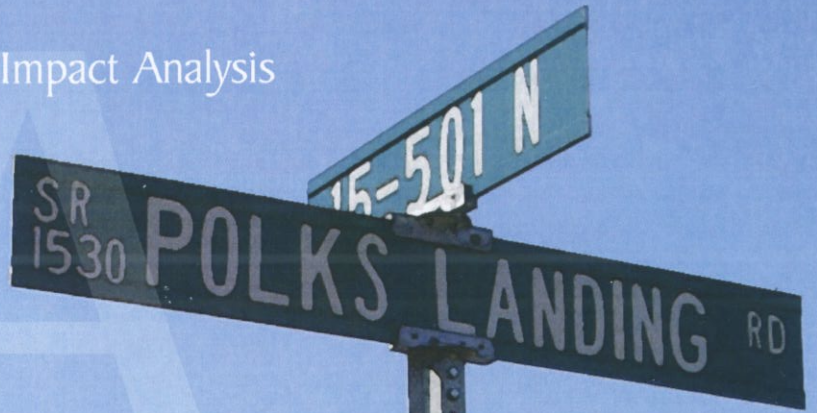


Traffic Impact Analysis



Polks Centre  
Chatham County, NC

Prepared for:  
Blake & Associates, Inc.

Prepared by:



Kimley-Horn  
and Associates, Inc.

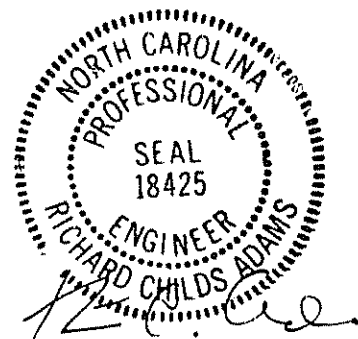
**Traffic Impact Analysis  
for  
Polks Centre  
Chatham County, North Carolina**

**Prepared for:  
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June 2006



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## 1.0 Executive Summary

The proposed Polks Centre Development is located in the northwest quadrant of the intersection of US 15-501 at Polks Landing Road (SR 1530) in Chatham County, North Carolina. As currently envisioned, the proposed development will consist of approximately 20,000 square feet (s.f.) of general office space, 92,500 s.f. of general retail space, one high-turnover sit-down restaurant, and a drive-in bank. As part of the Polks Centre Development, Holly Ridge Road is proposed to be extended to align with the proposed Williams Corner Center Driveway at a full-movement intersection with US 15-501. In addition, the existing US 15-501 intersection with Polks Landing Road is proposed to be converted from full-movement to a right-in/right-out operation. This will increase the spacing of full-movement intersections from 700 feet to 1200 feet. The proposed development will be accessed by the proposed Holly Ridge Road extension and is expected to be complete (built-out) in 2010.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands. The two traffic conditions studied include the existing (2006) traffic condition and the projected build-out (2010) traffic condition. The following is a summary of roadway improvements committed by the adjacent Williams Corner and Legend Oaks Developments:

### US 15-501 at Lystra Road

- Construct an additional westbound left-turn lane with 325 feet of storage on Lystra Road

### US 15-501 at Polks Landing Road/Williams Corner South Driveway

- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501

### US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway

- Provide an exclusive westbound left-turn lane with 200 feet of storage on Williams Corner Center Driveway
- Provide an exclusive westbound through lane on Williams Corner Center Driveway
- Provide an exclusive westbound right-turn lane with 100 feet of storage on Williams Corner Center Driveway
- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501
- Construct an exclusive southbound left-turn lane with 300 feet of storage on US 15-501

### US 15-501 at Williams Corner North Driveway

- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501
- Construct an exclusive southbound left-turn lane with 225 feet of storage on US 15-501

The following additional roadway improvements are recommended to accommodate traffic generated by the proposed Polks Centre Development:

US 15-501 at Lystra Road

- Extend the existing southbound left-turn lane to provide 400 feet of storage on US 15-501

US 15-501 at Polks Landing Road/Williams Corner South Driveway

- Convert full-movement side streets into right-in/right-out only access

US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway

- Install traffic signal
- Provide dual eastbound left-turn lanes with 175 feet of storage on the Holly Ridge Road Extension
- Provide an eastbound through lane on Holly Ridge Road Extension
- Provide an exclusive eastbound right-turn lane with 100 feet of storage on the Holly Ridge Road Extension
- Construct an exclusive northbound left-turn lane with 275 feet of storage on US 15-501
- Construct an exclusive southbound right-turn lane with 150 feet of storage on US 15-501

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

## 2.0 Introduction

The proposed Polks Centre Development is located in the northwest quadrant of the intersection of US 15-501 at Polks Landing Road (SR 1530) in Chatham County, North Carolina. As currently envisioned, the proposed development will consist of approximately 20,000 square feet (s.f.) of general office space, 92,500 s.f. of general retail space, one high-turnover sit-down restaurant, and a drive-in bank. As part of the Polks Centre Development, Holly Ridge Road is proposed to be extended to align with the proposed Williams Corner Center Driveway at a full-movement intersection with US 15-501. In addition, the existing US 15-501 intersection with Polks Landing Road is proposed to be converted from full-movement to a right-in/right-out operation. This will increase the spacing of full-movement intersections from 700 feet to 1200 feet. The proposed development will be accessed by the proposed Holly Ridge Road extension and is expected to be complete (built-out) in 2010.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands. The two traffic conditions studied include the existing (2006) traffic condition and the projected build-out (2010) traffic condition.

The North Carolina Department of Transportation (NCDOT) was contacted to obtain background information and to ascertain the elements to be covered in this Traffic Impact Analysis (TIA).

### 3.0 Inventory

#### 3.1 Study Area

The study area for this TIA includes the following intersections:

- § US 15-501 at Lystra Road
- § US 15-501 at Polks Landing Road/Williams Corner South Driveway
- § US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway
- § US 15-501 at Williams Corner North Driveway
- § Polks Landing Road at Holly Ridge Road/Holly Ridge Road Extension

This study area was determined based upon discussions with NCDOT staff. Figure 1 shows the site location, and Figure 2 shows the proposed site plan.

#### 3.2 Existing Conditions

The proposed Polks Centre Development is located in the northwest quadrant of the intersection of US 15-501 at Polks Landing Road (SR 1530) in Chatham County, North Carolina. Existing roadways in the immediate vicinity of the site include US 15-501, Lystra Road, and Polks Landing Road.

US 15-501 is a four-lane divided roadway with a posted speed limit of 55 mph and an estimated 2006 average daily traffic (ADT) volume of approximately 20,000 vehicles per day in the vicinity of the site.

Lystra Road is a two-lane undivided roadway with a posted speed limit of 45 mph and an estimated 2006 ADT volume of approximately 2,600 vehicles per day in the vicinity of the site.

Polks Landing Road is a two lane roadway with a posted speed limit of 25 mph and an estimated 2006 ADT volume of approximately 800 vehicles per day in the vicinity of the site.



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POLKS CENTRE  
TRAFFIC IMPACT ANALYSIS

SITE LOCATION

FIGURE  
1

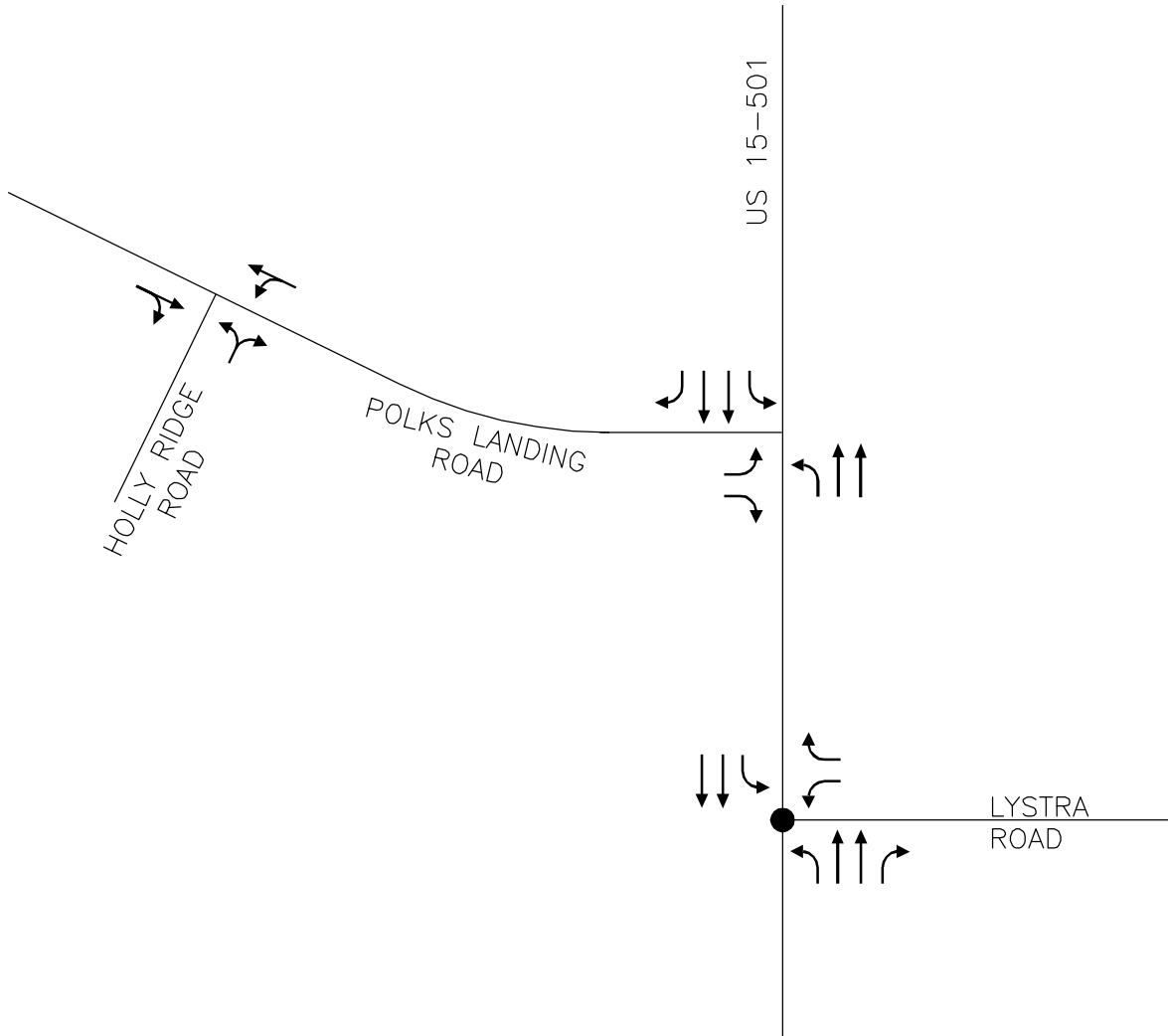
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NOT TO SCALE



LEGEND

- ← EXISTING LANE
- EXISTING TRAFFIC SIGNAL

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POLKS CENTRE  
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). Table 4.0 summarizes the estimated traffic generation for the proposed development.

