening	0.44	\$4,022,578.56	Div	No		N/A
A85b2	Leesville Rd	O'Neal Road (A Leesville Road Campus)	Lynn Rd	2	4	Widening	1.75	\$15,998,892.00	Div	No		N/A
A86b	Leesville Rd	New Leesville Blvd	TW Alexander Dr Ext	2	4	Widening	0.97	\$8,867,957.28	Div	No		N/A
A87	New Leesville Blvd Ext	Terminus	Carpenter Pond Rd	0	4	New Location	0.47	\$9,500,000.00	Div	No		N/A
A88	New Rand Rd	NC 50	Old Garner Rd	2	3	Turn Lane	1.63	\$10,746,508.50	Div	No		U-3607
A90c1	US 401 & NC 98 Interchange	-	-	-	-	Interchange	-	\$12,523,500.00	St	No		N/A
A90d	US 401 Widening	Flat Rock Church Rd	Fox Park Rd	2	4	Widening	5.32	\$16,333,091.00	Reg	Yes		R-2814D

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A94	NC 55	NC 540	Kit Creek Rd	4	6	Widening	1.58	\$11,907,535.07	Reg	Yes		N/A
A98	NC 55 Bypass	North Main St	Honeycutt Connector	4	6	Widening	5.95	\$66,927,861.00	Reg	Yes		N/A
A98a	Holly Springs Road Interchange	Holly Springs Road	NC-55 Bypass	-	-	Interchange	-	\$19,897,185.00	Reg	No		N/A
A98b	South Main Street Interchange	South Main Street	NC-55 Bypass	-	-	Interchange	0	\$19,897,185.00	Reg	No		N/A
Frnk1	US 1	Extend frwy project from US-1A	CAMPO MAB	4	6	Widening	8.28	\$131,004,519.53	St	Yes		N/A
Frnk11	Lane Store Extension	Oak Park Blvd	Lane Store Rd	0	2	New Location	1.39	\$8,064,496.44	Div	No		N/A
Frnk13	Western Service Rd	Bert Winston Rd	Pocomoke Rd	0	2	New Location	2.7	\$14,812,340.40	St	No		N/A
Grnv35	Woodland Church Rd	Wake Co. line	Bruce Garner Rd	2	3	Turn Lane	4.41	\$15,925,930.02	Div	No		N/A
Grnv94	I-85 / Brogden Interchange (New)	-	-	-	-	Interchange	3.94	\$13,946,625.00	St	Yes		N/A
Grnv951	26th Street Extension	26th Street	East Lyon Station Rd	0	2	New Location	0.72	\$8,219,000.00	Div	No		U-5829
Jhns13a	Ranch Road Extension	US 70 BUS / NC 42	Ranch Road	0	2	New Location	0.4	\$2,556,411.00	Div	No		N/A
Jhns4a1	North Connector	NC 42 East	Covered Bridge Rd	0	2	New Location	2.33	\$12,782,501.16	Div	No		N/A
2045 MTP												
F7b	US 64 East	US 64 Bypass (Wendell)	US 64/US 264 (Zebulon)	6	8	Widening	7.35	\$85,609,455.75	St	Yes		N/A
F84	I-540 Managed Shoulder	US 1	I-495 (Kinightdale Bypass)	0	1	TSM	18.1	\$77,089,736.00	St	No		N/A
F85	I-540 Managed Shoulder	I-40	US 1	0	1	TSM	7.72	\$32,880,263.00	St	No		N/A
A102	Edwards Mill Rd Ext - part III	Chapel Hill Rd	Western Blvd Ext	0	4	New Location	0.7	\$46,425,000.00	Div	Yes		U-3817
A112b	Smithfield Rd	Major Slade Rd	Johnston Co. line	2	4	Widening	1.4	\$12,799,113.60	Div	No		N/A
A117	New Hope Rd	Old Poole Rd	Rock Quarry Rd	2	4	Widening	1.8	\$16,456,003.20	Div	No		N/A
A118a	NC 55	Old Honeycutt Road	Jicarilla Rd	2	4	Widening	2.69	\$29,055,000.00	Reg	Yes		R-5705D
A125a2	Forestville Rd	Buffaloe Rd	Rogers Rd	2	4	Widening	7.5	\$68,566,680.00	Div	No		N/A
A125b	Heritage Lake Rd	Rogers Rd	End of Existing Heritage Lake Rd	2	4	Widening	0.93	\$8,502,268.32	Div	No		N/A
A126a	Ligon Mill Rd	Burlington Mills Rd	US 1A	2	3	Turn Lane	2.32	\$9,330,342.84	Div	No		N/A
A126b	Ligon Mill Rd	US 401	Burlington Mills Rd	2	3	Turn Lane	2.57	\$16,943,881.50	Div	No		N/A
A127b1	Ligon Mill Rd Connector	NC 98 Bypass	Richland Creek	0	4	New Location	0.25	\$8,499,834.00	Div	No		N/A
A127b3	Ligon Mill Rd Connector	Richland Creek	NC 98	2	4	Widening	0.75	\$6,856,668.00	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A127c	Ligon Mill Rd Connector	NC 98	Stadium Dr	0	4	Widening	0.78	\$8,330,851.62	Div	No		N/A
A130b	Mitchell Mill Rd (East)	Watkins Rd	Jonesville Rd	2	4	Widening	1.57	\$14,353,291.68	Div	No		N/A
A131c	NC 96	US 401	SE of Youngsville	2	3	Turn Lane	4.14	\$30,160,768.37	Reg	Yes		N/A
A135b	Lead Mine Rd	Millbrook Rd	Lynn Rd	2	4	Widening	1.12	\$10,239,290.88	Div	No		N/A
A136d	Lake Wheeler Rd	Hilltop-Needmore Rd	US 401	2	4	Widening	0.57	\$4,679,326.08	Div	No		N/A
A137d	Old Stage Rd	NC 42	NC 210	2	4	Widening	5.39	\$40,419,178.80	Div	No		N/A
A137e	Old Stage Rd	NC 210	NC 55	2	4	Widening	3.57	\$26,771,144.40	Div	No		N/A
A14	Ray Rd	Leesville Rd	Strickland Rd	2	3	Turn Lane	3.21	\$21,163,369.50	Div	No		N/A
A144	NC 50	Timber Dr	US 70	2	3	Turn Lane	1.5	\$9,889,425.00	Reg	Yes		N/A
A148b	Eagle Rock Rd	Martin Pond Rd	Lake Myra Rd	2	4	Widening	2.47	\$18,522,332.40	Div	No		N/A
A148c	Eagle Rock Rd	Lake Myra Rd	Covered Bridge Rd	2	4	Widening	4.97	\$37,567,065.53	Div	No		N/A
A148d	Eagle Rock Rd	-	-	2	4	Widening	3.08	\$23,096,673.60	Div	No		N/A
A149a	Poole Rd	I-540	Martin Pond Rd	2	4	Widening	5.6	\$51,196,454.40	Div	No		N/A
A155b	T.W. Alexander Dr	Aviation Parkway	US 70	4	6	Widening	1.02	\$17,722,990.69	Div	Yes		N/A
A157a	Eastern Parkway	Piney Grove Wilbon	NC 55	0	4	New Location	4.2	\$40,081,177.13	Reg	No		N/A
A157a1	Eastern Parkway / US 401 Interchange	-	-	-	-	Interchange	-	\$12,523,500.00	Reg	No		N/A
A157a2	Eastern Parkway / Angier Road Interchange	-	-	-	-	Interchange	-	\$12,523,500.00	Reg	No		N/A
A163b	Friendship Rd Widening	Old Holly Springs Apex	New Hill Holleman	2	4	Widening	1.93	\$17,075,830.20	Div	No		N/A
A169d1	NC 231 (Southern Wendell) Bypass (pc)	NC 231	Wendell Blvd	0	4	New Location	2.7	\$25,894,954.80	Div	Yes		N/A
A169d2	NC 231 (Southern Wendell) Bypass (pc)	Wendell Road at Stott's Mill Road	NC 231	0	4	New Location	0.7	\$6,713,506.80	Div	Yes		N/A
A172	Kelly Rd	Jenks Rd	Old US 1	2	4	Widening	5.23	\$47,813,831.52	Div	No		N/A
A178a	Olive Chapel Rd	Kelly Rd	NC 55	2	4	Widening	1.93	\$17,644,492.32	Div	No		N/A
A178b	Olive Chapel Rd	Richardson Rd	Kelly Rd	2	3	Turn Lane	1.81	\$11,933,239.50	Div	No		N/A
A178c	Olive Chapel Rd	New Hill Olive Chapel Rd	Richardson Rd	2	3	Turn Lane	1.31	\$8,636,764.50	Div	No		N/A
A179a	Richardson Rd	US 64 (West)	Olive Chapel Rd	0	4	New Location	1.42	\$25,974,194.40	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A179b	Richardson Rd	Olive Chapel Rd	Humie Olive Rd	2	4	Widening	1.86	\$13,947,991.20	Div	No		N/A
A179c	Richardson Rd	Humie Olive Rd	Old US 1 Highway	0	4	New Location	2.33	\$22,070,505.60	Div	No		N/A
A184	Apex Barbecue Rd	Old US 1	Olive Chapel Rd	2	3	Turn Lane	1.32	\$8,702,694.00	Div	No		N/A
A186a	Friendship Rd Widening	Friendship Road	Winding Way	2	3	Turn Lane	1.23	\$4,921,659.60	Div	No		N/A
A186b	Friendship Rd Widening	Winding Rd	Old US 1	2	3	Turn Lane	0.5	\$4,341,480.00	Div	No		N/A
A187a	Apex Peakway Widening (North)	Olive Chapel Rd	Laura Duncan Rd	2	4	Widening	1.6	\$14,627,558.40	Div	No		N/A
A187c	Apex Peakway Widening (South)	Broadstone Way	Old US 1	2	4	Widening	1.25	\$11,427,780.00	Div	No		N/A
A187d	Apex Peakway (West)	Old US 1	Olive Chapel Rd	2	4	Widening	1.09	\$9,965,024.16	Div	No		N/A
A192	Graham Newton Rd	Penny Rd	Optimist Farm Rd	2	2	Widening	2.83	\$18,513,353.43	Div	No		N/A
A197b	Cent Campus Connector & Interchange	Main Campus Dr Connector	I-40	0	4	New Location	0.38	\$18,336,477.36	Div	Yes		N/A
A204	Bethlehem Rd	Smithfield Rd	Old Faison Rd	2	4	Widening	0.93	\$6,973,995.60	Div	No		N/A
A207d	Judd Parkway SE	US 401	US 401	2	3	Turn Lane	1.76	\$10,419,552.00	Div	No		N/A
A214	Garner Rd	Tryon Rd	Rock Quarry Rd	2	3	Turn Lane	7.16	\$47,205,522.00	Div	No		N/A
A215b	Jones Dairy Rd	Chalk Road	Averette Rd	2	4	Widening	2.1	\$19,198,670.40	Div	No		N/A
A216a	Jones Dairy Rd Ext	Averette Rd	US 401	2	4	Widening	2.87	\$26,238,182.88	Div	No		N/A
A218f	Jessie Dr (part widening)	NC 55	Ten Ten Rd	2	4	Widening	1.58	\$11,884,891.20	Div	No		N/A
A224b	Johnson Pond Rd	Hilltop-Needmore Rd	US 401 North	2	3	Turn Lane	2.56	\$16,877,952.00	Div	No		N/A
A228b	NC 50	I-540	NC 42	2	4	Widening	1.85	\$13,873,002.00	Reg	Yes		N/A
A229	NC 54	Chapel Hill Rd	Harrison Avenue	4	6	Widening	0.8	\$7,911,540.00	Reg	No		N/A
A233b	NC 54	Reedy Creek Rd	Harrison Avenue	4	6	Widening	0.99	\$9,790,530.75	Reg	No		N/A
A234	Western Blvd	Gorman St	Pullen Rd	4	6	Widening	1.21	\$11,966,204.25	Div	No		N/A
A235b	US 1A	Rogers Rd	Forbes Rd	2	4	Widening	0.26	\$2,376,978.24	Reg	No		R-3600
A237b	Old Apex Rd	Cary Parkway	Laura Duncan Rd	2	4	Widening	0.39	\$3,565,467.36	Div	No		N/A
A240a	North Harrison Avenue	Reedy Creek Rd	Weston Parkway	4	6	Widening	0.81	\$8,010,434.25	Div	No		N/A
A240b	North Harrison Avenue	Weston Parkway	I-40	6	8	Widening	0.48	\$12,564,134.10	Div	No		N/A
A27a	Louis Stephens Dr Ext (part NL)	Wake County Line	Kit Creek Rd	2	4	Widening	1.23	\$9,223,671.60	Div	No		N/A
A27b	Louis Stephens Dr Ext (part NL)	Kit Creek Rd	O'Kelly Chapel Rd	2	4	Widening	1.13	\$8,473,779.60	Div	No		N/A
A2a	Southall Rd	Skycrest Dr	Buffaloe Rd	2	4	Widening	1.54	\$15,000,000.00	Div	No		N/A

