Traffic Impact Analysis

Williams Corner

Chatham County, NC

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Traffic Impact Analysis
for
Williams Corner
Chatham County, North Carolina

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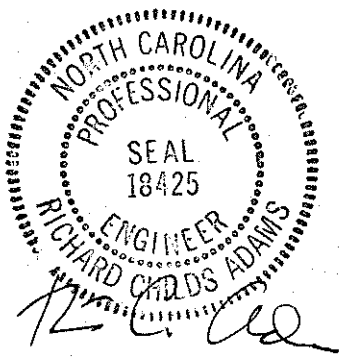

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1.0 Executive Summary

The proposed Williams Corner mixed-use development is located in the northeast quadrant of the intersection of US 15-501 at Lystra Road (SR 1721) in Chatham County, North Carolina. The proposed development will consist of approximately 40 townhomes, a day care center, a specialty supermarket, a pharmacy with drive-through window, a drive-in bank, 50,500 square feet (s.f.) of specialty retail, 50,500 s.f. of office space, 166,000 s.f. of medical office space, and 60,000 s.f. of flex space. The proposed Williams Corner development will be accessed by one full-movement driveway, one right-in/right-out driveway, and one "left-over" (right-in/right-out/left-in) driveway onto US 15-501. The full-movement driveway on US 15-501 will align with the existing Polks Landing Road. There will also be one right-in/right-out driveway and one full-movement driveway onto Lystra Road. A stub out will also be provided to the north to connect to the potential future development of approximately 60 single family homes. The development is expected to be completed (built-out) in 2010.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands. The scenarios studied include the existing (2005) traffic condition and the projected (2010) build-out traffic condition.

Analyses indicate that the unsignalized intersection of US 15-501 at Lystra Road currently operates with moderate delays for the minor street approach (Lystra Road) in the AM peak hour and with short delays for the minor street approach in the PM peak hour. The North Carolina Department of Transportation (NCDOT) is currently widening US 15-501 to a four lane divided section in the vicinity of the site (NCDOT Transportation Improvement Program project number R-942B). This intersection is planned to be signalized as part of that widening project. At project build-out in 2010 with the recommended improvements and a traffic signal in place, the intersection is projected to operate at LOS B in the AM peak hour and at LOS C in the PM peak hour.

Analyses indicate that the proposed unsignalized intersection of US 15-501 at Polks Landing Road/South Project Driveway is projected to operate with long delays for the minor street approaches (Polks Landing Road and the South Project Driveway) in the AM and PM peak hours with build-out of the proposed development. Due to its proximity to Lystra Road, this intersection is not anticipated to be a candidate for signalization.

Analyses indicate that the proposed unsignalized right-in/right-out intersection of US 15-501 at the Middle Project Driveway is projected to operate with short delays for the minor street approach (Middle Project Driveway) in the AM and PM peak hours with build-out of the proposed development.

Analyses indicate that the proposed unsignalized left-over intersection of US 15-501 at the North Project Driveway is projected to operate with short delays for the minor street approach (North Project Driveway) in the AM and PM peak hours with build-out of the proposed development.

Analyses indicate that the proposed unsignalized right-in/right-out intersection of Lystra Road at the West Project Driveway is projected to operate with short delays for the minor street approach (West Project Driveway) in the AM and PM peak hours with build-out of the proposed development.

Analyses indicate that the proposed unsignalized intersection of Lystra Road at the East Project Driveway is projected to operate with short delays for the minor street approach (East Project Driveway) in the AM and PM peak hours with build-out of the proposed development.

The following is a summary of the committed and recommended roadway improvements:

NCDOT Committed Improvements:

- Construct an additional northbound through lane on US 15-501
- Construct an additional southbound through lane on US 15-501

US 15-501 at Lystra Road:
- Construct an exclusive northbound left-turn lane on US 15-501
- Install a traffic signal

US 15-501 at Polks Landing Road:
- Construct exclusive northbound and southbound left-turn lanes on US 15-501

Recommended Improvements:

US 15-501 at Lystra Road:
- Construct an additional exclusive westbound left-turn lane on Lystra Road

US 15-501 at Polks Landing Road/South Project Driveway:
- Construct an exclusive northbound right-turn lane on US 15-501
- Provide a shared westbound left/through lane and an exclusive westbound right-turn lane on the full-movement driveway

US 15-501 at Middle Project Driveway:
- Construct an exclusive northbound right-turn lane on US 15-501

US 15-501 at Polks Landing Road/South Project Driveway:

- Construct an exclusive northbound right-turn lane on US 15-501
- Construct an exclusive southbound left-turn lane on US 15-501

Lystra Road at East Project Driveway:

- Construct an exclusive eastbound left-turn lane on Lystra Road

The committed and recommended roadway laneage is shown on Figure 8. With the committed and recommended improvements in place, all of the study intersections will operate at acceptable levels of service at project build-out.

2.0 Introduction

The proposed Williams Corner mixed-use development is located in the northeast quadrant of the intersection of US 15-501 at Lystra Road (SR 1721) in Chatham County, North Carolina. The proposed development will consist of approximately 40 townhomes, a day care center, a specialty supermarket, a pharmacy with drive-through window, a drive-in bank, 50,500 square feet (s.f.) of specialty retail, 50,500 s.f. of office space, 166,000 s.f. of medical office space, and 60,000 s.f. of flex space. The proposed Williams Corner development will be accessed by one full-movement driveway, one right-in/right-out driveway, and one "left-over" (right-in/right-out/left-in) driveway onto US 15-501. The full-movement driveway on US 15-501 will align with the existing Polks Landing Road. There will also be one right-in/right-out driveway and one full-movement driveway onto Lystra Road. A stub out will also be provided to the north to connect to the potential future development of approximately 60 single family homes. The development is expected to be completed (built-out) in 2010.

Kimley-Horn and Associates, Inc. was retained to determine the potential external traffic impacts of this development and to identify roadway improvements that may be required to accommodate the impacts of both background traffic and new development traffic. This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated project traffic demands. This report examines the existing traffic condition and the projected (2010) background and build-out traffic conditions.

3.0 Inventory

3.1 Study Area

The study area includes the following intersections:

- US 15-501 at Lystra Road (SR 1721)
- US 15-501 at Polks Landing Road/South Project Driveway
- US 15-501 at Middle Project Driveway
- US 15-501 at North Project Driveway
- Lystra Road (SR 1721) at West Project Driveway
- Lystra Road (SR 1721) at East Project Driveway

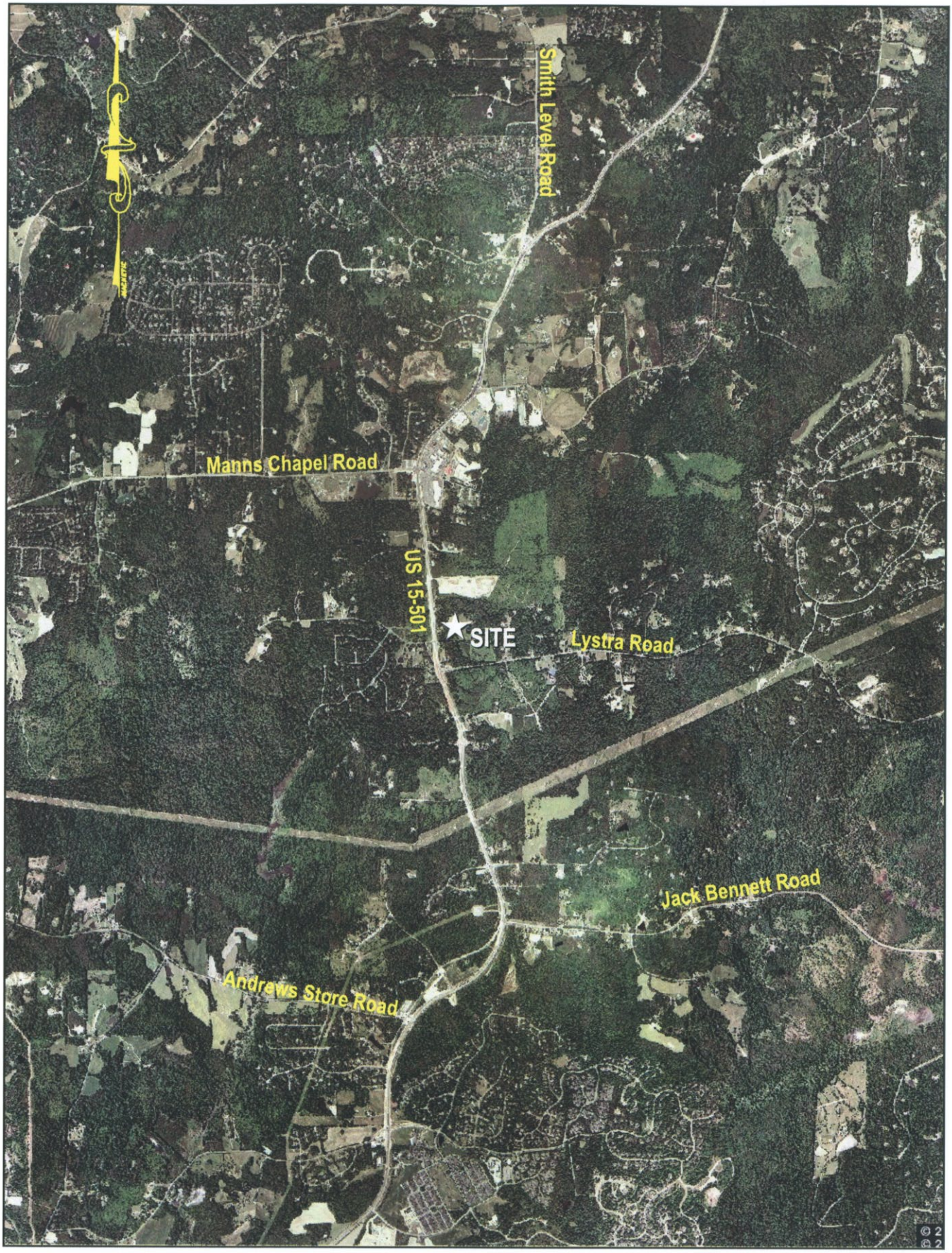
Figure 1 shows the site location. The proposed site plan is shown on Figure 2.

3.2 Existing Conditions

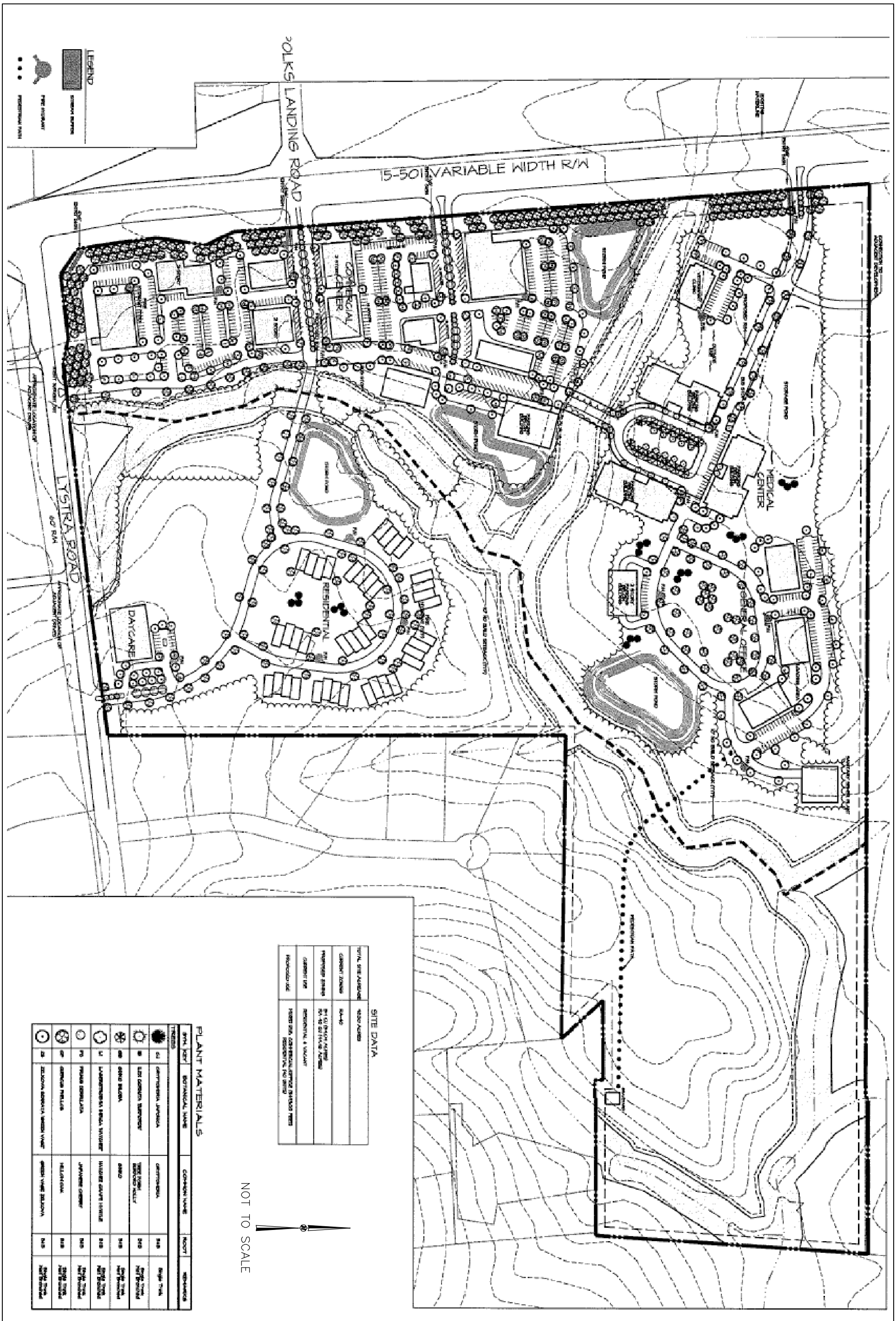
The proposed development is located in Chatham County, North Carolina in the northeast quadrant of the intersection of US 15-501 at Lystra Road. The existing roadway laneage is shown in Figure 3.

