

# **TRAFFIC IMPACT ANALYSIS REPORT**

**FOR THE**

## **PROPOSED FEARRINGTON RETAIL DEVELOPMENT**

**LOCATED IN**

**CHATHAM COUNTY, NORTH CAROLINA**

Prepared For  
Jesse Fearington

Prepared By  
Ramey Kemp & Associates, Inc.

April 2006

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### CHATHAM COUNTY, NORTH CAROLINA

Prepared For  
Jesse Fearrington  
724 Morris Road  
Pittsboro, NC 27312

Prepared By  
Ramey Kemp & Associates, Inc.  
4928-A Windy Hill Drive  
Raleigh, North Carolina

April 2006

RKA Project No. 06055



*RYNAL G. STEPHENSON*  
4/14/06

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# **TRAFFIC IMPACT ANALYSIS REPORT**

## **PROPOSED FEARRINGTON RETAIL DEVELOPMENT**

### **CHATHAM COUNTY, NORTH CAROLINA**

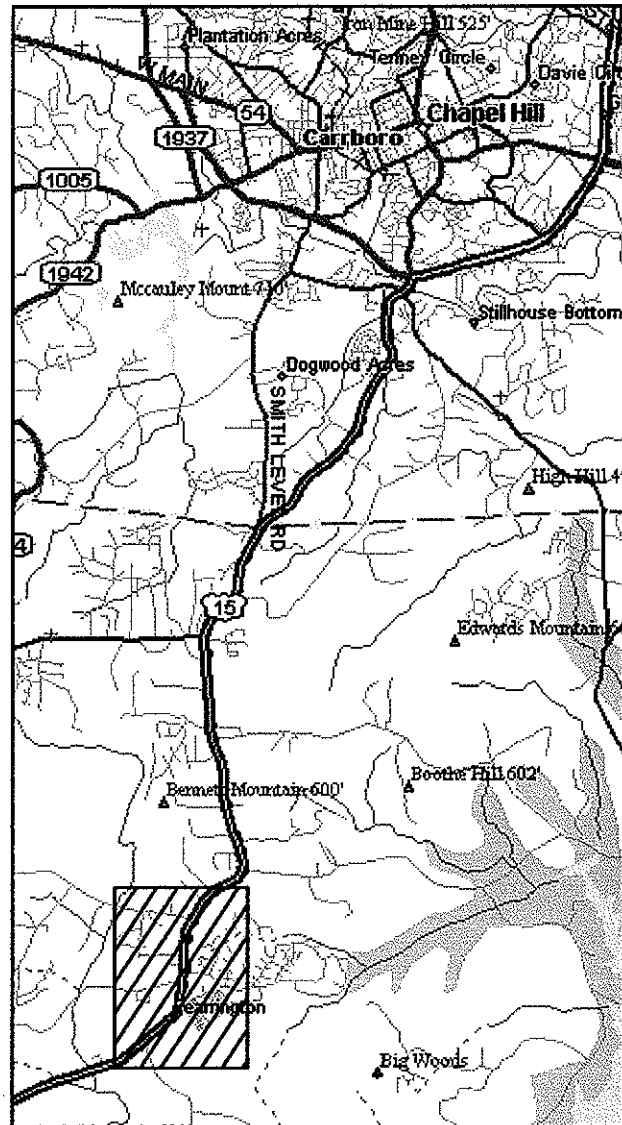
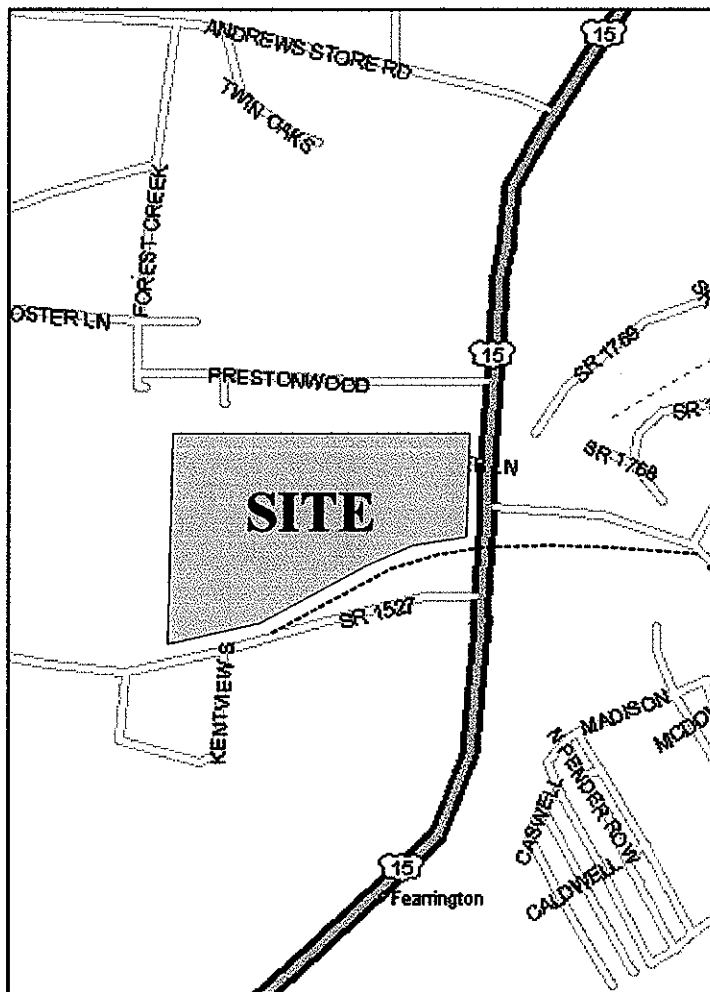
#### **1. INTRODUCTION**

This report summarizes the findings of the Traffic Impact Analysis (TIA) performed for the proposed Fearington Retail development in Chatham County, North Carolina. The site plan indicates the development will include a 30,000 square foot (sf) grocery store, 51,200 sf of retail space, and four outparcels. The purpose of this study is to determine the potential impacts to the surrounding transportation system caused by the additional traffic generated by the proposed development. In order to accomplish this objective, this study analyzed existing (2006) traffic conditions, background (2009) traffic conditions without the site, and combined (2009) traffic conditions with the site in place.

#### **1.1 Site Location and Study Area**

The proposed Fearington Retail development is located in the northwest quadrant of the intersection of US 15-501 and Morris Road / Village Way in Chatham County, North Carolina. Refer to Figure 1 for the site location map. The study area consists of the following intersections:

- US 15-501 and Morris Road / Village Way
- US 15-501 and Site Driveway #1
- Morris Road and Site Driveway #2



**LEGEND**

----- Morris Rd. / Village Way  
Realignment



**FEARRINGTON RETAIL DEVELOPMENT  
CHATHAM COUNTY, NORTH CAROLINA**

Site Location Map

Scale: Not to Scale

Figure 1

## **1.2 Land Use and Site Access**

The site plan indicates the Ferrington Retail development will consist of a 30,000 sf grocery store, 51,200 sf of retail space, and four outparcels. For purposes of this study, and based on discussions with the site engineer, the four outparcels will be considered as a 6,000 sf high-turnover sit-down restaurant, a 3,000 sf convenience market, a 14,000 sf pharmacy with drive through window, and a drive-in bank with 3 drive-through lanes. This study assumes a build out year of 2009.

Access to the site will be provided via two proposed unsignalized driveways. Site Driveway #1 is proposed to be located approximately 670 feet north of Morris Road on US 15-501 and will be built as a right-in / right-out driveway. Site Driveway #2 is proposed as a full access unsignalized driveway to be located on Morris Road. One scenario considers this driveway to be aligned with Kentview Drive and approximately 900 feet west of US 15-501. A second scenario considers this driveway to be located approximately 410 west of US 15-501. Refer to Figure 2 for the proposed site plan.

## **1.3 Existing Land Uses**

The subject property currently exists as undeveloped land. Development along Morris Road and Village Way consists of single family homes. Development to the south along US 15-501 consists of mostly residential development while development to the north along US 15-501 consists of a mix of residential and commercial development. The Briar Chapel development is located on US 15-501 north of the proposed site.

## **1.4 Existing Roadways**

The project study area for this TIA consists of the following facilities: US 15-501, Morris Road, and Village Way. US 15-501 carries traffic in the north and south directions between Chapel Hill and Pittsboro and has a posted speed limit of 55 miles per hour (mph) in the study area. US 15-501 exists as a multi-lane divided facility within the study area. Based on 2004 NCDOT ADT maps, US 15-501 carried approximately 11,000 vpd at a location south of Morris Road.



NO.	REVISIONS

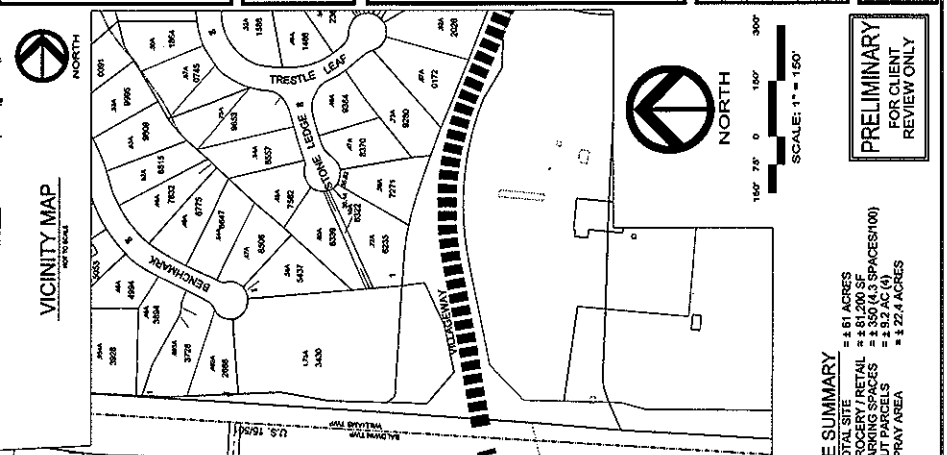
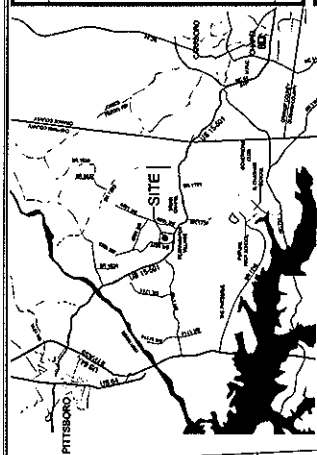
**CE Group, Inc.**  
**CIVIL ENGINEERING**  
**CONSTRUCTION MANAGEMENT**  
1100 S. W. 10TH AVENUE, SUITE 200, MIAMI, FL 33135  
 TEL: 305.444.4444 FAX: 305.444.4444



