

Traffic Impact Analysis Jones Dairy Road Residential Rolesville, NC



53 JONES DAIRY LN
SR 4478 ALFALPA 6200



Flash Dr
Jones Dairy Rd

TRAFFIC IMPACT ANALYSIS

FOR

JONES DAIRY ROAD RESIDENTIAL

LOCATED

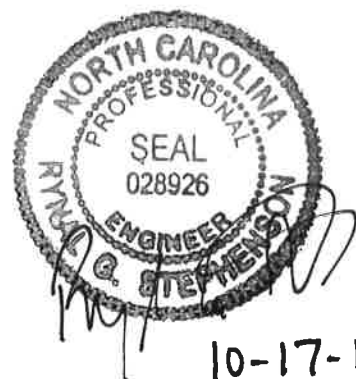
IN

ROLESVILLE, NORTH CAROLINA

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RKA Project No. 18293

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TRAFFIC IMPACT ANALYSIS
JONES DAIRY ROAD RESIDENTIAL
ROLESVILLE, NORTH CAROLINA

1. INTRODUCTION

The contents of this report present the findings of the Traffic Impact Analysis (TIA) conducted for the proposed Jones Dairy Road Residential development to be located along Jones Dairy Road and Averette Road in Rolesville, North Carolina. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts.

The proposed development, anticipated to be completed in 2024, is assumed to consist of approximately 250 townhomes and 600 single-family homes.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- Existing (2018) Traffic Conditions
- Background (2024) Traffic Conditions
- Combined (2024) Traffic Conditions

1.1. Site Location and Study Area

The development is proposed to be located along Jones Dairy Road and Averette Road in Rolesville, North Carolina. Refer to Figure 1 for the site location map.

The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the Town of Rolesville (Town) and consists of the following existing intersections:

- Jones Dairy Road and Averette Road
- Main Street and Young Street

- Jones Dairy Road and NC 98
- Averette Road and NC 98
- Winter Spring Drive and Jones Dairy Road
- Sweetclover Drive and Averette Road
- Alfalfa Lane and Jones Dairy Road
- Flash Drive and Jones Dairy Road

1.2. Proposed Land Use and Site Access

The proposed development, anticipated to be completed in 2024, is assumed to consist of approximately 600 single-family homes and 250 townhomes. Site access is proposed via one (1) full movement intersection on Averette Road and two (2) full movement intersections on Jones Dairy Road. Site access will also be provided through roadway connections to the development to the northwest of the site, Jones Dairy Farm via connections to Alfalfa Lane, Winter Springs Drive, and Sweetclover Drive. Refer to Figure 2 for a copy of the preliminary site plan.

1.3. Adjacent Land Uses

The proposed development is located in an area consisting primarily of undeveloped land and residential development.

1.4. Existing Roadways

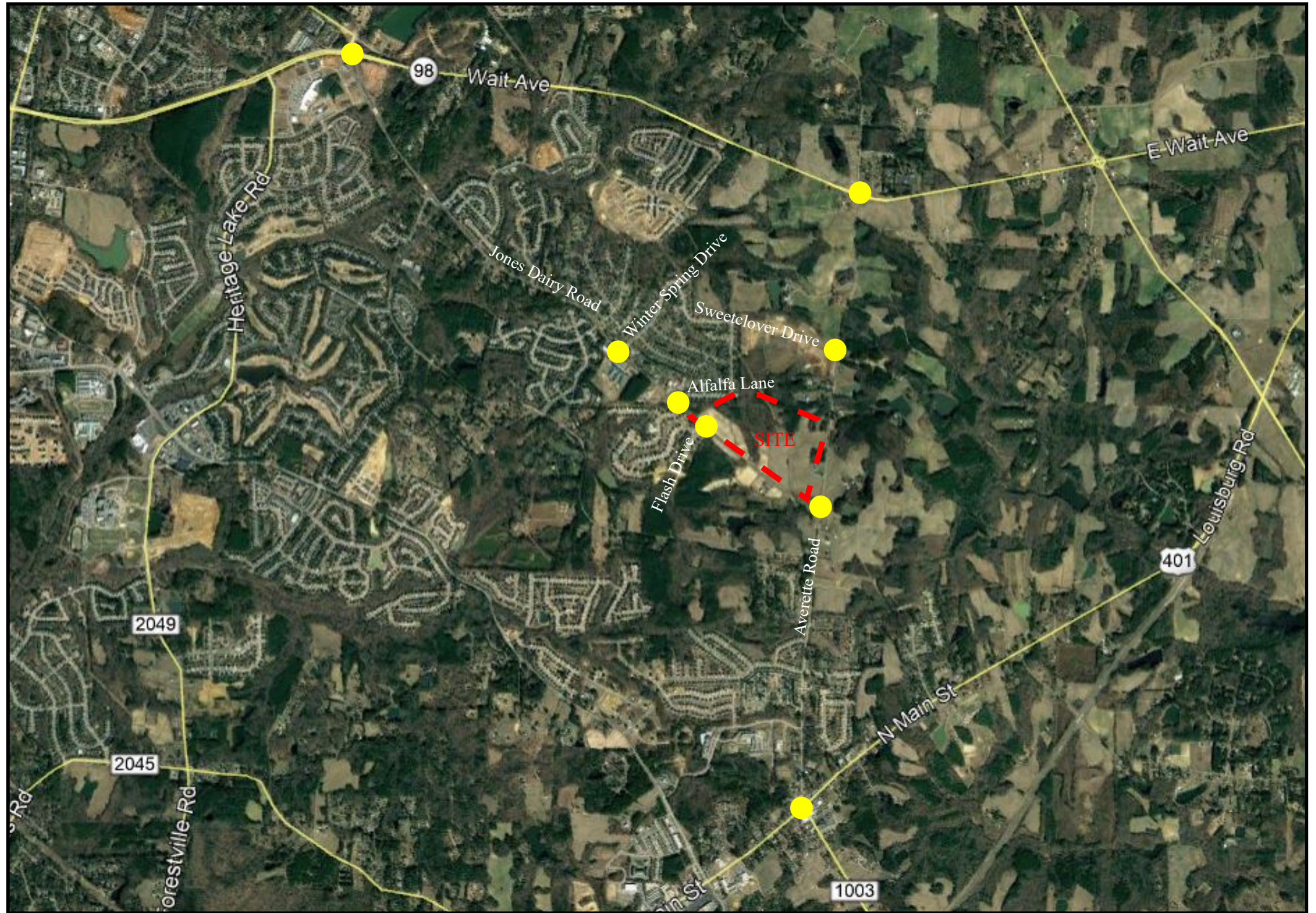
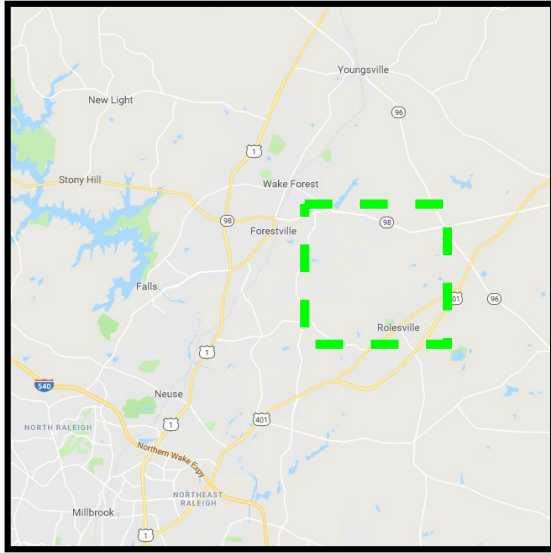
Existing lane configurations (number of traffic lanes on each intersection approach), lane widths, storage capacities, and other intersection and roadway information was collected through field reconnaissance by Ramey Kemp & Associates, Inc. (RKA). Table 1 provides a summary of the field data collected. Refer to Figure 3 for an illustration of the existing lane configurations within the study area.

Table 1: Existing Roadway Inventory




Road Name	Route Number	Typical Cross Section	Speed Limit	Maintained By	2015 AADT (vpd)
NC 98	NC 98	4-lane divided / 2-lane undivided	55 mph	NCDOT	17,000
Main Street	US 401	2-lane divided	35 mph	NCDOT	12,000 ¹
Jones Dairy Road	N/A	2-lane undivided	45 mph	NCDOT	4,700
Averette Road	SR 1945	2-lane undivided	55 mph / 45 mph	NCDOT	3,000
Young Street	SR 1003	2-lane undivided	35 mph	NCDOT	7,700 ¹
Winter Spring Drive	N/A	2-lane undivided	30 mph	NCDOT	900 ²
Alfalfa Lane	N/A	2-lane undivided	25 mph (assumed)	NCDOT	700 ²
Flash Drive	N/A	2-lane undivided	25 mph (assumed)	Private	500 ²

1. NCDOT 2016 AADT Counts

2. ADT based on the traffic counts from 2018 and assuming the weekday PM peak hour volume is 10% of the average daily traffic.