US 15-501 is currently being widened to a four-lane divided section by the North Carolina Department of Transportation (TIP #R-942B). US 15-501 has an estimated 2005 average daily traffic (ADT) volume of 15,000 vehicles per day and a posted speed limit of 45 mph in the vicinity of the site.

Lystra Road (SR 1721) is a two-lane roadway with an estimated 2005 average daily traffic (ADT) volume of 3,000 vehicles per day in the vicinity of the site. Lystra Road has a posted speed limit of 45 mph in the vicinity of the site.



Kimley-Horn and Associates, Inc.	WILLIAMS CORNER TRAFFIC IMPACT ANALYSIS	SITE LOCATION	FIGURE 1



Kimley-Horn and Associates, Inc.	WILLIAMS CORNER TRAFFIC IMPACT ANALYSIS
SITE PLAN (PROVIDED BY THE JOHN R. McADAMS COMPANY)	FIGURE 2

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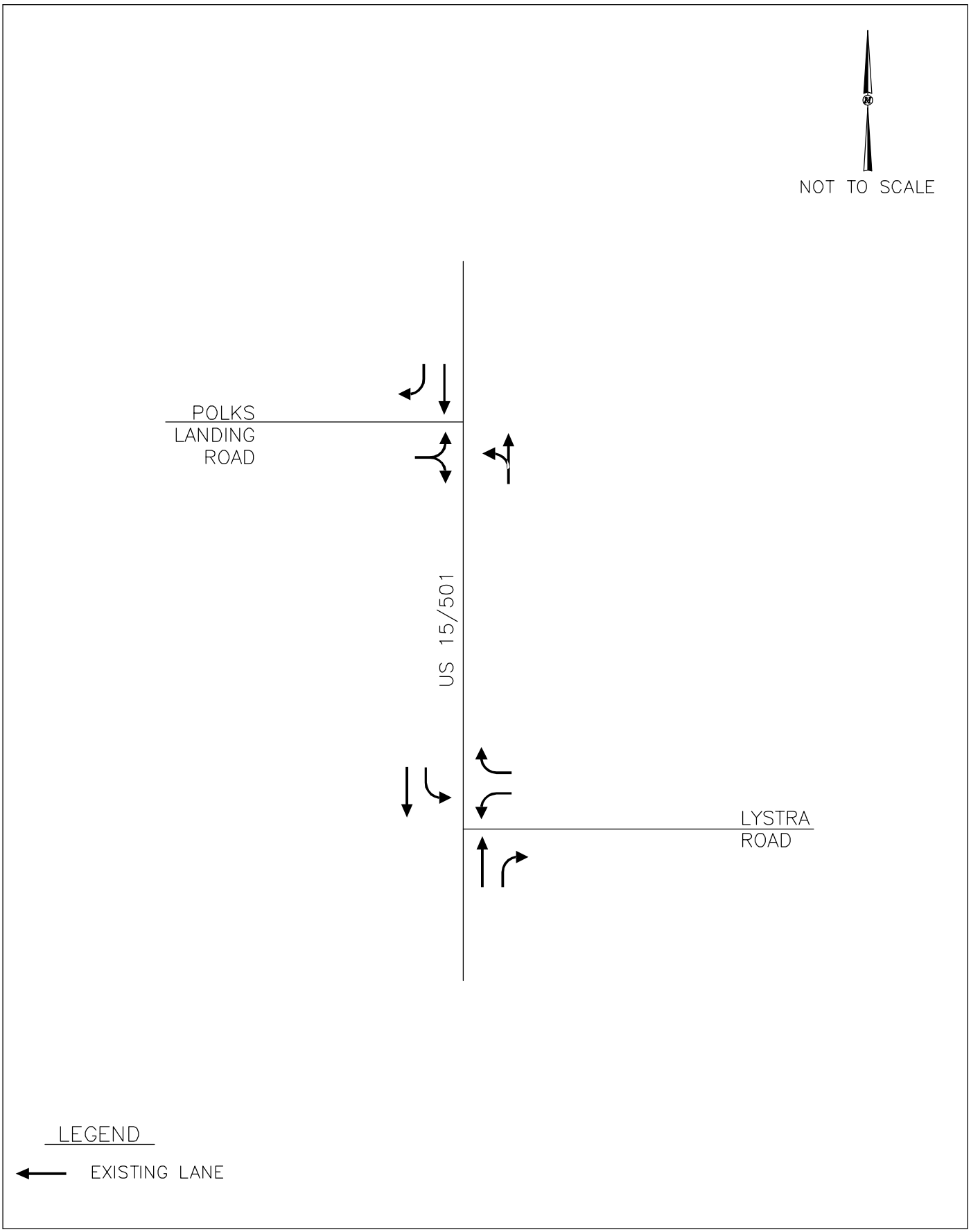

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Kimley-Horn and Associates, Inc.	WILLIAMS CORNER TRAFFIC IMPACT ANALYSIS	EXISTING ROADWAY LANEAGE	FIGURE 3

4.0 Traffic Generation

The traffic generation potential of the proposed development was determined using the traffic generation rates published in *Trip Generation* (Institute of Transportation Engineers, Seventh Edition, 2003). As currently the proposed development will consist of approximately 40 townhomes, a 12,500 s.f. day care center, 50,500 s.f. of general office space, 60,000 s.f. of flex space, 150,000 s.f. of medical/dental office space, a 6,000 s.f. veterinary office, a 10,000 s.f. opticians office, 50,500 s.f. of specialty retail, a 25,000 s.f. specialty supermarket, a 15,000 s.f. pharmacy/drugstore with drive-through window, and a 5,000 s.f. drive-in bank. Table 4.0 summarizes the estimated traffic generation for the proposed development.

Table 4.0
ITE Traffic Generation (Vehicles)

Land Use Code	Land Use	24 Hour		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out	In	Out
230	Townhomes (40 d.u.)	148	147	4	21	19	9
565	Day Care Center (12,500 s.f.)	496	495	85	75	52	59
710	General Office (50,500 s.f.)	394	394	96	13	23	112
720	Medical Office (150,000 s.f.)	2,959	2,960	294	78	124	335
720	Veterinarian (6,000 s.f.)	108	109	12	3	6	17
720	Optician (10,000 s.f.)	181	180	20	5	10	27
770	Flex Space (60,000 s.f.)	696	696	73	14	22	72
814	Specialty Retail (50,500 s.f.)	1,099	1,099	24	15	63	80
850	Supermarket (25,000 s.f.)	1,532	1,533	35	23	159	153
881	Pharmacy/Drugstore (15,000 s.f.)	661	661	23	17	63	66
912	Drive-In Bank (5,000 s.f.)	585	584	35	27	115	114
Subtotal		8,859	8,858	701	291	656	1,044
Internal Capture Total (4.7% Daily/4.1% PM)		415	414	0	0	35	34
Total Driveway Volumes		**8,444**	**8,444**	**701**	**291**	**621**	**1,010**
Pass-By Capture Total (16.8%)		1,050	1,050	0	0	138	135
Net New External Trips		**7,394**	**7,394**	**701**	**291**	**483**	**875**

Internally captured trips are trips that begin and end on the project site and do not access the external roadway network. Internal Capture was taken into account as appropriate using rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Handbook* (Second Edition, 2004).

Pass-by capture trips are trips already on the roadway network that will make a trip to the site as they pass by on the adjacent street. Pass-by was taken for the retail portion of the site using rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Handbook* (Second Edition, 2004).

Table 4.0 shows that the proposed development has the potential to generate 7,394 new trips in and 7,394 new trips out during a typical weekday with 701 new trips entering and 291 new trips exiting during the AM peak hour and 483 new trips entering and 875 new trips exiting during the PM peak hour. Detailed trip generation and internal capture calculations are included in the Appendix of the report.

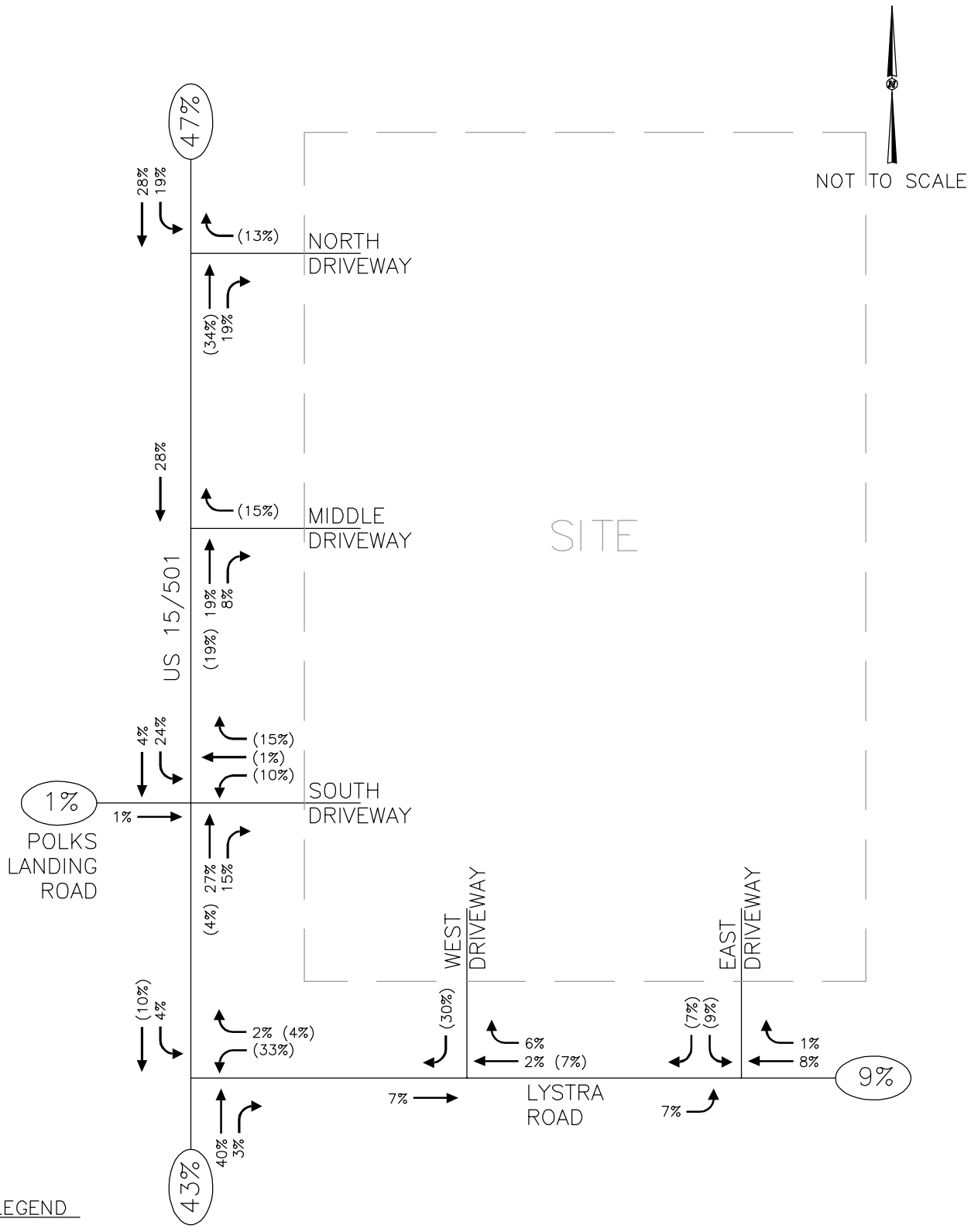
5.0 Site Access & Traffic Distribution

The proposed Williams Corner development will be accessed by one full-movement driveway, one right-in/right-out driveway, and one "left-over" (right-in/right-out/left-in) driveway onto US 15-501. The full-movement driveway on US 15-501 will align with the existing Polks Landing Road. There will also be one right-in/right-out driveway and one full-movement driveway onto Lystra Road. A stub out will also be provided to the north to connect to the potential future development of approximately 60 single family homes.

The proposed generated trips were assigned to the surrounding roadway network. The directional distribution and assignment are based on existing turning movement counts, land uses and population densities in the area as follows:

- 47% to/from the north on US 15-501
- 43% to/from the south on US 15-501
- 9% to/from the east on Lystra Road
- 1% to/from the west on Polks Landing Road

The site traffic distribution and assignment are shown in Figure 4.



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Kimley-Horn and Associates, Inc.	WILLIAMS CORNER TRAFFIC IMPACT ANALYSIS	SITE TRAFFIC DISTRIBUTION AND ASSIGNMENT	FIGURE 4

6.0 Projected Traffic Volumes

6.1 Existing Traffic

AM and PM peak hour turning movement counts at the following intersection were obtained from the Briar Chapel Transportation Impact Assessment prepared by Kimley-Horn and Associates, Inc. in June 2004:

- US 15-501 at Lystra Road March 17, 2004

These volumes were grown at an annual growth rate of 3% for one year to get existing year traffic volumes at this intersection. The existing AM and PM peak-hour traffic volumes are shown on Figure 5, and the traffic count data are included in the Appendix.

6.2 Historic Growth Traffic

Historic growth traffic is the increase in traffic due to usage increases and non-specific growth throughout the area. A 3% annual growth rate was applied to the existing traffic to calculate background traffic volumes expected in 2010.

6.3 Approved Development Traffic

Approved development traffic is generated by approved, but not yet constructed, projects in the vicinity of the proposed project. There are two approved developments in the study area vicinity that were included in this analysis.

Chatham Downs is a retail development located on the southeast quadrant of the intersection of US 15-501 at Lystra Road. The project will consist of a 45,000 s.f. supermarket, a 4,000 s.f. drive-in bank, and 12,000 s.f. of retail/office space and is anticipated to be completed (built-out) in 2006. The trip generation potential of the development was assigned to the intersections in the study area based on the Chatham Downs TIA prepared by Mandala Services, Inc. in July 2003.