**Farrington Retail**  
**Conceptual Site Plan**  
 Chatham County  
 North Carolina  
 US 15/501 and Morns Road

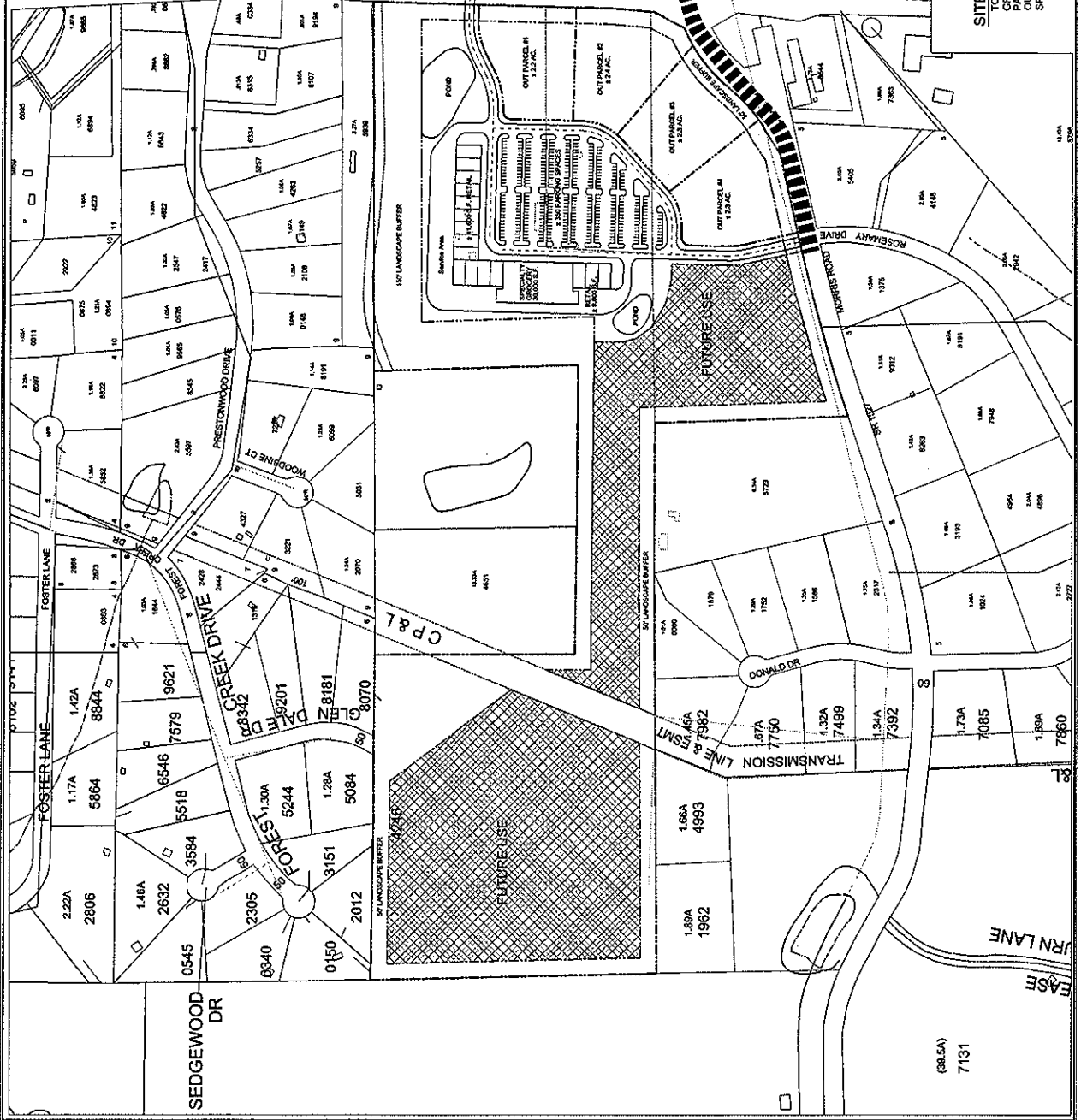
Date: April 23, 2008  
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 Drawing: 31A  
 Project: 101  
 Client: Farrington Retail  
 1500 S.W. 10th Ave.

Sheet No. **C** of **1**



**PRELIMINARY FOR CLIENT REVIEW ONLY**

**SITE SUMMARY**  
 TOTAL SITE = 5.61 ACRES  
 GROCERY / RETAIL = 2,812,000 SF  
 PARKING SPACES = 2,350 (4.3 SPACES/100)  
 OUT PARCELS = 2.92 AC (4)  
 SPUR AREA = 2.224 ACRES



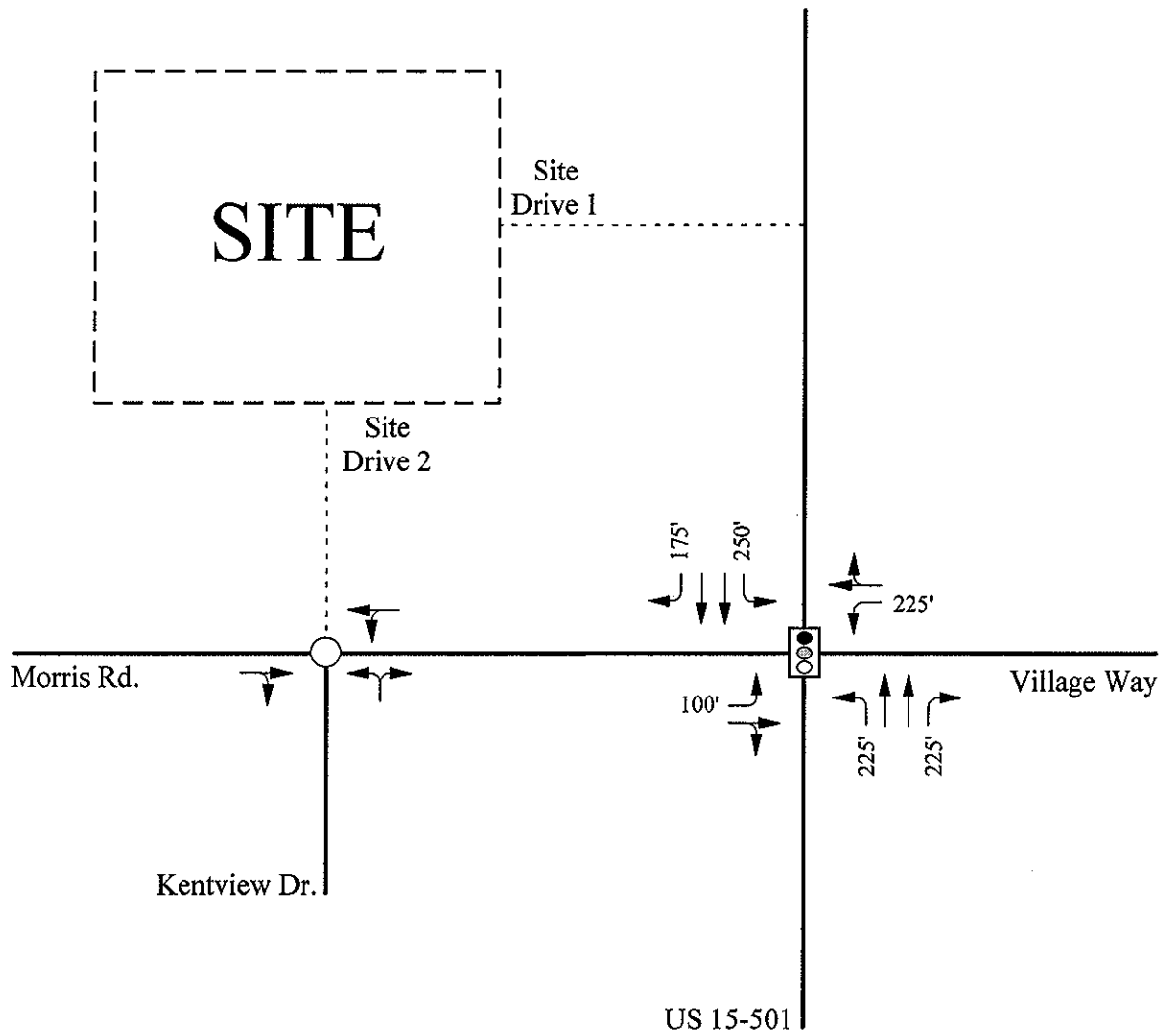
Morris Road is a two-lane roadway that provides access for residential uses to US 15-501. Morris Road has a posted speed limit of 45 mph in the study area. Village Way is a two-lane roadway that provides access for residential uses to US 15-501. Village Way has a posted speed limit of 25 mph in the study area.

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




## **2. TRAFFIC ANALYSIS PROCEDURE**

All intersection capacity analyses were completed using Synchro (Version 5.0). Synchro is a comprehensive software package that allows the user to model and optimize signal timing for coordinated and uncoordinated signalized intersections to determine levels of service (based on the thresholds specified in the 2000 Highway Capacity Manual). In addition, Synchro also allows unsignalized analyses to be performed utilizing the methodologies outlined in the 2000 Highway Capacity Manual. Therefore, all analyses in this study were performed using Synchro exclusively.

Analysis results for signalized intersections provide level of service calculations for all approaches and an overall resulting level of service. Capacity analysis results for unsignalized intersections do not provide an overall level of service, but rather a level of service for movements and/or approaches that have a conflicting movement. Capacity and level of service are the design criteria for this traffic study.



**LEGEND**

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Existing Lanes	
Scale: Not to Scale	Figure 3

The HCM defines capacity as “the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions.” Level of service (LOS) is a term used to represent different driving conditions, and is defined as a “qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers.” Level of service varies from Level “A” representing free flow, to Level “F” where greater vehicle delays are evident. Refer to Table 1 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized Intersections. Control delay as defined by the HCM includes “initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.” In previous versions of the HCM, the delay included only stopped delay. As shown in Table 1, levels of service are stated in terms of average control delay. An average control delay of 40 seconds at a signalized intersection corresponds to level of service D.

**TABLE 1  
HCM Levels of Service and Delay**

<b>SIGNALIZED INTERSECTION</b>		<b>UNSIGNALIZED INTERSECTION</b>	
<b>LEVEL OF SERVICE</b>	<b>AVERAGE CONTROL DELAY PER VEHICLE (S/VEH)</b>	<b>LEVEL OF SERVICE</b>	<b>AVERAGE CONTROL DELAY PER VEHICLE (S/VEH)</b>
A	0 – 10	A	0 – 10
B	10 – 20	B	10 – 15
C	20 – 35	C	15 – 25
D	35 – 55	D	25 – 35
E	55 – 80	E	35 – 50
F	> 80	F	> 50

### **3. EXISTING (2006) TRAFFIC CONDITIONS**

#### **3.1 Existing Peak Hour Traffic Volumes**

Weekday AM and PM peak hour traffic volumes at the intersection of US 15-501 at Morris Road / Village Way were determined from turning movement counts performed by RKA on March 28-29, 2006 during the AM (7:00 AM to 9:00 AM) and PM (4:30 to 6:30 PM) peak periods. A summary of the traffic count data can be found in Appendix A of this report.