LEGEND

-  Proposed Site Location
-  Study Intersection
-  Study Area




**RAMEY KEMP
&
ASSOCIATES**
TRANSPORTATION ENGINEERS

Jones Dairy Road Residential
Rolesville, NC

Site Location Map

Scale: Not to Scale	Figure 1
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WINTER SPRING DR.
60' PUBLIC R/W

NORTHERNMOST TRACT
140+/- SINGLE FAMILY
60+/- TOWNHOMES

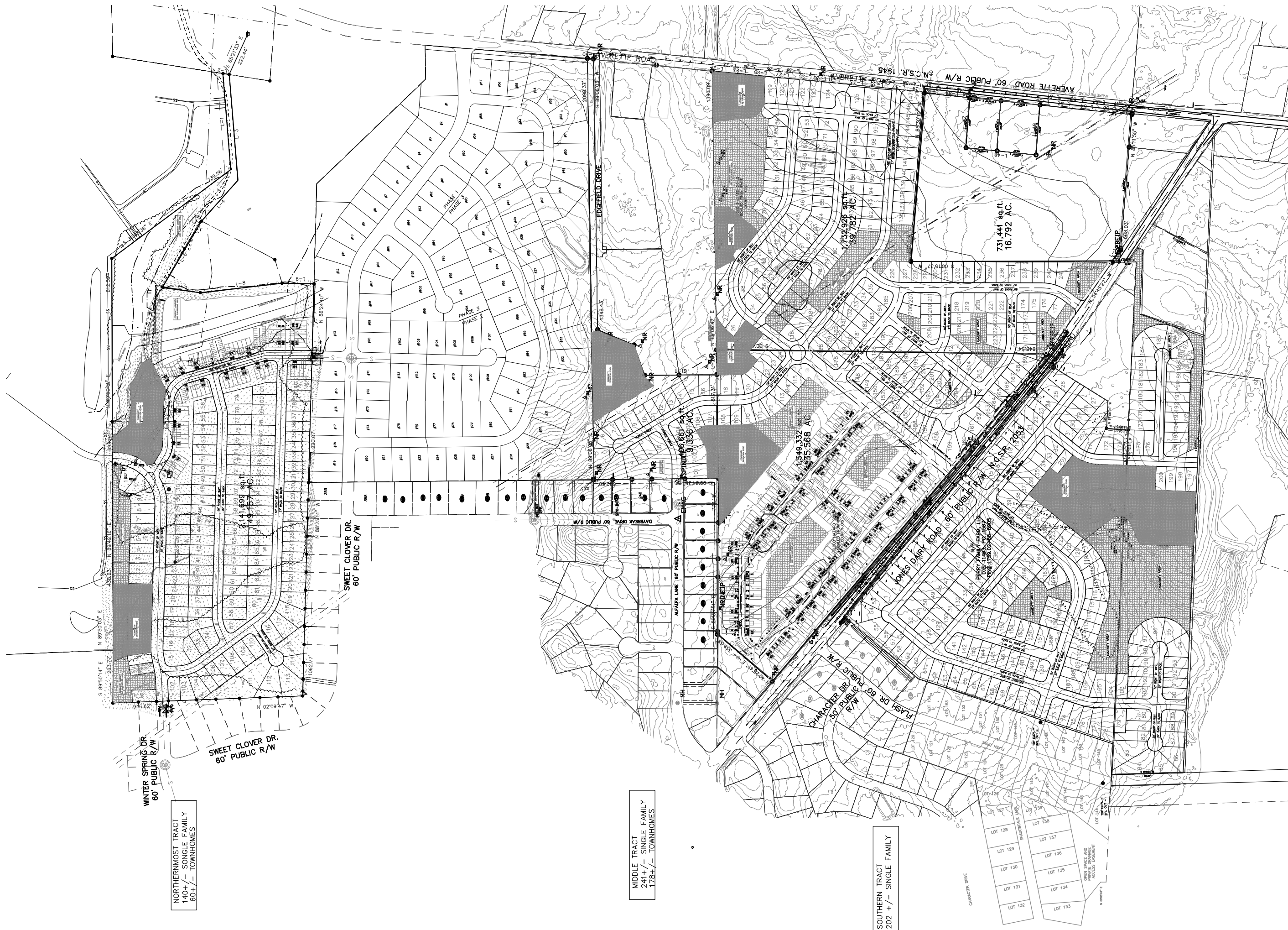
SWEET CLOVER DR.
60' PUBLIC R/W

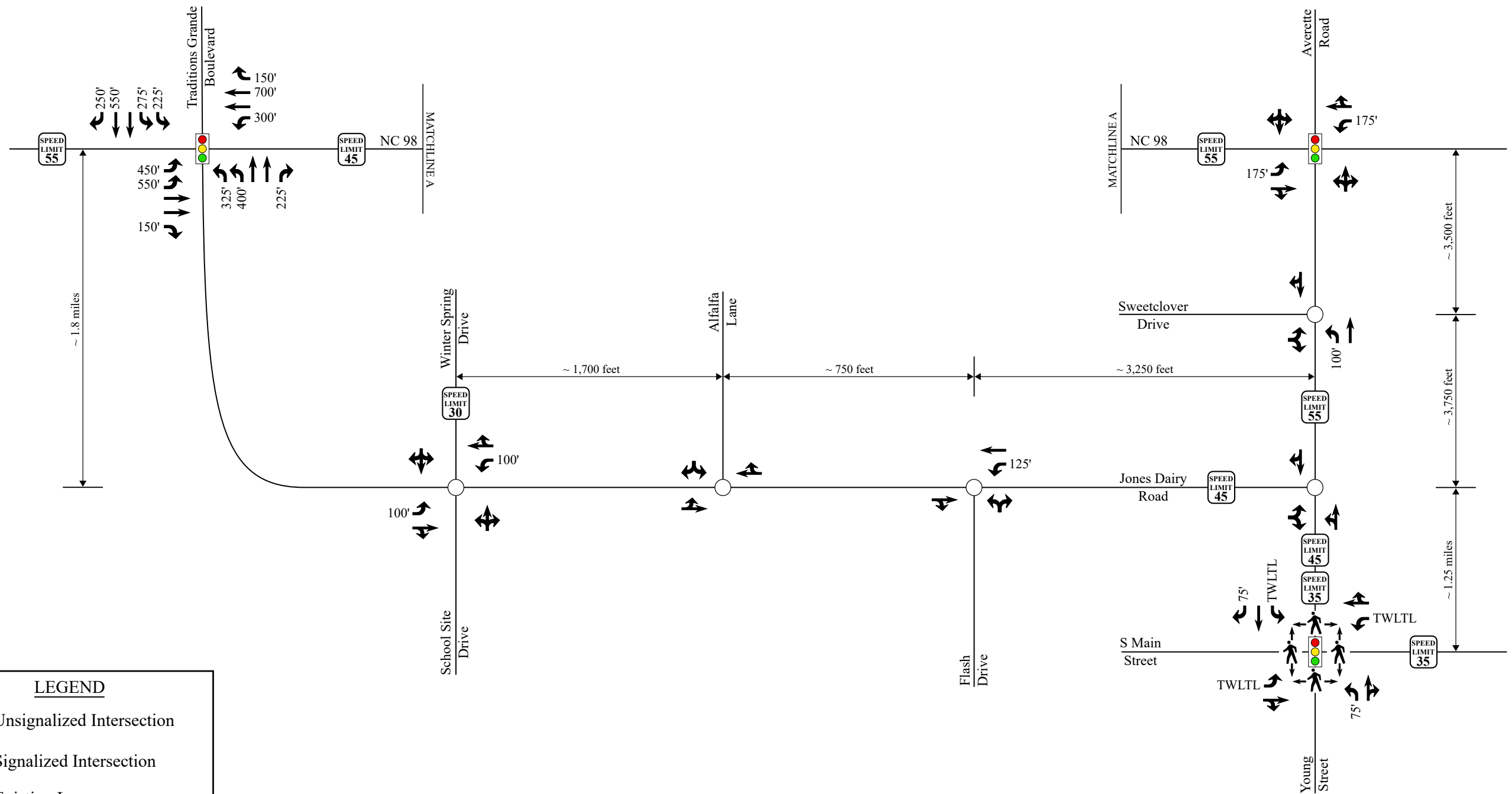
2,141,699 sq.ft.
49.15 AC

SWEET CLOVER DR.
60' PUBLIC R/W

MIDDLE TRACT
241+/- SINGLE FAMILY
178+/- TOWNHOMES

SOUTHERN TRACT
202 +/- SINGLE FAMILY





LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- Existing Lane
- x' Storage (In Feet)
- Posted Speed Limit
- Pedestrian Crosswalk
- TWLTL Two-Way Left-Turn Lane



