August 13, 2004

Mr. Jerry Radman
MacGregor Development Company
201 Shannon Oaks Circle
Cary, North Carolina 27511

Subject: Traffic Assessment
Proposed Booth Mountain PUD
Chatham County, North Carolina

Dear Mr. Radman:

This letter summarizes the findings of the traffic assessment prepared by Ramey Kemp and Associates, Inc. (RKA) for the proposed Booth Mountain PUD to be located east of US 15-501 south of Lystra Road and north of Jack Bennett Road. The purpose of this study is to determine impacts to the surrounding transportation system created by traffic generated by full build out of the development. The study area for this project includes the proposed unsignalized intersections of Lystra Road with one site driveway and Jack Bennett Road with two site driveways. All three intersections were analyzed under future traffic conditions with full build out site traffic during weekday AM and PM peak hour traffic conditions.

The proposed development is expected to be complete in 2011, and will consist of a total of 180 single-family residential units in three separate sections. One section includes 39 lots with access to Jack Bennett Road, while a second section includes 53 lots also with access to Jack Bennett Road. The largest section includes 88 lots with one driveway on Lystra Road. No internal connectivity is proposed between the three sections. Refer to the attached site land use and access plan.

Access to the development is proposed via one driveway on Lystra Road and two driveways on Jack Bennett Road. All three driveways will be full access driveways. The driveway on Lystra Road (Site Driveway 1) will be approximately 0.4 miles west of Sam Jones Road. The western driveway on Jack Bennett Road (Site Driveway 2) is approximately 1800 feet west of the eastern driveway on Jack Bennett Road (Site Driveway 3). Site Driveway 3 is approximately 2900 feet west of Big Woods Road. A driveway for the proposed North Chatham High School is proposed between Site Driveways 2 and 3 and is approximately 900 feet from each site driveway.

Existing (2004) Traffic Conditions

Daily traffic counts were conducted by RKA on July 14-15, 2004 on Lystra Road and Jack Bennett Road near the proposed driveways. Automated traffic counts were completed in

15-minute intervals from 1:00 p.m., July 14 to 3:00 p.m., July 15. These counts were conducted during the summer break of the nearby North Chatham School (K-8). Traffic generated by this school while in session has been estimated using the NCDOT School Calculator and has been added to the volumes obtained from the traffic counts to determine the existing (2004) peak hour traffic volumes presented in Figure 1. All figures referred to in this letter are located in Appendix A. Existing peak hour traffic count reports are included in Appendix B.

Background (2011) Traffic Conditions

To determine background traffic volumes, existing traffic volumes were projected to the build out year 2011 by applying a compounded annual growth rate of 3%. This growth rate is based on historical traffic volumes and engineering judgment. The background (2011) AM and PM peak hour traffic (i.e., without the site) is illustrated in Figure 2.

Adjacent Development

There are currently plans to construct the North Chatham High School on a parcel adjacent to the proposed site. The traffic volumes expected at this high school have been estimated using the NCDOT School Calculator based on the school's full build out, which will accommodate 1,200 students. The traffic generated during the school's a.m. peak hour has been included in this study. The traffic generated during the school's p.m. peak hour has been omitted from this study since the school's p.m. peak hour does not coincide with this study's p.m. peak hour. Traffic generated by the school during this study's p.m. peak hour will be negligible, and as such has been omitted as well. During the a.m. peak hour, the school is expected to generate 584 entering trips and 110 exiting trips. Half of the trips will travel to/from the west on Jack Bennett Road and half of the trips will travel to/from the east on Jack Bennett Road. Refer to Figure 3 for the a.m. peak hour traffic volumes of the adjacent development.

The adjacent development traffic volumes (Figure 3) were added to the background (2011) traffic volumes to determine background plus adjacent development traffic volumes (Figure 4). These volumes are expected in 2011 without construction of the proposed development.

Trip Generation and Distribution

Traffic generated by the proposed development was estimated utilizing methodology contained within the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 7th Edition. Although the site is in three separate sections, trips were generated for the total 180 single-family dwelling units. It is estimated that the proposed development will generate approximately 1,786 total new site trips (893 enter and 893 exit) during an average 24-hour weekday period. Of this total, approximately 136 total site trips (34 enter and 102 exit) will occur during the weekday a.m. peak hour, while approximately 182 total site trips (115 enter and 67 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.

