TRAFFIC IMPACT ANALYSIS

Mailman Post Subdivision

Knightdale, North Carolina

PREPARED FOR

Craig Duerr
EF One, LLC
6801 Winding Ridge Road
Zebulon, NC 27597
919.601.6962

PREPARED BY

VHB Engineering NC, P.C. (C-3075)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328

5/19/2022

DocuSigned by:
Nathaniel J Rhomberg
E419EBDD28E14F0...

Executive Summary

EF One, LLC has plans to construct the Mailman Post Subdivision off of Mailman Road in Knightdale, North Carolina (Figure 1). The development calls for up to 156 single-family homes and is expected to be completed by 2025.

Project Background

Based on the conceptual site plan (Figure 2), access to the development is proposed via two (2) full movement vehicular driveways on Mailman Road:

- Future Access #1, full movement access proposed as the fourth leg of a roundabout intersection on Mailman Road across from Sawdust Lane, approximately 4,300 feet north of Smithfield Road.
- Future Access #2, full movement access on Mailman Road, approximately 500 feet south of Future Access #1.

As determined through the project scoping process with the North Carolina Department of Transportation (NCDOT) and the Town of Knightdale, the following intersections were included in the study area and analyzed for existing and future conditions, as applicable:

- Robertson Street/ Knightdale Eagle Rock Road (SR 2500) at Mailman Road (SR 2514) (unsignalized)
- Mailman Road (SR 2514) at Fayetteville Street (SR 2513) (unsignalized)
- Smithfield Road (SR 2233) at Mailman Road (SR 2514) (unsignalized, future signalized)
- Mailman Road (SR 2514) at Sawdust Lane/ Future Access #1 (unsignalized, future roundabout)
- Mailman Road (SR 2514) at Future Access #2 (future unsignalized)

The Town of Knightdale UDO requires that 10 years after the proposed build-out be analyzed in addition to the opening year of the development. The following scenarios were analyzed for existing and future conditions to evaluate the impacts that the proposed development may have on the surrounding roadway network:

- Existing (2022) Conditions
- No-Build (2025) Conditions
- Build (2025) Conditions
- Build (2035) Conditions

The Existing (2022) scenario includes typical weekday AM and PM peak hour analysis based on turning movement count data collected in February 2022. The No-Build (2025) scenario includes existing traffic with an annual projected background growth rate of three percent (3%) applied in addition to site trips that were identified from five (5) nearby background developments. The Build (2025) scenario includes No-Build (2025) volumes with the addition of site trips generated by the full build-out of the proposed development. The Build (2035) scenario includes an additional annual background growth rate of one percent (1%) applied between 2025 and 2035 and background development site trips with the addition of the proposed site generated trips.

Existing (2022) Conditions

Existing analyses were conducted based on current roadway geometrics and intersection turning movement counts collected in February 2022. No adjustments were applied to the collected turning movements since area schools were in session and traffic volumes were consistent with historical annual average daily traffic (AADT) data.

As reported in the Summary Level of Service (LOS) table on page v, all stop-controlled approaches at the intersections included in the study area operate at LOS A or B during both the AM and PM peak hours.

No-Build (2025) Conditions

Based on growth trends observed in historical traffic data, an annual growth rate of three percent (3%) was applied to the Existing (2022) peak hour volumes to calculate the expected background growth within the study area. Five (5) background developments were identified within the study area, and the projected peak hour trips from these developments were included in the No-Build (2025) volume calculations:

- Smithfield/Mailman MXD
- Glenmere – Phases 1 through 7 (inclusion based on the actual construction/occupancy status of each phase)
- Project Hope (Build Out Year – 2025)
- Harper Street Fayetteville (Build Out Year – 2025)
- Baker Roofing HQ (Build Out Year – 2023, 2026)

The Smithfield/Mailman MXD development is expected to provide a traffic signal at the intersection of Smithfield Road and Mailman Road once it is warranted. It is assumed that this traffic signal will be constructed before the build-out year (2025), and it is assumed in the future year analyses.

As shown on the Summary LOS table on page v, all stop controlled approaches within the study area are expected to continue to operate at LOS A or B during both peak hours under No-Build (2025) conditions. The new traffic signal at the intersection of Smithfield Road and Mailman Road is projected to operate at LOS B during both peak hours.

Trip Generation and Assignment

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. The proposed development is to consist of up to 156 single-family homes; ITE Land Use Code (LUC) 210 (Single-Family Detached Housing) was used based on the NCDOT guidance.

As a result, the proposed development is projected to generate 1,565 daily weekday site trips, with 116 trips (29 entering, 87 exiting) occurring in the AM peak hour and 156 trips (98 entering, 58 exiting) occurring in the PM peak hour. The generated site trips were distributed in accordance with the existing turning movement counts and land uses.

Build (2025) Conditions

The Build (2025) conditions account for both the No-Build (2025) traffic and the site traffic generated by the proposed development after the completion.

As shown on the Summary LOS table on page v, with the addition of site trips, all signalized intersections and stop-controlled approaches are projected to operate at LOS A or B during both peak hours. The proposed single-lane roundabout at Future Access #1 is projected to operate at LOS A during both peak hours, with a single circulating lane, and stop-controlled Future Access #2 is projected to operate at LOS A during both peak hours.

Build (2035) Conditions

The Build (2035) conditions account for an additional annual background growth rate of one percent (1%) applied to the No-Build (2025) volumes (excluding background development site trips) with the proposed development site trips in place.

As shown on the Summary LOS table on page v, under Build (2035) all signalized intersections and stop-controlled approaches are projected to operate at LOS C or better during both peak hours. The proposed single-lane roundabout at Future Access #1 is projected to continue to operate at LOS A during both peak hours and stop-controlled Future Access #2 is projected to operate at LOS B or better during both peak hours.

Roadway Improvement Recommendations

As indicated in the traffic operations analyses, the proposed development is not projected to have a significant impact on the traffic operations at the study area intersections. The planned driveways meet NCDOT's engineering standards for intersection spacing and sight distance requirements. Turn lane warrant analysis indicate that traffic volumes along Mailman Road at Future Access #2 do not meet warrants for installation of dedicated turn lanes. Nevertheless, the development is committed to widening Mailman Road along the site frontage to meet the Town of Knightdale's ultimate cross-section requirements.

As a result, the following is recommended for all future access driveways along Mailman Road:

Mailman Road (SR 2514) and Sawdust Lane/ Future Access #1 (unsignalized)

Currently, Future Access #1 is proposed to be connected to Mailman Road via a new roundabout intersection across from existing Sawdust Lane. The proposed single-lane roundabout is expected to operate at LOS A during both peak hours under Build (2025) and Build (2035) conditions. It should be noted that the intersection would operate with acceptable levels of service under two-way stop-control (TWSC) conditions. However, the developer is committed to installing a roundabout as the desired intersection to meet the preference in the Town of Knightdale's UDO. As a result, the following lane configurations are recommended for the driveway connection.

- Construct Future Access #1 as a full movement driveway with one ingress lane and one egress lane.
- Construct a single-lane roundabout intersection for Mailman Road, Sawdust Lane, and Future Access #1 that meets design standards set by NCDOT and the Town of Knightdale.

Mailman Road (SR 2514) and Future Access #2 (unsignalized)

Stop-controlled Future Access #2 is expected to operate at LOS A during both peak hours under Build (2025) conditions. Although a turn lane is not warranted, the development is committed to installing a dedicated left-turn lane for safety and planning considerations. As a result, the following lane configurations are recommended for the driveway connection.

- Construct Future Access #2 as a full movement driveway with one ingress lane and one egress lane.
- Provide a dedicated left-turn lane on southbound Mailman Road with 100 feet of storage and appropriate taper.

The summary of LOS results are shown in Table ES, and the future lane configurations and traffic control at the study area intersections, with the development in place, are presented in Figure ES.

Table ES Summary Level of Service Table

Intersection and Approach	Traffic Control	Existing (2022)		No-Build (2025)		Build (2025)		Build (2035)	
		AM	PM	AM	PM	AM	PM	AM	PM
Roberton Street/ Knightdale Eagle Rock Road at Mailman Road	Unsignalized	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Northbound		A-9.4	B-10.1	B-10.6	B-11.6	B-11.3	B-12.7	B-12.4	C-15.1
Mailman Road at Fayetteville Street	Unsignalized	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Eastbound		A-8.7	A-8.9	A-9.3	A-9.9	A-9.6	B-10.4	B-10.3	B-11.8
Smithfield Road at Mailman Road	Unsignalized/ Signalized	**N/A**	**N/A**	**B (13.0)**	**B (10.1)**	**B (14.6)**	**B (12.6)**	**B (17.8)**	**B (17.6)**
Eastbound		---	---	B-11.1	A-6.2	B-12.5	A-6.8	B-15.9	A-8.4
Westbound		---	---	B-10.9	A-8.8	B-12.3	B-10.7	B-15.2	B-15.1
Southbound		B-12.9	B-13.5	C-21.2	C-26.4	C-22.4	C-34.8	C-24.9	D-49.4
Mailman Road at Sawdust Lane/ Future Access #1	Unsignalized/ Roundabout	**N/A**	**N/A**	**N/A**	**N/A**	**A (3.4)**	**A (3.8)**	**A (3.6)**	**A (4.1)**
Eastbound		A-0.0	A-8.5	A-0.0	A-8.8	A-3.1	A-3.3	A-3.3	A-3.4
Westbound		---	---	---	---	A-3.4	A-3.4	A-3.5	A-3.7
Northbound		---	---	---	---	A-3.3	A-3.9	A-3.4	A-4.3
Southbound		---	---	---	---	A-3.5	A-3.8	A-3.9	A-4.0
Mailman Road at Future Access #2	Unsignalized	**-**	**-**	**-**	**-**	**N/A**	**N/A**	**N/A**	**N/A**
Westbound		---	---	---	---	A-9.2	A-9.7	A-9.5	B-10.3

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay

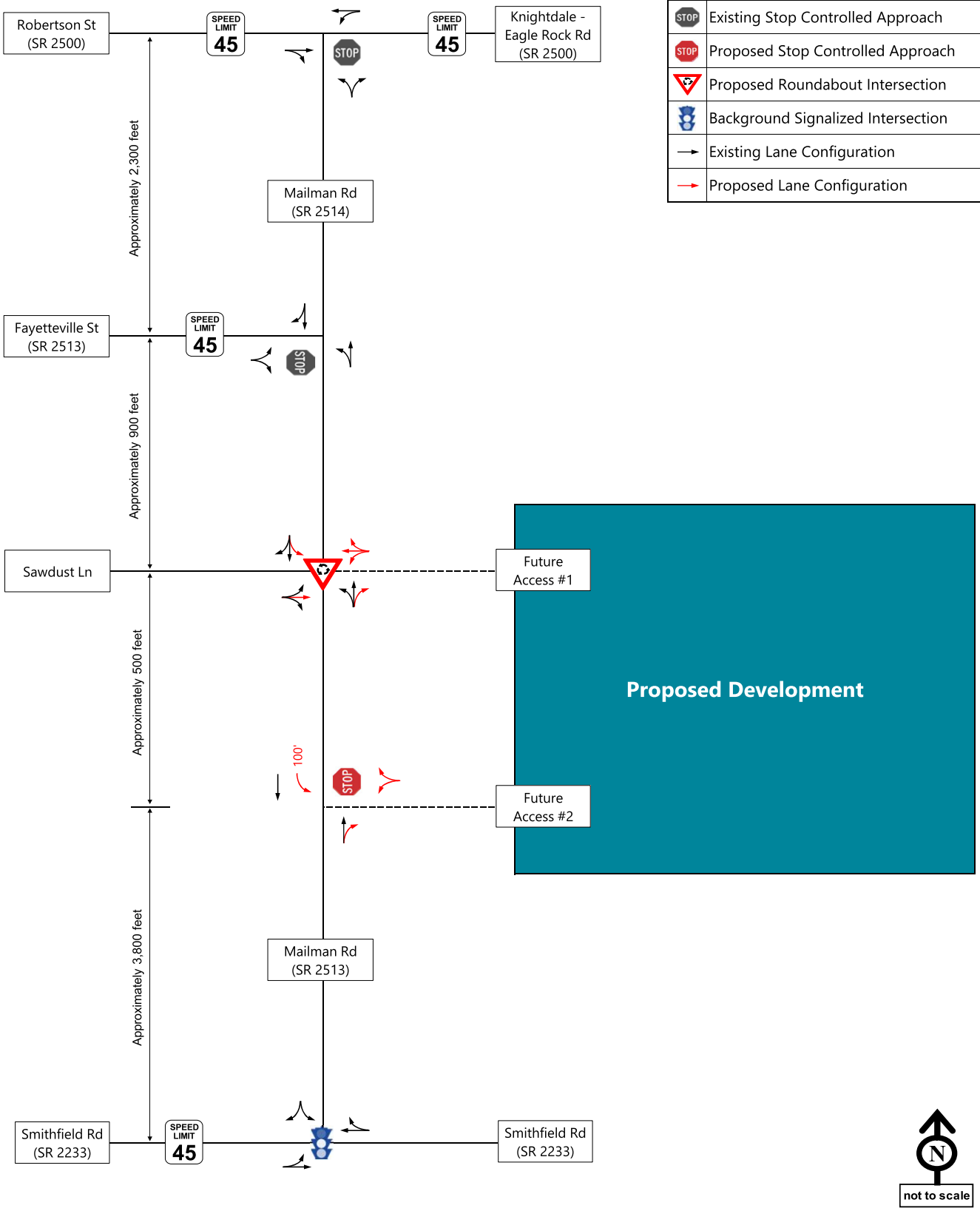


Figure ES **Future (2025) Lane Configurations and Traffic Control**	**Mailman Post TIA** **Knightdale, NC**

Table of Contents

Appendices

List of Tables

List of Figures

1

Introduction

EF One, LLC has plans to construct the Mailman Post Subdivision off of Mailman Road in Knightdale, North Carolina (Figure 1). The development calls for up to 156 single-family homes and is expected to be completed by 2025.

Project Background

Based on the conceptual site plan (Figure 2), access to the development is proposed via two (2) full movement vehicular driveways on Mailman Road:

- Future Access #1, full movement access proposed as the fourth leg of a roundabout intersection on Mailman Road across from Sawdust Lane, approximately 4,300 feet north of Smithfield Road.
- Future Access #2, full movement access on Mailman Road, approximately 500 feet south of Future Access #1.

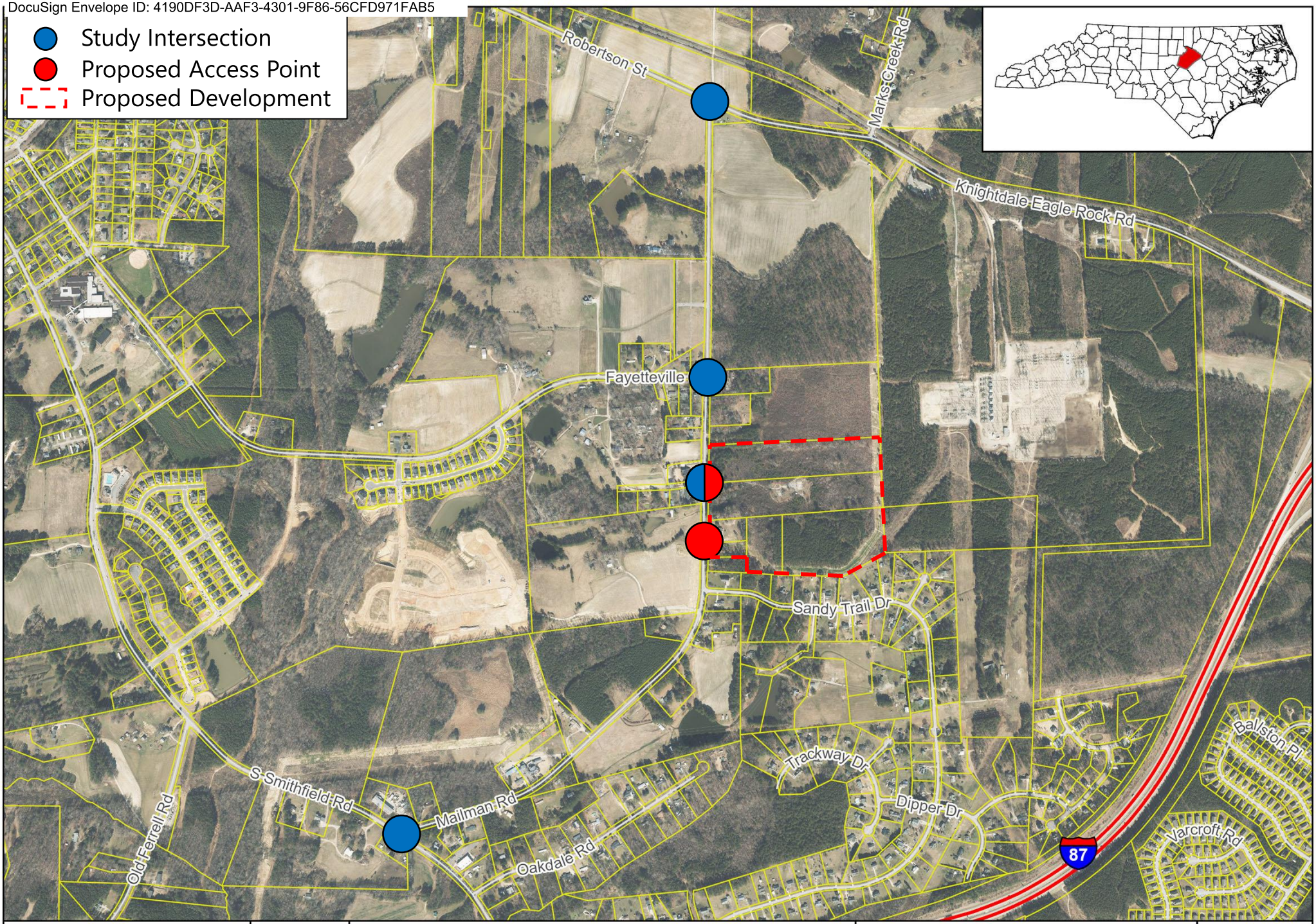
As determined through the project scoping process with the North Carolina Department of Transportation (NCDOT) and the Town of Knightdale, the following intersections were included in the study area and analyzed for existing and future conditions, as applicable:

- Robertson Street/ Knightdale Eagle Rock Road (SR 2500) at Mailman Road (SR 2514) (unsignalized)
- Mailman Road (SR 2514) at Fayetteville Street (SR 2513) (unsignalized)
- Smithfield Road (SR 2233) at Mailman Road (SR 2514) (unsignalized, future signalized)
- Mailman Road (SR 2514) at Sawdust Lane/ Future Access #1 (unsignalized, future roundabout)
- Mailman Road (SR 2514) at Future Access #2 (future unsignalized)

The Town of Knightdale UDO requires that 10 years after the proposed build-out be analyzed in addition to the opening year of the development. The following scenarios were analyzed for existing and future conditions to evaluate the impacts that the proposed development may have on the surrounding roadway network:

- Existing (2022) Conditions
- No-Build (2025) Conditions
- Build (2025) Conditions
- Build (2035) Conditions

VHB Engineering NC, P.C. (VHB) was retained by Land Alternatives, PLLC to analyze the potential traffic impacts of the proposed development and to identify any necessary roadway improvements. This Traffic Impact Analysis (TIA) summarizes trip generation, distribution, and traffic capacity analysis for the proposed development. A summary of the key assumptions made within this traffic study was sent to NCDOT and Town of Knightdale staff for review and comment prior to the completion of the TIA. These assumptions are provided within the Memorandum of Understanding attached within Appendix A.



Scale
0 750 1,500 Feet

Figure 1: Vicinity Map

Mailman Post TIA
Knightdale, NC
Wake County

SITE DATA:

TOTAL AREA	35.9 +/- AC
R.O.W. RESERVATION	0.2 +/- AC
NET AREA	35.7 +/- AC
30' X 90' REAR-LOAD SF LOTS	55
35' X 90' REAR-LOAD SF LOTS	63
60' X 110' FRONT-LOAD SF LOTS	25
80' X 110' FRONT-LOAD SF LOTS	13
TOTAL UNITS	156
PASSIVE OPEN SPACE REQUIRED	2.1 +/- AC
PASSIVE OPEN SPACE PROVIDED	2.8 +/- AC.
ACTIVE OPEN SPACE REQUIRED	2.1 +/- AC
ACTIVE OPEN SPACE PROVIDED	2.3 +/- AC
CONNECTIVITY RATIO	1.77

MAILMAN POST - KNIGHTDALE, NC

Conceptual Development Plan - April 21, 2022

N

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

COMMUNITY MASTER PLAN

2

Existing (2022) Conditions

This section describes the existing roadways in the vicinity of the proposed development. Annual Average Daily Traffic (AADT) data for the surrounding network of roadway was obtained from the NCDOT. The most recent AADT counts from the NCDOT are for 2019 on the study area roadways.

Mailman Road (SR 2514)

- Mailman Road (SR 2514) is a two-lane roadway with no posted speed limit.
- The land uses along Mailman Road (SR 2514) are primarily residential and agricultural within the study area.
- The 2015 AADT along Mailman Road (SR 2514) was 600 vehicles per day (vpd) north of Smithfield Road (SR 2233) and 530 vpd south of Robertson Street/ Knightdale Eagle Rock Road (SR 2500).

Robertson Street/ Knightdale Eagle Rock Road (SR 2500)

- Within the study area limits, Robertson Street/ Knightdale Eagle Rock Road (SR 2500) is a two-lane roadway with a posted speed limit of 45 mph.
- The land use along Robertson Street/ Knightdale Eagle Rock Road (SR 2500) is primarily agricultural within the study area limits.
- The 2019 AADT along Robertson Street/ Knightdale Eagle Rock Road (SR 2500) was 2,900 vpd east of Mailman Road (SR 2514) and 3,100 vpd west of Mailman Road (SR 2514).

Smithfield Road (SR 2233)

- Within the study area limits, Smithfield Road (SR 2233) is a two-lane roadway with a posted speed limit of 45 mph.

- The land uses along Smithfield Road (SR 2233) are primarily residential and commercial within the study area limits.
- The 2019 AADT along Smithfield Road (SR 2233) was 8,200 vpd east of Mailman Road (SR 2514).

Fayetteville Street (SR 2513)

- Within the study area limits, Fayetteville Street (SR 2513) is a two-lane roadway with a posted speed limit of 45 mph.
- The land use along Fayetteville Street (SR 2513) is primarily residential within the study area limits.
- The 2015 AADT along Fayetteville Street (SR 2513) was 260 vpd west of Mailman Road (SR 2514).

Figure 3 provides a schematic diagram of the existing roadways near the proposed development, including the intersection geometrics.

Existing Turning Movement Data

Weekday AM and PM peak hour intersection turning movement counts were collected in February 2022. Table 1 summarizes the schedule used to obtain the turning movement data. A detailed summary of the traffic counts can be found in Appendix B.

Table 1 Weekday Peak Hour Turning Movement Count Schedule

Intersection	Time Period	Data Collection Date
Robertson Street/ Knightdale Eagle Rock Road (SR 2500) and Mailman Road (SR 2514) (unsignalized)	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday February 22, 2022
Mailman Road (SR 2514) and Fayetteville Street (SR 2513) (unsignalized)	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday February 22, 2022
Smithfield Road (SR 2233) and Mailman Road (SR 2514) (unsignalized)	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday February 22, 2022
Mailman Road (SR 2514) and Sawdust Lane (unsignalized)	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday February 22, 2022

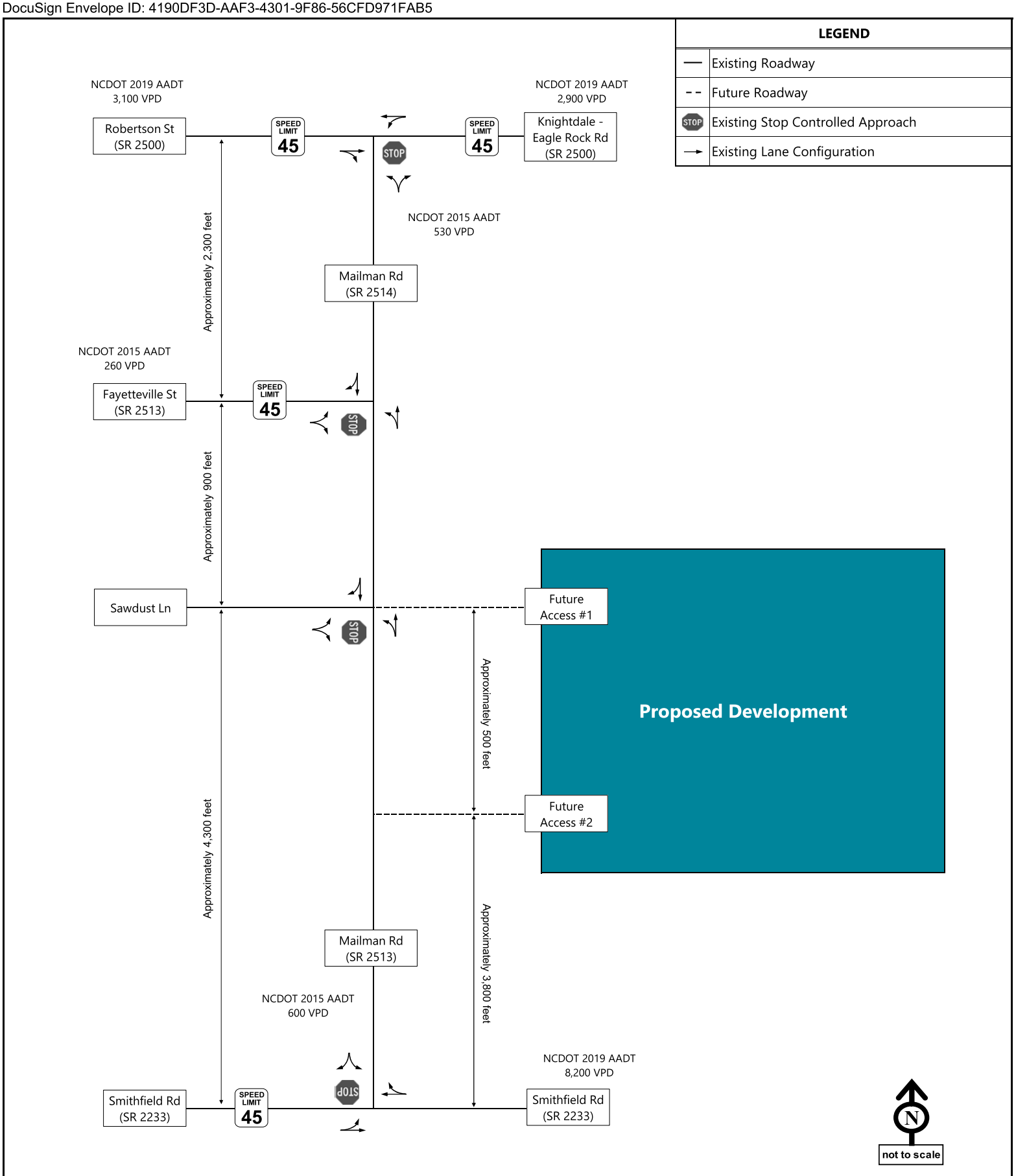


Figure 3
Existing (2022) Lane Configurations and Traffic Control

Mailman Post TIA
Knightdale, NC

Level of Service Criteria

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering professional generally accepts LOS D as an acceptable operating condition for signalized intersections in urban areas and LOS C for rural areas.

At unsignalized intersections, LOS E is generally considered acceptable only if the side street encounters the delay. Nevertheless, side streets sometimes function at LOS F during peak traffic periods; however, the traffic volume often does not warrant a traffic signal to assist side street traffic. Table 2 provides a general description of various levels of service categories and delay ranges.

Table 2 Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hour using *Synchro/SimTraffic Professional Version 10*. The turning movement volumes analyzed in the Existing (2022) scenario are displayed in Figure 4. A summary of the findings for the Existing (2022) scenario LOS analysis can be found in Table 3, and the full *Synchro* output can be found in Appendix C.

As reported in Table 3, all stop-controlled approaches at the intersections included in the study area operate at LOS A or B during both the AM and PM peak hours.