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A302c	Rawls Ch Rd Widening	US 401	Rawls Ch Rd Extension	2	4	Widening	3.32	\$27,255,022.08	Div	No		N/A
A302d	Eastern Angier Bypass	Wimberly Rd	Stratus St	0	4	New Location	0.39	\$3,740,382.36	Div	No		N/A
A302e	Eastern Angier Bypass	Stratus St	Kennebec Rd	2	4	Widening	0.96	\$7,880,970.24	Div	No		N/A
A302g	Kennebec Ch Realign	Rawls Ch Rd	NC 55	0	4	New Location	0.7	\$6,713,506.80	Div	No		N/A
A34	Cary Parkway	Evans Rd	Harrison Avenue	2	4	Widening	1.74	\$15,907,469.76	Div	No		N/A
A36c	Chatham St	N.E. Maynard Rd	I-40 bridge	2	4	Widening	0.93	\$8,502,268.32	Div	No		N/A
A38	Tryon Rd	US 64	Kildaire Farm Rd	4	6	Widening	0.8	\$7,911,540.00	Div	No		N/A
A400a	Ten-Ten Rd	Bells Lake Rd	Old Stage Rd	2	4	Widening	5.1	\$38,244,492.00	Div	No		N/A
A400b	Ten Ten Rd	Old Stage Rd	NC 50	2	4	Widening	3.43	\$25,721,295.60	Div	No		N/A
A401a	NC 97	Wendell Blvd	Hospital Rd	2	4	Widening	4.6	\$42,054,230.40	Reg	Yes		N/A
A401b	Hospital Rd	NC 97	Mack Todd Rd	2	4	Widening	0.18	\$1,645,600.32	Div	No		N/A
A401c	Hospital Rd	Mack Todd Rd	Barbee St Ext	0	4	New Location	0.42	\$4,485,843.18	Div	No		N/A
A401d	Moss Rd	Barbee St Ext	Morphus Bridge Rd	2	4	Widening	1.86	\$13,947,991.20	Div	No		N/A
A402b	Buffaloe Rd-Riley Hill Connector (part NL)	Forestville Rd	Rolesville Rd	2	4	Widening	4.44	\$35,347,540.80	Div	No		N/A
A402c	Buffaloe Rd-Riley Hill Connector (part NL)	Rolesville	Riley Hill Rd	0	3	New Location	4.4	\$28,306,449.60	Div	No		N/A
A402e	Proctor St	NC 96 (North)	Shepard School Rd	2	4	Widening	0.85	\$6,374,082.00	Div	No		N/A
A403b	Hodge Rd Ext	US 64	Old Milburnie Rd	0	4	Widening	1.31	\$12,314,016.00	Div	No		N/A
A403c	Hodge Rd	Auburn-Knightdale Rd	Poole Rd	2	4	Widening	1.9	\$14,247,948.00	Div	No		N/A
A406b	Amelia Ch Rd	US 70	East of NC 42	2	4	New Location	2	\$14,997,840.00	Div	No		N/A
A407b1	NC 42	Old Stage Rd	John Adams Rd	2	4	Widening	0.95	\$7,123,974.00	Reg	Yes		N/A
A410	Lake Pine Dr/Old Raleigh Rd	Cary Parkway	Apex Peakway	2	4	Widening	1.7	\$15,541,780.80	Div	No		N/A
A413	NC 54 (Chapel Hill Rd)	Corporate Center Dr	Hillsborough St	2	4	Widening	1.33	\$14,159,158.00	Reg	Yes		N/A
A418	NC 96 Bypass (Youngsville)	NC 96	US 1	0	4	New Location	2.99	\$30,411,959.76	Reg	Yes		N/A
A419	Knightdale Eagle Rock Rd	First Avenue	US 64/Knightdale Bypass	2	4	Widening	2.7	\$20,247,084.00	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A420	Intersection Realignment @ Mitchell Mill/Riley Hill/Old Milburnie/Rolesville	-	-	2	3	Intersection Realignment	1	\$6,592,950.00	Div	No		N/A
A426	NC 55 (Main St)	Holly Springs Rd	Technology Drive	2	4	Widening	2.79	\$25,506,804.96	Reg	Yes		N/A
A427c	Avent Ferry Rd	New Hill Holleman	Cass Holt	2	4	Widening	3.69	\$27,671,014.80	Div	No		N/A
A429b	Leesville-Westgate Connector	Leesville Rd	Carpenter Pond Rd	2	4	Widening	1.35	\$26,619,859.74	Div	No		N/A
A42a	Penny Rd	Ten Ten Rd	Kildaire Farm Rd	2	4	Widening	1.25	\$11,427,780.00	Div	No		N/A
A42b	Penny Rd	Kildaire Farm	Holly Springs Rd	2	4	Widening	1.62	\$14,810,402.88	Div	No		N/A
A43	Lake Wheeler Rd	Tryon Rd	I-40	2	4	Widening	1.3	\$17,884,891.00	Div	No		N/A
A433	Trawick Rd	Marsh Creek Rd	New Bern Avenue	2	3	Turn Lane	1.44	\$5,791,247.28	Div	No		N/A
A443a	Jenks Rd	NC55	Wimberly Rd	2	3	Turn Lane	2.17	\$7,836,568.74	Div	No		N/A
A443b	Jenks Rd	Wimberly Rd	US 64	2	4	Widening	0.51	\$1,841,774.22	Div	No		N/A
A445a	NC 50	NC 98	Beaver Creek Rec	2	4	Widening	3.9	\$32,016,441.60	Reg	Yes		N/A
A445b	NC 50	Beaver Creek Rec	Old Weaver Trail	2	4	Widening	2	\$16,418,688.00	Reg	Yes		N/A
A4c	Rogers Lane	Daleview Dr	Southall Rd	3	4	Widening	1.06	\$10,021,989.78	Div	No		N/A
A510	Cass Holt Rd Widening	Avent Ferry	NC 42	2	4	Widening	7.13	\$28,674,717.44	Div	No		N/A
A52	Smithfield Rd	Bethlehem Rd	US 64 Bypass	2	4	Widening	1.8	\$16,456,003.20	Div	No		N/A
A520a	Pleasant Grove Church Rd	Nelson Rd	Airport Blvd	2	4	Turn Lane	2.4	\$21,941,337.60	Div	No		N/A
A520b	Pleasant Grove Church Rd	Airport Blvd	Aviation Parkway	0	2	New Location	1.11	\$11,855,442.69	Div	No		N/A
A531b	Purfoy Rd Widening	Holland Rd	Chalybeate Springs Rd	2	4	Widening	4.12	\$35,773,795.20	Div	No		N/A
A532a	Holland Widening	Purfoy Rd	NC 55	2	4	Widening	2.28	\$17,413,281.60	Div	No		N/A
A532b	Holland Rd Turn Lane	NC 55	Kennebec Rd	2	3	Turn Lane	1.08	\$3,218,220.72	Div	No		N/A
A533	Old Honeycutt Turn Lane	Judd Pkwy	Kennebec Rd	2	3	Turn Lane	2.74	\$8,164,745.16	Div	No		N/A
A535a	NC 42 Widening	Christian Light Rd	Coley Farm Rd	2	4	Widening	2.98	\$22,346,781.60	Reg	Yes		N/A
A536	Wilbon Rd Widening	Judd Pkwy	Piney Grove Wilbon	2	4	Widening	1.45	\$10,873,434.00	Div	No		N/A
A538	Bass Lake Rd Widening	Holly Springs Rd	Hilltop-Needmore Rd	2	4	Widening	2.77	\$21,069,441.53	Div	No		N/A
A539	Banks Rd Turn Lane	US 401	Fanny Brown Rd	2	3	Turn Lane	1.55	\$11,292,075.11	Div	No		N/A
A540a	Rock Service Station Turn Lane	Old Stage Rd	NC 42	2	3	Turn Lane	3.68	\$24,371,334.41	Div	No		N/A
A540b	Rock Service Station Turn Lane	NC 42	Mt Pleasant Rd	2	3	Turn Lane	2.56	\$16,747,061.76	Div	No		N/A
A541	Mt Pleasant Rd Widening	NC 42	Old Fairground Rd	2	4	Median	5.31	\$43,591,616.64	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A543a	Rex Rd Widening	New Hill Holleman	Avent Ferry Connector (NL)	2	4	Widening	2.15	\$18,668,364.00	Div	No		N/A
A549	Wimberley Rd	Jenks Rd	Green Level West Rd	2	3	Widening	1.97	\$7,114,304.34	Div	No		N/A
A554	Laura Duncan Widening	US 64	Old Apex Rd	2	4	Widening	1.04	\$7,798,876.80	Div	No		N/A
A563	Trinity Rd	NC 54	Chatham St	2	4	Widening	1	\$2,934,653.90	Div	No		N/A
A568	Kit Creek Turn Lane	Davis Dr	Green Level Ch Rd	2	3	Turn Lane	1.81	\$13,623,781.76	Div	No		N/A
A56c	NC 98	NC 98 Bypass	US 401	2	4	Widening	5.29	\$48,362,364.96	Reg	Yes		N/A
A570	Ebenezer Ch Rd Turn Lane	Ebenezer Ch Rd	Westgate Rd	2	3	Turn Lane	1.96	\$14,279,011.11	Div	No		N/A
A571	Slater Rd Turn Lane	Airport Blvd	West of NC 540	2	3	Turn Lane	1.4	\$10,530,525.99	Div	No		N/A
A574	Grovemont Rd Turn Lane	Old Stage Rd	Timber Dr	2	3	Turn Lane	0.86	\$6,265,280.39	Div	No		N/A
A575	Woodland Rd Turn Lane	Old Stage Rd	Vandora Springs Rd	2	3	Turn Lane	1.47	\$10,709,258.33	Div	No		N/A
A576	Buffaloe Rd Turn Lane	NC 50	Buffaloe Rd	2	3	Turn Lane	1.48	\$10,782,110.43	Div	No		N/A
A578	Auburn Ch Rd Turn Lane	Jones Sausage Rd	Garner Rd	2	3	Turn Lane	2.84	\$18,578,771.64	Div	No		N/A
A581	Bethlehem Rd Turn Lane	Old Faison Rd	Grasshopper Rd	2	3	Turn Lane	2.47	\$18,572,584.27	Div	No		N/A
A585	Industrial Drive	Wendell Blvd	Western Wendell Loop	2	3	Turn Lane	0.79	\$5,346,631.29	Div	No		N/A
A586	Landing View Drive Ext	Western Wendell Loop	Hollybrook Rd	0	2	New Location	1.64	\$13,121,728.62	Div	No		N/A
A588a	NC 96 Bypass	NC 96	NC 96	0	4	New Location	4.52	\$45,820,526.40	Reg	Yes		N/A
A590	Mark's Creek Widening	Knightdale-Eagle Rock Rd	Rolesville Rd	2	4	Widening	3.54	\$26,546,176.80	Div	No		N/A
A592	First St Widening	Smithfield Rd	Horton Rd	2	4	Widening	2.87	\$22,488,866.40	Div	No		N/A
A593	Horton Rd Turn Lane	Forestville Rd	Horton Rd	2	3	Turn Lane	1.79	\$11,709,859.59	Div	No		N/A
A594	Rolesville Rd	Kiotti Dr	Mark's Creek Rd	2	4	Widening	2.54	\$21,426,721.80	Div	No		N/A
A596	NC 96 Widening	US 64/264	Ferrel Road	2	4	Widening	2.88	\$24,214,301.10	Reg	Yes		N/A
A599	Old Milburnie Rd Turn Lane	US 64	Milburnie Rd	2	3	Turn Lane	1.31	\$8,569,785.51	Div	No		N/A
A601	Old Wake Forest Rd	Falls of Neuse Rd	Atlantic Ave	2	3	Turn Lane	1.43	\$10,417,849.94	Div	No		N/A
A602	Fox Rd Turn Lane	Spring Forest Rd	Old Wake Forest Rd	2	3	Turn Lane	0.84	\$6,119,576.19	Div	No		N/A
A604	Peebles Road Ext.	US 401	US 401	0	2	New Location	2.81	\$14,972,185.80	Div	No		N/A
A605	Rogers Rd Widening	US 1A	W. of Heritage Branch Rd	2	4	Widening	0.44	\$4,022,578.56	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A607	Falls of Neuse Widening	New Falls of Neuse Blvd	NC 98 Bypass	2	4	Widening	3.14	\$26,516,575.80	Div	No		N/A
A608a	NC 98 Widening	Old NC 98	Ligon Mill Rd (future connector)	2	4	Widening	1.21	\$10,104,794.70	Reg	Yes		N/A
A611	NC 98 Turn Lane	NC 98 Bypass	Allen St.	2	3	Turn Lane	0.71	\$5,172,498.92	Reg	Yes		N/A
A612	White St Turn Lane	NC 98	Main St	2	3	Turn Lane	3.85	\$25,186,010.85	Div	No		N/A
A614	Pinecrest Dr Turn Lane	Fairbanks Dr	Tanglewild Dr	2	3	Turn Lane	1.2	\$8,742,251.70	Div	No		N/A
A617b	US 401 Bypass	NC 55	NC 210	0	6	New Location	4.25	\$113,834,820.00	Reg	Yes		N/A
A617c	US 401 Bypass	NC 210	US 401(South)	0	6	New Location	5.32	\$101,579,398.80	Reg	Yes		N/A
A618a	Gardner Rd	NC 210	Matthew Mill Pond Rd	0	3	New Location	0.48	\$3,779,455.68	Div	No		N/A
A618b	Gardner Rd	Matthew Mill Pond Rd	Old Buies Creek Rd	2	3	Turn Lane	0.81	\$4,795,362.00	Div	No		N/A
A618c	Gardner Rd	Old Buies Creek Rd	Ennis Rd	0	3	New Location	0.59	\$4,645,580.94	Div	No		N/A
A618d	Gardner Rd	Ennis Rd	NC 55	2	3	Turn Lane	0.6	\$3,552,120.00	Div	No		N/A
A618e	Gardner Rd	NC 55	Old Stage Rd	2	3	Turn Lane	1.27	\$9,999,809.82	Div	No		N/A
A623d1	Hilltop Needmore Extension	Bass Lake Road	Hilltop Needmore Road	2	4	Widening	0.75	\$6,263,302.50	Div	No		N/A
A623d4	Hilltop Needmore Extension	Hilltop Needmore Road	Wade Nash Rd	0	4	New Location	0.5	\$7,040,932.50	Div	No		N/A
A624c	Honeycutt Connector	Piney Grove Wilbon	Honeycutt Realignment	0	4	Widening	0.95	\$7,123,974.00	Div	No		N/A
A627	Old Buies Creek Rd Widening	NC 55	Matthew Mill Pond Rd	2	4	Widening	3.12	\$27,090,835.20	Div	No		N/A
A628	Piney Grove Rawls Rd Widening	Piney Grove Wilbon	US 401	2	4	Widening	1.16	\$10,072,233.60	Div	No		N/A
A631	Chalybeate Springs Widening	Future US 401 Bypass	Future Western Angier Bypass	2	4	Widening	3.51	\$33,663,441.24	Div	No		N/A
A632a	Angier Western Bypass	NC 55 (S of Angier)	Rawls Ch Rd	0	2	New Location	1.77	\$9,710,312.04	Div	No		N/A
A632b	Angier Western Bypass	Rawls Ch Rd	Kennebec Ch Realign	0	2	New Location	0.98	\$5,376,330.96	Div	No		N/A
A632c	Angier Western Bypass	NC 55 (S of Angier)	NC 210 (E of Angier)	0	2	New Location	1.14	\$6,254,099.28	Div	No		N/A
A633	Angier Rd Widening	Purfoy Rd	Rogers Rd	2	4	Widening	0.56	\$5,119,645.44	Div	No		N/A
A649	Jones Franklin Rd Extension	Hillsborough St	NC 54	0	2	New Location	0.2	\$26,000,000.00	St	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A665	Perry Curtis Rd/Wake County Line Rd Access Management	S. Arendell Ave	NC-39	2	3	Turn Lane	2.6	\$10,456,418.70	Div	No		N/A
A667	Todd Lane Extension	Marshburn Road	Wendell Blvd / US-64 BUS	0	3	New Location	1.27	\$9,098,710.53	Div	No		N/A
A668	Liles Dean Ext	Liles Dean Road	Knightdale-Eagle Rock Road	0	2	New Location	1.07	\$6,537,129.69	Div	No		N/A
A670	Western Wendell Ext	Poole Road	Lake Glad Road	0	4	New Location	1.4	\$13,261,248.00	Div	No		N/A
A673	Watkins Road Widening	NC-54	Perimeter Park Drive	2	4	Widening	0.65	\$5,942,445.60	Div	No		N/A
A675a	Morrisville East Connector	Trans Air Dr (N/S segment) / Airport Blvd (E/W segment)	International Dr (N/S segment) / Nova Dr (E/W segment)	0	2	New Location	1.48	\$8,781,809.40	Div	No		N/A
A676	East Wake Drive Ext	Existing portion of East Wake Drive	Forestville Road	0	2	New Location	0.2	\$1,186,731.00	Div	No		N/A
A677	Marcom Dr Ext	Watkins Road	Sorrell Grove Church Road	0	2	New Location	1.13	\$6,903,697.71	Div	No		N/A
A67a	Ferrell Rd	NC 96	Williams White Rd	0	3	New Location	2.82	\$18,141,860.88	Div	No		N/A
A67b	Ferrell-Dukes Lake Connector	Williams White Rd	NC 39	0	3	New Location	2.45	\$15,761,545.80	Div	No		N/A
A680a	Six Forks Road	I-540	Durant Road	2	4	Widening	0.9	\$8,228,001.60	Div	No		N/A
A688	Powell Drive Realignment	Powell Dr	Youth Center Dr	2	2	Grade Separation	0.35	\$44,000,000.00	St	No		N/A
A690	NC 231 (Southern Wendell) Bypass (pc) / Stott's Mill Road Widening	Eagle Rock Road	Wendell Road	0	4	Widening	2.5	\$20,523,360.00	Div	Yes		N/A
A691	Western Wendell Ext	Lake Glad Road	Stotts Mill Road	0	4	New Location	0.8	\$7,577,856.00	Div	No		N/A
A693	NC 231 (N. Selma Road)	Old Wilson Road	Stotts Mill Road	2	3	Widening	2.4	\$9,652,078.80	Div	No		N/A
A698	Gorman St Widening	Kaplan Drive	Western Blvd	2	3	Widening	0.95	\$3,820,614.53	Div	No		N/A
A72	Holly Springs Rd	Tryon Rd	SE Cary Parkway	2	4	Widening	0.61	\$5,576,756.64	Div	No		N/A
A73a	Jones Franklin Rd	Tryon Rd	Dillard Dr	2	4	Widening	0.67	\$6,125,290.08	Div	No		N/A
A74c	Piney Plains Rd	Dillard Dr	Walnut St	2	4	Widening	0.43	\$3,931,156.32	Div	No		N/A
A76	Optimist Farm Rd	Lake Wheeler Rd	Sunset Lake Rd	2	4	Widening	4.49	\$41,048,585.76	Div	No		N/A
A77a	West Lake Rd	Larboard Rd	Bells Lake Rd	0	2	New Location	1.25	\$7,417,068.75	Div	No		N/A
A80b	New Hope Rd	US 64 Bypass	New Bern Ave	2	4	Widening	1.19	\$19,210,479.00	Div	No		N/A
A81a	Western Blvd Ext	Existing Western Blvd	Cary Town Blvd	0	2	New Location	1.5	\$8,900,482.50	Div	No		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
A9	Strickland Rd	Leesville Rd	Creedmoor Rd	2	4	Widening	2.73	\$30,958,272.00	Div	No		N/A
A98c	Technology Drive Interchange	Technology Drive	NC-55 Bypass			Interchange	0	\$13,946,625.00	Reg	No		N/A
Frnk20a	Hicks Road Widening	Future Frankilinton South Bypass	Bert Winston Rd	2	4	Widening	1.1	\$9,493,002.75	Div	No		N/A
Frnk20b	Hicks Road Widening	Bert Winston Rd	Cedar Creek Rd	2	4	Widening	2.4	\$20,414,478.00	Div	No		N/A
Frnk21	Sid Mitchell Rd Ext	Holden Rd	US 1/Wall Rd	0	2	New Location	1.1	\$16,708,056.75	Div	No		N/A
Frnk4a	NC 56	W. of West Sandling Rd	US 1	2	4	Widening	3.63	\$27,221,079.60	Reg	Yes		N/A
Frnk4b	NC 56	US 1	Peach Orchard Rd	2	4	Widening	6.76	\$50,692,699.20	Reg	Yes		N/A
Frnk9	Franklinton S Bypass	NC 56 (west)	NC 56 (east)	2	4	New Location	4.13	\$36,949,941.60	Reg	Yes		N/A
Grnv1	I-85	Durham co. line	Vance Co. Line	4	6	Widening	24	\$339,614,222.11	St	Yes		N/A
Grnv110	Brogden Rd Turn Lane	NC 56	Belltown Rd	2	3	Turn Lane	5.59	\$37,964,732.19	Div	No		N/A
Grnv113	Joe Peed Rd Turn Lane	US 15	WB Clark Rd	2	3	Turn Lane	1.34	\$8,766,040.14	Div	No		N/A
Grnv18	NC 50	Old Weaver Trail	Dove Rd	2	4	Widening	2.67	\$20,022,116.40	Reg	Yes		N/A
Grnv2	US 15	I-85	Gate #2 Rd	2	4	Widening	2.42	\$24,706,569.53	Reg	Yes		N/A
Grnv20	NC 56	I-85	US-15	2	4	Widening	2.56	\$19,197,235.20	Reg	Yes		N/A
Grnv21	NC 56	NC 50	Hayes Rd	2	4	Widening	2.6	\$23,769,782.40	Reg	Yes		N/A
Grnv22b	NC 56	Hester Rd	W of Wes Sandling Rd	2	4	Widening	4.18	\$31,345,485.60	Reg	Yes		N/A
Grnv32	Brassfield Rd	Creedmoor Loop	Hayes Rd	2	4	Widening	1.8	\$13,498,056.00	Div	No		N/A
Grnv33	Brassfield Rd	Hayes Rd	NC 96	2	4	Widening	4.07	\$30,520,604.40	Div	No		N/A
Grnv47	Creedmoor Loop A	NC 56	US 15	0	4	New Location	1.59	\$15,060,988.80	Div	No		N/A
Grnv48	Creedmoor Loop B	US-15	Relocated US 15	2	4	Widening	0.66	\$4,949,287.20	Reg	No		N/A
Grnv49	Creedmoor Loop C	Relocated US 15	Brassfield Rd	0	4	New Location	2.23	\$21,123,273.60	Div	No		N/A
Grnv65	Hester Rd	NC-56	Sanders Rd	2	4	Widening	4.18	\$31,345,485.60	Div	No		N/A
Grnv66	Hester Rd	Sanders Rd	New Ext Hester Rd	2	4	Widening	2.8	\$20,996,976.00	Div	No		N/A
Grnv81	Northside Rd Ext	Northside Rd	Old Weaver Rd	0	4	New Location	0.92	\$8,714,534.40	Div	No		N/A
Grnv81a	Old Weaver Trail	From NC 50 (Wake Co)	Northside Rd Ext	2	4	Widening	1.65	\$12,373,218.00	Div	No		N/A
Grnv84c	Sanders Rd Ext (South)	US 15	Hester Rd	0	2	New Location	1.28	\$7,426,298.88	Div	No		N/A
Grnv93	Cash Rd / Gate 2 Rd	Old Weaver Trail	West B St	2	4	Widening	4.93	\$36,969,675.60	Div	No		N/A
Hrnt3a	NC 210	NC 55	Old Stage Rd	2	4	Widening	3.01	\$22,571,749.20	Reg	Yes		N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
2025 MTP												
316	Brier Creek Pkwy Extension	T.W. Alexander Dr	Andrew's Chapel Rd	-	4	New Location	0.4	\$3,990,000	Div	No	No	N/A
9	Carver St Ext	Armfield St	Old Oxford Rd	-	4	New Location	1.0	-	Div	No	No	N/A
15	East End Connector (EEC)	NC 147	North of NC 98 in Durham	-	4	New Location	3.2	\$35,175,000	St	Yes	No	U-0071
200	Eubanks Rd	MLK Blvd (NC 86)	Millhouse Rd	2	4	Widening	0.8	\$7,487,000	Div	No	No	N/A
23	Fayetteville Rd	Barbee Rd	Cornwallis Rd	2	4	Widening	1.0	\$3,374,000	Div	Yes	No	N/A
23.1	Fayetteville Rd	Woodcroft Pkwy	Barbee Rd	2	4	Widening	1.4	\$4,661,000	Div	Yes	No	U-6021
111	Fordham Blvd (US 15-501)	I-40	Ephesus Church Rd	4	4	Modernization	1.6	\$2,052,000	St	Yes	No	U-5304F
240	Fordham Blvd (US 15-501)	NC 54	Ephesus Church Rd	4	4	Modernization	2.1	\$45,498,000	St	Yes	No	U-5304D
73	Fordham Blvd (US 15-501)	NC 54	NC 86 (S. Columbia)	4	4	Modernization	2.3	\$49,832,000	St	Yes	No	U-5304B
204	Fordham Blvd/Raleigh Rd	Interchange	--	-	-	Upgrade	N/A	\$14,800,000	St	No	93.127	U-5774A
626	Fordham Blvd/S Columbia St	Interchange	--	-	-	Upgrade	N/A	\$35,000,000	St	Yes	No	U-5304A
379	Freeland Memorial Extension	S Churton St	New Collector Rd	-	2	New Location	0.5	\$3,203,000	Div	No	No	N/A
45.3	I-40 (westbound auxiliary lane)	NC 147	NC 55	6	7	Widening	1.2	\$3,850,000	St	No	No	I-5707
638	I-40/NC 86	Interchange	--	-	-	Upgrade	N/A	\$16,500,000	St	Yes	No	I-3306AC
223	Legion Rd Ext	Legion Rd	Fordham Blvd	-	2	New Location	0.1	\$1,500,000	Div	No	No	N/A
407	Lynn Rd/Pleasant Dr Connector	Lynn Rd	Pleasant Dr	-	2	New Location	0.6	\$3,651,000	Div	No	No	N/A
64.12	NC 147 (Operational Improvements)	Duke Street	Briggs Avenue	4	4	Modernization	1.8	\$58,400,000	St	No	No	U-5937
64.13	NC 147 (possible Managed Lanes)	East End Conn	I-40	4	8	Widening	3.9	\$179,248,000	St	Yes	No	U-5934
428	NC 54	Old Fayetteville Rd	MPO Boundary	2	2	Modernization	2.9	\$14,457,000	Reg	Yes	No	R-5821A
69.21	NC 54	Highgate Dr	Fayetteville Rd	4	4	Modernization	0.4	(see #69.2)	Reg	No	93.126	U-5774H
75.2	NC 55 (Alston Ave)	Main St	NC 98	2	2	Modernization	0.6	-	Reg	No	No	U-3308
75.1	NC 55 (Alston Ave)	NC 147	Main St	2	4	Widening	0.4	-	Reg	No	No	U-3308
437	New Collector Rd	Orange Grove Rd Extension	Becketts Ridge Rd	-	2	New Location	0.8	\$7,232,000	Div	No	No	N/A
89.3	Orange Grove Connector	Orange Grove Rd	US 70	-	2	New Location	0.4	\$5,299,000	Div	No	No	U-5848
220	Purefoy Rd Ext	Sandberg Ln	Weaver Dairy Rd	-	2	New Location	0.6	\$3,777,000	Div	No	No	N/A
221	S Elliot Rd Ext	Fordham Blvd	Ephesus Church Rd	-	2	New Location	0.3	\$4,230,000	Div	No	No	N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
87	S Churton St	Eno River in Hillsborough	I-40	2	4	Widening	2.2	\$31,825,000	Div	No	No	U-5845
113.1	US 15-501/Garrett Rd	Interchange	--	-	-	New	N/A	\$71,200,000	St	Yes	No	U-5717
485	US 70 (freeway conversion)	Lynn Rd	S Miami Blvd	4	6	Freeway	1.6	\$111,020,000	St	Yes	No	U-5720A
116.1	US 70/Miami Blvd/Sherron Rd	Interchange	--	-	-	New	N/A	\$46,621,000	St	Yes	No	U-5720B
123.11	Woodcroft Pkwy Ext	Garrett Rd	Hope Valley Rd	-	2	New Location	0.0	\$2,219,000	Div	No	No	U-5823
2035 MTP												
346	Danziger Dr Extension	Mt Moriah Rd	E Lakewood Dr	-	2	New Location	0.4	\$5,127,000	Div	No	No	N/A
367	Erwin Rd	Cameron Blvd	W Main St	4	4	Modernization	1.8	\$12,025,000	Div	No	No	N/A
373	Falconbridge Rd Connector	Falconbridge Rd	Farrington Rd	-	2	New Location	0.2	\$1,227,000	Div	No	No	N/A
201	Falconbridge Rd Extension	Farrington Rd	NC 54	-	4	New Location	0.9	\$16,685,000	Div	No	No	N/A
24.11	Garrett Rd	NC 751	Old Durham Rd	2	4	Widening	2.1	\$16,064,000	Div	No	No	N/A
36	Homestead Rd	Old NC 86	Rogers Rd	2	2	Modernization	2.1	\$10,234,000	Div	No	No	N/A
35	Homestead Rd	Rogers Rd	NC 86	2	2	Modernization	1.3	\$6,855,000	Div	No	No	N/A
77.1	Hope Valley Rd (NC 751)	S Roxboro St	Woodcroft Parkway	2	4	Widening	0.3	\$2,716,000	Reg	No	No	N/A
77.11	Hope Valley Rd (NC 751)	NC 54	Woodcroft Pkwy	4	4	Modernization	-	(see #77.1)	Reg	No	No	N/A
202	Hopson Rd	Davis Dr	S Miami Blvd (NC 54)	2	4	Widening	0.7	\$5,200,000	Div	No	No	N/A
44	I-40	NC 86	I-85	4	6	Widening	7.8	\$58,784,000	St	Yes	No	I-3306AA
43	I-40	Durham County Line	NC 86	4	6	Widening	3.9	\$29,316,000	St	Yes	No	I-3306AB
45	I-40 Managed Lanes	Wake County Line	NC 147	8	10	Widening	3.4	\$446,464,000	St	Yes	No	I-5702B
70.4	I-40/ NC 54 ramp	Farrington Rd.	I-40	-	1	New Location	0.2	\$1,600,000	St	No	No	N/A
646	I-85/NC 86	Interchange	--	-	-	Upgrade	N/A	\$16,488,000	St	No	No	I-5984
650	I-85/S Churton St	Interchange	--	-	-	Upgrade	N/A	\$20,700,000	St	No	No	I-5967
50.11	Jack Bennet Rd/Lystra Rd	US 15-501 South	Farrington Mill/Point Rd	2	2	Modernization	4.1	\$20,567,000	Div	No	No	N/A
51	Lake Hogan Farms Rd	Eubanks Rd	Legends Way	-	2	New Location	0.7	\$4,407,000	Div	No	No	N/A
410	Marriott Way	Friday Center Dr	Barbee Chapel Rd	-	2	New Location	0.2	\$682,000	Div	No	No	N/A
69.4	NC 54	Barbee	NC 55	2	4	Widening	1.3	\$46,400,000	Reg	No	No	U-5774J
69.3	NC 54	Fayetteville	Barbee	2	4	Widening	1.0	\$46,800,000	Reg	No	No	U-5774I
70.3	NC 54	Fordham Blvd (US 15-501)	Barbee Chapel Rd	6	6	Modernization	1.2	\$32,106,000	Reg	Yes	No	U-5774B