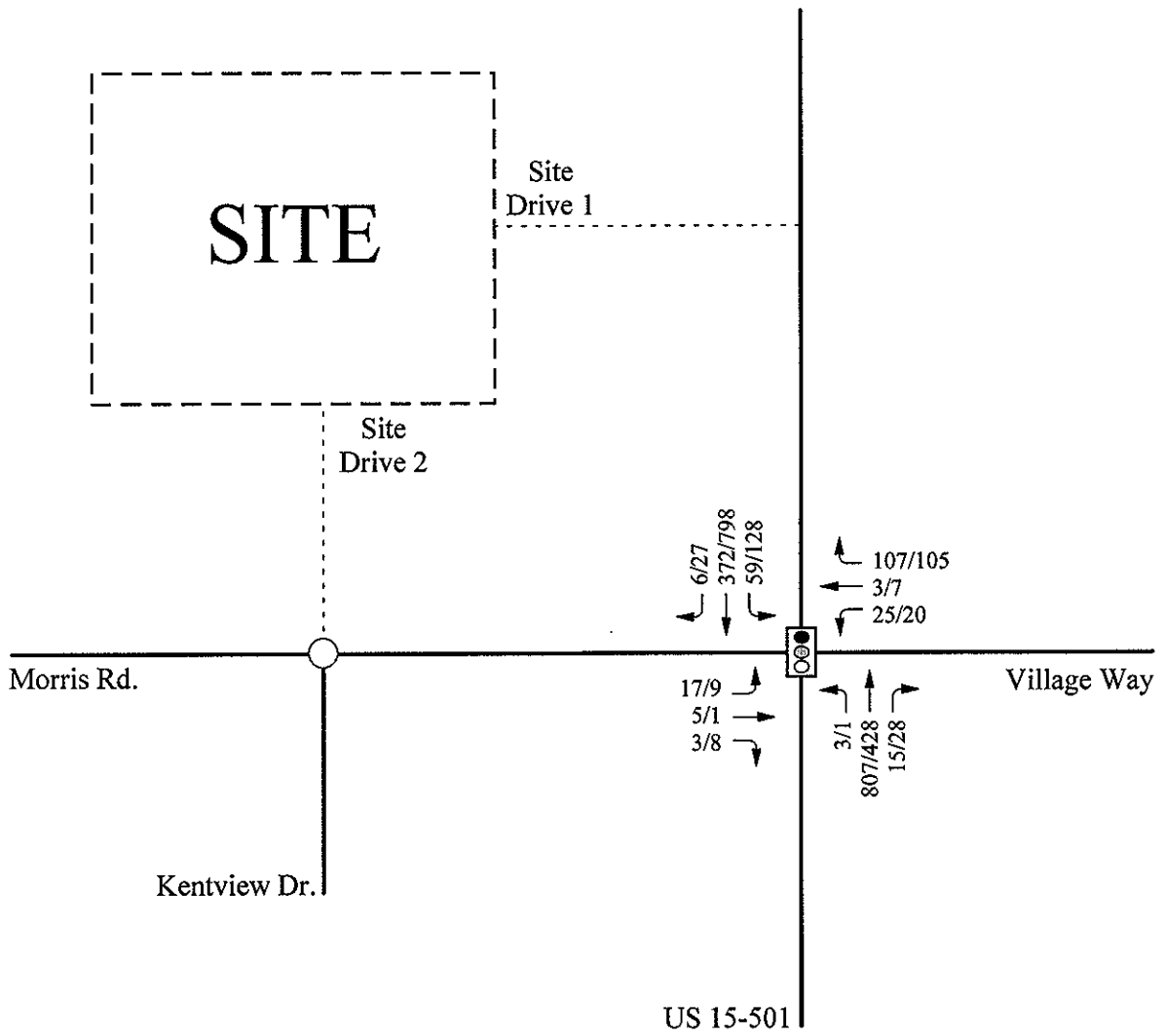
### 3.2 Analysis of Existing Peak Hour Traffic Volumes

To estimate current levels of service (LOS) at the study intersections, existing (2006) traffic volumes (see Figure 4) were analyzed using existing lane configurations and traffic control. Signal timings for the intersection of US 15-501 were provided by the NCDOT. This intersection was analyzed with a fully actuated controller operating under isolated conditions with timings and phasing as shown on the signal design plan. The results are presented in Table 2. Refer to Appendix B for more detailed capacity analysis results.



Analysis indicates the signalized intersection of us 15-501 and Morris Road / Village Way operates at an overall LOS A in the AM and PM peak hours with all approaches operating at LOS C or better under existing (2006) traffic conditions.

**TABLE 2**  
**Analysis of Existing (2006) Weekday Peak Hour Traffic**

INTERSECTION	A P P R O A C H	LANE CONFIGURATION	LEVEL OF SERVICE			
			AM PEAK HOUR		PM PEAK HOUR	
			Appr.	Overall	Appr.	Overall
US 15-501 and Morris Road / Village Way (Signalized)	EB	1 LT, 1 TH-RT	C	A	B	A
	WB	1 LT, 1 TH-RT	A		A	
	NB	1 LT, 2 TH, 1 RT	A		B	
	SB	1 LT, 2 TH, 1 RT	A		A	



**LEGEND**

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

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Existing (2006) Peak Hour Traffic	
Scale: Not to Scale	Figure 4

#### **4. BACKGROUND (2009) TRAFFIC CONDITIONS**

In order to account for the growth of traffic and subsequent traffic conditions at a future year, background traffic projections are needed. Background traffic is that component of traffic due to growth of the community and surrounding area that is anticipated to occur regardless of whether the proposed development is constructed.

##### **4.1 Background Peak Hour Traffic Volumes**

To determine background traffic volumes, the existing traffic volumes (see Figure 4) at study intersections were projected to the year 2009 by applying an annual compounded growth rate of 2%. A conservative growth rate of 2% was assumed based on a review of NCDOT ADT data from 2000 to 2004 and since there is a large amount of adjacent development traffic that is considered under background conditions. Future (2009) peak hour traffic (i.e., without the site and without adjacent development) is illustrated in Figure 5.

##### **4.2 Future Roadway Improvements**

It is our understanding that there are no future roadway improvements planned at the study intersections. Several roadway improvements will be constructed by Briar Chapel north of the site. Morris Road was recently realigned to intersect with Village Way as a four leg intersection at US 15-501.

##### **4.3 Adjacent Development Traffic**

Based on discussions with NCDOT and local agencies, this study assumes new traffic from two adjacent developments and diverted traffic from two existing developments. The new development trips are Briar Chapel and The Preserve Expansion. Diverted trips are considered from the existing Preserve development and The Legacy.

Briar Chapel is a mixed use development located on the west side of US 15-501 between Andrews Store Road and Mann's Chapel road, north of the proposed Fearington Retail Development. This is a large development that is expected to be fully built out by 2014 but is expected to be built out in phases. For purposes of this study, it was assumed that

approximately 75% of the Briar Chapel Development will be built by the study year 2009. Refer to Appendix C for figures illustrating Briar Chapel traffic (the volumes in these figures represent full build out of the Briar Chapel Development and were reduced by 25% for purposes of this study). Peak hour traffic volumes for the development were provided in the TIA report completed by Kimley-Horn and Associates.

The Preserve Expansion is a proposed expansion to the existing Preserve residential development located on the east side of Mt. Gilead Church Road, southeast of the proposed Fearington Retail development. This expansion is expected to include approximately 300 single family homes and will be built out by 2010. The Preserve Expansion is expected to contribute some traffic that will utilize Mt. Gilead Church Road to access US 15-501 and will travel to/from Chapel Hill to the north. Refer to Appendix C for a figure illustrating The Preserve Expansion traffic.

With the opening of the Preserve Expansion, a new connection will be provided that will allow traffic from The Preserve and Legacy residential developments (west of Big Woods Road) to utilize a more direct route to/from Chapel Hill via 15-501. This traffic will travel through The Preserve Expansion to Mt. Gilead Church Rd. and up to US 15-501. Refer to Appendix C for a figure illustrating diverted traffic from The Preserve and Legacy developments. Refer to Figure 6 For an illustration of total adjacent development traffic.

#### **4.4 Analysis of Background Peak Hour Traffic Volumes**

The total adjacent development trips (Figure 6) were added to future (2009) traffic volumes (Figure 5) to determine background (2009) traffic volumes. Background (2009) peak hour traffic is illustrated in Figure 7.

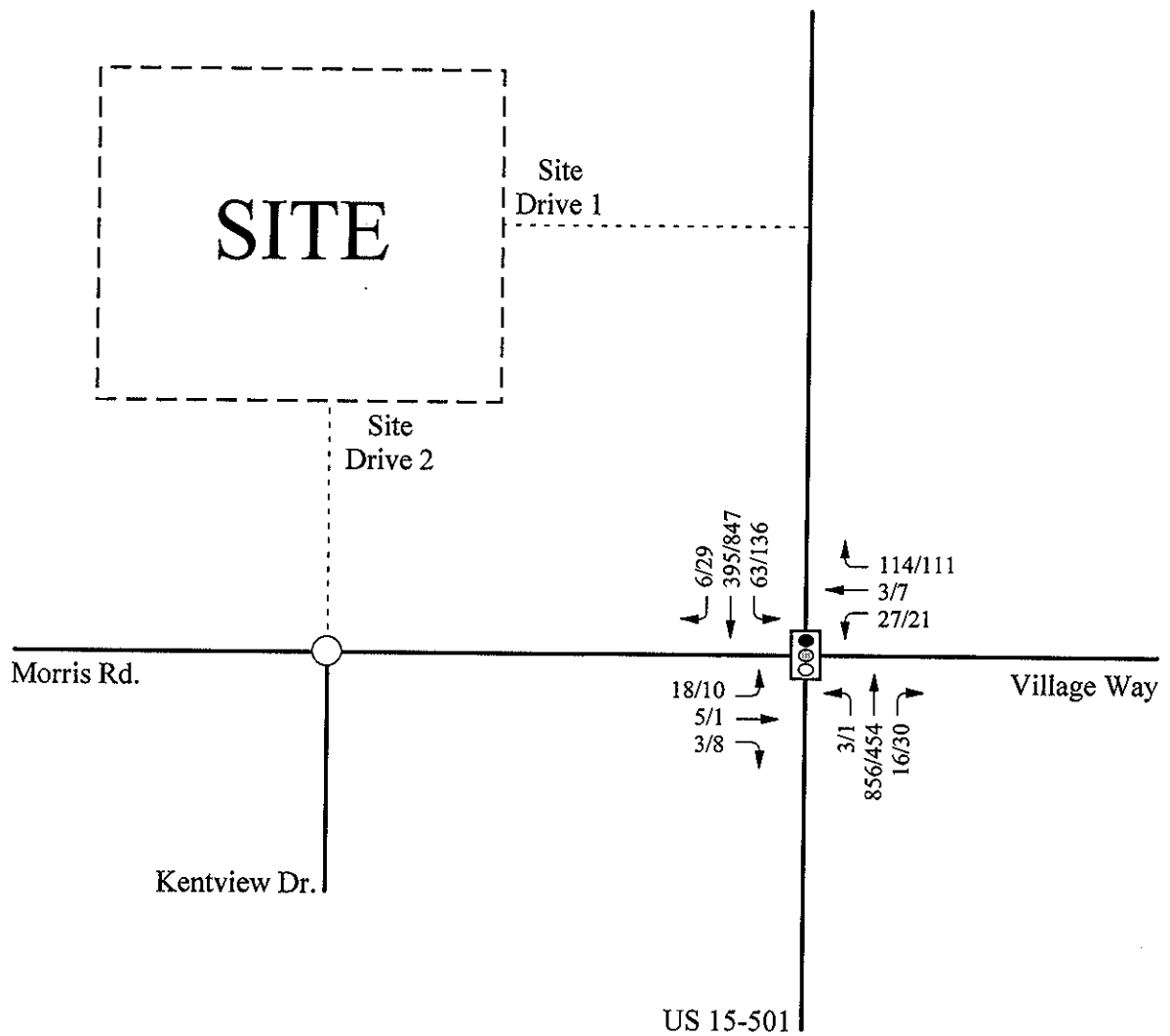
Study intersections were analyzed under background (2009) traffic conditions using the same methodology as previously noted for the existing traffic conditions. The signalized intersection of US 15-501 and Morris Road / Village Way was analyzed using the same cycle length and timings as used under existing (2006) conditions. A summary of the capacity analysis results is presented in Table 3. Refer to Appendix D for more detailed capacity analysis results.