Jones Dairy Road Residential
Rolesville, NC

2018 Existing Lane Configurations

Scale: Not to Scale Figure 3

2. EXISTING (2018) PEAK HOUR CONDITIONS

2.1. Existing (2018) Peak Hour Traffic

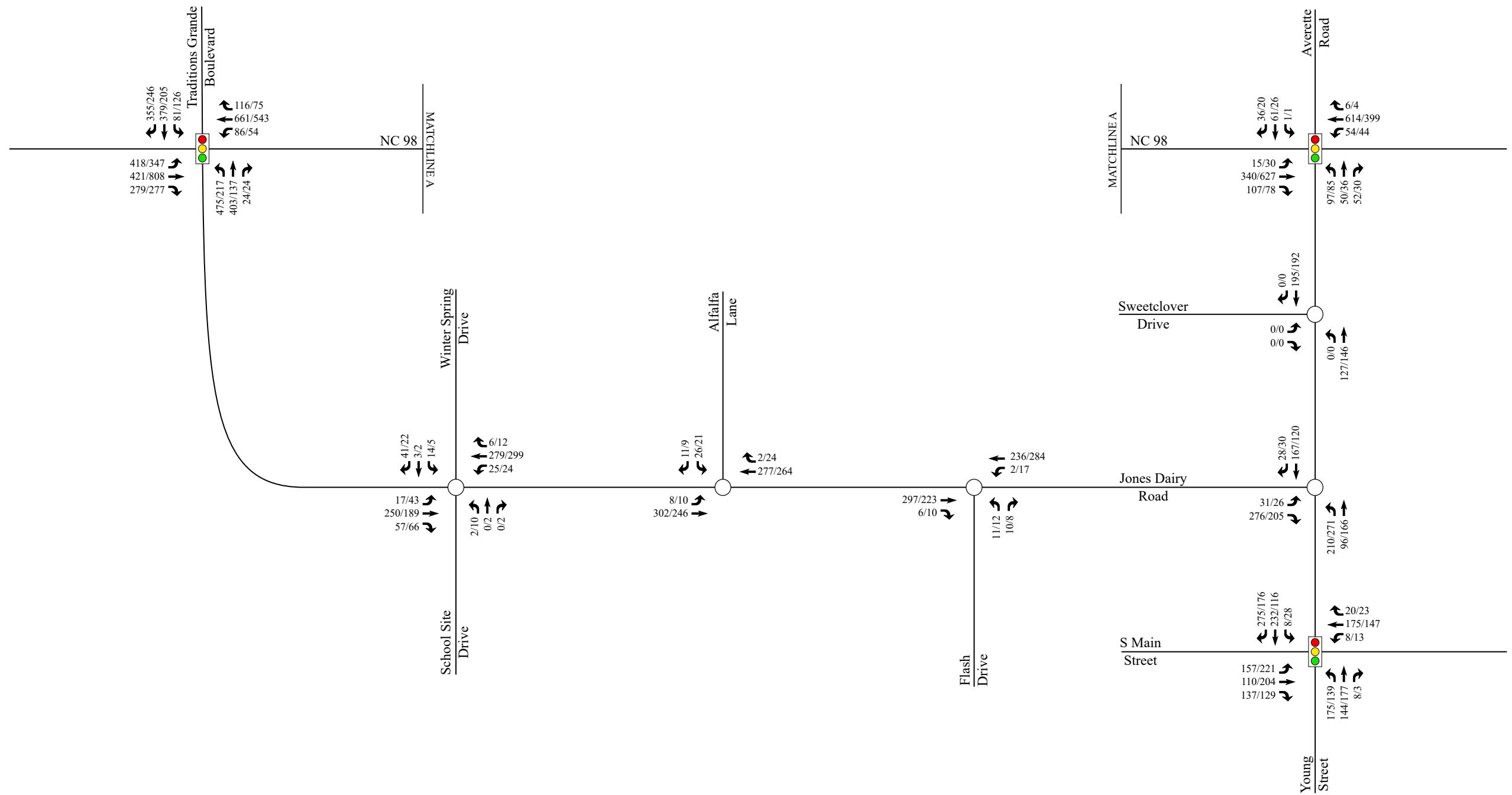
Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in September of 2018 by RKA during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- Jones Dairy Road and Averette Road
- Main Street and Young Street
- Jones Dairy Road and NC 98
- Averette Road and NC 98
- Winter Spring Drive and Jones Dairy Road
- Sweetclover Drive and Averette Road
- Alfalfa Lane and Jones Dairy Road
- Flash Drive and Jones Dairy Road

Traffic volumes were balanced between study intersections, where appropriate. Refer to Figure 4 for existing (2018) weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix A of this report.

2.2. Analysis of Existing (2018) Peak Hour Traffic

The existing (2018) weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions. Signal information was obtained from NCDOT and is included in Appendix B. The results of the analysis are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- X/Y → Weekday AM / PM Peak Hour Traffic



Jones Dairy Road Residential
Rolesville, NC

Existing (2018)
Peak Hour Traffic Volumes

Scale: Not to Scale Figure 4

3. BACKGROUND (2024) PEAK HOUR CONDITIONS

In order to account for growth of traffic and subsequent traffic conditions at a future year, background traffic projections are needed. Background traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether or not the proposed development is constructed. Background traffic is comprised of existing traffic growth within the study area and additional traffic created as a result of adjacent approved developments.

3.1. Ambient Traffic Growth

Through coordination with the Town and NCDOT, it was determined that an annual growth rate of 3% would be used to generate projected (2024) weekday AM and PM peak hour traffic volumes. Refer to Figure 5 for projected (2024) peak hour traffic.

3.2. Adjacent Development Traffic

It was determined, through coordination with the Town and NCDOT that four (4) adjacent developments were to be included in the future analysis scenarios. The adjacent developments to be considered for the purpose of this study include the following:

- *Perry Farms*: This residential development is to be located along Averette Road, north of Edgefield Drive and will consist of 116 single-family homes. The development was committed to the construction of a northbound left-turn lane at the intersection of Averette Road and Sweetclover Drive, which is currently built.
- *Elizabeth Heights*: This residential development is to be located along Averette Road, south of Old Pearce Road and will consist of 94 single-family homes and 108 townhomes. There are no committed improvements associated with this development.
- *Thales Academy*: This residential and school development is to be located in the southwest quadrant of the intersection of Averette Road and NC 98 and will consist of 115 single-family homes and a 1,100-student private school. The development is committed to an exclusive northbound left-turn lane and an exclusive eastbound right-turn lane at the intersection of Averette Road and NC 98.

- *Averette Ridge*: This residential development is currently being constructed along Jones Dairy Road, east of Alfalfa lane and will consist of 159 single-family homes. Currently, 124 homes are built and the trips associated with these homes were captured in the existing traffic volumes. Trips will be generated and distributed through the roadway network for the remaining 35 homes to be constructed along Flash Drive and Shadowdale Lane. The development was committed to the construction of a westbound left-turn lane at the intersection of Jones Dairy Road and Flash Drive.

Adjacent development trips are shown in Figure 6. Adjacent development information can be found in Appendix C.

3.3. Future Roadway Improvements

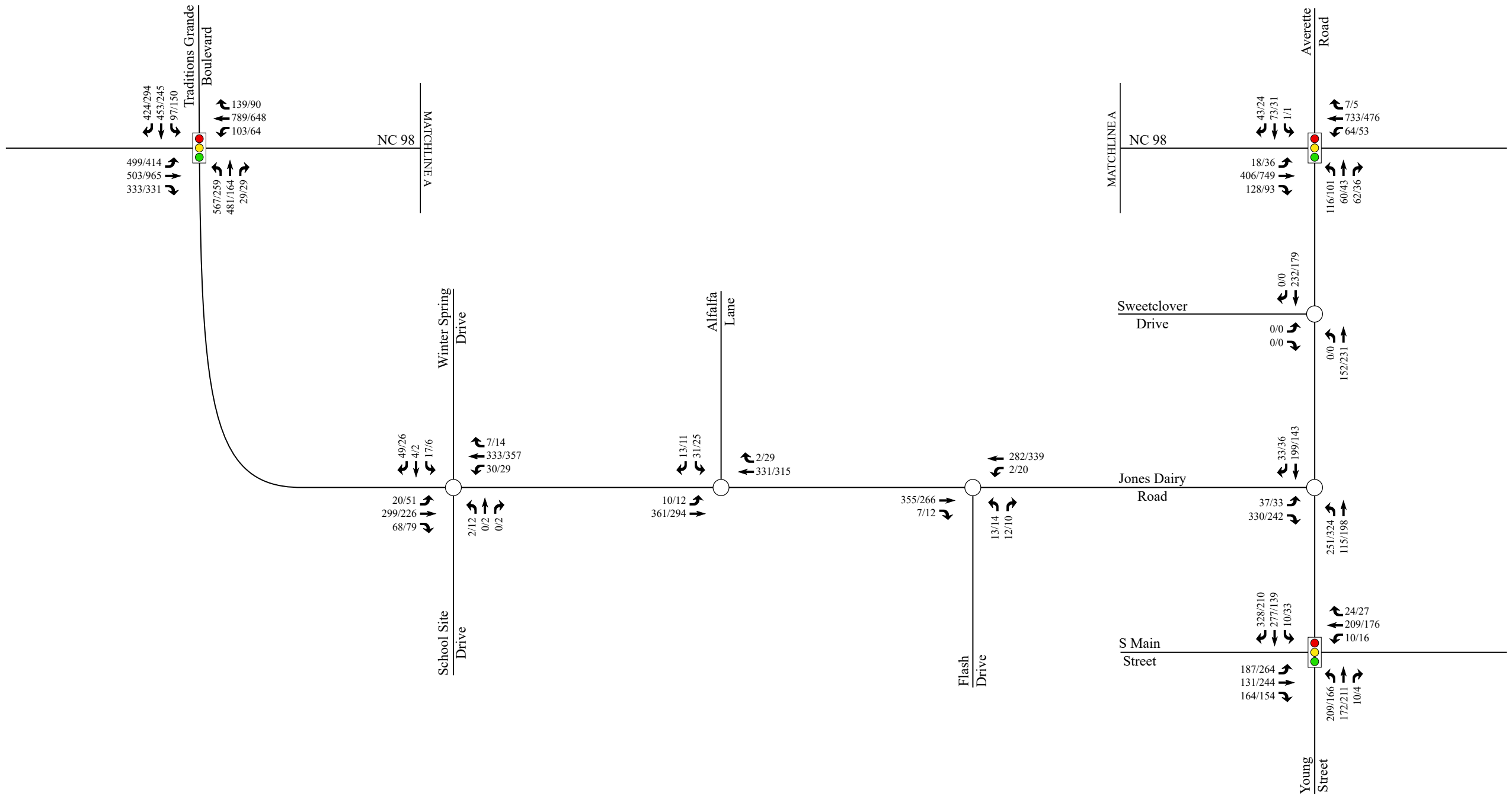
Based on coordination with the NCDOT and the Town, it was determined there were no future roadway improvements to consider with this study.

