



BASS, NIXON & KENNEDY, INC., CONSULTING ENGINEERS
 6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
 919/851-4422 FAX 919/851-8968 www.bnkinc.com

DATE: March 1, 2021
 TO: Ms. Julie Spriggs
 Planner
 Town of Rolesville Planning Department
 FROM: Marty D. Bizzell, PE, CPESC
 RE: Scarboro Property Rezoning Subdivision
 Trip Generation Calculations



The proposed development will consist of an approximately 240 senior living apartments. Traffic generation information including peak hour trips and daily traffic for the proposed development were estimated using methodology contained within the ITE Trip Generation Manual, 10th Edition. The following provides a summary of the trip generation potential for the site:

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Senior Adult Housing - Attached (252)	240	950	17	31	33	27

It is estimated that the proposed residential subdivision will generate approximately 255 average daily trips when fully built out an average weekday. Regarding peak hour trips, it is anticipated that a total of 21 trips (17 entering and 31 exiting) will occur in the AM peak hour and 28 trips (33 entering and 27 exiting) will occur during the PM peak hour.

Please contact me with any questions or concerns.



March 31, 2021

Julie Spriggs GISP, CFM, CZO
Town of Rolesville – Interim Planning Director
PO Box 250
502 Southtown Circle
Rolesville, NC 27571
Phone: 919.554.6517
Email: julie.spriggs@rolesville.nc.gov
[Sent via Email]

Reference: Scarboro Property – Rolesville, NC
Subject: Transportation Engineering Services Agreement

Dear Ms. Spriggs:

Ramey Kemp & Associates Inc. (RKA) is pleased to provide you with this Transportation Engineering Services Agreement for the above referenced project. We understand this proposed senior living facility is located south of Main Street and east of School Street in Rolesville, NC. Access to the site is proposed via one (1) site driveway on Main Street. The following is our proposed scope of services for the Project (“Services”) based on coordination with Town of Rolesville (Town) staff. The parties acknowledge that the scope of services may change following consultation or coordination with the North Carolina Department of Transportation (NCDOT) and the Town. The parties agree that should the scope of services change following any future consultation or coordination, RKA will provide the Client with a revised proposal or an addendum to this agreement setting forth any such changes and associated costs to be paid by the Client.

I.) SCOPE OF SERVICES:

A.) Traffic Engineering:

- a. Coordinate with Client to establish a thorough understanding of the project as well as to obtain all available information. This scope assumes that one (1) land use/density plan will be considered in the analysis. Analysis of more than one (1) land use/density plan is beyond the scope of this proposal and will be considered extra work.
- b. Coordinate with the Town and NCDOT to discuss the project, obtain information, and discuss the proposed site access for the subject development. This proposal assumes a maximum of one (1) virtual meeting [conference call or video teleconference] will be needed. Should additional meetings be needed, attendance will be billed on an hourly + expenses basis or an addendum to this proposal will be provided.
- c. The following intersections are to be included in the study area:
 - i. Main Street and Site Drive 1



- d. Available weekday AM peak period (7:00 – 9:00 AM) and weekday PM peak period (4:00 – 6:00 PM) traffic counts at the intersections in the surrounding area will be utilized, where available. If traffic counts are needed during the effects of COVID-19, a solution agreeable with the project team and the review agencies will be coordinated. As the extent of this solution is difficult to determine, a revised proposal will be provided if additional efforts or data collection is required.
- e. Utilizing trip generation formulas in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition, calculate the amount of weekday daily, weekday AM peak hour, and weekday PM peak hour traffic to be generated by the proposed development upon full build out.
- f. Determine site trip distribution percentages based on surrounding population densities, existing traffic patterns, the previously approved Traffic Impact Analysis (TIA) for nearby sites, and engineering judgment. Assign site-generated traffic to study intersections and site driveway utilizing trip distribution percentages.
- g. Project existing traffic volumes to the build-out year using a compounded growth rate typically approved by the Town and NCDOT. Combine the background traffic with the site traffic to determine the future traffic conditions that can be expected upon build-out of the site. The background traffic will include any proposed adjacent developments. This proposal assumes the traffic from any proposed adjacent development will be provided by the reviewing agencies.
- h. Analyze the study intersections during the weekday AM and PM peak hours under Build (Build-Out Year) Traffic Conditions.
- i. Review the roadway improvements associated with the Main Street Improvements project within the study area to determine what impacts the proposed site driveways for the subject development may have and provide recommendations for site access.
- j. Prepare a technical memorandum documenting the study findings with graphical aides and an appendix of supporting data. Provide a draft copy to the Client for review. Upon approval, submit necessary copies of the report to the NCDOT (if required) and local reviewing agencies for their review and comments.
- k. Coordinate with the Client to discuss to ensure an understanding of the study and answer questions via virtual meeting [conference call or video teleconference]. This proposal assumes a maximum of two (2) virtual meetings to discuss the study results.
- l. Coordinate with the NCDOT (if required) and local reviewing agencies (via telephone or written correspondence) to ensure an understanding of the study and answer questions. It is difficult to estimate the extent of comments to be provided by the local reviewing agency and/or NCDOT regarding the review. Should revised analyses, the TIA document, or any other additional effort beyond written clarifications be required to address comments or provide additional information to the agencies, a supplemental proposal will be provided.



B.) Additional Services:

Additional (extra) services are defined as any work item not included in the above scope of services that are requested by the client or review agencies. Additional services will be billable at the RKA billing rates that are current at the time the extra work is identified. Any meetings not included in the scope of services will be considered extra. Extra work will be identified either in writing or by verbal communication, if requested by the client, but must be approved in writing by client before proceeding to perform such additional services.

Additional services RKA provides includes, but is not limited to, the following areas:

- Driveway permits and encroachment agreements
- Roadway design
 - Intersection Improvement Design
 - Highway and Interchange Design
 - Roundabout Design
 - Sidewalk Design
 - Cost estimations
- Traffic signal design and timing plans
- Signing and pavement marking plans
- Hydraulic Design

II.) SUMMARY OF FEES:

RKA will provide the above noted services based on the following fee(s).

