

# TRAFFIC IMPACT ANALYSIS SUMMARY

FOR THE

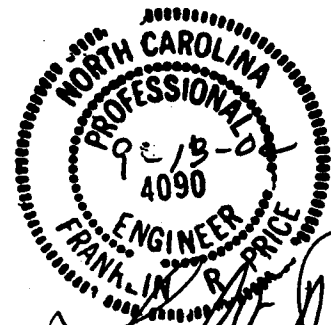
## PROPOSED RESIDENCE INN



Prepared For  
Town of Chapel Hill  
Chapel Hill, North Carolina

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

September 2002



# TRAFFIC IMPACT ANALYSIS PROPOSED RESIDENCE INN CHAPEL HILL, NORTH CAROLINA

## A. SUMMARY

The purpose of this document is to summarize the results of the Traffic Impact Analysis (TIA) Report for the proposed Residence Inn in Chapel Hill, North Carolina.

### 1. Project Overview

This study summarizes the findings of the Traffic Impact Analysis (TIA) that was performed for the proposed Residence Inn on Erwin Road in Chapel Hill, North Carolina. The purpose of this study is to determine the impact to the surrounding transportation system caused by the additional traffic generated by the proposed Residence Inn, which is anticipated to be fully built out by the year 2004. The TIA was prepared as part of the proposed development's Special use Permit application.

### 2. Study Area

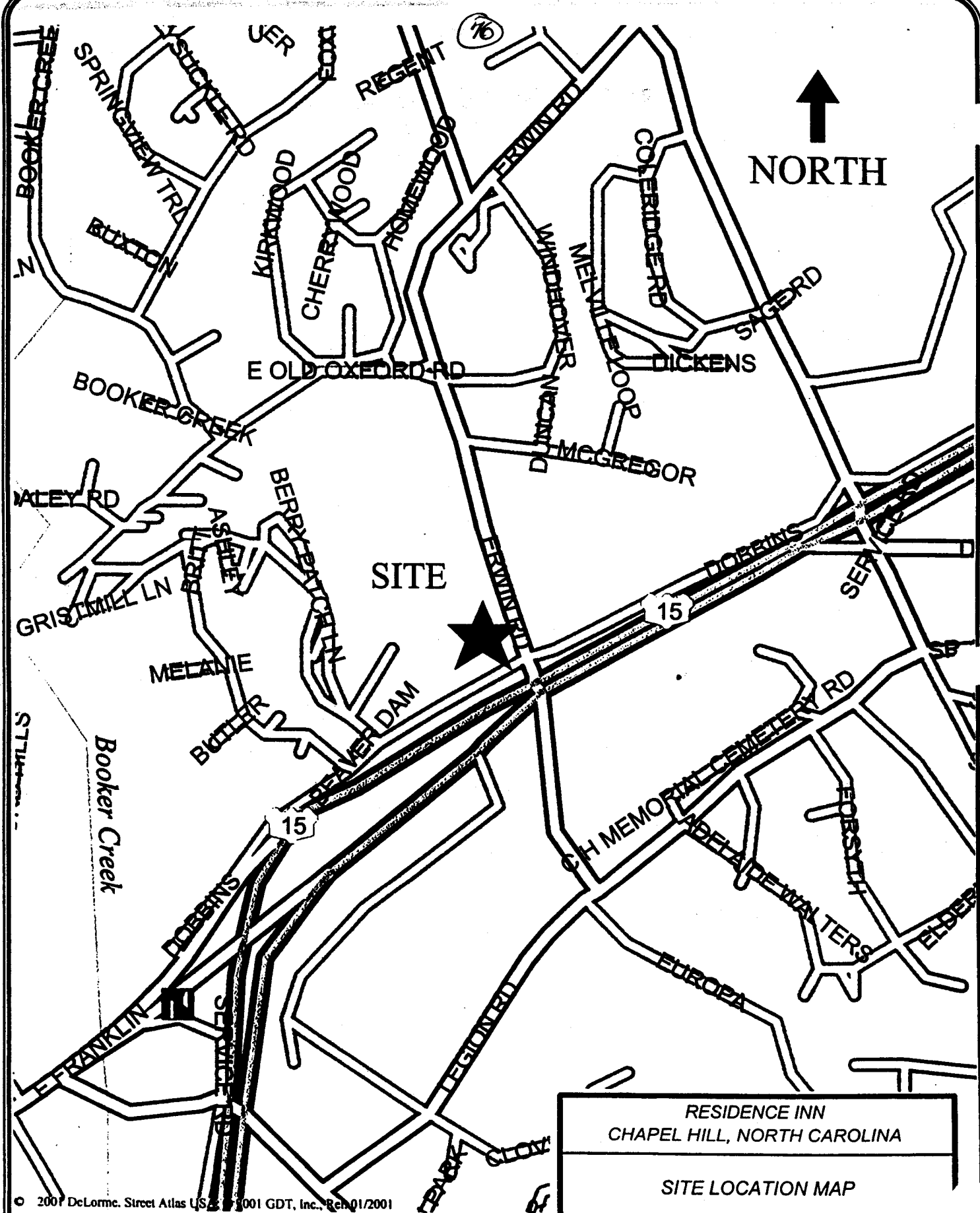
The study area for this project included the intersections of US 15-501 at Europa Drive/Erwin Road and Erwin Road at Dobbins Drive. The proposed development is located on the west side of Erwin Road between north of the Erwin Road/US 15-501 intersection. Refer to Figure S-1 for a site location map.