Table 3 Existing (2022) LOS Results

Intersection and Approach	Traffic Control	Existing (2022)	
		AM	PM
Roberton Street/ Knightdale Eagle Rock Road at Mailman Road	Unsignalized	**N/A**	**N/A**
Northbound		A-9.4	B-10.1
Mailman Road at Fayetteville Street	Unsignalized	**N/A**	**N/A**
Eastbound		A-8.7	A-8.9
Smithfield Road at Mailman Road	Unsignalized	**N/A**	**N/A**
Southbound		B-12.9	B-13.5
Mailman Road at Sawdust Lane	Unsignalized	**N/A**	**N/A**
Eastbound		A-0.0	A-8.5

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay

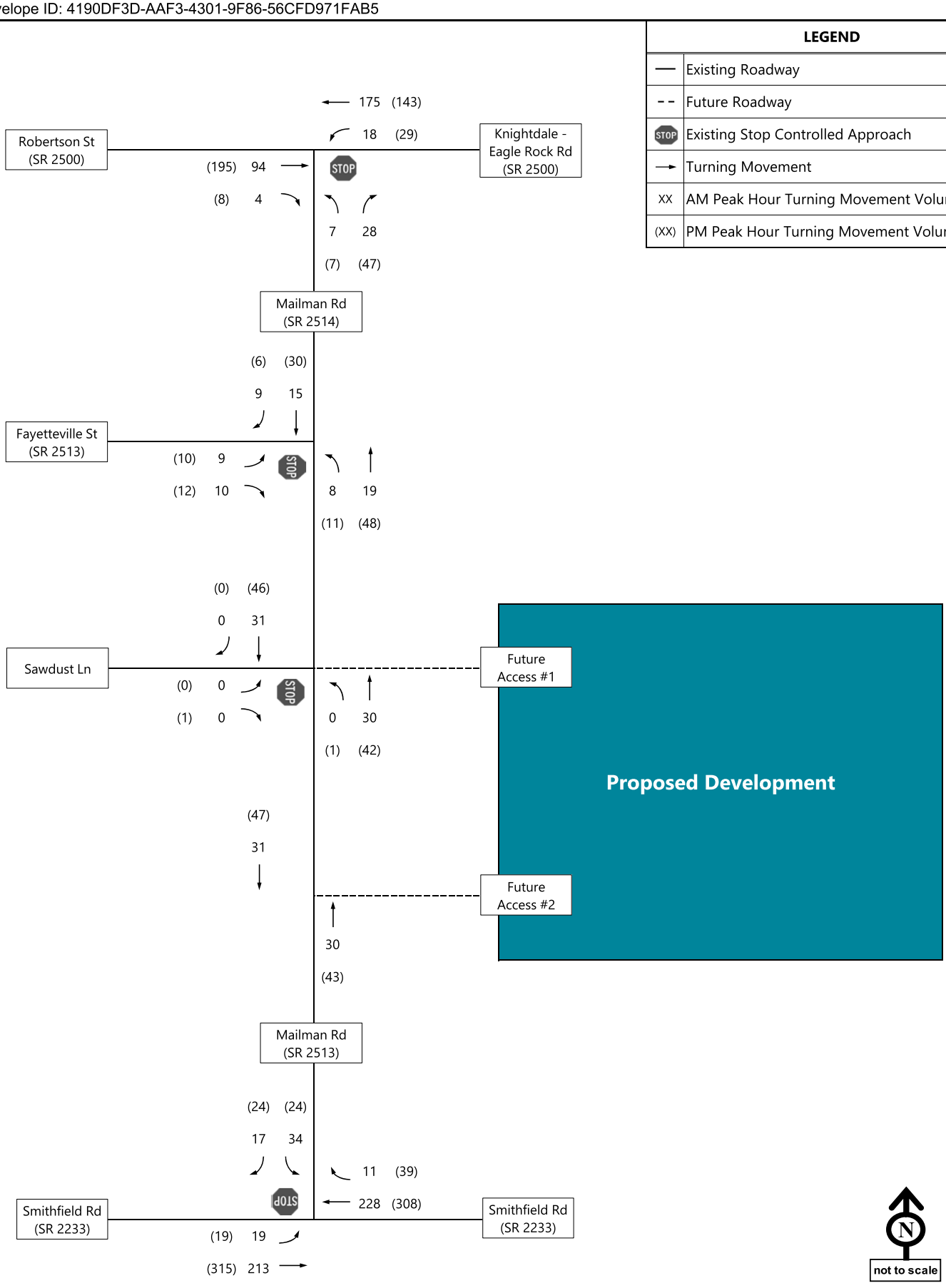


Figure 4
Existing (2022) AM and PM Peak Hour Volumes

Mailman Post TIA
Knightdale, NC

3

No-Build (2025) Conditions

Background Growth Calculations

Based on growth trends observed in historical traffic data, an annual growth rate of three percent (3%) was applied to the Existing (2022) peak hour volumes to calculate the expected background growth within the study area. Five (5) background developments were identified within the study area, and the projected peak hour trips from these developments were included in the No-Build (2025) volume calculations The site distributed trips for all background developments are included within Appendix E.

Smithfield/Mailman MXD – The proposed mixed-use development is planned along Mailman Road and Smithfield Road and proposes to build 97 single-family homes, 416 apartments, and 16,600 square feet (sf) of retail. A TIA was prepared by Ramey Kemp & Associates and was submitted in November 2020. The site is projected to generate 5,890 daily external site trips with 414 external trips (159 entering, 255 exiting) occurring during the AM peak hour and 422 external trips (245 entering, 177 exiting) occurring during the PM peak hour. Construction has not yet started for the development; therefore, 100% of the projected site trips were included in the background analysis.

Glenmere Residential – The proposed residential development is planned along Smithfield Road and Fayetteville Street and proposes to build 340 single-family homes. A TIA was prepared by Kimley-Horn and Associates and was submitted in February 2013. The site is projected to generate 3,206 daily site trips with 248 site trips (62 entering, 186 exiting) occurring during the AM peak hour and 316 site trips (199 entering, 117 exiting) occurring during the PM peak hour. Approximately 50% of the site has been constructed and is occupied at the time of this study; therefore, 50% of the remaining projected site trips were included in the background analysis.

Project Hope – The proposed development is planned along Mailman Road and proposes to build 164 single-family homes, 134 apartments, and additional space for the Raleigh Rescue Mission. A TIA has not yet been submitted for this development. Per ITE estimates, the site is projected to generate 2,611 daily site trips with 184 site trips (44 entering, 140 exiting) occurring during the AM peak hour and 240

site trips (152 entering, 88 exiting) occurring during the PM peak hour. It is assumed that 50% of the development will be completed by 2025 and 100% of the development will be completed by 2035.

Harper Street Fayetteville – The proposed development is planned along Robertson Street and Fayetteville Street and proposes to build 145 single-family homes and 71 townhomes. A TIA has not yet been submitted for this development. Per ITE estimates, the site is projected to generate 1,960 daily site trips with 142 site trips (35 entering, 107 exiting) occurring during the AM peak hour and 189 site trips (119 entering, 70 exiting) occurring during the PM peak hour. It is assumed that 50% of the development will be completed by 2025 and 100% of the development will be completed by 2035.

Baker Roofing HQ – The proposed development is planned along Smithfield Road and proposes to build 220,000-sf of warehousing and 145,000-sf of specialty trade contractor space. A TIA was prepared by Kimley-Horn and Associates and was submitted in November 2021. The analysis was completed in two phases: Phase 1 accounts for the new HQ facilities, and Phase 2 includes future mixed-use outparcel development. The total development is projected to generate 7,400 daily site trips with 795 trips (576 entering, 219 exiting) occurring during the AM peak hour and 995 trips (365 entering, 630 exiting) occurring during the PM peak hour. Phase 1 of the development will be completed before 2025, but the future outparcel development will not be completed until 2027. Therefore, the site trips for the new HQ facilities will be included in the 2025 analysis and the future outparcel development trips will be included in the 2035 analysis.

The Smithfield/Mailman MXD development is expected to provide a traffic signal at the intersection of Smithfield Road and Mailman Road once it is warranted. It is assumed that this traffic signal will be constructed before the build-out year (2025), and it is assumed in the future year analyses.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. The calculated No-Build (2025) peak hour turning movements are displayed in Figure 5, and the assumed No-Build (2025) lane configurations and traffic control are shown in Figure 6. A summary of the findings for the No-Build (2025) LOS analysis can be found in Table 4 and the full Synchro outputs can be found in Appendix C.

As reported in Table 4, all stop controlled approaches within the study area are expected to continue to operate at LOS A or B during both peak hours under No-Build (2025) conditions. The new traffic signal at the intersection of Smithfield Road and Mailman Road is projected to operate at LOS B during both peak hours.

Table 4 No-Build (2025) LOS Results

Intersection and Approach	Traffic Control	No-Build (2025)	
		AM	PM
Roberton Street/ Knightdale Eagle Rock Road at Mailman Road	Unsignalized	**N/A**	**N/A**
Northbound		B-10.6	B-11.6
Mailman Road at Fayetteville Street	Unsignalized	**N/A**	**N/A**
Eastbound		A-9.3	A-9.9
Smithfield Road at Mailman Road	Signalized	**B (13.0)**	**B (10.1)**
Eastbound		B-11.1	A-6.2
Westbound		B-10.9	A-8.8
Southbound		C-21.2	C-26.4
Mailman Road at Sawdust Lane	Unsignalized	**N/A**	**N/A**
Eastbound		A-0.0	A-8.8

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

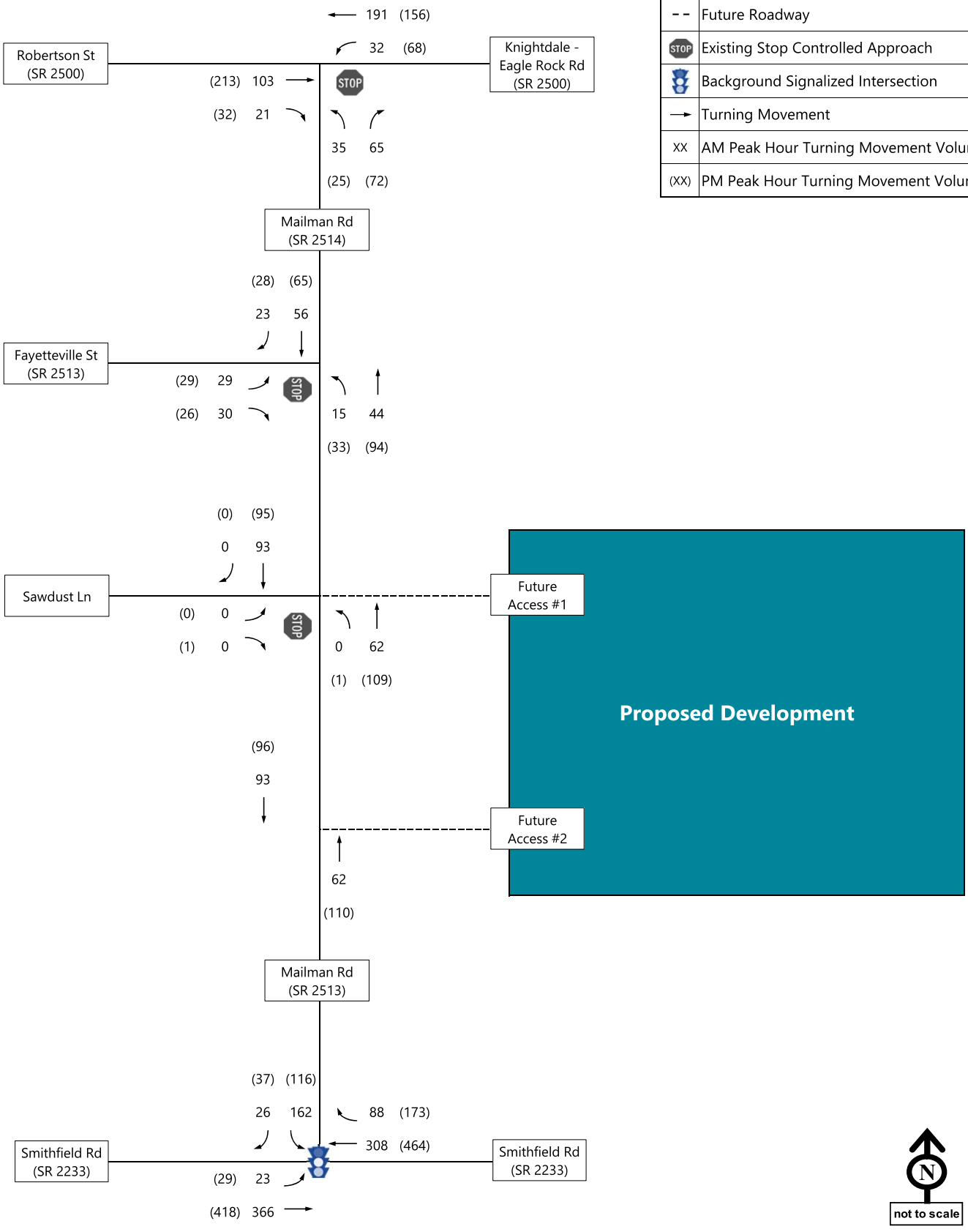


Figure 5
No-Build (2025) AM and PM Peak Hour Volumes

Mailman Post TIA
Knightdale, NC

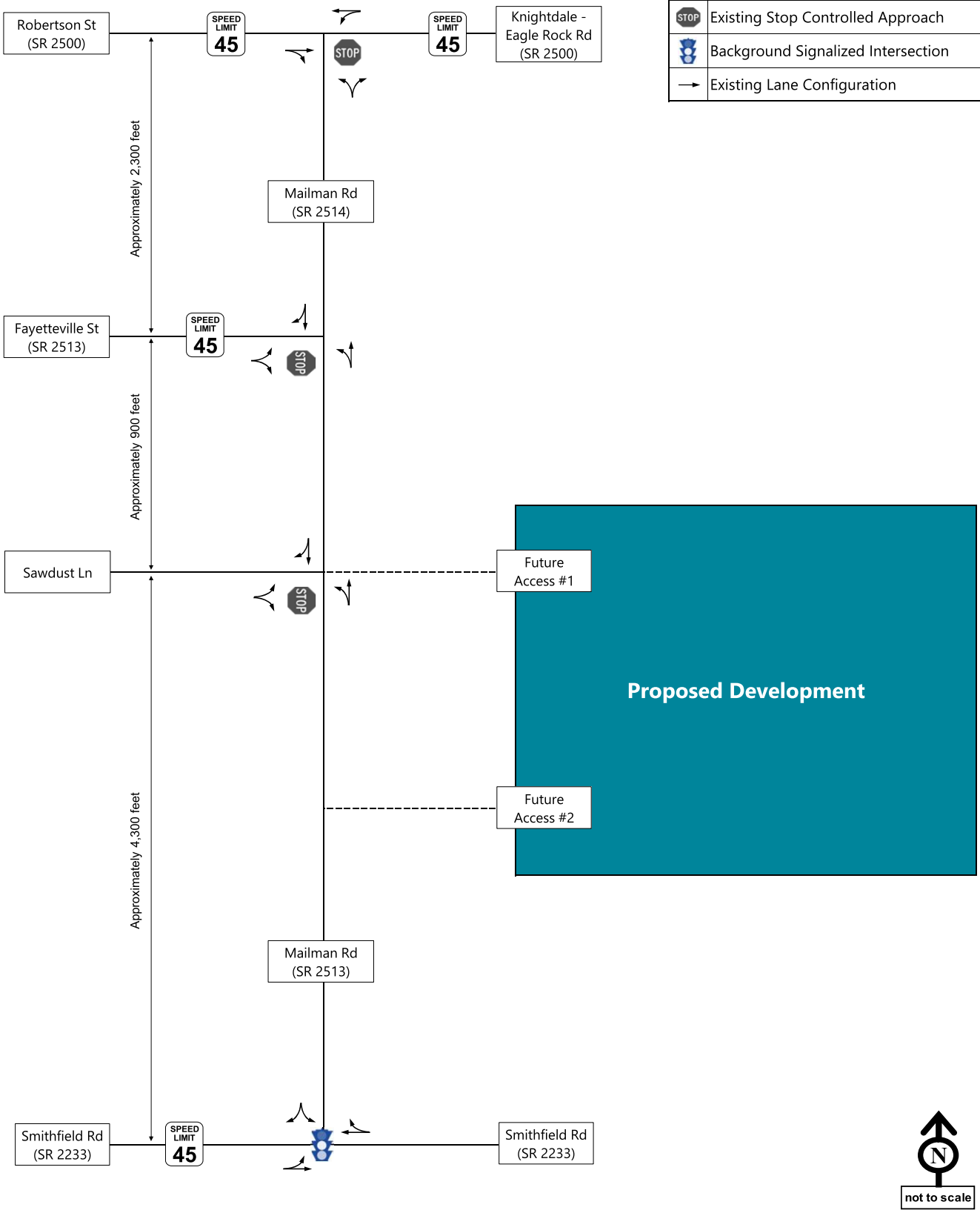


Figure 6
No-Build (2025) Lane Configurations and Traffic Control

Mailman Post TIA
Knightdale, NC

4

Build (2025) Conditions

EF One, LLC has plans to construct the Mailman Post Subdivision off of Mailman Road in Knightdale, North Carolina (Figure 1). The development calls for up to 156 single-family homes and is expected to be completed by 2025.

Trip Generation

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. The proposed development is to consist of up to 156 single-family homes; ITE Land Use Code (LUC) 210 (Single-Family Detached Housing) was used based on the NCDOT guidance.

Table 5 summarizes the assumed trip generation for the proposed development for typical weekday AM and PM peak hours.

Table 5 Trip Generation Rates (Vehicle Trips)

Land Use Code[1]	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Total Site Trips[2]									
210	Single-Family Detached Housing	156 du	1,565	29	87	116	98	58	156

Notes:

1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 10th Edition*
2. Total site trips are determined based on the suggested method in the NCDOT Rate vs Equation Spreadsheet

As a result, the proposed development is projected to generate 1,565 daily weekday site trips, with 116 trips (29 entering, 87 exiting) occurring in the AM peak hour and 156 trips (98 entering, 58 exiting) occurring in the PM peak hour. The generated site trips were distributed in accordance with the existing turning movement counts and land uses.

Trip Distribution and Assignment

The proposed development will be able to be accessed via two (2) new driveways along Mailman Road. The generated site trips were distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area as follows:

- Knightdale Eagle Rock Road (SR 2500) from/to the east – 25%
- Robertson Street (SR 2500) from/to the west – 20%
- Fayetteville Street (SR 2513) from/to the west – 10%
- Smithfield Road (SR 2233) from/to the east – 35%
- Smithfield Road (SR 2233) from/to the west – 10%

The trip distribution percentages are outlined in Figure 7, and the resulting distributed site trips are shown in Figure 8.

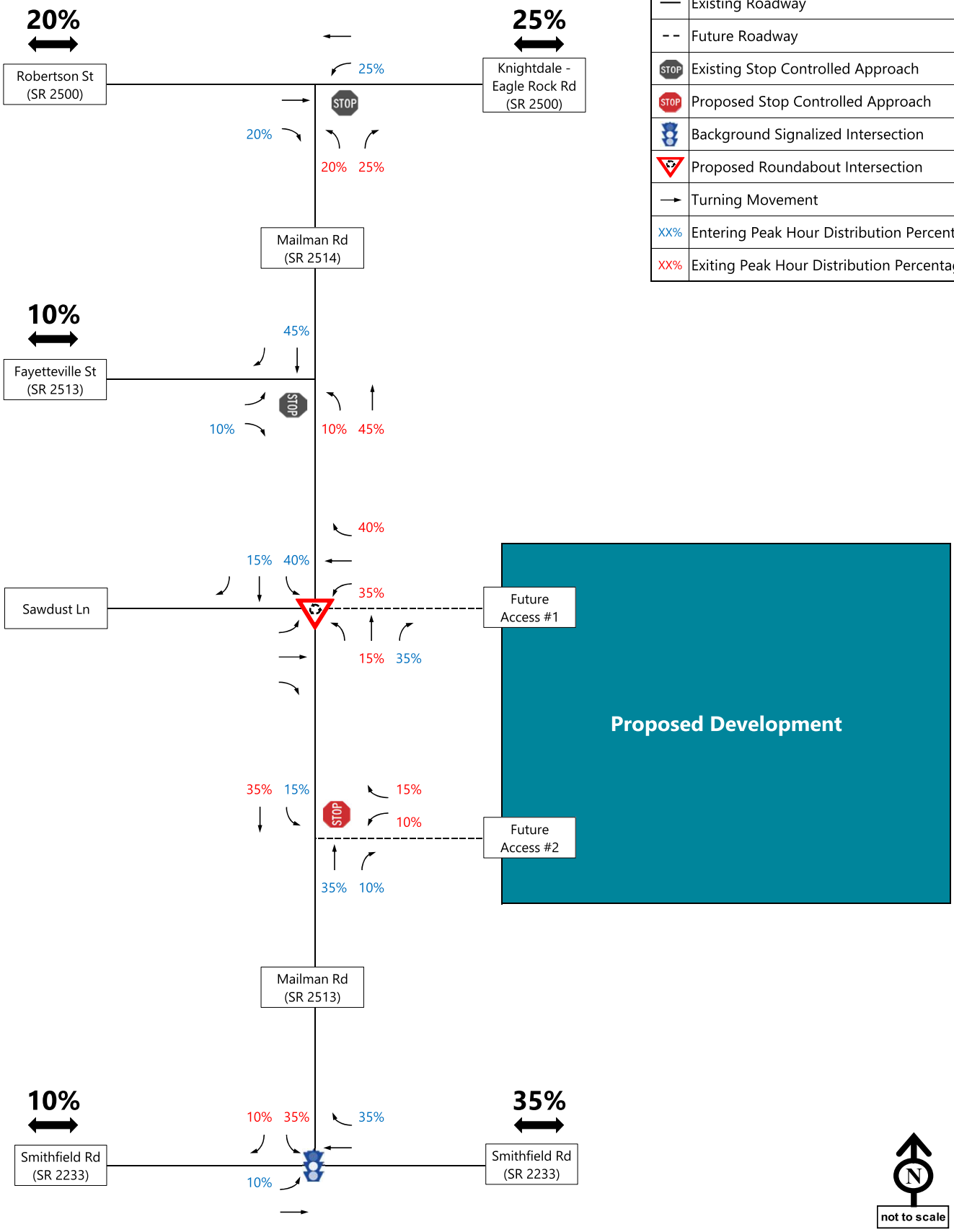


Figure 7
Peak Hour Trip Distribution Percentages

Mailman Post TIA
Knightdale, NC

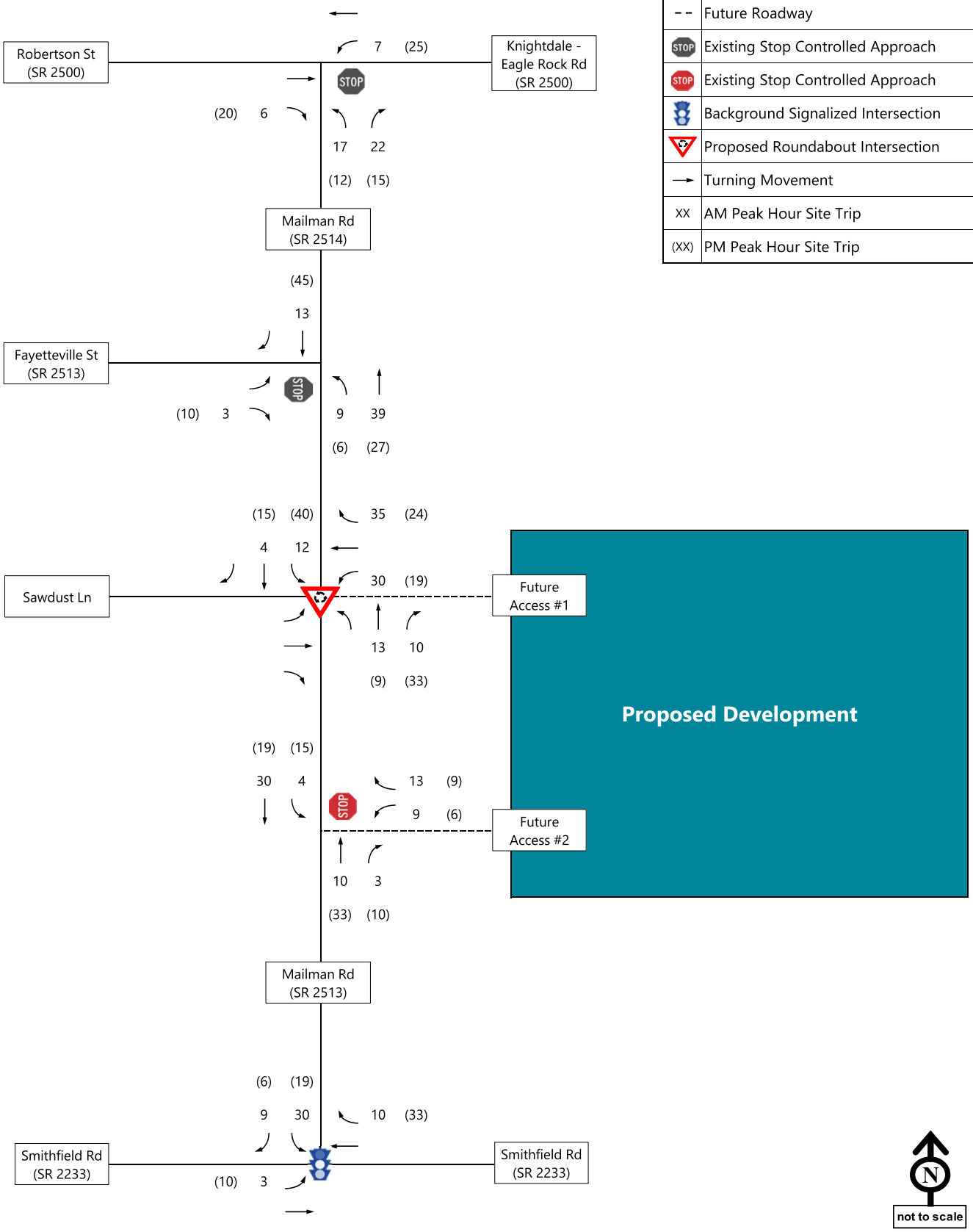


Figure 8
AM and PM Peak Hour Site Trips

Mailman Post TIA
Knightdale, NC

Level of Service Analysis

The Build (2025) analysis scenario includes the No-Build (2025) traffic and site-generated trips from the proposed development as described previously. Figure 9 depicts the turning movement volumes used in the Build (2025) scenario analysis. Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. Table 6 summarizes the findings of the LOS analysis, and Appendix C contains the full *Synchro* reports.

As reported in Table 6, with the addition of site trips, all signalized intersections and stop-controlled approaches are projected to operate at LOS A or B during both peak hours. The proposed single-lane roundabout at Future Access #1 is projected to operate at LOS A during both peak hours, with a single circulating lane, and stop-controlled Future Access #2 is projected to operate at LOS A during both peak hours.

Table 6 Build (2025) LOS Results

Intersection and Approach	Traffic Control	Build (2025)	
		AM	PM
Roberton Street/ Knightdale Eagle Rock Road at Mailman Road	Unsignalized	**N/A**	**N/A**
Northbound		B-11.3	B-12.7
Mailman Road at Fayetteville Street	Unsignalized	**N/A**	**N/A**
Eastbound		A-9.6	B-10.4
Smithfield Road at Mailman Road	Signalized	**B (14.6)**	**B (12.6)**
Eastbound		B-12.5	A-6.8
Westbound		B-12.3	B-10.7
Southbound		C-22.4	C-34.8
Mailman Road at Sawdust Lane/ Future Access #1	Roundabout	**A (3.4)**	**A (3.8)**
Eastbound		A-3.1	A-3.3
Westbound		A-3.4	A-3.4
Northbound		A-3.3	A-3.9
Southbound		A-3.5	A-3.8
Mailman Road at Future Access #2	Unsignalized	**N/A**	**N/A**
Westbound		A-9.2	A-9.7

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay

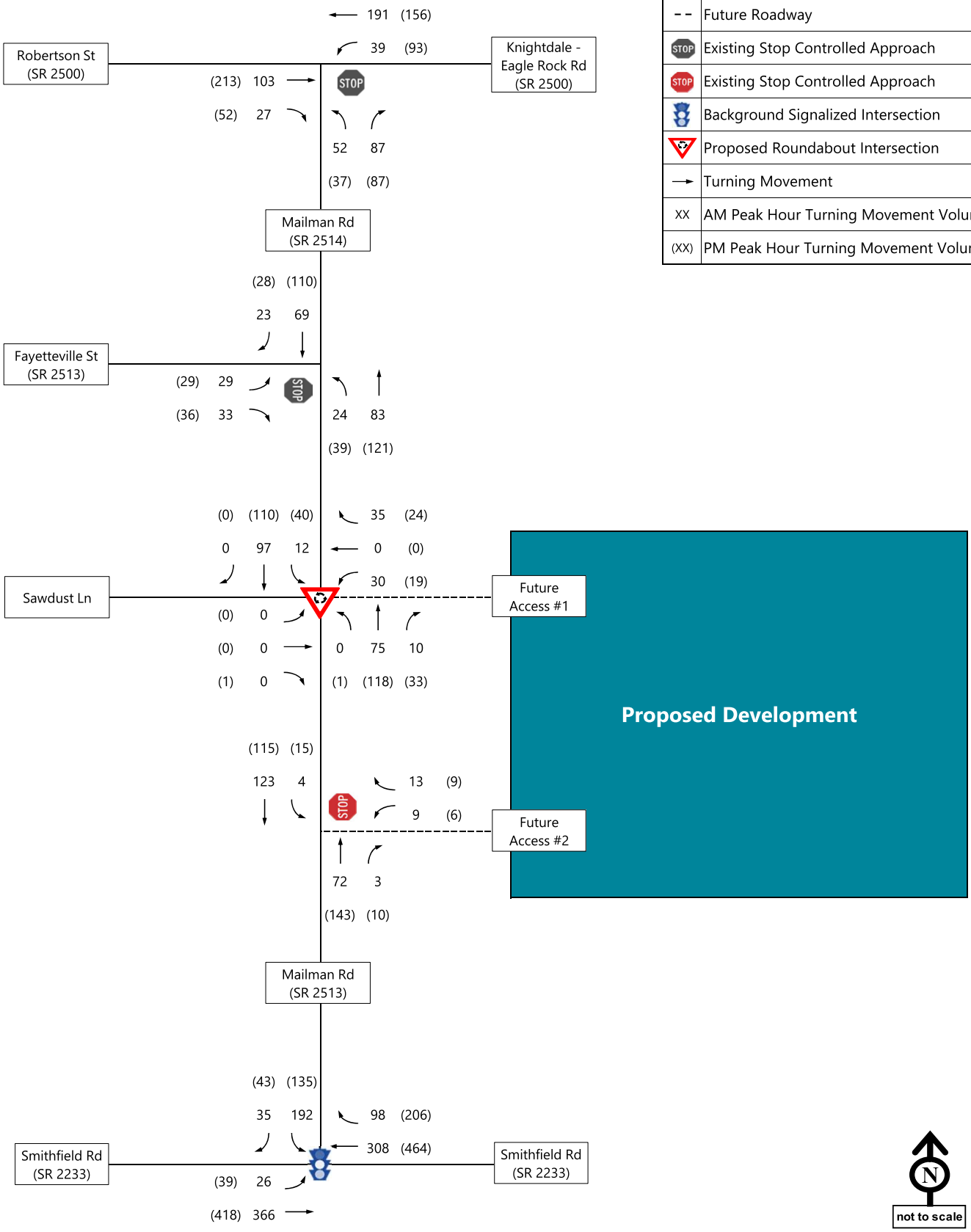


Figure 9
Build (2025) AM and PM Peak Hour Volumes

Mailman Post TIA
Knightdale, NC

5

Build (2035) Conditions

Level of Service Analysis

The Build (2035) conditions account for an additional annual background growth rate of one percent (1%) applied to the No-Build (2025) volumes (excluding background development site trips) with the proposed development site trips in place. Figure 10 depicts the turning movement volumes used in the Build (2035) scenario analysis. Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. Table 7 summarizes the findings of the LOS analysis, and Appendix C contains the full *Synchro* reports.

As reported in Table 7, under Build (2035) all signalized intersections and stop-controlled approaches are projected to operate at LOS C or better during both peak hours. The proposed single-lane roundabout at Future Access #1 is projected to continue to operate at LOS A during both peak hours and stop-controlled Future Access #2 is projected to operate at LOS B or better during both peak hours.