3.4. Background (2024) Peak Hour Traffic Volumes

The background (2024) traffic volumes were determined by projecting the existing (2018) peak hour traffic to the year 2024 and adding the adjacent development trips. Refer to Figure 7 for an illustration of the background (2024) peak hour traffic volumes at the study intersections.

3.5. Analysis of Background (2024) Peak Hour Traffic Conditions

The background (2024) AM and PM peak hour traffic volumes at the study intersections were analyzed with future geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.



LEGEND

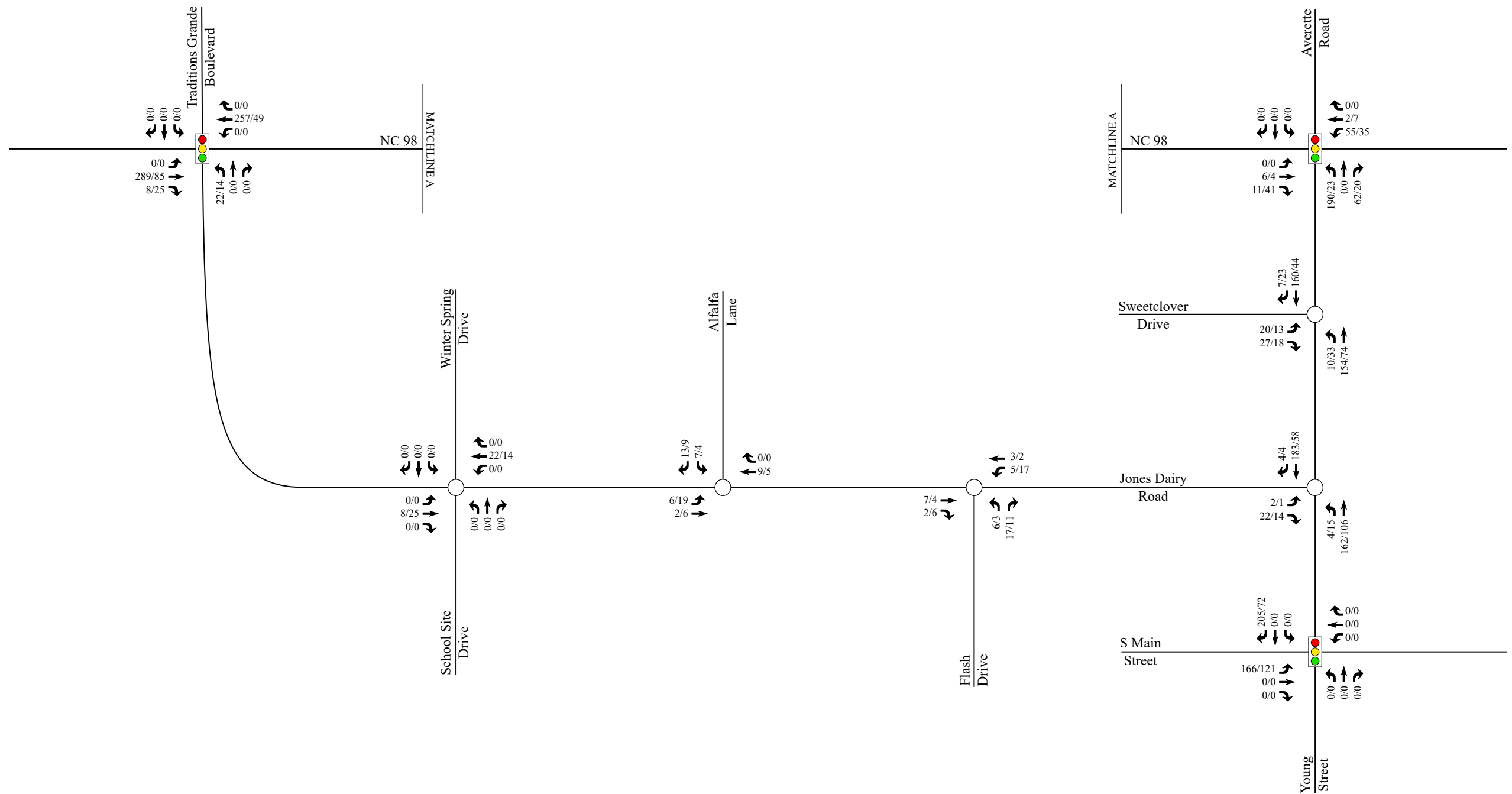
- Unsignalized Intersection
- 🚦 Signalized Intersection
- X/Y → Weekday AM / PM Peak Hour Traffic



Jones Dairy Road Residential
Rolesville, NC

Projected (2024)
Peak Hour Traffic Volumes

Scale: Not to Scale Figure 5



LEGEND

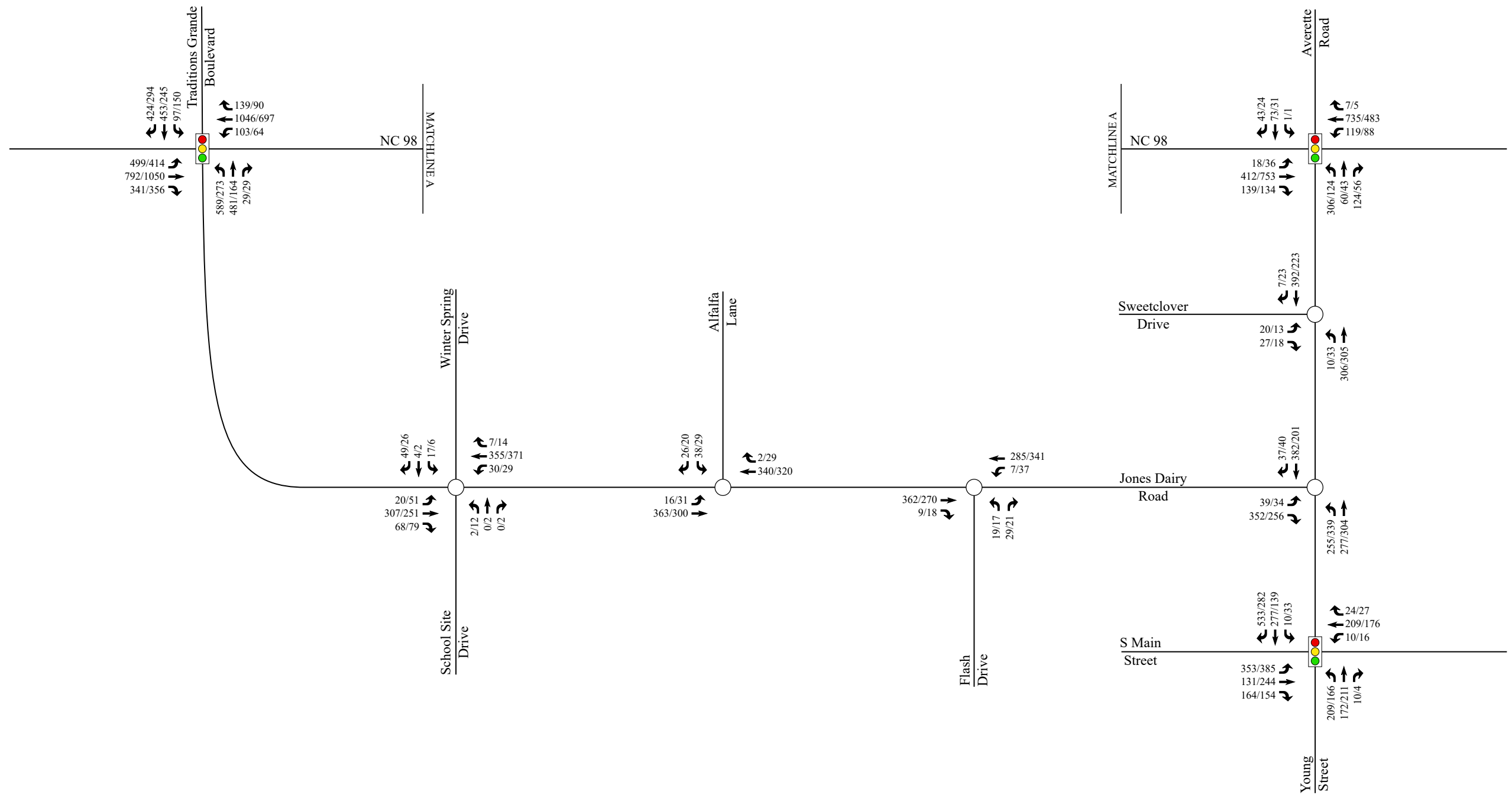
- Unsignalized Intersection
- 🚦 Signalized Intersection
- X/Y → Weekday Adjacent Development Trips



Jones Dairy Road Residential
Rolesville, NC

Adjacent Development Trips

Scale: Not to Scale	Figure 6
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LEGEND

- Unsignalized Intersection
- Signalized Intersection
- X/Y → Weekday AM / PM Peak Hour Traffic



Jones Dairy Road Residential
Rolesville, NC

Background (2024)
Peak Hour Traffic Volumes

Scale: Not to Scale Figure 7

4. SITE TRIP GENERATION AND DISTRIBUTION

4.1. Trip Generation

The proposed development is assumed to consist of approximately 600 single-family homes and 250 townhomes. Average weekday daily, weekday AM peak hour, and weekday PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 10th Edition. Table 2 provides a summary of the trip generation potential for the site.