### 3. Site Traffic Generation

Trip generation for the proposed development is based on rates obtained from the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 6<sup>th</sup> Edition. It is anticipated that the proposed 120-room hotel will be complete by the year 2004. Please refer to Table S-1 for the trip generation results of the proposed development.

**TABLE S-1  
TRIP GENERATION**

LAND USE (ITE CODE)	DENSITY	Daily Traffic (vpd)		AM Peak Hour Trips (vph)		Mid-Day Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Hotel (310)	120 rooms	494	494	41	26	40	33	40	33
<b>Total Trips</b>		988		67		73		73	



RESIDENCE INN CHAPEL HILL, NORTH CAROLINA		
SITE LOCATION MAP		
9/02	Scale: Not to Scale	Figure S-1

#### 4. Access Analysis

Access to the proposed development is proposed to be provided via one (1) new driveway connection on Erwin Road. This driveway will service all movements and will be located approximately 210 feet north of the Dobbins Drive intersection (as determined by NCDOT). Currently, there are no driveway connections located on the opposite side of Erwin Road for the site driveway to be aligned. However, it should be noted that any future driveways located on the opposite side of Erwin Road should be aligned with the proposed site driveway to eliminate potential turning conflicts associated with offset driveways. Refer to Figure S-2 for an illustration of the land use and access plan.

