RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS

4928-A Windy Hill Drive
Raleigh, North Carolina 27609
Phone: 919.872.5115
Fax: 919.878.5416

June 19, 2006

Roanoke Investments, LLC
c/o Nick Robinson
P.O. Box 5684
Cary, North Carolina 27512

Subject: Traffic Assessment - The Bluffs and McBane Property
Old Graham Road – Chatham County

Dear Mr. Robinson:

This letter summarizes a traffic assessment prepared by Ramey Kemp and Associates, Inc. (RKA) for The Bluffs and McBane Property developments to be located on Old Graham Road (SR 1520) at Rock Rest Road (SR 1547). Based on the Sketch Plan, The Bluffs development will include a total of 112 single-family homes on approximately 597 acres east of Old Graham Road. The McBane Property will include a total of 109 single-family homes and be located to the west of Old Graham Road. Access for The Bluffs development is provided to Old Graham Road via one existing connection and one proposed connection. An exiting connection to Old Graham Road is provided via existing Rock Rest Road and one proposed new driveway will be located on Old Graham Road approximately 750 feet south of Rock Rest Road. Access for the McBane Property is provided via two proposed connections to Old Graham Road. The northernmost connection for the McBane Property is proposed to align with Rock Rest Road while the southernmost driveway is proposed to align with the proposed Site Drive #2 for The Bluffs development.

Existing Traffic Volumes

Based on North Carolina Department of Transportation (NCDOT) Average Daily Traffic (ADT) maps, Old Graham Road carried approximately 510 vehicles per day (vpd) in 2004. Typically, roadways such as Old Graham Road would be expected to carry approximately 8,000 to 9,000 vpd before the roadway reached and exceeded capacity. Rock Rest Road currently provides access to a few residences east of Old Graham Road and no traffic volume information was available for this roadway from the NCDOT ADT maps. It is anticipated that this roadway carries much less traffic than Old Graham Road.

Traffic counts were conducted by RKA on Old Graham Road as part of the TA completed for the Page Property. Traffic counts were completed using automated traffic count equipment

during a 24-hour period on October 13, 2004. The a.m. peak hour occurred between 7:15 a.m. and 8:15 a.m., while the p.m. peak hour occurred between 5:30 p.m. and 6:30 p.m.

Future Traffic Volumes

Traffic volumes along Old Graham Road are expected to increase in the future due to completion of several adjacent developments. The Grantham Property, Page Property, Chapel Ridge, and Meadowview are future developments to be located along the west side of Old Graham Road just south of the proposed site. In addition, the Womble property is located along the east side of Old Graham Road immediately south of the site. Traffic studies have been completed for each of these developments by Ramey Kemp & Associates, Inc. Roadway improvements were recommended as part of the traffic studies for these developments to mitigate impacts of the traffic generated by each development. Traffic volumes for each of these developments are considered in this study although these developments are not expected to be completed by the build out year of The Bluffs and The McBane Property.

The heaviest traveled section of Old Graham Road would be located south of the Meadowview development. On this section of Old Graham Road, Chapel Ridge is expected to contribute approximately 2,000 vpd, while Meadowview is expected to contribute approximately 3,100 vpd. The remaining developments are smaller and combined will contribute approximately 900 vpd to this section of roadway. In total, traffic from the adjacent developments is expected to contribute approximately 6,000 vpd to Old Graham Road in the future when all developments are completely built out. Refer to Figure 1 for an illustration of the future peak hour traffic for full build out of the adjacent developments.