Briar Chapel is a mixed-use development primarily located west of US 15-501 between Mann's Chapel Road and Andrews Store Road in Chatham County, NC. The project will consist of approximately 1880 single family homes, 515 multi-family dwelling units, 252,000 s.f. of retail space, 270,000 s.f. of office space, two-schools serving a total of 1,300 students, and a county park. As currently envisioned, the development will be completed (built-out) in the year 2014. It was assumed that the development would be approximately 60% complete by the year 2010. Therefore, 60% of the trip generation potential of the development was assigned to the intersections in the study area based on the Briar Chapel TIA prepared by Kimley-Horn and Associates, Inc. in June 2004.

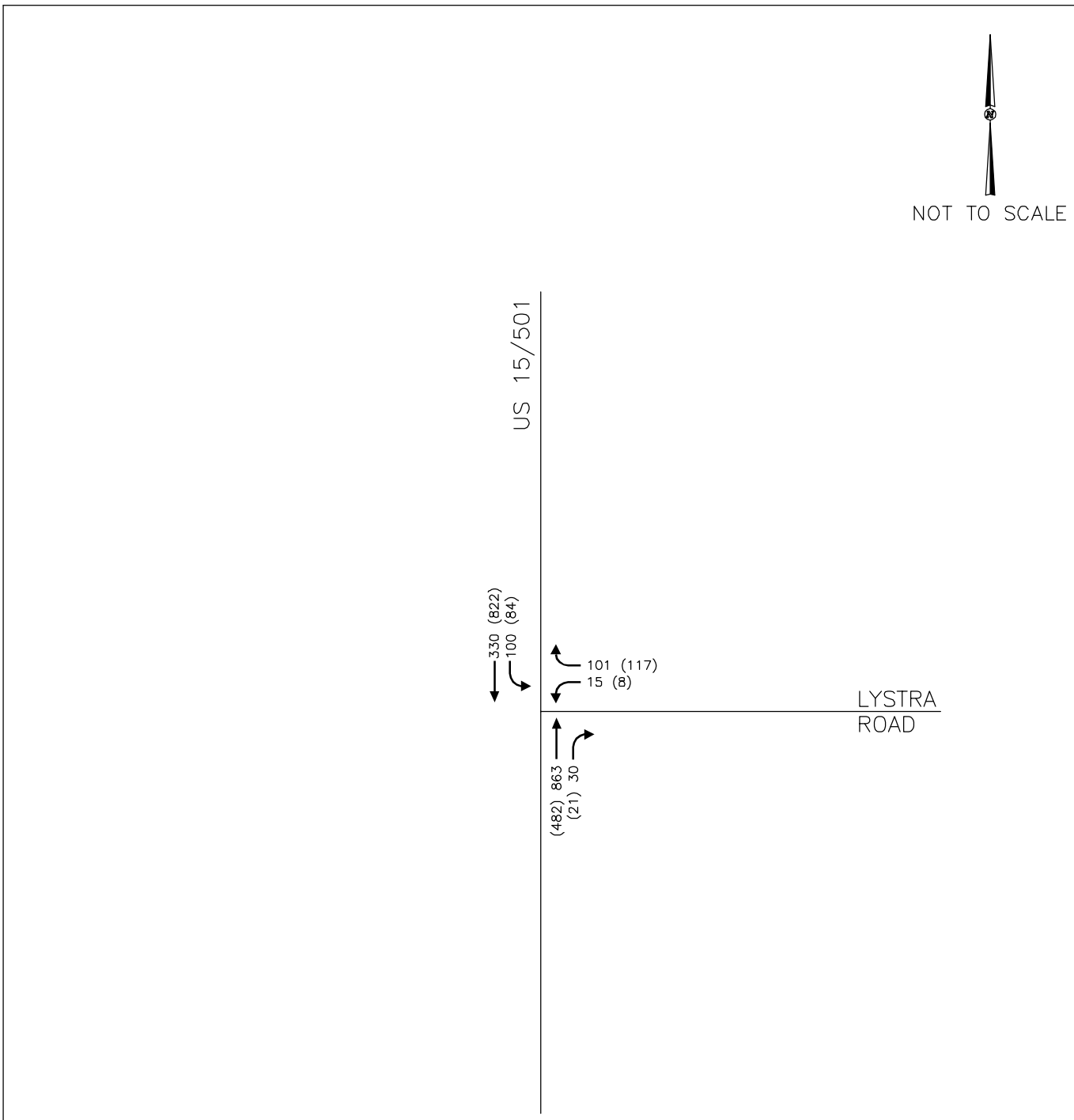
Total background traffic, which includes existing traffic, historical growth traffic, and approved development traffic is detailed on intersection worksheets included in the Appendix and is shown in Figures 6 and 7.

6.4 Site Traffic

The proposed site traffic was generated and assigned to the adjacent roadway network according to the distribution described in Section 5.0 and is shown in Figures 6 and 7.

6.5 Total Traffic

To obtain the 2010 build-out traffic volumes, the proposed site traffic was added to the projected (2010) background traffic. Traffic volume calculations are detailed on intersection spreadsheets in the Appendix of this report. Figures 6 and 7 show the projected 2010 background, site, and total AM and PM peak hour traffic volumes, respectively, at the study intersections.



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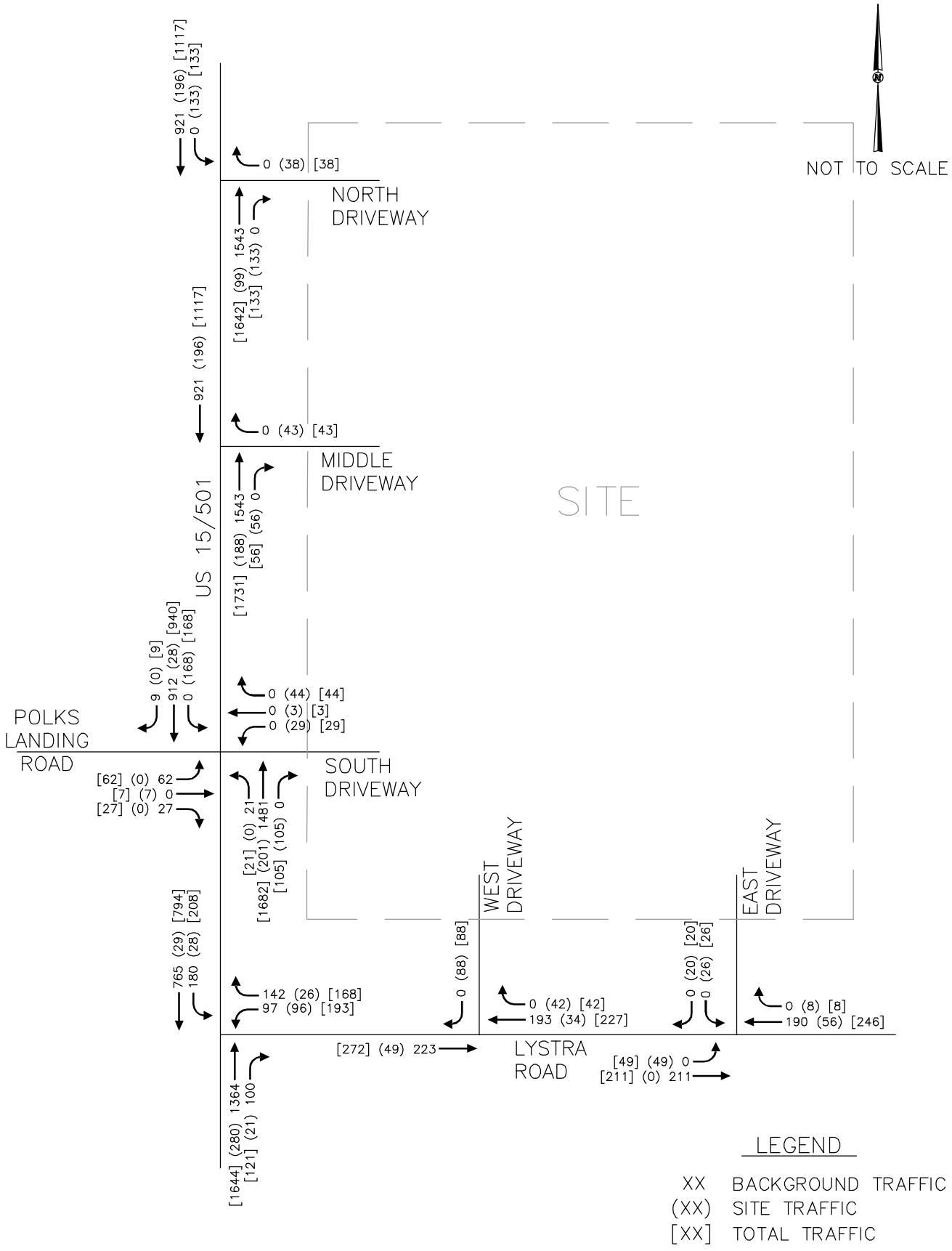
Kimley-Horn and Associates, Inc.	WILLIAMS CORNER TRAFFIC IMPACT ANALYSIS	EXISTING (2005) PEAK HOUR TRAFFIC VOLUMES	FIGURE 5



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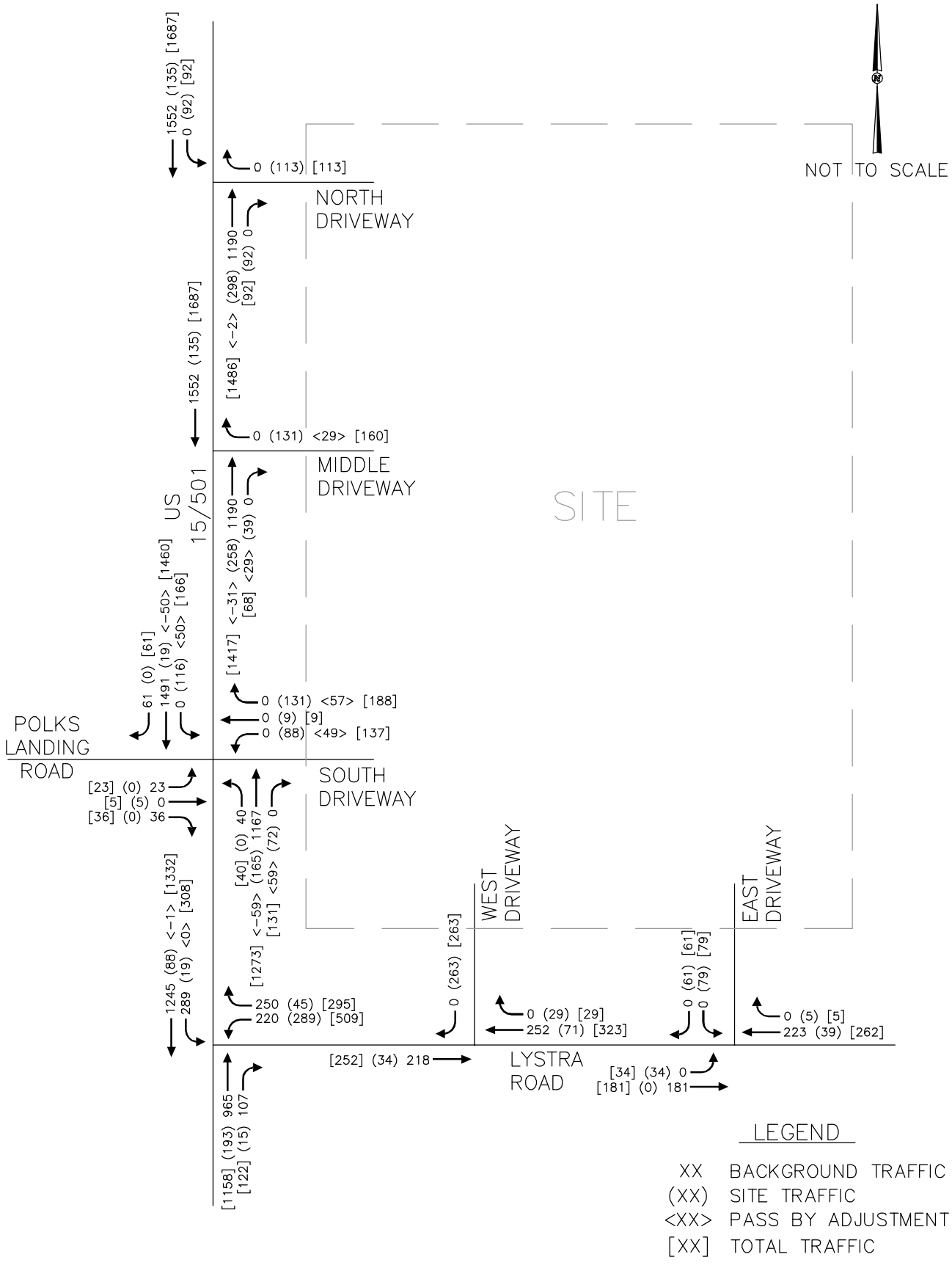
TRAFFIC IMPACT ANALYSIS

PROPOSED (2010) AM PEAK HOUR TRAFFIC VOLUMES

FIGURE 6



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TRAFFIC IMPACT ANALYSIS

PROPOSED (2010) PM PEAK HOUR TRAFFIC VOLUMES

FIGURE 7

7.0 Capacity Analysis

Capacity analyses (see Appendix) were performed for the AM and PM peak hours for the existing traffic condition and the projected (2010) build-out traffic condition using Synchro Version 5 software to determine the operating characteristics of the adjacent road network and the impacts of the proposed project.

Capacity is defined as the maximum number of vehicles that can pass over a particular road segment or through a particular intersection within a set time duration. Capacity is combined with Level-of-Service (LOS) to describe the operating characteristics of a road segment or intersection. LOS is a qualitative measure that describes operational conditions and motorist perceptions within a traffic stream. The *Highway Capacity Manual* defines six levels of service, LOS A through LOS F, with A representing the shortest average delays and F representing the longest average delays. LOS D is the typically accepted standard for signalized intersections in urbanized areas. For signalized intersections, LOS is defined for the overall intersection operation.