Analysis indicates the signalized intersection of US 15-501 and Morris Road / Village Way will operate at an overall LOS A in the AM and PM peak hours with all approaches operating at LOS C or better under background (2009) traffic conditions.

**TABLE 3**  
**Analysis of Background (2009) Weekday Peak Hour Traffic**

INTERSECTION	A P P R O A C H	LANE CONFIGURATION	LEVEL OF SERVICE			
			AM PEAK HOUR		PM PEAK HOUR	
			Appr.	Overall	Appr.	Overall
US 15-501 and Morris Road / Village Way (Signalized)	EB	1 LT, 1 TH-RT	C	A	C	A
	WB	1 LT, 1 TH-RT	B		B	
	NB	1 LT, 2 TH, 1 RT	B		B	
	SB	1 LT, 2 TH, 1 RT	A		A	

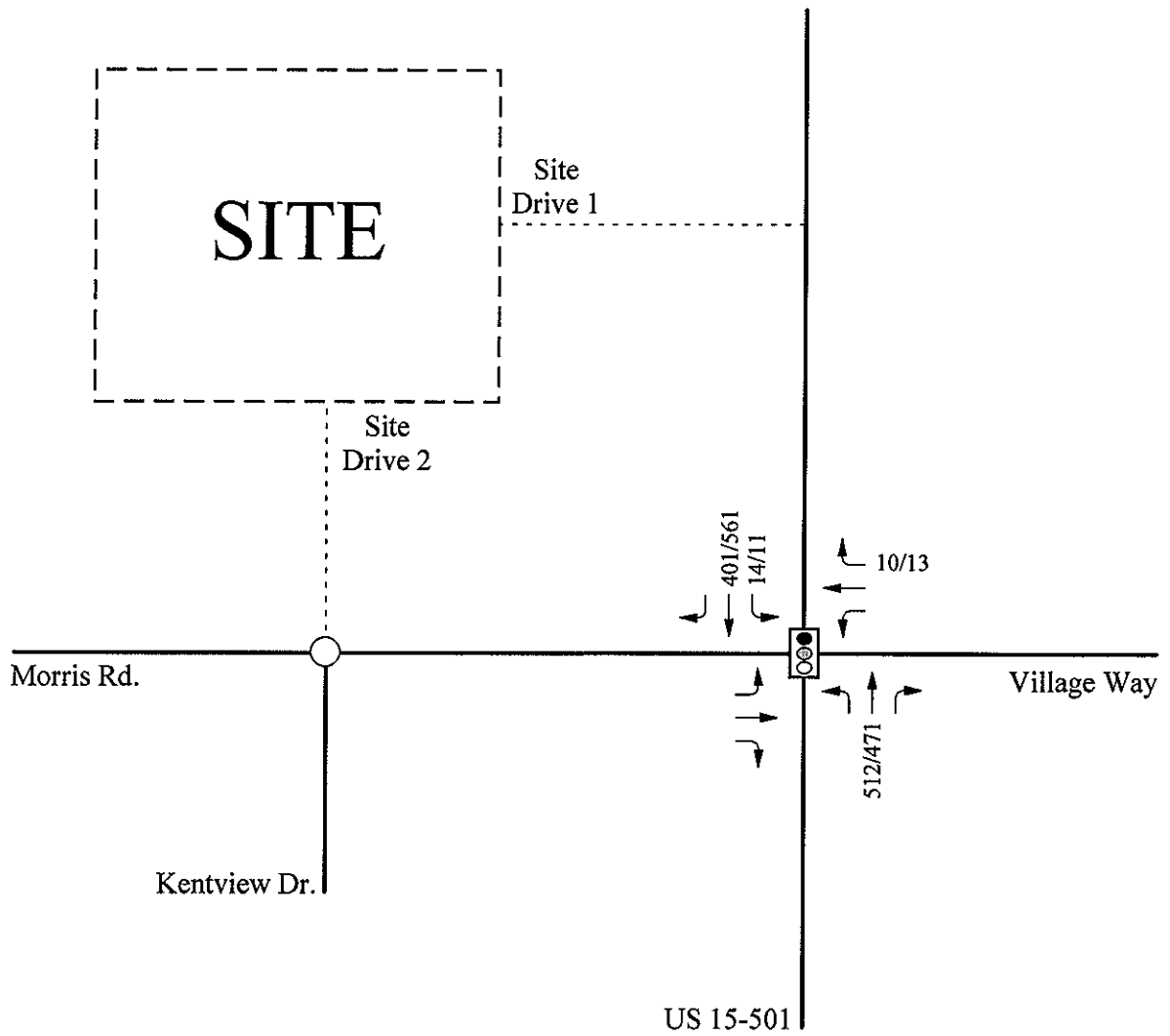


**LEGEND**



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



FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Future (2009) Peak Hour Traffic	
Scale: Not to Scale	Figure 5

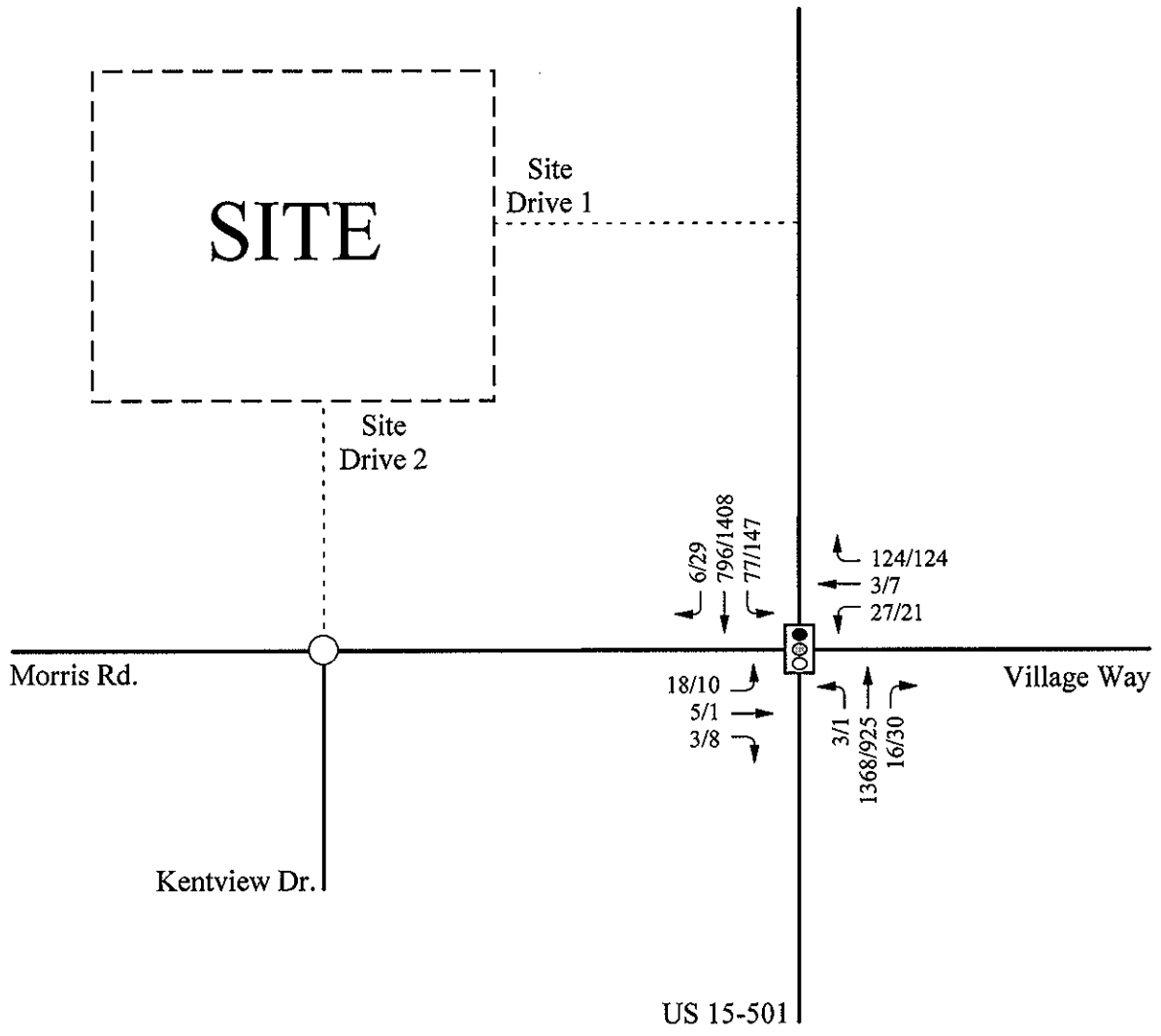


**LEGEND**



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



FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Total Adjacent Development Traffic	
Scale: Not to Scale	Figure 6



**LEGEND**

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

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Background (2009) Peak Hour Traffic	
Scale: Not to Scale	Figure 7

## 5. TRIP GENERATION

Average weekday daily, AM and PM peak hour site trips for this study were calculated utilizing methodology contained within the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 7<sup>th</sup> Edition. The site plan indicates the Fearington Retail development will consist of a 30,000 sf grocery store, 51,200 sf of retail space, and four outparcels. For purposes of this study, and based on discussions with the developer, the four outparcels will be considered as a 6,000 sf high-turnover sit-down restaurant, a 3,000 sf convenience market, a 14,000 sf pharmacy with drive through window, and a drive-in bank with 3 drive-through lanes.