Table 7 Build (2035) LOS Results

Intersection and Approach	Traffic Control	Build (2035)	
		AM	PM
Roberton Street/ Knightdale Eagle Rock Road at Mailman Road	Unsignalized	**N/A**	**N/A**
Northbound		B-12.4	C-15.1
Mailman Road at Fayetteville Street	Unsignalized	**N/A**	**N/A**
Eastbound		B-10.3	B-11.8
Smithfield Road at Mailman Road	Signalized	**B (17.8)**	**B (17.6)**
Eastbound		B-15.9	A-8.4
Westbound		B-15.2	B-15.1
Southbound		C-24.9	D-49.4
Mailman Road at Sawdust Lane/ Future Access #1	Roundabout	**A (3.6)**	**A (4.1)**
Eastbound		A-3.3	A-3.4
Westbound		A-3.5	A-3.7
Northbound		A-3.4	A-4.3
Southbound		A-3.9	A-4.0
Mailman Road at Future Access #2	Unsignalized	**N/A**	**N/A**
Westbound		A-9.5	B-10.3

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay

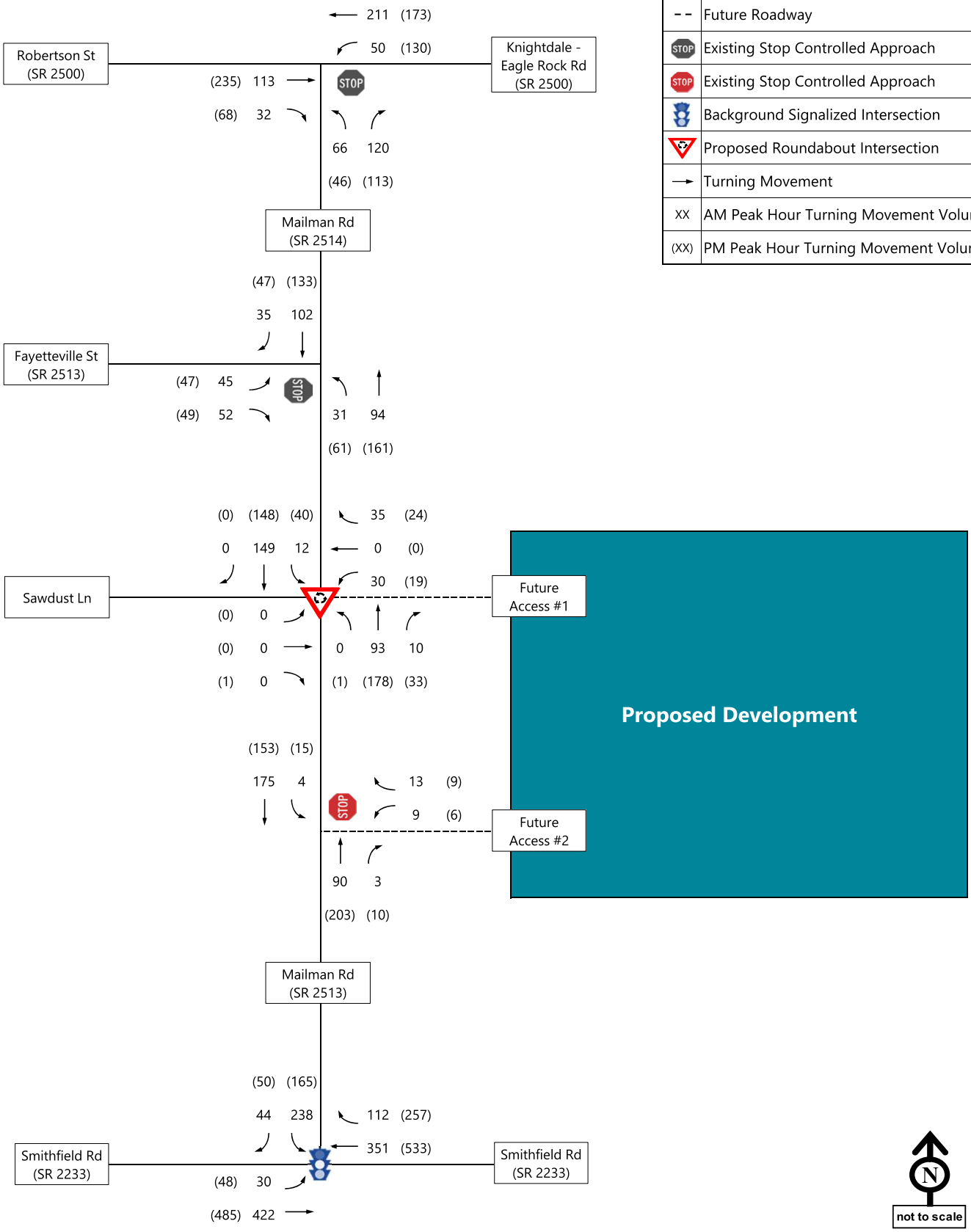


Figure 10
Build (2035) AM and PM Peak Hour Volumes

Mailman Post TIA
Knightdale, NC

6

Findings and Conclusions

As indicated in the traffic operations analyses, the proposed development is not projected to have a significant impact on the traffic operations at the study area intersections. The planned driveways meet NCDOT's engineering standards for intersection spacing and sight distance requirements. Turn lane warrant analysis indicate that traffic volumes along Mailman Road at Future Access #2 do not meet warrants for installation of dedicated turn lanes. Nevertheless, the development is committed to widening Mailman Road along the site frontage to meet the Town of Knightdale's ultimate cross-section requirements.

As a result, the following is recommended for all future access driveways along Mailman Road:

Mailman Road (SR 2514) and Sawdust Lane/ Future Access #1 (unsignalized)

Currently, Future Access #1 is proposed to be connected to Mailman Road via a new roundabout intersection across from existing Sawdust Lane. The proposed single-lane roundabout is expected to operate at LOS A during both peak hours under Build (2025) and Build (2035) conditions. It should be noted that the intersection would operate with acceptable levels of service under two-way stop-control (TWSC) conditions. However, the developer is committed to installing a roundabout as the desired intersection to meet the preference in the Town of Knightdale's UDO. As a result, the following lane configurations are recommended for the driveway connection.

- Construct Future Access #1 as a full movement driveway with one ingress lane and one egress lane.
- Construct a single-lane roundabout intersection for Mailman Road, Sawdust Lane, and Future Access #1 that meets design standards set by NCDOT and the Town of Knightdale.

Mailman Road (SR 2514) and Future Access #2 (unsignalized)

Stop-controlled Future Access #2 is expected to operate at LOS A during both peak hours under Build (2025) conditions. Although a turn lane is not warranted, the development is committed to installing a dedicated left-turn lane for safety and planning considerations. As a result, the following lane configurations are recommended for the driveway connection.

- Construct Future Access #2 as a full movement driveway with one ingress lane and one egress lane.
- Provide a dedicated left-turn lane on southbound Mailman Road with 100 feet of storage and appropriate taper.

The summary LOS results are shown in Table 8, and the future lane configurations and traffic control at the study area intersections, with the development in place, are presented in Figure 11.

Table 8 Summary of LOS Results

Intersection and Approach	Traffic Control	Existing (2022)		No-Build (2025)		Build (2025)		Build (2035)	
		AM	PM	AM	PM	AM	PM	AM	PM
Roberton Street/ Knightdale Eagle Rock Road at Mailman Road	Unsignalized	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Northbound		A-9.4	B-10.1	B-10.6	B-11.6	B-11.3	B-12.7	B-12.4	C-15.1
Mailman Road at Fayetteville Street	Unsignalized	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Eastbound		A-8.7	A-8.9	A-9.3	A-9.9	A-9.6	B-10.4	B-10.3	B-11.8
Smithfield Road at Mailman Road	Unsignalized/ Signalized	**N/A**	**N/A**	**B (13.0)**	**B (10.1)**	**B (14.6)**	**B (12.6)**	**B (17.8)**	**B (17.6)**
Eastbound		---	---	B-11.1	A-6.2	B-12.5	A-6.8	B-15.9	A-8.4
Westbound		---	---	B-10.9	A-8.8	B-12.3	B-10.7	B-15.2	B-15.1
Southbound		B-12.9	B-13.5	C-21.2	C-26.4	C-22.4	C-34.8	C-24.9	D-49.4
Mailman Road at Sawdust Lane/ Future Access #1	Unsignalized/ Roundabout	**N/A**	**N/A**	**N/A**	**N/A**	**A (3.4)**	**A (3.8)**	**A (3.6)**	**A (4.1)**
Eastbound		A-0.0	A-8.5	A-0.0	A-8.8	A-3.1	A-3.3	A-3.3	A-3.4
Westbound		---	---	---	---	A-3.4	A-3.4	A-3.5	A-3.7
Northbound		---	---	---	---	A-3.3	A-3.9	A-3.4	A-4.3
Southbound		---	---	---	---	A-3.5	A-3.8	A-3.9	A-4.0
Mailman Road at Future Access #2	Unsignalized	**-**	**-**	**-**	**-**	**N/A**	**N/A**	**N/A**	**N/A**
Westbound		---	---	---	---	A-9.2	A-9.7	A-9.5	B-10.3

X (XX.X) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay

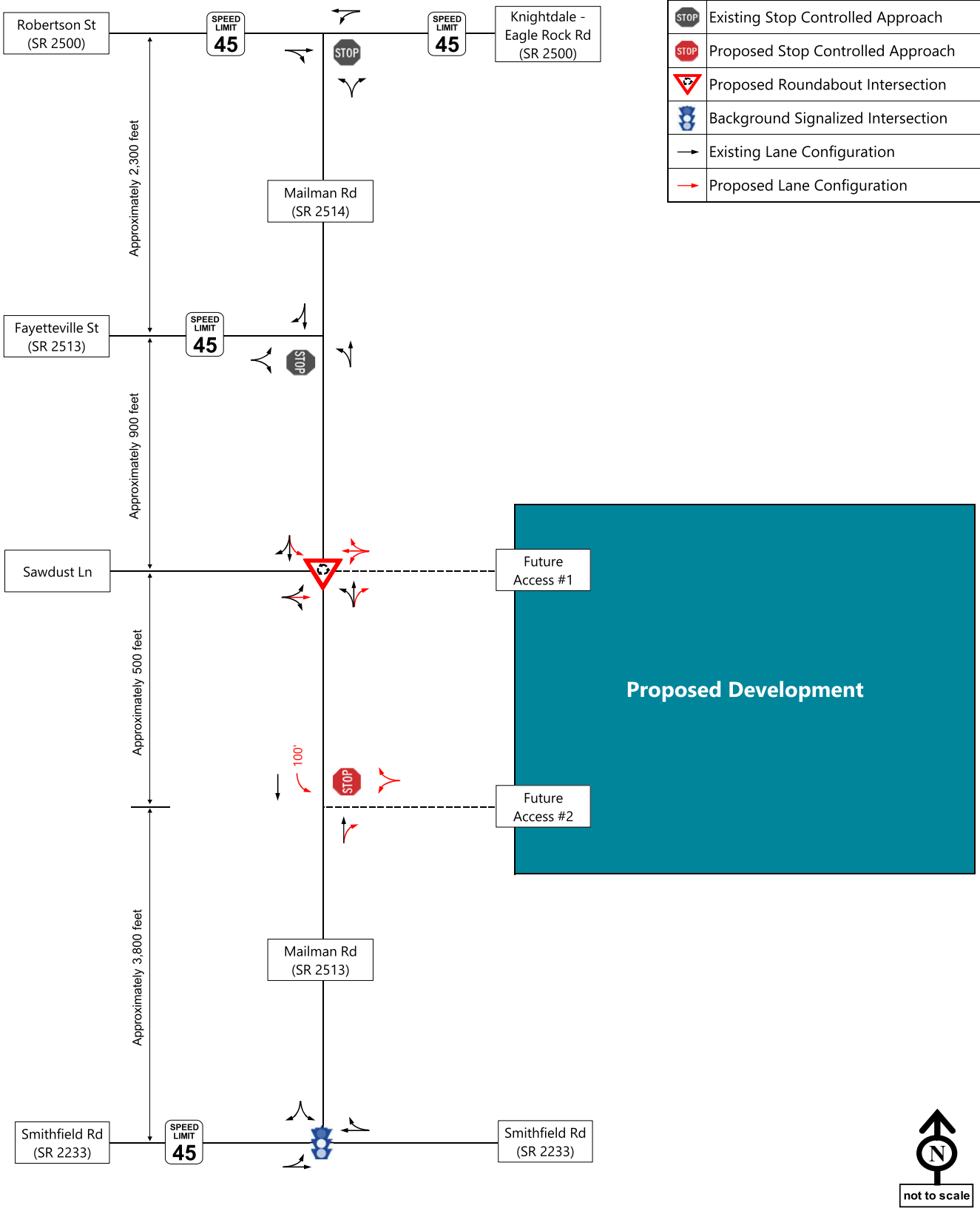


Figure 11
Future (2025) Lane Configurations and Traffic Control

Mailman Post TIA
Knightdale, NC

Appendices

A

Memorandum of Understanding

Memorandum

To: Andrew Spiliotis
Town of Knightdale Senior Planner

Sean Brennan, PE
NCDOT Division 5 District 1

Date: March 24, 2022

Project #: 39378.00

From: Baohong Wan, PhD, PE

Re: Mailman Post Traffic Impact Analysis Assumptions
Knightdale, NC

This memorandum summarizes the assumptions for conducting a traffic impact analysis (TIA) for the proposed Mailman Post residential development that is planned on the east side of Mailman Road in Knightdale, North Carolina. The proposed development will consist of up to 150 single-family homes.

The site is planned to be accessed via two (2) full movement driveways along Mailman Road, with Future Access #1 aligned across from existing Sawdust Lane and Future Access #2 approximately 500 feet south of Access #1.

Study Area

The following existing and future study area intersections are proposed to be analyzed for AM and PM peak hour conditions:

- Knightdale Eagle Rock Road/ Robertson Street (SR 2500) and Mailman Road (SR 2514) (unsignalized)
- Mailman Road (SR 2513/ SR 2514) and Fayetteville Street (SR 2513) (unsignalized)
- Smithfield Road (SR 2233) and Mailman Road (SR 2513) (unsignalized)
- Mailman Road (SR 2513) and Sawdust Lane/ Future Access #1 (unsignalized/future roundabout)
- Mailman Road (SR 2513) and Future Access #2 (future unsignalized)

Figure MOU-1 shows a vicinity map of the study area. The existing intersection's traffic control and lane geometrics throughout the study area are depicted in Figure MOU-2.

Data Collection

Peak hour turning movement counts were collected at the study area intersections in February 2022 while local schools were in session. At this time there are not any growth adjustments proposed for the peak hour volumes due to the COVID-19 pandemic. The Existing (2022) AM and PM peak hour volumes are displayed in Figure MOU-3.

Analysis Scenarios

The following four (4) scenarios are proposed to be analyzed for AM and PM peak hour conditions:

- Existing (2022) Conditions
- No-Build (2025) Conditions
- Build (2025) Conditions

› Build (2035) Conditions

Background Projects and Growth

In accordance with the Town of Knightdale's Unified Development Ordinance (UDO), a buildout + 1 year of 2025 will be analyzed to development traffic mitigation requirements, while a buildout + 10 year of 2035 will be analyzed to identify long term transportation needs. An annual growth rate of three percent (3%) is proposed to calculate the ambient traffic growth between the existing year (2022) and the build-out year (2025). For the 2035 study, an annual growth rate of one percent (1%) will be applied between 2025 and 2035 to project future year conditions.

In addition, the following background developments have been approved within the study area, and the resulting site trips from each development will be included in the future year 2025 volume calculations:

› Smithfield/Mailman MXD
› Glenmere – Phases 1 through 7 (inclusion based on the actual construction/occupancy status of each phase)

The following background developments were proposed within the study area. Despite the project status uncertainties, the resulting site trips from these developments will be included in the future year 2025 and 2035 volume calculations to be conservative:

› Project Hope (Build Out Year – 2025) – under the scoping/MOU process
› Harper Street Fayetteville (Build Out Year – 2025) – under the scoping/MOU process
› Baker Roofing HQ (Build Out Year – 2023, 2026) – TIA completed

As for roadway improvements, Smithfield/Mailman MXD is committed of constructing a new traffic signal at Mailman Road and Smithfield Road when it is warranted. There are no other known public roadway improvement projects within the study area.

Trip Generation

Trip Generation will be conducted based on the most appropriate corresponding trip generation codes included in the ITE *Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation"* spreadsheet. The proposed development will consist of up to 150 single-family homes; ITE Land Use Code (LUC) 210 (Single-Family Detached Housing) will be used based on the NCDOT guidance. The trip generation results are shown in Table 1 below.

Table 1: Trip Generation Results

Land Use Code[1]	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Total Site Trips[2]									
210	Single-Family Detached Housing	150 du	1,510	28	83	111	95	55	150

Notes:
1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 10th Edition*
2. Total site trips are determined based on the suggested method in the NCDOT Rate vs Equation Spreadsheet

As shown in Table 1, the proposed Mailman Post residential development is projected to generate up to 1,510 daily site trips with 111 trips (28 entering, 83 exiting) occurring in the AM peak hour and 150 trips (95 entering, 55 exiting)

in the PM peak hour. It should be noted that the proposed development is projected to generate less than 150 peak hour trips based on the rates included in the most recent version (11th Edition) of ITE Trip Generation Manual.

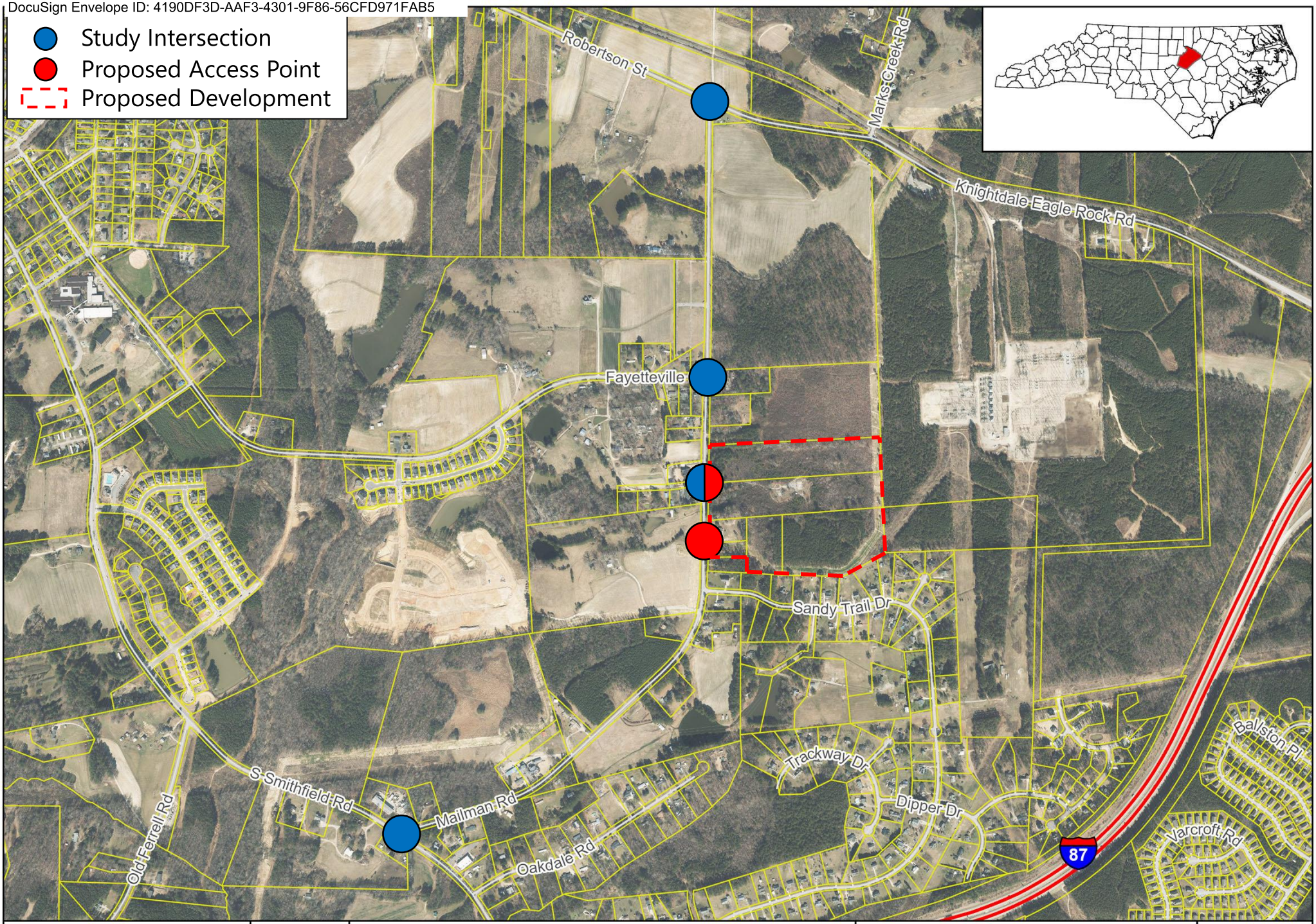
To be conservative, no walking or bicycling reductions will be applied.

Trip Distribution and Assignment

The generated site trips will be distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area as follows:

- Knightdale Eagle Rock Road (SR 2500) from/to the east – 25%
- Robertson Road (SR 2500) from/to the west – 20%
- Fayetteville Street (SR 2513) from/to the west – 10%
- Smithfield Road (SR 2233) from/to the east – 35%
- Smithfield Road (SR 2233) from/to the west – 10%

The proposed site trip assignment percentages are shown in Figure MOU-4, and the resulting site distributed trips are shown in Figure MOU-5.