TABLE 1
TRIP GENERATION TABLE

PROPOSED BOOTH MOUNTAIN DEVELOPMENT

ITE Land Use (Code)	Density	2-way Volume (vpd)	AM Peak Hour (vph)		PM Peak Hour (vph)	
			Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	180 D.U.	1,786	34	102	115	67
TOTAL NEW SITE TRIPS		**1,786**	**34**	**102**	**115**	**67**

Site trips generated by the proposed development were distributed based on existing traffic patterns, location of employment centers, and engineering judgment. Total site trips were assigned to the site driveways based on the percentage of lots in each section relative to the total development. Refer to Figure 5 for the site trip distribution percentages. For the northern section of the site accessed by Site Driveway 1, it is expected that approximately 22% of the site trips will access the site to/from the west on Lystra Road, while approximately 27% will access the site to/from the east on Lystra Road. For the southwest section of the site accessed by Site Driveway 2, it is expected that approximately 13% of the site trips will access the site to/from the west on Jack Bennett Road, while approximately 16% will access the site to/from the east on Jack Bennett Road. For the southeast section of the site accessed by Site Driveway 3, it is expected that approximately 10% of the site trips will access the site to/from the west on Jack Bennett Road, while approximately 12% will access the site to/from the east on Jack Bennett Road. Figure 6 illustrates the total a.m. and p.m. peak hour site trips for the proposed development.

Future (2011) Traffic Conditions

Total peak hour site trips (Figure 6) were added to the background plus adjacent development traffic volumes (Figure 4) to determine future traffic conditions with the proposed site. Refer to Figure 7 for the future a.m. and p.m. peak hour traffic volumes with full build out of the proposed site.

For this study, the Highway Capacity Software (HCS) output module in Synchro (Version 5.0) was utilized to analyze all study intersections. Synchro version 5.0 includes HCM calculations for unsignalized intersections based on methodologies of the 2000 Highway Capacity Manual (HCM).

Future a.m. and p.m. peak hour traffic volumes at the study intersections were analyzed to determine the expected levels of service. The capacity analysis results are presented in Table 2. The detailed capacity analysis reports can be found in Appendix C of this letter.

Analysis indicates minor street turning vehicles from each site driveway will experience short delays during the a.m. and p.m. peak hours. Analysis indicates that the minor street approaches of Site Driveways 1, 2, and 3 will operate at LOS C or better in the a.m. and p.m. peak hours under future traffic conditions with single lane approaches.

In addition, analysis indicates that all major street left turn movements at Site Driveways 1, 2, and 3 will operate at LOS A in the a.m. and p.m. peak hours under future traffic conditions.

TABLE 2

FUTURE (2011) PEAK HOUR CAPACITY ANALYSIS RESULTS

INTERSECTION	APPROACH	LANEAGE	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall	Approach	Overall
Lystra Road (EB/WB) And Site Driveway 1 (NB) (Unsignalized)	EB WB NB	1 TH-**RT** 1 **LT**-TH **1 LT-RT**	-- LOS A[1] LOS B[2]	N/A	-- LOS A[1] LOS B[2]	N/A
Jack Bennett Road (EB/WB) and Site Driveway 2 (SB) (Unsignalized)	EB WB SB	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	LOS A[1] -- LOS C[2]	N/A	LOS A[1] -- LOS B[2]	N/A
Jack Bennett Road (EB/WB) and Site Driveway 3 (SB) (Unsignalized)	EB WB SB	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	LOS A[1] -- LOS C[2]	N/A	LOS A[1] -- LOS B[2]	N/A

NOTE: Improvements are indicated in **Bold** print
1. Level of service for left turn movement on major approach.
2. Level of service for minor approach.

Conclusions

In summary, the proposed Booth Mountain PUD will include 180 single-family homes in three non-interconnected sections with each section having one access driveway. Traffic generated by the Booth Mountain PUD is not expected to have a significant impact on study intersections.

Future traffic conditions includes full build out of Booth Mountain as well as traffic generated by the future 1,200 student North Chatham High School.

Analysis indicates all minor street approaches of Site Driveways 1, 2, and 3 will operate at LOS C or better in the a.m. and p.m. peak hours under future traffic conditions. Further, all major street left turn movements on Jack Bennett Road and Lystra Road at the site driveways will operate at LOS A in the AM and PM peak hours under future traffic conditions. All site driveways were analyzed with one egress lane and one ingress lane.

As part of the future North Chatham High School, an eastbound left turn lane may be necessary on Jack Bennett Road at the school driveway. Since Site Driveway 2 is located approximately 900 feet west of the school driveway, the construction of a left turn lane at the high school driveway is not expected to impact the intersection with Site Driveway 2.

Recommendations

Site traffic volumes entering and exiting the site driveways on Lystra Road and Jack Bennett Road do not warrant construction of left turn or right turn lanes based on warrants for turn lanes shown in the *Policy on Street and Driveway Access to North Carolina Highways* (July 2003) published by NCDOT.