Trip Generation

Trips generated by the proposed developments were calculated utilizing methodology contained within the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, 7th Edition. At full build out it is estimated that The Bluffs development will generate approximately 1,154 total site trips (577 enter and 577 exit) during an average 24-hour weekday period. Of this total, approximately 88 total site trips (22 enter and 66 exit) will occur during the weekday a.m. peak hour. Approximately 119 total site trips (75 enter and 44 exit) will occur during the weekday p.m. peak hour. At full build out of The McBane Property, it is estimated that the development will generate approximately 1,126 total site trips (563 enter and 563 exit) during an average 24-hour weekday period. Of this total, approximately 85 total site trips (21 enter and 64 exit) will occur during the weekday a.m. peak hour. Approximately 116 total site trips (73 enter and 43 exit) will occur during the weekday p.m. peak hour. Refer to Table 1 for a detailed breakdown of the entering and exiting site traffic for the proposed developments.

TABLE 1
TRIP GENERATION TABLE

ITE Land Use (Code)	Dwelling Units	Average Daily Traffic (vpd)	AM Peak Hour (vph)		PM Peak Hour (vph)	
			Enter	Exit	Enter	Exit
The Bluffs Subdivision						
Single Family Residential (210)	112	1,154	22	66	75	44
McBane Property						
Single Family Residential (210)	109	1,126	21	64	73	43

Trip Distribution

Site trip distribution percentages were determined based on distribution percentages in previously completed traffic studies for other adjacent developments. As indicated in these studies, it is expected that approximately 60 percent of the residential trips will travel to/from the south on Old Graham Road, while approximately 40 percent of the residential trips will travel to/from the north on Old Graham Road. Refer to Figure 2 for the trip distribution percentages and Figure 3 for total peak hour site trips for The Bluffs and McBane Property developments.

Future Traffic Conditions With Site Build Out

In the future, traffic generated by The Bluffs and McBane Property is not expected to have a significant impact on study area roadways or intersections. During the a.m. and p.m. peak hours, the development is expected to generate relatively few trips turning onto and from Old Graham Road. The intersections of Old Graham Road at Rock Rest Road/McBane Property site driveway and the proposed site driveways to the south would be expected to operate at an acceptable level of service upon full build out of the development. Future traffic volumes were determined by adding the future peak hour traffic for full build out of the adjacent developments (Figure 1) to the total site trips for The Bluffs and McBane Property developments (Figure 3). Refer to Figure 4 for an illustration of the future traffic volumes with full build out of The Bluffs and McBane Property developments.

The Bluffs and McBane Property would be expected to contribute approximately 1,400 vpd to the section of Old Graham Road south of the Meadowview development. In the future with build out of The Bluffs development, McBane Property, Chapel Ridge, Meadowview, Page

Property, Womble Property, and Grantham Property, Old Graham Road would be expected to operate at an acceptable level of service. It should be noted that these development will be constructed over a period of time, and some of the larger developments may not be completed for 10-15 years or longer. The Bluffs and McBane Property are expected to be built out in a few years and result in a relatively minor increase in traffic in the study area.

The proposed driveway locations have been reviewed by the NCDOT during a field investigation of the driveway locations. At the request of the NCDOT, Rock Rest Road will be widened along the south side and restriped to provide an intersection angle with Old Graham Road as close to 90 degrees as possible. During the NCDOT review of the traffic study, it will be determined if turn lanes are needed on Old Graham Road. Based on capacity analysis results, turn lanes are not necessary at the site driveway intersections to achieve an acceptable level of service. NCDOT indicated in a field review that left turn lanes may be required on northbound and southbound Old Graham Road at the intersection with Rock Rest Road and the McBane driveway.