Table 2: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	600 dwellings	5,410	108	323	357	210
Townhomes (220)	250 units	1,850	26	88	84	49
Total Trips		7,260	134	411	441	259

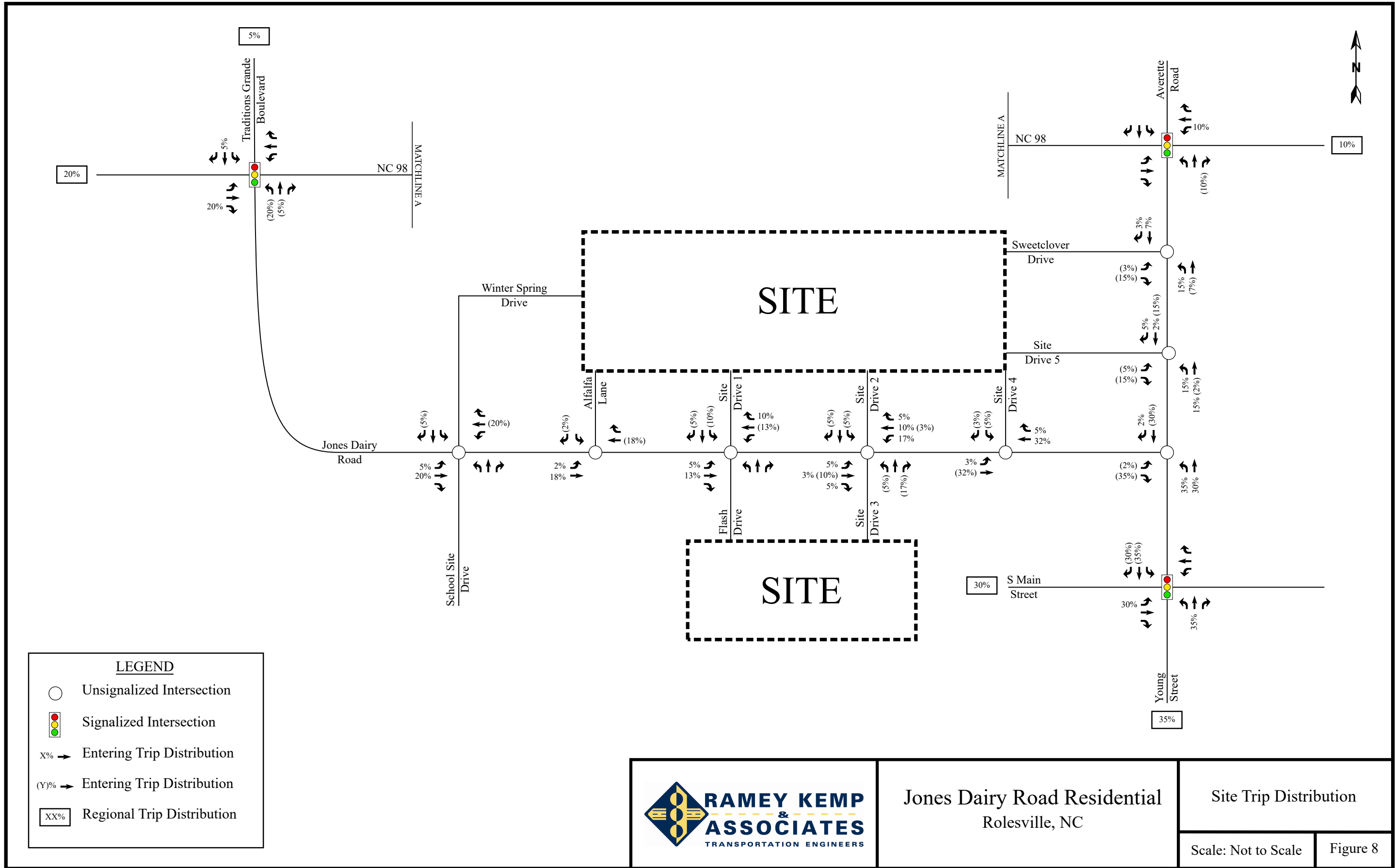
It is estimated at full build-out the proposed development will generate approximately 7,260 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 545 trips (134 entering and 411 exiting) will occur during the weekday AM peak hour and 700 (441 entering and 259 exiting) will occur during the weekday PM peak hour.

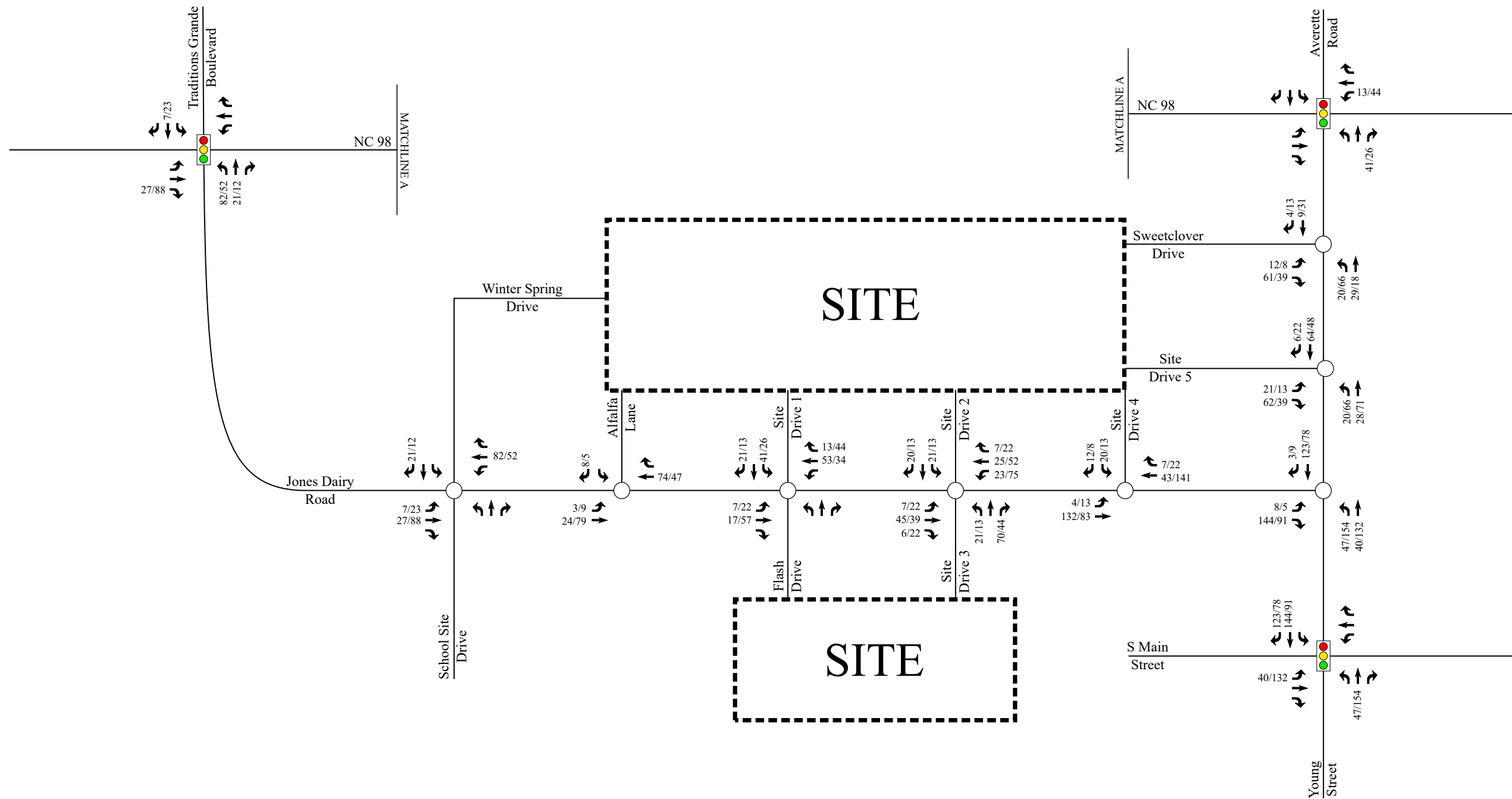
4.2. Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. It is estimated that trips will be distributed as follows:




- 35% to/from the south via Young Street
- 30% to/from the west via Main Street
- 20% to/from the west via NC 98
- 10% to/from the east via NC 98
- 5% to/from the north via Traditions Grande Boulevard

The site trip distribution is shown in Figure 8. Refer to Figure 9 for the site trip assignment.