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
69.1	NC 54	I-40 Interchange	NC 751	2	4	Widening	1.2	\$32,000,000	Reg	No	No	U-5774G
69.2	NC 54	NC 751	Highgate Dr	2	4	Widening	1.5	\$21,600,000	Reg	No	No	U-5774H
70	NC 54 (widening; superstreet)	I-40	Barbee Chapel Rd	4	6	Widening	1.6	\$9,100,000	Reg	Yes	No	U-5774C
75.3	NC 55 (Alston Ave)	Main St	NC 98	2	4	Modernization	0.5	\$1,000	Reg	No	No	U-3308
440	New Hope Commons Dr Extension	Eastowne Dr	New Hope Commons Dr	-	2	New Location	0.4	\$4,588,000	Div	No	No	N/A
94	Roxboro St	Cornwallis Rd	MLK Pkwy	-	4	New Location	1.2	\$12,063,000	Div	No	No	N/A
230	Southwest Durham Dr	NC 54	I-40	-	2	New Location	2.0	\$12,402,000	Div	No	No	N/A
476	University Dr	MLK Parkway	Shannon Rd	5	4	Modernization	0.5	\$768,000	Div	No	No	N/A
113	US 15-501 (expressway conversion)	US 15-501 Bypass	I-40	6	6	Expressway	2.0	\$195,300,000	St	Yes	No	U-6067
116	US 70 (freeway conversion)	S Miami Blvd	MPO boundary	4	6	Freeway	2.5	\$173,469,000	St	Yes	No	U-5720C
2045 MTP												
304.1	Angier Av Ext	US 70	Leesville Rd	-	2	New Location	0.8	\$4,784,000	Div	No	No	N/A
244	Angier/Glover Connector	Ellis Rd	Glover Rd	-	2	New Location	1.4	\$8,625,000	Div	No	No	N/A
343	Crown Pkwy/Roche Dr	Page Rd	T.W. Alexander Dr	-	2	New Location	2.7	\$11,041,000	Div	No	No	N/A
364	Eno Mountain Rd realignment	Mayo St	Eno Mountain Rd	2	2	New Location	0.3	\$2,015,000	Div	No	93.126	N/A
24.12	Garrett Rd	Old Durham Rd	US 15-501	2	4	Widening	1.0	\$7,761,000	Div	No	No	N/A
28.11	Glover Rd	Angier	US 70	-	2	New Location	0.6	\$3,714,000	Div	No	No	N/A
382	Hebron Rd Extension	Hebron Rd	Roxboro Rd (501 N)	-	2	New Location	0.5	\$3,612,000	Div	No	No	N/A
434	Holloway St (NC 98)	Miami Blvd	Nichols Farm Dr	4	4	Modernization	3.3	\$17,705,000	Reg	No	No	N/A
394	Hopson Rd	Louis Stephens Dr	Davis Dr	2	4	Widening	1.1	\$9,195,000	Div	No	No	N/A
45.21	I-40 Managed Lanes	NC 54	US 15-501	6	8	Widening	2.9	\$85,621,000	St	Yes	No	I-5702A
45.22	I-40 Managed Lanes	NC 147	NC 54	6	10	Widening	6.4	\$250,290,000	St	Yes	No	I-5702A
48.1	I-85	Mt Herman Church Rd	Durham County Line	4	6	Widening	2.5	\$39,118,000	St	Yes	No	I-5983
48	I-85	Mt Herman Church Rd	I-40	4	6	Widening	6.0	\$197,378,000	St	Yes	No	N/A
49	I-85	US 70	Red Mill Rd	4	6	Widening	8.2	\$215,940,000	St	Yes	No	N/A
53	Leesville Rd Ext	US 70/Page Rd Ext	Leesville Rd	-	2	New Location	0.4	\$2,644,000	Div	No	No	N/A
57	Lynn Rd Extension	US 70	Existing Lynn Rd	-	2	New Location	1.1	\$6,862,000	Div	No	No	N/A
242	Mt Carmel Ch Rd	US 15-501	Bennett Rd	2	2	Modernization	0.4	\$1,997,000	Div	No	No	N/A