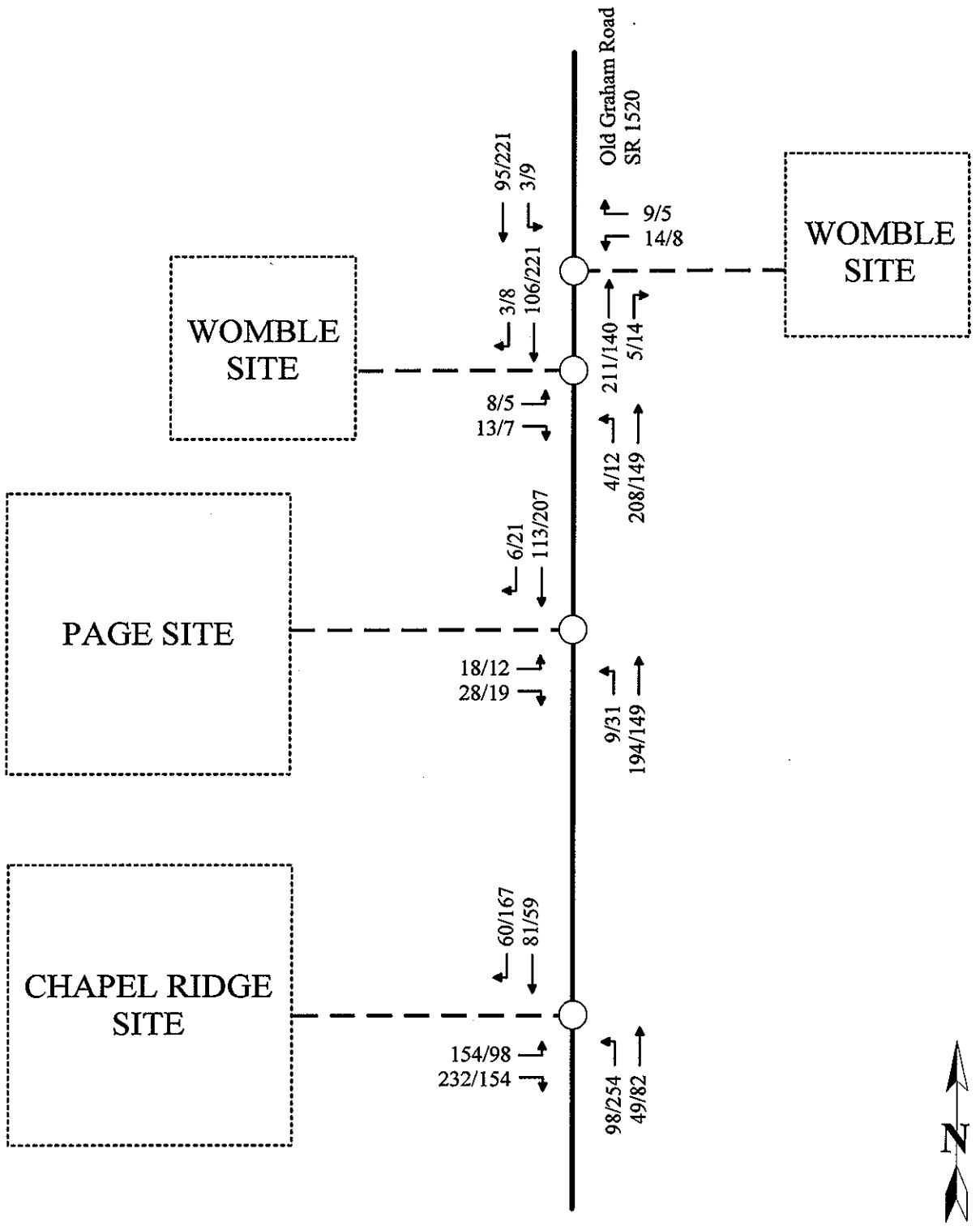
In summary, The Bluffs and McBane Property developments are not expected to have a significant impact on adjacent roadways or intersections. If you should have any questions or comments please free to contact me at (919) 872-5115.

Sincerely,
Ramey Kemp and Associates, Inc.

Rynal G. Stephenson, PE
Traffic Engineer

Attachments

cc: Mr. Mike Zaccardo, PE, CE Group, Inc.