<b>Table 4.0 ITE Traffic Generation (Vehicles)</b>							
Land Use Code	Land Use	24 Hour		AM Peak Hour		PM Peak Hour	
		In	Out	In	Out	In	Out
710	General Office (20,000 s.f.)	193	193	46	6	5	25
820	General Retail (92,500 s.f.)	3,228	3,228	91	58	286	309
932	High-Turnover Sit-Down Restaurant (7,500 s.f.)	477	477	45	41	50	32
912	Drive-In Bank (4 lanes)	789	789	45	33	102	102
	Internal Capture	469	469	0	0	45	45
	Pass-By Capture	1,490	1,490	0	0	149	149
	Net External Trips	2,728	2,728	227	138	249	274

Due to the high y-axis intercept in the ITE trip generation equation and the small amount of general office space in this development, the average rate was used for the PM peak hour.

Not all of the trips generated by this development will be new external trips. Some will be captured within the site. Internal capture methodologies presented in the *Trip Generation Handbook* (Institute of Transportation Engineers, 2004) indicate that this capture may be as high as 19% of the daily development traffic; however, to be conservative, the internal capture was limited to 10% of the daily and PM peak hour traffic.

Many retail developments attract pass-by trips, which are trips that are already on the adjacent roadway network. The average PM peak-hour pass-by percentage was taken from the *Trip Generation Handbook*

(Institute of Transportation Engineers, 2004) and applied to the site traffic. These pass-by volumes were limited to 10% of the adjacent street traffic.

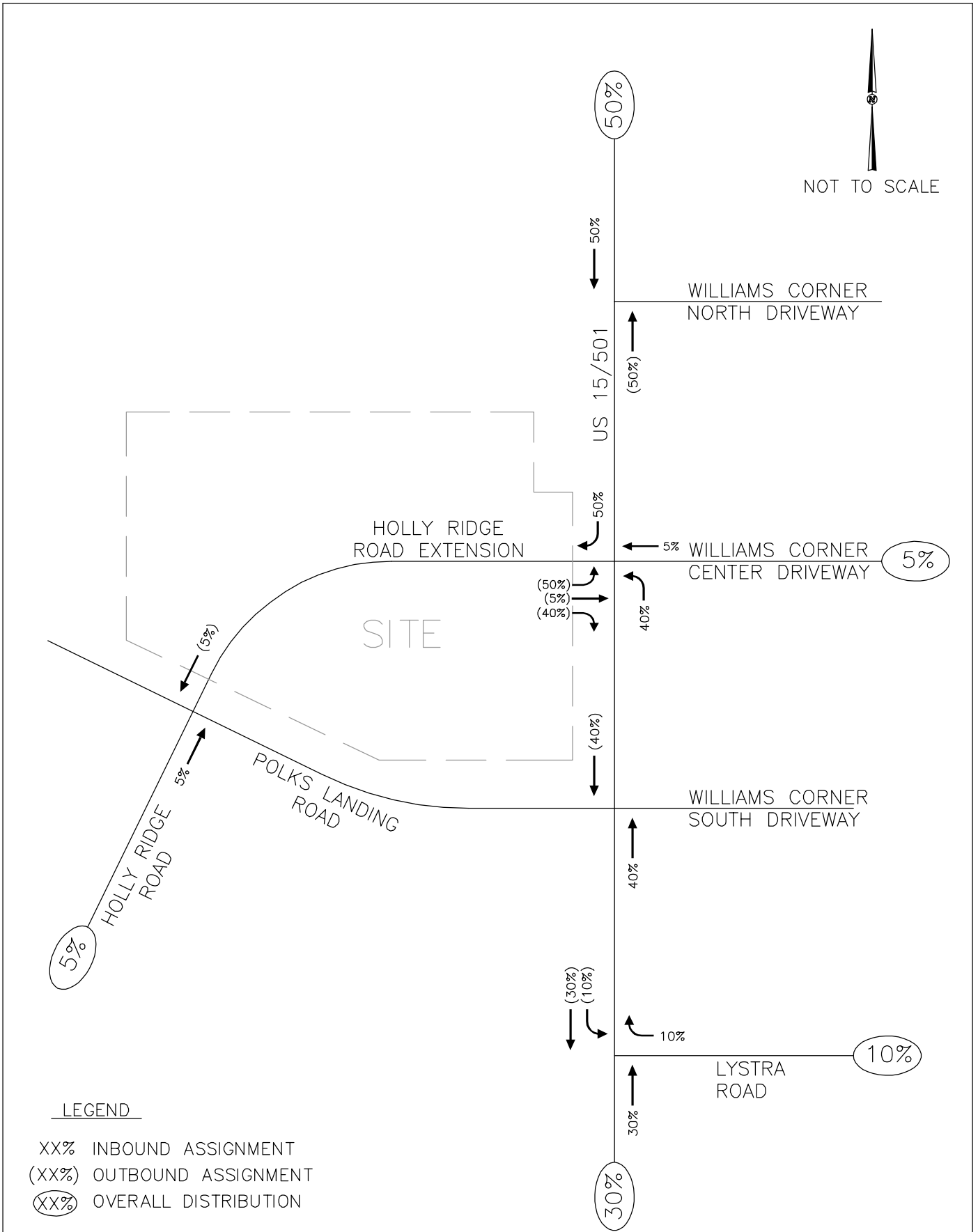
Table 4.0 shows that the proposed development has the potential to generate 2,728 new external trips in and 2,728 new external trips out during a typical weekday with 227 new external trips entering and 138 new external trips exiting during the AM peak hour and 249 new external trips entering and 274 new external trips exiting during the PM peak hour.

## 5.0 Site Traffic Distribution

The proposed generated trips were assigned to the surrounding roadway network. The directional distribution and assignment of new external trips are based on existing turning movement counts, land uses and population densities in the area, and discussion with NCDOT staff:

- 50% to/from the north on US 15-501
- 30% to/from the south on US 15-501
- 10% to/from the east on Lystra Road
- 5% to/from the west on Holly Ridge Road
- 5% to/from the Williams Corner Development

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



LEGEND

- XX% INBOUND ASSIGNMENT
- (XX%) OUTBOUND ASSIGNMENT
- (XX%) OVERALL DISTRIBUTION



POLKS CENTRE  
TRAFFIC IMPACT ANALYSIS

SITE TRAFFIC DISTRIBUTION  
AND ASSIGNMENT

FIGURE  
4



**6.0 Projected Traffic Volumes**

*6.1 Existing Traffic*

AM peak hour (7:00 AM to 9:00 AM) and PM peak hour (4:00 PM to 6:00 PM) turning movement counts were performed by Traffic Survey Services, Inc. at the following intersections:

- § US 15-501 at Lystra Road March 28, 2006
- § US 15-501 at Polks Landing Road March 23, 2006

All counts were performed while Chatham County traditional calendar schools were in session. The existing (2006) AM and PM peak hour traffic volumes at the study intersections are shown in Figure 5, and the traffic count data are included in the Appendix.

*6.2 Approved Development Traffic*

Approved development traffic is generated by approved but not yet constructed projects in the vicinity of the proposed project. Based on discussion with NCDOT staff, there are four significant approved developments within the immediate vicinity of the site that could have an impact on the study intersections.

Briar Chapel is a mixed-use development 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 1,880 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.

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. Since an Ace Hardware was already open on the site when the counts were performed, only the trip generation potential of the unbuilt portion 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.

Williams Corner is a mixed-use development located adjacent to the proposed Polks Centre Development on the east side of US 15-501. The project will consist of approximately 40 town homes, 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 development is expected to be completed (built-out) in 2010.

The trip generation potential of the development was assigned to the intersections in the study area based on the Williams Corner TIA prepared Kimley-Horn and Associates, Inc. in August 2005.

Legend Oaks is a residential development located on the east side of 15-501 north of the proposed Williams Corner Development. The project will consist of approximately 64 single family homes. In order to limit access points onto US 15-501, this development is proposed to share access through the north driveway of the Williams Corner Development. Legend Oaks is expected to be completed (built-out) by 2010. The trip generation potential of the development was generated using the traffic generation rates published in *Trip Generation* (Institute of Transportation Engineers, Seventh Edition, 2003) and assigned to the intersections in the study area based on the Williams Corner Assignment.

### **6.3 Site Traffic**

The proposed site traffic was generated and assigned to the adjacent roadway network according to the distribution discussed previously in Section 5.0. The AM and PM peak hour site traffic volumes are shown in Figures 6 and 7, respectively.