For unsignalized intersections, only the movements that must yield right-of-way experience control delay. Therefore, LOS criteria for the overall intersection is not reported by Synchro Version 5 or computable using methodology published in the *Highway Capacity Manual*. Accordingly, minor street approach delays are reported herein for unsignalized conditions. For descriptive purposes, results between LOS A and LOS C for the side street approach are assumed to represent short delays. Results between LOS D and LOS E for the side street approach are assumed to represent moderate delays, and LOS F for the side street approach is assumed to represent long delays. It is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. Table 7.0-A lists the LOS control delay thresholds published in the *Highway Capacity Manual* for signalized and unsignalized intersections, as well as the unsignalized operational descriptions assumed herein.

Table 7.0-A
Level-of-Service Control Delay Thresholds

Level-of-Service	Signalized Intersections – Control Delay Per Vehicle [sec/veh]	Unsignalized Intersections – Average Control Delay [sec/veh] & Qualitative Operational Description	
A	≤ 10	≤ 10	Short Delays
B	> 10 – 20	> 10 – 15	
C	> 20 – 35	> 15 – 25	
D	> 35 – 55	> 25 – 35	Moderate Delays
E	> 55 – 80	> 35 – 50	
F	> 80	> 50	Long Delays

Capacity analyses were performed for the existing (2005) traffic condition and the projected (2010) build-out traffic condition for the following intersections:

- US 15-501 at Lystra Road (SR 1721)
- US 15-501 at Polks Landing Road/South Project Driveway
- US 15-501 at Middle Project Driveway
- US 15-501 at North Project Driveway
- Lystra Road (SR 1721) at West Project Driveway
- Lystra Road (SR 1721) at East Project Driveway

Table 7.0-B summarizes the operation of all of the study intersections for the existing (2005) traffic condition and the projected (2010) build-out traffic condition. All capacity analyses are included in the Appendix and are briefly summarized in the following sub-sections.

Table 7.0-B
Level-of-Service Summary

Condition	AM Peak-Hour LOS (Delay)	PM Peak-Hour LOS (Delay)
US 15-501 at Lystra Road		
Existing Traffic	Moderate delays for minor street approach	Short delays for minor street approach
Projected (2010) Build-Out Traffic	B (19.1)	C (21.7)
US 15-501 at Polks Landing Road/South Project Driveway		
Projected (2010) Build-Out Traffic - Unsignalized	Long delays for minor street approach	Long delays for minor street approach
US 15-501 at Middle Project Driveway		
Projected (2010) Build-Out Traffic	Short delays for minor street approach	Short delays for minor street approach
US 15-501 at North Project Driveway		
Projected (2010) Build-Out Traffic	Short delays for minor street approach	Short delays for minor street approach
Lystra Road at West Project Driveway		
Projected (2010) Build-Out Traffic	Short delays for minor street approach	Short delays for minor street approach
Lystra Road at East Project Driveway		
Projected (2010) Build-Out Traffic	Short delays for minor street approach	Short delays for minor street approach

7.1 US 15-501 at Lystra Road (SR 1721)

Analyses indicate that the unsignalized intersection of US 15-501 at Lystra Road currently operates with moderate delays for the minor street approach (Lystra Road) in the AM peak hour and with short delays for the minor street approach in the PM peak hour.

US 15-501 is currently being widened in the vicinity of the site to a four-lane divided section by the North Carolina Department of Transportation. The following roadway improvements will be included in the widening at this intersection:

- Construct an additional northbound through lane on US 15-501
- Construct an additional southbound through lane on US 15-501
- Construct an exclusive northbound left-turn lane on US 15-501
- Install a traffic signal

Image 7.1 – Existing intersection of US 15-501 at Lystra Road looking southwest

In addition, the following roadway improvement is recommended at this intersection:

- Construct an additional exclusive westbound left-turn lane on Lystra Road

At project build-out in 2010 with the committed and recommended improvements and a signal in place, the intersection is projected to operate at LOS B in the AM peak hour and at LOS C in the PM peak hour.

Table 7.1 summarizes operation of the unsignalized intersection of US 15-501 at Lystra Road for the existing (2005) traffic condition and projected (2010) build-out traffic condition. Synchro LOS reports and intersection worksheets are included in the Appendix.

Table 7.1
Operation & Level-of-Service
US 15-501 at Lystra Road

Condition	AM Peak-Hour LOS (Delay)	PM Peak-Hour LOS (Delay)
Existing (2005) Traffic	Moderate delays for minor street approach	Short delays for minor street approach
Projected (2010) Build-out Traffic	B (19.1)	C (21.7)

7.2 US 15-501 at Polks Landing Road/South Project Driveway

Image 7.2 – Existing intersection of US 15-501 at Polks Landing Road looking north on US 15-501

A full-movement driveway on US 15-501 is proposed to align with Polks Landing Road. This section of US 15-501 is currently being widened to a four-lane divided section by the North Carolina Department of Transportation. The following roadway improvements will be included in the widening at this intersection:

- Construct an additional northbound through lane on US 15-501
- Construct an additional southbound through lane on US 15-501
- Construct exclusive northbound and southbound left-turn lanes on US 15-501

Analyses indicate that this intersection is projected to operate with long delays for the minor street approaches (Polks Landing Road and the South Project Driveway) in the AM and PM peak hours at project build-out in 2010. Due to its proximity to Lystra Road, this intersection is not expected to be a candidate for signalization. The following additional improvements are recommended at this intersection:

- Construct an exclusive northbound right-turn lane on US 15-501
- Provide a shared westbound left/through lane and an exclusive westbound right-turn lane on the full-movement driveway

Table 7.2 summarizes the operation of the unsignalized intersection of US 15-501 at the South Project Driveway for the projected (2010) build-out traffic condition. Synchro LOS reports and intersection analysis worksheets are included in the Appendix.

Table 7.2
Operation
US 15-501 at Polks Landing Road/South Project Driveway

Condition	AM Peak-Hour Operation	PM Peak-Hour Operation
Projected (2010) Build-Out Traffic	Long delays for minor street approach	Long delays for minor street approach

7.3 US 15-501 at Middle Project Driveway

A right-in/right-out driveway is proposed on US 15-501 north of Polks Landing Road. This section of US 15-501 is currently being widened to a four-lane divided section by the North Carolina Department of Transportation. The following roadway improvements will be included in the widening at this intersection:

- Construct an additional northbound through lane on US 15-501
- Construct an additional southbound through lane on US 15-501

Analyses indicate that the proposed unsignalized intersection of US 15-501 at the Middle Project Driveway is projected to operate with short delays for the minor street approach (Middle Project Driveway) in the AM and PM peak hours at project build-out in 2010. The following additional roadway improvements are recommended at this intersection:

- Construct an exclusive northbound right-turn lane on US 15-501

Table 7.3 summarizes the operation of the unsignalized intersection of US 15-501 at the Middle Project Driveway for the projected (2010) build-out traffic condition. Synchro LOS reports and intersection analysis worksheets are included in the Appendix.

Table 7.3
Operation
US 15-501 at Middle Project Driveway

Condition	AM Peak-Hour Operation	PM Peak-Hour Operation
Projected (2010) Build-out Traffic	Short delays for minor street approach	Short delays for minor street approach

7.4 US 15-501 at North Project Driveway

A directional "left-over" (right-in/right-out/left-in) driveway is proposed on US 15-501 north of Polks Landing Road. This section of US 15-501 is currently being widened to a four-lane divided section by the North Carolina Department of Transportation. The following roadway improvements will be included in the widening at this intersection:

- Construct an additional northbound through lane on US 15-501
- Construct an additional southbound through lane on US 15-501

Analyses indicate that the proposed unsignalized intersection of US 15-501 at the North Project Driveway is projected to operate with short delays for the minor street approach (North Project Driveway) in the AM and PM peak hours at project build-out in 2010. The following additional roadway improvements are recommended at this intersection:

- Construct an exclusive northbound right-turn lane on US 15-501
- Construct an exclusive southbound left-turn lane on US 15-501

Table 7.4 summarizes the operation of the unsignalized intersection of US 15-501 at the North Project Driveway for the projected (2010) build-out traffic condition. Synchro LOS reports and intersection analysis worksheets are included in the Appendix.

Table 7.4
Operation
US 15-501 at North Project Driveway

Condition	AM Peak-Hour Operation	PM Peak-Hour Operation
Projected (2010) Build-out Traffic	Short delays for minor street approach	Short delays for minor street approach

7.5 Lystra Road (SR 1721) at West Project Driveway

Analyses indicate that the proposed unsignalized intersection of Lystra Road at the right-in/right-out West Project Driveway is projected to operate with short delays for the minor street approach (West Project Driveway) in the AM and PM peak hours at project build-out in 2010. No roadway improvements are recommended at this intersection.

Table 7.5 summarizes the operation of the unsignalized intersection of Lystra Road at the West Project Driveway for the projected (2010) build-out traffic condition. Synchro LOS reports and intersection analysis worksheets are included in the Appendix.

Table 7.5
Operation
Lystra Road at West Project Driveway

Condition	AM Peak-Hour Operation	PM Peak-Hour Operation
Projected (2010) Build-out Traffic	Short delays for minor street approach	Short delays for minor street approach

7.6 Lystra Road (SR 1721) at East Project Driveway

Analyses indicate that the proposed, unsignalized intersection of Lystra Road at the full-movement East Project Driveway is projected to operate with short delays for the minor street approach (East Project Driveway) in the AM and PM peak hours at project build-out in 2010. The following roadway improvements are recommended at this intersection:

- Construct an exclusive eastbound left-turn lane on Lystra Road

Table 7.5 summarizes the operation of the unsignalized intersection of Lystra Road at the East Project Driveway for the projected (2010) build-out traffic condition. Synchro LOS reports and intersection analysis worksheets are included in the Appendix.

Table 7.6
Operation
Lystra Road at East Project Driveway

Condition	AM Peak-Hour Operation	PM Peak-Hour Operation
Projected (2010) Build-out Traffic	Short delays for minor street approach	Short delays for minor street approach

8.0 Recommendations

Based on the capacity analyses presented herein, all of the study intersections will operate at acceptable levels-of-service at project build-out with the committed and recommended roadway improvements, which are summarized below.

NCDOT Committed Improvements:

- Construct an additional northbound through lane on US 15-501
- Construct an additional southbound through lane on US 15-501

US 15-501 at Lystra Road:
- Construct an exclusive northbound left-turn lane on US 15-501
- Install a traffic signal

US 15-501 at Polks Landing Road:
- Construct exclusive northbound and southbound left-turn lanes on US 15-501

Recommended Improvements:

US 15-501 at Lystra Road:
- Construct an additional exclusive westbound left-turn lane on Lystra Road

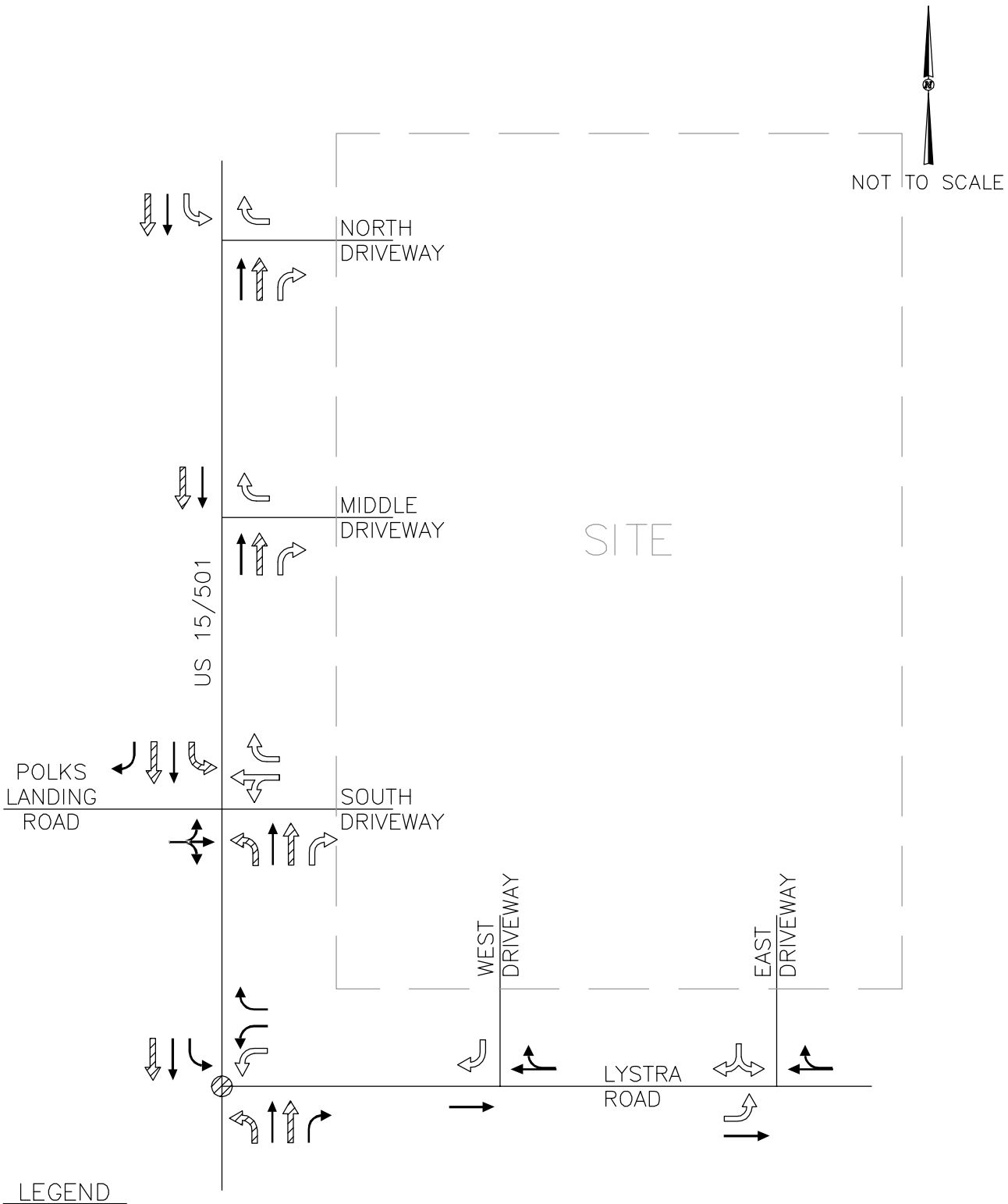
US 15-501 at Polks Landing Road/South Project Driveway:
- Construct an exclusive northbound right-turn lane on US 15-501
- Provide a shared westbound left/through lane and an exclusive westbound right-turn lane on the full-movement driveway

US 15-501 at Middle Project Driveway:
- Construct an exclusive northbound right-turn lane on US 15-501

US 15-501 at Polks Landing Road/South Project Driveway:
- Construct an exclusive northbound right-turn lane on US 15-501
- Construct an exclusive southbound left-turn lane on US 15-501

Lystra Road at East Project Driveway:
- Construct an exclusive eastbound left-turn lane on Lystra Road

The recommended roadway laneage is shown in Figure 8.