It is estimated the proposed Fearington Retail development will generate 13,240 trips (entering and exiting) during a typical weekday. Of this total, the development will generate 550 trips (304 entering and 246 exiting) during the AM peak hour and 1,261 trips (633 entering and 628 exiting) during the PM peak hour. However, not all of these trips will impact the adjacent roadway network. A portion of these trips will exist as pass-by trips. Refer to Table 4 for a detailed breakdown of the trip generation results.

There is expected to be internal trips between land uses within the development that will not access external roadways. These internal capture trips would reduce the trip generation shown in Table 4. To be conservative, this study does not consider any internal capture trips.

### 5.1 Pass-By Trips

The ITE *Trip Generation Handbook* defines pass-by trips as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from the traffic passing the site on an adjacent street, when the adjacent street provides direct access to the generator. An example of a pass-by trip is a stop at the proposed development for a vehicle on the way home from work. These trips will not add to the overall traffic volumes on the roadway, but will add to the turning traffic at the site's driveway connections. The ITE pass-by percentages for each land use were applied to PM peak hour trips. It is assumed that any pass-by trip that occurs during the peak hour will enter and exit during that hour. Therefore, the entering and exiting pass-by trips have been balanced. Refer to Table 4 for a breakdown of pass-by trips for the proposed Fearington Retail development.

**Table 4  
Site Trip Generation**

Development/Land Use	Size	Units	Weekday		AM Peak Hour			PM Peak Hour							
			Enter	Daily Exit	Total	In	Out	Total	In	Out	Total				
<b>Retail</b>															
Commercial Space (820) Pass-by Trips	51.2 34%	k.s.f.	2198	2198	4395	64	41	105	193	209	402	68	68	137	
Supermarket (850) Pass-by Trips	30.00 36%	k.s.f.	1700	1700	3400	48	31	79	184	177	361	65	65	130	
<b>Outparcels</b>															
High Turnover Sit-Down (932)	6.00 43%	k.s.f.	382	382	763	36	33	69	40	26	66	14	14	28	
Convenience Market (851)	3.00 61%	k.s.f.	1107	1107	2214	101	101	202	80	77	157	48	48	96	
Pharmacy w/ Drive Through (881)	14.00 49%	k.s.f.	617	617	1234	21	16	37	59	62	121	30	30	59	
Bank w/ Drive (912)	3.00 47%	lanes	617	617	1234	34	24	58	77	77	154	36	36	72	
<b>Total Trips</b>			<b>6,620</b>	<b>6,620</b>	<b>13,240</b>	<b>304</b>	<b>246</b>	<b>550</b>	<b>633</b>	<b>628</b>	<b>1,261</b>	<b>0</b>	<b>261</b>	<b>523</b>	
<b>Total Pass-by Trips</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Total Primary (New) Trips</b>			<b>6,620</b>	<b>6,620</b>	<b>13,240</b>	<b>304</b>	<b>246</b>	<b>550</b>	<b>372</b>	<b>367</b>	<b>739</b>	<b>304</b>	<b>367</b>	<b>739</b>	

(1) Based on ITE Trip Generation - 7th Edition

## **5.2 Primary Trips**

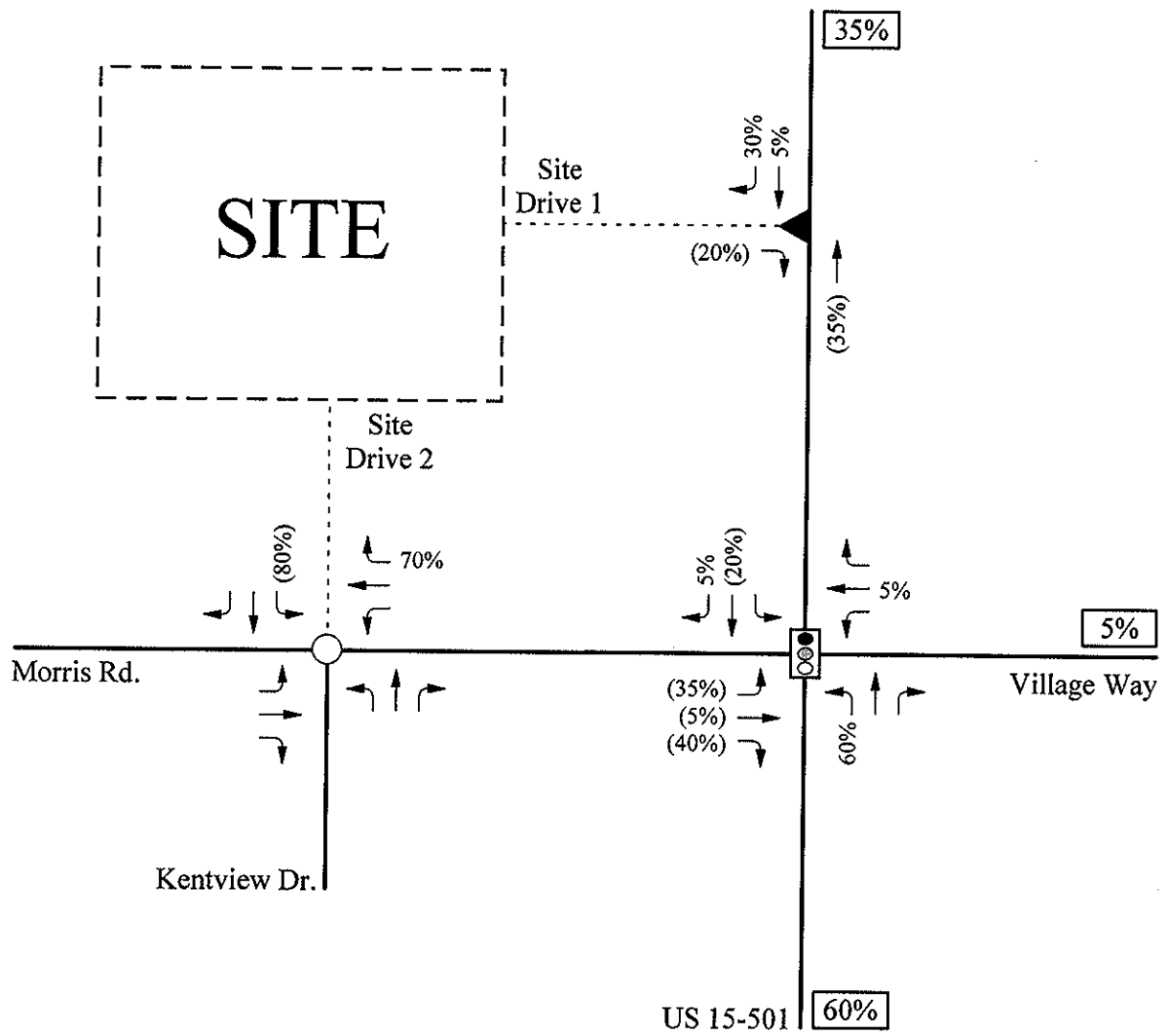
As previously indicated, not all of the total trips will be considered new trips to the roadway network. With adjustments made to account for pass-by trips, the Fearington Retail development will generate 550 new trips (304 entering and 246 exiting) during the AM peak hour and 739 new trips (372 entering and 367 exiting) during the PM peak hour. Refer to Table 4 for a detailed breakdown of the primary trips.

## **6. SITE TRIP DISTRIBUTION & ASSIGNMENT**



Primary trip distribution percentages for this development are based on the location of local population centers and engineering judgment. It is anticipated that approximately 60% of the primary trips will access the site via US 15-501 to/from the south, 35% of primary site trips will access the site via US 15-501 to/from the north, and 5% of primary site trips will access the site via Village Way to/from the east. Grocery stores and other commercial development is existing or planned north of the proposed site. Refer to Figure 8 for the primary site trip distribution percentages.

Pass-by trip distribution percentages were determined for the weekday PM peak hour based on existing traffic patterns and engineering judgment. All pass-by trips were taken from US 15-501. Refer to Figure 9 for the pass-by trip distribution percentages.

Primary and pass-by trips presented in Table 4 were assigned to the study intersections based on the distribution percentages shown in Figures 8 and 9. Refer to Figures 10 and 11 for an illustration of the total peak hour primary and pass-by site trips, respectively. Peak hour primary site trips were combined with peak hour pass-by site trips to determine the total site trips at study intersections. Refer to Figure 12 for the total AM and PM peak hour site trips at study intersections.

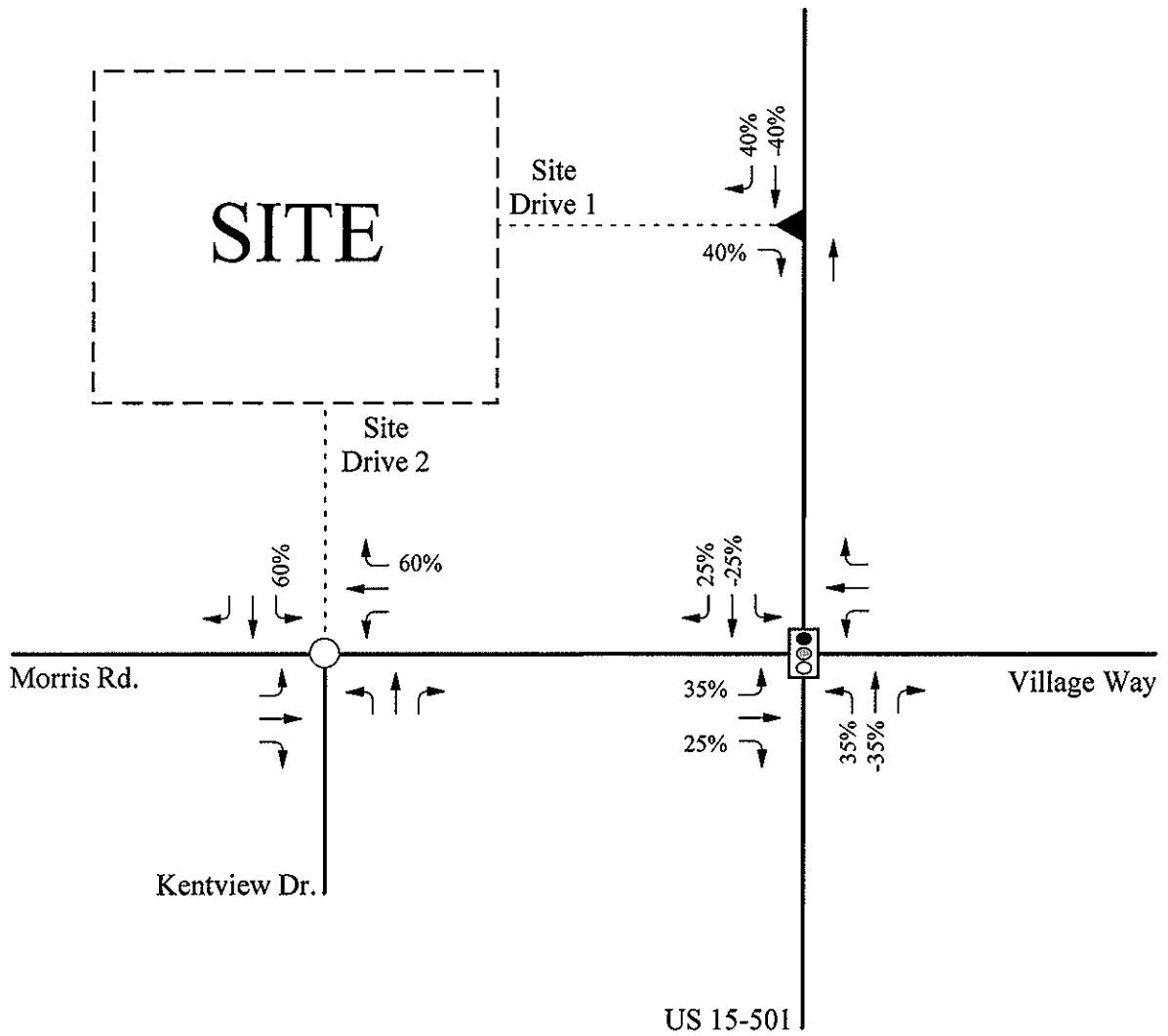


**LEGEND**



-  Signalized Intersection
-  Unsignalized Intersection
- X(Y) → Entering (Exiting) Site Distribution Percentages