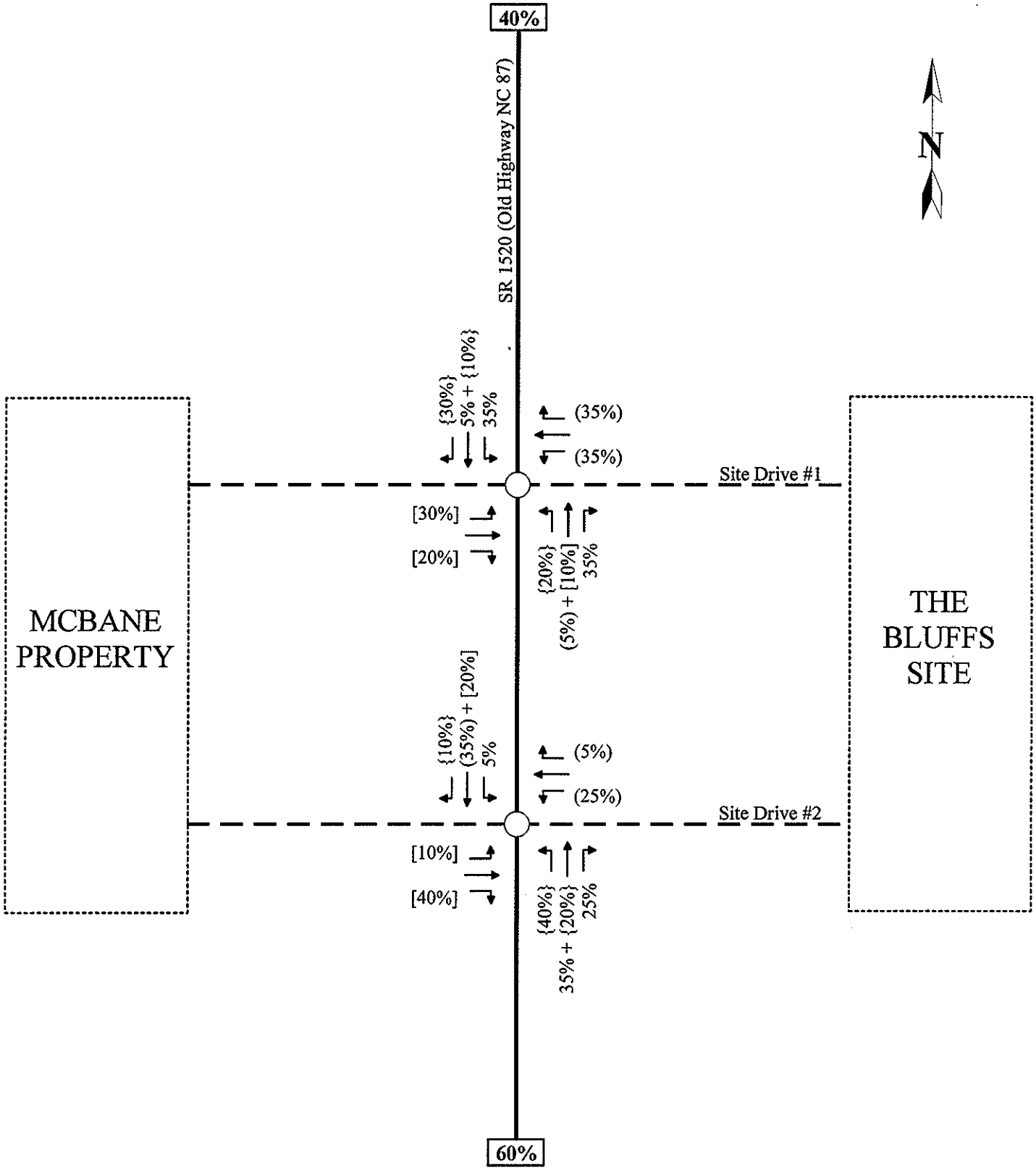


LEGEND

X/Y⟶ AM/PM Peak Hour Traffic Volume

◯ Unsignalized Intersection

THE BLUFFS RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
FUTURE DEVELOPMENT TRAFFIC		
	SCALE: Not to Scale	*Figure 1*