### **6.4 Historical Growth Traffic**

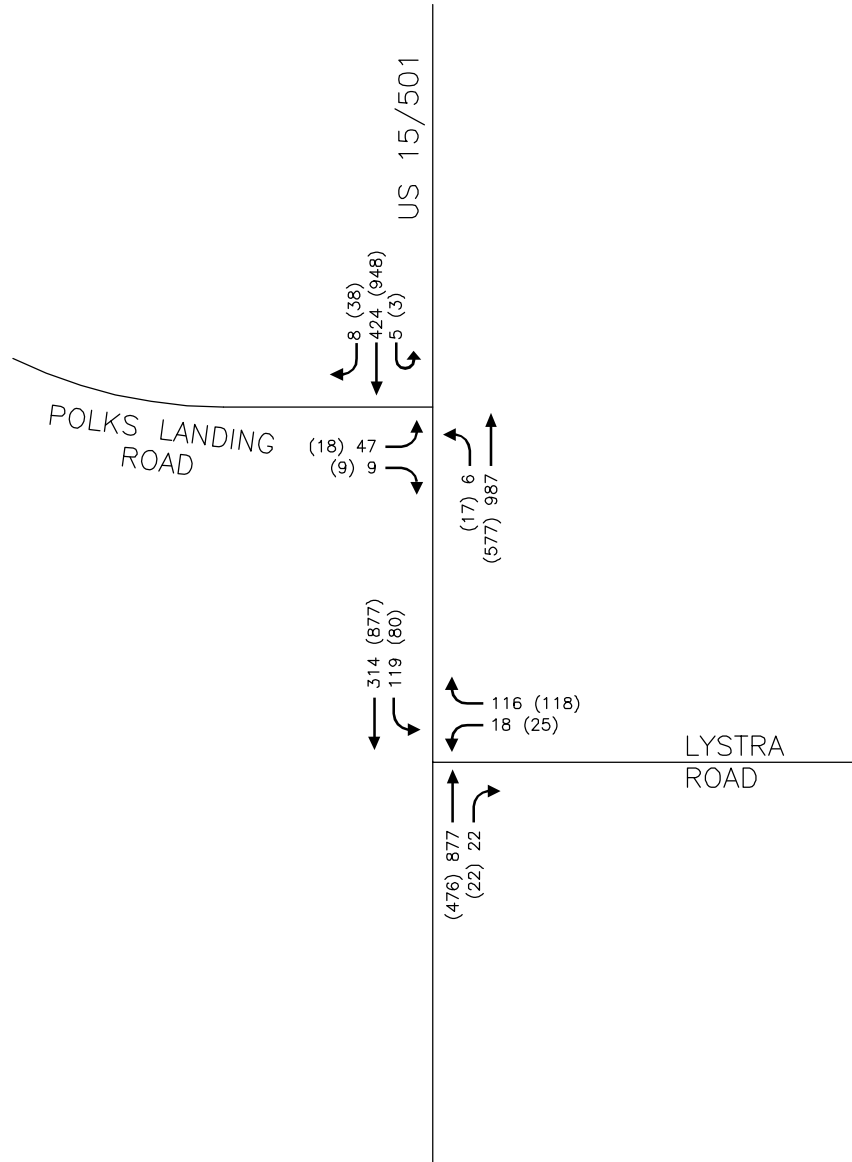
Historical growth traffic is the increase in traffic due to usage increases and non-specific growth throughout the area. Based on historical traffic growth and discussion with NCDOT staff, the existing peak hour traffic volumes were grown by an annual rate of 3.0% for four years.

### **6.5 Total Traffic**

To obtain the projected 2010 background traffic volumes, the approved development volumes and historical growth traffic volumes were added to the existing volumes. Background and site traffic were combined to obtain total 2010 build-out traffic volumes. Figures 6 and 7 show the 2010 background, site, and total buildout traffic volumes for the AM and PM peak hours, respectively at each of the study intersections.



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LEGEND

XX AM PEAK HOUR  
(XX) PM PEAK HOUR

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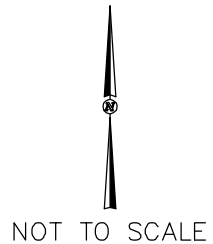
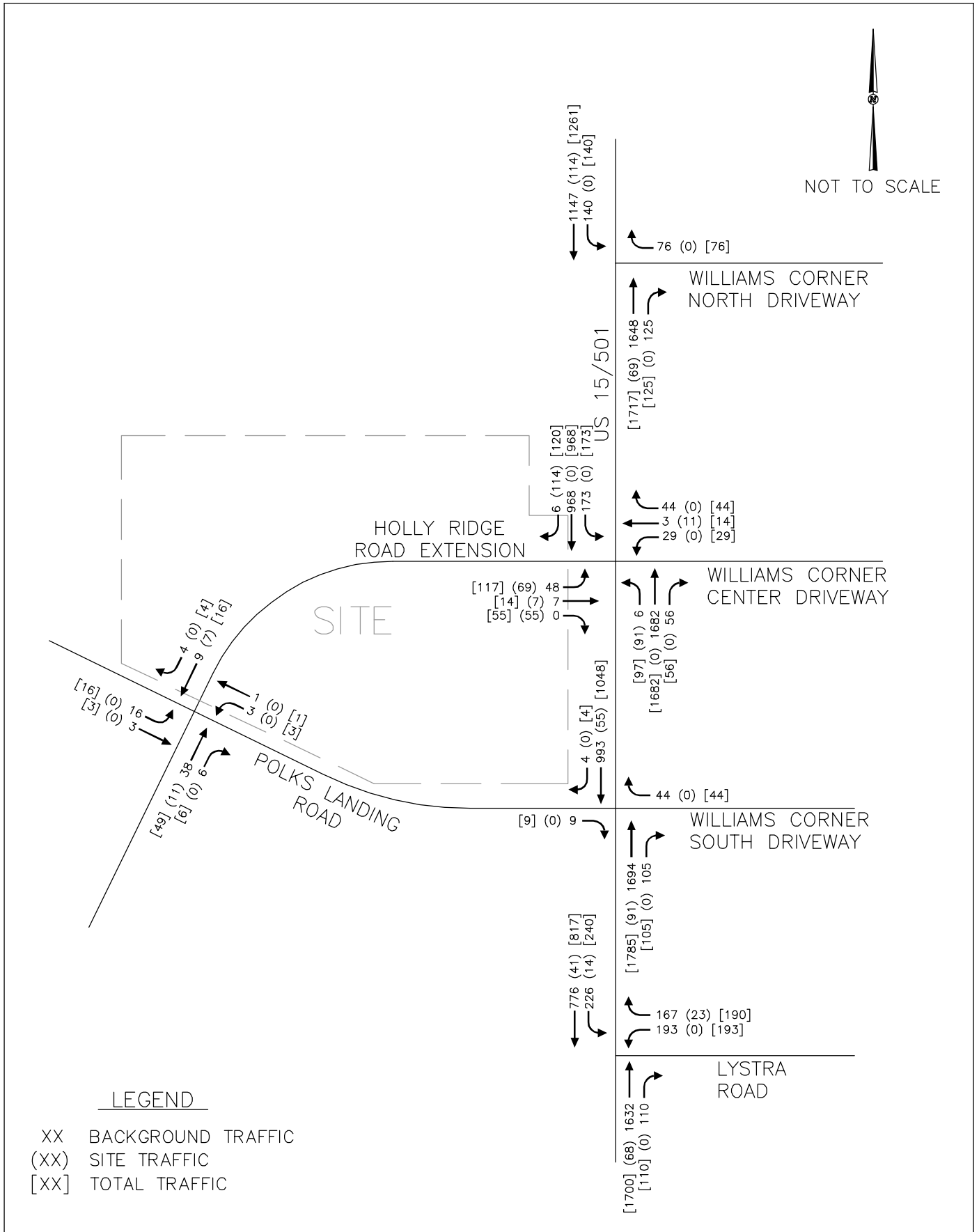


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POLKS CENTRE  
TRAFFIC IMPACT ANALYSIS

EXISTING (2006) PEAK HOUR  
TRAFFIC VOLUMES

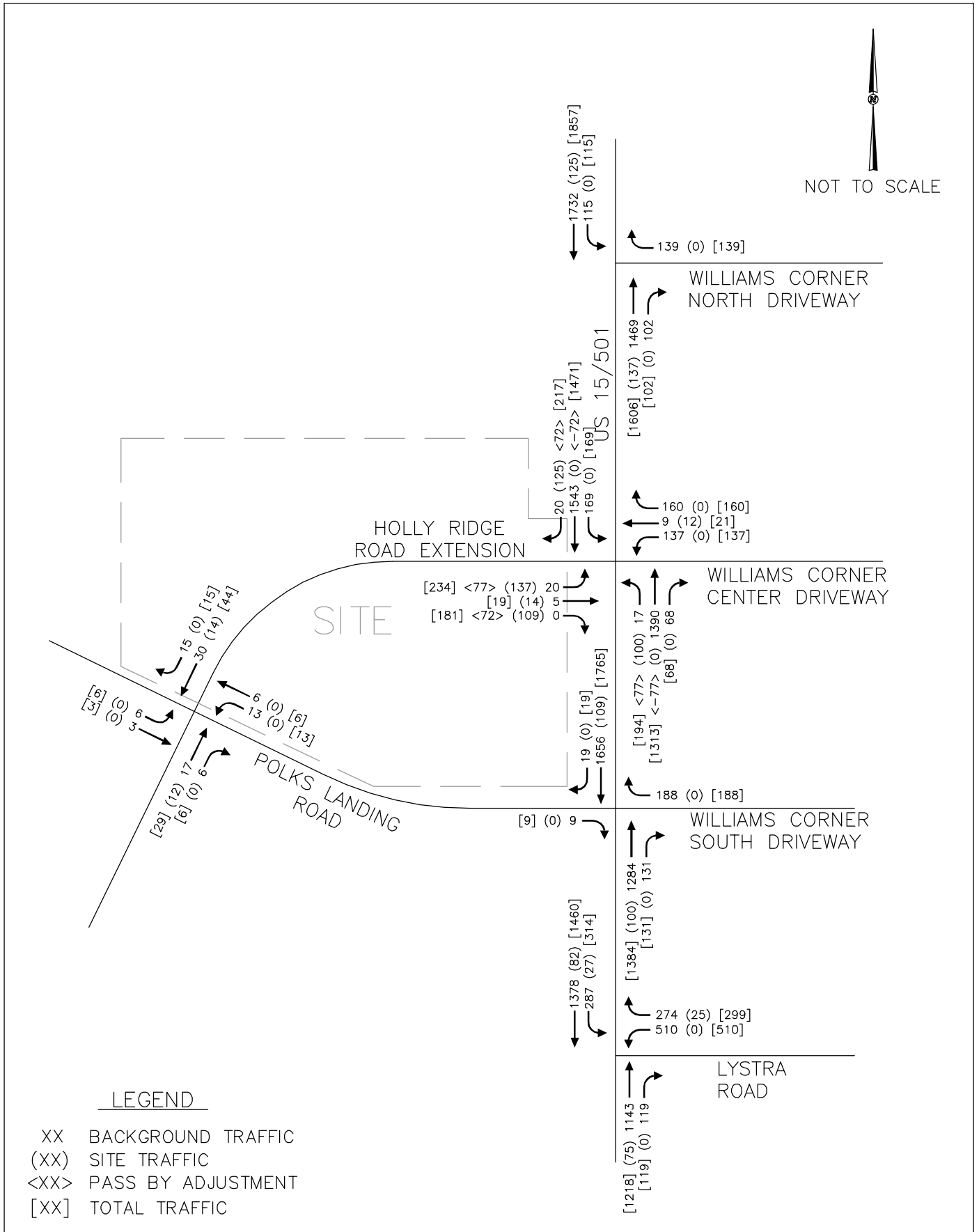
FIGURE  
5



POLKS CENTRE  
TRAFFIC IMPACT ANALYSIS

PROPOSED (2010) AM PEAK  
HOUR TRAFFIC VOLUMES

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POLKS CENTRE  
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. Synchro Version 5 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.