LEGEND

-  Unsignalized Intersection
-  Signalized Intersection
-  Weekday AM / PM Peak Hour Traffic



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TRANSPORTATION ENGINEERS

Jones Dairy Road Residential
Rolesville, NC

Site Trip Assignment

Scale: Not to Scale Figure 9

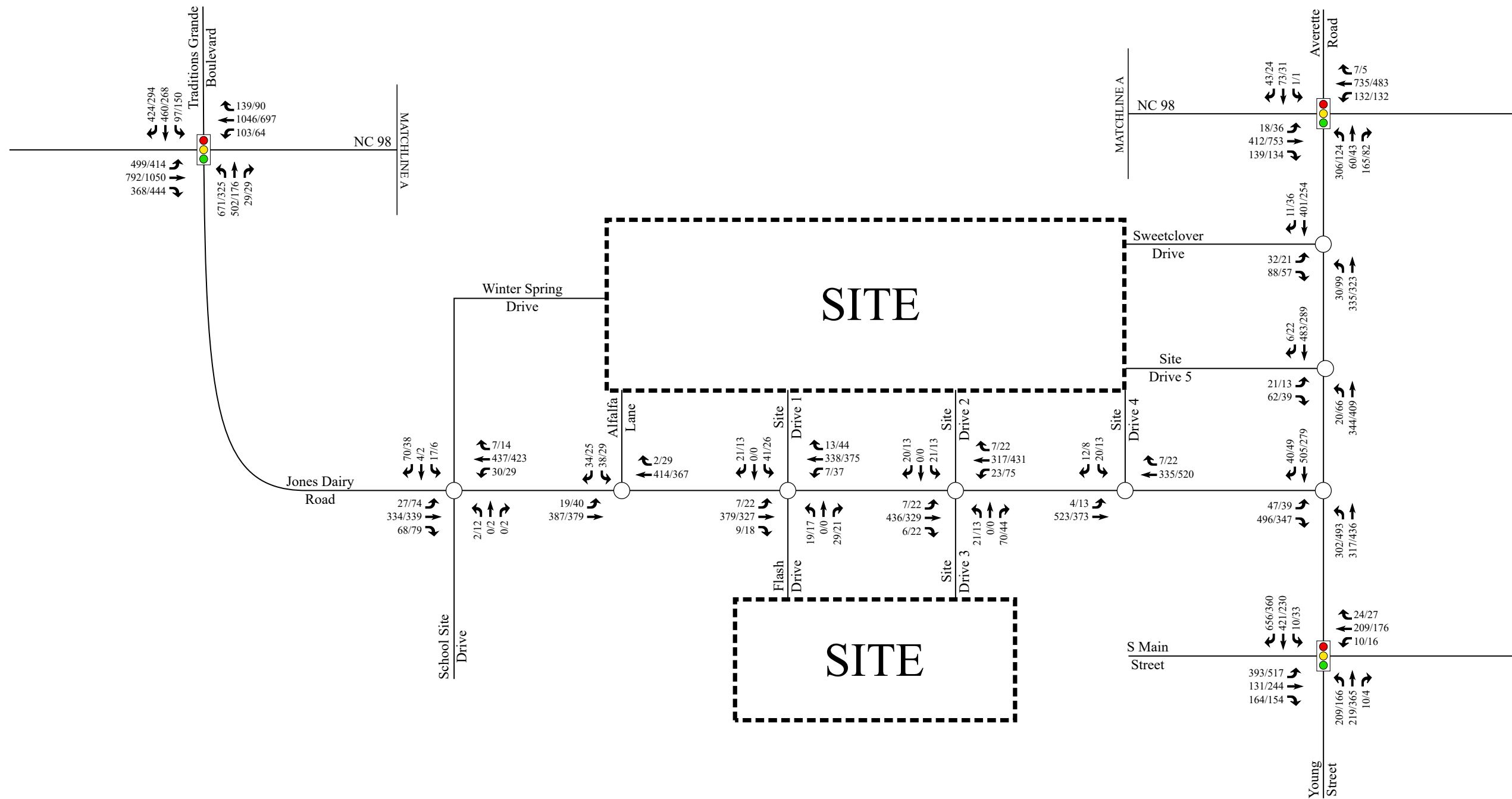
5. COMBINED (2024) TRAFFIC CONDITIONS

5.1. Combined (2024) Peak Hour Traffic Volumes

To estimate traffic conditions with the site fully built-out, the total site trips were added to the background (2024) traffic volumes to determine the combined (2024) traffic volumes. Refer to Figure 10 for an illustration of the combined (2024) peak hour traffic volumes with the proposed site fully developed.

5.2. Analysis of Combined (2024) Peak Hour Traffic

Study intersections were analyzed with the combined (2024) traffic volumes using the same methodology previously discussed for existing and background traffic conditions. Intersections were analyzed with improvements necessary to accommodate future traffic volumes. The results of the capacity analysis for each intersection are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- 🚦 Signalized Intersection
- x/y → Weekday AM / PM Peak Hour Traffic



Jones Dairy Road Residential
Rolesville, NC

Combined (2024)
Peak Hour Traffic Volumes

Scale: Not to Scale Figure 10

6. TRAFFIC ANALYSIS PROCEDURE

Study intersections were analyzed using the methodology outlined in the *2010 Highway Capacity Manual* (HCM) published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 9.2), was used to complete the analyses for most of the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement.

The HCM defines capacity as “the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions.” Level of service (LOS) is a term used to represent different driving conditions and is defined as a “qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers.” Level of service varies from Level “A” representing free flow, to Level “F” where breakdown conditions are evident. Refer to Table 3 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes “initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay”. An average control delay of 50 seconds at a signalized intersection results in LOS “D” operation at the intersection.

Table 3: Highway Capacity Manual – Levels-of-Service and Delay

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

6.1. Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to the NCDOT Congestions Management Guidelines.

7. CAPACITY ANALYSIS

7.1. Jones Dairy Road and Averette Road

The existing unsignalized intersection of Jones Dairy Road and Averette Road was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with the lane configurations and traffic control shown in Table 4. Refer to Table 4 for a summary of the analysis results. Refer to Appendix D for the Synchro capacity analysis reports.

Table 4: Analysis Summary of Jones Dairy Road and Averette Road

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	B ² A ¹ --	N/A	B ² A ¹ --	N/A
Background (2024) Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	F ² A ¹ --	N/A	D ² A ¹ --	N/A
Combined (2024) Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	F ² B ¹ --	N/A	F ² B ¹ --	N/A
Combined (2024) Conditions - Signalized	EB NB SB	1 LT, 1 RT 1 LT, 1 TH 1 TH-RT	C B C	C (24)	B B C	B (18)

Recommended improvements by the developer are shown in BOLD.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of existing (2018) traffic conditions indicates the major-street left-turn movement is expected to operate at LOS A and the minor-street approach is expected to operate at LOS B during the weekday AM and PM peak hours. Under background (2024) traffic conditions, the major-street left-turn movement is expected to operate at LOS A during the weekday AM and PM peak hours. The minor-street approach is expected to operate at LOS F during the weekday AM peak hour and LOS D during the weekday PM peak hour. Under combined (2024) traffic conditions, the major-street left-turn movement is expected to operate at LOS B and the minor-street approach is expected to operate at LOS F during the weekday AM and PM peak hours.

To determine whether additional turn lanes should be considered at this intersection, the methodology outlined in the *Policy on Street and Driveway Access to North Carolina Highways* (published by the NCDOT) was utilized. Based on the findings from the turn lane warrant analysis, the intersection meets the criteria to warrant an exclusive eastbound left-turn lane and an exclusive northbound left-turn lane.

The poor level-of-service experienced at this intersection is not uncommon for unsignalized minor-street approaches at a mainline with heavy volumes. Additional turn lanes were considered at this intersection under combined (2024) traffic conditions; however, these improvements are not expected to mitigate the increase in delay for the minor-street approaches. Therefore, a traffic signal was considered at this intersection.

The background (2024) and combined (2024) traffic conditions were analyzed utilizing the criteria contained in the *Manual on Uniform Traffic Control Devices* (MUTCD). The intersection meets the peak hour warrants for a traffic signal during the weekday AM and PM peak hours under background (2024) and combined (2024) traffic conditions. Due to the significant delay and queueing expected at this intersection, it is recommended that the developer monitor this intersection for signalization and install a traffic signal when the 4-hour or 8-hour signal warrants are met, which are preferred by the NCDOT. With the installation of a traffic signal, an exclusive eastbound left-turn lane, and an exclusive northbound left-turn lane, the intersection is expected to operate at an overall LOS C during the weekday AM peak hour and an overall LOS B during the weekday PM peak hour under combined (2024) traffic conditions.

It should be noted that the northbound left-turn movement was analyzed with protected-only phasing, to adhere to Congestion Management Guidelines. Upon construction of a traffic signal, the northbound left-turn movement will likely operate with protected-permitted phasing, which will improve queuing and delay at this intersection. Protected-permitted phasing will likely be used in the field since this is a T-intersection and adequate sight distance should be available for the northbound left-turn movement.

7.2. Main Street and Young Street

The existing signalized intersection of Main Street and Young Street was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with existing lane configurations and traffic control. Refer to Table 5 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports.

Table 5: Analysis Summary of Main Street and Young Street

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB	1 LT, 1 TH-RT	C	C (24)	B	C (25)
	WB	1 LT, 1 TH-RT	D		B	
	NB	1 LT, 1 TH-RT	B		D	
	SB	1 LT, 1 TH, 1 RT	C		D	
Background (2024) Conditions	EB	1 LT, 1 TH-RT	D	C (34)	B	C (27)
	WB	1 LT, 1 TH-RT	D		C	
	NB	1 LT, 1 TH-RT	B		C	
	SB	1 LT, 1 TH, 1 RT	C		D	
Combined (2024) Conditions	EB	1 LT, 1 TH-RT	E	D (49)	C	C (31)
	WB	1 LT, 1 TH-RT	D		D	
	NB	1 LT, 1 TH-RT	C		D	
	SB	1 LT, 1 TH, 1 RT	D		C	

Capacity analysis of existing (2018) and background (2024) traffic indicates the intersection of Main Street and Young Street is expected to operate at an overall LOS C during both weekday AM and PM peak hours. Under combined (2024) traffic conditions, the intersection is expected to operate at an overall LOS D during the weekday AM peak hour and an overall LOS C during the weekday PM peak hour.