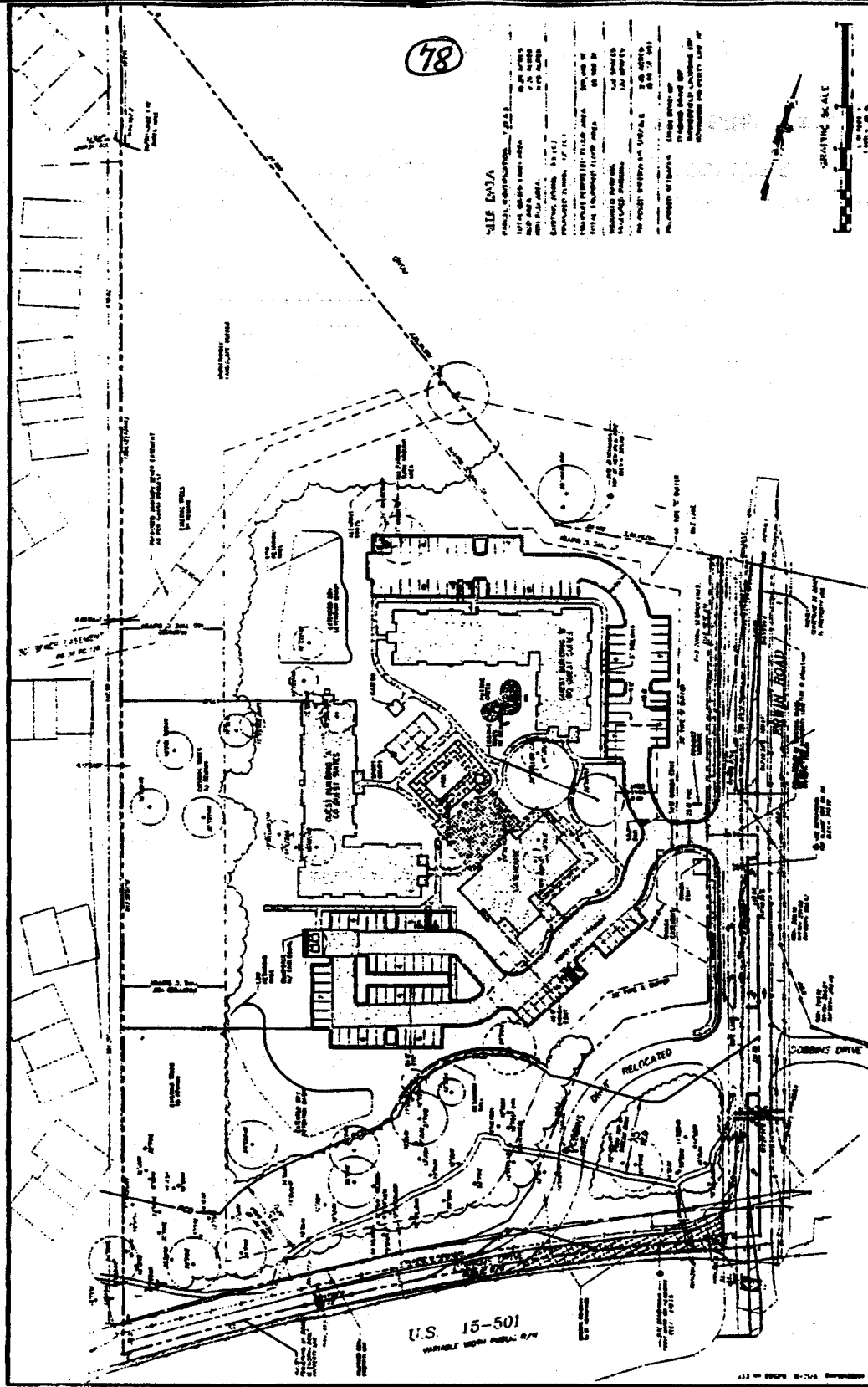
#### 5. Intersection Analysis

This study does not recommend signalization of the site driveway; therefore, a signal warrant analysis was not performed. However, an intersection accident analysis was performed as part of this study. According to accident data obtained from the NCDOT's Traffic Safety Systems Management Unit, a total of 51 crashes occurred at the intersection of US 15-501 and Europa Drive/Erwin Road between November 1, 1998 and October 31, 2001, with no fatal accidents. Based on North Carolina crash data obtained from the An Illustrated Analysis of North Carolina Traffic Crash Statistics for 2000, the total crash rate and severity index for the intersection was below the State and County averages. Refer to Appendix F for a detailed copy of the accident analysis.

#### 6. Peak Hour Intersection Level of Service

This study included three (3) separate analysis scenarios; existing (2002), background (2005), and combined (2005) traffic conditions for the AM, Mid-Day, and PM peak hours of a typical weekday. Based on information provided from the Town of Chapel Hill, five (5) adjacent developments will impact the study intersections. All traffic generated by these adjacent developments were included in the background (2005), as well as the combined (2005), traffic conditions. Refer to Tables S-2, S-3 and S-4 for existing (2002), background (2005), and combined (2005) peak hour traffic analysis results.

Capacity analysis indicates that the existing traffic signal located at the intersection of US 15-501 and Europa Drive/Erwin Road is currently operating acceptably during the AM and Mid-Day peak hours, but operates at an unacceptable level during the PM peak hour. The North Carolina Department of Transportation is redesigning this intersection to provide a superstreet configuration. Analysis indicates that all traffic signals associated with the superstreet design on US 15-501 will operate at acceptable levels of service under background (2005), and combined (2005), traffic conditions during peak periods.