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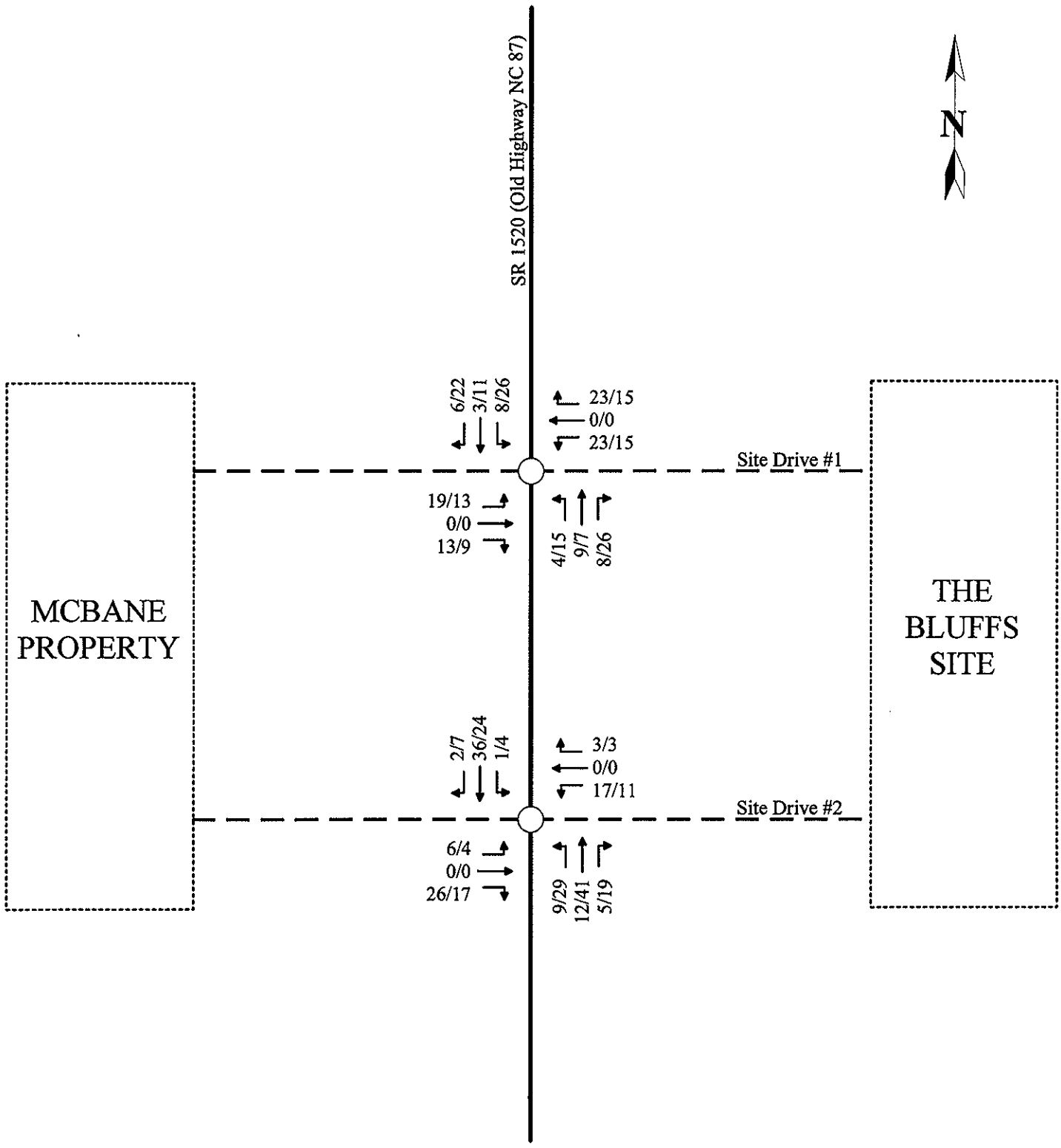
○	Unsignalized Intersection
X (Y) →	Entering (Exiting) Site Trip Distribution Percentages (The Bluffs)
{X} [Y] →	Entering (Exiting) Site Trip Distribution Percentages (McBane Property)