MTP ID	Highway Project	From	To	Existing Lanes	Proposed Lanes	Improvement Type	Length (miles)	Estimated Cost	STI	Reg. Sig.	Exempt	TIP#
14.1	N Duke St (501 N)	I-85	N Roxboro split	5	4	Modernization	2.5	\$13,279,000	Reg	Yes	No	N/A
76	NC 751	Martha's Chapel Rd	O'Kelly Ch. Rd	2	4	Widening	5.4	\$43,232,000	Reg	No	No	N/A
77.2	NC 751	NC 54	Renaissance Pkwy	2	4	Widening	1.2	\$5,290,000	Reg	No	No	N/A
77.3	NC 751	Renaissance Pkwy	O'Kelly Chapel Rd	2	4	Widening	2.7	\$21,697,000	Reg	No	No	N/A
80	NC 86	Old NC 10	US 70 Business	2	4	Widening	0.9	\$7,259,000	Reg	No	No	N/A
81	NC 86 (and US 70 intersection)	US 70 Bypass	NC 57	2	4	Widening	0.3	\$4,742,000	Reg	No	No	N/A
84	Northern Durham Pkwy	I 85 North	Old Oxford Hwy	-	4	New Location	2.7	\$23,291,000	Div	No	No	N/A
83.1	Northern Durham Pkwy	Sherron Rd	NC 98	-	4	New Location	4.3	\$13,600,000	Div	Yes	No	N/A
83.11	Northern Durham Pkwy	US 70 E	Sherron Rd	-	4	New Location	2.7	\$23,500,000	Div	Yes	No	N/A
502	Patriot Dr Extension	S Miami Blvd	Page Rd	-	2	New Location	1.9	\$13,086,000	Div	No	No	N/A
92	Roxboro Rd (501 N)	Duke St	Goodwin Rd	4	4	Modernization	2.7	\$14,574,000	Reg	Yes	No	N/A
96.1	Sherron Rd	S Mineral Springs Rd	Stallings Rd	2	4	Widening	3.1	\$25,003,000	Div	No	No	N/A
106.1	Southwest Durham Dr	US 15-501 Business	Mt Moriah Rd	-	4	New Location	0.4	\$3,667,000	Div	No	No	N/A
104	Southwest Durham Dr	Sawyer Dr	Old Chapel Hill Rd	2	4	Widening	0.7	\$5,432,000	Div	No	No	N/A
479	US 15-501	Smith Level Rd	MPO Boundary	4	4	Modernization	4.9	\$25,673,000	St	No	No	N/A
114	US 15-501 Bypass	MLK Parkway	I-85	4	6	Widening	4.8	\$80,734,000	St	Yes	No	N/A
81.1	Wake Forest Hwy (NC 98)	Nichols Farm Dr	Wake County Line	2	4	Widening	6.0	\$48,474,000	Reg	Yes	No	N/A
501	Yates Store Rd Extension	Yates Store Rd	Wake Rd	-	2	New Location	1.4	\$11,519,000	Div	No	No	N/A

Forestville Rd Ext

Project ID	A589a
Horizon Year	2035
From	US 64
To	Old Knight Rd
Estimated Cost (\$)	2,262,481
Toll	Non-tolled
Existing Lanes	0
Proposed Lanes	2
Distance	0.29
Proposed Improvement	New Location
Existing Facility	Not Applicable
Future Facility	Major Thoroughfare
STI Category	Division
Complete	0
Committed	0
Current Pavement Condition	Not Available
TIP Number	

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First St Widening

Project ID	A592
Horizon Year	2045
From	Smithfield Rd
To	Horton Rd
Estimated Cost (\$)	22,488,866
Toll	Non-tolled
Existing Lanes	2
Proposed Lanes	4
Distance	2.87
Proposed Improvement	Widening
Existing Facility	Minor Thoroughfare
Future Facility	Boulevard
STI Category	Division
Complete	0
Committed	0
Current Pavement Condition	Good
TIP Number	

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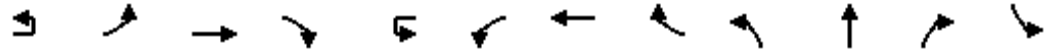
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Appendix E
Background (2023) Analyses

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Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

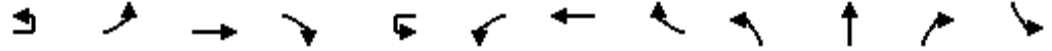
Background (2023) AM
 10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↘		↖	↗	↘	↖	↗	↘	↖
Traffic Volume (vph)	66	152	494	49	13	71	1168	152	177	181	71	166
Future Volume (vph)	66	152	494	49	13	71	1168	152	177	181	71	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.408			0.374
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	760	1863	1583	697
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											118	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	118	276	686	88	39	118	1557	230	268	318	118	263
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	394	686	88	0	157	1557	230	268	318	118	263
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	62.8	62.8			17.2	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.45	0.45			0.12	0.39	0.39	0.32	0.32	0.32
v/c Ratio		1.25	0.43	0.12			0.72	1.11	0.37	1.10	0.53	0.20
Control Delay		181.1	28.2	24.5			76.4	99.5	32.3	130.6	42.8	6.5
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	178	261
Future Volume (vph)	178	261
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	292	492
Shared Lane Traffic (%)		
Lane Group Flow (vph)	292	492
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.49	0.97
Control Delay	41.6	79.6
Queue Delay	0.0	0.0



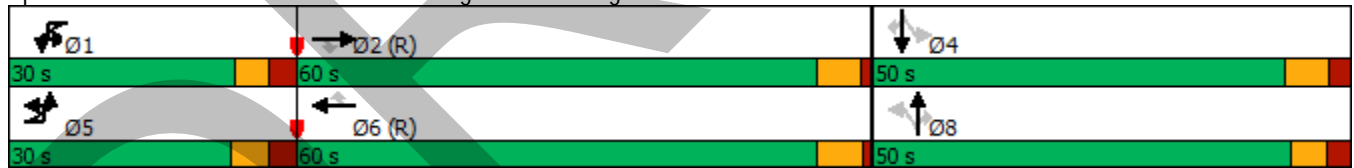
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		181.1	28.2	24.5		76.4	99.5	32.3	130.6	42.8	6.5	157.1
LOS		F	C	C		E	F	C	F	D	A	F
Approach Delay			79.5				89.7			70.1		
Approach LOS			E				F			E		
Queue Length 50th (ft)		-446	221	46		140	-850	147	-276	237	0	-285
Queue Length 95th (ft)		282	226	53		132	#685	152	#274	192	4	#263
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1586	709		319	1404	628	244	598	588	224
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.25	0.43	0.12		0.49	1.11	0.37	1.10	0.53	0.20	1.17

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 84.2
 Intersection Capacity Utilization 87.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service E

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	41.6	79.6
LOS	D	E
Approach Delay	88.5	
Approach LOS	F	
Queue Length 50th (ft)	214	441
Queue Length 95th (ft)	191	287
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.49	0.97
Intersection Summary		

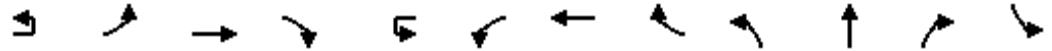
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Intersection						
Int Delay, s/veh	150.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	55	125	110	281	458	97
Future Vol, veh/h	55	125	110	281	458	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	63	70	49	61	44
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	145	198	157	573	751	220
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1748	861	971	0	0	
Stage 1	861	-	-	-	-	
Stage 2	887	-	-	-	-	
Critical Hdwy	6.42	6.22	4.12	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	2.218	-	-	
Pot Cap-1 Maneuver	~ 95	355	710	-	-	
Stage 1	414	-	-	-	-	
Stage 2	402	-	-	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 64	355	710	-	-	
Mov Cap-2 Maneuver	~ 64	-	-	-	-	
Stage 1	279	-	-	-	-	
Stage 2	402	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	893.7	2.5		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	710	-	122	-	-	
HCM Lane V/C Ratio	0.221	-	2.813	-	-	
HCM Control Delay (s)	11.5		893.7	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0.8	-	31.7	-	-	
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Intersection						
Int Delay, s/veh	37.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	15	296	259	81	259	38
Future Vol, veh/h	15	296	259	81	259	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	592	602	125	411	131
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1806	477	542	0	-	0
Stage 1	477	-	-	-	-	-
Stage 2	1329	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	87	~ 588	1027	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 36	~ 588	1027	-	-	-
Mov Cap-2 Maneuver	~ 36	-	-	-	-	-
Stage 1	258	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	98.3	11.1		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1027	-	36	588	-	-
HCM Lane V/C Ratio	0.586	-	1.437	1.007	-	-
HCM Control Delay (s)	13.4	-	\$ 475.9	65.3	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	4	-	5.5	15.2	-	-
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

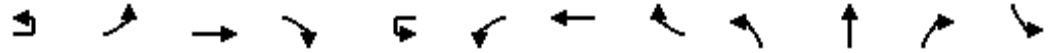
Background (2023) PM
 10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↕	↗		↖	↕	↗	↖	↕	↗	↖
Traffic Volume (vph)	89	168	1278	182	21	81	775	120	141	138	83	134
Future Volume (vph)	89	168	1278	182	21	81	775	120	141	138	83	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.412			0.565
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	767	1863	1583	1052
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											157	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	198	251	1469	268	50	131	1092	171	231	175	157	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	449	1469	268	0	181	1092	171	231	175	157	191
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		27.0	63.1	63.1			18.9	55.0	55.0	43.0	43.0	43.0
Actuated g/C Ratio		0.19	0.45	0.45			0.14	0.39	0.39	0.31	0.31	0.31
v/c Ratio		1.32	0.92	0.38			0.75	0.78	0.27	0.98	0.31	0.26
Control Delay		205.1	47.5	29.2			76.7	41.9	30.4	101.9	38.2	6.0
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	157	127
Future Volume (vph)	157	127
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	280	240
Shared Lane Traffic (%)		
Lane Group Flow (vph)	280	240
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	43.0	43.0
Actuated g/C Ratio	0.31	0.31
v/c Ratio	0.49	0.49
Control Delay	42.4	43.1
Queue Delay	0.0	0.0



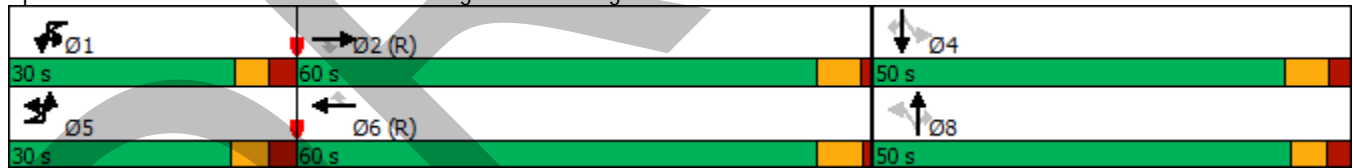
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		205.1	47.5	29.2		76.7	41.9	30.4	101.9	38.2	6.0	49.0
LOS		F	D	C		E	D	C	F	D	A	D
Approach Delay			77.6				44.9			55.3		
Approach LOS			E				D			E		
Queue Length 50th (ft)		~550	671	164		161	454	105	204	119	0	144
Queue Length 95th (ft)		#493	#856	183		153	384	123	188	158	0	166
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		341	1594	712		319	1404	628	246	598	615	338
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.32	0.92	0.38		0.57	0.78	0.27	0.94	0.29	0.26	0.57

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 60.6
 Intersection Capacity Utilization 73.9%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: E
 ICU Level of Service D

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	42.4	43.1
LOS	D	D
Approach Delay	44.4	
Approach LOS	D	
Queue Length 50th (ft)	204	175
Queue Length 95th (ft)	166	138
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.47
Intersection Summary		

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Intersection						
Int Delay, s/veh	32.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	49	155	110	295	205	42
Future Vol, veh/h	49	155	110	295	205	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	47	59	53	67	60	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	104	263	208	440	342	93
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1245	389	435	0	-	0
Stage 1	389	-	-	-	-	-
Stage 2	856	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	192	659	1125	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	145	659	1125	-	-	-
Mov Cap-2 Maneuver	145	-	-	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	121.7	2.9		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1125	-	328	-	-	
HCM Lane V/C Ratio	0.184	-	1.119	-	-	
HCM Control Delay (s)	8.9	0	121.7	-	-	
HCM Lane LOS	A	A	F	-	-	
HCM 95th %tile Q(veh)	0.7	-	14.4	-	-	

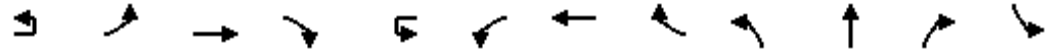
Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	11	79	82	254	164	5
Future Vol, veh/h	11	79	82	254	164	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	263	195	358	248	12
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1002	254	260	0	-	0
Stage 1	254	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	269	785	1304	-	-	-
Stage 1	788	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	229	785	1304	-	-	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	670	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	13.5	2.9	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1304	-	229	785	-	-
HCM Lane V/C Ratio	0.15	-	0.172	0.335	-	-
HCM Control Delay (s)	8.2	-	23.9	11.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.6	1.5	-	-

Appendix F
Background (2032) Analyses

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Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

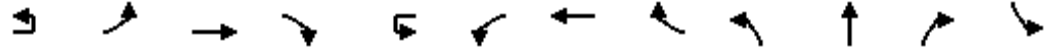
Background (2032) AM
 10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↖		↖	↗	↖	↖	↗	↖	↖
Traffic Volume (vph)	86	228	651	66	19	93	1530	214	233	250	93	240
Future Volume (vph)	86	228	651	66	19	93	1530	214	233	250	93	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.261			0.218
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	486	1863	1583	406
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											155	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	154	415	904	118	58	155	2040	324	353	439	155	381
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	569	904	118	0	213	2040	324	353	439	155	381
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	59.2	59.2			20.8	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.42	0.42			0.15	0.39	0.39	0.32	0.32	0.32
v/c Ratio		1.80	0.60	0.18			0.80	1.45	0.52	2.26	0.73	0.25
Control Delay		405.2	34.1	27.2			79.3	240.9	36.0	612.3	50.7	6.0
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	247	409
Future Volume (vph)	247	409
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	405	772
Shared Lane Traffic (%)		
Lane Group Flow (vph)	405	772
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.68	1.52
Control Delay	47.9	277.8
Queue Delay	0.0	0.0