This intersection operates with signalized control as part of a coordinated signal system (US 401 Closed Loop System). Timings for this intersection were obtained from the field by RKA and remain the same under all analysis scenarios. The intersection is currently operating with free-run timings during the weekday AM peak hour. The intersection was analyzed as an actuated-uncoordinated signal during the weekday AM peak hour because it is not expected to be coordinated with any other signals studied in this report.

7.3. Jones Dairy Road and NC 98

The existing signalized intersection of Jones Dairy Road and NC 98 was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with existing lane configurations and traffic control. Refer to Table 6 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports.

Table 6: Analysis Summary of Jones Dairy Road and NC 98

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB	2 LT, 2 TH, 1 RT	D	D (40)	C	C (29)
	WB	1 LT, 2 TH, 1 RT	C		C	
	NB	2 LT, 2 TH, 1 RT	D		C	
	SB	2 LT, 2 TH, 1 RT	D		C	
Background (2024) Conditions	EB	2 LT, 2 TH, 1 RT	F	F (88)	C	D (36)
	WB	1 LT, 2 TH, 1 RT	D		C	
	NB	2 LT, 2 TH, 1 RT	F		D	
	SB	2 LT, 2 TH, 1 RT	D		D	
Combined (2024) Conditions	EB	2 LT, 2 TH, 1 RT	F	F (104)	C	D (36)
	WB	1 LT, 2 TH, 1 RT	D		C	
	NB	2 LT, 2 TH, 1 RT	F		D	
	SB	2 LT, 2 TH, 1 RT	D		D	

Capacity analysis of existing (2018) traffic conditions indicates the intersection of Jones Dairy Road and NC 98 is expected to operate at an overall LOS D during the weekday AM peak hour and an overall LOS C during the weekday PM peak hour. Under background (2024) and combined (2024) traffic conditions, the intersection is expected to operate at an overall LOS F during the weekday AM peak hour and an overall LOS D during the weekday PM peak hour.

This intersection operates with signalized control as part of a coordinated signal system (NC 98 Closed Loop Signal System); however, through field reconnaissance by RKA, it was determined the intersection is currently operating under free-run timings. The intersection was analyzed as an actuated-uncoordinated signal because it is not expected to be coordinated with any other signals studied in this report.

This intersection is expected to operate poorly due to background traffic growth in the study area. Major geometric improvements, such as additional through lanes to increase capacity along NC 98, would be required to mitigate the overall delay. Although the intersection is not expected to operate at acceptable levels of service and delay under background (2024) and combined (2024) traffic conditions, the proposed development is not expected to have a significant negative impact at the intersection.

7.4. Averette Road and NC 98

The existing signalized intersection of Averette Road and NC 98 was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with the lane configurations and traffic control shown in Table 7. Refer to Table 7 for a summary of the analysis results. Refer to Appendix G for the Synchro capacity analysis reports.

Table 7: Analysis Summary of Averette Road and NC 98

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB	1 LT, 1 TH-RT	B	B (15)	B	B (13)
	WB	1 LT, 1 TH-RT	B			
	NB	1 LT-TH-RT	C			
	SB	1 LT-TH-RT	B			
Background (2024) Conditions	EB	1 LT, 1 TH, 1 RT	B	C (26)	B	B (17)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT , 1 TH-RT	C			
	SB	1 LT-TH-RT	E			
Combined (2024) Conditions	EB	1 LT, 1 TH, 1 RT	B	C (26)	B	C (20)
	WB	1 LT, 1 TH-RT	C			
	NB	1 LT , 1 TH-RT	C			
	SB	1 LT-TH-RT	E			

Thales Academy improvements and/or revised lane configurations shown in **BOLD** type.

Capacity analysis of existing (2018), background (2024), and combined (2024) traffic conditions indicates the intersection of Averette Road and NC 98 is expected to operate at an overall LOS C or better during both weekday AM and PM peak hours. Improvements are considered that are required of the adjacent developments.

7.5. Winter Spring Drive and Jones Dairy Road

The existing unsignalized intersection of Winter Spring Drive and Jones Dairy Road was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with existing lane configurations and traffic control. Refer to Table 8 for a summary of the analysis results. Refer to Appendix H for the Synchro capacity analysis reports.

Table 8: Analysis Summary of Winter Spring Drive and Jones Dairy Road

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	A ¹ A ¹ B ² B ²	N/A	A ¹ A ¹ C ² B ²	N/A
Background (2024) Conditions	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	A ¹ A ¹ C ² C ²	N/A	A ¹ A ¹ C ² B ²	N/A
Combined (2024) Conditions	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	A ¹ A ¹ C ² C ²	N/A	A ¹ A ¹ D ² C ²	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of existing (2018), background (2024), and combined (2024) traffic conditions indicates all minor-street approaches and major-street left-turn movements at the intersection of Winter Spring Drive and Jones Dairy Road are expected to operate at LOS D or better during both weekday AM and PM peak hours.

7.6. Sweetclover Drive and Averette Road

The existing unsignalized intersection of Sweetclover Drive and Averette Road was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with existing lane configurations and traffic control. Refer to Table 9 for a summary of the analysis results. Refer to Appendix I for the Synchro capacity analysis reports.

Table 9: Analysis Summary of Sweetclover Drive and Averette Road

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	B ² A ¹ --	N/A	B ² A ¹ --	N/A
Background (2024) Conditions	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	B ² A ¹ --	N/A	B ² A ¹ --	N/A
Combined (2024) Conditions	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	C ² A ¹ --	N/A	B ² A ¹ --	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of existing (2018), background (2024), and combined (2024) traffic conditions indicates the all minor-street approaches and major-street left-turn movements at the intersection of Sweetclover Drive and Averette Road are expected to operate at LOS C or better during both weekday AM and PM peak hours.

7.7. Alfalfa Lane and Jones Dairy Road

The existing unsignalized intersection of Alfalfa Lane and Jones Dairy Road was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with existing lane configurations and traffic control. Refer to Table 10 for a summary of the analysis results. Refer to Appendix J for the Synchro capacity analysis reports.

Table 10: Analysis Summary of Alfalfa Lane and Jones Dairy Road

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A ¹ -- B ²	N/A	A ¹ -- B ²	N/A
Background (2024) Conditions	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A ¹ -- C ²	N/A	A ¹ -- B ²	N/A
Combined (2024) Conditions	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A ¹ -- B ²	N/A	A ¹ -- B ²	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of existing (2018), background (2024), and combined (2024) traffic conditions indicates the all minor-street approaches and major-street left-turn movements at the intersection of Alfalfa Lane and Jones Dairy Road are expected to operate at LOS C or better during both weekday AM and PM peak hours.

7.8. Jones Dairy Road and Flash Drive / Site Drive 1

The existing unsignalized intersection of Jones Dairy Road and Flash Drive / Site Drive 1 was analyzed under existing (2018), background (2024), and combined (2024) traffic conditions with the lane configurations and traffic control shown in Table 11. Refer to Table 11 for a summary of the analysis results. Refer to Appendix K for the Synchro capacity analysis reports.

Table 11: Analysis Summary of Jones Dairy Road and Flash Drive / Site Drive 1

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2018) Conditions	EB WB NB	1 TH-RT 1 LT, 1 TH 1 LT-RT	-- A ¹ B ²	N/A	-- A ¹ B ²	N/A
Background (2024) Conditions	EB WB NB	1 TH-RT 1 LT, 1 TH 1 LT-RT	-- A ¹ B ²	N/A	-- A ¹ B ²	N/A
Combined (2024) Conditions	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT- TH-RT 1 LT-TH-RT	A ¹ A ¹ C ² C ²	N/A	A ¹ A ¹ C ² C ²	N/A

Recommended improvements by the developer are shown in BOLD.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of existing (2018), background (2024), and combined (2024) traffic conditions indicates the all minor-street approaches and major-street left-turn movements at the intersection of Jones Dairy Road and Flash Drive / Site Drive 1 are expected to operate at LOS C or better during both weekday AM and PM peak hours.

7.9. Jones Dairy Road and Site Drive 2 / Site Drive 3

The unsignalized intersection of Jones Dairy Road and Site Drive 2 / Site Drive 3 was analyzed under combined (2024) traffic conditions with the proposed lane configurations and traffic control. Refer to Table 12 for a summary of the analysis results. Refer to Appendix L for the Synchro capacity analysis reports.

Table 12: Analysis Summary of Jones Dairy Road and Site Drive 2 / Site Drive 3

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Combined (2024) Conditions	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	A ¹ A ¹ C ² C ²	N/A	A ¹ A ¹ C ² C ²	N/A

Recommended improvements by the developer are shown in BOLD.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of combined (2024) traffic conditions indicates all minor-street approaches and major-street left-turn movements at the intersection of Jones Dairy Road and Site Drive 2 / Site Drive 3 are expected to operate at LOS C or better during the weekday AM and PM peak hours. Jones Dairy Road is anticipated to be widened to a three-lane roadway along the site frontage.

7.10. Jones Dairy Road and Site Drive 4

The proposed unsignalized intersection of Jones Dairy Road and Site Drive 4 was analyzed under combined (2024) traffic conditions with the proposed lane configurations and traffic control. Refer to Table 13 for a summary of the analysis results. Refer to Appendix M for the Synchro capacity analysis reports.

Table 13: Analysis Summary of Jones Dairy Road and Site Drive 4

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Combined (2024) Conditions	EB WB SB	1 LT, 1 TH 1 TH-RT 1 LT-RT	A ¹ -- C ²	N/A	A ¹ -- C ²	N/A

Recommended improvements by the developer are shown in BOLD.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of combined (2024) traffic conditions indicates all minor-street approaches and major-street left-turn movements at the intersection of Jones Dairy Road and Site Drive 4 are expected to operate at LOS C or better during the weekday AM and PM peak hours. Jones Dairy Road is anticipated to be widened to a three-lane roadway along the site frontage.