Scale
0 750 1,500 Feet

Figure MOU-1: Vicinity Map

Mailman Post TIA
Knightdale, NC
Wake County

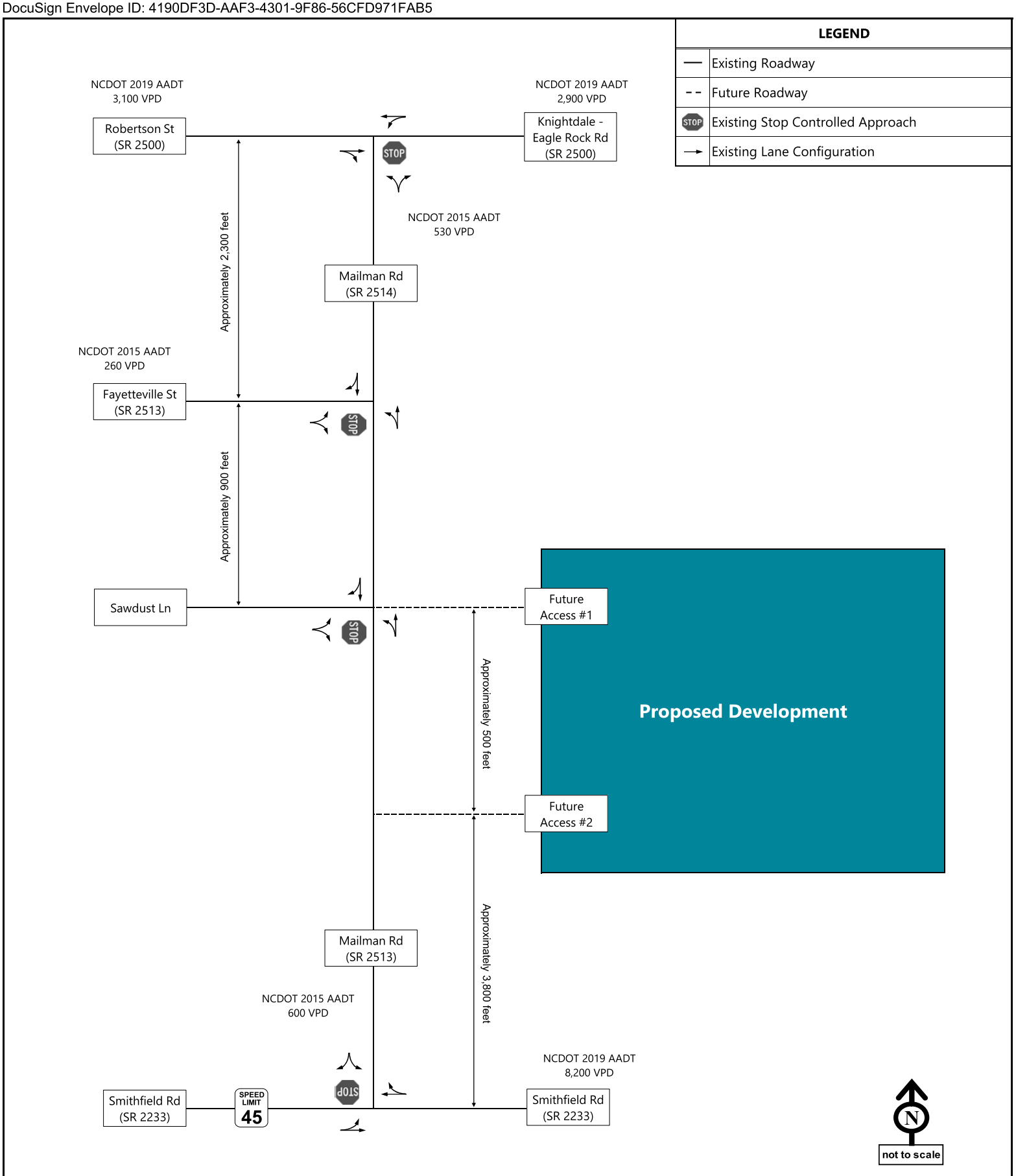


Figure MOU-2
Existing (2022) Lane Configurations and Traffic Control

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

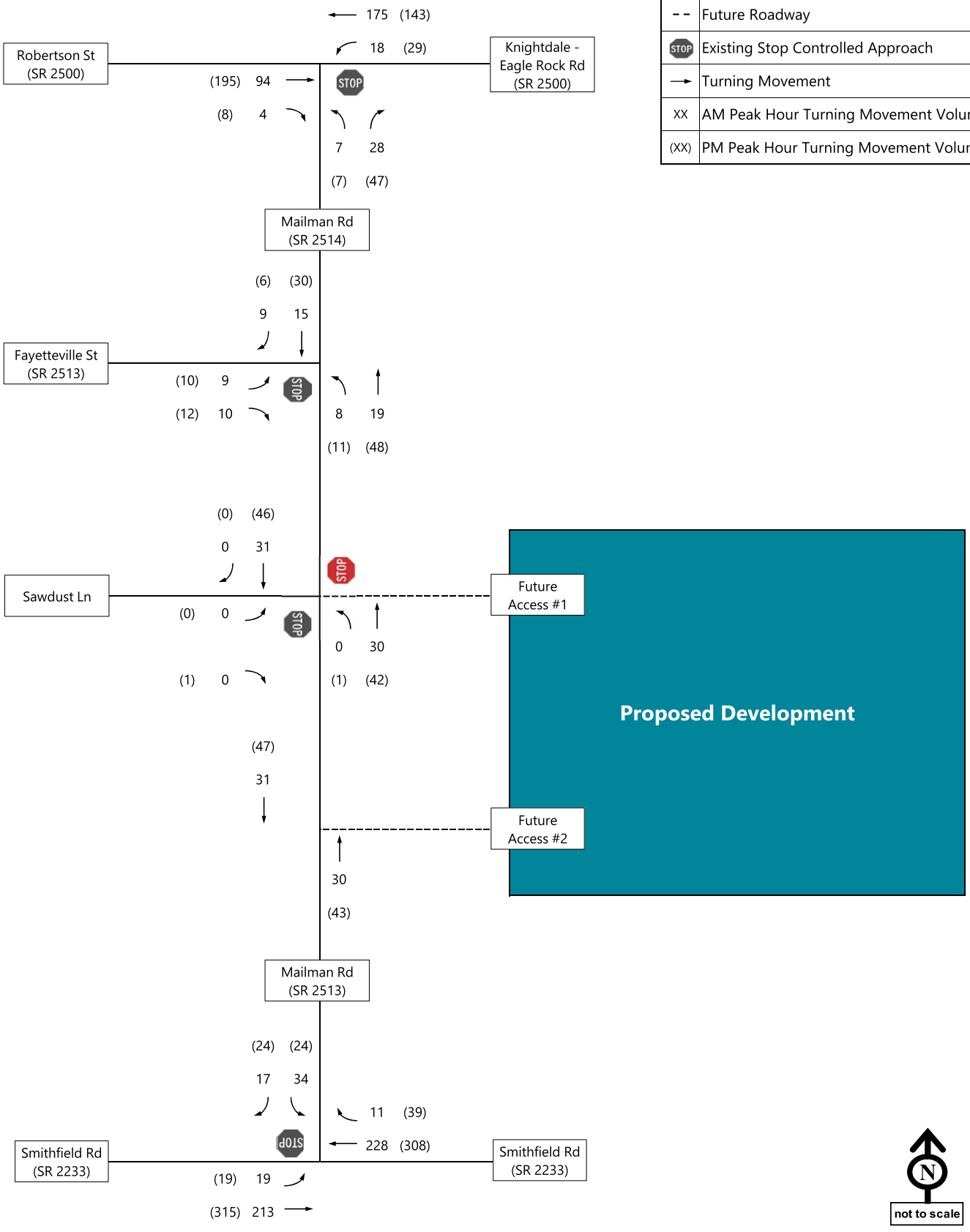


Figure MOU-3
Existing (2022) AM and PM Peak Hour Volumes

Mailman Post TIA
Knightdale, NC

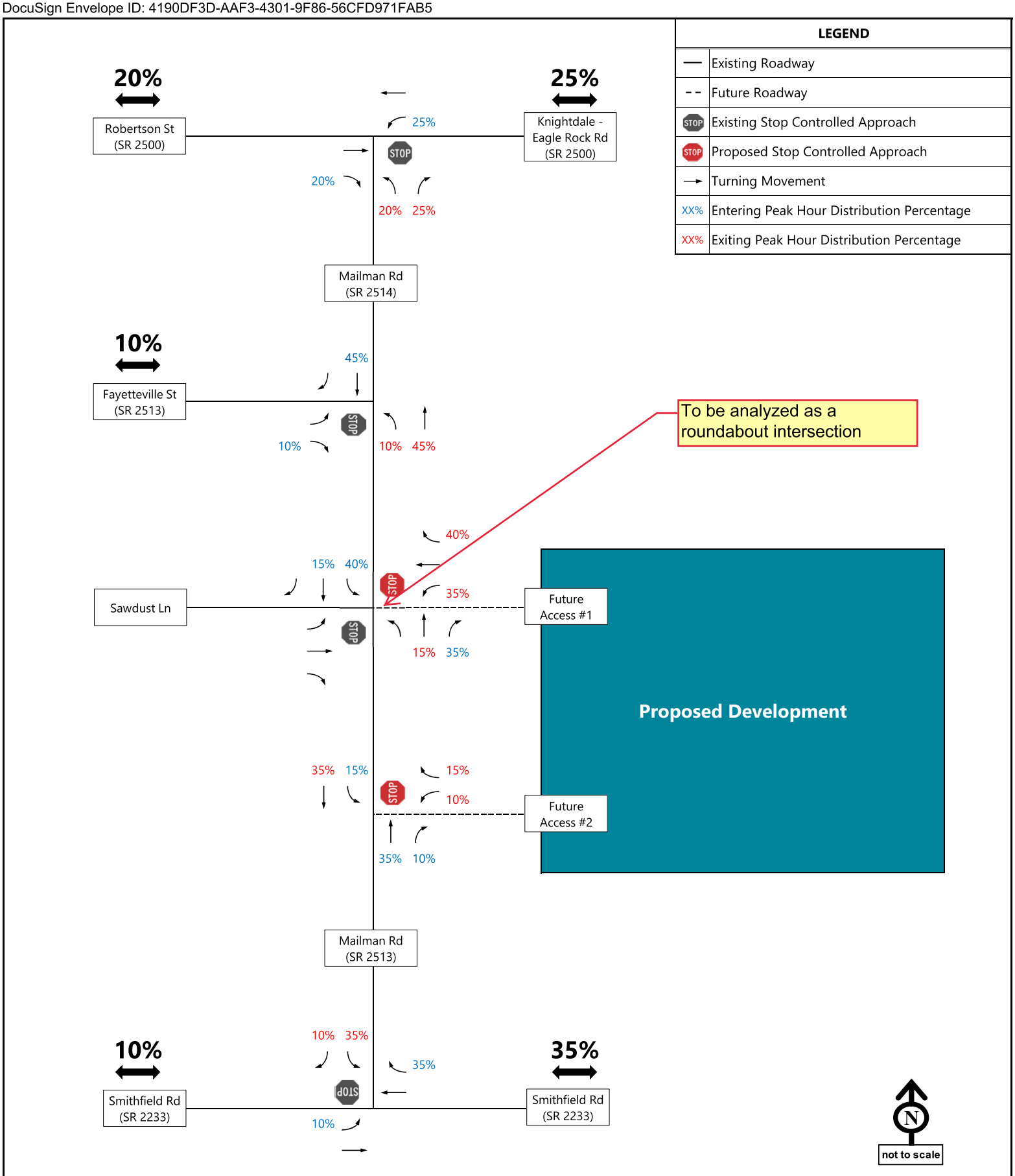


Figure MOU-4
Peak Hour Trip Distribution Percentages

Mailman Post TIA
Knightdale, NC

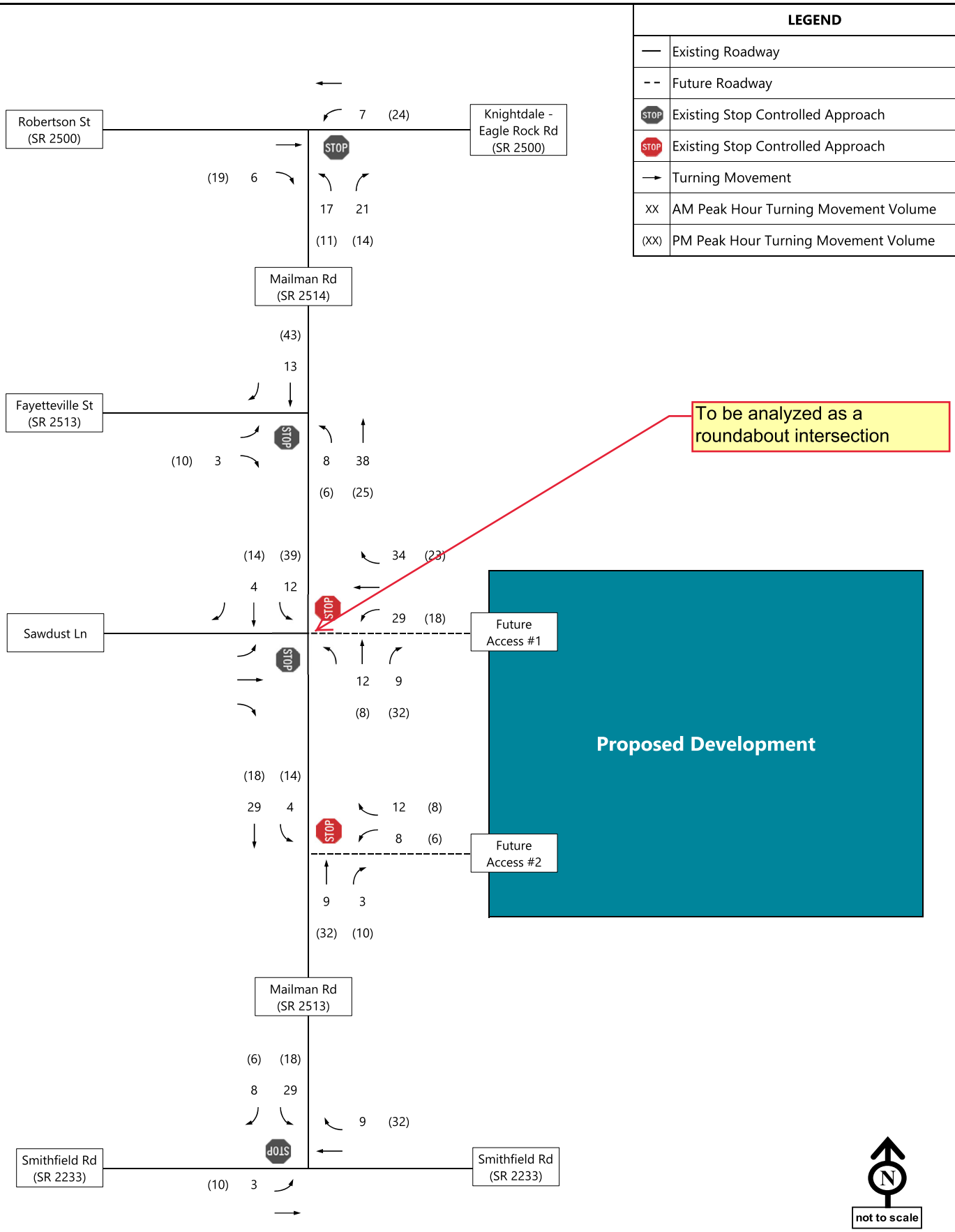


Figure MOU-5 **AM and PM Peak Hour Site Trips**	**Mailman Post TIA** **Knightdale, NC**

B

Turning Movement Counts

VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@Fayetteville
Site Code :
Start Date : 2/22/2022
Page No : 1

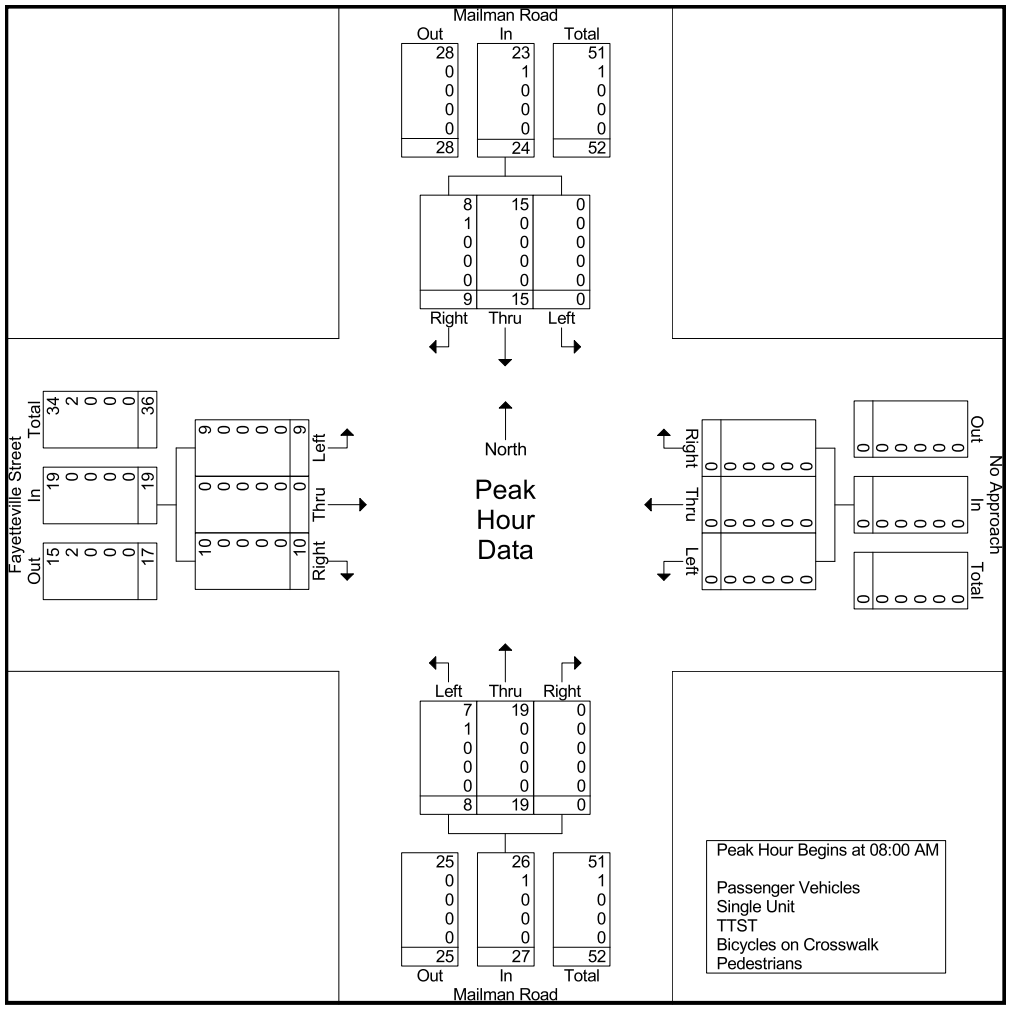
Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Mailman Road Southbound				No Approach Westbound				Mailman Road Northbound				Fayetteville Street Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	6	1	0	0	0	0	0	0	7	0	0	0	0	2	0	0	16	16
07:15 AM	0	4	0	0	0	0	0	0	0	8	0	0	3	0	4	0	0	19	19
07:30 AM	0	3	0	0	0	0	0	0	1	8	0	0	1	0	2	0	0	15	15
07:45 AM	0	5	3	0	0	0	0	0	1	6	0	0	2	0	2	0	0	19	19
Total	0	18	4	0	0	0	0	0	2	29	0	0	6	0	10	0	0	69	69
08:00 AM	0	5	1	0	0	0	0	0	1	4	0	0	2	0	3	0	0	16	16
08:15 AM	0	1	4	0	0	0	0	0	1	6	0	0	2	0	3	0	0	17	17
08:30 AM	0	5	1	0	0	0	0	0	3	4	0	0	0	0	1	0	0	14	14
08:45 AM	0	4	3	0	0	0	0	0	3	5	0	0	5	0	3	0	0	23	23
Total	0	15	9	0	0	0	0	0	8	19	0	0	9	0	10	0	0	70	70
BREAK																			
04:00 PM	0	18	0	0	0	0	0	0	0	5	0	0	4	0	5	0	0	32	32
04:15 PM	0	4	1	0	0	0	0	0	3	6	0	0	0	0	1	0	0	15	15
04:30 PM	0	7	2	0	0	0	0	0	4	5	0	0	4	0	8	0	0	30	30
04:45 PM	0	6	1	0	0	0	0	0	3	6	0	0	3	0	5	0	0	24	24
Total	0	35	4	0	0	0	0	0	10	22	0	0	11	0	19	0	0	101	101
05:00 PM	0	6	3	0	0	0	0	0	5	14	0	0	4	0	3	0	0	35	35
05:15 PM	0	7	2	0	0	0	0	0	0	13	0	0	2	0	3	0	0	27	27
05:30 PM	0	8	1	0	0	0	0	0	3	12	0	0	1	0	2	0	0	27	27
05:45 PM	0	9	0	0	0	0	0	0	3	9	0	0	3	0	4	0	0	28	28
Total	0	30	6	0	0	0	0	0	11	48	0	0	10	0	12	0	0	117	117
Grand Total	0	98	23	0	0	0	0	0	31	118	0	0	36	0	51	0	0	357	357
Apprch %	0	81	19		0	0	0		20.8	79.2	0		41.4	0	58.6				
Total %	0	27.5	6.4		0	0	0		8.7	33.1	0		10.1	0	14.3		0	100	
Passenger Vehicles	0	96	22		0	0	0		29	116	0		35	0	48		0	0	346
% Passenger Vehicles	0	98	95.7	0	0	0	0	0	93.5	98.3	0	0	97.2	0	94.1	0	0	0	96.9
Single Unit	0	2	1		0	0	0		2	2	0		1	0	3		0	0	11
% Single Unit	0	2	4.3	0	0	0	0	0	6.5	1.7	0	0	2.8	0	5.9	0	0	0	3.1
TTST	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@Fayetteville
Site Code :
Start Date : 2/22/2022
Page No : 2

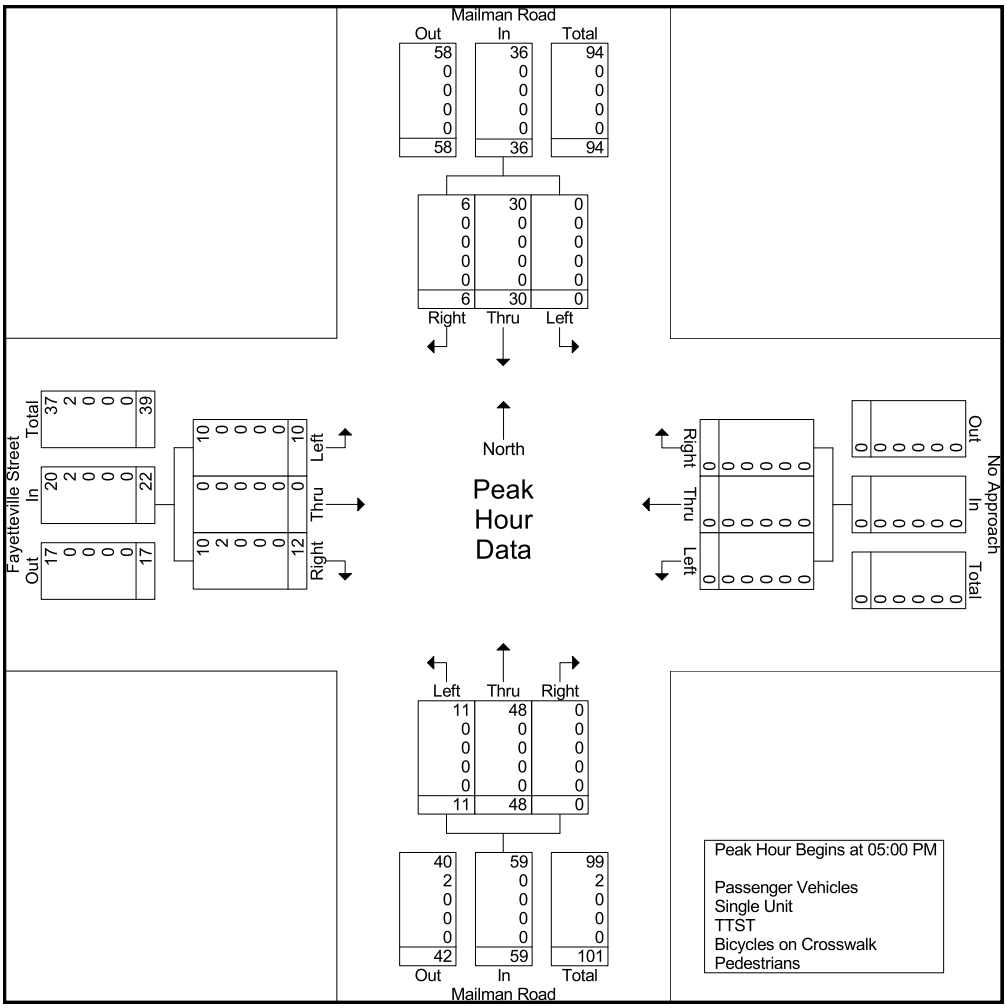
	Mailman Road Southbound				No Approach Westbound				Mailman Road Northbound				Fayetteville Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	5	1	6	0	0	0	0	1	4	0	5	2	0	3	5	16
08:15 AM	0	1	4	5	0	0	0	0	1	6	0	7	2	0	3	5	17
08:30 AM	0	5	1	6	0	0	0	0	3	4	0	7	0	0	1	1	14
08:45 AM	0	4	3	7	0	0	0	0	3	5	0	8	5	0	3	8	23
Total Volume	0	15	9	24	0	0	0	0	8	19	0	27	9	0	10	19	70
% App. Total	0	62.5	37.5		0	0	0		29.6	70.4	0		47.4	0	52.6		
PHF	.000	.750	.563	.857	.000	.000	.000	.000	.667	.792	.000	.844	.450	.000	.833	.594	.761
Passenger Vehicles	0	15	8	23	0	0	0	0	7	19	0	26	9	0	10	19	68
% Passenger Vehicles	0	100	88.9	95.8	0	0	0	0	87.5	100	0	96.3	100	0	100	100	97.1
Single Unit	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	2
% Single Unit	0	0	11.1	4.2	0	0	0	0	12.5	0	0	3.7	0	0	0	0	2.9
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@Fayetteville
Site Code :
Start Date : 2/22/2022
Page No : 3

	Mailman Road Southbound				No Approach Westbound				Mailman Road Northbound				Fayetteville Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	6	3	9	0	0	0	0	5	14	0	19	4	0	3	7	35
05:15 PM	0	7	2	9	0	0	0	0	0	13	0	13	2	0	3	5	27
05:30 PM	0	8	1	9	0	0	0	0	3	12	0	15	1	0	2	3	27
05:45 PM	0	9	0	9	0	0	0	0	3	9	0	12	3	0	4	7	28
Total Volume	0	30	6	36	0	0	0	0	11	48	0	59	10	0	12	22	117
% App. Total	0	83.3	16.7		0	0	0		18.6	81.4	0		45.5	0	54.5		
PHF	.000	.833	.500	1.00	.000	.000	.000	.000	.550	.857	.000	.776	.625	.000	.750	.786	.836
Passenger Vehicles	0	30	6	36	0	0	0	0	11	48	0	59	10	0	10	20	115
% Passenger Vehicles	0	100	100	100	0	0	0	0	100	100	0	100	100	0	83.3	90.9	98.3
Single Unit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
% Single Unit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.7	9.1	1.7
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@KnightdaleEagleRock-Robertson
Site Code :
Start Date : 2/22/2022
Page No : 1

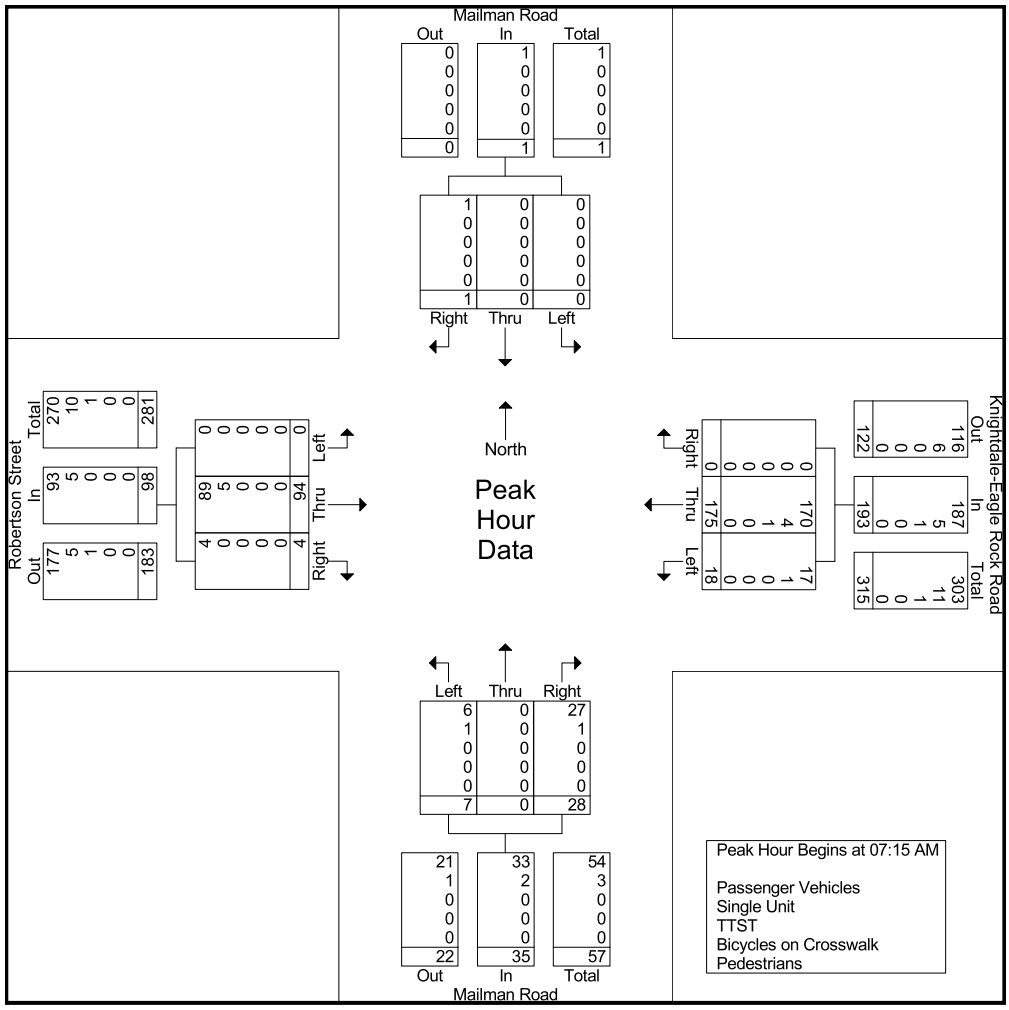
Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Mailman Road Southbound				Knightdale-Eagle Rock Road Westbound				Mailman Road Northbound				Robertson Street Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	7	24	0	0	3	0	3	0	1	11	0	0	0	49	49
07:15 AM	0	0	0	0	3	35	0	0	4	0	8	0	0	24	1	0	0	75	75
07:30 AM	0	0	1	0	1	47	0	0	2	0	7	0	0	27	2	0	0	87	87
07:45 AM	0	0	0	0	7	42	0	0	0	0	8	0	0	32	1	0	0	90	90
Total	0	0	1	0	18	148	0	0	9	0	26	0	1	94	4	0	0	301	301
08:00 AM	0	0	0	0	7	51	0	0	1	0	5	0	0	11	0	0	0	75	75
08:15 AM	0	0	0	0	3	25	0	0	3	0	5	0	0	14	1	0	0	51	51
08:30 AM	0	0	0	0	4	22	0	0	1	0	3	0	0	15	2	0	0	47	47
08:45 AM	0	0	0	0	6	31	0	0	0	0	10	0	0	16	2	0	0	65	65
Total	0	0	0	0	20	129	0	0	5	0	23	0	0	56	5	0	0	238	238
BREAK																			
04:00 PM	0	0	0	0	13	37	0	0	1	0	7	0	0	34	1	0	0	93	93
04:15 PM	0	0	0	0	3	40	0	1	4	0	4	0	0	40	2	0	1	93	94
04:30 PM	0	0	0	0	4	38	0	0	1	0	9	0	0	43	5	0	0	100	100
04:45 PM	0	0	0	0	5	38	0	0	2	0	8	0	0	43	2	0	0	98	98
Total	0	0	0	0	25	153	0	1	8	0	28	0	0	160	10	0	1	384	385
05:00 PM	0	0	0	0	8	36	0	0	0	1	17	0	0	51	1	0	0	114	114
05:15 PM	0	0	0	0	7	33	0	0	3	1	11	0	0	49	2	0	0	106	106
05:30 PM	0	0	0	0	8	36	0	0	1	0	12	0	0	52	3	0	0	112	112
05:45 PM	0	0	0	0	6	38	0	0	3	0	7	0	0	43	2	0	0	99	99
Total	0	0	0	0	29	143	0	0	7	2	47	0	0	195	8	0	0	431	431
Grand Total	0	0	1	0	92	573	0	1	29	2	124	0	1	505	27	0	1	1354	1355
Apprch %	0	0	100		13.8	86.2	0		18.7	1.3	80		0.2	94.7	5.1				
Total %	0	0	0.1		6.8	42.3	0		2.1	0.1	9.2		0.1	37.3	2		0.1	99.9	
Passenger Vehicles	0	0	1		91	555	0		28	2	122		1	494	25		0	0	1319
% Passenger Vehicles	0	0	100	0	98.9	96.9	0	0	96.6	100	98.4	0	100	97.8	92.6	0	0	0	97.3
Single Unit	0	0	0		1	15	0		1	0	2		0	11	2		0	0	32
% Single Unit	0	0	0	0	1.1	2.6	0	0	3.4	0	1.6	0	0	2.2	7.4	0	0	0	2.4
TTST	0	0	0		0	3	0		0	0	0		0	0	0		0	0	3
% TTST	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	1
% Bicycles on Crosswalk	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0.1
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@KnightdaleEagleRock-Robertson
Site Code :
Start Date : 2/22/2022
Page No : 2

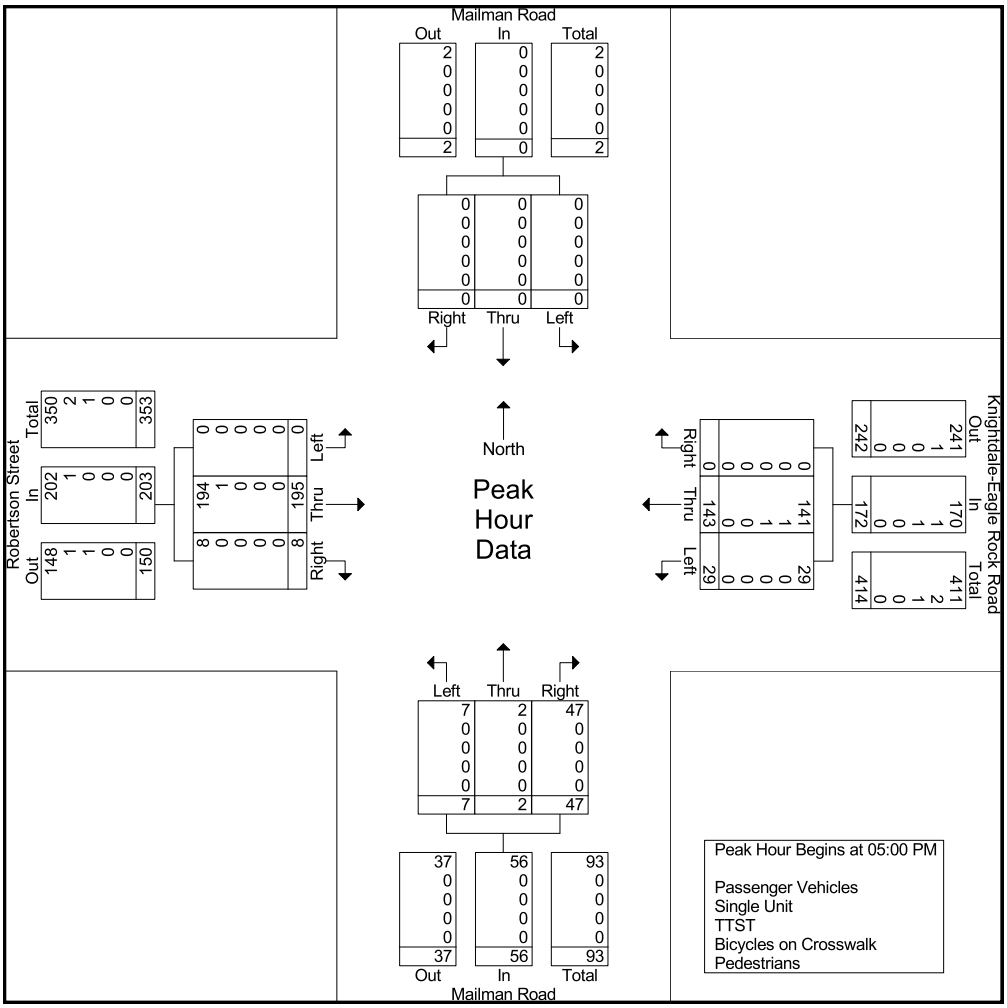
	Mailman Road Southbound				Knightdale-Eagle Rock Road Westbound				Mailman Road Northbound				Robertson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	3	35	0	38	4	0	8	12	0	24	1	25	75
07:30 AM	0	0	1	1	1	47	0	48	2	0	7	9	0	27	2	29	87
07:45 AM	0	0	0	0	7	42	0	49	0	0	8	8	0	32	1	33	90
08:00 AM	0	0	0	0	7	51	0	58	1	0	5	6	0	11	0	11	75
Total Volume	0	0	1	1	18	175	0	193	7	0	28	35	0	94	4	98	327
% App. Total	0	0	100		9.3	90.7	0		20	0	80		0	95.9	4.1		
PHF	.000	.000	.250	.250	.643	.858	.000	.832	.438	.000	.875	.729	.000	.734	.500	.742	.908
Passenger Vehicles	0	0	1	1	17	170	0	187	6	0	27	33	0	89	4	93	314
% Passenger Vehicles	0	0	100	100	94.4	97.1	0	96.9	85.7	0	96.4	94.3	0	94.7	100	94.9	96.0
Single Unit	0	0	0	0	1	4	0	5	1	0	1	2	0	5	0	5	12
% Single Unit	0	0	0	0	5.6	2.3	0	2.6	14.3	0	3.6	5.7	0	5.3	0	5.1	3.7
TTST	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% TTST	0	0	0	0	0	0.6	0	0.5	0	0	0	0	0	0	0	0	0.3
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@KnightdaleEagleRock-Robertson
Site Code :
Start Date : 2/22/2022
Page No : 3