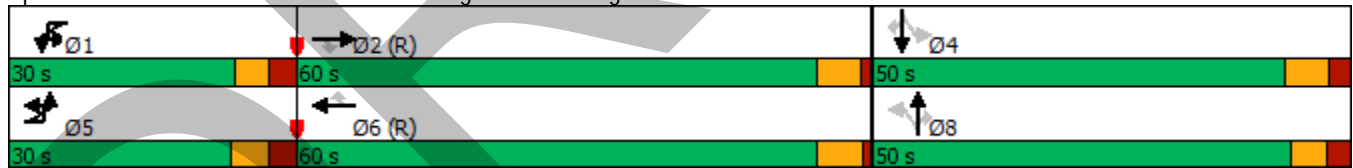
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		405.2	34.1	27.2		79.3	240.9	36.0	612.3	50.7	6.0	908.4
LOS		F	C	C		E	F	D	F	D	A	F
Approach Delay			166.3				201.8			252.7		
Approach LOS			F				F			F		
Queue Length 50th (ft)		-777	335	67		189	-1330	223	-519	355	0	-597
Queue Length 95th (ft)		#499	314	69		171	#1104	214	#489	266	0	#525
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1496	669		319	1404	628	156	598	614	130
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.80	0.60	0.18		0.67	1.45	0.52	2.26	0.73	0.25	2.93

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.93
 Intersection Signal Delay: 240.4
 Intersection Capacity Utilization 114.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	47.9	277.8
LOS	D	F
Approach Delay	372.3	
Approach LOS	F	
Queue Length 50th (ft)	320	-978
Queue Length 95th (ft)	266	#525
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.68	1.52
Intersection Summary		

DRAFT

Intersection						
Int Delay, s/veh	5066.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	FF			FF	FF	
Traffic Vol, veh/h	71	204	176	394	663	127
Future Vol, veh/h	71	204	176	394	663	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	38	63	70	49	61	44
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	187	324	251	804	1087	289
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2538	1232	1376	0	-	0
Stage 1	1232	-	-	-	-	-
Stage 2	1306	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 30	~ 216	498	-	-	-
Stage 1	275	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 3	~ 216	498	-	-	-
Mov Cap-2 Maneuver	~ 3	-	-	-	-	-
Stage 1	~ 24	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	179.2	4.6	0			
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	498	-	8	-	-	
HCM Lane V/C Ratio	0.505	-	63.831	-	-	
HCM Control Delay (s)	19.4	-	179.2	-	-	
HCM Lane LOS	C	A	F	-	-	
HCM 95th %tile Q(veh)	2.8	-	65.7	-	-	
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Intersection						
Int Delay, s/veh	610.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑	↗	
Traffic Vol, veh/h	20	386	338	131	385	50
Future Vol, veh/h	20	386	338	131	385	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	772	786	202	611	172
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2471	697	783	0	-	0
Stage 1	697	-	-	-	-	-
Stage 2	1774	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 33	~ 441	835	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 2	~ 441	835	-	-	-
Mov Cap-2 Maneuver	~ 2	-	-	-	-	-
Stage 1	~ 29	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, \$1859.2		32.5	0			
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	835	-	2	441	-	-
HCM Lane V/C Ratio	0.941	-	34.483	1.751	-	-
HCM Control Delay (s)	40.8	-	\$ 18541.1	\$ 369	-	-
HCM Lane LOS	E	-	F	F	-	-
HCM 95th %tile Q(veh)	14.4	-	10.8	47.5	-	-
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Watson Tract TIA
1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

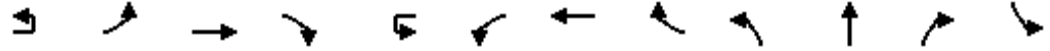
Background (2023) PM
10/29/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↖		↖	↗	↖	↖	↗	↖	↖
Traffic Volume (vph)	115	282	1673	240	31	106	1017	180	186	194	108	193
Future Volume (vph)	115	282	1673	240	31	106	1017	180	186	194	108	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850				0.850
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.283			0.471
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	527	1863	1583	877
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												193
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	256	421	1923	353	74	171	1432	257	305	246	204	276
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	677	1923	353	0	245	1432	257	305	246	204	276
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	57.5	57.5			22.5	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.41	0.41			0.16	0.39	0.39	0.32	0.32	0.32
v/c Ratio		2.14	1.32	0.54			0.85	1.02	0.41	1.80	0.41	0.32
Control Delay		552.0	185.3	35.9			82.7	70.9	33.2	414.0	39.7	6.8
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	217	206
Future Volume (vph)	217	206
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	388	389
Shared Lane Traffic (%)		
Lane Group Flow (vph)	388	389
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.65	0.77
Control Delay	46.8	54.1
Queue Delay	0.0	0.0



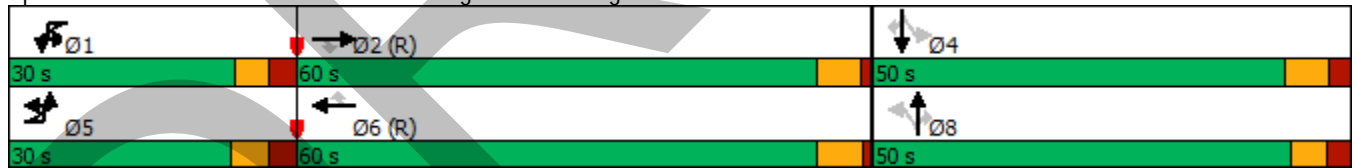
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		552.0	185.3	35.9		82.7	70.9	33.2	414.0	39.7	6.8	96.5
LOS		F	F	D		F	E	C	F	D	A	F
Approach Delay			251.5				67.4			182.0		
Approach LOS			F				E			F		
Queue Length 50th (ft)		-981	-1216	248		216	-725	168	-416	175	7	249
Queue Length 95th (ft)		#833	#1288	244		203	548	181	#360	219	0	#284
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1452	649		319	1404	628	169	598	639	281
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		2.14	1.32	0.54		0.77	1.02	0.41	1.80	0.41	0.32	0.98

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.14
 Intersection Signal Delay: 160.8
 Intersection Capacity Utilization 92.2%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	46.8	54.1
LOS	D	D
Approach Delay	62.5	
Approach LOS	E	
Queue Length 50th (ft)	303	319
Queue Length 95th (ft)	229	223
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.65	0.77
Intersection Summary		

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Intersection						
Int Delay, s/veh	499.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	64	227	187	443	313	54
Future Vol, veh/h	64	227	187	443	313	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	47	59	53	67	60	45
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	385	353	661	522	120
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1949	582	642	0	-	0
Stage 1	582	-	-	-	-	-
Stage 2	1367	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 71	513	943	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 29	513	943	-	-	-
Mov Cap-2 Maneuver	~ 29	-	-	-	-	-
Stage 1	228	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, \$	2079.3	3.9		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	943	-	96	-	-	
HCM Lane V/C Ratio	0.374	-	5.426	-	-	
HCM Control Delay (s)	11.1		2079.3	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	1.8	-	56.6	-	-	
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

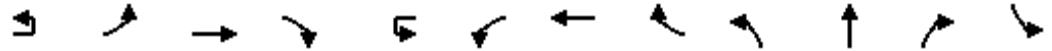
Intersection						
Int Delay, s/veh	6.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	14	103	107	377	248	7
Future Vol, veh/h	14	103	107	377	248	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	343	255	531	376	17
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1426	385	393	0	-	0
Stage 1	385	-	-	-	-	-
Stage 2	1041	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	149	663	1166	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	116	663	1166	-	-	-
Mov Cap-2 Maneuver	116	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	21.4	2.9	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1166	-	116	663	-	-
HCM Lane V/C Ratio	0.218	-	0.431	0.518	-	-
HCM Control Delay (s)	8.9	-	57.7	16.1	-	-
HCM Lane LOS	A	-	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	1.9	3	-	-

Appendix G
Build (2023) Analyses

DRAFT

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

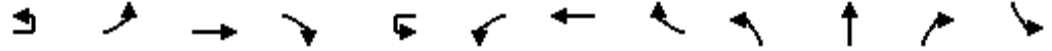
Build (2023) AM
 12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↖		↖	↗	↖	↖	↗	↖	↖
Traffic Volume (vph)	66	164	494	49	13	71	1168	154	177	182	71	173
Future Volume (vph)	66	164	494	49	13	71	1168	154	177	182	71	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.402			0.372
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	749	1863	1583	693
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											118	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	118	298	686	88	39	118	1557	233	268	319	118	275
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	416	686	88	0	157	1557	233	268	319	118	275
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	62.8	62.8			17.2	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.45	0.45			0.12	0.39	0.39	0.32	0.32	0.32
v/c Ratio		1.32	0.43	0.12			0.72	1.11	0.37	1.12	0.53	1.24
Control Delay		207.1	28.2	24.5			76.4	99.5	32.4	136.5	42.9	6.5
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	181	299
Future Volume (vph)	181	299
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Fr _t		0.850
Fl _t Protected		
Satd. Flow (prot)	1863	1583
Fl _t Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	297	564
Shared Lane Traffic (%)		
Lane Group Flow (vph)	297	564
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.50	1.11
Control Delay	41.8	117.3
Queue Delay	0.0	0.0



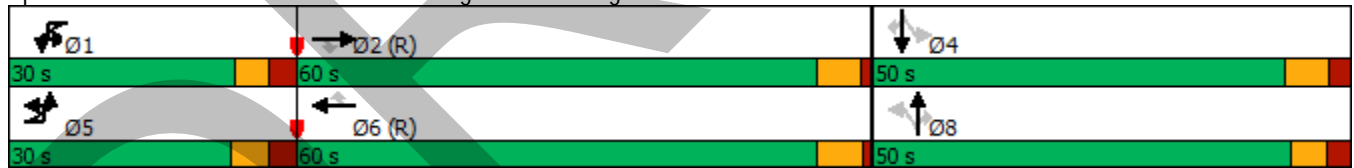
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		207.1	28.2	24.5		76.4	99.5	32.4	136.5	42.9	6.5	179.9
LOS		F	C	C		E	F	C	F	D	A	F
Approach Delay			90.5				89.6			72.4		
Approach LOS			F				F			E		
Queue Length 50th (ft)		-488	221	46		140	-850	150	-279	238	0	-309
Queue Length 95th (ft)		#310	226	53		132	#685	153	#277	193	4	#281
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1586	709		319	1404	628	240	598	588	222
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.32	0.43	0.12		0.49	1.11	0.37	1.12	0.53	0.20	1.24

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 92.7
 Intersection Capacity Utilization 90.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service E

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	41.8	117.3
LOS	D	F
Approach Delay	112.8	
Approach LOS	F	
Queue Length 50th (ft)	219	-585
Queue Length 95th (ft)	194	335
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.50	1.11
Intersection Summary		

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Intersection												
Int Delay, s/veh	362.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	55	6	125	48	17	3	110	281	15	1	458	97
Future Vol, veh/h	55	6	125	48	17	3	110	281	15	1	458	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	90	63	90	90	90	70	49	90	90	61	44
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	145	7	198	53	19	3	157	573	17	1	751	220

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1770	1767	861	1862	1869	582	971	0	0	590	0	0
Stage 1	863	863	-	896	896	-	-	-	-	-	-	-
Stage 2	907	904	-	966	973	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 65	84	355	56	72	513	710	-	-	985	-	-
Stage 1	349	372	-	335	359	-	-	-	-	-	-	-
Stage 2	330	356	-	306	330	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 34	56	355	~ 17	48	513	710	-	-	985	-	-
Mov Cap-2 Maneuver	~ 34	56	-	~ 17	48	-	-	-	-	-	-	-
Stage 1	234	371	-	224	241	-	-	-	-	-	-	-
Stage 2	202	239	-	132	329	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$	1884.3	1547.9	2.4	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	710	-	-	71	21	985	-	-
HCM Lane V/C Ratio	0.221	-	-	4.927	3.598	0.001	-	-
HCM Control Delay (s)	11.5	0	\$ 1884.3	\$ 1547.9	8.7	0	-	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	38.3	9.7	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	37.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	15	296	259	84	260	38
Future Vol, veh/h	15	296	259	84	260	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	592	602	129	413	131
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1812	479	544	0	-	0
Stage 1	479	-	-	-	-	-
Stage 2	1333	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	86	~ 587	1025	-	-	-
Stage 1	623	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 36	~ 587	1025	-	-	-
Mov Cap-2 Maneuver	~ 36	-	-	-	-	-
Stage 1	257	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	98.8	11	0			
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1025	-	36	587	-	-
HCM Lane V/C Ratio	0.588	-	1.437	1.009	-	-
HCM Control Delay (s)	13.4	-	\$ 475.9	65.8	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	4	-	5.5	15.2	-	-
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	22	17	0	0	51
Future Vol, veh/h	0	22	17	0	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	19	0	0	57
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	19
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1059
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1059
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		8.6		
HCM LOS				A		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1059		
HCM Lane V/C Ratio	-	-	-	0.054		
HCM Control Delay (s)	-	-	-	8.6		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.2		

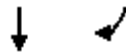
Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	22	0	0	0	0	17
Future Vol, veh/h	22	0	0	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	0	0	0	19
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1	0	-	0	49	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	48	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	960	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	974	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	946	1084
Mov Cap-2 Maneuver	-	-	-	-	946	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	974	-
Approach	EB	WB		SB		
HCM Control Delay, s	7.3	0		8.4		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	1084	
HCM Lane V/C Ratio	0.015	-	-	-	0.017	
HCM Control Delay (s)	7.3	0	-	-	8.4	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

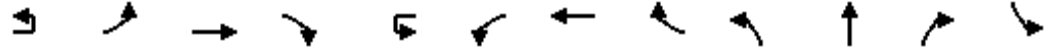
Build (2023) PM
 12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↕	↗		↖	↕	↗	↖	↕	↗	↖
Traffic Volume (vph)	89	208	1278	182	21	81	775	128	141	142	83	139
Future Volume (vph)	89	208	1278	182	21	81	775	128	141	142	83	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.408			0.558
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	760	1863	1583	1039
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											157	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	198	310	1469	268	50	131	1092	183	231	180	157	199
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	508	1469	268	0	181	1092	183	231	180	157	199
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		26.8	62.8	62.8			18.9	55.0	55.0	43.2	43.2	43.2
Actuated g/C Ratio		0.19	0.45	0.45			0.14	0.39	0.39	0.31	0.31	0.31
v/c Ratio		1.50	0.93	0.38			0.75	0.78	0.29	0.99	0.31	0.26
Control Delay		279.1	48.0	29.3			76.7	41.9	30.8	102.8	38.2	6.0
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	159	152
Future Volume (vph)	159	152
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	284	287
Shared Lane Traffic (%)		
Lane Group Flow (vph)	284	287
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	43.2	43.2
Actuated g/C Ratio	0.31	0.31
v/c Ratio	0.49	0.59
Control Delay	42.4	46.1
Queue Delay	0.0	0.0



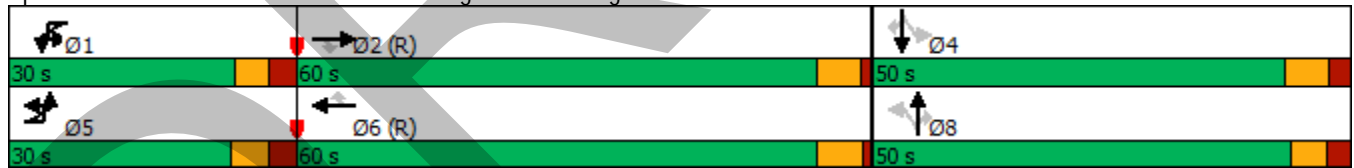
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		279.1	48.0	29.3		76.7	41.9	30.8	102.8	38.2	6.0	50.6
LOS		F	D	C		E	D	C	F	D	A	D
Approach Delay			98.0				44.8			55.6		
Approach LOS			F				D			E		
Queue Length 50th (ft)		-661	671	164		161	454	113	205	123	0	152
Queue Length 95th (ft)		#582	#856	183		153	384	131	189	163	0	175
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		338	1588	710		319	1404	628	244	598	615	333
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.50	0.93	0.38		0.57	0.78	0.29	0.95	0.30	0.26	0.60