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Kimley-Horn and Associates, Inc.

WILLIAMS CORNER
TRAFFIC IMPACT ANALYSIS

RECOMMENDED ROADWAY
LANEAGE

FIGURE
8

Appendix

Trip Generation

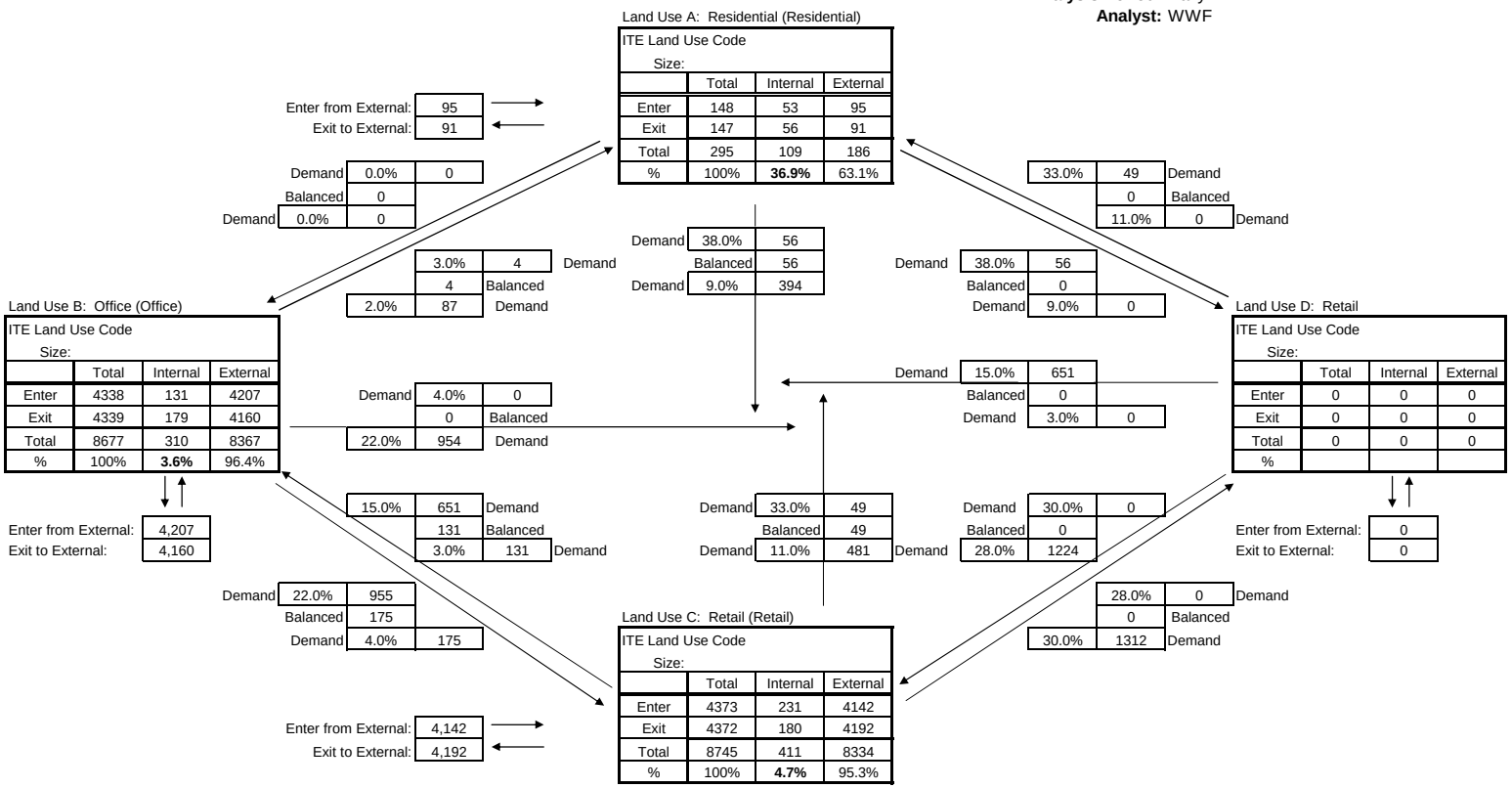
Williams Corner
Trip Generation

Land Use	Intensity	Daily	Daily In	Daily Out	AM Peak Hour Total	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out
230 Residential Condominium/Townhouse	40 d.u.	295	148	147	25	4	21	28	19	9
565 Day Care Center	12,500 s.f.	991	496	495	160	85	75	111	52	59
710 General Office Building	50,500 s.f.	788	394	394	109	96	13	135	23	112
770 Business Park	60,000 s.f.	1,392	696	696	87	73	14	94	22	72
720 Medical-Dental Office Building	150,000 s.f.	5,919	2,959	2,960	372	294	78	459	124	335
720 Medical-Dental Office Building (Veterinary)	6,000 s.f.	217	108	109	15	12	3	23	6	17
720 Medical-Dental Office Building (Optician)	10,000 s.f.	361	181	180	25	20	5	37	10	27
814 Specialty Retail	50,500 s.f.	2,198	1,099	1,099	39	24	15	143	63	80
850 Supermarket	25,000 s.f.	3,065	1,532	1,533	58	35	23	312	159	153
881 Pharmacy/Drugstore with Drive Thru	15,000 s.f.	1,322	661	661	40	23	17	129	63	66
912 Drive-in Bank	5,000 s.f.	1,169	585	584	62	35	27	229	115	114
Subtotal		**17,717**	**8,859**	**8,858**	**992**	**701**	**291**	**1,700**	**656**	**1,044**
Internal Capture										
Residential Condominium/Townhouse		109	53	56	0	0	0	11	6	5
Day Care Center		46	26	20	0	0	0	4	2	2
General Office Building		28	12	16	0	0	0	5	3	2
Business Park		50	21	29	0	0	0	3	2	1
Medical-Dental Office Building		211	89	122	0	0	0	15	9	6
Medical-Dental Office Building (Veterinary)		7	3	4	0	0	0	0	0	0
Medical-Dental Office Building (Optician)		12	5	7	0	0	0	1	1	0
Specialty Retail		103	58	45	0	0	0	5	2	3
Supermarket		144	81	63	0	0	0	12	5	7
Pharmacy/Drugstore with Drive Thru		62	35	27	0	0	0	5	2	3
Drive-in Bank		57	32	25	0	0	0	8	3	5
Internal Capture Total (4.7% Daily / 4.1% PM)		**829**	**415**	**414**	**0**	**0**	**0**	**69**	**35**	**34**
Total Driveway Volumes		**16,888**	**8,444**	**8,444**	**992**	**701**	**291**	**1,631**	**621**	**1,010**
Pass-By Capture	AM PM									
Supermarket	0% 36%	1,103	552	552	0	0	0	108	55	53
Pharmacy/Drugstore with Drive Thru	0% 49%	648	324	324	0	0	0	61	30	31
Drive-in Bank	0% 47%	549	275	275	0	0	0	104	53	51
Pass-By Capture Subtotal		2,300	1,150	1,150	0	0	0	273	138	135
10% Adjacent Street Traffic		2,100	1,050	1,050	0	0	0	614	307	307
Pass-By Total (12.4%)		**2,100**	**1,050**	**1,050**	**0**	**0**	**0**	**273**	**138**	**135**
Net New External Trips		**14,788**	**7,394**	**7,394**	**992**	**701**	**291**	**1,358**	**483**	**875**

ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET

(Source: Chapter 7, ITE *Trip Generation Handbook*, October 1998)

Project Number:
Project Name: Williams Corner
Scenario: Daily
Analysis Period: Daily
Analyst: WWF



NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

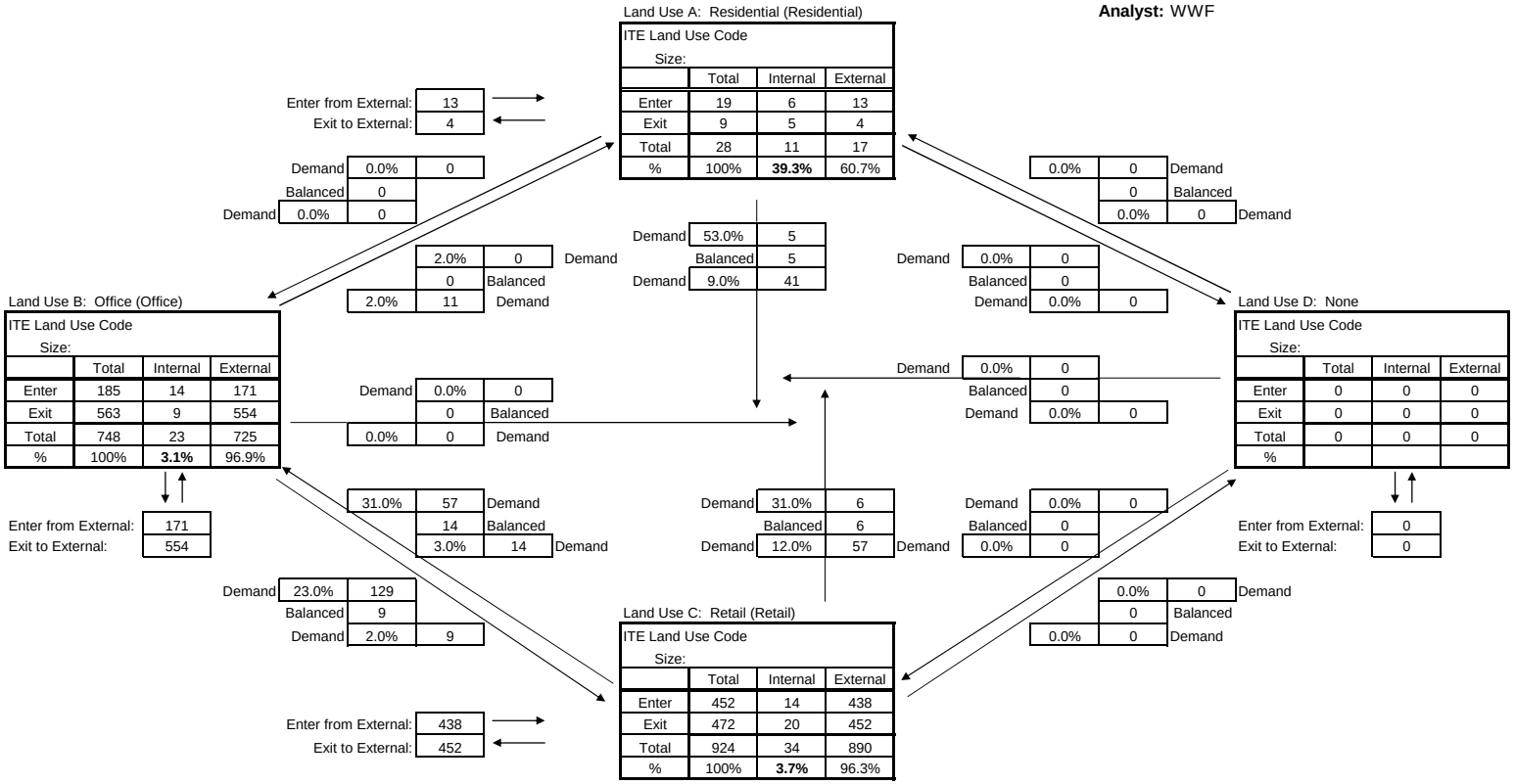
Category	Land Use A	B	C	D	Total
Enter	95	4,207	4,192	0	8,494
Exit	91	4,160	4,142	0	8,393
Total	186	8,367	8,334	0	**16,887**
Single Use Trip Gen Estimate	295	8,677	8,745	0	**17,717**

Overall Internal Capture = **4.68%**

ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET

(Source: Chapter 7, ITE *Trip Generation Handbook*, October 1998)

Project Number:
Project Name: Williams Corner
Scenario: PM
Analysis Period: PM Peak
Analyst: WWF



NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

	Land Use				
Category	A	B	C	D	Total
Enter	13	171	452	0	636
Exit	4	554	438	0	996
Total	17	725	890	0	**1,632**
Single Use Trip Gen Estimate	28	748	924	0	**1,700**

Overall Internal Capture = **4.00%**

Williams Corner
Polks Landing Trip Generation

Land Use	Intensity	Daily	Daily In	Daily Out	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
210 Single-Family Detached	156 d.u.	1,565	783	783	119	30	89	160	101	59
Net New External Trips		**1,565**	**783**	**783**	**119**	**30**	**89**	**160**	**101**	**59**

H:\PN\012726000 501 Centre TIA\[501 Centre Specialty Retail.xls]Trip Gen (Adj SF)