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
Primary Site Trip Distribution Percentages		
	Scale: Not to Scale	Figure 8

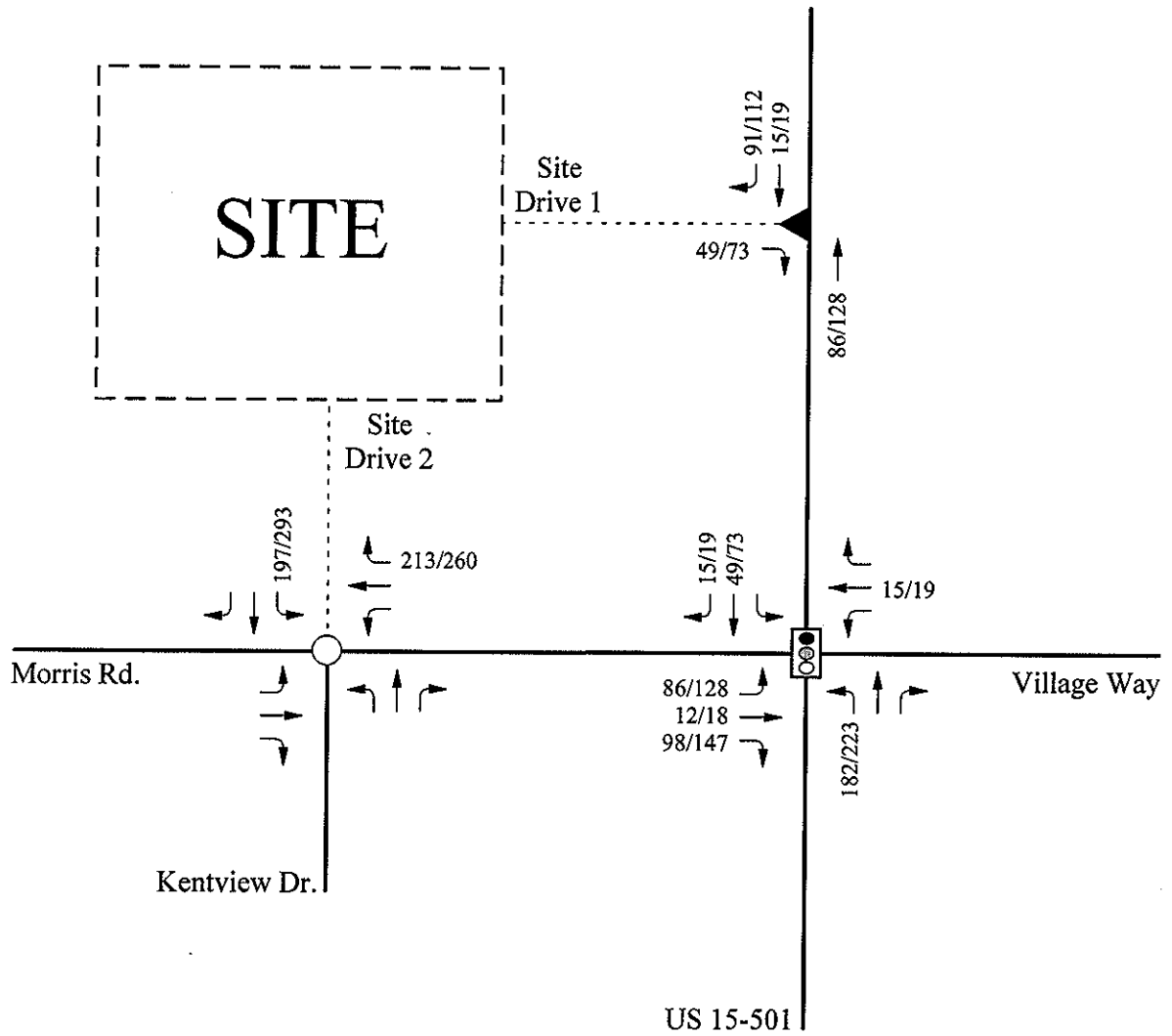







**LEGEND**

-  Signalized Intersection
-  Unsignalized Intersection
- X → Pass-By Site Trip Distribution Percentages

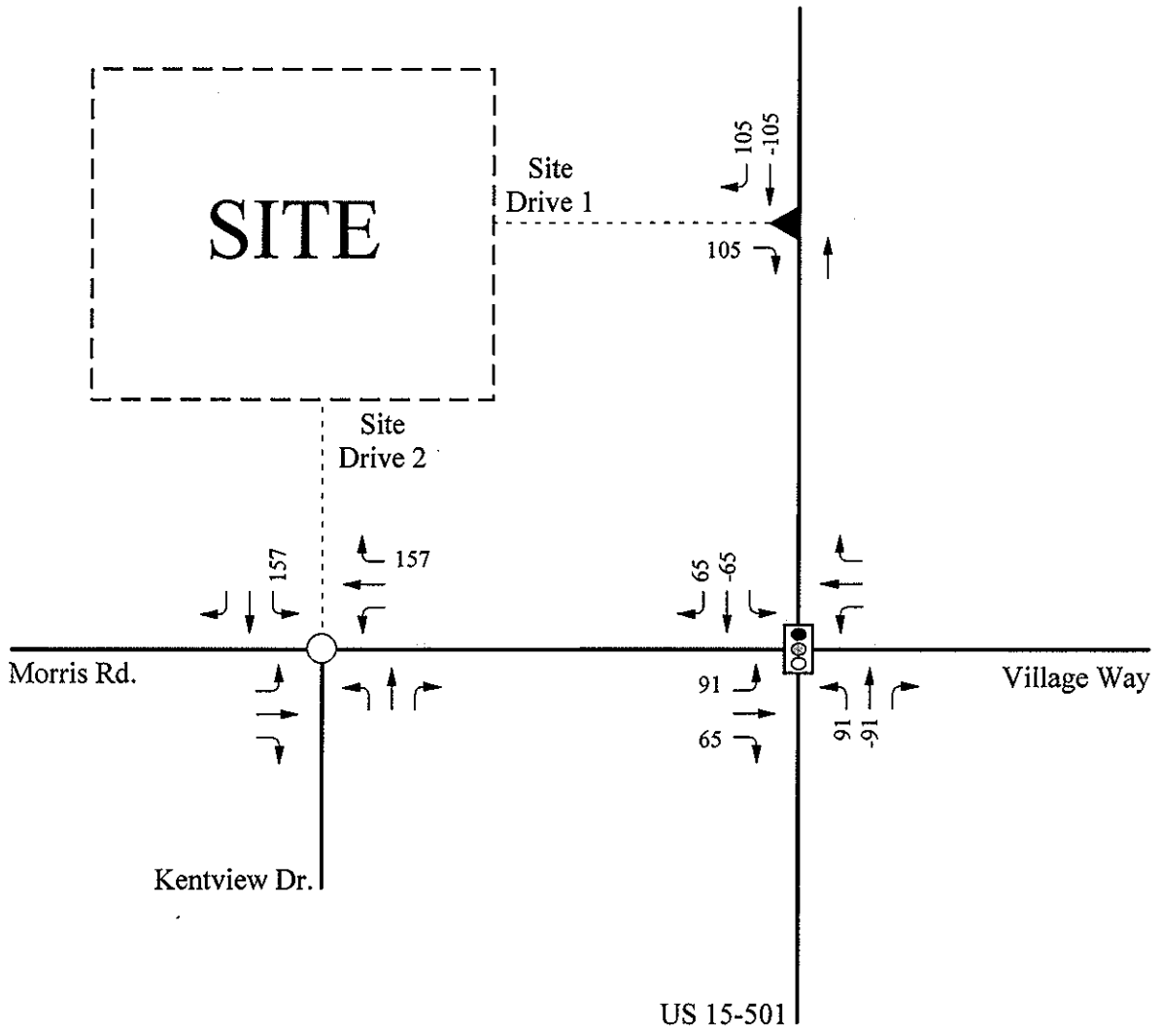
FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Pass-By Site Trip Distribution Percentages	
Scale: Not to Scale	Figure 9