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.50
 Intersection Signal Delay: 69.9
 Intersection Capacity Utilization 74.0%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service D

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	42.4	46.1
LOS	D	D
Approach Delay	45.9	
Approach LOS	D	
Queue Length 50th (ft)	207	217
Queue Length 95th (ft)	169	164
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.56
Intersection Summary		

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Intersection												
Int Delay, s/veh	84.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	49	18	155	32	11	2	110	295	53	4	205	42
Future Vol, veh/h	49	18	155	32	11	2	110	295	53	4	205	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	90	59	90	90	90	53	67	90	90	60	45
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	104	20	263	36	12	2	208	440	59	4	342	93

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1290	1312	389	1424	1329	470	435	0	0	499	0	0
Stage 1	397	397	-	886	886	-	-	-	-	-	-	-
Stage 2	893	915	-	538	443	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	140	159	659	113	155	594	1125	-	-	1065	-	-
Stage 1	629	603	-	339	363	-	-	-	-	-	-	-
Stage 2	336	352	-	527	576	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 103	117	659	47	114	594	1125	-	-	1065	-	-
Mov Cap-2 Maneuver	~ 103	117	-	47	114	-	-	-	-	-	-	-
Stage 1	467	600	-	252	269	-	-	-	-	-	-	-
Stage 2	237	261	-	305	573	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$	315.7	194.3	2.6	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1125	-	-	245	58	1065	-
HCM Lane V/C Ratio	0.184	-	-	1.579	0.862	0.004	-
HCM Control Delay (s)	8.9	0	-	\$ 315.7	194.3	8.4	0
HCM Lane LOS	A	A	-	F	F	A	A
HCM 95th %tile Q(veh)	0.7	-	-	23.8	3.9	0	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	11	79	82	256	168	5
Future Vol, veh/h	11	79	82	256	168	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	263	195	361	255	12
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1012	261	267	0	-	0
Stage 1	261	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	265	778	1297	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	225	778	1297	-	-	-
Mov Cap-2 Maneuver	225	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	13.6	2.9	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1297	-	225	778	-	-
HCM Lane V/C Ratio	0.151	-	0.175	0.338	-	-
HCM Control Delay (s)	8.3	-	24.4	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.6	1.5	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	75	11	0	0	34
Future Vol, veh/h	0	75	11	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	83	12	0	0	38
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	12
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1069
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	SB			
HCM Control Delay, s	0	0	8.5			
HCM LOS						A
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1069		
HCM Lane V/C Ratio	-	-	-	0.035		
HCM Control Delay (s)	-	-	-	8.5		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Intersection						
Int Delay, s/veh	7.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	75	0	0	0	0	11
Future Vol, veh/h	75	0	0	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	0	0	0	0	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1	0	-	0	167
Stage 1	-	-	-	-	1
Stage 2	-	-	-	-	166
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1622	-	-	-	823
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	863
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	781
Mov Cap-2 Maneuver	-	-	-	-	781
Stage 1	-	-	-	-	970
Stage 2	-	-	-	-	863

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.4
HCM LOS			A

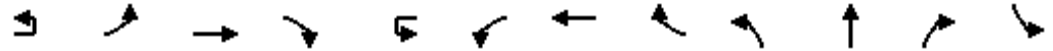
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.051	-	-	-	0.011
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0

Appendix H
Build (2032) Analyses

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Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

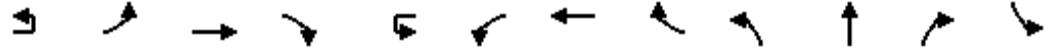
Build (2032) AM
 12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↖		↖	↗	↖	↖	↗	↖	↖
Traffic Volume (vph)	86	240	651	66	19	93	1530	216	233	251	93	247
Future Volume (vph)	86	240	651	66	19	93	1530	216	233	251	93	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.255			0.217
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	475	1863	1583	404
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											155	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	154	436	904	118	58	155	2040	327	353	440	155	392
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	590	904	118	0	213	2040	327	353	440	155	392
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	59.2	59.2			20.8	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.42	0.42			0.15	0.39	0.39	0.32	0.32	0.32
v/c Ratio		1.87	0.60	0.18			0.80	1.45	0.52	2.32	0.74	0.25
Control Delay		433.5	34.1	27.2			79.3	240.9	36.1	638.7	50.8	956.2
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	250	447
Future Volume (vph)	250	447
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	410	843
Shared Lane Traffic (%)		
Lane Group Flow (vph)	410	843
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.69	1.66
Control Delay	48.3	337.0
Queue Delay	0.0	0.0



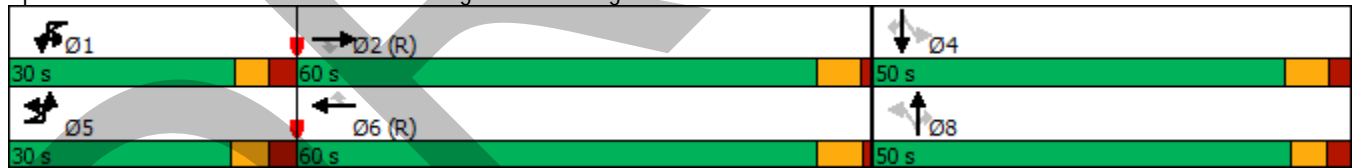
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		433.5	34.1	27.2		79.3	240.9	36.1	638.7	50.8	6.0	956.2
LOS		F	C	C		E	F	D	F	D	A	F
Approach Delay			179.8				201.6			262.4		
Approach LOS			F				F			F		
Queue Length 50th (ft)		-816	335	67		189	-1330	226	-523	356	0	-618
Queue Length 95th (ft)		#525	314	69		171	#1104	215	#493	267	0	#541
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1496	669		319	1404	628	152	598	614	129
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.87	0.60	0.18		0.67	1.45	0.52	2.32	0.74	0.25	3.04

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 3.04
 Intersection Signal Delay: 256.1
 Intersection Capacity Utilization 117.6%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service H

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	48.3	337.0
LOS	D	F
Approach Delay	412.6	
Approach LOS	F	
Queue Length 50th (ft)	325	~1112
Queue Length 95th (ft)	269	#606
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	1.66
Intersection Summary		

DRAFT

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	71	6	204	48	17	3	176	394	15	1	663	127
Future Vol, veh/h	71	6	204	48	17	3	176	394	15	1	663	127
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	90	63	90	90	90	70	49	90	90	61	44
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	187	7	324	53	19	3	251	804	17	1	1087	289

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2560	2557	1232	2714	2693	813	1376	0	0	821	0	0
Stage 1	1234	1234	-	1315	1315	-	-	-	-	-	-	-
Stage 2	1326	1323	-	1399	1378	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 18	26	~ 216	~ 14	22	378	498	-	-	808	-	-
Stage 1	216	249	-	194	228	-	-	-	-	-	-	-
Stage 2	192	226	-	174	212	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 2	~ 216	-	~ 2	378	498	-	-	808	-	-
Mov Cap-2 Maneuver	-	~ 2	-	-	~ 2	-	-	-	-	-	-	-
Stage 1	~ 15	248	-	~ 14	~ 16	-	-	-	-	-	-	-
Stage 2	-	16	-	-	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s					4.5		0	
HCM LOS								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	498	-	-	-	808	-	-
HCM Lane V/C Ratio	0.505	-	-	-	0.001	-	-
HCM Control Delay (s)	19.4	0	-	-	9.5	0	-
HCM Lane LOS	C	A	-	-	A	A	-
HCM 95th %tile Q(veh)	2.8	-	-	-	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	610					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑	↗	
Traffic Vol, veh/h	20	386	338	134	386	50
Future Vol, veh/h	20	386	338	134	386	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	772	786	206	613	172

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2477	699	785	0	-	0
Stage 1	699	-	-	-	-	-
Stage 2	1778	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 33	~ 440	834	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 2	~ 440	834	-	-	-
Mov Cap-2 Maneuver	~ 2	-	-	-	-	-
Stage 1	~ 29	-	-	-	-	-
Stage 2	148	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, \$1860.9		32.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	834	-	2	440	-	-
HCM Lane V/C Ratio	0.943	-	34.483	1.755	-	-
HCM Control Delay (s)	41.1	\$ 18541.1	\$ 370.8		-	-
HCM Lane LOS	E	-	F	F	-	-
HCM 95th %tile Q(veh)	14.4	-	10.8	47.6	-	-

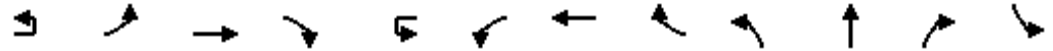
Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	22	17	0	0	51
Future Vol, veh/h	0	22	17	0	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	19	0	0	57
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	19
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1059
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1059
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	SB			
HCM Control Delay, s	0	0	8.6			
HCM LOS						A
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1059		
HCM Lane V/C Ratio	-	-	-	0.054		
HCM Control Delay (s)	-	-	-	8.6		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.2		

Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	22	0	0	0	0	17
Future Vol, veh/h	22	0	0	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	0	0	0	19
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1	0	-	0	49	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	48	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	960	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	974	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	946	1084
Mov Cap-2 Maneuver	-	-	-	-	946	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	974	-
Approach	EB	WB		SB		
HCM Control Delay, s	7.3	0		8.4		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	1084	
HCM Lane V/C Ratio	0.015	-	-	-	0.017	
HCM Control Delay (s)	7.3	0	-	-	8.4	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

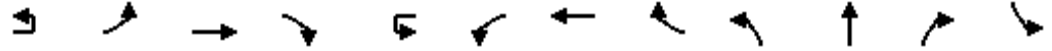
Build (2032) PM
 12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↕	↗		↖	↕	↗	↖	↕	↗	↖
Traffic Volume (vph)	115	322	1673	240	31	106	1017	188	186	198	108	198
Future Volume (vph)	115	322	1673	240	31	106	1017	188	186	198	108	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.279			0.464
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	520	1863	1583	864
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											193	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	256	481	1923	353	74	171	1432	269	305	251	204	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	1923	353	0	245	1432	269	305	251	204	283
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	57.5	57.5			22.5	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.41	0.41			0.16	0.39	0.39	0.32	0.32	0.32
v/c Ratio		2.33	1.32	0.54			0.85	1.02	0.43	1.83	0.42	0.32
Control Delay		634.6	185.3	35.9			82.7	70.9	33.7	423.4	39.9	6.8
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	219	231
Future Volume (vph)	219	231
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	391	436
Shared Lane Traffic (%)		
Lane Group Flow (vph)	391	436
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.65	0.86
Control Delay	47.0	62.1
Queue Delay	0.0	0.0



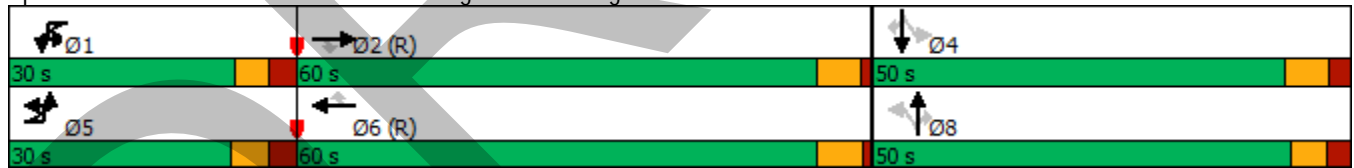
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		634.6	185.3	35.9		82.7	70.9	33.7	423.4	39.9	6.8	106.3
LOS		F	F	D		F	E	C	F	D	A	F
Approach Delay			277.7				67.3			184.9		
Approach LOS			F				E			F		
Queue Length 50th (ft)		~1094	~1216	248		216	~725	177	~418	179	7	~272
Queue Length 95th (ft)		#920	#1288	244		203	548	189	#362	224	0	#297
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1452	649		319	1404	628	167	598	639	277
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		2.33	1.32	0.54		0.77	1.02	0.43	1.83	0.42	0.32	1.02

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.33
 Intersection Signal Delay: 173.3
 Intersection Capacity Utilization 93.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	47.0	62.1
LOS	D	E
Approach Delay	68.0	
Approach LOS	E	
Queue Length 50th (ft)	306	372
Queue Length 95th (ft)	231	251
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.65	0.86
Intersection Summary		

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Intersection												
Int Delay, s/veh	1920.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	64	18	227	32	11	2	187	443	53	4	313	54
Future Vol, veh/h	64	18	227	32	11	2	187	443	53	4	313	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	90	59	90	90	90	53	67	90	90	60	45
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	136	20	385	36	12	2	353	661	59	4	522	120

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1994	2016	582	2190	2047	691	642	0	0	720	0	0
Stage 1	590	590	-	1397	1397	-	-	-	-	-	-	-
Stage 2	1404	1426	-	793	650	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 45	59	513	~ 33	56	445	943	-	-	882	-	-
Stage 1	494	495	-	175	208	-	-	-	-	-	-	-
Stage 2	173	201	-	382	465	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 12	22	513	~ 1	20	445	943	-	-	882	-	-
Mov Cap-2 Maneuver	~ 12	22	-	~ 1	20	-	-	-	-	-	-	-
Stage 1	182	492	-	65	77	-	-	-	-	-	-	-
Stage 2	~ 53	74	-	91	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$	5527.6	28862	3.6	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	943	-	-	42	1	882	-	-
HCM Lane V/C Ratio	0.374	-	-	12.879	50	0.005	-	-
HCM Control Delay (s)	11.1	0	\$ 5527.6	28862	9.1	0	-	-
HCM Lane LOS	B	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	1.8	-	-	65.5	8.4	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 6.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	14	103	107	379	252	7
Future Vol, veh/h	14	103	107	379	252	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	343	255	534	382	17

Major/Minor

	Minor2	Major1	Major2		
Conflicting Flow All	1435	391	399	0	0
Stage 1	391	-	-	-	-
Stage 2	1044	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	147	658	1160	-	-
Stage 1	683	-	-	-	-
Stage 2	339	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	115	658	1160	-	-
Mov Cap-2 Maneuver	115	-	-	-	-
Stage 1	533	-	-	-	-
Stage 2	339	-	-	-	-

Approach

	EB	NB	SB
HCM Control Delay, s	21.7	2.9	0
HCM LOS	C		

Minor Lane/Major Mvmt

	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1160	-	115	658	-	-
HCM Lane V/C Ratio	0.22	-	0.435	0.522	-	-
HCM Control Delay (s)	9	-	58.5	16.3	-	-
HCM Lane LOS	A	-	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	1.9	3	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	75	11	0	0	34
Future Vol, veh/h	0	75	11	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	83	12	0	0	38
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	12
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1069
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		8.5		
HCM LOS				A		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1069		
HCM Lane V/C Ratio	-	-	-	0.035		
HCM Control Delay (s)	-	-	-	8.5		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Intersection						
Int Delay, s/veh	7.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	75	0	0	0	0	11
Future Vol, veh/h	75	0	0	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	0	0	0	0	12
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	1	0	-	0	167	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	823	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	781	1084
Mov Cap-2 Maneuver	-	-	-	-	781	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	863	-
Approach	EB	WB	SB			
HCM Control Delay, s	7.3	0	8.4			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	1084	
HCM Lane V/C Ratio	0.051	-	-	-	0.011	
HCM Control Delay (s)	7.3	0	-	-	8.4	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.2	-	-	-	0	