	Mailman Road Southbound				Knightdale-Eagle Rock Road Westbound				Mailman Road Northbound				Robertson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	8	36	0	44	0	1	17	18	0	51	1	52	114
05:15 PM	0	0	0	0	7	33	0	40	3	1	11	15	0	49	2	51	106
05:30 PM	0	0	0	0	8	36	0	44	1	0	12	13	0	52	3	55	112
05:45 PM	0	0	0	0	6	38	0	44	3	0	7	10	0	43	2	45	99
Total Volume	0	0	0	0	29	143	0	172	7	2	47	56	0	195	8	203	431
% App. Total	0	0	0		16.9	83.1	0		12.5	3.6	83.9		0	96.1	3.9		
PHF	.000	.000	.000	.000	.906	.941	.000	.977	.583	.500	.691	.778	.000	.938	.667	.923	.945
Passenger Vehicles	0	0	0	0	29	141	0	170	7	2	47	56	0	194	8	202	428
% Passenger Vehicles	0	0	0	0	100	98.6	0	98.8	100	100	100	100	0	99.5	100	99.5	99.3
Single Unit	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% Single Unit	0	0	0	0	0	0.7	0	0.6	0	0	0	0	0	0.5	0	0.5	0.5
TTST	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% TTST	0	0	0	0	0	0.7	0	0.6	0	0	0	0	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@Sawdust
Site Code :
Start Date : 2/24/2022
Page No : 1

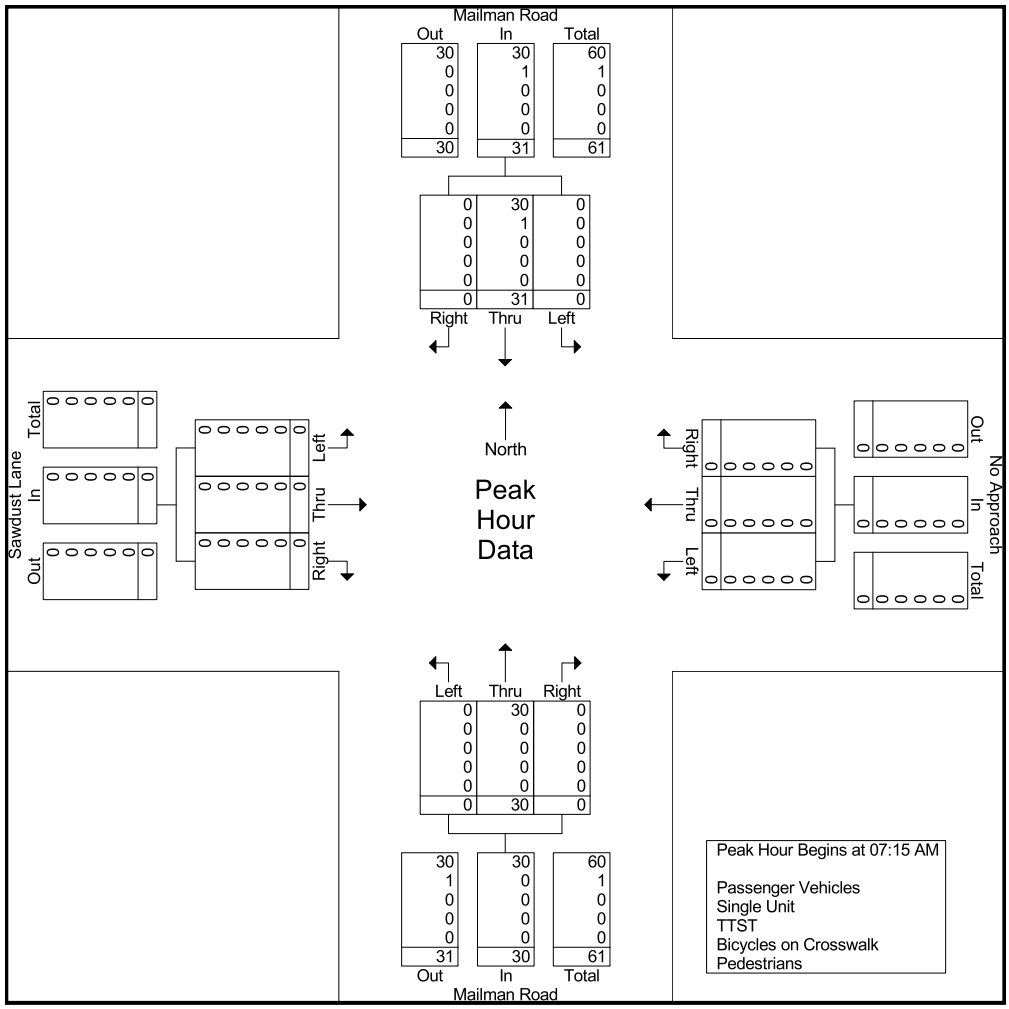
Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Mailman Road Southbound				No Approach Westbound				Mailman Road Northbound				Sawdust Lane Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	5	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	16	16
07:15 AM	0	7	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	14	14
07:30 AM	0	8	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	15	15
07:45 AM	0	5	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	12	12
Total	0	25	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	57	57
08:00 AM	0	11	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	20	20
08:15 AM	0	5	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	11	11
08:30 AM	0	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	10	10
08:45 AM	0	6	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	12	12
Total	0	27	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	53	53
BREAK																			
04:00 PM	0	11	0	0	0	0	0	0	1	11	0	0	0	0	0	0	0	23	23
04:15 PM	0	8	1	0	0	0	0	0	0	7	0	0	0	0	0	0	0	16	16
04:30 PM	0	8	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	16	16
04:45 PM	0	7	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	15	15
Total	0	34	1	0	0	0	0	0	1	34	0	0	0	0	0	0	0	70	70
05:00 PM	0	10	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	19	19
05:15 PM	0	11	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	19	19
05:30 PM	0	11	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	21	21
05:45 PM	0	14	0	0	0	0	0	0	1	15	0	0	0	0	1	0	0	31	31
Total	0	46	0	0	0	0	0	0	1	42	0	0	0	0	1	0	0	90	90
Grand Total	0	132	1	0	0	0	0	0	2	134	0	0	0	0	1	0	0	270	270
Apprch %	0	99.2	0.8		0	0	0		1.5	98.5	0		0	0	100				
Total %	0	48.9	0.4		0	0	0		0.7	49.6	0		0	0	0.4		0	100	
Passenger Vehicles	0	126	1		0	0	0		1	129	0		0	0	1		0	0	258
% Passenger Vehicles	0	95.5	100	0	0	0	0	0	50	96.3	0	0	0	0	100	0	0	0	95.6
Single Unit	0	4	0		0	0	0		1	5	0		0	0	0		0	0	10
% Single Unit	0	3	0	0	0	0	0	0	50	3.7	0	0	0	0	0	0	0	0	3.7
TTST	0	2	0		0	0	0		0	0	0		0	0	0		0	0	2
% TTST	0	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@Sawdust
Site Code :
Start Date : 2/24/2022
Page No : 2

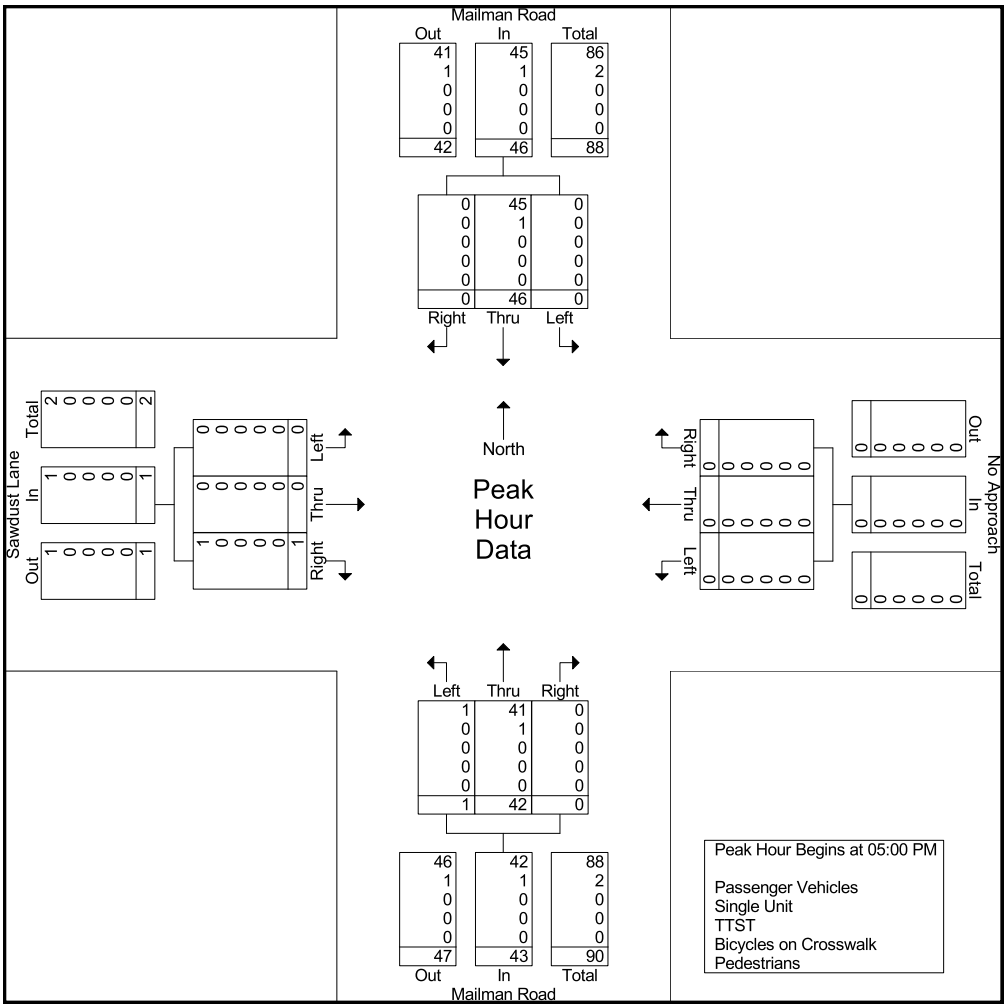
	Mailman Road Southbound				No Approach Westbound				Mailman Road Northbound				Sawdust Lane Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	7	0	7	0	0	0	0	0	7	0	7	0	0	0	0	14
07:30 AM	0	8	0	8	0	0	0	0	0	7	0	7	0	0	0	0	15
07:45 AM	0	5	0	5	0	0	0	0	0	7	0	7	0	0	0	0	12
08:00 AM	0	11	0	11	0	0	0	0	0	9	0	9	0	0	0	0	20
Total Volume	0	31	0	31	0	0	0	0	0	30	0	30	0	0	0	0	61
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.705	.000	.705	.000	.000	.000	.000	.000	.833	.000	.833	.000	.000	.000	.000	.763
Passenger Vehicles	0	30	0	30	0	0	0	0	0	30	0	30	0	0	0	0	60
% Passenger Vehicles	0	96.8	0	96.8	0	0	0	0	0	100	0	100	0	0	0	0	98.4
Single Unit	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Single Unit	0	3.2	0	3.2	0	0	0	0	0	0	0	0	0	0	0	0	1.6
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Mailman@Sawdust
Site Code :
Start Date : 2/24/2022
Page No : 3

	Mailman Road Southbound				No Approach Westbound				Mailman Road Northbound				Sawdust Lane Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	10	0	10	0	0	0	0	0	9	0	9	0	0	0	0	19
05:15 PM	0	11	0	11	0	0	0	0	0	8	0	8	0	0	0	0	19
05:30 PM	0	11	0	11	0	0	0	0	0	10	0	10	0	0	0	0	21
05:45 PM	0	14	0	14	0	0	0	0	1	15	0	16	0	0	1	1	31
Total Volume	0	46	0	46	0	0	0	0	1	42	0	43	0	0	1	1	90
% App. Total	0	100	0		0	0	0		2.3	97.7	0		0	0	100		
PHF	.000	.821	.000	.821	.000	.000	.000	.000	.250	.700	.000	.672	.000	.000	.250	.250	.726
Passenger Vehicles	0	45	0	45	0	0	0	0	1	41	0	42	0	0	1	1	88
% Passenger Vehicles	0	97.8	0	97.8	0	0	0	0	100	97.6	0	97.7	0	0	100	100	97.8
Single Unit	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% Single Unit	0	2.2	0	2.2	0	0	0	0	0	2.4	0	2.3	0	0	0	0	2.2
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Smithfield@Mailman
Site Code :
Start Date : 2/22/2022
Page No : 1

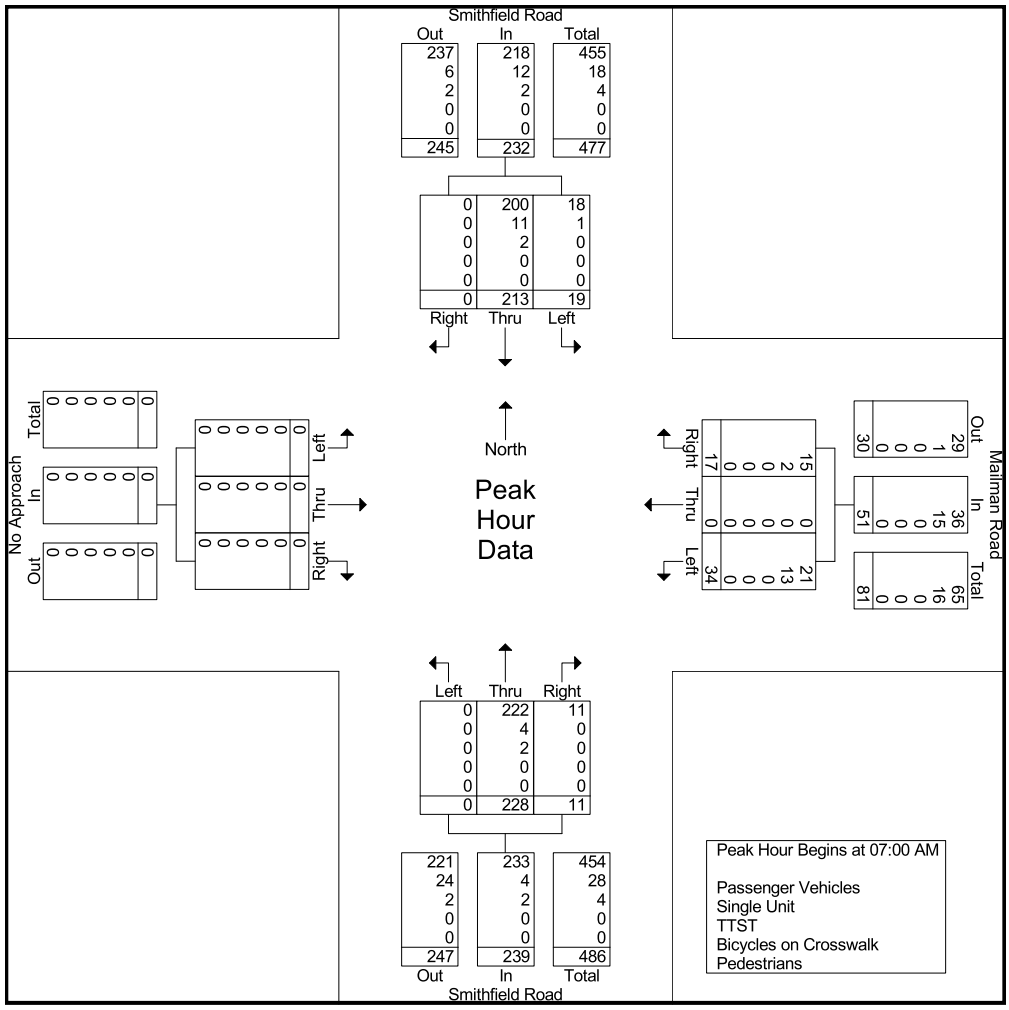
Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Smithfield Road Southbound				Mailman Road Westbound				Smithfield Road Northbound				No Approach Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	9	39	0	0	11	0	7	0	0	49	5	0	0	0	0	0	0	120	120
07:15 AM	4	57	0	0	11	0	1	0	0	43	2	0	0	0	0	0	0	118	118
07:30 AM	4	68	0	0	7	0	4	0	0	59	3	0	0	0	0	0	0	145	145
07:45 AM	2	49	0	0	5	0	5	0	0	77	1	0	0	0	0	0	0	139	139
Total	19	213	0	0	34	0	17	0	0	228	11	0	0	0	0	0	0	522	522
08:00 AM	1	49	0	0	6	0	2	1	0	55	0	0	0	0	0	0	1	113	114
08:15 AM	1	38	0	0	5	0	2	0	0	64	1	0	0	0	0	0	0	111	111
08:30 AM	2	38	0	0	6	0	0	0	0	69	4	0	0	0	0	0	0	119	119
08:45 AM	2	55	0	0	5	0	3	0	0	70	5	0	0	0	0	0	0	140	140
Total	6	180	0	0	22	0	7	1	0	258	10	0	0	0	0	0	1	483	484
BREAK																			
04:00 PM	3	93	0	0	11	0	9	0	0	66	4	0	0	0	0	0	0	186	186
04:15 PM	5	75	0	0	3	0	1	0	0	63	6	0	0	0	0	0	0	153	153
04:30 PM	2	80	0	0	4	0	4	0	0	70	5	0	0	0	0	0	0	165	165
04:45 PM	5	87	0	0	6	0	3	0	0	65	9	0	0	0	0	0	0	175	175
Total	15	335	0	0	24	0	17	0	0	264	24	0	0	0	0	0	0	679	679
05:00 PM	6	72	0	0	6	0	8	0	0	83	10	0	0	0	0	0	0	185	185
05:15 PM	6	77	0	0	5	0	6	0	0	89	10	0	0	0	0	0	0	193	193
05:30 PM	2	79	0	0	7	0	7	0	0	71	10	0	0	0	0	0	0	176	176
05:45 PM	2	81	0	0	6	0	2	0	0	76	8	0	0	0	0	0	0	175	175
Total	16	309	0	0	24	0	23	0	0	319	38	0	0	0	0	0	0	729	729
Grand Total	56	1037	0	0	104	0	64	1	0	1069	83	0	0	0	0	0	1	2413	2414
Apprch %	5.1	94.9	0		61.9	0	38.1		0	92.8	7.2		0	0	0				
Total %	2.3	43	0		4.3	0	2.7		0	44.3	3.4		0	0	0		0	100	
Passenger Vehicles	52	994	0		89	0	59		0	1028	70		0	0	0		0	0	2292
% Passenger Vehicles	92.9	95.9	0	0	85.6	0	92.2	0	0	96.2	84.3	0	0	0	0	0	0	0	94.9
Single Unit	4	35	0		15	0	5		0	36	13		0	0	0		0	0	108
% Single Unit	7.1	3.4	0	0	14.4	0	7.8	0	0	3.4	15.7	0	0	0	0	0	0	0	4.5
TTST	0	8	0		0	0	0		0	5	0		0	0	0		0	0	13
% TTST	0	0.8	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0.5
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	1
% Pedestrians	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0

VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Smithfield@Mailman
Site Code :
Start Date : 2/22/2022
Page No : 2

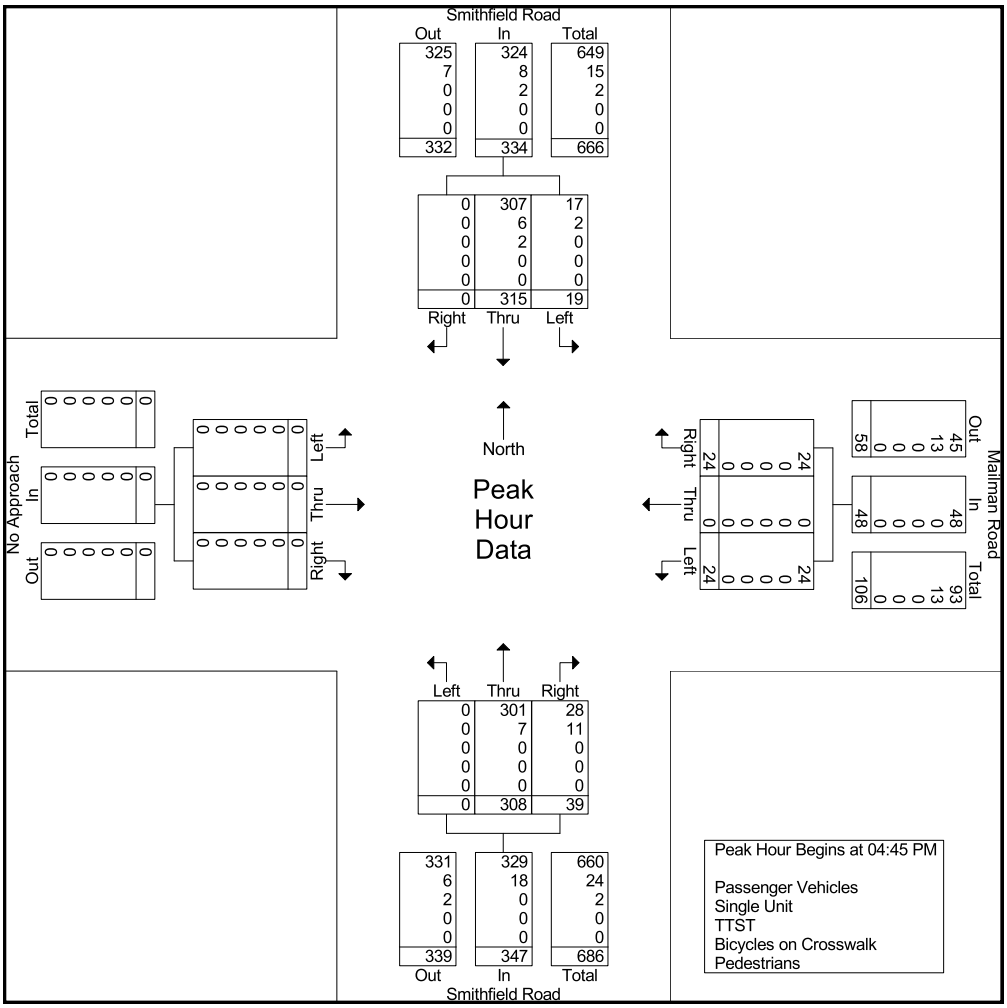
	Smithfield Road Southbound				Mailman Road Westbound				Smithfield Road Northbound				No Approach Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	9	39	0	48	11	0	7	18	0	49	5	54	0	0	0	0	120
07:15 AM	4	57	0	61	11	0	1	12	0	43	2	45	0	0	0	0	118
07:30 AM	4	68	0	72	7	0	4	11	0	59	3	62	0	0	0	0	145
07:45 AM	2	49	0	51	5	0	5	10	0	77	1	78	0	0	0	0	139
Total Volume	19	213	0	232	34	0	17	51	0	228	11	239	0	0	0	0	522
% App. Total	8.2	91.8	0		66.7	0	33.3		0	95.4	4.6		0	0	0		
PHF	.528	.783	.000	.806	.773	.000	.607	.708	.000	.740	.550	.766	.000	.000	.000	.000	.900
Passenger Vehicles	18	200	0	218	21	0	15	36	0	222	11	233	0	0	0	0	487
% Passenger Vehicles	94.7	93.9	0	94.0	61.8	0	88.2	70.6	0	97.4	100	97.5	0	0	0	0	93.3
Single Unit	1	11	0	12	13	0	2	15	0	4	0	4	0	0	0	0	31
% Single Unit	5.3	5.2	0	5.2	38.2	0	11.8	29.4	0	1.8	0	1.7	0	0	0	0	5.9
TTST	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
% TTST	0	0.9	0	0.9	0	0	0	0	0	0.9	0	0.8	0	0	0	0	0.8
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Smithfield@Mailman
Site Code :
Start Date : 2/22/2022
Page No : 3

	Smithfield Road Southbound				Mailman Road Westbound				Smithfield Road Northbound				No Approach Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	5	87	0	92	6	0	3	9	0	65	9	74	0	0	0	0	175
05:00 PM	6	72	0	78	6	0	8	14	0	83	10	93	0	0	0	0	185
05:15 PM	6	77	0	83	5	0	6	11	0	89	10	99	0	0	0	0	193
05:30 PM	2	79	0	81	7	0	7	14	0	71	10	81	0	0	0	0	176
Total Volume	19	315	0	334	24	0	24	48	0	308	39	347	0	0	0	0	729
% App. Total	5.7	94.3	0		50	0	50		0	88.8	11.2		0	0	0		
PHF	.792	.905	.000	.908	.857	.000	.750	.857	.000	.865	.975	.876	.000	.000	.000	.000	.944
Passenger Vehicles	17	307	0	324	24	0	24	48	0	301	28	329	0	0	0	0	701
% Passenger Vehicles	89.5	97.5	0	97.0	100	0	100	100	0	97.7	71.8	94.8	0	0	0	0	96.2
Single Unit	2	6	0	8	0	0	0	0	0	7	11	18	0	0	0	0	26
% Single Unit	10.5	1.9	0	2.4	0	0	0	0	0	2.3	28.2	5.2	0	0	0	0	3.6
TTST	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% TTST	0	0.6	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0.3
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



C

Intersection Capacity Analysis

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	94	4	18	175	7	28
Future Volume (vph)	94	4	18	175	7	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.995				0.893	
Flt Protected				0.995	0.990	
Satd. Flow (prot)	1802	0	0	1830	1584	0
Flt Permitted				0.995	0.990	
Satd. Flow (perm)	1802	0	0	1830	1584	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	6%	3%	14%	4%
Adj. Flow (vph)	104	4	20	194	8	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	0	214	39	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 26.9% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	94	4	18	175	7	28
Future Vol, veh/h	94	4	18	175	7	28
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, %	5	2	6	3	14	4
Mvmt Flow	104	4	20	194	8	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	108	0	340	106
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	234	-
Critical Hdwy	-	-	4.16	-	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.254	-	3.626	3.336
Pot Cap-1 Maneuver	-	-	1458	-	632	943
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	777	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1458	-	623	943
Mov Cap-2 Maneuver	-	-	-	-	623	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	855	-	-	1458	-
HCM Lane V/C Ratio	0.045	-	-	0.014	-
HCM Control Delay (s)	9.4	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	10	8	19	15	9
Future Volume (vph)	9	10	8	19	15	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.929				0.950	
Flt Protected	0.977			0.985		
Satd. Flow (prot)	1691	0	0	1777	1714	0
Flt Permitted	0.977			0.985		
Satd. Flow (perm)	1691	0	0	1777	1714	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	13%	2%	2%	11%
Adj. Flow (vph)	10	11	9	21	17	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	30	27	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 18.0% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	10	8	19	15	9
Future Vol, veh/h	9	10	8	19	15	9
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	13	2	2	11
Mvmt Flow	10	11	9	21	17	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	61	22	27	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.23	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.317	-	-	-
Pot Cap-1 Maneuver	945	1055	1518	-	-	-
Stage 1	1001	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	939	1055	1518	-	-	-
Mov Cap-2 Maneuver	939	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	983	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1518	-	997	-	-
HCM Lane V/C Ratio	0.006	-	0.021	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	213	228	11	34	17
Future Volume (vph)	19	213	228	11	34	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.994		0.955	
Flt Protected		0.996			0.968	
Satd. Flow (prot)	0	1787	1834	0	1358	0
Flt Permitted		0.996			0.968	
Satd. Flow (perm)	0	1787	1834	0	1358	0
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	6%	3%	2%	38%	12%
Adj. Flow (vph)	21	237	253	12	38	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	258	265	0	57	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.9% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	213	228	11	34	17
Future Vol, veh/h	19	213	228	11	34	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, %	5	6	3	2	38	12
Mvmt Flow	21	237	253	12	38	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	265	0	-	0	538	259
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	4.15	-	-	-	6.78	6.32
Critical Hdwy Stg 1	-	-	-	-	5.78	-
Critical Hdwy Stg 2	-	-	-	-	5.78	-
Follow-up Hdwy	2.245	-	-	-	3.842	3.408
Pot Cap-1 Maneuver	1282	-	-	-	447	756
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1282	-	-	-	439	756
Mov Cap-2 Maneuver	-	-	-	-	439	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	692	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1282	-	-	-	510
HCM Lane V/C Ratio	0.016	-	-	-	0.111
HCM Control Delay (s)	7.9	0	-	-	12.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	30	31	0
Future Volume (vph)	0	0	0	30	31	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1845	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1845	0
Link Speed (mph)	25			55	55	
Link Distance (ft)	1275			905	870	
Travel Time (s)	34.8			11.2	10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	0	0	33	34	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	33	34	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 6.7% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	30	31	0
Future Vol, veh/h	0	0	0	30	31	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	3	2
Mvmt Flow	0	0	0	33	34	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	67	34	34	0	-	0
Stage 1	34	-	-	-	-	-
Stage 2	33	-	-	-	-	-
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	938	1039	1578	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	938	1039	1578	-	-	-
Mov Cap-2 Maneuver	938	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	989	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1578	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	195	8	29	143	7	47
Future Volume (vph)	195	8	29	143	7	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.995				0.883	
Flt Protected				0.992	0.993	
Satd. Flow (prot)	1853	0	0	1848	1633	0
Flt Permitted				0.992	0.993	
Satd. Flow (perm)	1853	0	0	1848	1633	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	217	9	32	159	8	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	226	0	0	191	60	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 33.2% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	195	8	29	143	7	47
Future Vol, veh/h	195	8	29	143	7	47
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	217	9	32	159	8	52