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**SITE DATA**

PROJECT: RESIDENCE INN, 78.5  
 TOTAL AREA: 100,000 SQ. FT.  
 TOTAL BUILDING AREA: 100,000 SQ. FT.  
 TOTAL PAVED AREA: 100,000 SQ. FT.  
 TOTAL GREEN SPACE: 100,000 SQ. FT.  
 TOTAL TREES: 100,000  
 TOTAL PLANTS: 100,000  
 TOTAL LANDSCAPING: 100,000  
 TOTAL SITEWORK: 100,000  
 TOTAL UTILITIES: 100,000  
 TOTAL SITEWORK: 100,000  
 TOTAL UTILITIES: 100,000

GRAPHIC SCALE  
1" = 100' N.T.S.

<p><b>Kimley-Horn and Associates, Inc.</b>        100 S. W. 10th St., Suite 200        Fort Lauderdale, FL 33304        Phone: (305) 555-1111        Fax: (305) 555-1112</p>		<p>Summit Hospitality Group LTD</p>	<p>Residence Inn Chapel Hill, NC</p>
<p>DATE: 9/02</p>		<p>PROJECT: RESIDENCE INN</p>	<p>SCALE: 1" = 100' N.T.S.</p>
<p>DESIGNED BY: [Name]</p>		<p>CHECKED BY: [Name]</p>	<p>DATE: 9/02</p>
<p>APPROVED BY: [Name]</p>		<p>DATE: 9/02</p>	<p>FIGURE: S-2</p>
<p><b>SITE PLAN</b></p>			

<p><b>RESIDENCE INN CHAPEL HILL, NORTH CAROLINA</b></p>		
<p><b>LAND USE PLAN</b></p>		
9/02	Scale: Not to Scale	Figure S-2

**TABLE S-2**  
**ANALYSIS OF EXISTING (2002) TRAFFIC CONDITIONS**

INTERSECTION	A P P R O A C H	LANE CONFIGURATIONS	PEAK HOUR LEVEL OF SERVICE					
			AM PEAK		MID-DAY PEAK		PM PEAK	
			Approach	Overall	Approach	Overall	Approach	Overall
US 15-501 and Erwin Road (signalized)	EB	1 LT, 2 TH, 1 RT	C		C		D	
	WB	1 LT, 1 TH, 1 TH-RT	D	<b>D</b>	D	<b>D</b>	E	<b>E</b>
	NB	1 LT-TH, 1 RT	F		F		F	
	SB	1 LT-TH, 1 RT	F		E		F	
Erwin Road and Dobbins Drive (Western Leg) (unsignalized)	NB	1 LT, 1 TH	A <sup>1</sup>				A <sup>1</sup>	
SB	1 TH, 1 RT							
EB	1 LT-RT	C <sup>2</sup>		B <sup>2</sup>		D <sup>2</sup>		
Erwin Road and Dobbins Drive (Eastern Leg) (unsignalized)	NB	1 LT-TH	A <sup>1</sup>		A <sup>1</sup>		A <sup>1</sup>	
	SB	1 TH-RT						
	WB	1 LT-RT	C <sup>2</sup>		C <sup>2</sup>		D <sup>2</sup>	