Service(s)	Lump Sum or Hourly+Expenses	FEE
A.) Traffic Engineering	Lump Sum	\$3,500.00

- a.) Fee is valid for 30 days from the date of this agreement.
- b.) RKA’s hourly rates/expenses are subject to change and RKA reserves the right to make modifications.
- c.) A schedule of Hourly Rate and Reimbursable Expenses can be provided upon request.

III.) DEPOSIT:

~~Client will be required to pay to RKA fifty percent (50%) of the fee identified in the proposal before RKA commences any services or work pursuant to this Agreement. RKA will submit invoices to client as provided herein as the services are performed. RKA will hold the client’s deposit and credit the amount of the deposit against RKA’s final invoice(s) for RKA’s services.~~

IV.) GENERAL CONDITIONS PER 2020 MSA:

~~RKA General Conditions (**Attachment 1**) are incorporated herein by reference (see attached). The undersigned client represents and acknowledges that they have been provided with a copy of the General Conditions and have read and fully understand the General Conditions.~~

V.) PROJECT/CLIENT INFORMATION SHEET:

~~RKA Project/Client Information Sheet (**Attachment 2**) is incorporated herein by reference (see attached). A completed Project/Client Information Sheet must be returned with signed agreement.~~

RAMEY KEMP ASSOCIATES

Moving forward.



T 919 872 5115

5808 Faringdon Place
Raleigh, NC 27609

V.) ACCEPTANCE:

The undersigned represents and warrants that (1) he or she is duly authorized and has legal capacity to execute/deliver this Agreement, (2) the execution/delivery of this Agreement and the performance of the Client's obligations hereunder have been duly authorized, (3) and the Agreement is a valid/legal agreement binding on the Client and enforceable in accordance with its terms.

Accepted this _____ day of _____ (month), _____ (year)

Client Name: _____
(Print)

By: _____ Title: _____
(Sign) (Print)

We very much appreciate you contacting us and look forward to assisting you with this project.

Sincerely,
Ramey Kemp Associates

Jessica McClure, P.E.
State Traffic Engineering Lead

Attachments: 1- RKA General Conditions

ATTACHMENT - 1**Ramey Kemp & Associates General Conditions PER 2020 MSA**

(As of January 1, 2016)

1.01 — Payment Procedures

- A. ~~Invoices: Invoices are due and payable upon receipt. If Client fails to make any payment due Engineer for Services, extra work, or expenses within 30 days after receipt of Engineer's invoice, then (1) the amounts due Engineer will be increased at the rate of 1.5% per month (or the maximum rate of interest permitted by law, if less) from said thirtieth day, and (2) in addition Engineer may, after giving three days written notice to Client, suspend Services under this Agreement until Engineer has been paid in full all amounts due for Services, extra work, expenses, and other related charges. Client waives any and all claims against Engineer for any such suspension.~~
- B. ~~Payment: As compensation for Engineer providing or furnishing Services and extra work, Client shall pay Engineer as set forth herein. If Client disputes an invoice, either as to amount or entitlement, then Client shall promptly advise Engineer in writing of the specific basis for doing so, may withhold only that portion so disputed, and must pay the undisputed portion.~~

2.01 — Termination

- A. ~~The obligation to continue performance under this Agreement may be terminated for cause:~~
1. ~~By either party upon 14 days written notice in the event of substantial failure by the other party to perform in accordance with the Agreement's terms through no fault of the terminating party. Failure to pay Engineer for its Services shall constitute a substantial failure to perform and a basis for termination.~~
 2. ~~By Engineer:~~
 - a. ~~upon seven days written notice if Client demands that Engineer furnish or perform services contrary to Engineer's responsibilities as a licensed professional; or~~
 - b. ~~upon seven days written notice if the Engineer's Services are delayed for more than 30 days for reasons beyond Engineer's control.~~
- B. ~~Engineer shall have no liability to Client on account of a termination for cause by Engineer.~~
- C. ~~Notwithstanding the foregoing, this Agreement will not terminate as a result of a substantial failure under Paragraph 2.01.A.1 if the party receiving such notice begins, within three days of receipt of such notice, to correct its substantial failure to perform, proceeds diligently to cure such failure, and does cure such failure within no more than 14 days of receipt of notice; provided, however, that if and to the extent such substantial failure cannot be reasonably cured within such 14 day period, and if such party has diligently attempted to cure the same and thereafter continues diligently to cure the same, then the cure period provided for herein shall extend up to, but in no case more than, 30 days after the date of receipt of the notice.~~
- D. ~~The Agreement may be terminated for convenience by Client effective upon Engineer's receipt of written notice from Client.~~
- E. ~~In the event of any termination under Paragraph 2.01.D, Engineer will be entitled to invoice Client and to receive full payment for all Services and extra work performed or furnished in accordance with this Agreement, plus reimbursement of expenses incurred through the effective date of termination in connection with providing the Services and extra work, Engineer's consultants' charges, if any, and any other reasonable costs incurred by Engineer as a result of such termination.~~

3.01 — General Considerations

- A. ~~Should completion of any portion of the Services by Engineer be delayed, suspended, or impaired, through no fault of Engineer, then the time for completion of Engineer's Services, and the rates and amounts of Engineer's compensation, shall be adjusted equitably.~~