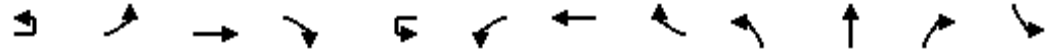
Appendix I
Improved (2023) Analyses

DRAFT

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2023) AM

12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↕	↗		↖	↕	↗	↖	↕	↗	↖
Traffic Volume (vph)	66	164	494	49	13	71	1168	154	177	182	71	173
Future Volume (vph)	66	164	494	49	13	71	1168	154	177	182	71	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.402			0.372
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	749	1863	1583	693
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											118	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	118	298	686	88	39	118	1557	233	268	319	118	275
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	416	686	88	0	157	1557	233	268	319	118	275
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	62.8	62.8			17.2	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.45	0.45			0.12	0.39	0.39	0.32	0.32	0.32
v/c Ratio		1.32	0.43	0.12			0.72	1.11	0.37	1.12	0.53	1.24
Control Delay		207.1	28.2	24.5			76.4	99.5	32.4	136.5	42.9	6.5
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	181	299
Future Volume (vph)	181	299
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Fr _t		0.850
Fl _t Protected		
Satd. Flow (prot)	1863	1583
Fl _t Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	297	564
Shared Lane Traffic (%)		
Lane Group Flow (vph)	297	564
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.50	1.11
Control Delay	41.8	117.3
Queue Delay	0.0	0.0

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2023) AM
 12/14/2020



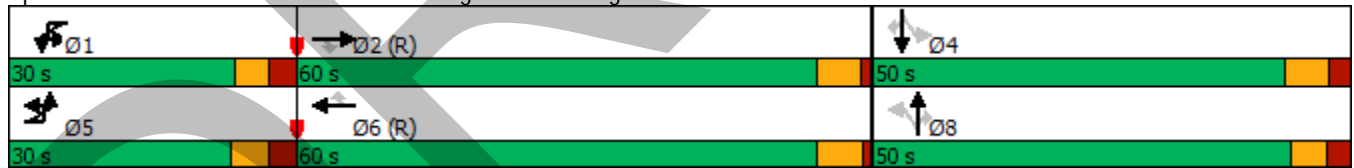
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		207.1	28.2	24.5		76.4	99.5	32.4	136.5	42.9	6.5	179.9
LOS		F	C	C		E	F	C	F	D	A	F
Approach Delay			90.5				89.6			72.4		
Approach LOS			F				F			E		
Queue Length 50th (ft)		-488	221	46		140	-850	150	-279	238	0	-309
Queue Length 95th (ft)		#310	226	53		132	#685	153	#277	193	4	#281
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1586	709		319	1404	628	240	598	588	222
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.32	0.43	0.12		0.49	1.11	0.37	1.12	0.53	0.20	1.24

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 92.7
 Intersection Capacity Utilization 90.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service E

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	41.8	117.3
LOS	D	F
Approach Delay	112.8	
Approach LOS	F	
Queue Length 50th (ft)	219	-585
Queue Length 95th (ft)	194	335
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.50	1.11
Intersection Summary		

DRAFT

Intersection												
Int Delay, s/veh	344.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	55	6	125	48	17	3	110	281	15	1	458	97
Future Vol, veh/h	55	6	125	48	17	3	110	281	15	1	458	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	125	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	90	63	90	90	90	70	49	90	90	61	44
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	145	7	198	53	19	3	157	573	17	1	751	220

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1770	1767	861	1862	1869	582	971	0	0	590	0	0
Stage 1	863	863	-	896	896	-	-	-	-	-	-	-
Stage 2	907	904	-	966	973	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 65	84	355	56	72	513	710	-	-	985	-	-
Stage 1	349	372	-	335	359	-	-	-	-	-	-	-
Stage 2	330	356	-	306	330	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 34	56	355	~ 17	48	513	710	-	-	985	-	-
Mov Cap-2 Maneuver	~ 34	56	-	~ 17	48	-	-	-	-	-	-	-
Stage 1	234	371	-	224	241	-	-	-	-	-	-	-
Stage 2	202	239	-	132	329	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$	1884.3	1037.8	2.4	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	710	-	-	71	17	56	985	-	-
HCM Lane V/C Ratio	0.221	-	-	4.927	3.137	0.397	0.001	-	-
HCM Control Delay (s)	11.5	0	\$ 1884.3	1425.8	106.5	8.7	0	-	-
HCM Lane LOS	B	A	-	F	F	F	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	38.3	7.3	1.5	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	37.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	15	296	259	84	260	38
Future Vol, veh/h	15	296	259	84	260	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	592	602	129	413	131
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1812	479	544	0	-	0
Stage 1	479	-	-	-	-	-
Stage 2	1333	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	86	~ 587	1025	-	-	-
Stage 1	623	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 36	~ 587	1025	-	-	-
Mov Cap-2 Maneuver	~ 36	-	-	-	-	-
Stage 1	257	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	98.8	11	0			
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1025	-	36	587	-	-
HCM Lane V/C Ratio	0.588	-	1.437	1.009	-	-
HCM Control Delay (s)	13.4	-	\$ 475.9	65.8	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	4	-	5.5	15.2	-	-
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	22	17	0	0	51
Future Vol, veh/h	0	22	17	0	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	19	0	0	57
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	19
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1059
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1059
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		8.6		
HCM LOS				A		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1059		
HCM Lane V/C Ratio	-	-	-	0.054		
HCM Control Delay (s)	-	-	-	8.6		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.2		

Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	22	0	0	0	0	17
Future Vol, veh/h	22	0	0	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	0	0	0	19

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1	0	-	0	49
Stage 1	-	-	-	-	1
Stage 2	-	-	-	-	48
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1622	-	-	-	960
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	974
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	946
Mov Cap-2 Maneuver	-	-	-	-	946
Stage 1	-	-	-	-	1007
Stage 2	-	-	-	-	974

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.015	-	-	-	0.017
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Watson Tract TIA
1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2023) PM
12/14/2020



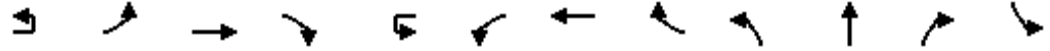
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↕	↗		↖	↕	↗	↖	↕	↗	↖
Traffic Volume (vph)	89	208	1278	182	21	81	775	128	141	142	83	139
Future Volume (vph)	89	208	1278	182	21	81	775	128	141	142	83	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.408			0.558
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	760	1863	1583	1039
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											157	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	198	310	1469	268	50	131	1092	183	231	180	157	199
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	508	1469	268	0	181	1092	183	231	180	157	199
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		26.8	62.8	62.8			18.9	55.0	55.0	43.2	43.2	43.2
Actuated g/C Ratio		0.19	0.45	0.45			0.14	0.39	0.39	0.31	0.31	0.31
v/c Ratio		1.50	0.93	0.38			0.75	0.78	0.29	0.99	0.31	0.26
Control Delay		279.1	48.0	29.3			76.7	41.9	30.8	102.8	38.2	6.0
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2023) PM
 12/14/2020



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	159	152
Future Volume (vph)	159	152
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	284	287
Shared Lane Traffic (%)		
Lane Group Flow (vph)	284	287
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	43.2	43.2
Actuated g/C Ratio	0.31	0.31
v/c Ratio	0.49	0.59
Control Delay	42.4	46.1
Queue Delay	0.0	0.0



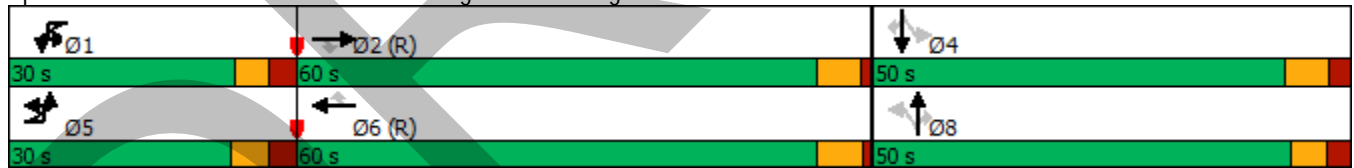
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		279.1	48.0	29.3		76.7	41.9	30.8	102.8	38.2	6.0	50.6
LOS		F	D	C		E	D	C	F	D	A	D
Approach Delay			98.0				44.8			55.6		
Approach LOS			F				D			E		
Queue Length 50th (ft)		-661	671	164		161	454	113	205	123	0	152
Queue Length 95th (ft)		#582	#856	183		153	384	131	189	163	0	175
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		338	1588	710		319	1404	628	244	598	615	333
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.50	0.93	0.38		0.57	0.78	0.29	0.95	0.30	0.26	0.60

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.50
 Intersection Signal Delay: 69.9
 Intersection Capacity Utilization 74.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: E
 ICU Level of Service D

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	42.4	46.1
LOS	D	D
Approach Delay	45.9	
Approach LOS	D	
Queue Length 50th (ft)	207	217
Queue Length 95th (ft)	169	164
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.56
Intersection Summary		

DRAFT

Intersection												
Int Delay, s/veh	83.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	49	18	155	32	11	2	110	295	53	4	205	42
Future Vol, veh/h	49	18	155	32	11	2	110	295	53	4	205	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	125	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	90	59	90	90	90	53	67	90	90	60	45
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	104	20	263	36	12	2	208	440	59	4	342	93

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1290	1312	389	1424	1329	470	435	0	0	499	0	0
Stage 1	397	397	-	886	886	-	-	-	-	-	-	-
Stage 2	893	915	-	538	443	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	140	159	659	113	155	594	1125	-	-	1065	-	-
Stage 1	629	603	-	339	363	-	-	-	-	-	-	-
Stage 2	336	352	-	527	576	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 103	117	659	47	114	594	1125	-	-	1065	-	-
Mov Cap-2 Maneuver	~ 103	117	-	47	114	-	-	-	-	-	-	-
Stage 1	467	600	-	252	269	-	-	-	-	-	-	-
Stage 2	237	261	-	305	573	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	315.7	150.7	2.6	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1125	-	-	245	47	130	1065	-	-
HCM Lane V/C Ratio	0.184	-	-	1.579	0.757	0.111	0.004	-	-
HCM Control Delay (s)	8.9	0	-	\$ 315.7	197.3	36.1	8.4	0	-
HCM Lane LOS	A	A	-	F	F	E	A	A	-
HCM 95th %tile Q(veh)	0.7	-	-	23.8	3	0.4	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	11	79	82	256	168	5
Future Vol, veh/h	11	79	82	256	168	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	263	195	361	255	12

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1012	261	267	0	-	0
Stage 1	261	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	265	778	1297	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	225	778	1297	-	-	-
Mov Cap-2 Maneuver	225	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	466	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	2.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1297	-	225	778	-	-
HCM Lane V/C Ratio	0.151	-	0.175	0.338	-	-
HCM Control Delay (s)	8.3	-	24.4	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.6	1.5	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	75	11	0	0	34
Future Vol, veh/h	0	75	11	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	83	12	0	0	38
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	12
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1069
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		8.5		
HCM LOS				A		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1069		
HCM Lane V/C Ratio	-	-	-	0.035		
HCM Control Delay (s)	-	-	-	8.5		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Intersection						
Int Delay, s/veh	7.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	75	0	0	0	0	11
Future Vol, veh/h	75	0	0	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	0	0	0	0	12

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1622	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1622	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.051	-	-	-	0.011
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0

Appendix J
Improved (2032) Analyses

DRAFT

Watson Tract TIA
1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2032) AM
12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↗	↖		↖	↗	↖	↖	↗	↖	↖
Traffic Volume (vph)	86	240	651	66	19	93	1530	216	233	251	93	247
Future Volume (vph)	86	240	651	66	19	93	1530	216	233	251	93	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.255			0.217
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	475	1863	1583	404
Right Turn on Red				No				No			Yes	
Satd. Flow (RTOR)											155	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.56	0.55	0.72	0.56	0.33	0.60	0.75	0.66	0.66	0.57	0.60	0.63
Adj. Flow (vph)	154	436	904	118	58	155	2040	327	353	440	155	392
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	590	904	118	0	213	2040	327	353	440	155	392
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	59.2	59.2			20.8	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.42	0.42			0.15	0.39	0.39	0.32	0.32	0.32
v/c Ratio		1.87	0.60	0.18			0.80	1.45	0.52	2.32	0.74	0.25
Control Delay		433.5	34.1	27.2			79.3	240.9	36.1	638.7	50.8	956.2
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

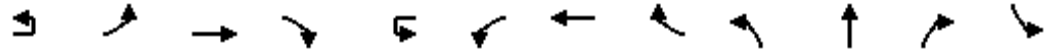
Improved (2032) AM
 12/14/2020



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	250	447
Future Volume (vph)	250	447
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.61	0.53
Adj. Flow (vph)	410	843
Shared Lane Traffic (%)		
Lane Group Flow (vph)	410	843
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.69	1.66
Control Delay	48.3	337.0
Queue Delay	0.0	0.0

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2032) AM
 12/14/2020



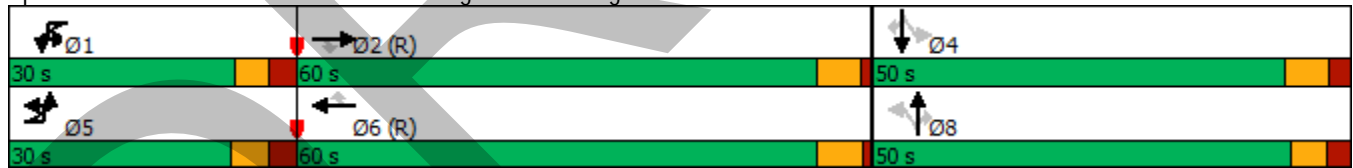
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		433.5	34.1	27.2		79.3	240.9	36.1	638.7	50.8	6.0	956.2
LOS		F	C	C		E	F	D	F	D	A	F
Approach Delay			179.8				201.6			262.4		
Approach LOS			F				F			F		
Queue Length 50th (ft)		-816	335	67		189	-1330	226	-523	356	0	-618
Queue Length 95th (ft)		#525	314	69		171	#1104	215	#493	267	0	#541
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1496	669		319	1404	628	152	598	614	129
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.87	0.60	0.18		0.67	1.45	0.52	2.32	0.74	0.25	3.04

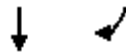
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 85 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 3.04
 Intersection Signal Delay: 256.1
 Intersection Capacity Utilization 117.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: F
 ICU Level of Service H

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	48.3	337.0
LOS	D	F
Approach Delay	412.6	
Approach LOS	F	
Queue Length 50th (ft)	325	~1112
Queue Length 95th (ft)	269	#606
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.69	1.66
Intersection Summary		

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Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	71	6	204	48	17	3	176	394	15	1	663	127
Future Vol, veh/h	71	6	204	48	17	3	176	394	15	1	663	127
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	125	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	90	63	90	90	90	70	49	90	90	61	44
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	187	7	324	53	19	3	251	804	17	1	1087	289

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2560	2557	1232	2714	2693	813	1376	0	0	821	0	0
Stage 1	1234	1234	-	1315	1315	-	-	-	-	-	-	-
Stage 2	1326	1323	-	1399	1378	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 18	26	~ 216	~ 14	22	378	498	-	-	808	-	-
Stage 1	216	249	-	194	228	-	-	-	-	-	-	-
Stage 2	192	226	-	174	212	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	~ 2	~ 216	-	~ 2	378	498	-	-	808	-	-
Mov Cap-2 Maneuver	-	~ 2	-	-	~ 2	-	-	-	-	-	-	-
Stage 1	~ 15	248	-	~ 14	~ 16	-	-	-	-	-	-	-
Stage 2	-	16	-	-	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s					4.5		0	
HCM LOS								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	498	-	-	-	-	2	808	-	-
HCM Lane V/C Ratio	0.505	-	-	-	-	-11.111	0.001	-	-
HCM Control Delay (s)	19.4	0	-	-	-	\$ 7845.1	9.5	0	-
HCM Lane LOS	C	A	-	-	-	F	A	A	-
HCM 95th %tile Q(veh)	2.8	-	-	-	-	4.4	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	610					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↑	↗	
Traffic Vol, veh/h	20	386	338	134	386	50
Future Vol, veh/h	20	386	338	134	386	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	29	50	43	65	63	29
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	772	786	206	613	172