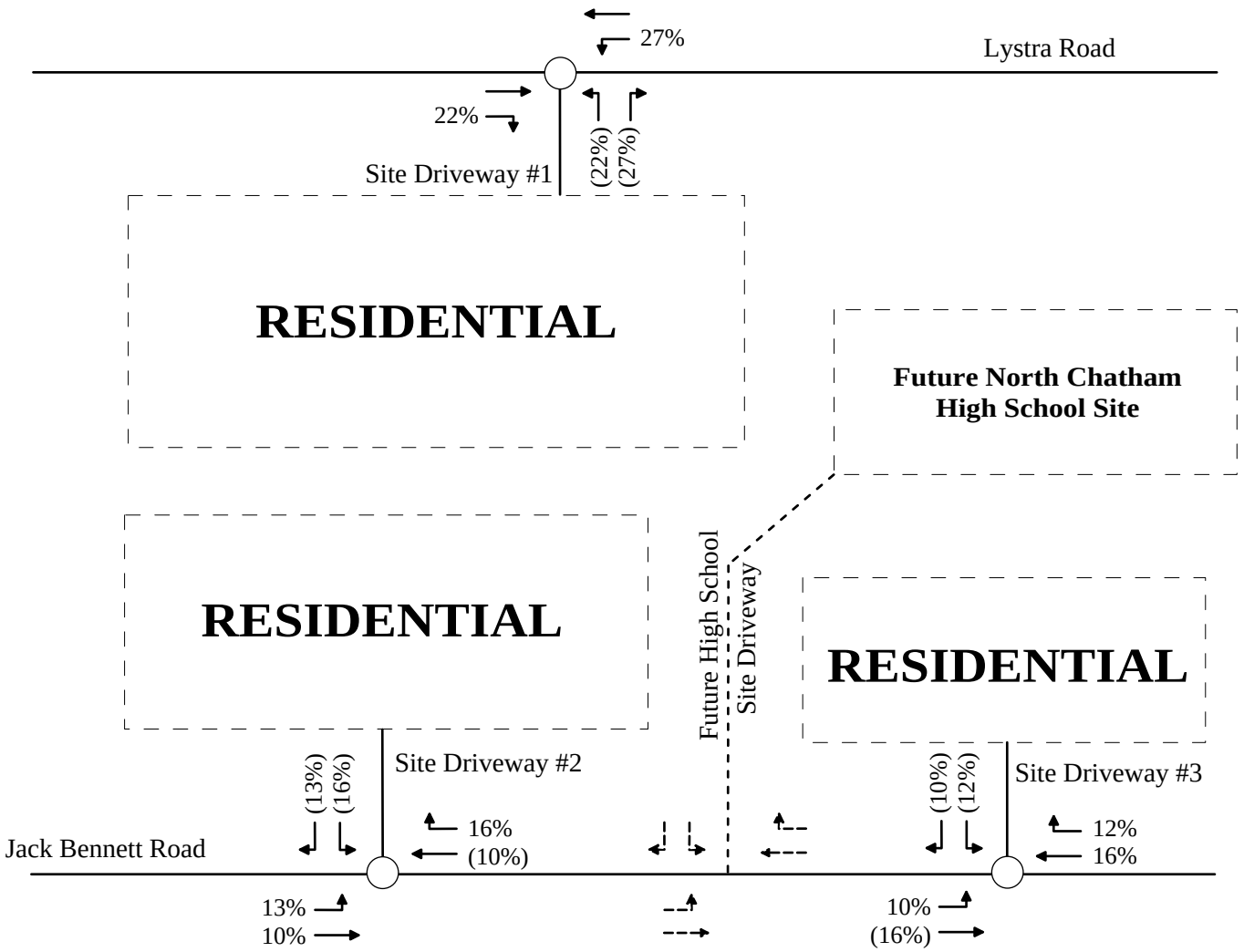
It is recommended to construct Site Driveways 1, 2, and 3 with one ingress lane and one egress lane.

If you should have any questions, or comments, relative to this traffic assessment, please feel free to contact me at (919) 872-5115.

Sincerely,
Ramey Kemp and Associates, Inc.

Rynal G. Stephenson, P.E.