<b>Table 7.0-A Level-of-Service Control Delay Thresholds</b>			
<b>Level-of-Service</b>	<b>Signalized Intersections – Control Delay Per Vehicle [sec/veh]</b>	<b>Unsignalized Intersections – Average Control Delay [sec/veh] &amp; Qualitative Operational Description</b>	
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 (2006) and buildout (2010) out traffic conditions for the following intersections:

- § US 15-501 at Lystra Road
- § US 15-501 at Polks Landing Road/Williams Corner South Driveway
- § US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway
- § US 15-501 at Williams Corner North Driveway
- § Polks Landing Road at Holly Ridge Road/Holly Ridge Road Extension

Table 7.0-B summarizes the LOS and delay (seconds per vehicle) for all of the study intersections for the AM and PM peak hour traffic conditions listed above. All capacity analyses are included in the Appendix and are briefly summarized in the following sub-sections.



<b>Table 7.0-B Level-of-Service Summary</b>		
<b>Condition</b>	<b>AM Peak-Hour LOS (Delay)</b>	<b>PM Peak-Hour LOS (Delay)</b>
<b>US 15-501 at Lystra Road (Signalized)</b>		
Existing (2006) Traffic	A (6.9)	A (4.9)
Projected (2010) Build-Out Traffic w/ Improvements	C (25.7)	C (30.3)
<b>US 15-501 at Polks Landing Road/South Driveway (Unsignalized)</b>		
Existing (2006) Traffic – <i>Full-Movement</i>	Short Delays for Minor Street Approach	Moderate Delays for Minor Street Approach
Projected (2010) Build-Out Traffic – <i>Right- In/Right-Out</i>	Short Delays for Minor Street Approach	Short Delays for Minor Street Approach
<b>US 15-501 at Holly Ridge Road Extension/Center Driveway (Signalized)</b>		
Projected (2010) Build-Out Traffic	C (21.8)	C (32.4)
<b>US 15-501 at North Driveway (Unsignalized)</b>		
Projected (2010) Build-Out Traffic	Long Delays for Major Street Left-Turns	Moderate Delays for Major Street Left-Turns
<b>Polks Landing Road at Holly Ridge Road/Holly Ridge Road Extension (Unsignalized)</b>		
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

Analyses indicate that the signalized intersection of US 15-501 at Lystra Road currently operates at LOS A in both the AM and PM peak hours.

As part of the Williams Corner Development, an additional westbound left-turn lane with 325 feet of storage was recommended on Lystra Road to provide dual left-turn lanes. The following additional improvement is recommended at this intersection:

- Extend the existing southbound left-turn lane to provide 400 feet of storage



**Image 7.1 - Existing intersection of US 15-501 at Lystra Road looking West on Lystra Road**

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

Table 7.1 summarizes the LOS and delay for the signalized intersection of US 15-501 at Lystra Road for the existing (2006) and projected (2010) build-out traffic conditions.

<b>Table 7.1 Level-of-Service US 15-501 at Lystra Road (Signalized)</b>		
<b>Condition</b>	<b>AM Peak-Hour LOS (Delay)</b>	<b>PM Peak-Hour LOS (Delay)</b>
Existing (2006) Traffic	A (6.9)	A (4.9)
Projected (2010) Build-Out Traffic w/ Improvements	C (25.7)	C (30.3)

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



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

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

The South Driveway for Williams Corner is proposed to be aligned with Polks Landing Road as part of that development along with the construction of an exclusive northbound right-turn lane with 100 feet of storage on US 15-501. As part of the proposed Polks Centre Development, Polks Landing Road and

Williams Corner South Driveway are to be converted to right-in/right-out only access from US 15-501. At project build-out in 2010, with this intersection modification in place, the intersection is projected to operate with short delays for the minor street approaches in both the AM and PM peak hours. No additional roadway improvements are recommended at this intersection.

Table 7.2 summarizes the operation of the unsignalized intersection of US 15-501 at Polks Landing Road/Williams Corner South Driveway for the existing (2006) and projected (2010) build-out traffic conditions.

<p align="center"><b>Table 7.2</b> <b>Operation</b> <b>US 15-501 at Polks Landing Road/Williams Corner South Driveway (Unsignalized)</b></p>		
<b>Condition</b>	<b>AM Peak-Hour LOS (Delay)</b>	<b>PM Peak-Hour LOS (Delay)</b>
Existing (2006) Traffic – <i>Full-Movement</i>	Short Delays for Minor Street Approach	Moderate Delays for Minor Street Approach
Projected (2010) Build-Out Traffic – <i>Right-In/Right-Out</i>	Short Delays for Minor Street Approach	Short Delays for Minor Street Approach

### 7.3 US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway

As part of the proposed Polks Centre Development, Holly Ridge Road will be extended to align with the Williams Corner Center Driveway across US 15-501 north of Polks Landing Road. The following improvements are committed by the Williams Corner Development at this intersection:

- Provide an exclusive westbound left-turn lane with 200 feet of storage on the Williams Corner Center Driveway
- Provide an exclusive westbound through lane on the Williams Corner Center Driveway
- Provide an exclusive westbound right-turn lane with 100 feet of storage on the Williams Corner Center Driveway
- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501
- Construct an exclusive southbound left-turn lane with 300 feet of storage on US 15-501

This intersection is expected to meet signal warrants for the 2010 build-out condition. The following additional improvements are recommended at this intersection for the Polks Centre Development:

- Install traffic signal
- Provide dual eastbound left-turn lanes with 175 feet of storage on the Holly Ridge Road Extension
- Provide an eastbound through lane on Holly Ridge Road Extension
- Provide an exclusive eastbound right-turn lane with 100 feet of storage on the Holly Ridge Road Extension
- Construct an exclusive northbound left-turn lane with 275 feet of storage on US 15-501
- Construct an exclusive southbound right-turn lane with 150 feet of storage on US 15-501

At project build-out in 2010, with the recommended improvements in place, the intersection is projected to operate at LOS C in both the AM and PM peak hours

Table 7.3 summarizes the LOS and Delay for the signalized intersection of US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway for the projected (2010) build-out traffic condition.

<b>Table 7.3 Level of Service US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway (Signalized)</b>		
<b>Condition</b>	<b>AM Peak-Hour LOS (Delay)</b>	<b>PM Peak-Hour LOS (Delay)</b>
Projected (2010) Build-Out Traffic	C (21.8)	C (32.4)

7.4 US 15-501 at Williams Corner North Driveway

As part of the Williams Corner Development, the intersection will be constructed with left-in/right-in/right-out only access to the North Driveway. Analyses indicate that at project build-out in 2010, with this access condition, the intersection of US 15-501 at the Williams Corner North Driveway is projected to operate with long delays for the major street (US 15-501) left-turns in the AM peak hour and with moderate delays for the major street left-turns in the PM peak hour but with short delays for the minor street (North Driveway) approach in both the AM and PM peak hours. The following roadway improvements are committed by the Williams Corner development:

- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501
- Construct an exclusive southbound left-turn lane with 225 feet of storage on US 15-501

Despite the long delays projected for the major street left-turns in the AM peak hour at project build-out, queues for this movement are not expected to exceed the recommended left-turn storage. No additional roadway improvements are recommended at this intersection.

Table 7.4 summarizes the operation of the unsignalized intersection of US 15-501 at Williams Corner North Driveway for the projected (2010) build-out traffic conditions.

<b>Table 7.4 Operation US 15-501 at Williams Corner North Driveway (Unsignalized)</b>		
<b>Condition</b>	<b>AM Peak-Hour LOS (Delay)</b>	<b>PM Peak-Hour LOS (Delay)</b>
Projected (2010) Build-Out Traffic	Long Delays for Major Street Left-Turns	Moderate Delays for Major Street Left-Turns

7.5 Polks Landing Road at Holly Ridge Road

At project build-out in 2010, with Holly Ridge Road extension in place, the intersection is projected to operate with short delays for the minor street approaches (Holly Ridge Road) in both the AM and PM peak hours. No roadway improvements are recommended at this intersection:

Table 7.5 summarizes the operation of the unsignalized intersection of Polks Landing Road at Holly Ridge Road for the existing (2006) and projected (2010) build-out traffic conditions.

<b>Table 7.5 Operation Polks Landing Road at Holly Ridge Road (Unsignalized)</b>		
<b>Condition</b>	<b>AM Peak-Hour LOS (Delay)</b>	<b>PM Peak-Hour LOS (Delay)</b>
Projected (2010) Build-Out Traffic	Short Delays for Minor Street Approach	Short Delays for Minor Street Approach



## 8.0 Recommendations

The following is a summary of roadway improvements committed by the adjacent Williams Corner and Legend Oaks Developments:

### US 15-501 at Lystra Road

- Construct an additional westbound left-turn lane with 325 feet of storage on Lystra Road

### US 15-501 at Polks Landing Road/Williams Corner South Driveway

- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501

### US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway

- Provide an exclusive westbound left-turn lane with 200 feet of storage on Williams Corner Center Driveway
- Provide an exclusive westbound through lane on Williams Corner Center Driveway
- Provide an exclusive westbound right-turn lane with 100 feet of storage on Williams Corner Center Driveway
- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501
- Construct an exclusive southbound left-turn lane with 300 feet of storage on US 15-501

### US 15-501 at Williams Corner North Driveway

- Construct an exclusive northbound right-turn lane with 100 feet of storage on US 15-501
- Construct an exclusive southbound left-turn lane with 225 feet of storage on US 15-501

The following roadway improvements are recommended to accommodate traffic generated by the proposed Polks Centre Development:

### US 15-501 at Lystra Road

- Extend the existing southbound left-turn lane to provide 400 feet of storage on US 15-501