THE BLUFFS RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA
SITE TRIP DISTRIBUTION PERCENTAGES
SCALE: Not to Scale — *Figure 2*

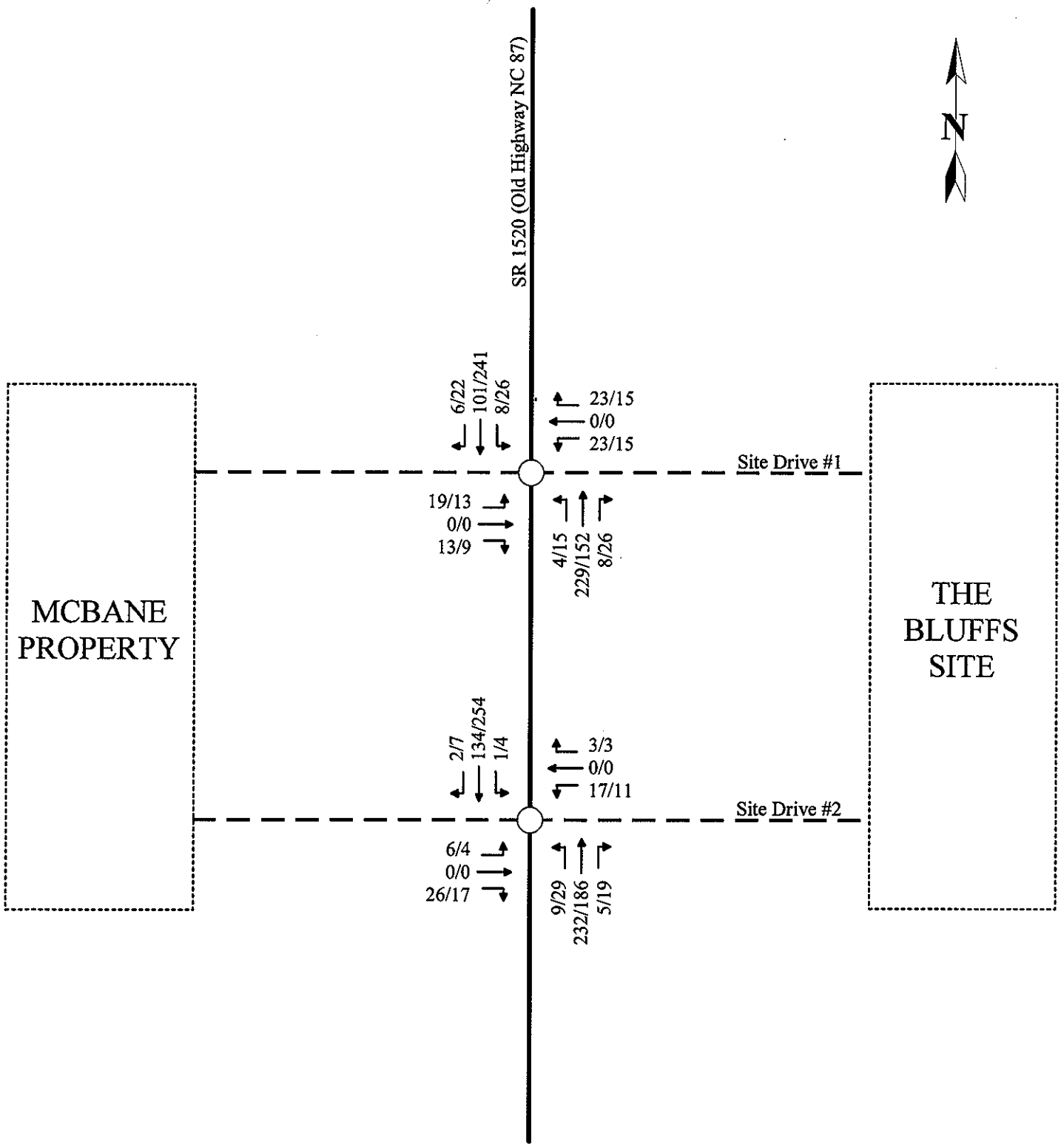


LEGEND

○ Unsignalized Intersection

X/Y → AM/PM Peak Hour Site Trips

THE BLUFFS RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
SITE TRIP ASSIGNMENT		
	SCALE: Not to Scale	*Figure 3*