Traffic Count Data

US 15-501 at Lystra Rd
Chatham County, NC

3/17/04
Counted: JAG
Stop Sign on Lystra Church Road
Clear

File Name : US15_501_Lystra
Site Code : 00240164
Start Date : 3/17/2004
Page No : 1

Groups Printed- 1 - Vehicles

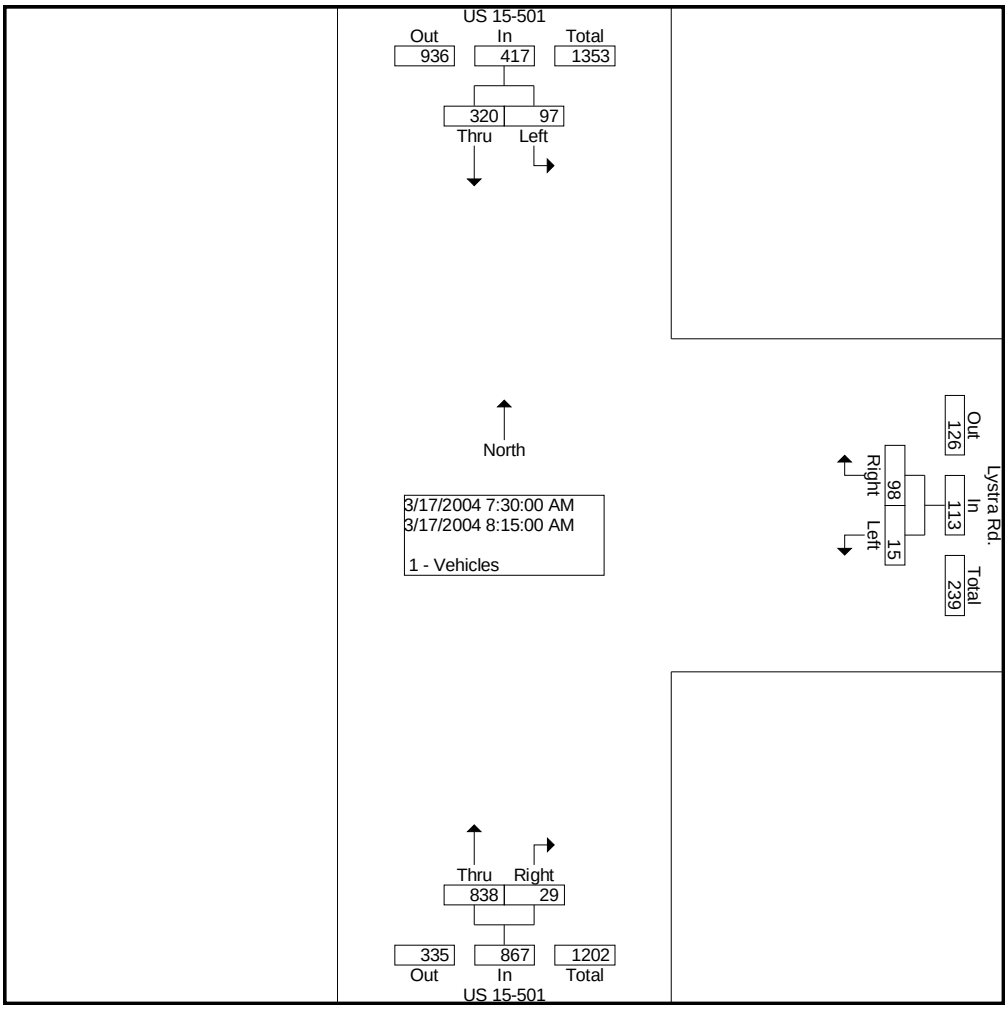
	US 15-501 From South			US 15-501 From North			Lystra Rd. From East			From West			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	7	195	0	0	48	23	16	0	3	0	0	0	292
07:15 AM	8	210	0	0	69	29	20	0	3	0	0	0	339
07:30 AM	11	244	0	0	70	23	26	0	10	0	0	0	384
07:45 AM	4	178	0	0	67	16	32	0	2	0	0	0	299
Total	30	827	0	0	254	91	94	0	18	0	0	0	1314
08:00 AM	6	206	0	0	96	35	19	0	1	0	0	0	363
08:15 AM	8	210	0	0	87	23	21	0	2	0	0	0	351
08:30 AM	5	185	0	0	74	13	14	0	1	0	0	0	292
08:45 AM	4	161	0	0	70	24	25	0	1	0	0	0	285
Total	23	762	0	0	327	95	79	0	5	0	0	0	1291
*** BREAK ***													
04:00 PM	3	102	0	0	184	20	22	0	2	0	0	0	333
04:15 PM	4	109	0	0	192	23	21	0	1	0	0	0	350
04:30 PM	2	112	0	0	198	25	25	0	3	0	0	0	365
04:45 PM	5	103	0	0	209	21	29	0	2	0	0	0	369
Total	14	426	0	0	783	89	97	0	8	0	0	0	1417
05:00 PM	4	106	0	0	191	19	24	0	1	0	0	0	345
05:15 PM	6	112	0	0	198	25	29	0	2	0	0	0	372
05:30 PM	5	119	0	0	210	22	30	0	3	0	0	0	389
05:45 PM	5	131	0	0	199	16	31	0	2	0	0	0	384
Total	20	468	0	0	798	82	114	0	8	0	0	0	1490
Grand Total	87	2483	0	0	2162	357	384	0	39	0	0	0	5512
Apprch %	3.4	96.6	0.0	0.0	85.8	14.2	90.8	0.0	9.2	0.0	0.0	0.0	
Total %	1.6	45.0	0.0	0.0	39.2	6.5	7.0	0.0	0.7	0.0	0.0	0.0	

US 15-501 at Lystra Rd
Chatham County, NC

3/17/04
Counted: JAG
Stop Sign on Lystra Church Road
Clear

File Name : US15_501_Lystra
Site Code : 00240164
Start Date : 3/17/2004

	US 15-501 From South				US 15-501 From North				Lystra Rd. From East				From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Intersection 07:30 AM																	
Volume	29	838	0	867	0	320	97	417	98	0	15	113	0	0	0	0	1397
Percent	3.3	96.7	0.0		0.0	76.7	23.3		86.7	0.0	13.3		0.0	0.0	0.0		
07:30 Volume	11	244	0	255	0	70	23	93	26	0	10	36	0	0	0	0	384
Peak Factor																	0.910
High Int.	07:30 AM				08:00 AM				07:30 AM				6:45:00 AM				
Volume	11	244	0	255	0	96	35	131	26	0	10	36					
Peak Factor				0.850				0.796				0.785					

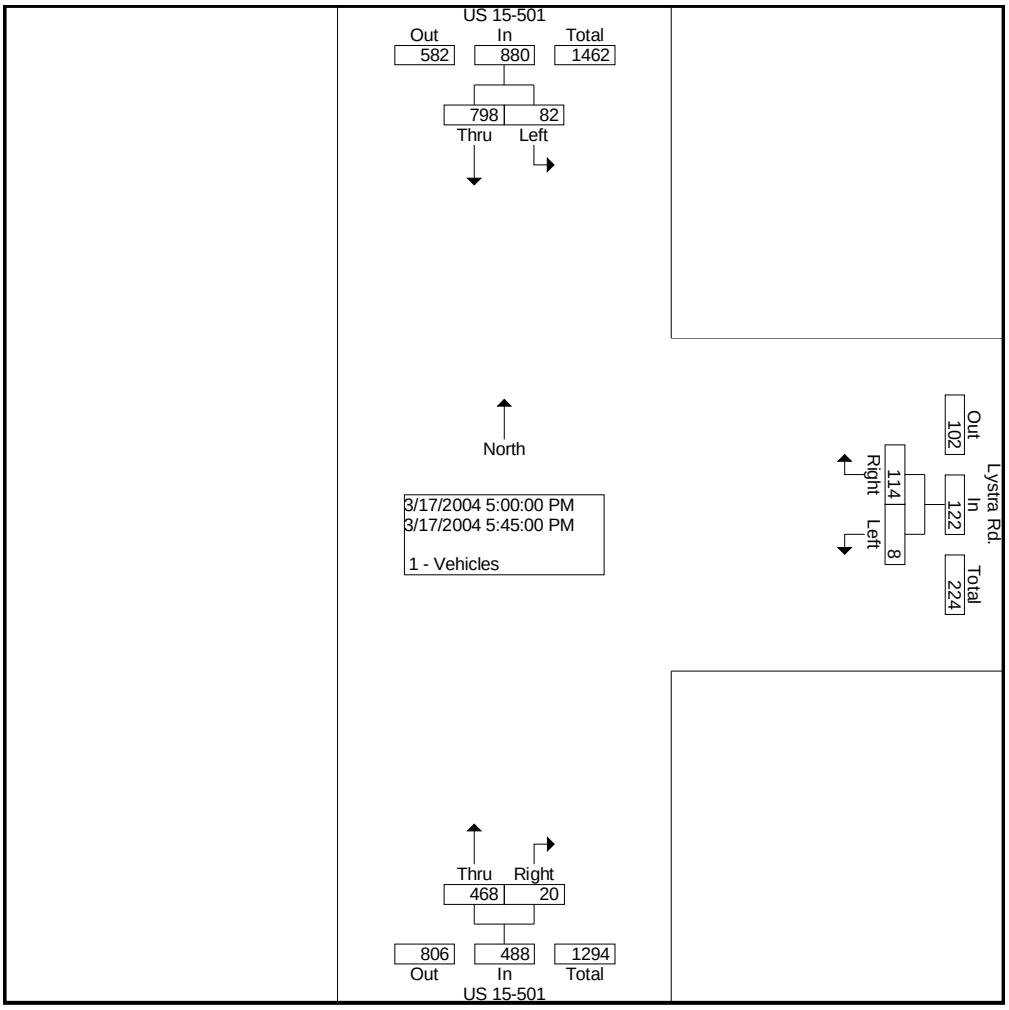


US 15-501 at Lystra Rd
Chatham County, NC

3/17/04
Counted: JAG
Stop Sign on Lystra Church Road
Clear

File Name : US15_501_Lystra
Site Code : 00240164
Start Date : 3/17/2004
Page No : 3

	US 15-501 From South				US 15-501 From North				Lystra Rd. From East				From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Intersection 05:00 PM																	
Volume	20	468	0	488	0	798	82	880	114	0	8	122	0	0	0	0	1490
Percent	4.1	95.9	0.0		0.0	90.7	9.3		93.4	0.0	6.6		0.0	0.0	0.0		
05:30 Volume	5	119	0	124	0	210	22	232	30	0	3	33	0	0	0	0	389
Peak Factor																	0.958
High Int.	05:45 PM				05:30 PM				05:30 PM								
Volume	5	131	0	136	0	210	22	232	30	0	3	33					
Peak Factor				0.897				0.948				0.924					



Intersection Spreadsheets

Williams Corner Traffic Impact Analysis
Chatham County, NC

INTERSECTION VOLUME DEVELOPMENT

US 15/501 & Lystra Road
AM PEAK HOUR

Description	US 15/501 Northbound			US 15/501 Southbound			- Eastbound			Lystra Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	838	29	97	320	0	0	0	0	15	0	98
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	863	30	100	330	0	0	0	0	15	0	101
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	137	5	16	53	0	0	0	0	2	0	16
Approved Development												
Briar Chapel	0	347	52	4	382	0	0	0	0	44	0	1
Chatham Downs	0	17	13	60	0	0	0	0	0	36	0	24
Total Approved Development Traffic	0	364	65	64	382	0	0	0	0	80	0	25
2010 Background Traffic	0	1,364	100	180	765	0	0	0	0	97	0	142
Project Traffic												
Percent Assignment	0%	40%	3%	4%	10%	0%	0%	0%	0%	33%	0%	6%
Direction		in	in	in	out					out		in + out
New Project Traffic	0	280	21	28	29	0	0	0	0	96	0	26
2010 Buildout Total	0	1,644	121	208	794	0	0	0	0	193	0	168

PM PEAK HOUR

Description	US 15/501 Northbound			US 15/501 Southbound			- Eastbound			Lystra Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	468	20	82	798	0	0	0	0	8	0	114
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	482	21	84	822	0	0	0	0	8	0	117
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	77	3	13	131	0	0	0	0	1	0	19
Approved Development												
Briar Chapel	0	374	43	2	374	0	0	0	0	46	0	4
Briar Chapel (Pass-By Capture)	0	-15	0	0	-34	0	0	0	0	0	0	0
Chatham Downs	0	57	30	142	0	0	0	0	0	123	0	80
Chatham Downs (Pass-By Capture)	0	-10	10	48	-48	0	0	0	0	42	0	30
Total Approved Development Traffic	0	406	83	192	292	0	0	0	0	211	0	114
2010 Background Traffic	0	965	107	289	1,245	0	0	0	0	220	0	250
Project Traffic												
Percent Assignment	0%	40%	3%	4%	10%	0%	0%	0%	0%	33%	0%	6%
Direction		in	in	in	out					out		in + out
New Project Traffic	0	193	15	19	88	0	0	0	0	289	0	45
Pass-By Traffic	0	0	0	0	-1	0	0	0	0	0	0	0
2010 Buildout Total	0	1,158	122	308	1,332	0	0	0	0	509	0	295

Williams Corner Traffic Impact Analysis
Chatham County, NC

INTERSECTION VOLUME DEVELOPMENT

US 15/501 & Polks Landing Road/South Project Driveway
AM PEAK HOUR

	US 15-501 Northbound			US 15-501 Southbound			Polks Landing Road Eastbound			South Project Driveway Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	915	0	0	390	0	0	0	0	0	0	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	942	0	0	402	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.000	0.159	0.000	0.000	0.159	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	150	0	0	64	0	0	0	0	0	0	0
Polks Landing Traffic	21	0	0	0	0	9	62	0	27	0	0	0
Approved Development												
Briar Chapel	0	348	0	0	386	0	0	0	0	0	0	0
Chatham Downs	0	41	0	0	60	0	0	0	0	0	0	0
Total Approved Development Traffic	0	389	0	0	446	0	0	0	0	0	0	0
2010 Background Traffic	21	1,481	0	0	912	9	62	0	27	0	0	0
Project Traffic												
Percent Assignment	0%	31%	15%	24%	4%	0%	0%	1%	0%	10%	1%	15%
Direction		in + out	in	in	in			in		out	out	out
New Project Traffic	0	201	105	168	28	0	0	7	0	29	3	44
2010 Buildout Total	21	1,682	105	168	940	9	62	7	27	29	3	44