### US 15-501 at Polks Landing Road/Williams Corner South Driveway

- Convert full-movement side streets into right-in/right-out only access

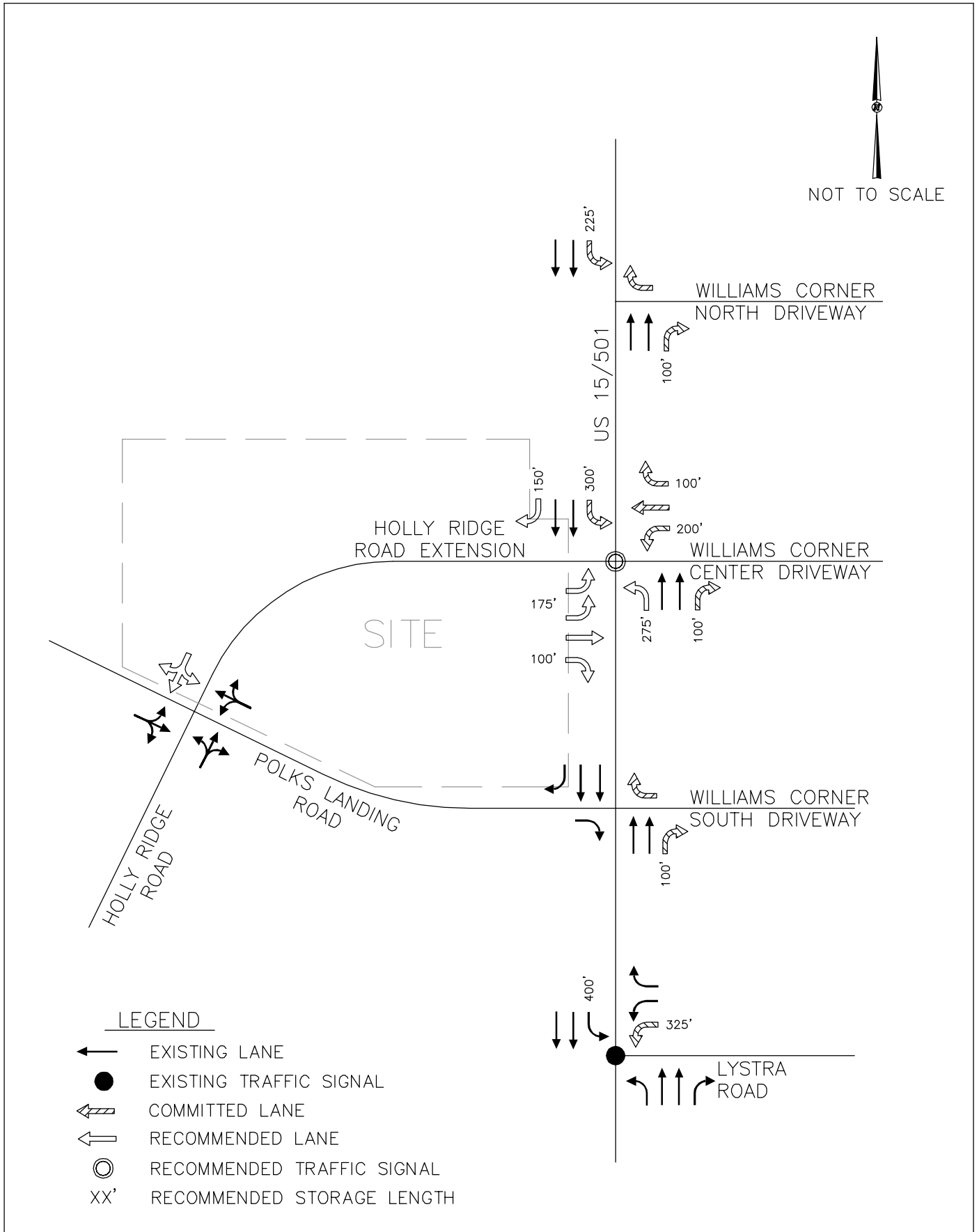
### US 15-501 at Holly Ridge Road Extension/Williams Corner Center Driveway

- Install traffic signal
- Provide dual eastbound left-turn lanes with 175 feet of storage on the Holly Ridge Road Extension
- Provide an eastbound through lane on Holly Ridge Road Extension

- Provide an exclusive eastbound right-turn lane with 100 feet of storage on the Holly Ridge Road Extension
- Construct an exclusive northbound left-turn lane with 275 feet of storage on US 15-501
- Construct an exclusive southbound right-turn lane with 150 feet of storage on US 15-501

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

H:\PN\012726001 Polks Corner\Figures\Polks Center Figures.dwg



POLKS CENTRE  
TRAFFIC IMPACT ANALYSIS

RECOMMENDED ROADWAY  
LANEAGE

FIGURE  
8

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

# Appendix

# **Assumptions Memo**

**Preliminary Assumptions  
Polks Center Development - Traffic Impact Analysis  
Chatham County, North Carolina**

KHA will perform analyses for the proposed Polks Center Development in Chatham County, North Carolina using the following assumptions:

The study area will consist of the following intersections:

- US 15-501 & Lystra Road
- US 15-501 & Polks Landing Road (existing full-movement, proposed right-in/right-out)
- US 15-501 & Center Drive (proposed full-movement)
- Polks Landing Road & Project Driveway
- Center Drive & Project Driveways
- Polks Landing Road & Center Drive

The study scenarios will consist of:

- Existing (2006)
- Build-out (2008)

Based on historic ADT volumes, an annual growth rate of 3% will be applied to existing traffic volumes within the study area to obtain 2008 background traffic volumes. There are four approved developments in the vicinity that will have a significant impact on the study intersections: Briar Chapel, Williams Corner, Chatham Downs, and the residential development north of Williams Corner. Traffic from the unconstructed portions of these developments to be built by the build-out year for Polks Center will be included in the study.

The following distribution will be used for site traffic (see the attached figure):

- 50% to/from the north on US 15-501
- 30% to/from the south on US 15-501
- 10% to/from the east on Lystra Road
- 5% to/from the west on Polks Landing Road
- 5% to/from the Williams Corner Development

As currently envisioned the Polks Center development will consist of 70,000 square feet (SF) of general retail, 20,000 SF of office space, 20,000 SF of flex space, two fast-food restaurants (5,000 SF each), and a 5,000 SF drive-in bank. Traffic for the development will be generated using ITE trip generation rates.

Not all trips generated by this development will be new external trips. According to the internal capture methodologies presented in the *Trip Generation Handbook* (Institute of Transportation Engineers, 2004), this development may have an internal capture rate of approximately 21% in the PM peak hour. However, to be conservative the internal capture will be limited to 10% of the daily and PM peak hour site traffic. No internal capture will be taken for the AM peak hour. Internal capture spreadsheets showing the ITE internal capture rates are attached for reference.

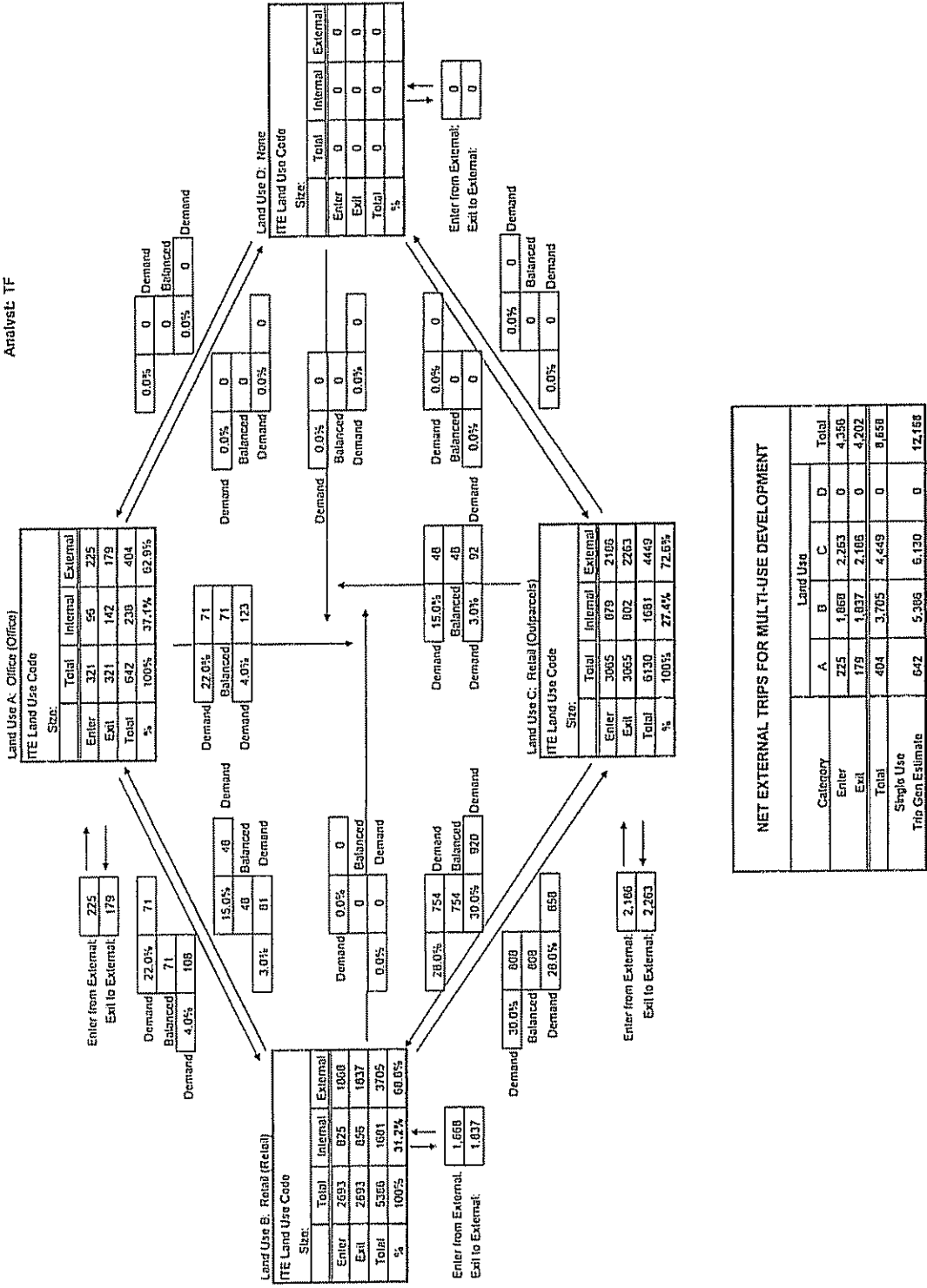
Pass-By capture will be taken as appropriate using ITE pass-by capture rates. However, the pass-by capture will be limited to 10% of the adjacent street traffic on US 15-501 for the daily and PM peak hour. The proposed trip generation for the site is attached.