- ~~B. Engineer shall not be responsible for any decision made regarding the construction contract requirements, or any application, interpretation, clarification, or modification of the construction contract documents other than those made by Engineer or its consultants.~~
- ~~C. All documents prepared or furnished by Engineer are instruments of service, and Engineer retains all ownership and property interest (including the copyright and the right of reuse) in such documents, whether or not the Project is completed. Client shall have a limited license to use the documents on the Project, extensions of the Project, and for related uses of the Client, subject to receipt by Engineer of full payment due and owing for all Services and extra work relating to preparation of the documents and subject to the following limitations:
 - ~~1. Client acknowledges that such documents are not intended or represented to be suitable for use on the Project unless completed by Engineer, or for use or reuse by Client or others on extensions of the Project, on any other project, or for any other use or purpose, without written verification or adaptation by Engineer;~~
 - ~~2. any such use or reuse, or any modification of the documents, without written verification, completion, or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Client's sole risk;~~
 - ~~3. Client shall defend, indemnify and hold harmless Engineer and its officers, directors, members, partners, agents, employees, and consultants from all claims, damages, losses, and expenses, including attorneys' fees, arising out of or resulting from any use, reuse, or modification of the documents without written verification, completion, or adaptation by Engineer; and such limited license to Client shall not create any rights in third parties.~~~~
- ~~D. To the fullest extent permitted by law, Client and Engineer waive against each other, and the other's employees, officers, directors, members, agents, insurers, partners, and consultants, any and all claims for or entitlement to special, incidental, indirect, or consequential damages arising out of, resulting from, or in any way related to this Agreement or the Project.~~
- ~~E. ENGINEER AND CLIENT AGREE THAT ENGINEER'S (INCLUDING ENGINEER'S OFFICERS, DIRECTORS, MEMBERS, PARTNERS, AGENTS, AND EMPLOYEES) TOTAL LIABILITY TO THE CLIENT AND TO ANYONE CLAIMING BY, THROUGH, OR UNDER THE CLIENT FOR ANY AND ALL INJURIES, CLAIMS, LOSSES, COSTS, DAMAGES, AND EXPENSES ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE SERVICES PERFORMED HEREUNDER, WHETHER ARISING IN CONTRACT, TORT, EQUITY, STRICT LIABILITY, BY STATUTE, OR OTHERWISE, SHALL BE LIMITED TO \$25,000.00 OR ENGINEER'S TOTAL FEE FOR THE SERVICES PERFORMED HEREUNDER, WHICHEVER IS GREATER.~~
- ~~F. Any disputes relating to or arising out of this Agreement or Engineer's Services shall be subject to mandatory mediation, which shall be a condition precedent to any form of binding dispute resolution. The Parties shall select a mutually agreeable mediator for any such dispute and the Parties agree to split the mediator's costs evenly. The Parties may mutually agree to waive mediation. Any disputes not resolved by mediation shall be subject to Arbitration administered by the American Arbitration Association under its Construction Industry Arbitration Rules in effect as of the date of this Agreement.~~
- ~~G. This Agreement shall be governed by the laws of the State of North Carolina. The Parties agree that any dispute or other legal action relating to this Agreement, shall be conducted only in Wake County, North Carolina, unless otherwise agreed to by the Parties or provided by law.~~
- ~~H. A party's non-enforcement of any provision in the Agreement shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or the remainder of this Agreement.~~

Client Initials: _____

Town of Rolesville
 P.O. Box 250
 Rolesville, NC 27571-
 (919)556-3506

Fee Schedule

effective July 1, 2020

Planning Dept Misc Fee MA-20-03



	KDM Development Corporation
	0 N Main Street
	Broughton Townhomes
	585-465-0099

PAYMENT

Date: 4/23/2021
 Time: 4:01 PM

KDM Dev Corp MA-20-03

ck#2195 Broughton

Cash: \$0.00
 Check: \$3,500.00
 Charge: \$0.00
 MoneyOrder: \$0.00
 Total Fee: \$3,500.00
 TOTAL PAID: \$3,500.00
 Change Due: \$0.00

Acct. No.	Fee
11-315-01	\$ -
11-315-02	
11-315-03	
11-315-04	\$ -
11-315-25	
11-315-26	\$ -
11-315-27	\$ -
11-315-29	
11-315-30	
11-206-00	\$ 3,500.00
Rolesville Total	\$ 3,500.00

1 0009 Development Fee \$3,500.00

Operator: 14
 Receipt#: 68474

Staff Initials: SFR
 Date Estimated: 4/5/2021
 Date Paid:

Fee schedule information is available at Town Hall and www.rolesvillenc.gov.

Kenneth C. Burnham
 428 Swan's Mill Crossing
 Raleigh, NC 27614
 585-303-5131

2196

 66-46/531

DATE 4-23-21

PAY TO THE ORDER OF Town of Rolesville \$ 3,500.-

Three thousand five hundred & 00/100 DOLLARS

SUNTRUST
 13341 FALLS OF NEUSE ROAD
 RALEIGH, NC 27614

FOR RVA - Broughton

⑈0000 2196⑈ ⑆053 100465⑆ 1000 2458 77658⑈

May 28, 2021

Julie Spriggs, GISP, CFM, CZO
Town of Rolesville - Interim Planning Director
PO Box 250
502 Southtown Circle
Rolesville, NC 27571
P: 919.554.6517
E: julie.spriggs@rolesville.nc.gov
[Sent via Email]

Subject: **DRAFT Site Analysis** - Scarboro Property
Rolesville, NC

Dear Ms. Spriggs,

This letter provides an assessment of the proposed Scarboro Property to be located south of Main Street and east of School Street in Rolesville, North Carolina. The purpose of this study is to determine the potential impacts to the site driveways and surrounding transportation system created by traffic generated by the proposed development.

Proposed Land Use and Site Access

The proposed development is expected to consist of 240 units of senior adult housing and is estimated to be built-out in 2023. Site access is proposed via one (1) site driveway on Main Street and one (1) site driveway on School Street. Refer to the attachments for the site location map and the preliminary site plan.

Access at the Main Street site driveway (Site Drive 1) is expected to align with the Main Street Park driveway to create a 4-leg, unsignalized intersection. The North Carolina Department of Transportation (NCDOT) *Policy on Street and Driveway Access to North Carolina Highways* (Driveway Manual) advises that side streets should be aligned directly across from each other in lieu of two (2) offset 3-leg intersections in close proximity to one another. Based on coordination with NCDOT, a left-turn lane on Main Street will likely be required at Site Drive 1 if this intersection is expected to provide full-movement access for the proposed development. It should be noted that the existing two-way left-turn lane (TWLTL) on Main Street along the frontage of the proposed development is expected to be removed with the improvements associated with the Main Street LAPP funded project (STIP U-6241). Therefore, if a left-turn lane can not be provided at Site Drive 1, access for the proposed development will likely be restricted to a right-in/right-out (RIRO) configuration. A RIRO configuration at Site Drive 1 can be accommodated with a concrete monolithic island within the throat of the driveway.