1. Level of service for minor (left turn) movement.
2. Level of service for minor approach.

**TABLE S-3**  
**BACKGROUND (2005) TRAFFIC CONDITIONS WITHOUT SITE**

INTERSECTION	A P P R O A C H	LANE CONFIGURATIONS	PEAK HOUR LEVEL OF SERVICE					
			AM PEAK		MID-DAY PEAK		PM PEAK	
			Approach	Overall	Approach	Overall	Approach	Overall
US 15-501 (WB) and Median	WB NB	2 TH 2 LT	B D	<b>C</b>	B D	<b>C</b>	C D	<b>C</b>
US 15-501 (WB) and Erwin Road	WB SB	3 TH, 1 RT 2 RT	B D	<b>B</b>	A D	<b>B</b>	B D	<b>B</b>
US 15-501 (EB) and Median	EB SB	2 TH 2 LT	B D	<b>B</b>	B D	<b>B</b>	C D	<b>C</b>
US 15-501 (EB) and Europa Drive	EB NB	3 TH, 1 RT 2 RT	A D	<b>A</b>	A D	<b>A</b>	A D	<b>B</b>
Erwin Road and Dobbins Drive	NB SB EB WB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT-TH-RT 1 LT-TH-RT	A <sup>1</sup> A <sup>1</sup> F <sup>2</sup> D <sup>2</sup>		A <sup>1</sup> A <sup>1</sup> C <sup>2</sup> E <sup>2</sup>		B <sup>1</sup> A <sup>1</sup> F <sup>2</sup> F <sup>2</sup>	
Erwin Road and Dobbins Drive (Improved)	NB SB EB WB	1 LT, 1 TH-RT 1 LT, 1, TH, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH, 1 RT	A <sup>1</sup> A <sup>1</sup> F <sup>2</sup> D <sup>2</sup>		A <sup>1</sup> A <sup>1</sup> C <sup>2</sup> E <sup>2</sup>		B <sup>1</sup> A <sup>1</sup> F <sup>2</sup> F <sup>2</sup>	

**Bold type denotes lane improvements, or revised lane configurations.**

1. Level of service for minor (left turn) movement.
2. Level of service for minor approach.

**TABLE S-4**  
**COMBINED (2005) TRAFFIC CONDITIONS WITH SITE**

INTERSECTION	A P P R O A C H	LANE CONFIGURATIONS	PEAK HOUR LEVEL OF SERVICE					
			AM PEAK		MID-DAY PEAK		PM PEAK	
			Approach	Overall	Approach	Overall	Approach	Overall
US 15-501 (WB) and Median	WB NB	2 TH 2 LT	B D	<b>C</b>	B D	<b>C</b>	C D	<b>C</b>
US 15-501 (WB) and Erwin Road	WB SB	3 TH, 1 RT 2 RT	B D	<b>B</b>	A D	<b>B</b>	B D	<b>B</b>
US 15-501 (EB) and Median	EB SB	2 TH 2 LT	B D	<b>B</b>	B D	<b>B</b>	C D	<b>D</b>
US 15-501 (EB) and Europa Drive	EB NB	3 TH, 1 RT 2 RT	A D	<b>A</b>	A D	<b>A</b>	A D	<b>B</b>
Erwin Road and Dobbins Drive	NB SB EB WB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH, 1 RT	B <sup>1</sup> A <sup>1</sup> F <sup>2</sup> D <sup>2</sup>		A <sup>1</sup> A <sup>1</sup> C <sup>2</sup> E <sup>2</sup>		B <sup>1</sup> A <sup>1</sup> F <sup>2</sup> F <sup>2</sup>	
Erwin Road and Site Driveway	NB SB EB	1 LT, 1 TH 1 TH, 1 RT 1 LT-RT	B <sup>1</sup>  C <sup>2</sup>		A <sup>1</sup>  B <sup>2</sup>		A <sup>1</sup>  C <sup>2</sup>	

**Bold type denotes lane improvements, or revised lane configurations.**

1. Level of service for minor (left turn) movement.
2. Level of service for minor approach.



Analysis indicates that the left turn movements on Erwin Road at Dobbins Drive operate acceptably, while the minor approaches on Dobbins Drive experience minor to moderate delays during peak periods of the day. While the left turn movements will continue to operate acceptably under background (2005) traffic conditions during peak periods of the day, the delays experienced on the side streets increase due to background traffic growth. The poor levels of operation on the minor approaches of Dobbins Drive are primarily a result of the delays experienced by the through and left turn movements, which are typical at unsignalized intersections located on heavily traveled facilities. While the through and left turn movements will continue to experience long delays, the delays experienced by the right turn movements can be minimized with the addition of exclusive right turn lanes on both approaches of Dobbins Drive under background (2005), and combined (2005), traffic conditions during peak periods. It should be noted that the southbound queue on Erwin Road at US 15-501 could possibly block Dobbins Drive during peak times of the day adding to the delays experienced by the side street movements.

Capacity analysis indicates that the left turn movements on Erwin Road and the minor approach of the proposed site driveway will experience minor delays during peak times.