LEGEND

◯ Unsignalized Intersection

X/Y → AM/PM Weekday Peak Hour Traffic

THE BLUFFS RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
FUTURE TRAFFIC		
	SCALE: Not to Scale	*Figure 4*

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	0	13	23	0	23	4	229	8	8	101	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	21	0	14	25	0	25	4	249	9	9	110	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	417	397	113	407	396	253	116			258		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417	397	113	407	396	253	116			258		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	98	95	100	97	100			99		
cM capacity (veh/h)	525	535	940	543	536	785	1472			1307		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	35	25	25	262	125
Volume Left	21	25	0	4	9
Volume Right	14	0	25	9	7
cSH	639	543	785	1472	1307
Volume to Capacity	0.05	0.05	0.03	0.00	0.01
Queue Length (ft)	4	4	2	0	1
Control Delay (s)	11.0	12.0	9.7	0.1	0.6
Lane LOS	B	B	A	A	A
Approach Delay (s)	11.0	10.8		0.1	0.6
Approach LOS	B	B			

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	30.5%	ICU Level of Service	A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	0	26	17	0	3	9	232	5	1	134	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	7	0	28	18	0	3	10	252	5	1	146	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	427	426	147	452	424	255	148			258		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	427	426	147	452	424	255	148			258		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	97	96	100	100	99			100		
cM capacity (veh/h)	533	516	900	499	518	784	1434			1307		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	35	22	267	149
Volume Left	7	18	10	1
Volume Right	28	3	5	2
cSH	797	528	1434	1307
Volume to Capacity	0.04	0.04	0.01	0.00
Queue Length (ft)	3	3	1	0
Control Delay (s)	9.7	12.1	0.3	0.1
Lane LOS	A	B	A	A
Approach Delay (s)	9.7	12.1	0.3	0.1
Approach LOS	A	B		

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	26.3%	ICU Level of Service	A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	13	0	9	15	0	15	15	152	26	26	241	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	14	0	10	16	0	16	16	165	28	28	262	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	559	557	274	552	554	179	286			193		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	559	557	274	552	554	179	286			193		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	96	100	98	99			98		
cM capacity (veh/h)	421	425	765	428	426	863	1276			1380		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	24	16	16	210	314
Volume Left	14	16	0	16	28
Volume Right	10	0	16	28	24
cSH	516	428	863	1276	1380
Volume to Capacity	0.05	0.04	0.02	0.01	0.02
Queue Length (ft)	4	3	1	1	2
Control Delay (s)	12.3	13.8	9.2	0.7	0.9
Lane LOS	B	B	A	A	A
Approach Delay (s)	12.3	11.5		0.7	0.9
Approach LOS	B	B			

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	38.8%	ICU Level of Service	A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	0	17	11	0	3	29	186	19	4	254	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	4	0	18	12	0	3	32	202	21	4	276	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	567	574	280	583	568	212	284			223		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	567	574	280	583	568	212	284			223		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	98	97	100	100	98			100		
cM capacity (veh/h)	423	417	759	405	420	828	1279			1346		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	23	15	254	288
Volume Left	4	12	32	4
Volume Right	18	3	21	8
cSH	659	455	1279	1346
Volume to Capacity	0.03	0.03	0.02	0.00
Queue Length (ft)	3	3	2	0
Control Delay (s)	10.7	13.2	1.2	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	10.7	13.2	1.2	0.1
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A