Access at the School Street site driveway (Site Drive 2) is expected to align with the Rolesville Elementary School (RES) ingress only carpool driveway to create a 4-leg, unsignalized intersection. School Street is a 2-lane undivided roadway that provides access to RES and four (4) single-family homes south of the proposed development. Additionally, School Street provides direct access to Main Street at the 4-leg, full-movement unsignalized intersection of Main Street and Old Rodgers Road / School Street. Based on coordination with NCDOT, the storage for the westbound (Main Street) left-turn lane at the intersection of Main Street and Old

Rodgers Road / School Street may need to be extended to accommodate Scarborough Property site traffic if Site Drive 1 is designed with a RIRO configuration. Based on a review of the latest plans for the Main Street LAPP funded project, an exclusive westbound (Main Street) left-turn lane with approximately 100 feet of storage is expected to be provided at the intersection of Main Street and Old Rodgers Road / School Street.

Site Trip Generation and Distribution

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 10th Edition. Table 1 provides a summary of the trip generation potential for the site.

Table 1: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday AM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Senior Adult Housing - Attached (252)	240 Units	950	17	31	33	27

It is estimated that the proposed development will generate approximately 950 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it was anticipated that 48 trips (17 entering and 31 exiting) will occur during the weekday AM peak hour and 60 trips (33 entering and 27 exiting) will occur during the weekday PM peak hour.

Trip distribution percentages used in assigning site traffic for this development were estimated based on the approved scope and methodology from the Cobblestone Crossing TIA submitted in March of 2021 by RKA. It is estimated that the site trips will be regionally distributed as follows:

- 60% to/from the west via Main Street
- 40% to/from the east via Main Street

2023 Build Traffic Conditions

To estimate the 2023 build traffic conditions with the site fully built-out, turning movement counts, COVID-19 adjustment factors, and future traffic projections from the previously submitted Cobblestone Crossing TIA were utilized for analysis purposes. Refer to the attachments for the 2023 build weekday AM and PM peak hour traffic volumes at the study intersections with the site fully developed.

Based on coordination with RES staff, carpool traffic enters the campus utilizing School Street before turning right and proceeding towards the designated pick-up/drop-off area behind the school. Carpool traffic exiting the campus continues along the one-way RES driveway behind the school and exits onto Redford Place Drive where they have direct access to the signalized intersection of Main Street and Rogers Road / Redford Place Drive. While RES carpool traffic and Scarborough Property site traffic are both expected to utilize School Street during the weekday AM peak hour, RES carpool traffic is exclusively utilizing School Street to enter the campus while Scarborough Property site traffic is expected to primarily exit the proposed development onto School Street due to the nature of residential development primarily exiting the site during the weekday AM peak hour. It

should be noted that the PM peak periods for RES and the proposed development are expected have minimal overlap because the PM peak periods for each development do not coincide.

Capacity Analysis

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual (HCM)*, 6th Edition published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 10.3), was used to complete the analyses for most of the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement. Refer to Table 2 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections.

Table 2: Highway Capacity Manual – Levels-of-Service and Delay

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

Main Street and Main Street Park Driveway / Site Drive 1

The proposed unsignalized intersection of Main Street and Main Street Park driveway / Site Drive 1 was analyzed under 2023 build traffic conditions with the lane configurations and traffic control shown in Table 3. Refer to Table 3 for a summary of the analysis results. Copies of the Synchro analysis output reports are provided in the attachments.

Table 3: Analysis Summary of Main Street and Main Street Park Driveway / Site Drive 1

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Build Conditions	EB	1 LT-TH-RT	B ¹	N/A	A ¹	N/A
	WB	1 LT-TH-RT	A ¹			
	NB	1 LT-TH-RT	F ²			
	SB	1 LT-TH-RT	F ²			

1. Level of service and delay for major-street left-turn movement.
 2. Level of service and delay for minor-street approach.
- Improvements and/or revised lane configurations by developer are shown in **BOLD** type.

Capacity analysis indicates that the major street left-turn movements are expected to operate at LOS B or better, while the minor street approaches are expected to operate at LOS F during the weekday AM and PM peak hours under 2023 build conditions. These levels of service are not uncommon for a stop-controlled minor street approach with heavy mainline traffic volumes. It should be noted that if Site Drive 1 is designed with a RIRO configuration, the level of service and delay for the northbound approach (Site Drive 1) are expected to improve compared to those shown in Table 3 (full-movement intersection).

Due to the poor level of service expected for the minor street approaches, a traffic signal was considered at this intersection under 2023 build traffic conditions to achieve acceptable levels-of-service. The peak hour signal warrant from the *Manual on Uniform Traffic Control Devices* (MUTCD) was considered; however, this intersection does not meet the peak hour warrants for either peak hour under 2023 build traffic conditions. It is not expected that this intersection would satisfy the MUTCD 8-hour and 4-hour warrants, which NCDOT favors for installation of a traffic signal. These longer period warrants are not typically met for residential and school areas due to the distinct peak traffic period for these types of development. For these reasons, signalization is not recommended at this intersection. It is expected that the adjacent signalized intersections located approximately 1,200 and 1,500 feet to the east and west, respectively, along Main Street will provide gaps sufficient for vehicles turning from the minor street.

Turn lanes were considered based on the NCDOT Driveway Manual and the anticipated turning movement volumes into the proposed development from Main Street are not expected to warrant exclusive turn lanes. However, based on coordination with NCDOT, an exclusive westbound (Main Street) left-turn lane will likely be required due to safety concerns and potential impacts to traffic flow along Main Street.