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	226	0	445	222
Stage 1	-	-	-	-	222	-
Stage 2	-	-	-	-	223	-
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	-	-	1342	-	571	818
Stage 1	-	-	-	-	815	-
Stage 2	-	-	-	-	814	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1342	-	556	818
Mov Cap-2 Maneuver	-	-	-	-	556	-
Stage 1	-	-	-	-	815	-
Stage 2	-	-	-	-	793	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	771	-	-	1342	-
HCM Lane V/C Ratio	0.078	-	-	0.024	-
HCM Control Delay (s)	10.1	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	12	11	48	30	6
Future Volume (vph)	10	12	11	48	30	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.927				0.976	
Flt Protected	0.978			0.991		
Satd. Flow (prot)	1564	0	0	1846	1818	0
Flt Permitted	0.978			0.991		
Satd. Flow (perm)	1564	0	0	1846	1818	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	17%	2%	2%	2%	2%
Adj. Flow (vph)	11	13	12	53	33	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	0	65	40	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.8% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	12	11	48	30	6
Future Vol, veh/h	10	12	11	48	30	6
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	90	90	90	90	90	90
Heavy Vehicles, %	2	17	2	2	2	2
Mvmt Flow	11	13	12	53	33	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	114	37	40	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.42	6.37	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.453	2.218	-	-	-
Pot Cap-1 Maneuver	882	994	1570	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	875	994	1570	-	-	-
Mov Cap-2 Maneuver	875	-	-	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1570	-	936	-	-
HCM Lane V/C Ratio	0.008	-	0.026	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	315	308	39	24	24
Future Volume (vph)	19	315	308	39	24	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985		0.932	
Flt Protected		0.997			0.976	
Satd. Flow (prot)	0	1831	1784	0	1694	0
Flt Permitted		0.997			0.976	
Satd. Flow (perm)	0	1831	1784	0	1694	0
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	3%	2%	28%	2%	2%
Adj. Flow (vph)	21	350	342	43	27	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	371	385	0	54	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 42.1% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	315	308	39	24	24
Future Vol, veh/h	19	315	308	39	24	24
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, %	11	3	2	28	2	2
Mvmt Flow	21	350	342	43	27	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	385	0	-	0	756	364
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	392	-
Critical Hdwy	4.21	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.299	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1126	-	-	-	376	681
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	683	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1126	-	-	-	367	681
Mov Cap-2 Maneuver	-	-	-	-	367	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	683	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1126	-	-	-	477
HCM Lane V/C Ratio	0.019	-	-	-	0.112
HCM Control Delay (s)	8.3	0	-	-	13.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	42	46	0
Future Volume (vph)	0	1	1	42	46	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected				0.999		
Satd. Flow (prot)	1611	0	0	1861	1863	0
Flt Permitted				0.999		
Satd. Flow (perm)	1611	0	0	1861	1863	0
Link Speed (mph)	25			55	55	
Link Distance (ft)	1275			905	870	
Travel Time (s)	34.8			11.2	10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1	1	47	51	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	48	51	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	1	42	46	0
Future Vol, veh/h	0	1	1	42	46	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1	47	51	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	100	51	51	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	49	-	-	-	-	-
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	899	1017	1555	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	973	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	898	1017	1555	-	-	-
Mov Cap-2 Maneuver	898	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	973	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1555	-	1017	-	-
HCM Lane V/C Ratio	0.001	-	0.001	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	103	21	32	191	35	65
Future Volume (vph)	103	21	32	191	35	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.977				0.912	
Flt Protected				0.993	0.983	
Satd. Flow (prot)	1776	0	0	1824	1584	0
Flt Permitted				0.993	0.983	
Satd. Flow (perm)	1776	0	0	1824	1584	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	6%	3%	14%	4%
Adj. Flow (vph)	114	23	36	212	39	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	248	111	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.5% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	21	32	191	35	65
Future Vol, veh/h	103	21	32	191	35	65
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, %	5	2	6	3	14	4
Mvmt Flow	114	23	36	212	39	72

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	137	0	410	126
Stage 1	-	-	-	-	126	-
Stage 2	-	-	-	-	284	-
Critical Hdwy	-	-	4.16	-	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.254	-	3.626	3.336
Pot Cap-1 Maneuver	-	-	1423	-	575	919
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1423	-	558	919
Mov Cap-2 Maneuver	-	-	-	-	558	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	716	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	749	-	-	1423	-
HCM Lane V/C Ratio	0.148	-	-	0.025	-
HCM Control Delay (s)	10.6	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	29	30	15	44	56	23
Future Volume (vph)	29	30	15	44	56	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.931				0.960	
Flt Protected	0.976			0.987		
Satd. Flow (prot)	1693	0	0	1789	1743	0
Flt Permitted	0.976			0.987		
Satd. Flow (perm)	1693	0	0	1789	1743	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	13%	2%	2%	11%
Adj. Flow (vph)	32	33	17	49	62	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	0	0	66	88	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.9% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	30	15	44	56	23
Future Vol, veh/h	29	30	15	44	56	23
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	13	2	2	11
Mvmt Flow	32	33	17	49	62	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	158	75	88	0	-	0
Stage 1	75	-	-	-	-	-
Stage 2	83	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.23	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.317	-	-	-
Pot Cap-1 Maneuver	833	986	1441	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	823	986	1441	-	-	-
Mov Cap-2 Maneuver	823	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	940	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1441	-	899	-	-
HCM Lane V/C Ratio	0.012	-	0.073	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	23	366	308	88	162	26
Future Volume (vph)	23	366	308	88	162	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.970		0.981	
Flt Protected		0.997			0.959	
Satd. Flow (prot)	0	1788	1793	0	1330	0
Flt Permitted		0.960			0.959	
Satd. Flow (perm)	0	1722	1793	0	1330	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	6%	3%	2%	38%	12%
Adj. Flow (vph)	26	407	342	98	180	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	433	440	0	209	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	
Minimum Split (s)	19.0	19.0	19.0		14.0	
Total Split (s)	35.0	35.0	35.0		25.0	
Total Split (%)	58.3%	58.3%	58.3%		41.7%	
Maximum Green (s)	28.0	28.0	28.0		18.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	
Total Lost Time (s)		5.0	5.0		5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	6.0	6.0		2.0	
Recall Mode	Min	Min	Min		None	
Act Effct Green (s)		24.9	24.9		13.9	
Actuated g/C Ratio		0.51	0.51		0.28	
v/c Ratio		0.50	0.48		0.55	
Control Delay		11.1	10.9		21.2	
Queue Delay		0.0	0.0		0.0	
Total Delay		11.1	10.9		21.2	
LOS		B	B		C	
Approach Delay		11.1	10.9		21.2	
Approach LOS		B	B		C	
Queue Length 50th (ft)		70	71		44	
Queue Length 95th (ft)		165	164		114	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		1025	935		796	
Turn Bay Length (ft)						
Base Capacity (vph)		1076	1121		554	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.40	0.39		0.38	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 49
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 13.0 Intersection LOS: B
Intersection Capacity Utilization 57.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Smithfield Rd & Mailman Rd

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	62	93	0
Future Volume (vph)	0	0	0	62	93	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1845	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1845	0
Link Speed (mph)	25			55	55	
Link Distance (ft)	1275			905	870	
Travel Time (s)	34.8			11.2	10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	0	0	69	103	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	69	103	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 8.2% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	62	93	0
Future Vol, veh/h	0	0	0	62	93	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	3	2
Mvmt Flow	0	0	0	69	103	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	172	103	103	0	-	0
Stage 1	103	-	-	-	-	-
Stage 2	69	-	-	-	-	-
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	818	952	1489	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	952	1489	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1489	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	213	32	68	156	25	72
Future Volume (vph)	213	32	68	156	25	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.982				0.900	
Flt Protected				0.985	0.987	
Satd. Flow (prot)	1829	0	0	1835	1655	0
Flt Permitted				0.985	0.987	
Satd. Flow (perm)	1829	0	0	1835	1655	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	237	36	76	173	28	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	273	0	0	249	108	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.9% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	213	32	68	156	25	72
Future Vol, veh/h	213	32	68	156	25	72
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	237	36	76	173	28	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	273	0	580	255
Stage 1	-	-	-	-	255	-
Stage 2	-	-	-	-	325	-
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	-	-	1290	-	477	784
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	732	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1290	-	446	784
Mov Cap-2 Maneuver	-	-	-	-	446	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	656	-	-	1290	-
HCM Lane V/C Ratio	0.164	-	-	0.059	-
HCM Control Delay (s)	11.6	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	29	26	33	94	65	28
Future Volume (vph)	29	26	33	94	65	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.936				0.959	
Flt Protected	0.974			0.987		
Satd. Flow (prot)	1587	0	0	1839	1786	0
Flt Permitted	0.974			0.987		
Satd. Flow (perm)	1587	0	0	1839	1786	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	17%	2%	2%	2%	2%
Adj. Flow (vph)	32	29	37	104	72	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	0	0	141	103	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 23.4% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	26	33	94	65	28
Future Vol, veh/h	29	26	33	94	65	28
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	90	90	90	90	90	90
Heavy Vehicles, %	2	17	2	2	2	2
Mvmt Flow	32	29	37	104	72	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	266	88	103	0	-	0
Stage 1	88	-	-	-	-	-
Stage 2	178	-	-	-	-	-
Critical Hdwy	6.42	6.37	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.453	2.218	-	-	-
Pot Cap-1 Maneuver	723	930	1489	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	704	930	1489	-	-	-
Mov Cap-2 Maneuver	704	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	853	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	1.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1489	-	795	-	-
HCM Lane V/C Ratio	0.025	-	0.077	-	-
HCM Control Delay (s)	7.5	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	29	418	464	173	116	37
Future Volume (vph)	29	418	464	173	116	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.963		0.967	
Flt Protected		0.997			0.963	
Satd. Flow (prot)	0	1830	1678	0	1735	0
Flt Permitted		0.938			0.963	
Satd. Flow (perm)	0	1722	1678	0	1735	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	3%	2%	28%	2%	2%
Adj. Flow (vph)	32	464	516	192	129	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	496	708	0	170	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	
Minimum Split (s)	19.0	19.0	19.0		14.0	
Total Split (s)	44.0	44.0	44.0		16.0	
Total Split (%)	73.3%	73.3%	73.3%		26.7%	
Maximum Green (s)	37.0	37.0	37.0		9.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	
Total Lost Time (s)		5.0	5.0		5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	6.0	6.0		2.0	
Recall Mode	Min	Min	Min		None	
Act Effct Green (s)		36.6	36.6		10.5	
Actuated g/C Ratio		0.70	0.70		0.20	
v/c Ratio		0.41	0.60		0.48	
Control Delay		6.2	8.8		26.4	
Queue Delay		0.0	0.0		0.0	
Total Delay		6.2	8.8		26.4	
LOS		A	A		C	
Approach Delay		6.2	8.8		26.4	
Approach LOS		A	A		C	
Queue Length 50th (ft)		73	128		50	
Queue Length 95th (ft)		124	224		109	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		1025	935		796	
Turn Bay Length (ft)						
Base Capacity (vph)		1310	1277		380	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.38	0.55		0.45	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 52
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 10.1 Intersection LOS: B
Intersection Capacity Utilization 62.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Smithfield Rd & Mailman Rd

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	1	109	95	0
Future Volume (vph)	0	1	1	109	95	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1611	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1611	0	0	1863	1863	0
Link Speed (mph)	25			55	55	
Link Distance (ft)	1275			905	870	
Travel Time (s)	34.8			11.2	10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1	1	121	106	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	122	106	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 16.5% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	1	109	95	0
Future Vol, veh/h	0	1	1	109	95	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	1	121	106	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	229	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	123	-	-	-	-	-
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	759	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	758	948	1485	-	-	-
Mov Cap-2 Maneuver	758	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	902	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	948	-	-
HCM Lane V/C Ratio	0.001	-	0.001	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	103	27	39	191	52	87
Future Volume (vph)	103	27	39	191	52	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.972				0.916	
Flt Protected				0.992	0.982	
Satd. Flow (prot)	1769	0	0	1821	1586	0
Flt Permitted				0.992	0.982	
Satd. Flow (perm)	1769	0	0	1821	1586	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	6%	3%	14%	4%
Adj. Flow (vph)	114	30	43	212	58	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	0	0	255	155	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.5% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	27	39	191	52	87
Future Vol, veh/h	103	27	39	191	52	87
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, %	5	2	6	3	14	4
Mvmt Flow	114	30	43	212	58	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	144	0	427	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	298	-
Critical Hdwy	-	-	4.16	-	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.254	-	3.626	3.336
Pot Cap-1 Maneuver	-	-	1414	-	562	916
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1414	-	543	916
Mov Cap-2 Maneuver	-	-	-	-	543	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	702	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	729	-	-	1414	-
HCM Lane V/C Ratio	0.212	-	-	0.031	-
HCM Control Delay (s)	11.3	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	29	33	24	83	69	23
Future Volume (vph)	29	33	24	83	69	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.928				0.966	
Flt Protected	0.977			0.989		
Satd. Flow (prot)	1689	0	0	1798	1760	0
Flt Permitted	0.977			0.989		
Satd. Flow (perm)	1689	0	0	1798	1760	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	13%	2%	2%	11%
Adj. Flow (vph)	32	37	27	92	77	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	0	119	103	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 22.7% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	33	24	83	69	23
Future Vol, veh/h	29	33	24	83	69	23
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	13	2	2	11
Mvmt Flow	32	37	27	92	77	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	236	90	103	0	-	0
Stage 1	90	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.23	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.317	-	-	-
Pot Cap-1 Maneuver	752	968	1423	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	737	968	1423	-	-	-
Mov Cap-2 Maneuver	737	-	-	-	-	-
Stage 1	915	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1423	-	844	-	-
HCM Lane V/C Ratio	0.019	-	0.082	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

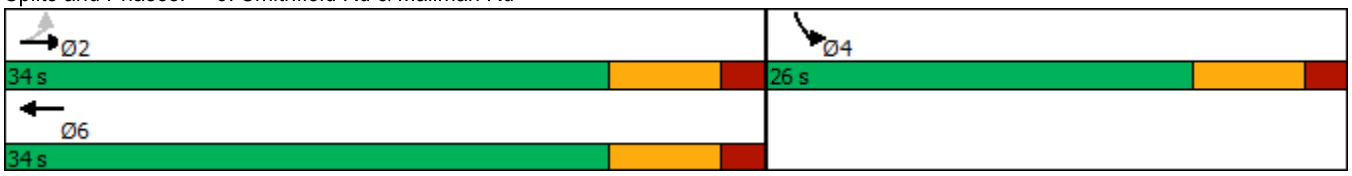
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	26	366	308	98	192	35
Future Volume (vph)	26	366	308	98	192	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967		0.979	
Flt Protected		0.997			0.959	
Satd. Flow (prot)	0	1788	1788	0	1331	0
Flt Permitted		0.953			0.959	
Satd. Flow (perm)	0	1709	1788	0	1331	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	6%	3%	2%	38%	12%
Adj. Flow (vph)	29	407	342	109	213	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	436	451	0	252	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	
Minimum Split (s)	19.0	19.0	19.0		14.0	
Total Split (s)	34.0	34.0	34.0		26.0	
Total Split (%)	56.7%	56.7%	56.7%		43.3%	
Maximum Green (s)	27.0	27.0	27.0		19.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	
Total Lost Time (s)		5.0	5.0		5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	6.0	6.0		2.0	
Recall Mode	Min	Min	Min		None	
Act Effct Green (s)		24.1	24.1		15.3	
Actuated g/C Ratio		0.48	0.48		0.31	
v/c Ratio		0.53	0.52		0.61	
Control Delay		12.5	12.3		22.4	
Queue Delay		0.0	0.0		0.0	
Total Delay		12.5	12.3		22.4	
LOS		B	B		C	
Approach Delay		12.5	12.3		22.4	
Approach LOS		B	B		C	
Queue Length 50th (ft)		80	82		58	
Queue Length 95th (ft)		174	178		136	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		1025	935		796	
Turn Bay Length (ft)						
Base Capacity (vph)		1025	1073		578	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.43	0.42		0.44	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 49.7
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Smithfield Rd & Mailman Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	30	0	35	0	75	10	12	97	0
Future Volume (vph)	0	0	0	30	0	35	0	75	10	12	97	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.927			0.984				
Flt Protected					0.978						0.995	
Satd. Flow (prot)	0	1863	0	0	1689	0	0	1833	0	0	1837	0
Flt Permitted					0.978						0.995	
Satd. Flow (perm)	0	1863	0	0	1689	0	0	1833	0	0	1837	0
Link Speed (mph)		25			25			55			55	
Link Distance (ft)		1275			912			905			870	
Travel Time (s)		34.8			24.9			11.2			10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	0	0	33	0	39	0	83	11	13	108	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	72	0	0	94	0	0	121	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 22.9% ICU Level of Service A
Analysis Period (min) 15

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	13	72	3	4	123
Future Volume (vph)	9	13	72	3	4	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.921		0.995			
Flt Protected	0.980				0.950	
Satd. Flow (prot)	1681	0	1853	0	1770	1863
Flt Permitted	0.980				0.950	
Satd. Flow (perm)	1681	0	1853	0	1770	1863
Link Speed (mph)	25		55			55
Link Distance (ft)	918		964			905
Travel Time (s)	25.0		12.0			11.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	14	80	3	4	137
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	83	0	4	137
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 16.5% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	13	72	3	4	123
Future Vol, veh/h	9	13	72	3	4	123
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	-	-	-	100	-
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	10	14	80	3	4	137

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	227	82	0	0	83	0
Stage 1	82	-	-	-	-	-
Stage 2	145	-	-	-	-	-
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	761	978	-	-	1514	-
Stage 1	941	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	759	978	-	-	1514	-
Mov Cap-2 Maneuver	759	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	875	1514	-
HCM Lane V/C Ratio	-	-	0.028	0.003	-
HCM Control Delay (s)	-	-	9.2	7.4	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

MOVEMENT SUMMARY

Site: 101 [Site Driveway - AM (Site Folder: General)]

Mailman Rd at Future Access #1
Site Category: Build (2025) AM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Mailman Rd														
3	L2	1	2.0	1	2.0	0.072	3.3	LOS A	0.3	8.0	0.08	0.02	0.08	35.8
8	T1	75	2.0	83	2.0	0.072	3.3	LOS A	0.3	8.0	0.08	0.02	0.08	35.9
18	R2	10	2.0	11	2.0	0.072	3.3	LOS A	0.3	8.0	0.08	0.02	0.08	34.9
Approach		86	2.0	96	2.0	0.072	3.3	LOS A	0.3	8.0	0.08	0.02	0.08	35.7
East: Future Access #1														
1	L2	30	2.0	33	2.0	0.059	3.4	LOS A	0.3	6.5	0.21	0.09	0.21	34.4
6	T1	1	2.0	1	2.0	0.059	3.4	LOS A	0.3	6.5	0.21	0.09	0.21	34.4
16	R2	35	2.0	39	2.0	0.059	3.4	LOS A	0.3	6.5	0.21	0.09	0.21	33.5
Approach		66	2.0	73	2.0	0.059	3.4	LOS A	0.3	6.5	0.21	0.09	0.21	33.9
North: Mailman Rd														
7	L2	12	2.0	13	2.0	0.094	3.5	LOS A	0.4	10.7	0.13	0.04	0.13	35.4
4	T1	97	2.0	108	2.0	0.094	3.5	LOS A	0.4	10.7	0.13	0.04	0.13	35.4
14	R2	1	2.0	1	2.0	0.094	3.5	LOS A	0.4	10.7	0.13	0.04	0.13	34.5
Approach		110	2.0	122	2.0	0.094	3.5	LOS A	0.4	10.7	0.13	0.04	0.13	35.4
West: Sawdust Ln														
5	L2	1	2.0	1	2.0	0.003	3.1	LOS A	0.0	0.3	0.28	0.11	0.28	34.9
2	T1	1	2.0	1	2.0	0.003	3.1	LOS A	0.0	0.3	0.28	0.11	0.28	34.9
12	R2	1	2.0	1	2.0	0.003	3.1	LOS A	0.0	0.3	0.28	0.11	0.28	34.0
Approach		3	2.0	3	2.0	0.003	3.1	LOS A	0.0	0.3	0.28	0.11	0.28	34.6
All Vehicles		265	2.0	294	2.0	0.094	3.4	LOS A	0.4	10.7	0.14	0.05	0.14	35.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	213	52	93	156	37	87
Future Volume (vph)	213	52	93	156	37	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.905	
Flt Protected				0.982	0.985	
Satd. Flow (prot)	1812	0	0	1829	1660	0
Flt Permitted				0.982	0.985	
Satd. Flow (perm)	1812	0	0	1829	1660	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	237	58	103	173	41	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	295	0	0	276	138	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 45.1% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	213	52	93	156	37	87
Future Vol, veh/h	213	52	93	156	37	87
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	237	58	103	173	41	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	295	0	645	266
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	379	-
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	-	-	1266	-	437	773
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1266	-	398	773
Mov Cap-2 Maneuver	-	-	-	-	398	-
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	630	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	603	-	-	1266	-
HCM Lane V/C Ratio	0.228	-	-	0.082	-
HCM Control Delay (s)	12.7	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.3	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	29	36	39	121	110	28
Future Volume (vph)	29	36	39	121	110	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.925				0.973	
Flt Protected	0.978			0.988		
Satd. Flow (prot)	1558	0	0	1840	1812	0
Flt Permitted	0.978			0.988		
Satd. Flow (perm)	1558	0	0	1840	1812	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	17%	2%	2%	2%	2%
Adj. Flow (vph)	32	40	43	134	122	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	0	177	153	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.8% ICU Level of Service A
Analysis Period (min) 15

Intersection						
Int Delay, s/veh	2.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	36	39	121	110	28
Future Vol, veh/h	29	36	39	121	110	28
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	90	90	90	90	90	90
Heavy Vehicles, %	2	17	2	2	2	2
Mvmt Flow	32	40	43	134	122	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	358	138	153	0	-	0
Stage 1	138	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Critical Hdwy	6.42	6.37	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.453	2.218	-	-	-
Pot Cap-1 Maneuver	640	872	1428	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	619	872	1428	-	-	-
Mov Cap-2 Maneuver	619	-	-	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1428	-	738	-	-
HCM Lane V/C Ratio	0.03	-	0.098	-	-
HCM Control Delay (s)	7.6	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	418	464	206	135	43
Future Volume (vph)	39	418	464	206	135	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.959		0.967	
Flt Protected		0.996			0.964	
Satd. Flow (prot)	0	1825	1657	0	1736	0
Flt Permitted		0.908			0.964	
Satd. Flow (perm)	0	1664	1657	0	1736	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	3%	2%	28%	2%	2%
Adj. Flow (vph)	43	464	516	229	150	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	507	745	0	198	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	
Minimum Split (s)	19.0	19.0	19.0		14.0	
Total Split (s)	45.0	45.0	45.0		15.0	
Total Split (%)	75.0%	75.0%	75.0%		25.0%	
Maximum Green (s)	38.0	38.0	38.0		8.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	
Total Lost Time (s)		5.0	5.0		5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	6.0	6.0		2.0	
Recall Mode	Min	Min	Min		None	
Act Effct Green (s)		36.3	36.3		9.8	
Actuated g/C Ratio		0.65	0.65		0.17	
v/c Ratio		0.47	0.70		0.65	
Control Delay		6.8	10.7		34.8	
Queue Delay		0.0	0.0		0.0	
Total Delay		6.8	10.7		34.8	
LOS		A	B		C	
Approach Delay		6.8	10.7		34.8	
Approach LOS		A	B		C	
Queue Length 50th (ft)		71	132		61	
Queue Length 95th (ft)		122	236		#151	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		1025	935		796	
Turn Bay Length (ft)						
Base Capacity (vph)		1190	1185		310	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.43	0.63		0.64	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 56.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 72.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Smithfield Rd & Mailman Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	19	0	24	1	118	33	40	110	0
Future Volume (vph)	0	0	1	19	0	24	1	118	33	40	110	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.924			0.970				
Flt Protected					0.979						0.987	
Satd. Flow (prot)	0	1611	0	0	1685	0	0	1807	0	0	1825	0
Flt Permitted					0.979						0.987	
Satd. Flow (perm)	0	1611	0	0	1685	0	0	1807	0	0	1825	0
Link Speed (mph)		25			25			55			55	
Link Distance (ft)		1275			912			905			870	
Travel Time (s)		34.8			24.9			11.2			10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	0	1	21	0	27	1	131	37	44	122	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	48	0	0	169	0	0	166	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 35.5% ICU Level of Service A
Analysis Period (min) 15

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	9	143	10	15	115
Future Volume (vph)	6	9	143	10	15	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.921		0.991			
Flt Protected	0.980				0.950	
Satd. Flow (prot)	1681	0	1846	0	1770	1863
Flt Permitted	0.980				0.950	
Satd. Flow (perm)	1681	0	1846	0	1770	1863
Link Speed (mph)	25		55			55
Link Distance (ft)	918		964			905
Travel Time (s)	25.0		12.0			11.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	10	159	11	17	128
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	170	0	17	128
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 22.5% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	9	143	10	15	115
Future Vol, veh/h	6	9	143	10	15	115
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	-	-	-	100	-
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	7	10	159	11	17	128

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	327	165	0	0	170	0
Stage 1	165	-	-	-	-	-
Stage 2	162	-	-	-	-	-
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	667	879	-	-	1407	-
Stage 1	864	-	-	-	-	-
Stage 2	867	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	659	879	-	-	1407	-
Mov Cap-2 Maneuver	659	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	775	1407	-
HCM Lane V/C Ratio	-	-	0.022	0.012	-
HCM Control Delay (s)	-	-	9.7	7.6	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

MOVEMENT SUMMARY

Site: 101 [Site Driveway - PM (Site Folder: General)]

Mailman Rd at Future Access #1
Site Category: Build (2025) PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Mailman Rd														
3	L2	1	2.0	1	2.0	0.131	3.9	LOS A	0.6	15.5	0.16	0.06	0.16	35.5
8	T1	118	2.0	131	2.0	0.131	3.9	LOS A	0.6	15.5	0.16	0.06	0.16	35.5
18	R2	33	2.0	37	2.0	0.131	3.9	LOS A	0.6	15.5	0.16	0.06	0.16	34.5
Approach		152	2.0	169	2.0	0.131	3.9	LOS A	0.6	15.5	0.16	0.06	0.16	35.3
East: Future Access #1														
1	L2	19	2.0	21	2.0	0.042	3.4	LOS A	0.2	4.4	0.27	0.13	0.27	34.5
6	T1	1	2.0	1	2.0	0.042	3.4	LOS A	0.2	4.4	0.27	0.13	0.27	34.5
16	R2	24	2.0	27	2.0	0.042	3.4	LOS A	0.2	4.4	0.27	0.13	0.27	33.6
Approach		44	2.0	49	2.0	0.042	3.4	LOS A	0.2	4.4	0.27	0.13	0.27	34.0
North: Mailman Rd														
7	L2	40	2.0	44	2.0	0.127	3.8	LOS A	0.6	15.1	0.11	0.03	0.11	34.8
4	T1	110	2.0	122	2.0	0.127	3.8	LOS A	0.6	15.1	0.11	0.03	0.11	34.8
14	R2	1	2.0	1	2.0	0.127	3.8	LOS A	0.6	15.1	0.11	0.03	0.11	33.9
Approach		151	2.0	168	2.0	0.127	3.8	LOS A	0.6	15.1	0.11	0.03	0.11	34.8
West: Sawdust Ln														
5	L2	1	2.0	1	2.0	0.003	3.3	LOS A	0.0	0.3	0.31	0.13	0.31	34.8
2	T1	1	2.0	1	2.0	0.003	3.3	LOS A	0.0	0.3	0.31	0.13	0.31	34.9
12	R2	1	2.0	1	2.0	0.003	3.3	LOS A	0.0	0.3	0.31	0.13	0.31	33.9
Approach		3	2.0	3	2.0	0.003	3.3	LOS A	0.0	0.3	0.31	0.13	0.31	34.5
All Vehicles		350	2.0	389	2.0	0.131	3.8	LOS A	0.6	15.5	0.15	0.06	0.15	34.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	113	32	50	211	66	120
Future Volume (vph)	113	32	50	211	66	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.970				0.913	
Flt Protected				0.990	0.983	
Satd. Flow (prot)	1766	0	0	1816	1586	0
Flt Permitted				0.990	0.983	
Satd. Flow (perm)	1766	0	0	1816	1586	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	6%	3%	14%	4%
Adj. Flow (vph)	126	36	56	234	73	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	0	0	290	206	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 42.8% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	113	32	50	211	66	120
Future Vol, veh/h	113	32	50	211	66	120
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, %	5	2	6	3	14	4
Mvmt Flow	126	36	56	234	73	133

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	162	0	490	144
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	346	-
Critical Hdwy	-	-	4.16	-	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	2.254	-	3.626	3.336
Pot Cap-1 Maneuver	-	-	1393	-	516	898
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1393	-	492	898
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	658	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	695	-	-	1393	-
HCM Lane V/C Ratio	0.297	-	-	0.04	-
HCM Control Delay (s)	12.4	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.1	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	52	31	94	102	35
Future Volume (vph)	45	52	31	94	102	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.927				0.965	
Flt Protected	0.977			0.988		
Satd. Flow (prot)	1687	0	0	1793	1758	0
Flt Permitted	0.977			0.988		
Satd. Flow (perm)	1687	0	0	1793	1758	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	13%	2%	2%	11%
Adj. Flow (vph)	50	58	34	104	113	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	0	138	152	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.8% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	52	31	94	102	35
Future Vol, veh/h	45	52	31	94	102	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	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	13	2	2	11
Mvmt Flow	50	58	34	104	113	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	305	133	152	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	172	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.23	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.317	-	-	-
Pot Cap-1 Maneuver	687	916	1364	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	669	916	1364	-	-	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	870	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1364	-	782	-	-
HCM Lane V/C Ratio	0.025	-	0.138	-	-
HCM Control Delay (s)	7.7	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

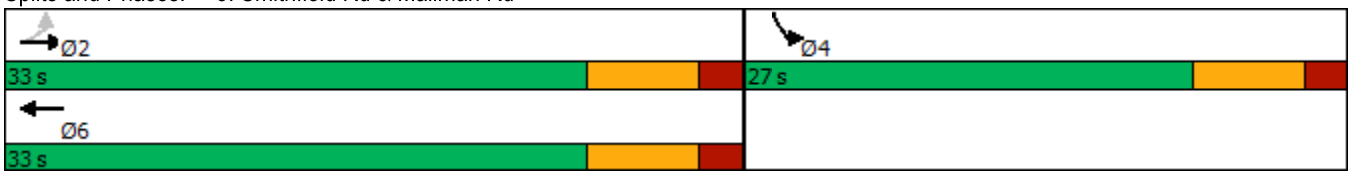
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	30	422	351	112	238	44
Future Volume (vph)	30	422	351	112	238	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967		0.979	
Flt Protected		0.997			0.960	
Satd. Flow (prot)	0	1788	1788	0	1333	0
Flt Permitted		0.946			0.960	
Satd. Flow (perm)	0	1697	1788	0	1333	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	6%	3%	2%	38%	12%
Adj. Flow (vph)	33	469	390	124	264	49
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	502	514	0	313	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	
Minimum Split (s)	19.0	19.0	19.0		14.0	
Total Split (s)	33.0	33.0	33.0		27.0	
Total Split (%)	55.0%	55.0%	55.0%		45.0%	
Maximum Green (s)	26.0	26.0	26.0		20.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	
Total Lost Time (s)		5.0	5.0		5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	6.0	6.0		2.0	
Recall Mode	Min	Min	Min		None	
Act Effct Green (s)		23.7	23.7		17.4	
Actuated g/C Ratio		0.46	0.46		0.34	
v/c Ratio		0.64	0.62		0.70	
Control Delay		15.9	15.2		24.9	
Queue Delay		0.0	0.0		0.0	
Total Delay		15.9	15.2		24.9	
LOS		B	B		C	
Approach Delay		15.9	15.2		24.9	
Approach LOS		B	B		C	
Queue Length 50th (ft)		116	117		87	
Queue Length 95th (ft)		220	220		169	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		1025	935		796	
Turn Bay Length (ft)						
Base Capacity (vph)		959	1010		591	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.52	0.51		0.53	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.5
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 17.8 Intersection LOS: B
Intersection Capacity Utilization 71.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: Smithfield Rd & Mailman Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	30	0	35	0	93	10	12	149	0
Future Volume (vph)	0	0	0	30	0	35	0	93	10	12	149	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.927			0.987				
Flt Protected					0.978						0.996	
Satd. Flow (prot)	0	1863	0	0	1689	0	0	1839	0	0	1839	0
Flt Permitted					0.978						0.996	
Satd. Flow (perm)	0	1863	0	0	1689	0	0	1839	0	0	1839	0
Link Speed (mph)		25			25			55			55	
Link Distance (ft)		1275			912			905			870	
Travel Time (s)		34.8			24.9			11.2			10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	0	0	33	0	39	0	103	11	13	166	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	72	0	0	114	0	0	179	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 25.6% ICU Level of Service A
Analysis Period (min) 15