Polks Center Trip Generation													
Land Use	Intensity	Daily	Daily In	Daily Out	AM Peak Hour			PM Peak Hour					
					Total	In	Out	Total	In	Out			
710 General Office Building	20,000 s.f.	386	193	193	52	46	6	101	17	84			
770 Business Park	20,000 s.f.	255	128	127	30	25	5	34	8	26			
820 General Retail	70,000 s.f.	5,386	2,693	2,693	126	77	49	495	238	257			
934 Fast-Food Restaurant with Drive-Through	10,000 s.f.	4,961	2,480	2,481	531	271	260	346	180	166			
912 Drive-in Bank	5,000 s.f.	1,169	585	584	62	35	27	229	115	114			
<b>Subtotal</b>		<b>12,157</b>	<b>6,079</b>	<b>6,078</b>	<b>801</b>	<b>454</b>	<b>347</b>	<b>1,205</b>	<b>558</b>	<b>647</b>			
<i>Internal Capture</i>													
General Office Building		39	20	19	0	0	0	10	2	8			
Business Park		26	13	13	0	0	0	3	1	2			
General Retail		539	269	270	0	0	0	50	26	24			
Fast-Food Restaurant with Drive-Through		496	248	248	0	0	0	34	19	15			
Drive-in Bank		117	59	58	0	0	0	23	12	11			
<b>Internal Capture</b>	<b>10.00%</b>	<b>1,216</b>	<b>608</b>	<b>608</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>120</b>	<b>60</b>	<b>60</b>			
<i>Pass-By Capture</i>													
General Retail	AM 0% PM 34%	1,513	757	757	0	0	0	151	72	79			
Fast-Food Restaurant with Drive-Through	49% 50%	1,560	780	780	260	133	127	156	81	76			
Drive-in Bank	0% 47%	968	484	484	0	0	0	97	48	48			
<b>Pass-By Capture Subtotal</b>		<b>4,041</b>	<b>2,021</b>	<b>2,021</b>	<b>260</b>	<b>133</b>	<b>127</b>	<b>404</b>	<b>201</b>	<b>203</b>			
10% Adjacent Street Traffic		2,980	1,490	1,490	280	140	140	298	149	149			
<b>Pass-By Total</b>	<b>24.73%</b>	<b>2,980</b>	<b>1,490</b>	<b>1,490</b>	<b>260</b>	<b>133</b>	<b>127</b>	<b>298</b>	<b>149</b>	<b>149</b>			
<b>Net New External Trips</b>		<b>7,961</b>	<b>3,981</b>	<b>3,980</b>	<b>541</b>	<b>321</b>	<b>220</b>	<b>787</b>	<b>349</b>	<b>438</b>			



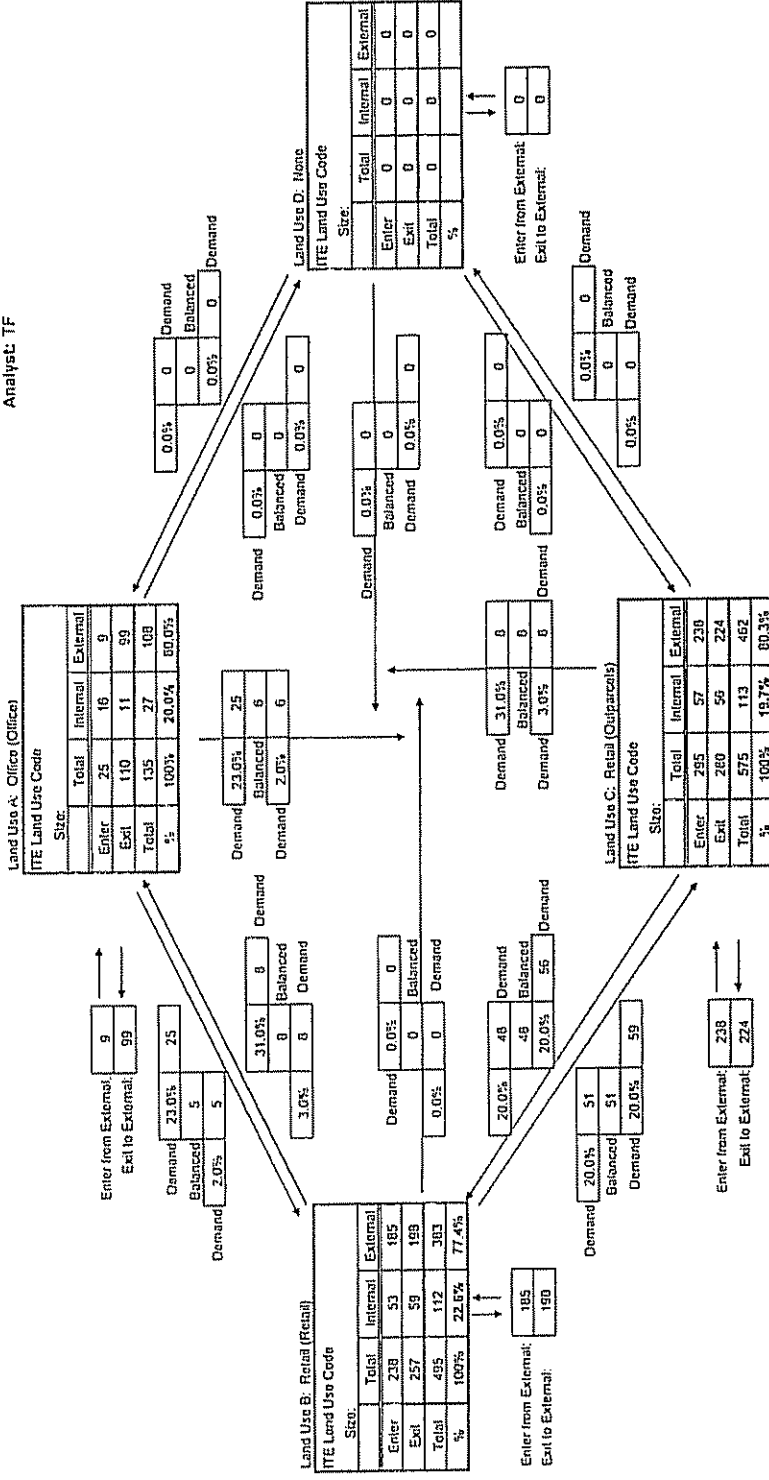
ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET  
 (Source: Chapter 7, ITE Trip Generation Handbook, October 1998)

Project Number: 012726001  
 Project Name: Peiks Center  
 Scenario: Daily  
 Analysis Period: Daily  
 Analyst: TF

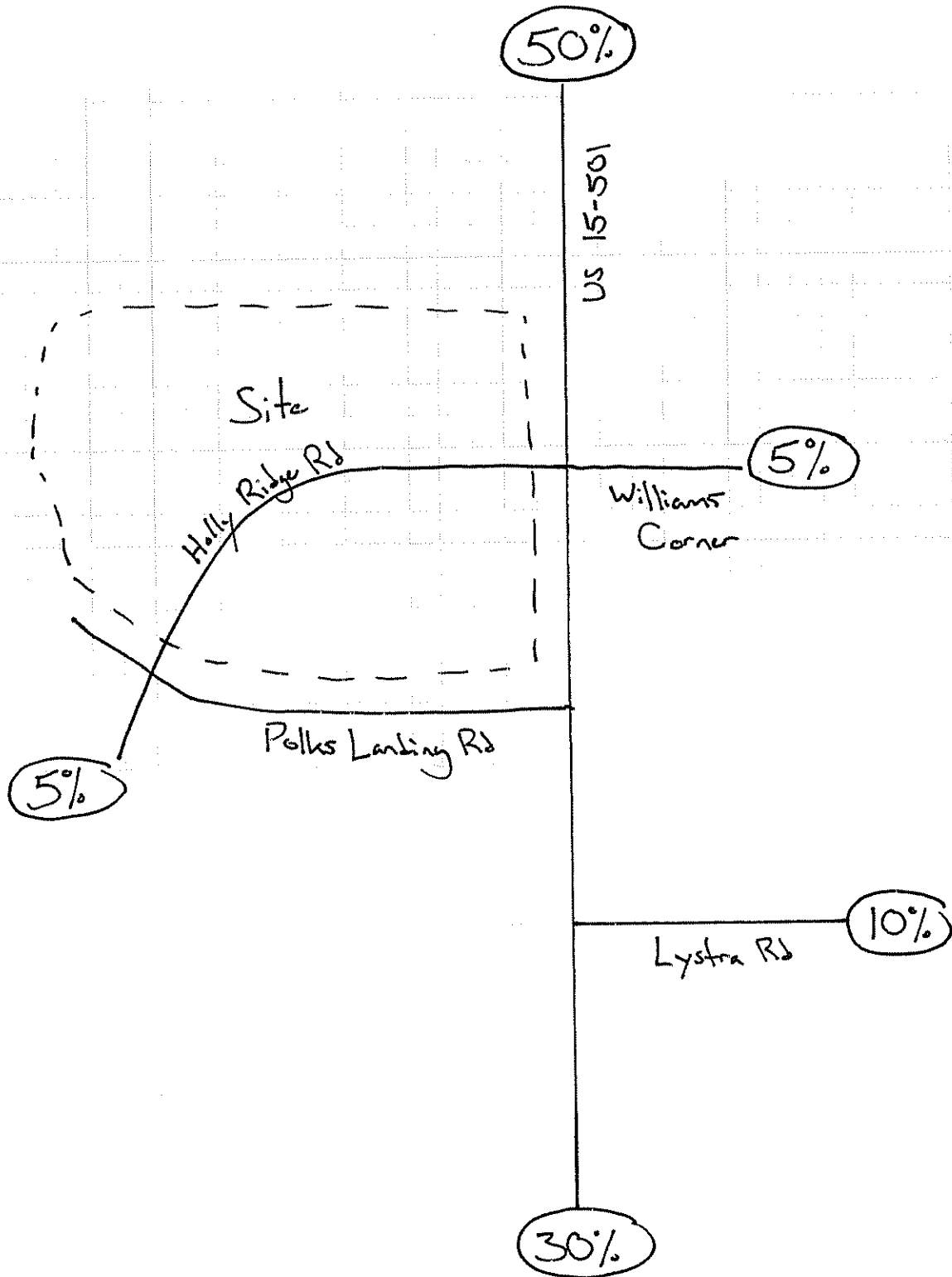


ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET  
 (Source: Chapter 7, ITE Trip Generation Handbook, October 1998)

Project Number: 012726001  
 Project Name: Poiks Center  
 Scenario: PM  
 Analysis Period: PM Peak  
 Analyst: TF



Category	Land Use			Total
	A	B	C	
Enter	9	105	224	418
Exit	99	198	238	535
Total	108	303	462	963
Single Use Trip Gen Estimate	135	495	575	1,205
Overall Internal Capture =				20.91%