Conclusions

This letter provides the results of the site analysis for the proposed Scarborough Property, located south of Main Street and east of School Street in Rolesville, North Carolina. The proposed development, anticipated to be completed in 2023, is expected to consist of 240 units of senior adult housing. It is estimated that the proposed development will generate 48 trips (17 entering and 31 exiting) during the weekday AM peak hour and 60 trips (33 entering and 27 exiting) will occur during the weekday PM peak hour.

The existing two-way left-turn lane (TWLTL) on Main Street along the frontage of the proposed development is expected to be removed with the improvements associated with the Main Street LAPP funded project (STIP U-6241). Based on coordination with NCDOT, the proposed development can not have a primary access point on Main Street without a left-turn lane due to safety concerns and potential impacts to traffic flow along Main Street. The following items will likely be required by NCDOT prior to issuance of a driveway permit for the subject development:

Main Street and Main Street Park Driveway / Site Drive 1

- Construct the northbound approach (Site Drive 1) aligning with the Main Street Park driveway.
- Provide stop-control for the northbound approach.
- Provide an exclusive westbound (Main Street) left-turn lane with a minimum of 100 feet of full width storage and appropriate decel and taper.
 - If construction of this left-turn lane proves to be infeasible, provide right-in/right-out access configurations for Site Drive 1. Left-turn movements to/from Site Drive 1 will be restricted through implementation of on-site concrete monolithic islands, signing, and pavement markings.

School Street and Site Drive 2

- Construct the westbound approach (Site Drive 2) aligning with the Rolesville Elementary School (RES) ingress only carpool driveway.
- Provide stop-control for the westbound approach.

Main Street and Old Rodgers Road / School Street

- Extend the full-width storage for the westbound (Main Street) left-turn lane to accommodate Scarborough Property site traffic.
 - This improvement is only applicable if construction of a westbound (Main Street) left-turn lane at the intersection of Main Street and Main Street Park Driveway / Site Drive 1 proves to be infeasible and Site Drive 1 is designed with a RIRO configuration.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,




Michael Karpinski, P.E.
Traffic Engineering Project Manager
Ramey Kemp & Associates, Inc.

NC Corporate License # C-0910

Attachments: Site Location Map
Preliminary Site Plan
Site Trip Distribution Figure
Site Trip Assignment Figure
2023 Build Peak Hour Traffic Volumes Figure
Synchro Reports – 2023 Build Traffic Conditions



LEGEND

-  Proposed Site Location
-  Study Intersection
-  Study Area

Moving forward.

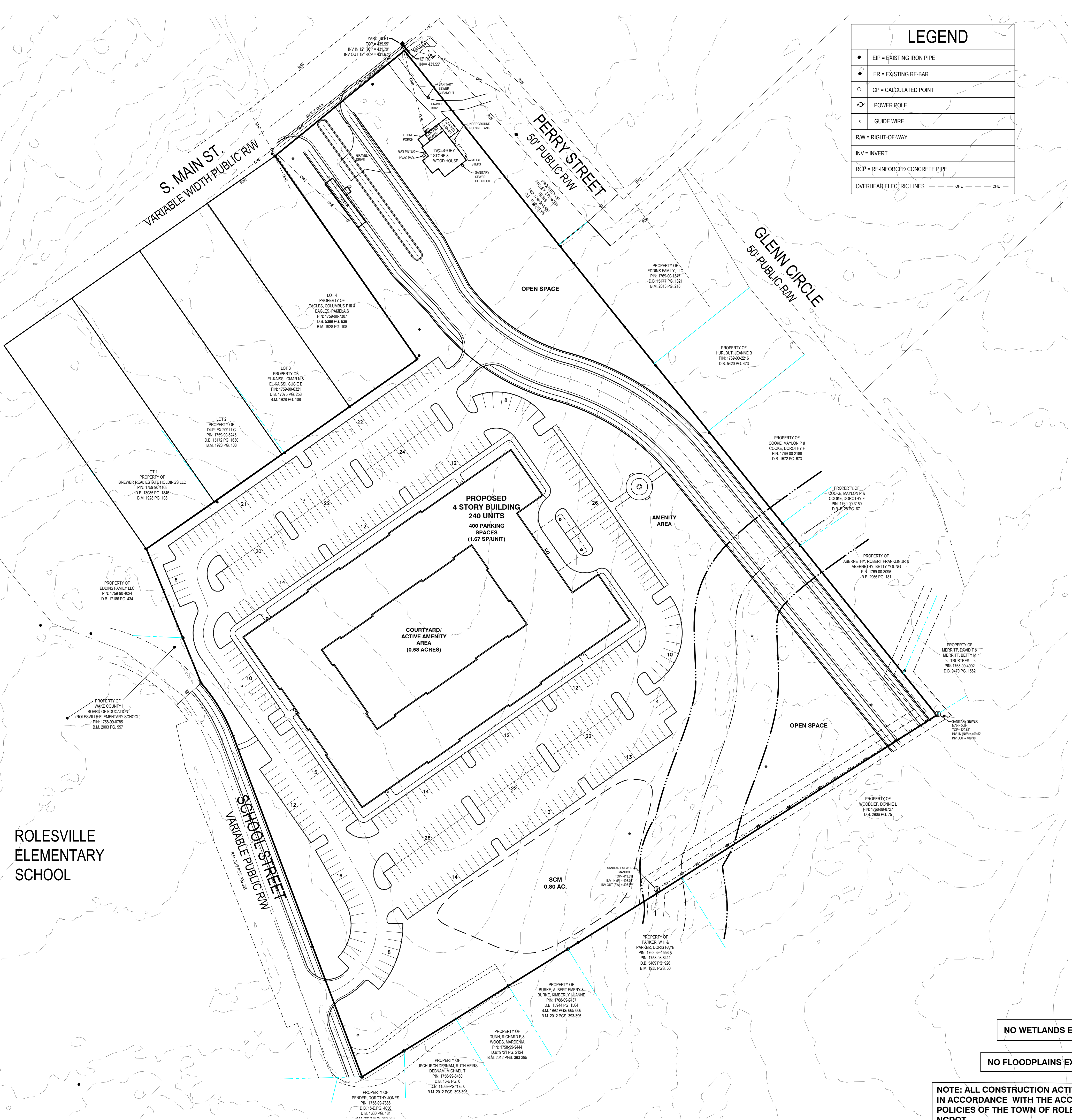


Scarboro Property
Rolesville, NC

Site Location Map

Scale: Not to Scale

Figure 1



LEGEND	
●	EIP = EXISTING IRON PIPE
●	ER = EXISTING RE-BAR
○	CP = CALCULATED POINT
⊙	POWER POLE
⋈	GUIDE WIRE
---	RW = RIGHT-OF-WAY
▽	INV = INVERT
▭	RCP = RE-INFORCED CONCRETE PIPE
---	OVERHEAD ELECTRIC LINES