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	9	13	90	3	4	175
Future Volume (vph)	9	13	90	3	4	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.921		0.996			
Flt Protected	0.980				0.950	
Satd. Flow (prot)	1681	0	1855	0	1770	1863
Flt Permitted	0.980				0.950	
Satd. Flow (perm)	1681	0	1855	0	1770	1863
Link Speed (mph)	25		55			55
Link Distance (ft)	918		964			905
Travel Time (s)	25.0		12.0			11.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	14	100	3	4	194
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	103	0	4	194
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.2% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	13	90	3	4	175
Future Vol, veh/h	9	13	90	3	4	175
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	-	-	-	100	-
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	10	14	100	3	4	194

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	304	102	0	0	103	0
Stage 1	102	-	-	-	-	-
Stage 2	202	-	-	-	-	-
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	688	953	-	-	1489	-
Stage 1	922	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	686	953	-	-	1489	-
Mov Cap-2 Maneuver	686	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	822	1489	-
HCM Lane V/C Ratio	-	-	0.03	0.003	-
HCM Control Delay (s)	-	-	9.5	7.4	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

MOVEMENT SUMMARY

Site: 101 [Site Driveway - AM (Site Folder: General)]

Mailman Rd at Future Access #1
Site Category: Build (2035) AM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Mailman Rd														
3	L2	1	2.0	1	2.0	0.087	3.4	LOS A	0.4	9.9	0.08	0.02	0.08	35.8
8	T1	93	2.0	103	2.0	0.087	3.4	LOS A	0.4	9.9	0.08	0.02	0.08	35.8
18	R2	10	2.0	11	2.0	0.087	3.4	LOS A	0.4	9.9	0.08	0.02	0.08	34.8
Approach		104	2.0	116	2.0	0.087	3.4	LOS A	0.4	9.9	0.08	0.02	0.08	35.7
East: Future Access #1														
1	L2	30	2.0	33	2.0	0.060	3.5	LOS A	0.3	6.6	0.24	0.11	0.24	34.4
6	T1	1	2.0	1	2.0	0.060	3.5	LOS A	0.3	6.6	0.24	0.11	0.24	34.4
16	R2	35	2.0	39	2.0	0.060	3.5	LOS A	0.3	6.6	0.24	0.11	0.24	33.5
Approach		66	2.0	73	2.0	0.060	3.5	LOS A	0.3	6.6	0.24	0.11	0.24	33.9
North: Mailman Rd														
7	L2	12	2.0	13	2.0	0.138	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	35.3
4	T1	149	2.0	166	2.0	0.138	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	35.3
14	R2	1	2.0	1	2.0	0.138	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	34.4
Approach		162	2.0	180	2.0	0.138	3.9	LOS A	0.6	16.5	0.14	0.05	0.14	35.3
West: Sawdust Ln														
5	L2	1	2.0	1	2.0	0.003	3.3	LOS A	0.0	0.3	0.33	0.15	0.33	34.8
2	T1	1	2.0	1	2.0	0.003	3.3	LOS A	0.0	0.3	0.33	0.15	0.33	34.8
12	R2	1	2.0	1	2.0	0.003	3.3	LOS A	0.0	0.3	0.33	0.15	0.33	33.9
Approach		3	2.0	3	2.0	0.003	3.3	LOS A	0.0	0.3	0.33	0.15	0.33	34.5
All Vehicles		335	2.0	372	2.0	0.138	3.6	LOS A	0.6	16.5	0.14	0.05	0.14	35.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	235	68	130	173	46	113
Future Volume (vph)	235	68	130	173	46	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.970				0.904	
Flt Protected				0.979	0.986	
Satd. Flow (prot)	1807	0	0	1824	1660	0
Flt Permitted				0.979	0.986	
Satd. Flow (perm)	1807	0	0	1824	1660	0
Link Speed (mph)	45			45	55	
Link Distance (ft)	1674			1270	2314	
Travel Time (s)	25.4			19.2	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	76	144	192	51	126
Shared Lane Traffic (%)						
Lane Group Flow (vph)	337	0	0	336	177	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.3% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	235	68	130	173	46	113
Future Vol, veh/h	235	68	130	173	46	113
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	261	76	144	192	51	126

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	337	0	779	299
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	480	-
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	-	-	1222	-	364	741
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	622	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1222	-	316	741
Mov Cap-2 Maneuver	-	-	-	-	316	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	540	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	533	-	-	1222	-
HCM Lane V/C Ratio	0.331	-	-	0.118	-
HCM Control Delay (s)	15.1	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.4	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	47	49	61	161	133	47
Future Volume (vph)	47	49	61	161	133	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.931				0.965	
Flt Protected	0.976			0.986		
Satd. Flow (prot)	1575	0	0	1837	1798	0
Flt Permitted	0.976			0.986		
Satd. Flow (perm)	1575	0	0	1837	1798	0
Link Speed (mph)	45			55	55	
Link Distance (ft)	1095			870	2314	
Travel Time (s)	16.6			10.8	28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	17%	2%	2%	2%	2%
Adj. Flow (vph)	52	54	68	179	148	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	106	0	0	247	200	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.3% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	47	49	61	161	133	47
Future Vol, veh/h	47	49	61	161	133	47
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	90	90	90	90	90	90
Heavy Vehicles, %	2	17	2	2	2	2
Mvmt Flow	52	54	68	179	148	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	489	174	200	0	-	0
Stage 1	174	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Critical Hdwy	6.42	6.37	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.453	2.218	-	-	-
Pot Cap-1 Maneuver	538	832	1372	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	508	832	1372	-	-	-
Mov Cap-2 Maneuver	508	-	-	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	740	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1372	-	634	-	-
HCM Lane V/C Ratio	0.049	-	0.168	-	-
HCM Control Delay (s)	7.8	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	48	485	533	257	165	50
Future Volume (vph)	48	485	533	257	165	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.956		0.968	
Flt Protected		0.996			0.963	
Satd. Flow (prot)	0	1825	1644	0	1736	0
Flt Permitted		0.836			0.963	
Satd. Flow (perm)	0	1531	1644	0	1736	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		45	45		55	
Link Distance (ft)		1105	1015		876	
Travel Time (s)		16.7	15.4		10.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	3%	2%	28%	2%	2%
Adj. Flow (vph)	53	539	592	286	183	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	592	878	0	239	0
Turn Type	Perm	NA	NA		Prot	
Protected Phases		2	6		4	
Permitted Phases	2					
Detector Phase	2	2	6		4	
Switch Phase						
Minimum Initial (s)	12.0	12.0	12.0		7.0	
Minimum Split (s)	19.0	19.0	19.0		14.0	
Total Split (s)	45.0	45.0	45.0		15.0	
Total Split (%)	75.0%	75.0%	75.0%		25.0%	
Maximum Green (s)	38.0	38.0	38.0		8.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	
Total Lost Time (s)		5.0	5.0		5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	6.0	6.0		2.0	
Recall Mode	Min	Min	Min		None	
Act Effct Green (s)		39.3	39.3		10.0	
Actuated g/C Ratio		0.66	0.66		0.17	
v/c Ratio		0.58	0.81		0.82	
Control Delay		8.4	15.1		49.4	
Queue Delay		0.0	0.0		0.0	
Total Delay		8.4	15.1		49.4	
LOS		A	B		D	
Approach Delay		8.4	15.1		49.4	
Approach LOS		A	B		D	
Queue Length 50th (ft)		94	184		85	
Queue Length 95th (ft)		168	#389		#193	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		1025	935		796	
Turn Bay Length (ft)						
Base Capacity (vph)		1032	1108		292	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	
Reduced v/c Ratio		0.57	0.79		0.82	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 59.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 17.6 Intersection LOS: B
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Smithfield Rd & Mailman Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	19	0	24	1	178	33	40	148	0
Future Volume (vph)	0	0	1	19	0	24	1	178	33	40	148	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.924			0.979				
Flt Protected					0.979						0.990	
Satd. Flow (prot)	0	1611	0	0	1685	0	0	1824	0	0	1830	0
Flt Permitted					0.979						0.990	
Satd. Flow (perm)	0	1611	0	0	1685	0	0	1824	0	0	1830	0
Link Speed (mph)		25			25			55			55	
Link Distance (ft)		1275			912			905			870	
Travel Time (s)		34.8			24.9			11.2			10.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	0	1	21	0	27	1	198	37	44	164	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1	0	0	48	0	0	236	0	0	208	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary

Area Type: Other
Control Type: Roundabout
Intersection Capacity Utilization 40.6% ICU Level of Service A
Analysis Period (min) 15

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	9	203	10	15	153
Future Volume (vph)	6	9	203	10	15	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	100				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.921		0.994			
Flt Protected	0.980				0.950	
Satd. Flow (prot)	1681	0	1852	0	1770	1863
Flt Permitted	0.980				0.950	
Satd. Flow (perm)	1681	0	1852	0	1770	1863
Link Speed (mph)	25		55			55
Link Distance (ft)	918		964			905
Travel Time (s)	25.0		12.0			11.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	10	226	11	17	170
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	237	0	17	170
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 22.5% ICU Level of Service A
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	9	203	10	15	153
Future Vol, veh/h	6	9	203	10	15	153
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	-	-	-	100	-
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	7	10	226	11	17	170

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	436	232	0	0	237	0
Stage 1	232	-	-	-	-	-
Stage 2	204	-	-	-	-	-
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	578	807	-	-	1330	-
Stage 1	807	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	570	807	-	-	1330	-
Mov Cap-2 Maneuver	570	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	692	1330	-
HCM Lane V/C Ratio	-	-	0.024	0.013	-
HCM Control Delay (s)	-	-	10.3	7.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

MOVEMENT SUMMARY

Site: 101 [Site Driveway - PM (Site Folder: General)]

Mailman Rd at Future Access #1
Site Category: Build (2035) PM
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Mailman Rd														
3	L2	1	2.0	1	2.0	0.183	4.3	LOS A	0.9	22.9	0.17	0.06	0.17	35.3
8	T1	178	2.0	198	2.0	0.183	4.3	LOS A	0.9	22.9	0.17	0.06	0.17	35.3
18	R2	33	2.0	37	2.0	0.183	4.3	LOS A	0.9	22.9	0.17	0.06	0.17	34.3
Approach		212	2.0	236	2.0	0.183	4.3	LOS A	0.9	22.9	0.17	0.06	0.17	35.1
East: Future Access #1														
1	L2	19	2.0	21	2.0	0.044	3.7	LOS A	0.2	4.7	0.34	0.19	0.34	34.3
6	T1	1	2.0	1	2.0	0.044	3.7	LOS A	0.2	4.7	0.34	0.19	0.34	34.4
16	R2	24	2.0	27	2.0	0.044	3.7	LOS A	0.2	4.7	0.34	0.19	0.34	33.4
Approach		44	2.0	49	2.0	0.044	3.7	LOS A	0.2	4.7	0.34	0.19	0.34	33.8
North: Mailman Rd														
7	L2	40	2.0	44	2.0	0.159	4.0	LOS A	0.8	19.5	0.11	0.03	0.11	34.8
4	T1	148	2.0	164	2.0	0.159	4.0	LOS A	0.8	19.5	0.11	0.03	0.11	34.8
14	R2	1	2.0	1	2.0	0.159	4.0	LOS A	0.8	19.5	0.11	0.03	0.11	33.9
Approach		189	2.0	210	2.0	0.159	4.0	LOS A	0.8	19.5	0.11	0.03	0.11	34.8
West: Sawdust Ln														
5	L2	1	2.0	1	2.0	0.003	3.4	LOS A	0.0	0.3	0.35	0.16	0.35	34.8
2	T1	1	2.0	1	2.0	0.003	3.4	LOS A	0.0	0.3	0.35	0.16	0.35	34.8
12	R2	1	2.0	1	2.0	0.003	3.4	LOS A	0.0	0.3	0.35	0.16	0.35	33.9
Approach		3	2.0	3	2.0	0.003	3.4	LOS A	0.0	0.3	0.35	0.16	0.35	34.5
All Vehicles		448	2.0	498	2.0	0.183	4.1	LOS A	0.9	22.9	0.16	0.06	0.16	34.9

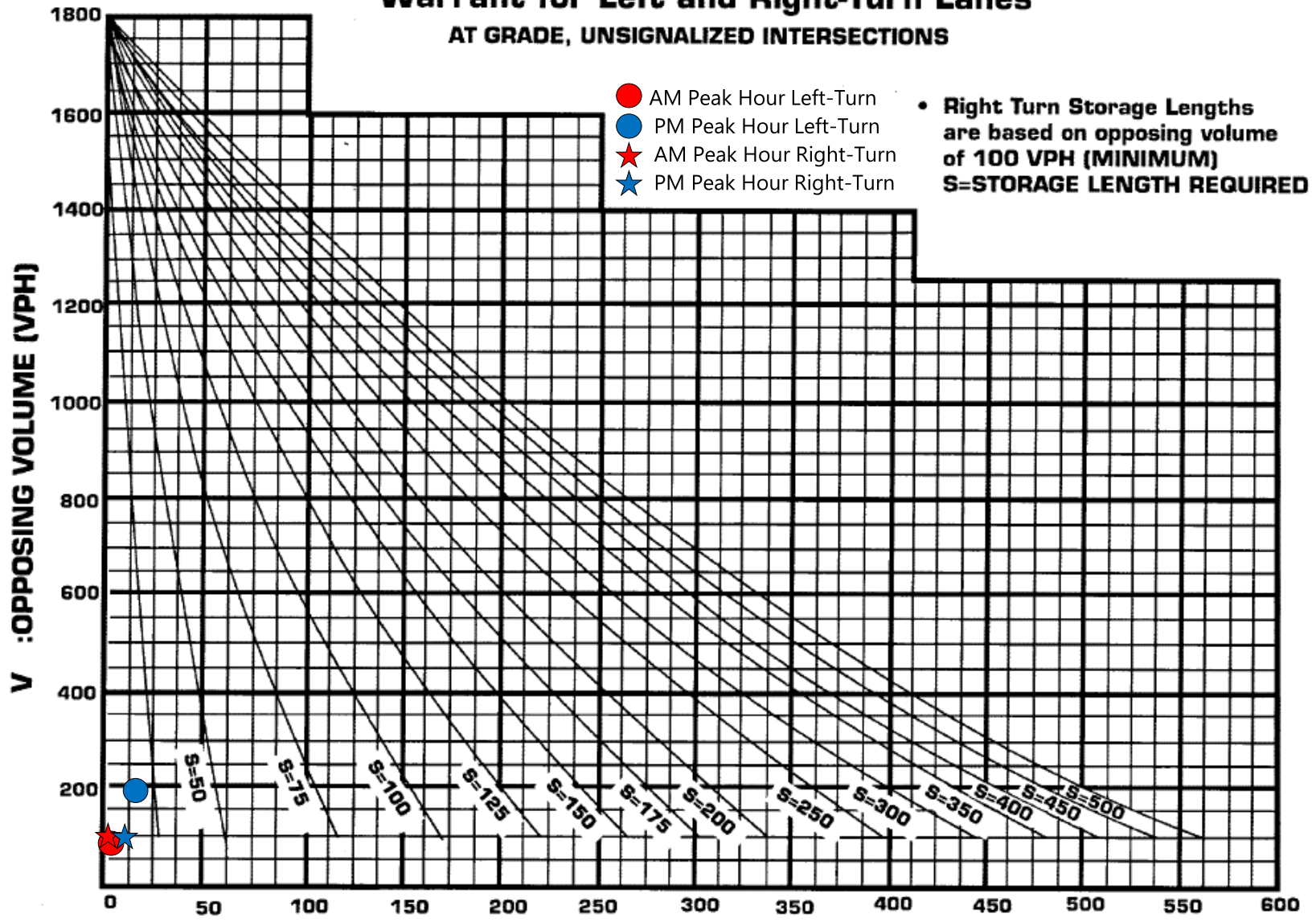
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

D

Turn Lane Warrant Analysis

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS



Policy On Street And Driveway Access to North Carolina Highways

V_L: LEFT TURNING VOLUME (VPH)
V_R: RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

vhb	**Figure D-1** **Future Access #2 Turn Lane Warrant Analysis**	**Mailman Post TIA** **Knightdale, NC**