## Traffic Count Data

US 15-501 at Polks Landing Road  
Chatham County, NC

Date: March 23, 2006  
Counter: JAG  
Weather: Clear

File Name : US15501Polks  
Site Code : 00026015  
Start Date : 3/23/2006  
Page No : 1

Groups Printed- 1 - Unshifted

Start Time	US 15-501 From South			US 15-501 From North			Polks Landing Rd From West			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:00 AM	0	164	1	3	88	0	4	0	8	268
06:15 AM	0	122	2	2	86	2	1	0	3	218
06:30 AM	0	131	0	1	46	1	1	0	1	181
06:45 AM	0	114	0	1	47	1	3	0	2	168
Total	0	531	3	7	267	4	9	0	14	835
07:00 AM	0	126	1	0	73	0	2	0	3	205
07:15 AM	0	185	2	1	94	1	8	0	11	302
07:30 AM	0	265	2	2	91	0	6	0	9	375
07:45 AM	0	228	3	2	103	4	2	0	14	356
Total	0	804	8	5	361	5	18	0	37	1238
08:00 AM	0	238	1	2	98	0	1	0	13	353
08:15 AM	0	230	0	2	92	1	0	0	11	336
08:30 AM	0	160	1	2	140	0	2	0	9	314
08:45 AM	0	147	2	2	100	1	2	0	9	263
Total	0	775	4	8	430	2	5	0	42	1266
09:00 AM	0	138	1	3	63	0	0	0	6	211
09:15 AM	0	157	0	1	105	0	1	0	3	267
09:30 AM	0	170	2	0	110	0	4	0	4	290
09:45 AM	0	174	0	2	113	0	3	0	5	297
Total	0	639	3	6	391	0	8	0	18	1065
10:00 AM	0	133	3	4	114	4	1	0	5	264
10:15 AM	0	131	1	0	100	3	3	0	3	241
10:30 AM	0	124	0	4	115	0	2	0	4	249
10:45 AM	0	165	1	2	120	1	0	0	4	293
Total	0	553	5	10	449	8	6	0	16	1047
11:00 AM	0	143	0	6	117	1	0	0	6	273
11:15 AM	0	82	1	2	126	0	0	0	1	212
11:30 AM	0	136	1	0	133	2	3	0	5	280
11:45 AM	0	105	3	0	128	1	0	0	7	244
Total	0	466	5	8	504	4	3	0	19	1009
12:00 PM	0	118	1	5	135	1	0	0	3	263
12:15 PM	0	122	0	5	146	4	0	0	6	283
12:30 PM	0	124	1	5	145	4	1	0	2	282
12:45 PM	0	123	1	2	138	0	0	0	4	268
Total	0	487	3	17	564	9	1	0	15	1096
01:00 PM	0	102	2	5	127	3	1	0	1	241
01:15 PM	0	131	0	2	112	1	0	0	2	248
01:30 PM	0	119	2	6	112	3	1	0	3	246
01:45 PM	0	122	0	2	128	0	0	0	3	255
Total	0	474	4	15	479	7	2	0	9	990
02:00 PM	0	114	1	7	115	0	2	0	4	243
02:15 PM	0	130	0	1	126	2	1	0	2	262
02:30 PM	0	135	1	8	160	2	0	0	0	306
02:45 PM	0	155	4	5	135	0	0	0	1	300
Total	0	534	6	21	536	4	3	0	7	1111
03:00 PM	0	154	3	5	171	0	1	0	2	336
03:15 PM	0	159	7	6	166	1	2	0	5	346
03:30 PM	0	123	3	3	188	1	2	0	4	324
03:45 PM	0	133	2	3	219	0	0	0	3	360
Total	0	569	15	17	744	2	5	0	14	1366

US 15-501 at Polks Landing Road  
Chatham County, NC

Date: March 23, 2006  
Counter: JAG  
Weather: Clear

File Name : US15501Polks  
Site Code : 00026015  
Start Date : 3/23/2006  
Page No : 2

Groups Printed- 1 - Unshifted

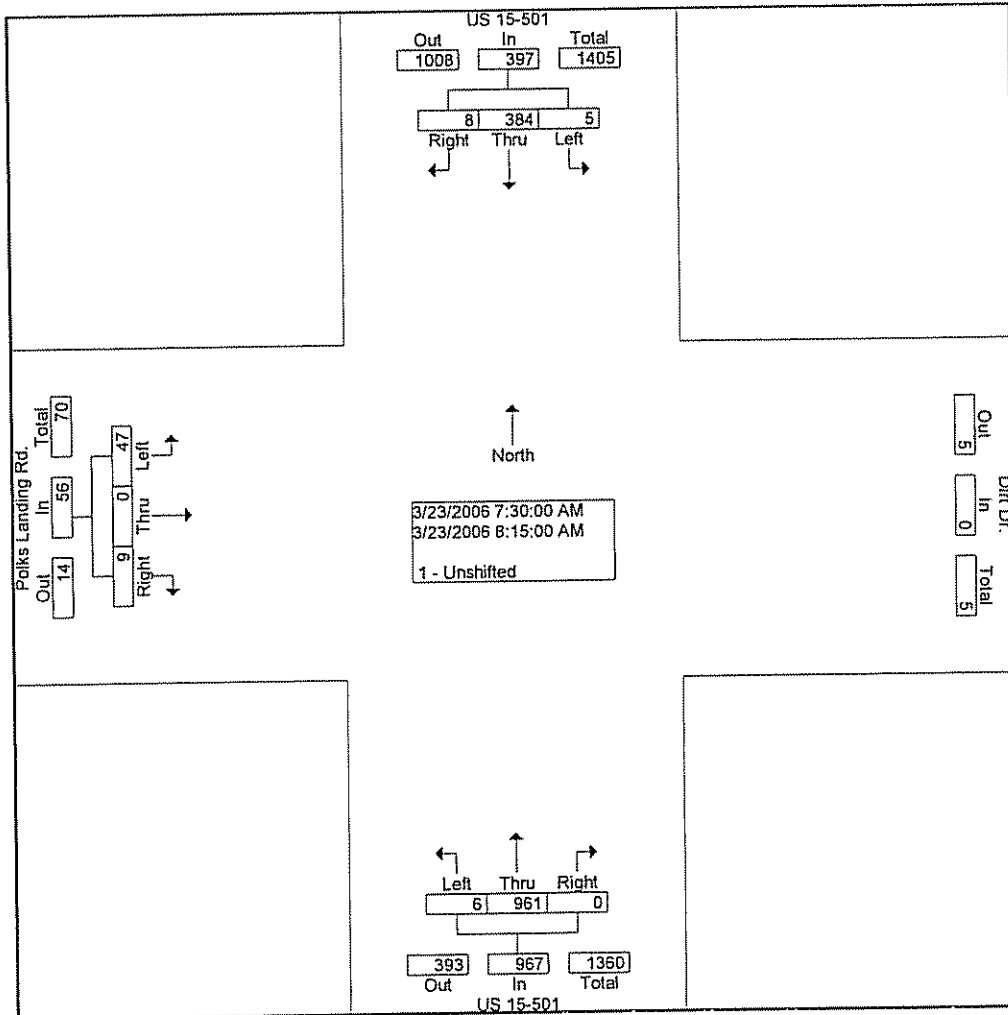
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	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	0	116	3	2	215	1	0	0	6	343
04:15 PM	0	122	2	3	228	1	0	0	2	358
04:30 PM	0	126	3	7	240	1	2	0	3	382
04:45 PM	0	105	4	11	214	1	2	0	5	342
Total	0	469	12	23	897	4	4	0	16	1425
05:00 PM	0	114	4	8	237	1	0	0	2	366
05:15 PM	0	138	6	12	257	0	5	0	8	426
05:30 PM	0	118	5	5	212	2	1	0	6	349
05:45 PM	0	133	5	13	215	1	2	0	6	375
Total	0	503	20	38	921	4	8	0	22	1516
06:00 PM	0	100	1	11	180	1	2	0	2	297
06:15 PM	0	116	1	8	193	1	1	0	3	323
06:30 PM	0	110	2	7	146	0	2	0	4	271
06:45 PM	0	98	4	13	128	1	0	0	5	249
Total	0	424	8	39	647	3	5	0	14	1140
07:00 PM	0	107	0	10	116	0	0	0	2	235
07:15 PM	0	80	0	9	103	1	0	0	1	194
07:30 PM	0	74	2	5	83	0	0	0	2	166
07:45 PM	0	54	0	5	95	1	0	0	0	155
Total	0	315	2	29	397	2	0	0	5	750
08:00 PM	0	62	0	6	88	0	0	0	1	157
08:15 PM	0	55	3	7	69	1	1	0	1	137
08:30 PM	0	40	0	6	73	1	0	0	1	121
08:45 PM	0	44	1	8	60	1	0	0	2	116
Total	0	201	4	27	290	3	1	0	5	531
09:00 PM	0	40	2	0	66	0	1	0	1	110
09:15 PM	0	34	2	6	91	0	0	0	2	135
09:30 PM	0	39	1	4	69	1	1	0	2	117
09:45 PM	0	29	0	2	48	0	0	0	1	80
Total	0	142	5	12	274	1	2	0	6	442
Grand Total	0	7886	107	282	8151	62	80	0	259	16827
Apprch %	0.0	98.7	1.3	3.3	96.0	0.7	23.6	0.0	76.4	
Total %	0.0	46.9	0.6	1.7	48.4	0.4	0.5	0.0	1.5	

US 15-501 at Polks Landing Road  
Chatham County, NC

Date: March 23, 2006  
Counter: JAG  
Weather: Clear

File Name : US15501Polks  
Site Code : 00026015  
Start Date : 3/23/2006  
Page No : 3

Start Time	US 15-501 From South				US 15-501 From North				Polks Landing Rd From West				App. Total	Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total		
Peak Hour From 06:00 AM to 02:00 PM - Peak 1 of 1														
Intersection 07:30 AM														
Volume	0	961	6	967	8	384	5	397	9	0	47	56	0	1420
Percent	0.0	99.4	0.6		2.0	96.7	1.3		16.1	0.0	83.9	15	0	375
07:30 Volume	0	265	2	267	2	91	0	93	6	0	9	15	0	0.947
Peak Factor														
High Int. 07:30 AM														
Volume	0	265	2	267	2	103	4	109	2	0	14	16	5:45:00 AM	
Peak Factor	0.905				0.911				0.875					