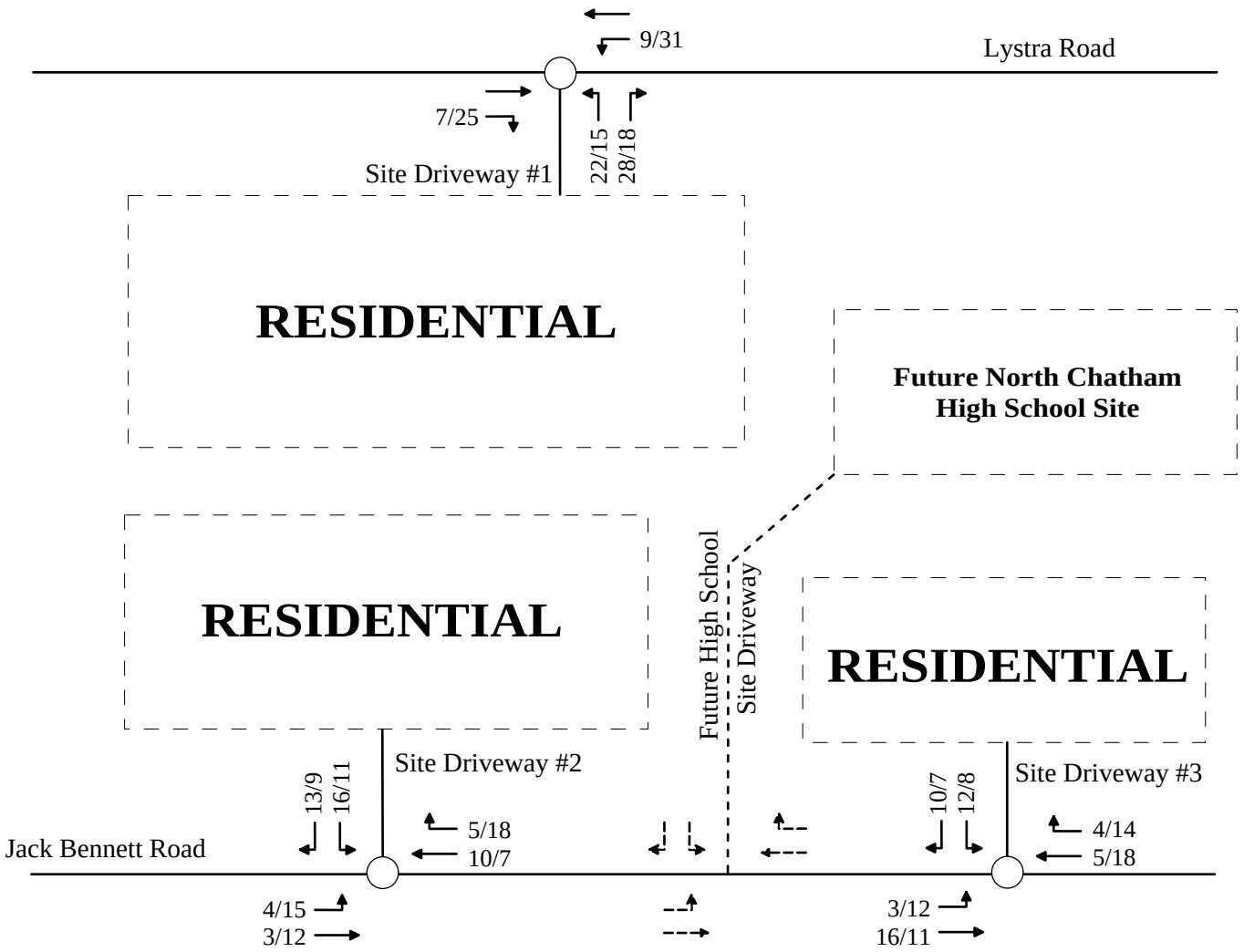
Attachments



LEGEND

◯ Unsignalized Intersection
X% Entering Peak Hour Percentages
(X%) Exiting Peak Hour Percentages

PROPOSED RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
TRIP DISTRIBUTION PERCENTAGES		
	SCALE: Not to Scale	*Figure 5*