E

Background Development

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

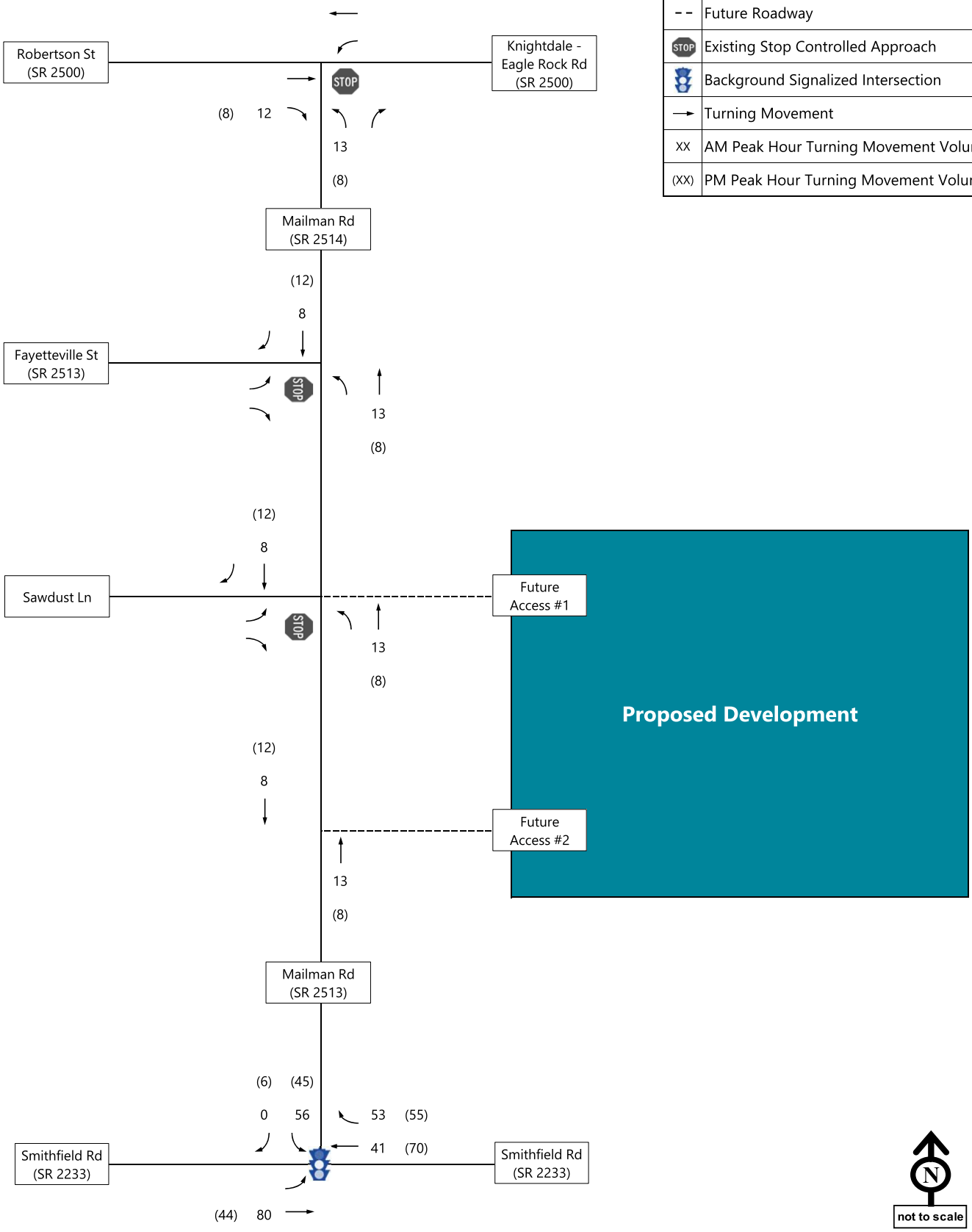


Figure E-1
Smithfield/Mailman MXD Peak Hour Site Trips

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

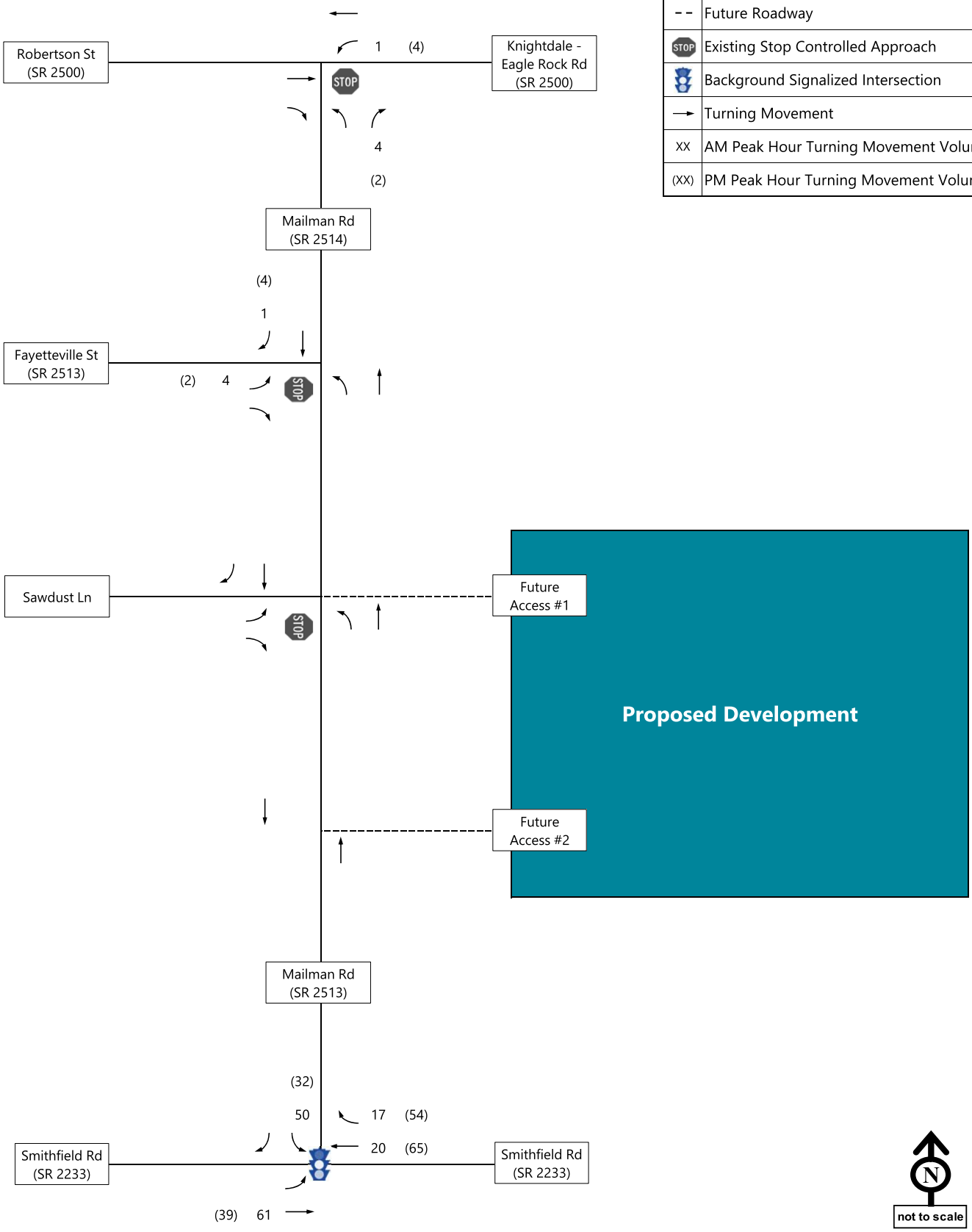


Figure E-2
Glenmere Residential Peak Hour Site Trips - All Phases

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

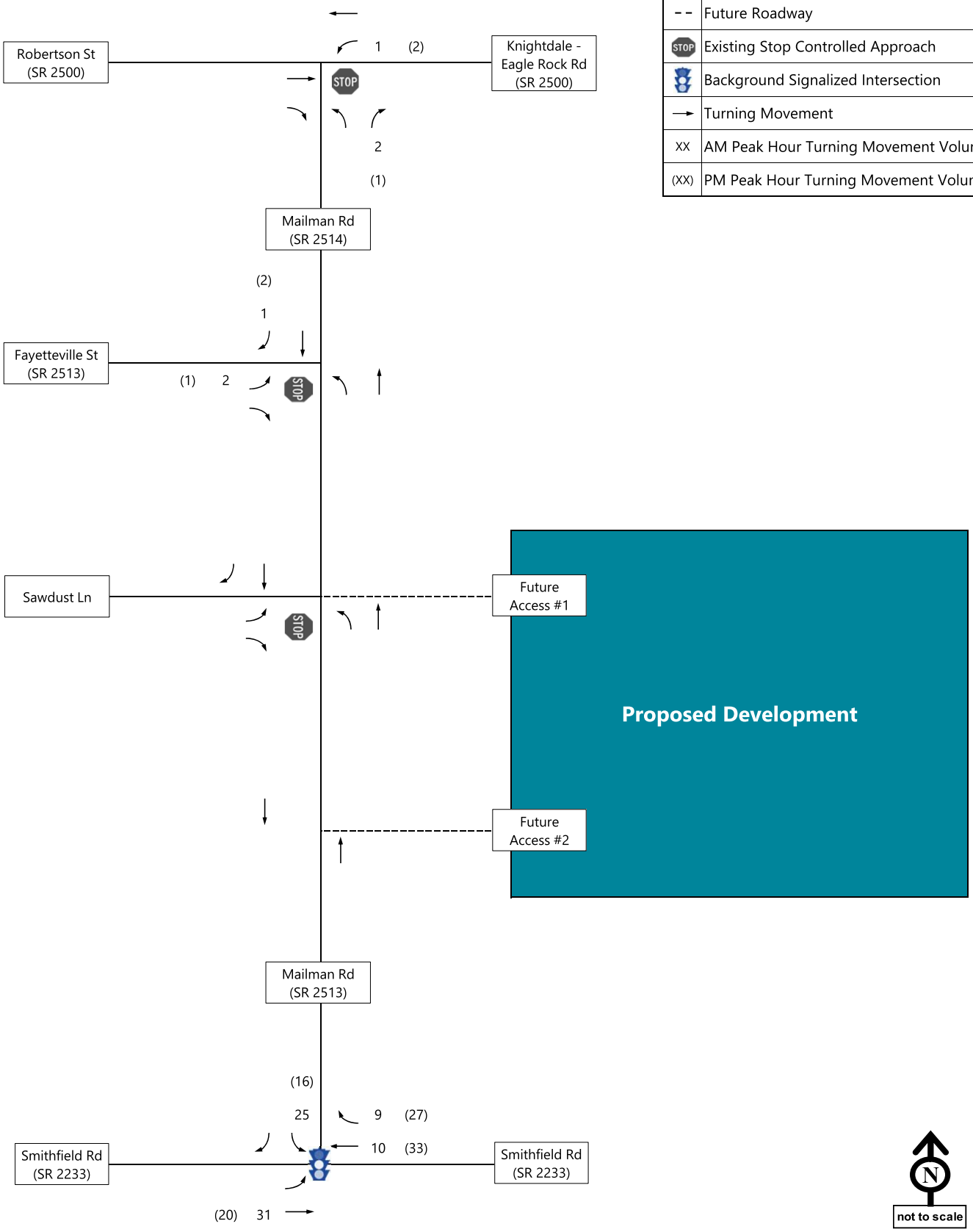


Figure E-3
Glenmere Residential Peak Hour Site Trips - 50% of Trips

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

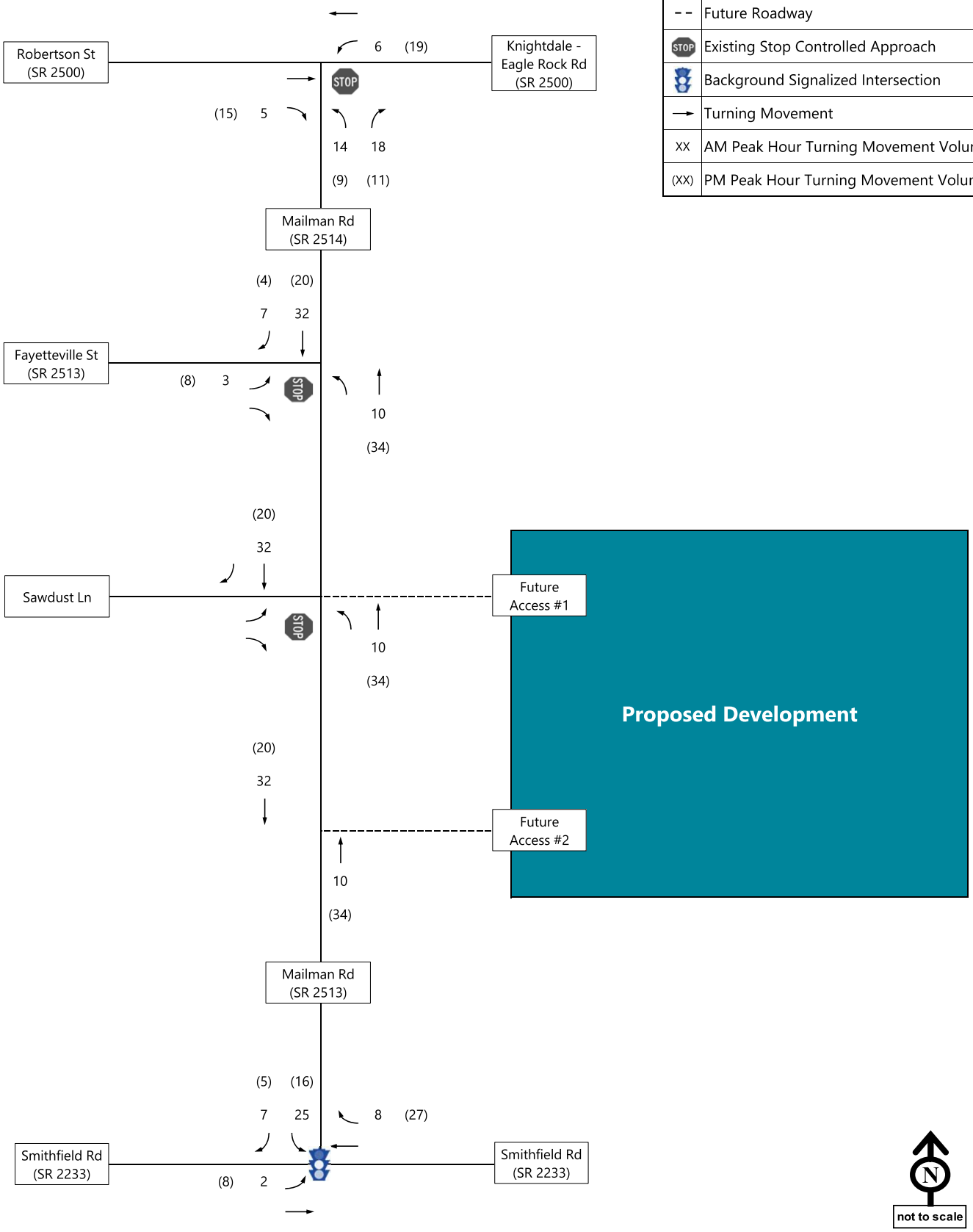
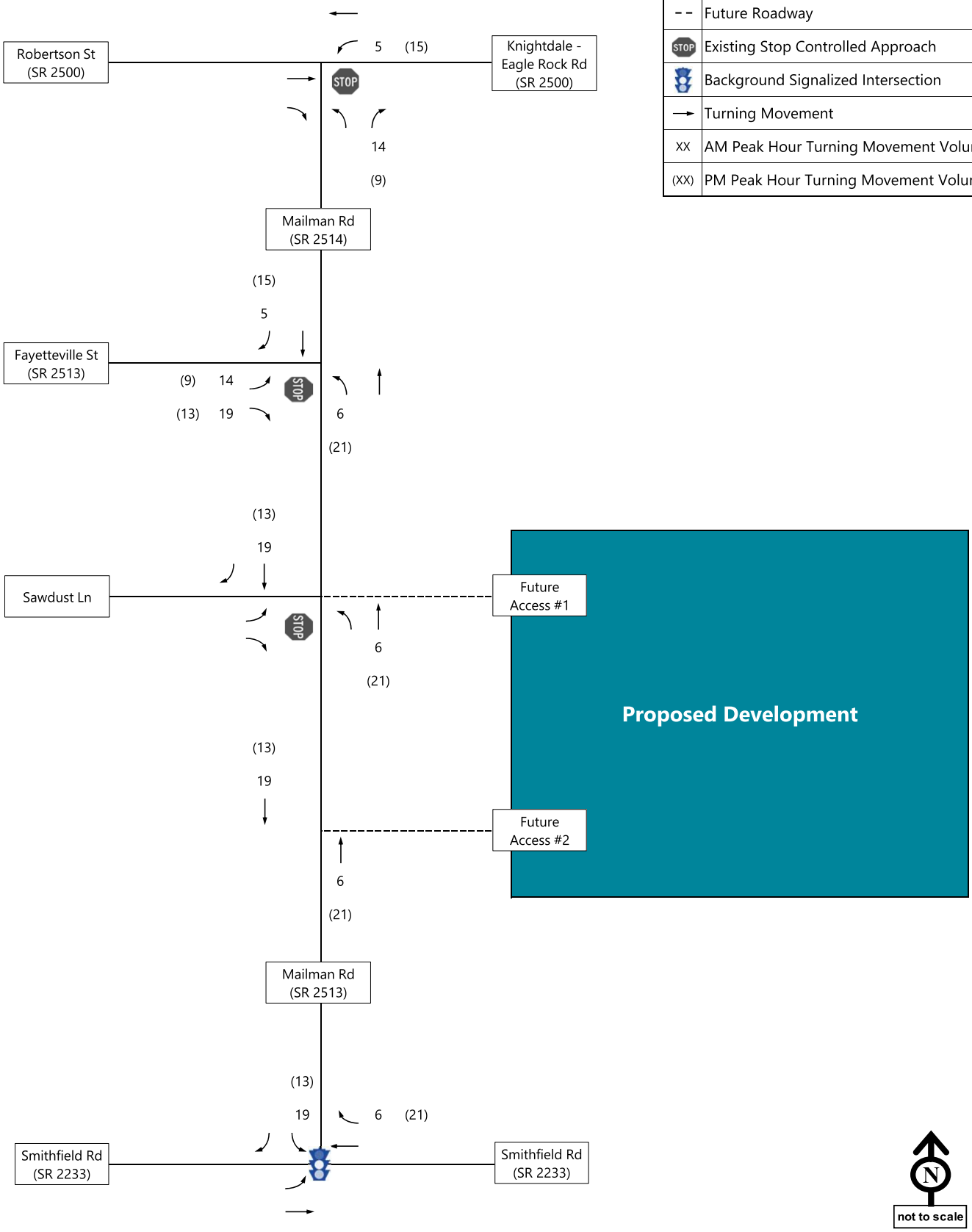


Figure E-4
Project Hope Peak Hour Site Trips - 50% of Trips

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



vhb	**Figure E-5** **Harper Preserve Fayetteville Street Peak Hour Site Trips - 50% of Trips**	**Mailman Post TIA** **Knightdale, NC**

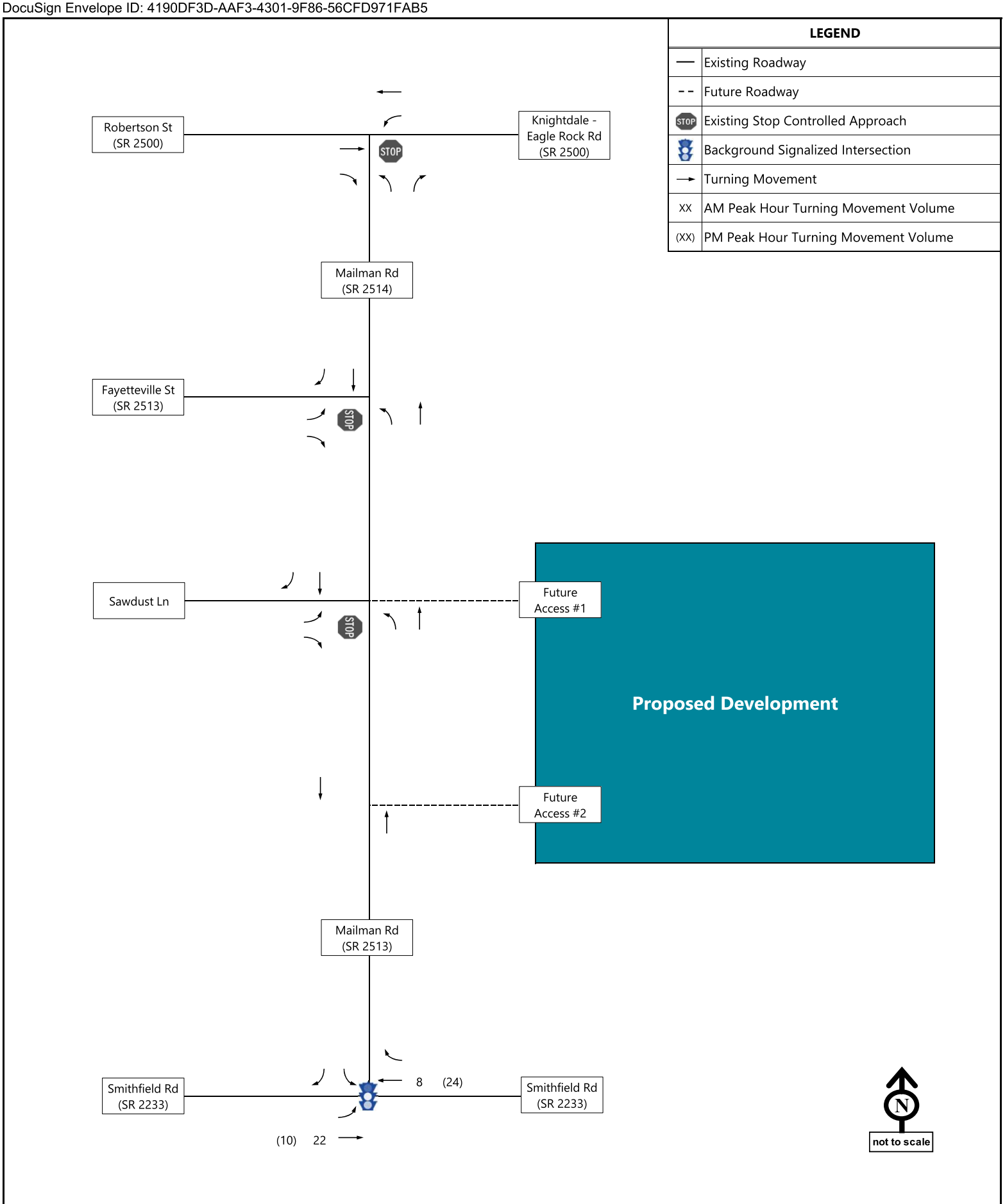


Figure E-6
Baker Roofing HQ Peak Hour Site Trips - Phase 1

Mailman Post TIA
Knightdale, NC

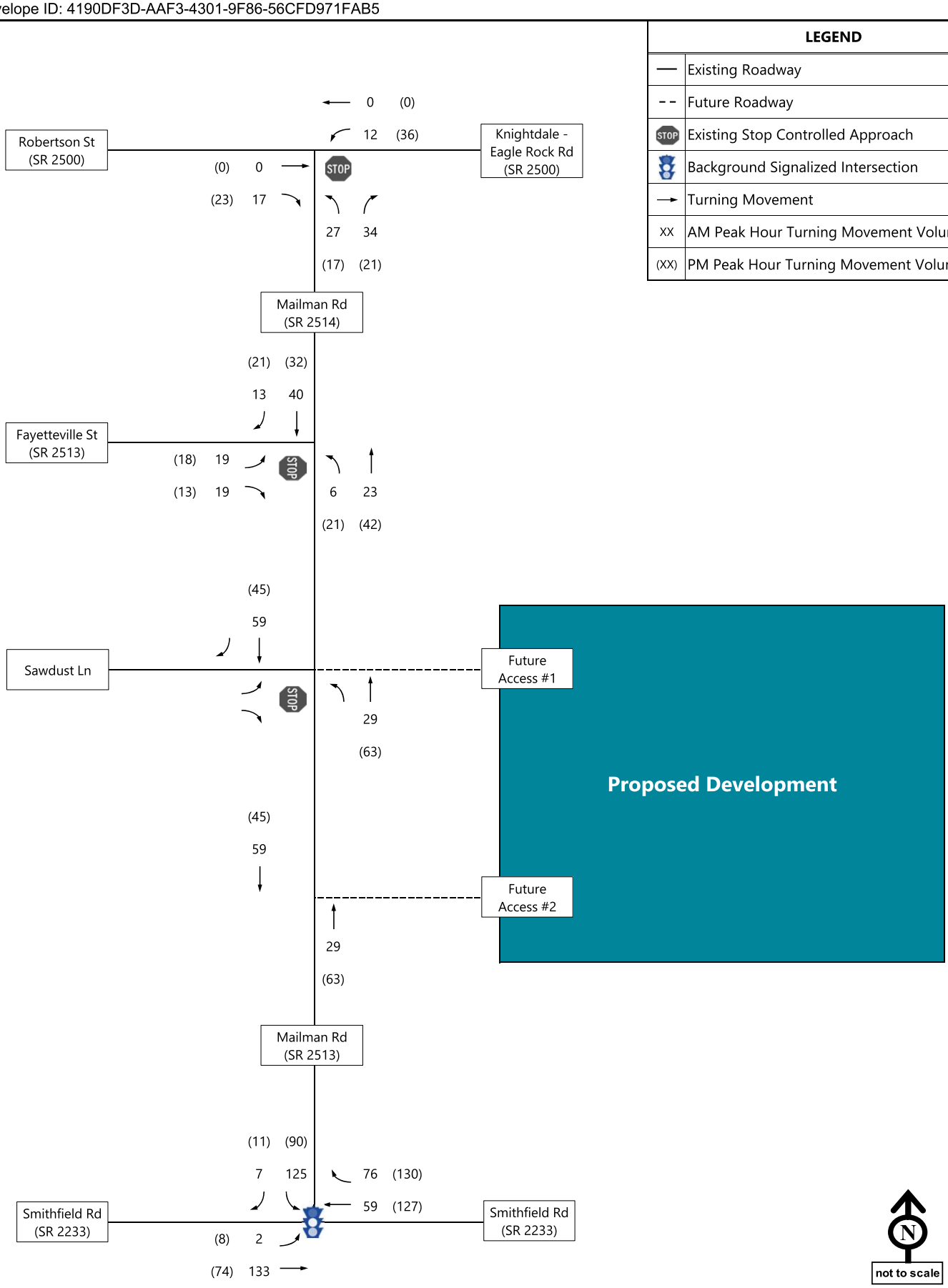


Figure E-7
Total Background Development Peak Hour Site Trips - 2025

Mailman Post TIA
Knightdale, NC

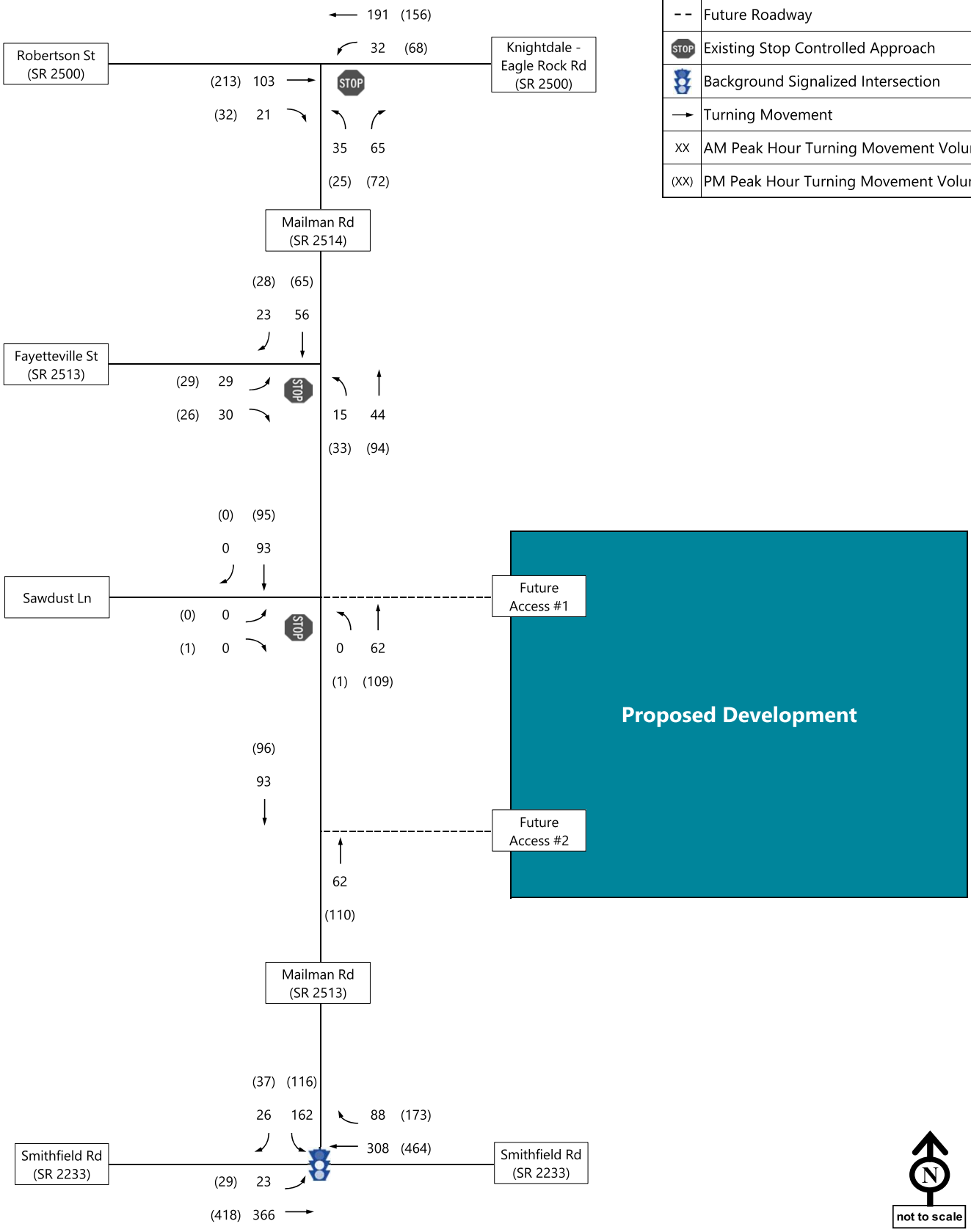


Figure E-8
No-Build (2025) AM and PM Peak Hour Volumes

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

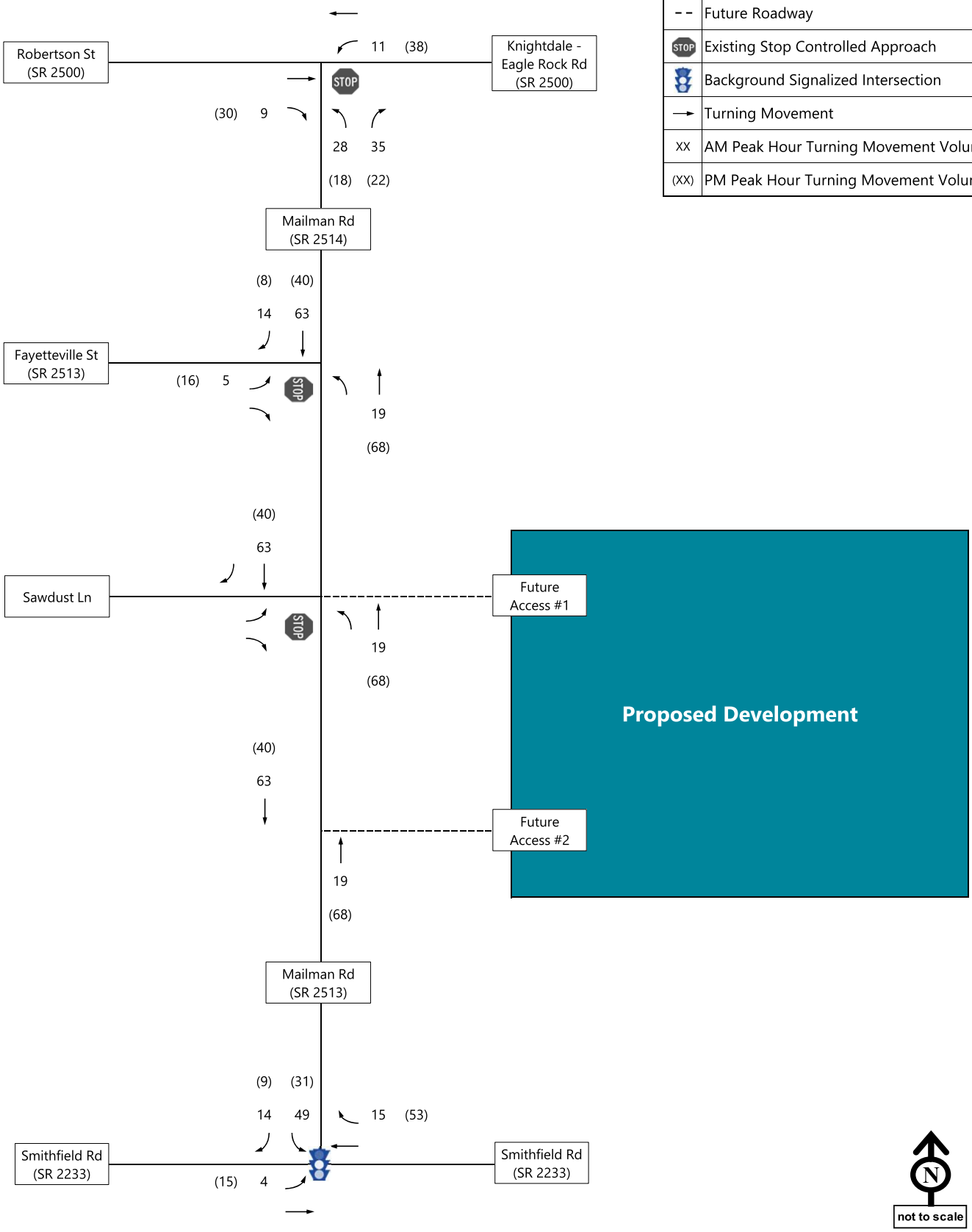


Figure E-9
Project Hope Peak Hour Site Trips

Mailman Post TIA
Knightdale, NC

LEGEND	
—	Existing Roadway
- -	Future Roadway
STOP	Existing Stop Controlled Approach
	Background Signalized Intersection
→	Turning Movement
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

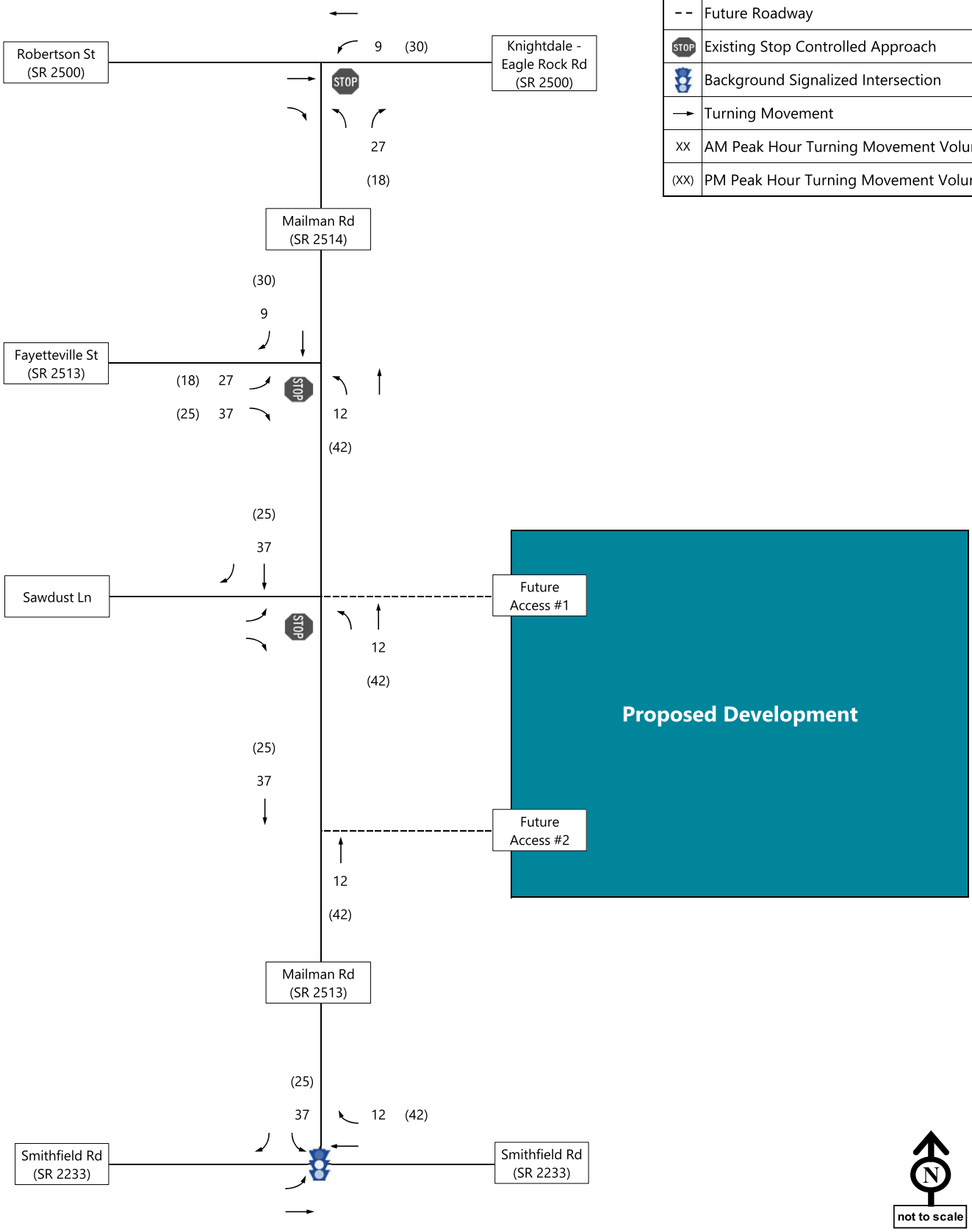


Figure E-10
Harper Preserve Fayetteville Street Peak Hour Site Trips

Mailman Post TIA
Knightdale, NC

F

VHB Resumes

February 23, 2022

Traffic Operations Group Qualifications

for Traffic Impact Analyses (TIAs)

Qualifications

The VHB team has a deep bench of resources, resulting in a collaborative effort among staff. VHB has conducted more than 400 transportation impact studies for private and public clients, including institutions, developers, architects, and engineering firms, as well as through on-call agreements with municipalities. These studies address critical traffic congestion and queuing, vehicular and pedestrian access, and safety issues in support of vital economic developments in the region and across the state. VHB provides on-call traffic engineering consulting services (including TIA and TIA review) to several local jurisdictions in Chatham County, Wake County, Orange County, and Durham County, as well as the NCDOT division and central offices.

Education

EMBA, Strategy and Leadership, University of North Carolina at Chapel Hill, 2014

PhD, Transportation Engineering, North Carolina State University (NCSU), 2004

MS, Transportation Engineering, NCSU, 2002

BS, Transportation Management & Engineering, Beijing Jiaotong University, 1995

Registrations

PE NC 2008

Baohong Wan, PhD, PE

Senior Project Manager | 22 years of professional experience

Baohong specializes in advanced traffic modeling and quantitative analysis, traffic operations and capacity studies, traffic simulation and modeling of complex transportation systems, complete street design, unconventional intersection and roadway design, transit signal priorities, traffic safety planning studies, pedestrian/bike operations, and freight mobility. He has extensive experience in applications of various local, state, and national planning and engineering standards, and is proficient in numerous modeling tools including HCM/HCS, Synchro/SimTraffic, SIDRA, VISSIM, CORSIM, TransModeler, Vistro, Tru-Traffic, ArcGIS, and Microstation.

RELEVANT PROJECTS

- Town of Cary, On-Call Traffic Analysis Reports (since 2005)
- Pulte Homes, On-Call Traffic Engineering Analysis and Design, multiple locations, NC
- Town of Holly Springs, On-Call Traffic Impact Analysis Review (since 2016)
- City of Mebane, On-Call Traffic Impact Analysis Review (since 2020)
- Town of Cary, Morrisville Parkway Interchange Alternative Analysis, Cary, NC
- Town of Cary, Cary Parkway and High House Intersection Improvements, Cary, NC
- Town of Holly Springs, Avent Ferry Road Improvement Study, Holly Springs, NC
- Town of Holly Springs, Ting Park/North Main Athletic Complex Traffic Consulting Services, Holly Springs, NC
- Town of Apex, Pleasant Park Traffic Access Study and Impact Analysis, Apex, NC
- Epic Games/JLL, Epic Games HQ Traffic Analysis and Design, Cary, NC
- SAS Institute, SAS Campus Master Planning Traffic Consulting Services, Cary, NC
- Ballentine Associates, Credit Suisse RTP Expansion, RTP, NC
- Hock Development, Voyager Academy Schools Traffic Assistance, Durham, NC
- Duke Health, Duke University Hospital Transportation Assistance, Durham, NC
- WakeMed FV Medical Office Buildings Traffic Impact Analysis, Fuquay-Varina, NC
- UNC Chapel Hill, UNC-CH Main Campus Development Plan, Chapel Hill, NC
- McNair Mill LLC, First Health Regional Hospital, Hoke County, NC
- Capital Broadcasting Company, Rock Mount Mills TIA, Rocky Mount, NC

Nathaniel Rhomberg, PE

Traffic Engineering | 5 years of professional experience

Education

BS, Civil Engineering, University of Alabama, 2017

Registrations

PE NC 2021

Nathaniel is a Transportation Analyst in VHB's Raleigh office. He has experience with capacity study analyses, traffic impact analyses, signal warrant analyses, and traffic safety studies. For these projects, he has provided data collection support, developed technical reports, and performed technical analysis. His software skills include Synchro, SimTraffic, HCS, Vissim, Vistro, and SIDRA. Prior to graduating from the University of Alabama and joining VHB, Nathan worked part-time with the Alabama Department of Transportation.

RELEVANT PROJECTS

- Town of Holly Springs On-Call TIA Review, Holly Springs, NC
- Town of Cary, On-Call Traffic Analysis Reports, Cary, NC
- Town of Cary, Trinity Road Transportation Study, Cary, NC
- NCDOT TSU, Traffic Safety Fatal Crash Review Program, Statewide, NC
- NCDOT TSU, Highway Safety Improvement Program, Statewide, NC
- NCDOT TSU, On-Call TEAAS Intersection and Corridor Safety Analysis, Statewide, NC
- NHTSA, GO Team State Traffic Records System Assistance, Statewide, NC
- UNC Chapel Hill, UNC-CH Main Campus Development Plan, Chapel Hill, NC
- NCDOT, HDR-ICA/I-5880 NC 109/I-40 Traffic NCDOT, Winston-Salem, NC
- Lions Club Property TIA, Wendell, NC
- S Saunders Redevelopment TIA, Raleigh, NC
- Providence Oaks TIA, Fuquay-Varina, NC
- Carver Street Residential TIA, Durham, NC

www.vhb.com