7.11. Averette Road and Site Drive 5

The unsignalized intersection of Averette Road and Site Drive 5 was analyzed under combined (2024) traffic conditions with the proposed lane configurations and traffic control. Refer to Table 14 for a summary of the analysis results. Refer to Appendix N for the Synchro capacity analysis reports.

Table 14: Analysis Summary of Averette Road and Site Drive 5

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Combined (2024) Conditions	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	C ² A ¹ --	N/A	B ² A ¹ --	N/A

Recommended improvements by the developer are shown in BOLD.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of combined (2024) traffic conditions indicates all minor-street approaches and major-street left-turn movements at the intersection of Averette Road and Site Drive 5 are expected to operate at LOS C or better during the weekday AM and PM peak hours.

8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the proposed Jones Dairy Road Residential, located along Jones Dairy Road and Averette Road in Rolesville, North Carolina. The proposed development is expected to be a residential development and be built out in 2024. Site access is proposed via one full movement intersection on Averette Road and two full movement intersections on Jones Dairy Road. Site access will also be provided through roadway connections to the development to the northwest of the site, Jones Dairy Farm via connections to Alfalfa Lane, Winter Springs Drive, and Sweetclover Drive.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- Existing (2018) Traffic Conditions
- Background (2024) Traffic Conditions
- Combined (2024) Traffic Conditions

Trip Generation

It is estimated at full build-out the proposed development will generate approximately 7,260 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 545 trips (134 entering and 411 exiting) will occur during the weekday AM peak hour and 700 (441 entering and 259 exiting) will occur during the weekday PM peak hour.

Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to the Town's LDO and NCDOT Congestion Management Guidelines. Refer to section 6.1 of this report for a detailed description of any adjustments to these guidelines made throughout the analysis.

Intersection Capacity Analysis Summary

All the study area intersections (including the proposed site driveways) are expected to operate at acceptable levels-of-service under existing and future year conditions with the exception of

the intersections listed below. A summary of the study area intersections that are expected to need improvements are as follows:

Jones Dairy Road and Averette Road

The poor level-of-service experienced at this intersection is not uncommon for unsignalized minor-street approaches at a mainline with heavy volumes. Based on the findings from the turn lane warrant analysis, the intersection meets the criteria to warrant an exclusive eastbound left-turn lane and an exclusive northbound left-turn lane. Additional laneage was considered at this intersection under combined (2024) traffic conditions; however, these improvements are not expected to mitigate the delay for the minor-street approaches. Therefore, a traffic signal was considered at this intersection.

The intersection meets the peak hour warrants for a traffic signal during the weekday AM and PM peak hours under background (2024) and combined (2024) traffic conditions. Due to the significant delay and queueing expected at this intersection, it is recommended that the developer monitor this intersection for signalization and install a traffic signal when the 4-hour or 8-hour signal warrants are met.

Jones Dairy Road and NC 98

This intersection is expected to operate poorly due to background traffic growth in the study area. Major geometric improvements, such as additional through lanes to increase capacity along NC 98, would be required to mitigate the overall delay. Although the intersection is not expected to operate at acceptable levels of service and delay under background (2024) and combined (2024) traffic conditions, the proposed development is not expected to have a significant negative impact at the intersection.

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 11 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer

Jones Dairy Road and Averette Road

- Construct an exclusive eastbound left-turn lane on Jones Dairy Road with a minimum 50 feet of storage and appropriate deceleration and taper length.
- Construct an exclusive northbound left-turn lane on Averette Road with a minimum 150 feet of storage and appropriate deceleration and taper length.
- Monitor for signalization and install a traffic signal if and when warranted.

Jones Dairy Road and Flash Drive / Site Drive 1

- Construct the southbound approach (Site Drive 1) with one ingress lane and one egress lane.
- Provide stop control for southbound approach.
- Restripe the eastbound two-way left-turn lane on Jones Dairy Road to provide a minimum 50 feet of storage.

Jones Dairy Road and Site Drive 2 / Site Drive 3

- Construct the southbound approach (Site Drive 2) with one ingress lane and one egress lane.
- Construct the northbound approach (Site Drive 3) with one ingress lane and one egress lane.
- Provide stop control for southbound and northbound approach.
- Construct an eastbound two-way left-turn lane on Jones Dairy Road stiped with a minimum 50 feet of storage.

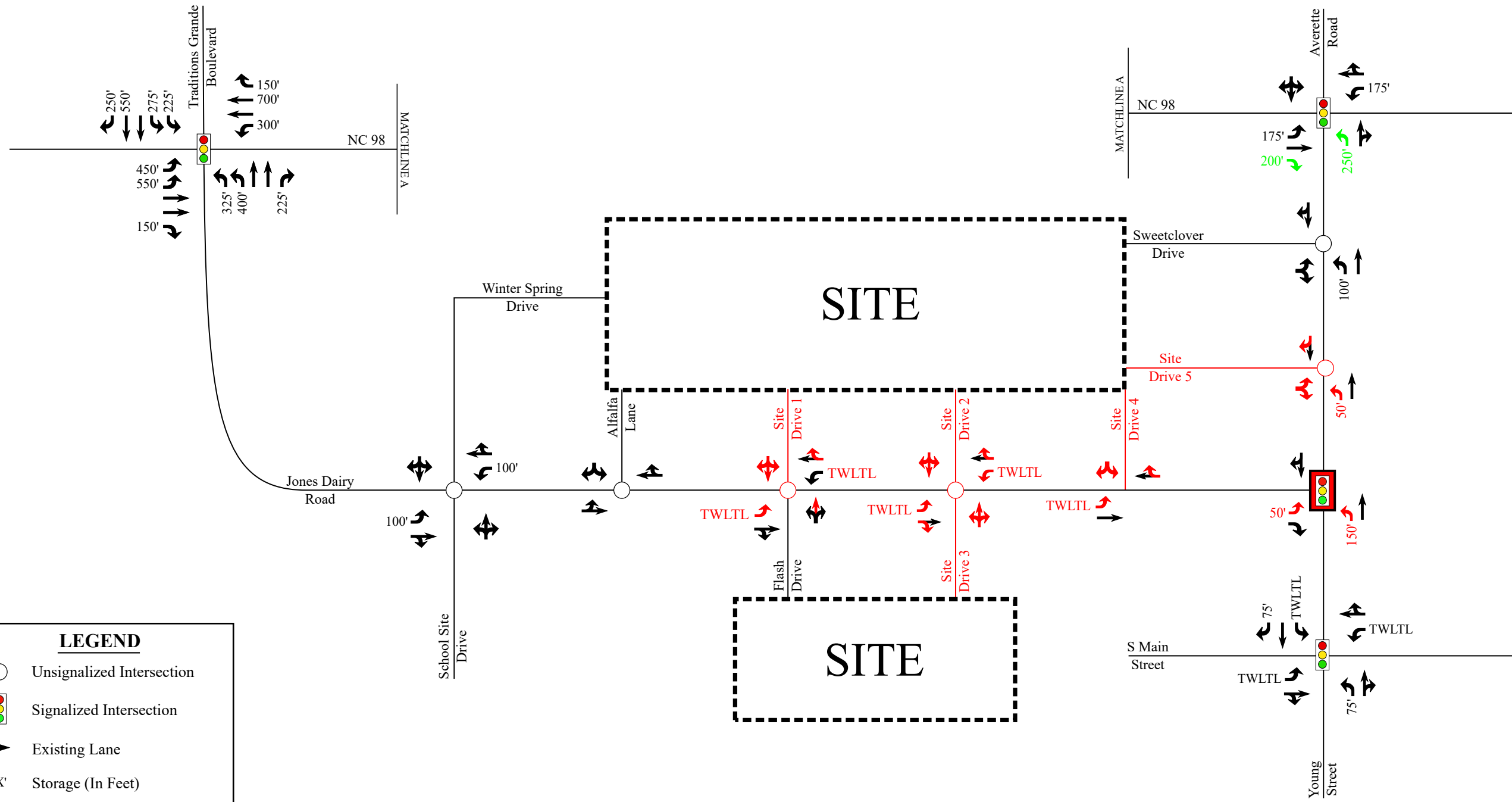
- Construct a westbound two-way left-turn lane on Jones Dairy Road striped with a minimum 50 feet of storage.

Jones Dairy Road and Site Drive 4

- Construct the southbound approach (Site Drive 4) with one ingress lane and one egress lane.
- Provide stop control for southbound approach.
- Construct an eastbound two-way left-turn lane on Jones Dairy Road striped with a minimum 50 feet of storage.

Averette Road and Site Drive 5

- Construct the eastbound approach (Site Drive 5) with one ingress land and one egress lane.
- Provide stop control for eastbound approach.
- Construct an exclusive northbound left-turn lane on Averette Road with a minimum 50 feet of storage and appropriate deceleration and taper length.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- X' Storage (In Feet)
- TWLTL Two-Way Left-Turn Lane
- Improvement by Developer
- Thales Academy Improvement
- Monitor for Signalization



Jones Dairy Road Residential
Rolesville, NC

Recommended Lane Configurations

Scale: Not to Scale	Figure 11
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Charleston, SC - Charlotte, NC - Columbia, SC - Raleigh, NC - Richmond, VA - Winston-Salem, NC