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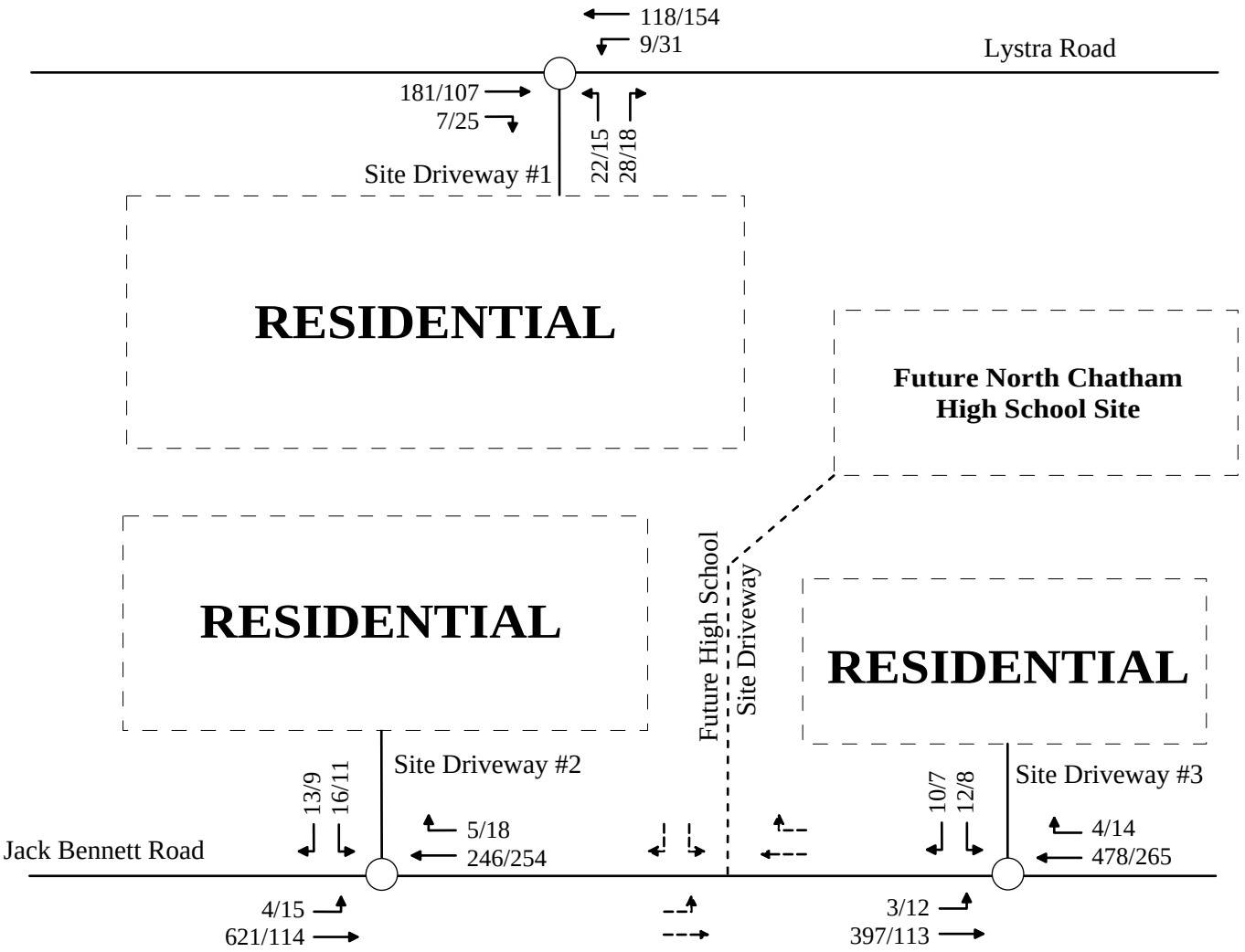
LEGEND

X/Y — Unsignalized Intersection
AM/PM Peak Hour Trips

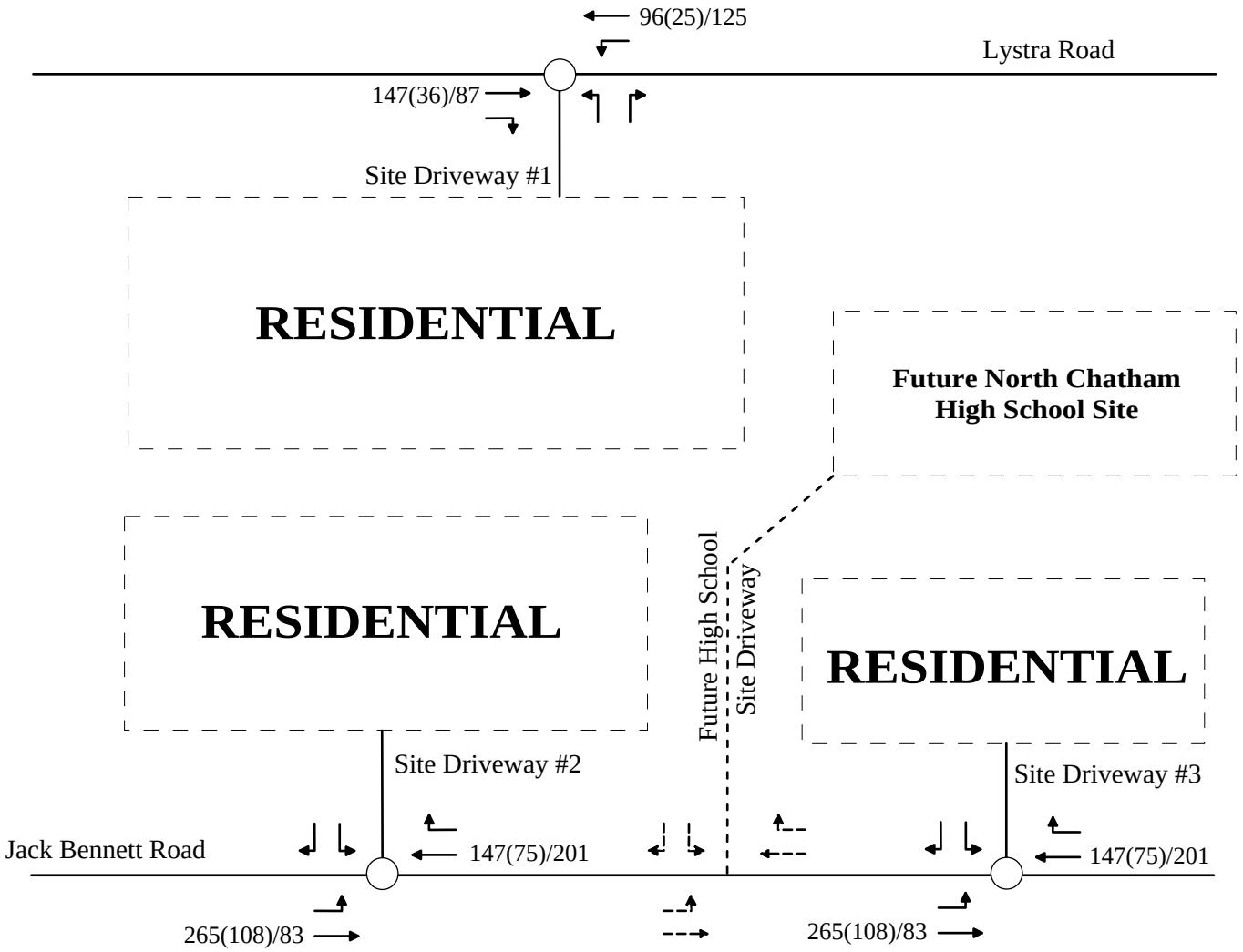
PROPOSED RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
PEAK HOUR SITE TRIPS		
	SCALE: Not to Scale	*Figure 6*