**LEGEND**

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

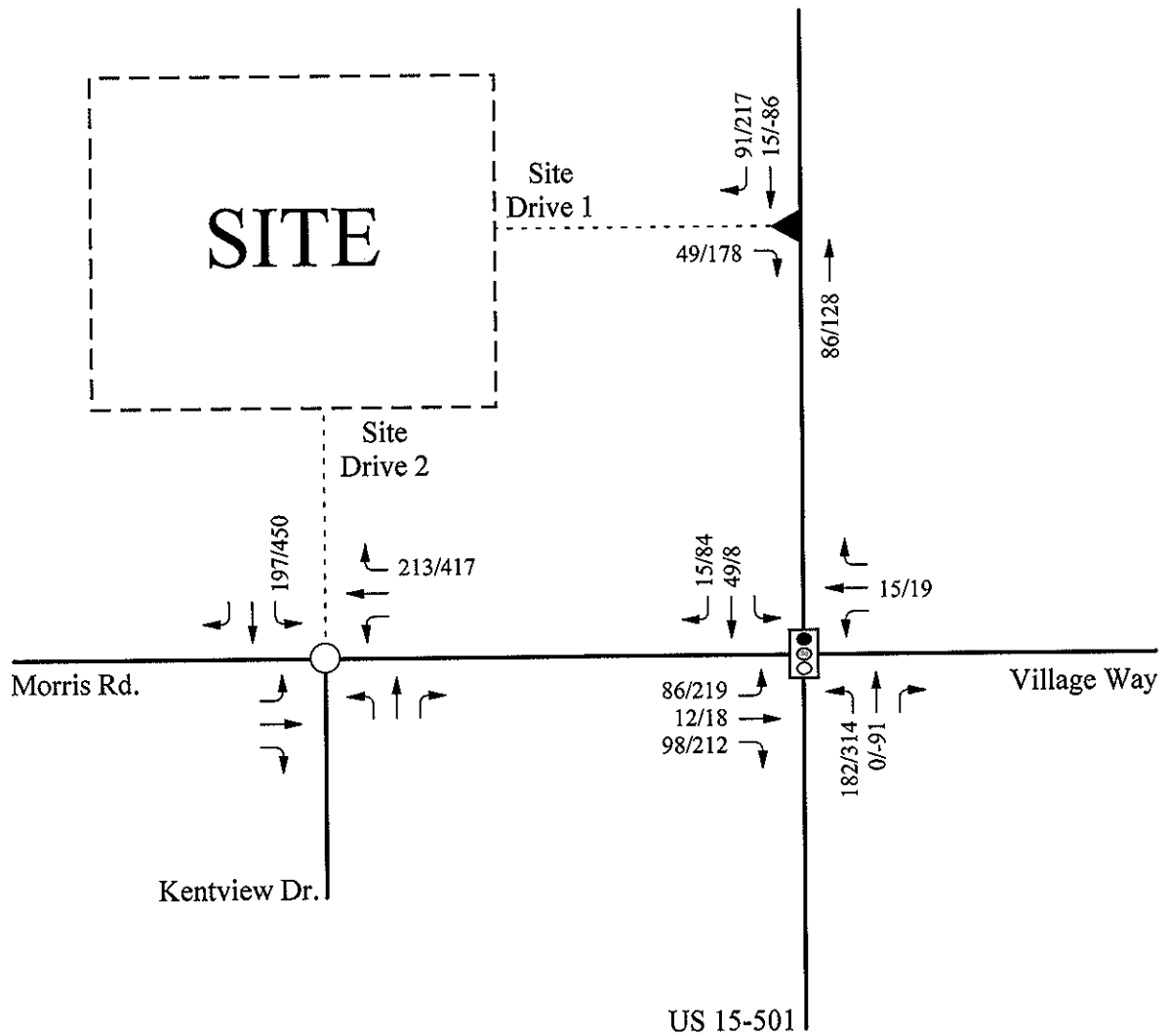
FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Primary Peak Hour Site Trip Assignment	
Scale: Not to Scale	Figure 10





**LEGEND**

-  Signalized Intersection
-  Unsignalized Intersection
-  PM Peak Hour Pass-By Site Trip

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA		
PM Peak Hour Pass-By Site Trip Assignment		
	Scale: Not to Scale	Figure 11

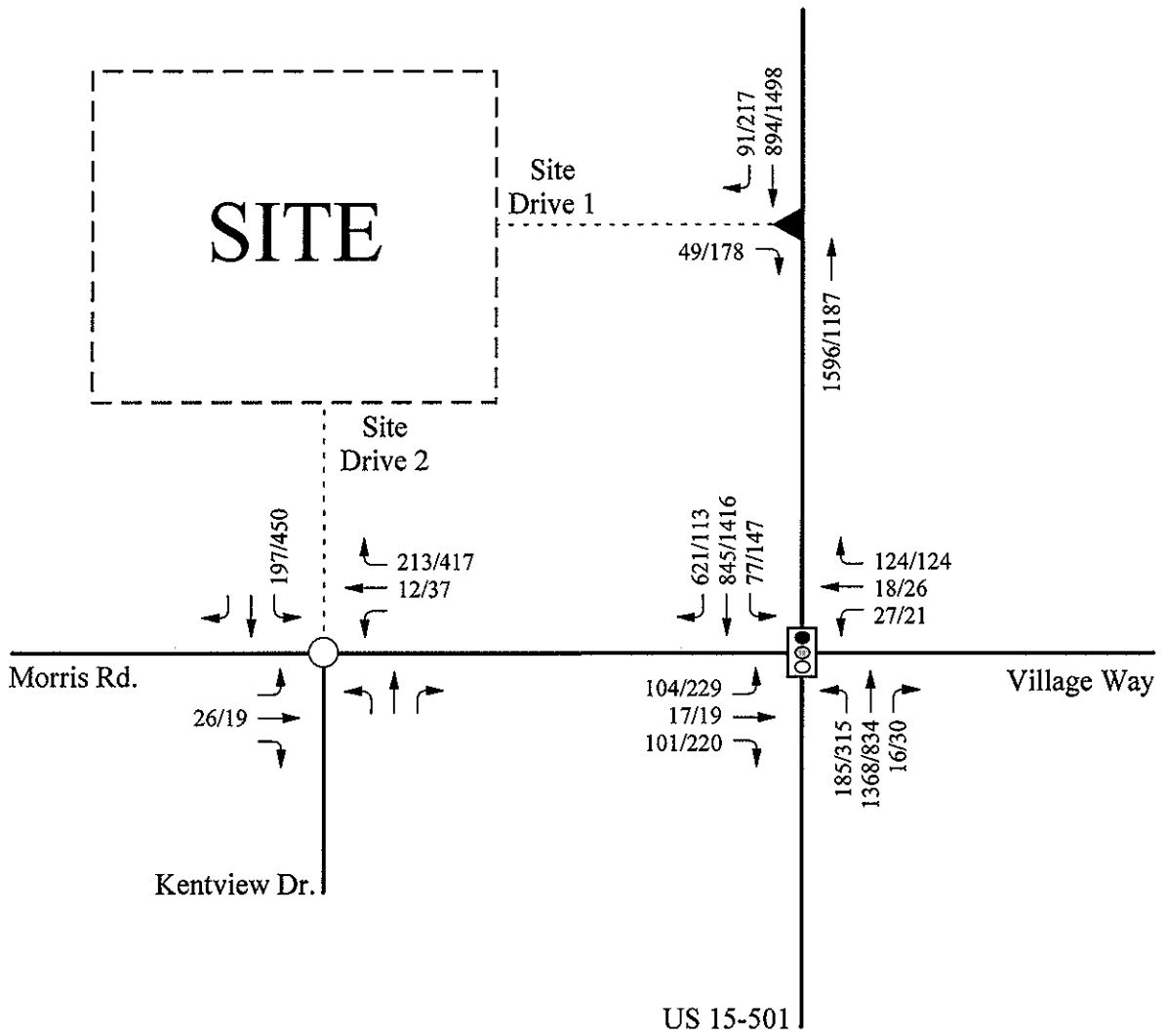


**LEGEND**



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

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Total Peak Hour Site Trip Assignment	
Scale: Not to Scale	Figure 12





**LEGEND**

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

FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Combined (2009) Peak Hour Traffic	
Scale: Not to Scale	Figure 13

## **7. COMBINED (2009) TRAFFIC CONDITIONS**

In order to determine peak hour traffic volumes for combined (2009) conditions, total peak hour site trips (Figure 12) were added to background (2009) traffic volumes (Figure 7). Refer to Figure 13 for the combined (2009) peak hour traffic volumes.

### **7.1 Analysis of Combined Peak Hour Traffic Volumes**

Combined (2009) traffic volumes were analyzed using the same lane configurations and traffic control conditions as under background (2009) conditions plus any necessary improvements to achieve an acceptable level of service, minimize delay, and accommodate expected queues. Note that since traffic counts were not taken at the intersection of Morris Road and Kentview Drive, five vehicles were added to each movement with zero turns in order to provide a more accurate analysis using the Synchro software. Table 5 includes a summary of the capacity analysis results under combined (2009) traffic conditions. Refer to Appendix E for detailed capacity analysis results.

With the addition of site traffic, analysis indicates the signalized intersection of US 15-501 and Morris Road / Village Way will operate at an overall LOS B during the AM peak hour and LOS D during the PM peak hour with existing lane configurations and signal timings.

To minimize delays and queues and achieve an acceptable level of service, this intersection was analyzed with improvements including dual eastbound left turn lanes, a protected eastbound left turn phase, and a 120 second cycle length. With these improvements, the intersection of US 15-501 and Morris Road / Village Way is expected to operate at LOS B during the AM peak hour and LOS C during the PM peak hour. All approaches are expected to operate at LOS D or better and queuing analysis indicates that queues are not expected to be significant.

**TABLE 5**  
**Analysis of Combined (2009) Weekday Peak Hour Traffic**

INTERSECTION	A P P R O A C H	LANE CONFIGURATION	LEVEL OF SERVICE			
			AM PEAK HOUR		PM PEAK HOUR	
			Appr.	Overall	Appr.	Overall
US 15-501 and Morris Road / Village Way (Signalized)	EB	1 LT, 1 TH-RT	C	B	F	D
	WB	1 LT, 1 TH-RT	B		C	
	NB	1 LT, 2 TH, 1 RT	B		C	
	SB	1 LT, 2 TH, 1 RT	B		C	
US 15-501 and Morris Road / Village Way (Signalized) <b>With Improvements</b>	EB	2 LT, 1 TH-RT	C	B	D	C
	WB	1 LT, 1 TH-RT	B		B	
	NB	1 LT, 2 TH, 1 RT	B		C	
	SB	1 LT, 2 TH, 1 RT	B		C	
US 15-501 at Site Driveway #1 (Unsignalized)	EB	1 RT	B <sup>2</sup>	N/A	D <sup>2</sup>	N/A
NB	2 TH	--	--			
SB	2 TH, 1 RT	--	--			
Morris Road at Site Driveway #2 / Kentview Drive (Unsignalized) Scenario 1	EB	1 LT-TH-RT	A <sup>1</sup>	N/A	A <sup>1</sup>	N/A
	WB	1 LT-TH-RT	A <sup>1</sup>		A <sup>1</sup>	
	NB	1 LT-TH-RT	A <sup>2</sup>		B <sup>2</sup>	
	SB	1 LT-TH-RT	B <sup>2</sup>		D <sup>2</sup>	
Morris Road at Site Driveway #2 (Unsignalized) Scenario 2	EB	1 LT-TH-RT	A <sup>1</sup>	N/A	A <sup>1</sup>	N/A
	WB	1 LT-TH, 1 RT	--		--	
	SB	1 LT-TH-RT	B <sup>2</sup>		D <sup>2</sup>	

NOTE: Improvements in **BOLD** type.

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

Capacity analysis indicates that the eastbound approach of Site Driveway #1 at US 15-501 is expected to operate at LOS B during the AM peak hour and LOS D during the PM peak hour. Queues on the eastbound approach of Site Driveway #1 are not expected to be significant.

There are two scenarios for the proposed location of Site Driveway #2. The first scenario considers Site Driveway #2 to be aligned with Kentview Drive, approximately 900 feet west of US 15-501. Capacity analysis indicates that the minor street approaches and major street left turn movements at the intersection of Morris Road and Site Driveway #2 / Kentview

Drive are expected to operate at LOS B or better during the AM and PM peak hours with the exception of the southbound approach of Site Driveway #2 which is expected to operate at LOS D during the PM peak hour. Queues on the southbound approach of Site Driveway #2 are not expected to be significant during the peak hours.

A second scenario considers Site Driveway #2 to be located between US 15-501 and Kentview Drive, approximately 410 feet west of US 15-501. Under this scenario, the southbound approach of Site Driveway #2 is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. Because of the proximity of Site Driveway #2 to US 15-501 under this scenario, it is recommended to construct a short westbound right turn lane on Morris Road to remove turning vehicles from the through movement. This should help prevent any potential queuing on Morris Road.