PM PEAK HOUR

	US 15-501 Northbound			US 15-501 Southbound			Polks Landing Road Eastbound			South Project Driveway Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	542	0	0	844	0	0	0	0	0	0	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	558	0	0	869	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.000	0.159	0.000	0.000	0.159	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Existing 2005 Traffic	0	89	0	0	138	0	0	0	0	0	0	0
Polks Landing Traffic	40	0	0	0	0	61	23	0	36	0	0	0
Approved Development												
Briar Chapel	0	378	0	0	376	0	0	0	0	0	0	0
Briar Chapel (Pass-By Capture)	0	-15	0	0	-34	0	0	0	0	0	0	0
Chatham Downs	0	137	0	0	142	0	0	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	20	0	0	0	0	0	0	0	0	0	0
Total Approved Development Traffic	0	520	0	0	484	0	0	0	0	0	0	0
2010 Background Traffic	40	1,167	0	0	1,491	61	23	0	36	0	0	0
Project Traffic												
Percent Assignment	0%	31%	15%	24%	4%	0%	0%	1%	0%	10%	1%	15%
Direction		in + out	in	in	in			in		out	out	out
New Project Traffic	0	165	72	116	19	0	0	5	0	88	9	131
Pass-By Traffic	0	-59	59	50	-50	0	0	0	0	49	0	57
2010 Buildout Total	40	1,273	131	166	1,460	61	23	5	36	137	9	188

Williams Corner Traffic Impact Analysis
Chatham County, NC

INTERSECTION VOLUME DEVELOPMENT

US 15/501 & Middle Project Driveway
AM PEAK HOUR

	US 15-501 Northbound			US 15-501 Southbound			- Eastbound			Middle Project Driveway Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	915	0	0	390	0	0	0	0	0	0	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	942	0	0	402	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	150	0	0	64	0	0	0	0	0	0	0
Polks Landing Traffic	0	62	0	0	9	0	0	0	0	0	0	0
Approved Development												
Briar Chapel	0	348	0	0	386	0	0	0	0	0	0	0
Chatham Downs	0	41	0	0	60	0	0	0	0	0	0	0
Total Approved Development Traffic	0	389	0	0	446	0	0	0	0	0	0	0
2010 Background Traffic	0	1,543	0	0	921	0	0	0	0	0	0	0
Project Traffic												
Percent Assignment	0%	38%	8%	0%	28%	0%	0%	0%	0%	0%	0%	15%
Direction		in + out	in		in							out
New Project Traffic	0	188	56	0	196	0	0	0	0	0	0	43
2010 Buildout Total	0	1,731	56	0	1,117	0	0	0	0	0	0	43

PM PEAK HOUR

	US 15-501 Northbound			US 15-501 Southbound			- Eastbound			Middle Project Driveway Westbound		
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	542	0	0	844	0	0	0	0	0	0	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	558	0	0	869	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Existing 2005 Traffic	0	89	0	0	138	0	0	0	0	0	0	0
Polks Landing Traffic	0	23	0	0	61	0	0	0	0	0	0	0
Approved Development												
Briar Chapel	0	378	0	0	376	0	0	0	0	0	0	0
Briar Chapel (Pass-By Capture)	0	-15	0	0	-34	0	0	0	0	0	0	0
Chatham Downs	0	137	0	0	142	0	0	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	20	0	0	0	0	0	0	0	0	0	0
Total Approved Development Traffic	0	520	0	0	484	0	0	0	0	0	0	0
2010 Background Traffic	0	1,190	0	0	1,552	0	0	0	0	0	0	0
Project Traffic												
Percent Assignment	0%	38%	8%	0%	28%	0%	0%	0%	0%	0%	0%	15%
Direction		in + out	in		in							out
New Project Traffic	0	258	39	0	135	0	0	0	0	0	0	131
Pass-By Traffic	0	-31	29	0	0	0	0	0	0	0	0	29
2010 Buildout Total	0	1,417	68	0	1,687	0	0	0	0	0	0	160

Williams Corner Traffic Impact Analysis
Chatham County, NC

INTERSECTION VOLUME DEVELOPMENT

US 15/501 & North Project Driveway
AM PEAK HOUR

Description	US 15-501 Northbound			US 15-501 Southbound			- Eastbound			North Project Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	915	0	0	390	0	0	0	0	0	0	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	942	0	0	402	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	150	0	0	64	0	0	0	0	0	0	0
Polks Landing Traffic	0	62	0	0	9	0	0	0	0	0	0	0
Approved Development												
Briar Chapel	0	348	0	0	386	0	0	0	0	0	0	0
Chatham Downs	0	41	0	0	60	0	0	0	0	0	0	0
Total Approved Development Traffic	0	389	0	0	446	0	0	0	0	0	0	0
2010 Background Traffic	0	1,543	0	0	921	0	0	0	0	0	0	0
Project Traffic												
Percent Assignment	0%	34%	19%	19%	28%	0%	0%	0%	0%	0%	0%	13%
Direction		out	in	in	in							out
New Project Traffic	0	99	133	133	196	0	0	0	0	0	0	38
2010 Buildout Total	0	1,642	133	133	1,117	0	0	0	0	0	0	38

PM PEAK HOUR

Description	US 15-501 Northbound			US 15-501 Southbound			- Eastbound			North Project Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	542	0	0	844	0	0	0	0	0	0	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	558	0	0	869	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	89	0	0	138	0	0	0	0	0	0	0
Polks Landing Traffic	0	23	0	0	61	0	0	0	0	0	0	0
Approved Development												
Briar Chapel	0	378	0	0	376	0	0	0	0	0	0	0
Briar Chapel (Pass-By Capture)	0	-15	0	0	-34	0	0	0	0	0	0	0
Chatham Downs	0	137	0	0	142	0	0	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	20	0	0	0	0	0	0	0	0	0	0
Total Approved Development Traffic	0	520	0	0	484	0	0	0	0	0	0	0
2010 Background Traffic	0	1,190	0	0	1,552	0	0	0	0	0	0	0
Project Traffic												
Percent Assignment	0%	34%	19%	19%	28%	0%	0%	0%	0%	0%	0%	13%
Direction		out	in	in	in							out
New Project Traffic	0	298	92	92	135	0	0	0	0	0	0	113
Pass-By Traffic	0	-2	0	0	0	0	0	0	0	0	0	0
2010 Buildout Total	0	1,486	92	92	1,687	0	0	0	0	0	0	113

Williams Corner Traffic Impact Analysis
Chatham County, NC

INTERSECTION VOLUME DEVELOPMENT

US 15/501 & West Project Driveway
AM PEAK HOUR

Description	- Northbound			West Project Driveway Southbound			Lystra Road Eastbound			Lystra Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	0	0	0	0	0	0	126	0	0	113	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	0	0	0	0	0	0	130	0	0	116	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	0	0	0	0	0	0	21	0	0	18	0
Approved Development												
Briar Chapel	0	0	0	0	0	0	0	56	0	0	45	0
Chatham Downs	0	0	0	0	0	0	0	16	0	0	14	0
Total Approved Development Traffic	0	0	0	0	0	0	0	72	0	0	59	0
2010 Background Traffic	0	0	0	0	0	0	0	223	0	0	193	0
Project Traffic												
Percent Assignment	0%	0%	0%	0%	0%	30%	0%	7%	0%	0%	9%	6%
Direction						out		in			in + out	in
New Project Traffic	0	0	0	0	0	88	0	49	0	0	34	42
2010 Buildout Total	0	0	0	0	0	88	0	272	0	0	227	42

PM PEAK HOUR

Description	- Northbound			West Project Driveway Southbound			Lystra Road Eastbound			Lystra Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	0	0	0	0	0	0	102	0	0	122	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	0	0	0	0	0	0	105	0	0	126	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	0	0	0	0	0	0	17	0	0	20	0
Approved Development												
Briar Chapel	0	0	0	0	0	0	0	45	0	0	50	0
Briar Chapel (Pass-By Capture)	0	0	0	0	0	0	0	0	0	0	0	0
Chatham Downs	0	0	0	0	0	0	0	41	0	0	41	0
Chatham Downs (Pass-By Capture)	0	0	0	0	0	0	0	10	0	0	15	0
Total Approved Development Traffic	0	0	0	0	0	0	0	96	0	0	106	0
2010 Background Traffic	0	0	0	0	0	0	0	218	0	0	252	0
Project Traffic												
Percent Assignment	0%	0%	0%	0%	0%	30%	0%	7%	0%	0%	9%	6%
Direction						out		in			in + out	in
New Project Traffic	0	0	0	0	0	263	0	34	0	0	71	29
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
2010 Buildout Total	0	0	0	0	0	263	0	252	0	0	323	29

Williams Corner Traffic Impact Analysis
Chatham County, NC

INTERSECTION VOLUME DEVELOPMENT

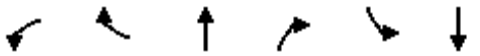
US 15/501 & East Project Driveway
AM PEAK HOUR

Description	- Northbound			East Project Driveway Southbound			Lystra Road Eastbound			Lystra Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	0	0	0	0	0	0	126	0	0	113	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	0	0	0	0	0	0	130	0	0	116	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	0	0	0	0	0	0	21	0	0	18	0
Approved Development												
Briar Chapel	0	0	0	0	0	0	0	56	0	0	45	0
Chatham Downs	0	0	0	0	0	0	0	4	0	0	11	0
Total Approved Development Traffic	0	0	0	0	0	0	0	60	0	0	56	0
2010 Background Traffic	0	0	0	0	0	0	0	211	0	0	190	0
Project Traffic												
Percent Assignment	0%	0%	0%	9%	0%	7%	7%	0%	0%	0%	8%	1%
Direction				out		out	in				in	in
New Project Traffic	0	0	0	26	0	20	49	0	0	0	56	8
2010 Buildout Total	0	0	0	26	0	20	49	211	0	0	246	8

PM PEAK HOUR

Description	- Northbound			East Project Driveway Southbound			Lystra Road Eastbound			Lystra Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/17/04)	0	0	0	0	0	0	0	102	0	0	122	0
Growth Factor (3% per year)	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030	1.030
Existing 2005 Traffic	0	0	0	0	0	0	0	105	0	0	126	0
Background Growth Factor (3% per year)	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
Background Growth	0	0	0	0	0	0	0	17	0	0	20	0
Approved Development												
Briar Chapel	0	0	0	0	0	0	0	45	0	0	50	0
Briar Chapel (Pass-By Capture)	0	0	0	0	0	0	0	0	0	0	0	0
Chatham Downs	0	0	0	0	0	0	0	14	0	0	27	0
Chatham Downs (Pass-By Capture)	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Development Traffic	0	0	0	0	0	0	0	59	0	0	77	0
2010 Background Traffic	0	0	0	0	0	0	0	181	0	0	223	0
Project Traffic												
Percent Assignment	0%	0%	0%	9%	0%	7%	7%	0%	0%	0%	8%	1%
Direction				out		out	in				in	in
New Project Traffic	0	0	0	79	0	61	34	0	0	0	39	5
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
2010 Buildout Total	0	0	0	79	0	61	34	181	0	0	262	5

Synchro Output:
Existing (2005) AM Peak-Hour Traffic



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	15	101	863	30	100	330
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	17	112	959	33	111	367
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1548	959			992	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1548	959			992	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	64			84	
cM capacity (veh/h)	106	312			697	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	959	33	111	367
Volume Left	17	0	0	111	0
Volume Right	112	0	33	0	0
cSH	358	1700	1700	697	1700
Volume to Capacity	0.36	0.56	0.02	0.16	0.22
Queue Length (ft)	40	0	0	14	0
Control Delay (s)	25.8	0.0	0.0	11.1	0.0
Lane LOS	D			B	
Approach Delay (s)	25.8	0.0		2.6	
Approach LOS	D				

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C

Synchro Output:
Existing (2005) PM Peak-Hour Traffic

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	8	117	482	21	84	822
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	9	130	536	23	93	913
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		4				
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1636	536			559	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1636	536			559	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	76			91	
cM capacity (veh/h)	101	545			1012	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	139	536	23	93	913
Volume Left	9	0	0	93	0
Volume Right	130	0	23	0	0
cSH	582	1700	1700	1012	1700
Volume to Capacity	0.24	0.32	0.01	0.09	0.54
Queue Length (ft)	23	0	0	8	0
Control Delay (s)	15.6	0.0	0.0	8.9	0.0
Lane LOS	C			A	
Approach Delay (s)	15.6	0.0		0.8	
Approach LOS	C				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	59.7%	ICU Level of Service	A

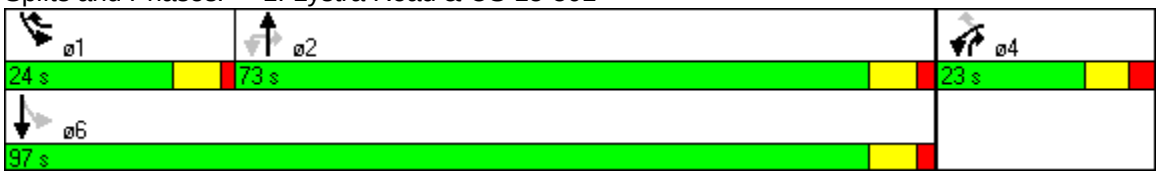
Synchro Output:
Projected (2010) Build-Out
AM Peak-Hour Traffic

Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%
Storage Length (ft)	275	250	0		100	350	
Storage Lanes	1	1	1		1	1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Leading Detector (ft)	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0
Turning Speed (mph)	15	9	9		9	15	
Satd. Flow (prot)	3433	1583	1863	3539	1583	1770	3539
Flt Permitted	0.950					0.055	
Satd. Flow (perm)	3433	1583	1863	3539	1583	102	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		13			86		
Link Speed (mph)	45			45			45
Link Distance (ft)	449			1312			810
Travel Time (s)	6.8			19.9			12.3
Volume (vph)	193	168	0	1644	121	208	794
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%			0%
Lane Group Flow (vph)	214	187	0	1827	134	231	882
Turn Type		pm+ov	Perm		pm+ov	pm+pt	
Protected Phases	4	1		2	4	1	6
Permitted Phases		4	2		2	6	
Detector Phases	4	1	2	2	4	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.5	10.6	23.1	23.1	23.5	10.6	23.1
Total Split (s)	23.0	24.0	73.0	73.0	23.0	24.0	97.0
Total Split (%)	19%	20%	61%	61%	19%	20%	81%
Yellow Time (s)	4.5	5.1	5.1	5.1	4.5	5.1	5.1
All-Red Time (s)	3.0	1.5	2.0	2.0	3.0	1.5	2.0
Lead/Lag		Lead	Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes	Yes		Yes	
Recall Mode	None	None	Min	Min	None	None	Min
Act Effct Green (s)	14.3	34.5		60.3	79.8	80.5	80.5
Actuated g/C Ratio	0.14	0.33		0.57	0.76	0.77	0.77
v/c Ratio	0.46	0.35		0.90	0.11	0.73	0.33
Uniform Delay, d1	41.7	24.8		19.2	1.1	25.4	3.7
Delay	44.5	26.6		22.8	1.5	27.8	3.9
LOS	D	C		C	A	C	A
Approach Delay	36.1			21.4			8.9
Approach LOS	D			C			A

Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	76	98		570	7	110	81
Queue Length 95th (ft)	117	161		765	22	205	117
Internal Link Dist (ft)	369			1232			730
50th Up Block Time (%)							
95th Up Block Time (%)							
Turn Bay Length (ft)	275	250			100	350	
50th Bay Block Time %				34%			
95th Bay Block Time %				38%			
Queuing Penalty (veh)				48			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 105.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 81.9%		ICU Level of Service D	

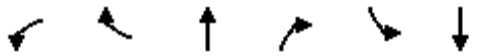
Splits and Phases: 1: Lystra Road & US 15-501



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)	62	7	27	29	3	44	21	1682	105	168	940	9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	69	8	30	32	3	49	23	1869	117	187	1044	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								810				
pX, platoon unblocked	0.52	0.52		0.52	0.52	0.52				0.52		
vC, conflicting volume	2449	3450	522	2845	3343	934	1054			1986		
vC1, stage 1 conf vol							0			0		
vC2, stage 2 conf vol							0			0		
vCu, unblocked vol	2866	4795	522	3629	4589	0	1054			1972		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)							3.1			3.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	94	0	0	91	98			77		
cM capacity (veh/h)	0	0	499	0	0	563	1039			809		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	107	36	49	23	934	934	117	187	522	522	10
Volume Left	69	32	0	23	0	0	0	187	0	0	0
Volume Right	30	0	49	0	0	0	117	0	0	0	10
cSH	0	0	563	1039	1700	1700	1700	809	1700	1700	1700
Volume to Capacity	Err	Err	0.09	0.02	0.55	0.55	0.07	0.23	0.31	0.31	0.01
Queue Length (ft)	Err	Err	7	2	0	0	0	22	0	0	0
Control Delay (s)	Err	Err	12.0	8.5	0.0	0.0	0.0	10.8	0.0	0.0	0.0
Lane LOS	F	F	B	A				B			
Approach Delay (s)	Err	Err		0.1				1.6			
Approach LOS	F	F									

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	87.2%	ICU Level of Service	D	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	43	1731	56	0	1117
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	48	1923	62	0	1241
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			1266			
pX, platoon unblocked	0.52	0.52			0.52	
vC, conflicting volume	2544	962			1986	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3046	2			1972	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	91			100	
cM capacity (veh/h)	5	562			151	

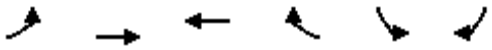
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	48	962	962	62	621	621
Volume Left	0	0	0	0	0	0
Volume Right	48	0	0	62	0	0
cSH	562	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.57	0.57	0.04	0.37	0.37
Queue Length (ft)	7	0	0	0	0	0
Control Delay (s)	12.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.0	0.0			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	64.8%	ICU Level of Service	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	38	1642	133	133	1117
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	42	1824	148	148	1241
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2741	912			1972	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2741	912			1972	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	85			49	
cM capacity (veh/h)	8	276			290	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	42	912	912	148	148	621	621
Volume Left	0	0	0	0	148	0	0
Volume Right	42	0	0	148	0	0	0
cSH	276	1700	1700	1700	290	1700	1700
Volume to Capacity	0.15	0.54	0.54	0.09	0.51	0.37	0.37
Queue Length (ft)	13	0	0	0	68	0	0
Control Delay (s)	20.4	0.0	0.0	0.0	29.6	0.0	0.0
Lane LOS	C				D		
Approach Delay (s)	20.4	0.0			3.2		
Approach LOS	C						

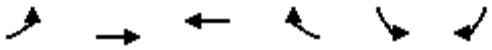
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	67.0%	ICU Level of Service	B



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	272	227	42	0	88
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	302	252	47	0	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		449				
pX, platoon unblocked						
vC, conflicting volume	299				578	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	299				578	276
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	87
cM capacity (veh/h)	1262				478	763

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	302	299	98
Volume Left	0	0	0
Volume Right	0	47	98
cSH	1700	1700	763
Volume to Capacity	0.18	0.18	0.13
Queue Length (ft)	0	0	11
Control Delay (s)	0.0	0.0	10.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	30.5%	ICU Level of Service	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	49	211	246	8	26	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	54	234	273	9	29	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	282				621	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	282				621	278
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				93	97
cM capacity (veh/h)	1280				432	761

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	54	234	282	51
Volume Left	54	0	0	29
Volume Right	0	0	9	22
cSH	1280	1700	1700	532
Volume to Capacity	0.04	0.14	0.17	0.10
Queue Length (ft)	3	0	0	8
Control Delay (s)	7.9	0.0	0.0	12.5
Lane LOS	A			B
Approach Delay (s)	1.5		0.0	12.5
Approach LOS				B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A

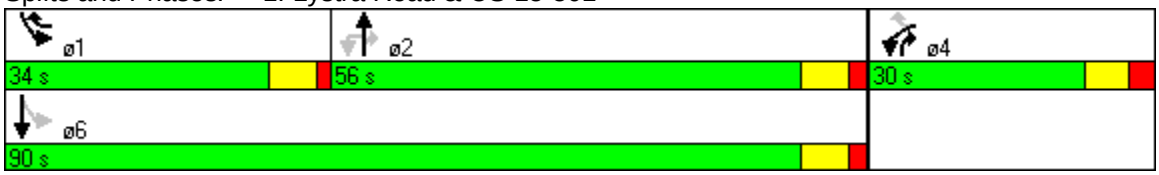
Synchro Output:
Projected (2010) Build-Out
PM Peak-Hour Traffic

Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%
Storage Length (ft)	275	250	0		100	350	
Storage Lanes	1	1	1		1	1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Leading Detector (ft)	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0
Turning Speed (mph)	15	9	9		9	15	
Satd. Flow (prot)	3433	1583	1863	3539	1583	1770	3539
Flt Permitted	0.950					0.071	
Satd. Flow (perm)	3433	1583	1863	3539	1583	132	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		18			93		
Link Speed (mph)	45			45			45
Link Distance (ft)	449			1312			810
Travel Time (s)	6.8			19.9			12.3
Volume (vph)	509	295	0	1158	122	308	1332
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%			0%
Lane Group Flow (vph)	566	328	0	1287	136	342	1480
Turn Type		pm+ov	Perm		pm+ov	pm+pt	
Protected Phases	4	1		2	4	1	6
Permitted Phases		4	2		2	6	
Detector Phases	4	1	2	2	4	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.5	10.6	23.1	23.1	23.5	10.6	23.1
Total Split (s)	30.0	34.0	56.0	56.0	30.0	34.0	90.0
Total Split (%)	25%	28%	47%	47%	25%	28%	75%
Yellow Time (s)	4.5	5.1	5.1	5.1	4.5	5.1	5.1
All-Red Time (s)	3.0	1.5	2.0	2.0	3.0	1.5	2.0
Lead/Lag		Lead	Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes	Yes		Yes	
Recall Mode	None	None	Min	Min	None	None	Min
Act Effct Green (s)	22.3	49.3		43.8	71.3	70.8	70.8
Actuated g/C Ratio	0.22	0.48		0.42	0.69	0.68	0.68
v/c Ratio	0.77	0.43		0.86	0.12	0.79	0.61
Uniform Delay, d1	37.9	16.8		26.3	1.6	26.1	8.6
Delay	41.5	17.9		29.1	2.5	27.9	8.8
LOS	D	B		C	A	C	A
Approach Delay	32.8			26.6			12.4
Approach LOS	C			C			B

Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	207	149		438	9	187	270
Queue Length 95th (ft)	281	224		565	31	296	325
Internal Link Dist (ft)	369			1232			730
50th Up Block Time (%)							
95th Up Block Time (%)							
Turn Bay Length (ft)	275	250			100	350	
50th Bay Block Time %				44%			
95th Bay Block Time %	4%			48%			2%
Queuing Penalty (veh)	13			62			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 103.6			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 21.7		Intersection LOS: C	
Intersection Capacity Utilization 83.2%		ICU Level of Service D	

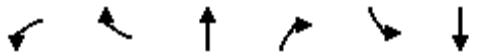
Splits and Phases: 1: Lystra Road & US 15-501



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)	23	5	36	137	9	188	40	1273	131	166	1460	61
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	26	6	40	152	10	209	44	1414	146	184	1622	68
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								810				
pX, platoon unblocked	0.68	0.68		0.68	0.68	0.68				0.68		
vC, conflicting volume	3001	3640	811	2726	3562	707	1690			1560		
vC1, stage 1 conf vol							0			0		
vC2, stage 2 conf vol							0			0		
vCu, unblocked vol	3464	4399	811	3062	4285	109	1690			1356		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)							3.1			3.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	88	0	0	67	95			79		
cM capacity (veh/h)	0	1	322	0	1	632	911			897		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	71	162	209	44	707	707	146	184	811	811	68
Volume Left	26	152	0	44	0	0	0	184	0	0	0
Volume Right	40	0	209	0	0	0	146	0	0	0	68
cSH	0	0	632	911	1700	1700	1700	897	1700	1700	1700
Volume to Capacity	Err	Err	0.33	0.05	0.42	0.42	0.09	0.21	0.48	0.48	0.04
Queue Length (ft)	Err	Err	36	4	0	0	0	19	0	0	0
Control Delay (s)	Err	Err	13.5	9.2	0.0	0.0	0.0	10.0	0.0	0.0	0.0
Lane LOS	F	F	B	A				B			
Approach Delay (s)	Err	Err		0.3				1.0			
Approach LOS	F	F									

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	77.4%	ICU Level of Service	C	



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	160	1417	68	0	1687
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	178	1574	76	0	1874
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			1266			
pX, platoon unblocked	0.70	0.70			0.70	
vC, conflicting volume	2512	787			1650	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2728	274			1502	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	65			100	
cM capacity (veh/h)	12	508			311	

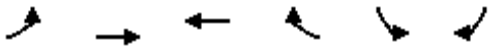
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	178	787	787	76	937	937
Volume Left	0	0	0	0	0	0
Volume Right	178	0	0	76	0	0
cSH	508	1700	1700	1700	1700	1700
Volume to Capacity	0.35	0.46	0.46	0.04	0.55	0.55
Queue Length (ft)	39	0	0	0	0	0
Control Delay (s)	15.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	15.8	0.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	113	1486	92	92	1687
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	126	1651	102	102	1874
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2793	826			1753	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2793	826			1753	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	60			71	
cM capacity (veh/h)	11	315			353	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	126	826	826	102	102	937	937
Volume Left	0	0	0	0	102	0	0
Volume Right	126	0	0	102	0	0	0
cSH	315	1700	1700	1700	353	1700	1700
Volume to Capacity	0.40	0.49	0.49	0.06	0.29	0.55	0.55
Queue Length (ft)	46	0	0	0	29	0	0
Control Delay (s)	23.8	0.0	0.0	0.0	19.3	0.0	0.0
Lane LOS	C				C		
Approach Delay (s)	23.8	0.0			1.0		
Approach LOS	C						

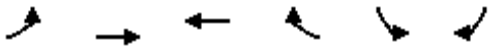
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	252	323	29	0	263
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	280	359	32	0	292
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)		449				
pX, platoon unblocked						
vC, conflicting volume	391				655	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	391				655	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	56
cM capacity (veh/h)	1167				431	671

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	280	391	292
Volume Left	0	0	0
Volume Right	0	32	292
cSH	1700	1700	671
Volume to Capacity	0.16	0.23	0.44
Queue Length (ft)	0	0	55
Control Delay (s)	0.0	0.0	14.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.4
Approach LOS			B

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	34	181	262	5	79	61
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	38	201	291	6	88	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	297				571	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	297				571	294
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				81	91
cM capacity (veh/h)	1265				468	745

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	38	201	297	156
Volume Left	38	0	0	88
Volume Right	0	0	6	68
cSH	1265	1700	1700	559
Volume to Capacity	0.03	0.12	0.17	0.28
Queue Length (ft)	2	0	0	28
Control Delay (s)	7.9	0.0	0.0	13.9
Lane LOS	A			B
Approach Delay (s)	1.3		0.0	13.9
Approach LOS				B

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A