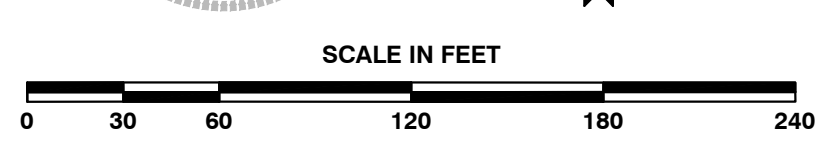
SITE DATA

PROJECT NAME:	ROLESVILLE INDEPENDENT LIVING
PIN:	1758-99-8909, 1759-90-9525, 1758-99-8560
ADDRESS:	201 SOUTH MAIN STREET ROLESVILLE, NORTH CAROLINA
EXISTING ZONING:	NONE
PROPOSED ZONING:	TOWN CENTER
USE:	EXISTING: SINGLE-FAMILY RESIDENTIAL/VACANT PROPOSED: SENIOR LIVING APARTMENTS/ MIXED USE
SITE AREA (GROSS): (RECOMBINATION REQ'D)	13.04 AC.
OPEN SPACE REQUIRED (10% OF SITE)	1.304 AC.
TOTAL DWELLING UNITS	18.4 DUA
DENSITY: 240 UNITS/13.04 ACRES	18.4 DUA
PARKING:	REQUIRED: 2 SPACES PER UNIT PROVIDED: 1.67 SPACES PER UNIT
	480 SPACES 400 SPACES

NO WETLANDS EXIST ON-SITE

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT



BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919) 851-8222 OR (919) 354-1879 • FAX: (919) 851-8868
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY

PROGRESS	DATE	DRAWN BY
03-2023		

SCARBOROUGH PROPERTY SENIOR LIVING FACILITY
NORTH MAIN STREET
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C1.1 OF XX

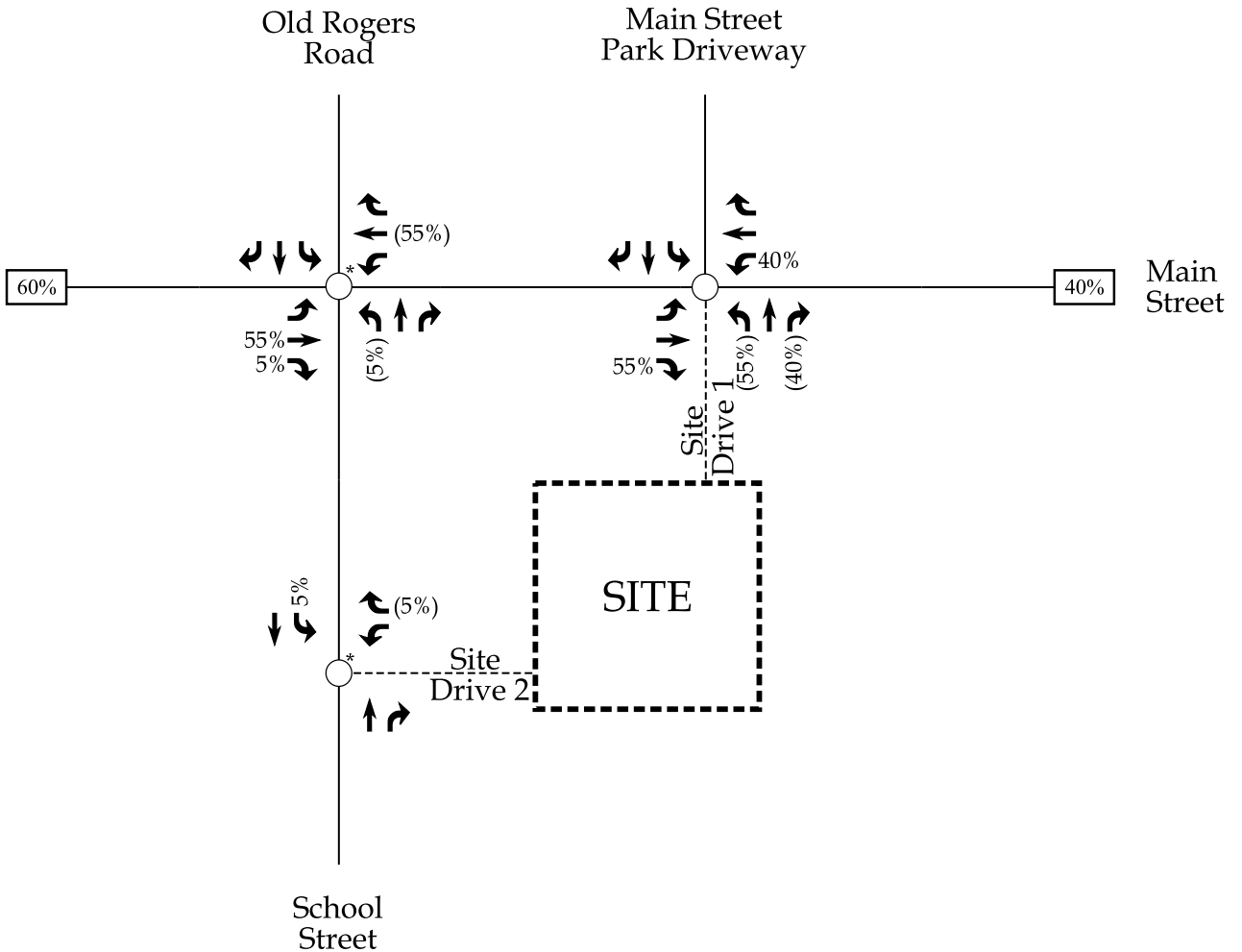
SCALE: 1" = 60'

CHK BY: MDB



LEGEND

- Unsignalized Intersection
- x% → Entering Trip Distribution
- (y%) → Exiting Trip Distribution
- XX% Regional Trip Distribution



*Note: Intersection included for informational purposes only

Moving forward.