LEGEND

◯	Unsignalized Intersection
XX/YY	AM / PM Peak Hour Trips

PROPOSED RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA
COMBINED (2011) PEAK HOUR TRAFFIC
SCALE: Not to Scale — *Figure 7*



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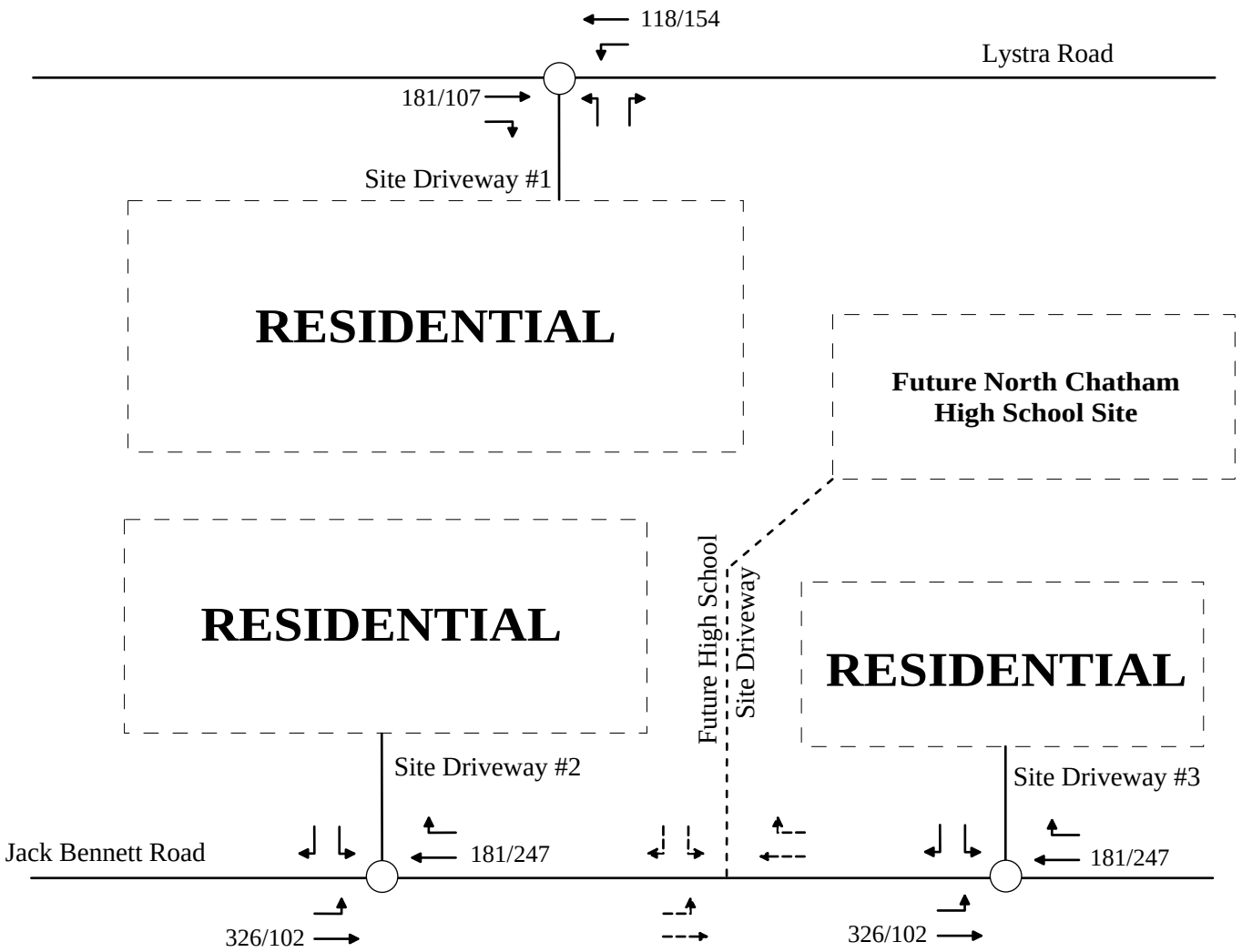
◯	Unsignalized Intersection
XX(YY*)/ZZ	AM (SCHOOL) / PM Peak Hour Trips (*traffic generated by the North Chatham School (K-8) is in parenthesis and is included in the AM volume)