In conclusion, the additional traffic generated by the proposed Residence Inn is expected to have minimal impact to the surrounding roadway network with the improvements that are planned under the superstreet design, the Dobbins Drive/Erwin Road project, and the improvements that are deemed necessary regardless of whether the site is built out.

## **7. Pedestrian and Bicycle Analysis**

As indicated in Figure 4, sections of sidewalk exist on north side of Dobbins Drive as well as on the east side of Erwin Road. As part of the proposed Residence Inn, sidewalk will be provided along the site's frontage to Erwin Road. In order to accommodate pedestrian traffic along Erwin Road, a continuous sidewalk is needed between Dobbins Drive and Weaver Dairy Road. In addition, a continuous sidewalk is needed along Dobbins Drive between East Franklin Street and Sage Road. While the proposed development will likely be responsible for installing sidewalk across their frontage on Dobbins Drive, there will still remain 300 feet of frontage without sidewalk between East Franklin Street and Erwin Road; therefore, the Town of Chapel Hill or other parties should be responsible for the installation of sidewalk along the remaining section where sidewalk does not exist. In addition, the Town of Chapel Hill or other parties should be responsible for the installation of sidewalk along the northern side of Dobbins Drive between Erwin Road and Sage Road, with the exception of two pieces of property where sidewalk currently exists. The Town of Chapel Hill or other parties should be responsible for the installation of sidewalk along the western side of Erwin Road from the proposed development's property line to Weaver Dairy Road. It should be noted that the installation of sidewalk is not recommended along Erwin Road towards US 15-501, since sidewalks are not currently provided along US 15-501.

While there are currently no bicycle lanes on Erwin Road, the additional pavement widening on Erwin Road that is proposed as part of the Residence Inn will provide a 5-foot bike lane to accommodate bicycle traffic across the site's frontage.

**8. Public Transportation Analysis**

Based on information obtained from the Chapel Hill Transit Guide, the bus stops located along Erwin Road are serviced during the weekday by Bus Routes CL (AM and PM hours) and D (all day), while the bus stops on Erwin Road are serviced by Bus Route CL (AM and PM peak hours). In addition, transit service is provided along Dobbins Drive during the weeknight by Bus Route C/D. Transit service is also provided on Saturday for Dobbins Drive by Bus Route D/J. Refer to Figure 4 for the approximate locations of existing bus stops.

**9. Special Analysis/Issues**

Per the Town of Chapel Hill's request, a long-term analysis was conducted as part of this traffic study. Based on 2025 ADT traffic volumes for US 15-501 and Erwin Road that were obtained from the Regional Model and provided by the Town of Chapel Hill, US 15-501 is anticipated to carry 71,628 vpd west of the site and 55,838 vpd east of the site. As for Erwin Road, it is expected to carry 21,970 vpd north of the site. The proposed Residence Inn will add approximately 988 vehicles to the surrounding roadway network. When considering the distribution of site traffic on Erwin Road and US 15-501, the traffic associated with the site will account for approximately 1% of the traffic, if not less, on US 15-501 and Erwin Road in the year 2025. Therefore, it appears that the proposed development will have a minimal impact to the surrounding roadways when considering the anticipated traffic volumes in the year 2025.

**10. Mitigation Measures/Recommendations**

The majority of improvements, as summarized below, is the result of planned projects, or can be attributed to the significant background growth from the surrounding community. Refer to Figure S-3 for an illustration of improvements.

**Planned Improvements**

The intersection of US 15-501 and Europa Drive/Erwin Road will be modified by the NCDOT under TIP U-4008. A superstreet design will be provided so that two-phase signals can be utilized to process the heavy traffic volumes along US 15-501. Movements (left and through) associated with Europa Drive and Erwin Road will basically be converted into u-turn movements at nearby median breaks.

In addition, the NCDOT is going to realign the western leg of Dobbins Drive to intersect Erwin Road opposite the eastern leg of Dobbins Drive. Erwin Road will also be widened from US 15-501 to the northern property line of the proposed

Residence Inn. As previously mentioned, the developer is contributing funds to this project.