RAMEY KEMP ASSOCIATES

Scarboro Property
Rolesville, NC

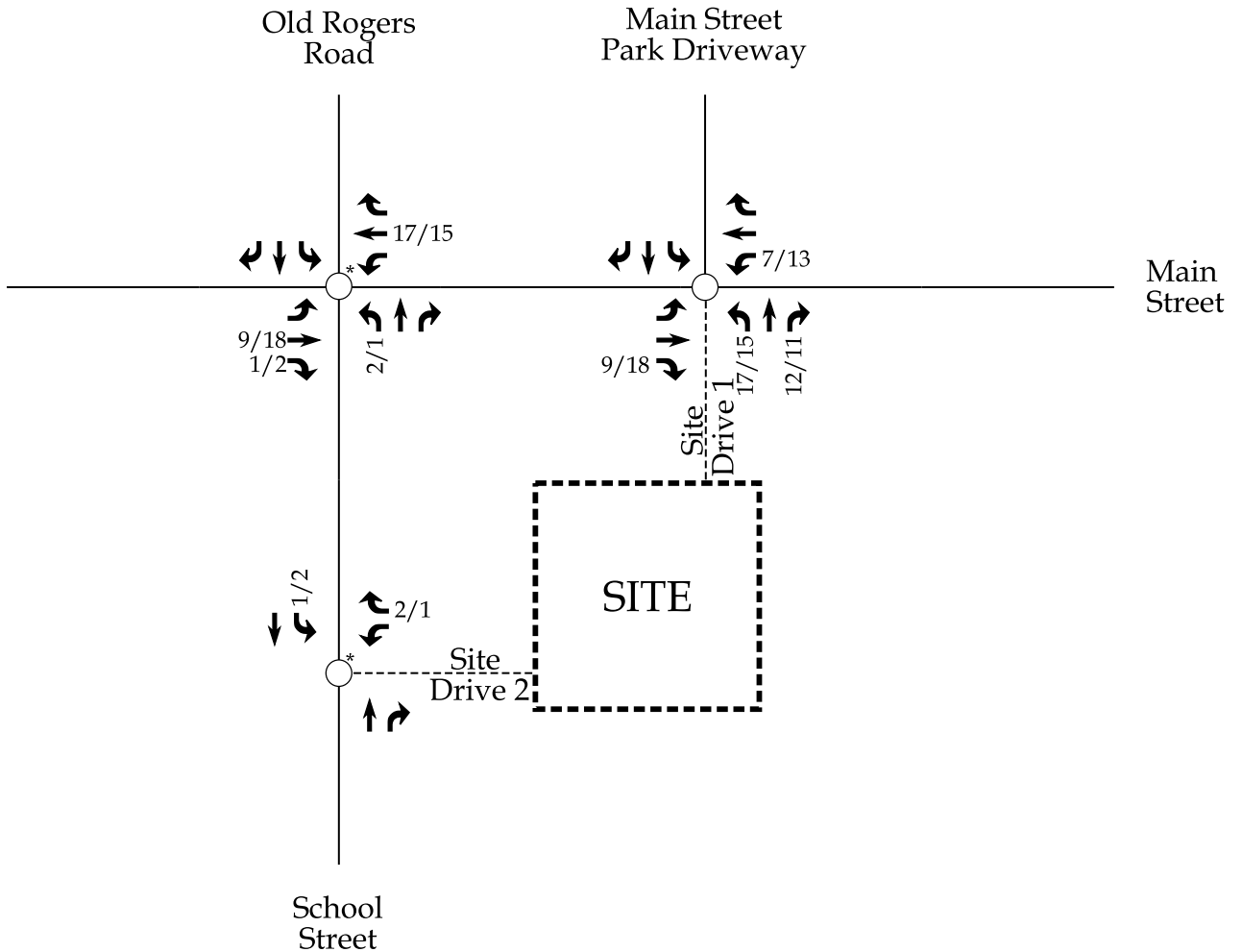
Residential Site Trip
Distribution

Scale: Not to Scale

Figure 3

LEGEND

- Unsignalized Intersection
- X / Y → Weekday AM / PM Peak Hour Site Trips



*Note: Intersection included for informational purposes only

Moving forward.