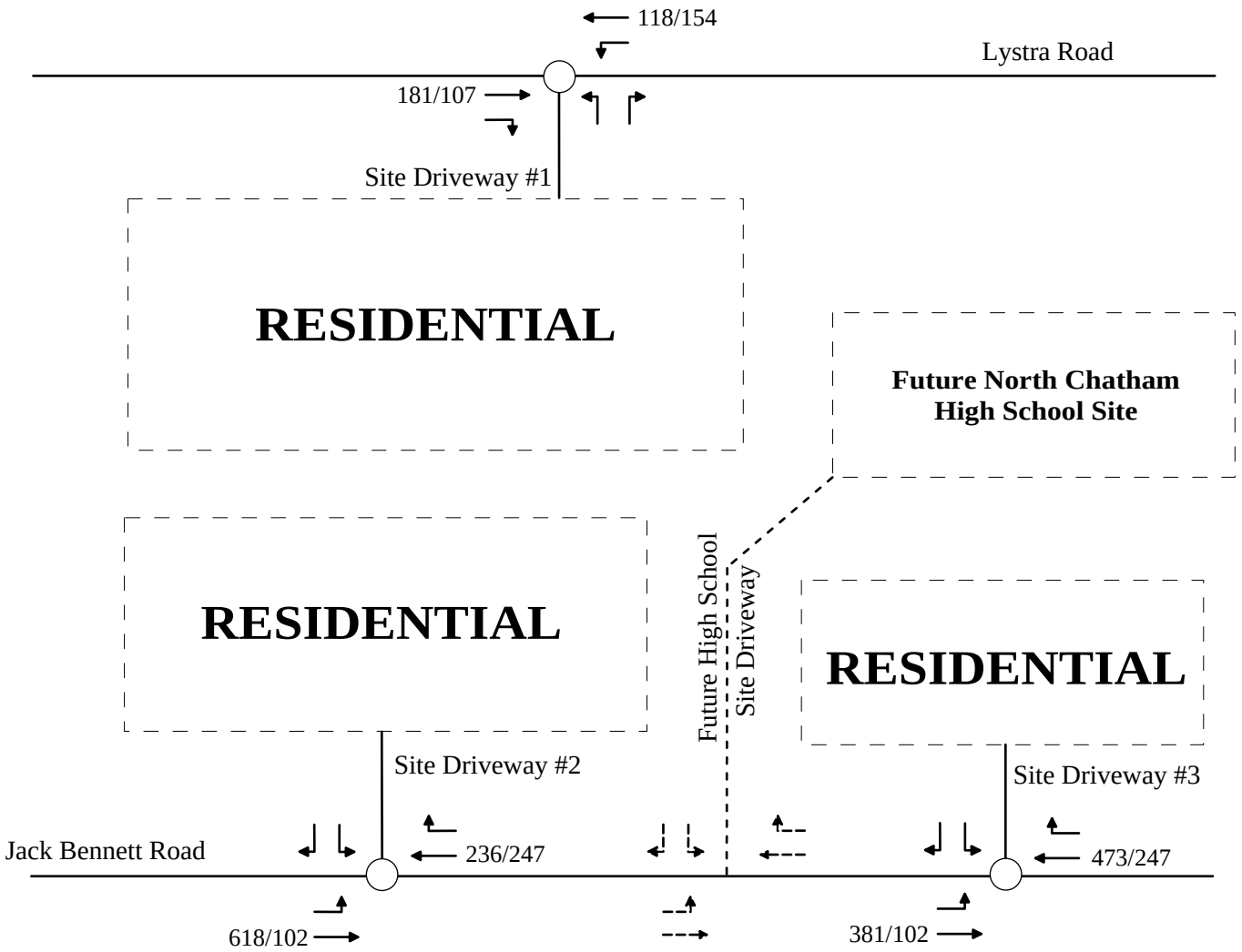
PROPOSED RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA
EXISTING (2004) PEAK HOUR TRAFFIC
SCALE: Not to Scale — *Figure 1*