## **8. CONCLUSIONS**

This study determines the potential impacts to the surrounding transportation system caused by the additional traffic generated by the proposed Fearington Retail development to be located in the northwest quadrant of the intersection of US 15-501 and Morris Road / Village Way in Chatham County, North Carolina. The site plan indicates the Fearington Retail development will consist of a 30,000 sf grocery store, 51,200 sf of retail, and four outparcels. For purposes of this study, and based on discussions with the developer, the four outparcels will be considered as a 6,000 sf high-turnover sit-down restaurant, a 3,000 sf convenience market, a 14,000 sf pharmacy with drive through window, and a drive-in bank with 3 lanes. Access to the site will be provided via two proposed unsignalized driveways; one right-in/right-out unsignalized driveway on US 15-501 and one full access unsignalized driveway on Morris Road across from Kentview Drive. This study analyzed existing (2006) traffic conditions, background (2009) traffic conditions without the site, and combined (2009) traffic conditions with the site in place.

Future traffic from the Briar Chapel and The Preserve Expansion development are considered in the study along with diverted traffic from the Legacy and Preserve developments.



At full build out, the proposed Fearington Retail development will generate 13,240 trips (entering and exiting) during a typical weekday. Of this total, the development will generate 550 trips (304 entering and 246 exiting) during the AM peak hour and 1,261 trips (633 entering and 628 exiting) during the PM peak hour. With adjustments made to account for pass-by trips, the development will generate 739 new trips (372 entering and 367 exiting) during the PM peak hour.

#### US 15-501 and Morris Road / Village Way

Analysis indicates the signalized intersection of US 15-501 and Morris Road / Village Way operates at an overall LOS A in the AM and PM peak hours with all approaches operating at LOS C or better under existing (2006) and background (2009) traffic conditions. Improvements were recently made to this intersection including the realignment of Morris Road and the installation of a traffic signal.

Under combined conditions with site trips, analysis indicates the intersection of US 15-501 and Morris Road / Village Way will operate at an overall LOS B during the AM peak hour and LOS D during the PM peak hour with existing lane configurations and signal timings. With the addition of dual eastbound left turn lanes on Morris Way, a protected phase for the eastbound left turn movement, and a 120 second cycle length, this intersection is expected to operate at LOS C or better during the peak hours with all approaches operating at LOS D or better. Queuing analysis indicates that eastbound left turning queues will be accommodated by the installation of the dual left turn lanes while queues for other turning movements will be accommodated by existing storages.

#### US 15-501 and Site Driveway #1

Site Driveway #1 is proposed as a right-in/right-out driveway to be constructed on US 15-501 approximately 670 feet north of Morris Road / Village Way. Capacity analysis indicates that the eastbound approach of Site Driveway #1 at US 15-501 is expected to operate at LOS B during the AM peak hour and LOS D during the PM peak hour. Queues on the eastbound approach of Site Driveway #1 are not expected to be significant.

### Morris Road and Site Driveway #2

There are two scenarios for the proposed location of Site Driveway #2. The first scenario considers Site Driveway #2 to be aligned with Kentview Drive, approximately 900 feet west of US 15-501. Capacity analysis indicates that the minor street approaches and major street left turn movements at the intersection of Morris Road and Site Driveway #1 / Kentview Drive are expected to operate at LOS B or better during the AM and PM peak hours with the exception of the southbound approach of Site Driveway #2 which is expected to operate at LOS D during the PM peak hour. Queues on the southbound approach of Site Driveway #2 are not expected to be significant during the peak hours.

A second scenario considers Site Driveway #2 to be located between US 15-501 and Kentview Drive, approximately 410 feet west of US 15-501. Under this scenario, the southbound approach of Site Driveway #2 is expected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour. Because of the proximity of Site Driveway #2 to US 15-501 under this scenario, it is recommended to construct a short westbound right turn lane on Morris Road to remove turning vehicles from the through movement. This should help prevent any potential queuing on Morris Road.

Currently Morris Road serves a very low amount of traffic. However, if volumes on Morris Road increase significantly in the future, additional improvements may be needed to accommodate site traffic in and out of Site Driveway #2. It is recommended to monitor the traffic on Morris Road in the future to determine if any additional improvements are needed.

## 9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended as part of the proposed development to mitigate site traffic generated by the development. Refer to Figure 14 for an illustration of the recommended improvements.

### US 15-501 and Morris Road / Village Way

- Construct dual eastbound left turn lanes on Morris Road at US 15-501 with a minimum storage of 225 feet and a 100-foot taper.
- Provide a protected only phase for the eastbound left turn movement on Morris Road at US 15-501. Alter the signal timing plan at this intersection to lower the cycle length from 180 seconds to 120 seconds to reduce queuing.

### US 15-501 and Site Driveway #1

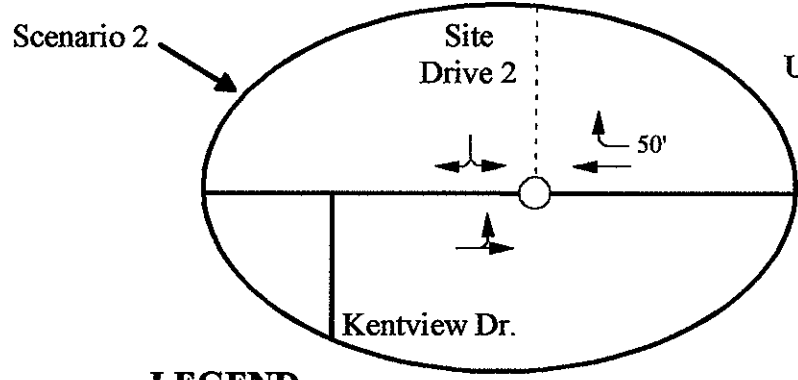
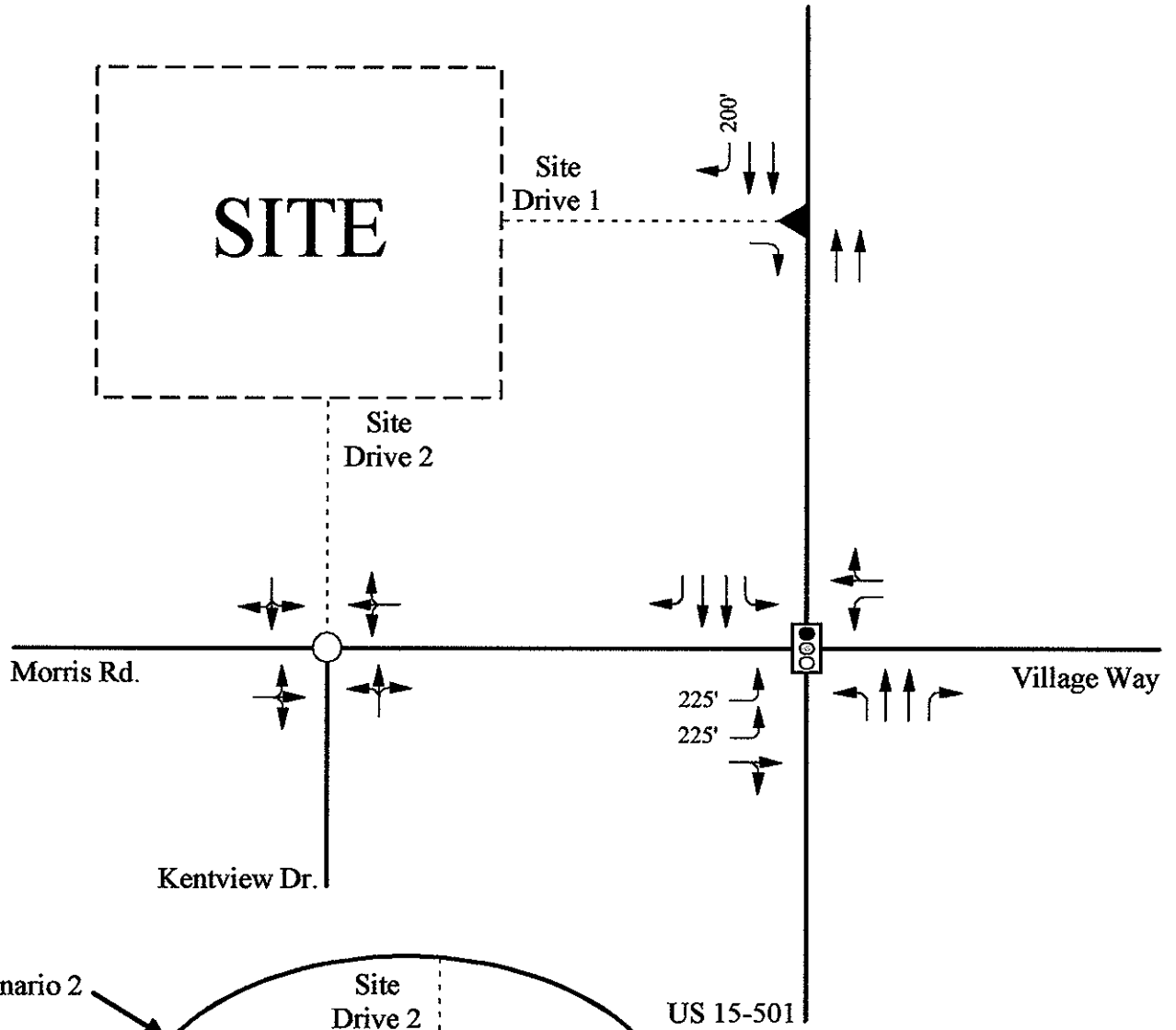
- Construct Site Driveway #1 with one ingress lane and one egress lane (one right turn lane).
- Construct an exclusive southbound right turn lane on US 15-501 at Site Driveway #1 with a minimum storage of 200 feet and a 100-foot taper.

### Morris Road and Site Driveway #2 / Kentview Drive (Scenario 1)

- Construct Site Driveway #2 with one ingress lane and one egress lane (one left-through-right shared lane). Align Site Driveway #2 with Kentview Drive.
- Monitor traffic volumes on Morris Road in the future to determine other improvements will be necessary at the intersection.

### Morris Road and Site Driveway #2 / Kentview Drive (Scenario 2)

- Construct Site Driveway #2 with one ingress lane and one egress lane (one left-right shared lane). Site Driveway #2 should be located between outparcels #3 and #4, approximately 410 feet west of US 15-501.
- Construct an exclusive westbound right turn lane on Morris Road at Site Driveway #2 with a minimum storage of 50 feet and a 100-foot taper.
- Monitor traffic volumes on Morris Road in the future to determine other improvements will be necessary at the intersection.



**LEGEND**

- Existing Lane
- Recommended Lane
- ◄ Recommended Right-In / Right-Out



FEARRINGTON RETAIL DEVELOPMENT CHATHAM COUNTY, NORTH CAROLINA	
Recommended Improvements	
Scale: Not to Scale	Figure 14