RAMEY KEMP ASSOCIATES

Scarboro Property
Rolesville, NC

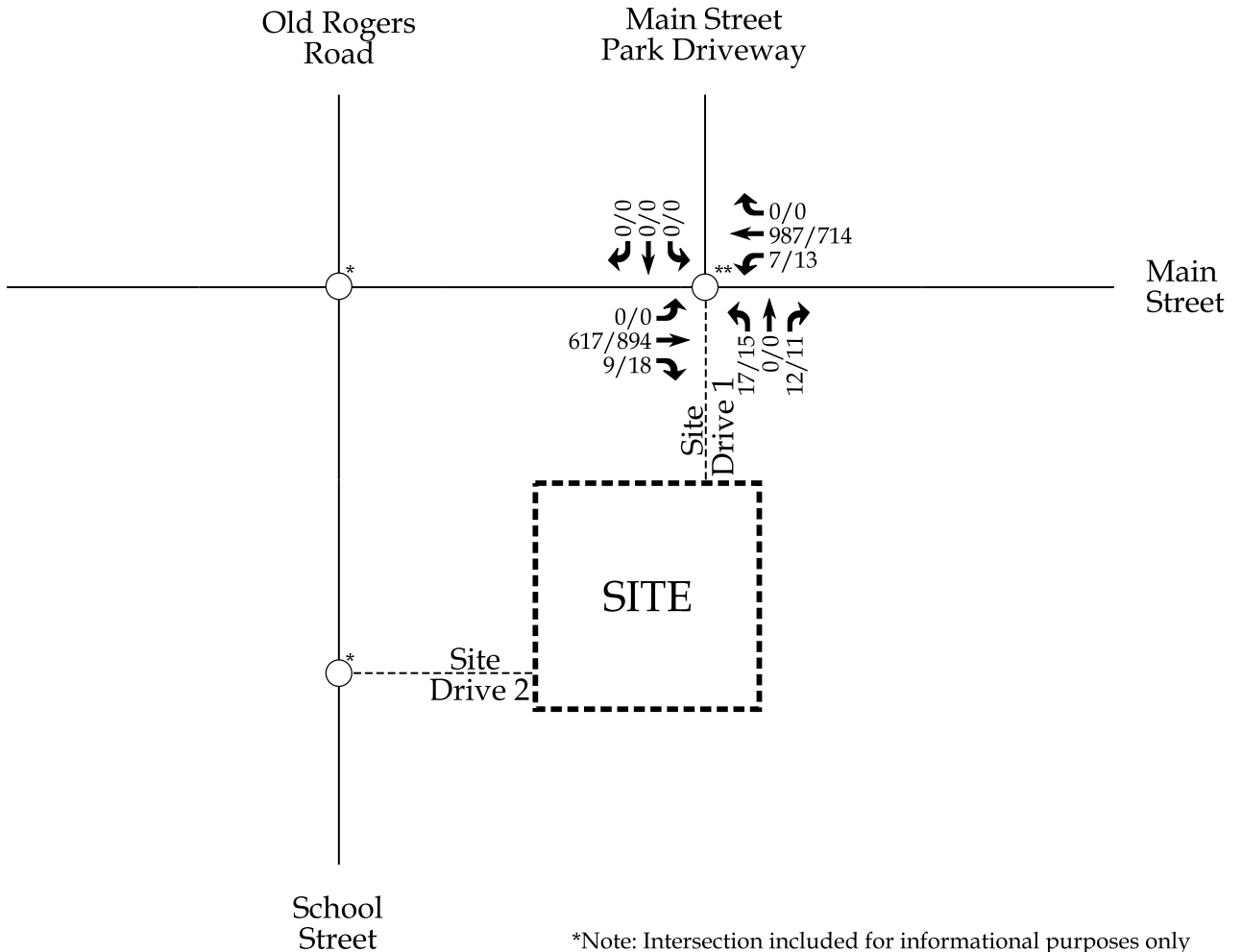
Residential Site Trip
Assignment

Scale: Not to Scale

Figure 4

LEGEND

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



*Note: Intersection included for informational purposes only

**Note: Per Congestion Management Guidelines, traffic volumes below 4vph are modeled as 4 in the analysis

Moving forward.



RAMEY KEMP ASSOCIATES

Scarboro Property
Rolesville, NC

2023 Build
Peak Hour Traffic

Scale: Not to Scale | Figure 5

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	617	9	7	987	4	17	4	12	4	4	4
Future Vol, veh/h	4	617	9	7	987	4	17	4	12	4	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	686	10	8	1097	4	19	4	13	4	4	4

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1101	0	0	696	0	0	1818	1816	691	1823	1819	1099
Stage 1	-	-	-	-	-	-	699	699	-	1115	1115	-
Stage 2	-	-	-	-	-	-	1119	1117	-	708	704	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	634	-	-	900	-	-	60	78	445	60	78	258
Stage 1	-	-	-	-	-	-	430	442	-	252	283	-
Stage 2	-	-	-	-	-	-	251	283	-	426	440	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	634	-	-	900	-	-	55	75	445	54	75	258
Mov Cap-2 Maneuver	-	-	-	-	-	-	55	75	-	54	75	-
Stage 1	-	-	-	-	-	-	426	438	-	249	276	-
Stage 2	-	-	-	-	-	-	237	276	-	405	436	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.1		0.1		76.2		55.8	
HCM LOS					F		F	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	85	634	-	-	900	-	-	84
HCM Lane V/C Ratio	0.431	0.007	-	-	0.009	-	-	0.159
HCM Control Delay (s)	76.2	10.7	0	-	9	0	-	55.8
HCM Lane LOS	F	B	A	-	A	A	-	F
HCM 95th %tile Q(veh)	1.8	0	-	-	0	-	-	0.5

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	894	18	13	714	4	15	4	11	4	4	4
Future Vol, veh/h	4	894	18	13	714	4	15	4	11	4	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	993	20	14	793	4	17	4	12	4	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	797	0	0	1013	0	0	1838	1836	1003	1842	1844	795
Stage 1	-	-	-	-	-	-	1011	1011	-	823	823	-
Stage 2	-	-	-	-	-	-	827	825	-	1019	1021	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	825	-	-	684	-	-	58	76	294	58	75	388
Stage 1	-	-	-	-	-	-	289	317	-	368	388	-
Stage 2	-	-	-	-	-	-	366	387	-	286	314	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	825	-	-	684	-	-	53	72	294	51	71	388
Mov Cap-2 Maneuver	-	-	-	-	-	-	53	72	-	51	71	-
Stage 1	-	-	-	-	-	-	286	314	-	364	374	-
Stage 2	-	-	-	-	-	-	344	373	-	267	311	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			79			56.5		
HCM LOS							F			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	80	825	-	-	684	-	-	83
HCM Lane V/C Ratio	0.417	0.005	-	-	0.021	-	-	0.161
HCM Control Delay (s)	79	9.4	0	-	10.4	0	-	56.5
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	1.7	0	-	-	0.1	-	-	0.5