LEGEND

◯	Unsignalized Intersection
XX/YY	AM / PM Peak Hour Trips

PROPOSED RESIDENTIAL DEVELOPMENT *CHATHAM COUNTY, NORTH CAROLINA*
BACKGROUND (2011) *PEAK HOUR TRAFFIC*
SCALE: Not to Scale — *Figure 2*



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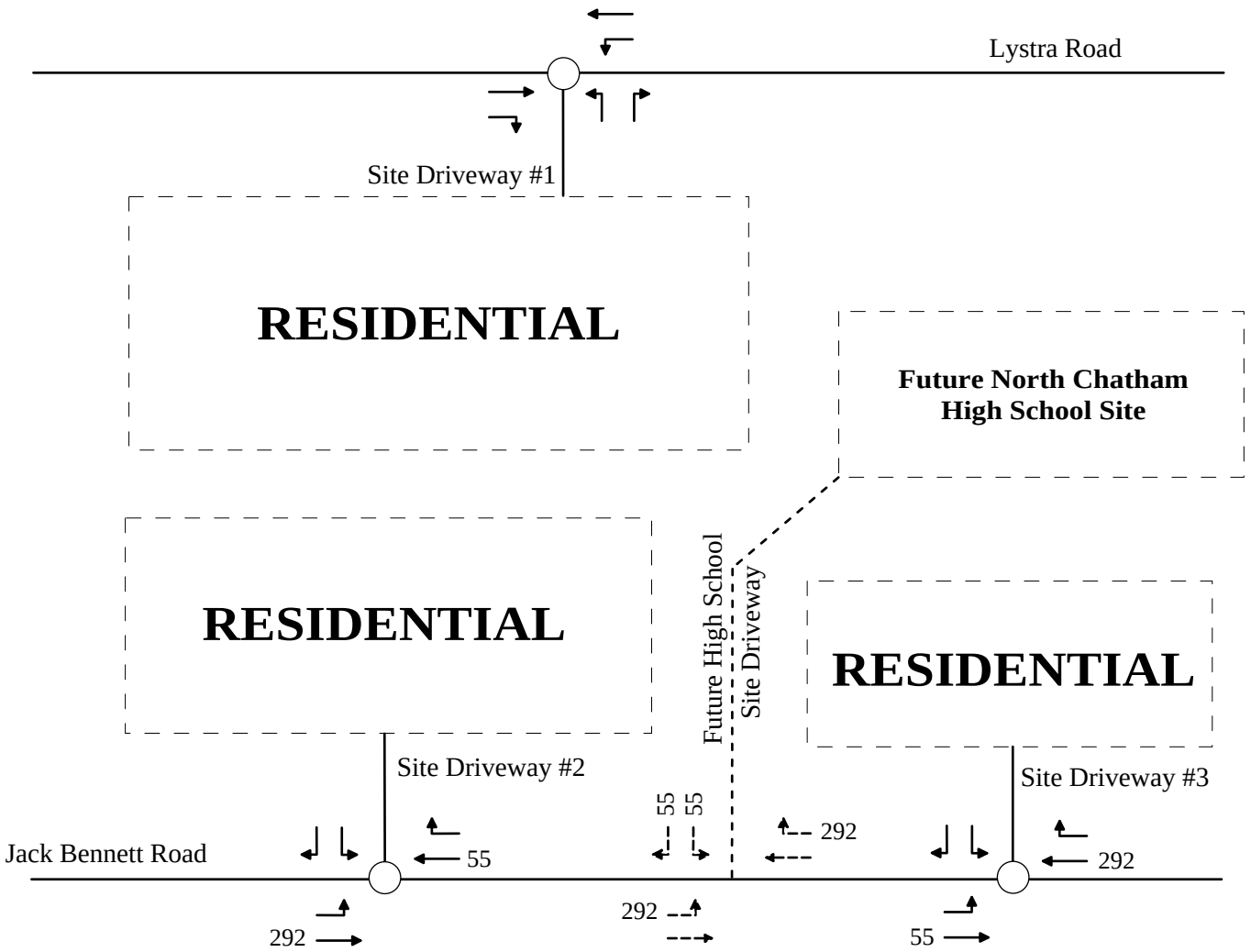
○	Unsignalized Intersection
XX/YY	AM / PM Peak Hour Trips

PROPOSED RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
BACKGROUND (2011) PLUS ADJACENT DEVELOPMENT PEAK HOUR TRAFFIC		
	SCALE: Not to Scale	*Figure 4*



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LEGEND

◯ Unsignalized Intersection

XX AM Peak Hour Trips

PROPOSED RESIDENTIAL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
ADJACENT DEVELOPMENT AM PEAK HOUR TRAFFIC		
	SCALE: Not to Scale	*Figure 3*