**Background Committed Improvements**

Per discussions with the Town of Chapel of Hill, there are no committed roadway improvements by adjacent developments within the study area.

**Applicant Committed Improvements**

As previously indicated, the developer is contributing funds to the project that NCDOT will realign Dobbins Drive while widening Erwin Road. As part of this project, left turn lanes will be provided on Erwin Road at Dobbins Drive as well as the proposed development's driveway. In addition, an exclusive right turn lane will be provided on Erwin Road at the proposed development's driveway.

**Necessary Improvements**

In order to minimize delays experienced by the right turn movements on Dobbins Drive, exclusive right turn lanes are needed on both approaches regardless of whether the proposed development is constructed. These improvements would require some pavement widening.

**SITE**



Erwin Road



Dobbins Drive

Dobbins Drive

**SUPERSTREET**

US 15-501

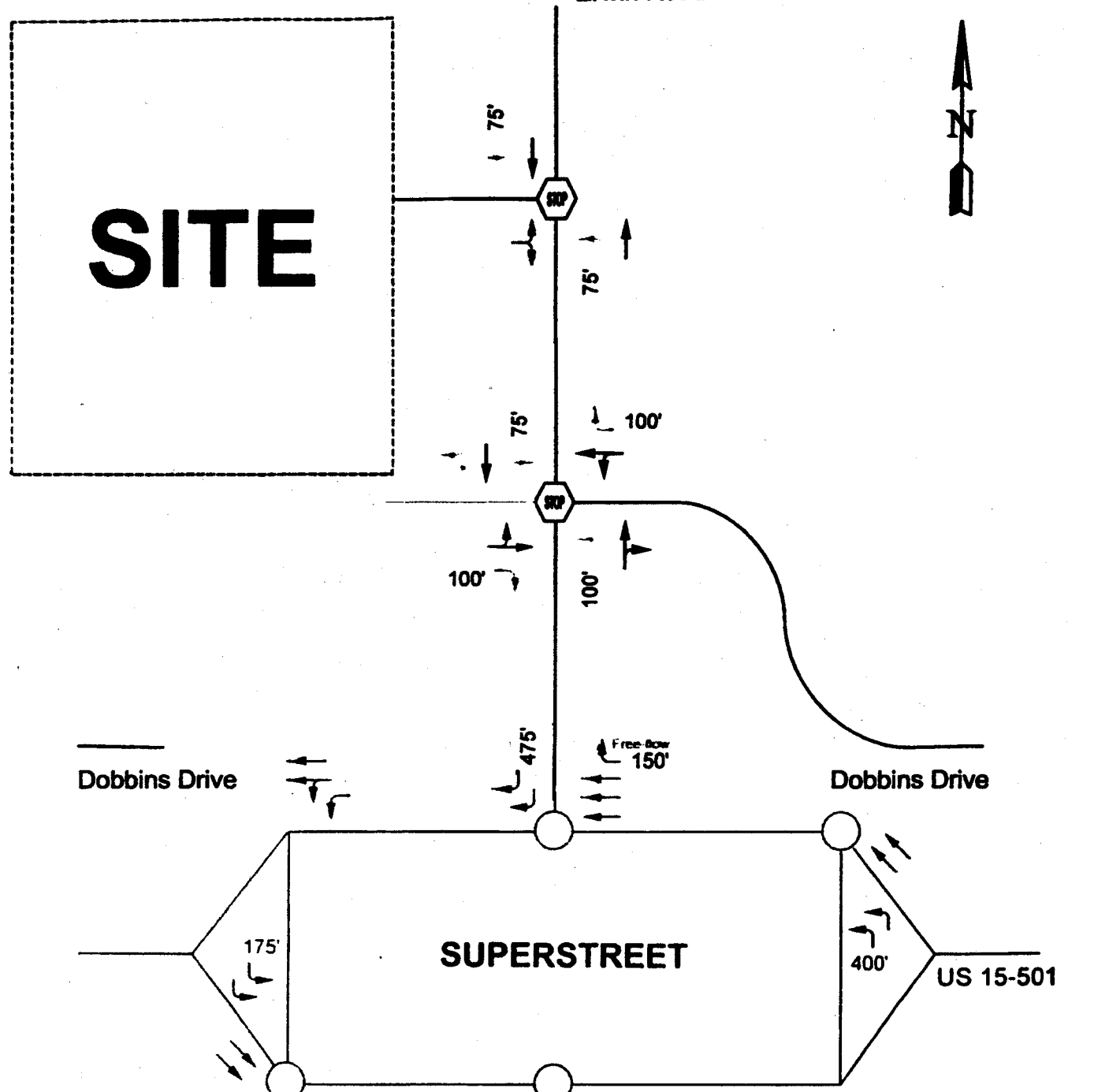
Europa Drive

**LEGEND**

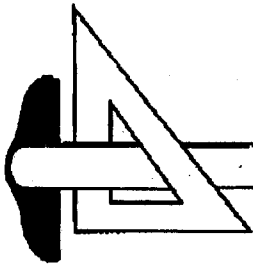
- Planned Traffic Signal
- Planned Improvement
- Planned/Applicant Committed Improvement
- Applicant Committed Improvement
- Necessary Improvement

125' Recommended Storage (Minimum)

RESIDENCE INN CHAPEL HILL, NORTH CAROLINA		
<b>RECOMMENDED LANE CONFIGURATIONS</b>		
9/02	Scale: Not to Scale	Figure S-3



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**Ramey Kemp & Associates, Inc.**  
**Transportation Engineers**

January 15, 2003

Mr. Kumar Neppalli, E.I.T.  
 Town of Chapel Hill  
 306 N. Columbia Street  
 Chapel Hill, North Carolina 27516-2124

RE: Residence Inn Site - Trip Generation Comparison

Dear Mr. Neppalli:

Per your request, Ramey Kemp and Associates, Inc. has generated trips based on the new land use plan for the Residence Inn site on Erwin Road. Our original traffic study assumed that the site would consist of a 120-room hotel. However, since our original submittal, the site plan has been modified to consist of the following land uses: 108-room hotel, 3,000 square feet of office space, and 4 condominiums. A new trip generation was performed to determine whether or not our conclusions and recommendations would be applicable to the modified site plan.

**TABLE 1**  
**TRIP GENERATION RESULTS**

LAND USE (ITE CODE)	DENSITY	Daily Traffic (vpd)	AM Peak Hour (vph)		Mid-Day Peak Hour (vph)		PM Peak Hour (vph)	
			Enter	Exit	Enter	Exit	Enter	Exit
<b>EXISTING DEVELOPMENT</b>								
Hotel (310)	120 rooms	988	41	26	40	33	40	33
<b>Total Trips</b>		<b>988</b>	<b>67</b>		<b>73</b>		<b>73</b>	
<b>PROPOSED DEVELOPMENT</b>								
Hotel (310)	108 rooms	889	37	24	36	30	36	30
General Office (710)	3,000 sf	33	4	1	3	3	1	4
Condominiums (230)	4 units	23	0	1	1	1	1	1
<b>Total Trips</b>		<b>945</b>	<b>67</b>		<b>74</b>		<b>73</b>	

Considering the small amount of office space and number of condominiums, it was determined that average rates would be utilized to obtain realistic trip generation results. In addition, the Mid-Day peak hour trips for the office space and condominiums are based on an average of the AM and PM peak hour trips due to the low traffic volumes associated with each land use.

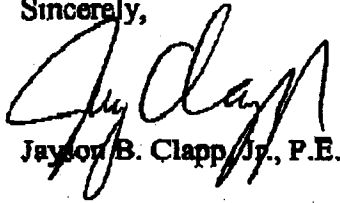
Mr. Kumar Neppalli, E.I.T.  
January 15, 2003  
Page 2

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According to the estimated trip generation for each land use plan (as presented in the Table 1), the modified land use plan will generate less traffic on a typical weekday than the original land use plan, but will generate an equivalent amount of traffic during weekday peak periods. Therefore, the findings of our original study should apply to the modified land use plan.

If you should have any questions, or need further assistance, please feel free to contact me at (919) 872-5115.

Sincerely,



Jayson B. Clapp, Jr., P.E.