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	2477	699	785	0	0
Stage 1	699	-	-	-	-
Stage 2	1778	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	~ 33	~ 440	834	-	-
Stage 1	493	-	-	-	-
Stage 2	148	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	~ 2	~ 440	834	-	-
Mov Cap-2 Maneuver	~ 2	-	-	-	-
Stage 1	~ 29	-	-	-	-
Stage 2	148	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, \$1860.9		32.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	834	-	2	440	-	-
HCM Lane V/C Ratio	0.943	-	34.483	1.755	-	-
HCM Control Delay (s)	41.1	\$ 18541.1	\$ 370.8		-	-
HCM Lane LOS	E	-	F	F	-	-
HCM 95th %tile Q(veh)	14.4	-	10.8	47.6	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	22	17	0	0	51
Future Vol, veh/h	0	22	17	0	0	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	19	0	0	57
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	19
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	1059
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	1059
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	SB			
HCM Control Delay, s	0	0	8.6			
HCM LOS						A
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	1059		
HCM Lane V/C Ratio	-	-	-	0.054		
HCM Control Delay (s)	-	-	-	8.6		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0.2		

Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	22	0	0	0	0	17
Future Vol, veh/h	22	0	0	0	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	0	0	0	19

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1	0	-	0	49
Stage 1	-	-	-	-	1
Stage 2	-	-	-	-	48
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1622	-	-	-	960
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	974
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	946
Mov Cap-2 Maneuver	-	-	-	-	946
Stage 1	-	-	-	-	1007
Stage 2	-	-	-	-	974

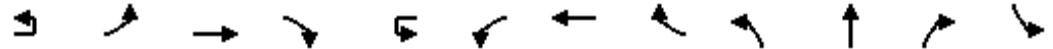
Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.015	-	-	-	0.017
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Watson Tract TIA
 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard

Improved (2032) PM

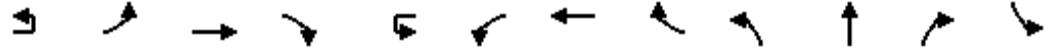
12/14/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖	↕	↗		↖	↕	↗	↖	↕	↗	↖
Traffic Volume (vph)	115	322	1673	240	31	106	1017	188	186	198	108	198
Future Volume (vph)	115	322	1673	240	31	106	1017	188	186	198	108	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%				-2%			0%		
Storage Length (ft)		350		225		525		450	100		275	200
Storage Lanes		1		1		1		1	1		1	1
Taper Length (ft)		150				150			125			100
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frnt				0.850				0.850				0.850
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1770	3539	1583	0	1787	3575	1599	1770	1863	1583	1770
Flt Permitted		0.950				0.950			0.279			0.464
Satd. Flow (perm)	0	1770	3539	1583	0	1787	3575	1599	520	1863	1583	864
Right Turn on Red				No				No				Yes
Satd. Flow (RTOR)												193
Link Speed (mph)			45				45			35		
Link Distance (ft)			1380				1073			1122		
Travel Time (s)			20.9				16.3			21.9		
Peak Hour Factor	0.45	0.67	0.87	0.68	0.42	0.62	0.71	0.70	0.61	0.79	0.53	0.70
Adj. Flow (vph)	256	481	1923	353	74	171	1432	269	305	251	204	283
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	1923	353	0	245	1432	269	305	251	204	283
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA	Perm	Perm	NA	Perm	Perm
Protected Phases	5	5	2		1	1	6			8		
Permitted Phases				2				6	8		8	4
Detector Phase	5	5	2	2	1	1	6	6	8	8	8	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.8	13.8	17.8	17.8	13.5	13.5	17.8	17.8	22.5	22.5	22.5	23.0
Total Split (s)	30.0	30.0	60.0	60.0	30.0	30.0	60.0	60.0	50.0	50.0	50.0	50.0
Total Split (%)	21.4%	21.4%	42.9%	42.9%	21.4%	21.4%	42.9%	42.9%	35.7%	35.7%	35.7%	35.7%
Maximum Green (s)	23.2	23.2	54.2	54.2	23.5	23.5	54.2	54.2	43.5	43.5	43.5	43.0
Yellow Time (s)	3.8	3.8	4.5	4.5	3.5	3.5	4.7	4.7	3.8	3.8	3.8	4.5
All-Red Time (s)	3.0	3.0	1.3	1.3	3.0	3.0	1.1	1.1	2.7	2.7	2.7	2.5
Lost Time Adjust (s)		-1.8	-0.8	-0.8			-1.5	-0.8	-0.8	-1.5	-1.5	-2.0
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Vehicle Extension (s)	1.0	1.0	6.0	6.0	1.0	1.0	6.0	6.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	3.0	3.0	3.2	3.2	3.0	3.0	3.2	3.2	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	C-Min	None	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)		25.0	57.5	57.5			22.5	55.0	55.0	45.0	45.0	45.0
Actuated g/C Ratio		0.18	0.41	0.41			0.16	0.39	0.39	0.32	0.32	0.32
v/c Ratio		2.33	1.32	0.54			0.85	1.02	0.43	1.83	0.42	0.32
Control Delay		634.6	185.3	35.9			82.7	70.9	33.7	423.4	39.9	6.8
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0



Lane Group	SBT	SBR
Lane Configurations	↑	↑
Traffic Volume (vph)	219	231
Future Volume (vph)	219	231
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	1.00	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	1863	1583
Flt Permitted		
Satd. Flow (perm)	1863	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	641	
Travel Time (s)	9.7	
Peak Hour Factor	0.56	0.53
Adj. Flow (vph)	391	436
Shared Lane Traffic (%)		
Lane Group Flow (vph)	391	436
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Detector Phase	4	4
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	23.0	23.0
Total Split (s)	50.0	50.0
Total Split (%)	35.7%	35.7%
Maximum Green (s)	43.0	43.0
Yellow Time (s)	4.5	4.5
All-Red Time (s)	2.5	2.5
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	45.0	45.0
Actuated g/C Ratio	0.32	0.32
v/c Ratio	0.65	0.86
Control Delay	47.0	62.1
Queue Delay	0.0	0.0



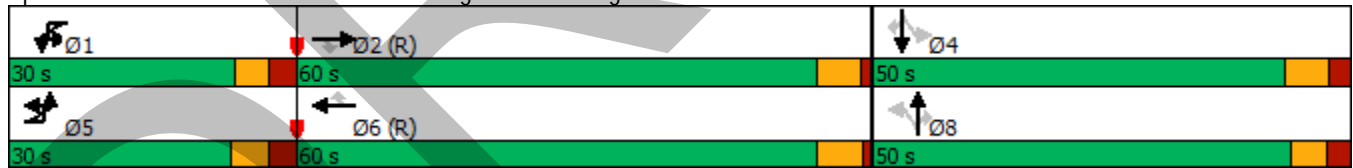
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		634.6	185.3	35.9		82.7	70.9	33.7	423.4	39.9	6.8	106.3
LOS		F	F	D		F	E	C	F	D	A	F
Approach Delay			277.7				67.3			184.9		
Approach LOS			F				E			F		
Queue Length 50th (ft)		~1094	~1216	248		216	~725	177	~418	179	7	~272
Queue Length 95th (ft)		#920	#1288	244		203	548	189	#362	224	0	#297
Internal Link Dist (ft)			1300				993			1042		
Turn Bay Length (ft)		350		225		525		450	100		275	200
Base Capacity (vph)		316	1452	649		319	1404	628	167	598	639	277
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		2.33	1.32	0.54		0.77	1.02	0.43	1.83	0.42	0.32	1.02

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 65 (46%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.33
 Intersection Signal Delay: 173.3
 Intersection Capacity Utilization 93.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

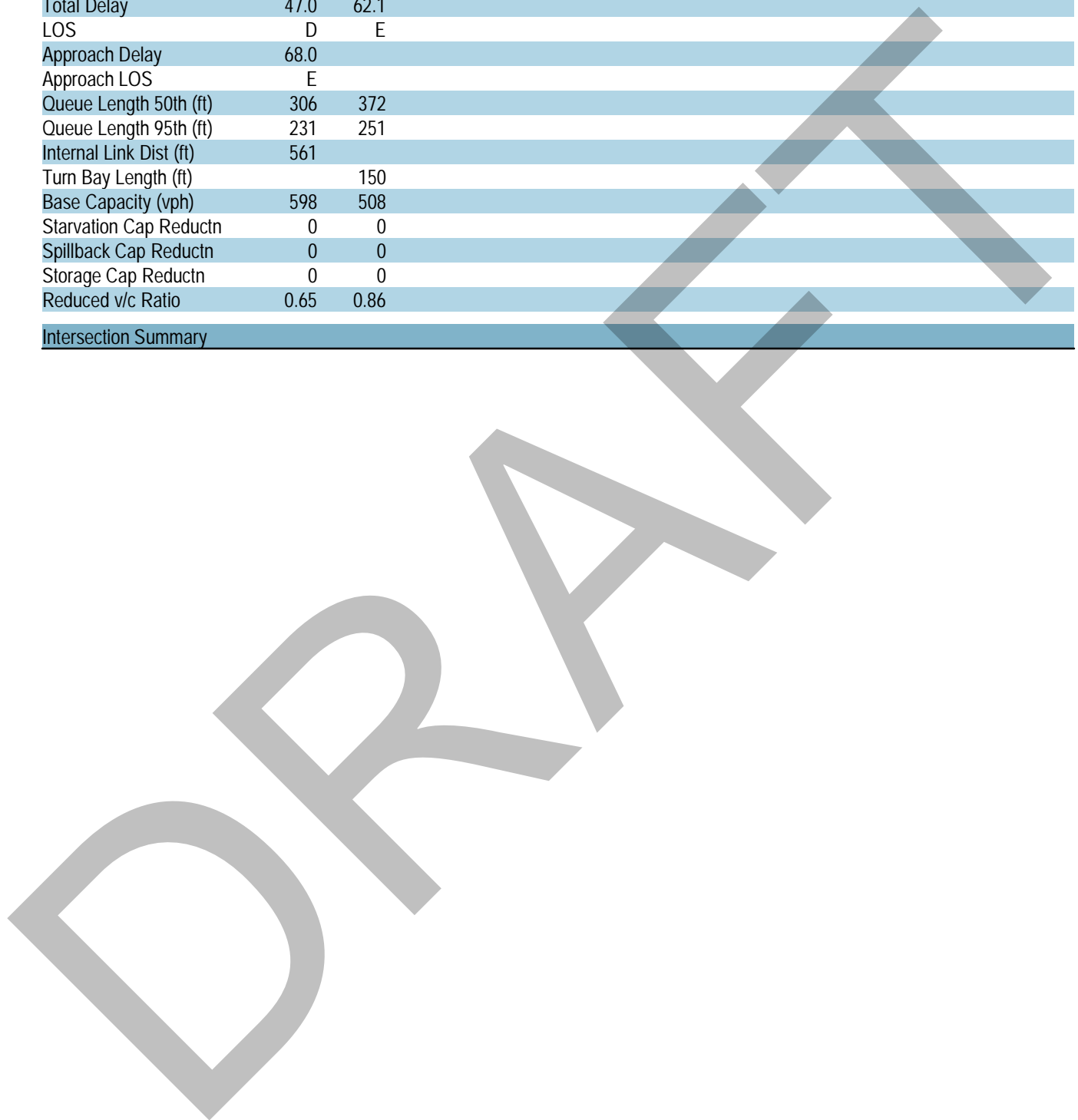
Intersection LOS: F
 ICU Level of Service F

Splits and Phases: 1: N 1st Avenue/Old Knight Road & Knightdale Boulevard





Lane Group	SBT	SBR
Total Delay	47.0	62.1
LOS	D	E
Approach Delay	68.0	
Approach LOS	E	
Queue Length 50th (ft)	306	372
Queue Length 95th (ft)	231	251
Internal Link Dist (ft)	561	
Turn Bay Length (ft)		150
Base Capacity (vph)	598	508
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.65	0.86
Intersection Summary		



Watson Tract TIA
 2: Old Knight Road & Forestville Road/Forestville Road Extension

Improved (2032) PM
 12/14/2020

Intersection												
Int Delay, s/veh	1640.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	64	18	227	32	11	2	187	443	53	4	313	54
Future Vol, veh/h	64	18	227	32	11	2	187	443	53	4	313	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	125	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	47	90	59	90	90	90	53	67	90	90	60	45
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	136	20	385	36	12	2	353	661	59	4	522	120

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1994	2016	582	2190	2047	691	642	0	0	720	0	0
Stage 1	590	590	-	1397	1397	-	-	-	-	-	-	-
Stage 2	1404	1426	-	793	650	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 45	59	513	~ 33	56	445	943	-	-	882	-	-
Stage 1	494	495	-	175	208	-	-	-	-	-	-	-
Stage 2	173	201	-	382	465	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 12	22	513	~ 1	20	445	943	-	-	882	-	-
Mov Cap-2 Maneuver	~ 12	22	-	~ 1	20	-	-	-	-	-	-	-
Stage 1	182	492	-	65	77	-	-	-	-	-	-	-
Stage 2	~ 53	74	-	91	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$	5527.6	15906.6	3.6	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	943	-	-	42	1	23	882	-	-
HCM Lane V/C Ratio	0.374	-	-	12.879	35.556	0.628	0.005	-	-
HCM Control Delay (s)	11.1	0	\$ 5527.6	2245.1	\$ 304.2	9.1	0	-	-
HCM Lane LOS	B	A	-	F	F	F	A	A	-
HCM 95th %tile Q(veh)	1.8	-	-	65.5	6.4	1.9	0	-	-

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	6.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↑	↗	
Traffic Vol, veh/h	14	103	107	379	252	7
Future Vol, veh/h	14	103	107	379	252	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	28	30	42	71	66	42
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	343	255	534	382	17
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1435	391	399	0	-	0
Stage 1	391	-	-	-	-	-
Stage 2	1044	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	147	658	1160	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	115	658	1160	-	-	-
Mov Cap-2 Maneuver	115	-	-	-	-	-
Stage 1	533	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	21.7	2.9	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1160	-	115	658	-	-
HCM Lane V/C Ratio	0.22	-	0.435	0.522	-	-
HCM Control Delay (s)	9	-	58.5	16.3	-	-
HCM Lane LOS	A	-	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	1.9	3	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	75	11	0	0	34
Future Vol, veh/h	0	75	11	0	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	83	12	0	0	38

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	- 6.22
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	- 3.318
Pot Cap-1 Maneuver	0	-	- 0 1069
Stage 1	0	-	- 0
Stage 2	0	-	- 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- 1069
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1069
HCM Lane V/C Ratio	-	-	-	0.035
HCM Control Delay (s)	-	-	-	8.5
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	7.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	75	0	0	0	0	11
Future Vol, veh/h	75	0	0	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	0	0	0	0	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1	0	-	0	167
Stage 1	-	-	-	-	1
Stage 2	-	-	-	-	166
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1622	-	-	-	823
Stage 1	-	-	-	-	1022
Stage 2	-	-	-	-	863
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1622	-	-	-	781
Mov Cap-2 Maneuver	-	-	-	-	781
Stage 1	-	-	-	-	970
Stage 2	-	-	-	-	863

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.051	-	-	-	0.011
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0