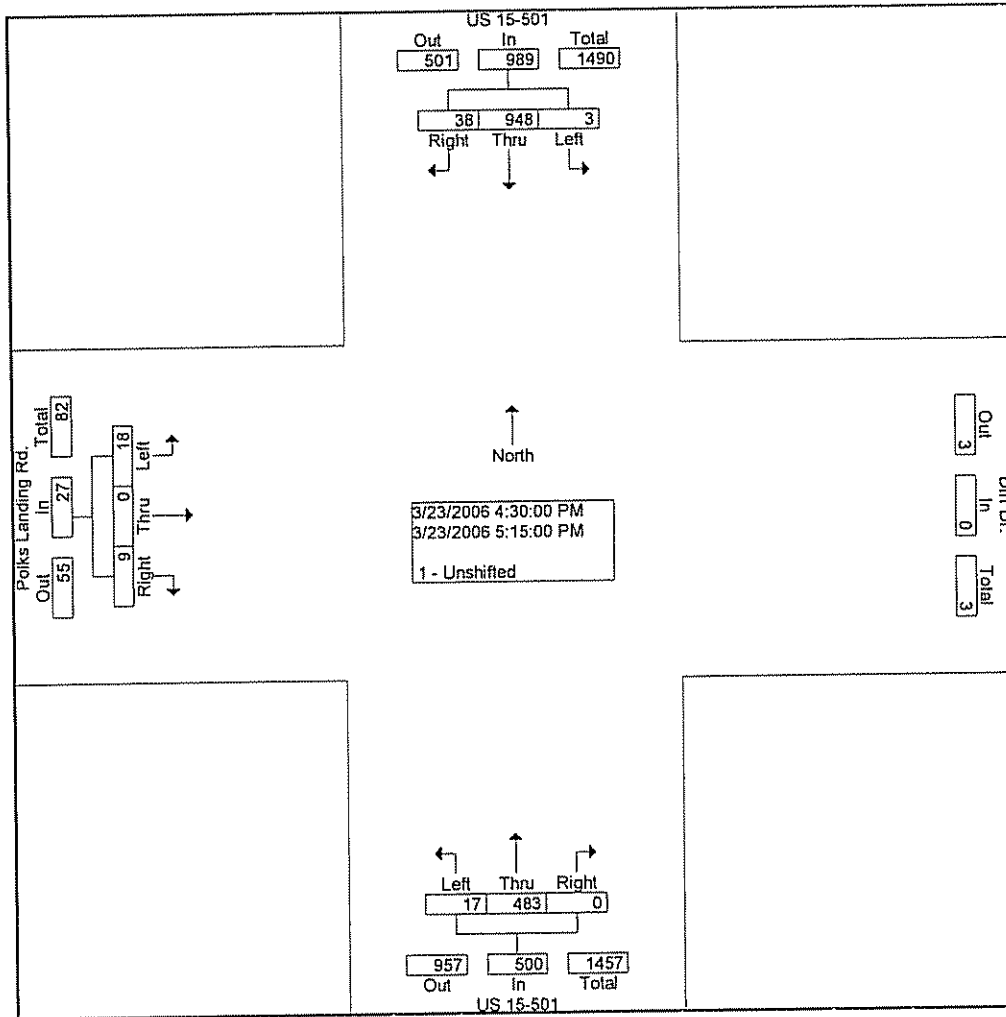


US 15-501 at Polks Landing Road  
Chatham County, NC

Date: March 23, 2006  
Counter: JAG  
Weather: Clear

File Name : US15501Polks  
Site Code : 00026015  
Start Date : 3/23/2006  
Page No : 4

Start Time	US 15-501 From South				US 15-501 From North				Polks Landing Rd From West				App. Total	Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total		
Peak Hour From 02:15 PM to 09:45 PM - Peak 1 of 1														
Intersection	04:30 PM													
Volume	0	483	17	500	38	948	3	989	9	0	18	27	0	1516
Percent	0.0	96.6	3.4		3.8	95.9	0.3		33.3	0.0	66.7		0	
05:15 Volume	0	138	6	144	12	257	0	269	5	0	8	13	0	426
Peak Factor														0.890
High Int.	05:15 PM				05:15 PM				05:15 PM					
Volume	0	138	6	144	12	257	0	269	5	0	8	13		
Peak Factor	0.868								0.519					





US 15-501 at Lystra Road  
Chatham County, NC

Date: March 28, 2006  
Counter: JAG  
Weather: Clear

File Name : 15501Lystra  
Site Code : 00260152  
Start Date : 3/28/2006  
Page No : 1

Groups Printed- Unshifted

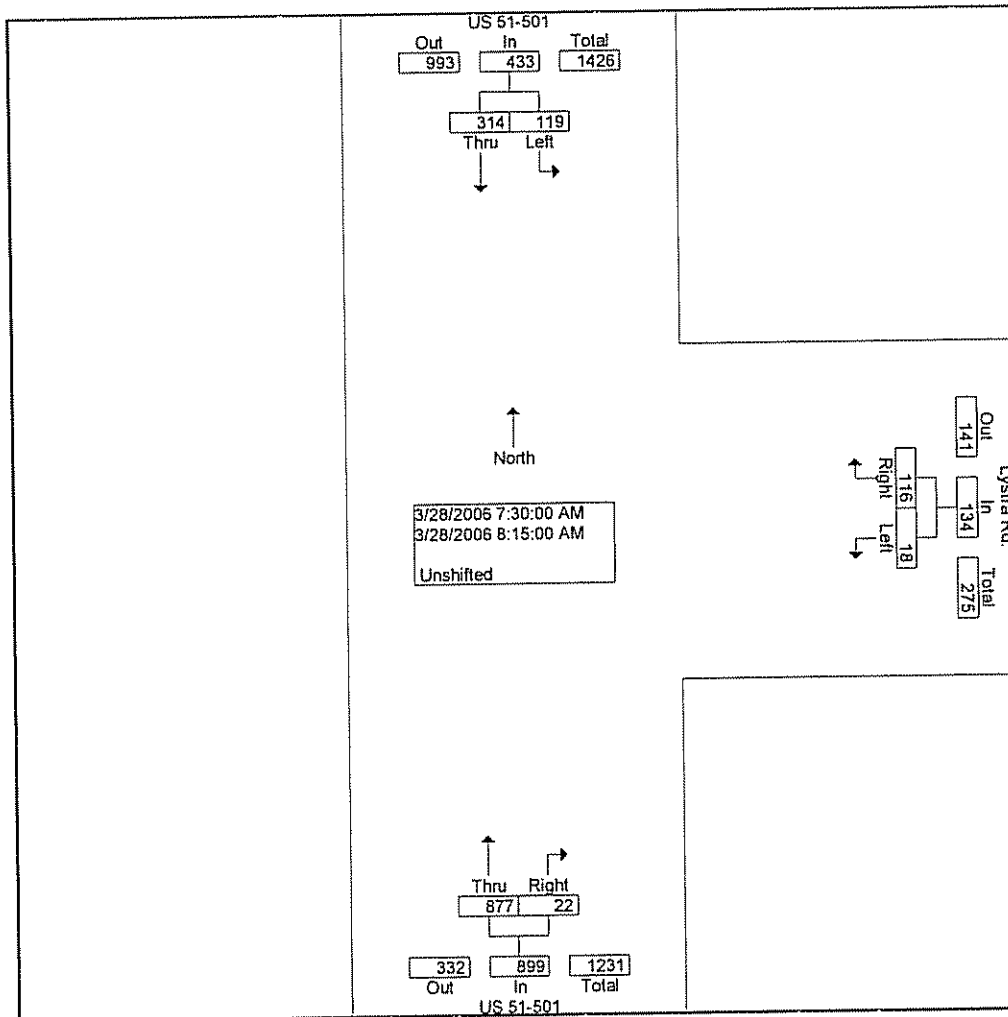
Start Time	US 51-501 From South			US 51-501 From North			Lystra Rd. From East			Int. Total
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	4	174	0	0	65	25	14	0	9	291
07:15 AM	4	199	0	0	87	26	15	0	4	335
07:30 AM	10	222	0	0	71	30	35	0	7	375
07:45 AM	6	219	0	0	64	26	33	0	4	352
Total	24	814	0	0	287	107	97	0	24	1353
08:00 AM	5	215	0	0	96	30	27	0	6	379
08:15 AM	1	221	0	0	83	33	21	0	1	360
08:30 AM	4	161	0	0	94	18	14	0	2	293
08:45 AM	3	151	0	0	88	21	15	0	4	282
Total	13	748	0	0	361	102	77	0	13	1314
*** BREAK ***										
04:00 PM	3	119	0	0	167	15	13	0	2	319
04:15 PM	6	98	0	0	194	40	20	0	9	367
04:30 PM	6	106	0	0	173	16	30	0	8	339
04:45 PM	3	90	0	0	138	12	17	0	6	266
Total	18	413	0	0	672	83	80	0	25	1291
05:00 PM	2	94	0	0	208	24	21	0	8	357
05:15 PM	9	139	0	0	225	19	32	0	7	431
05:30 PM	7	123	0	0	214	20	28	0	5	397
05:45 PM	4	120	0	0	204	17	37	0	5	387
Total	22	476	0	0	851	80	118	0	25	1572
Grand Total	77	2451	0	0	2171	372	372	0	87	5530
Apprch %	3.0	97.0	0.0	0.0	85.4	14.6	81.0	0.0	19.0	
Total %	1.4	44.3	0.0	0.0	39.3	6.7	6.7	0.0	1.6	

US 15-501 at Lystra Road  
Chatham County, NC

Date: March 28, 2006  
Counter: JAG  
Weather: Clear

File Name : 15501Lystra  
Site Code : 00260152  
Start Date : 3/28/2006  
Page No : 2

Start Time	US 51-501 From South				US 51-501 From North				Lystra Rd. From East				App. Total	Int. Total	
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total			
Peak Hour From 07:00 AM to 12:30 PM - Peak 1 of 1															
Intersection	07:30 AM														
Volume	22	877	0	899	0	314	119	433	116	0	18	134	0	1466	
Percent	2.4	97.6	0.0		0.0	72.5	27.5		86.6	0.0	13.4		0	379	
08:00 Volume	5	215	0	220	0	96	30	126	27	0	6	33	0	0 967	
Peak Factor															
High Int	07:30 AM				08:00 AM				07:30 AM				6:45:00 AM		
Volume	10	222	0	232	0	96	30	126	35	0	7	42			
Peak Factor	0.969				0.859				0.798						

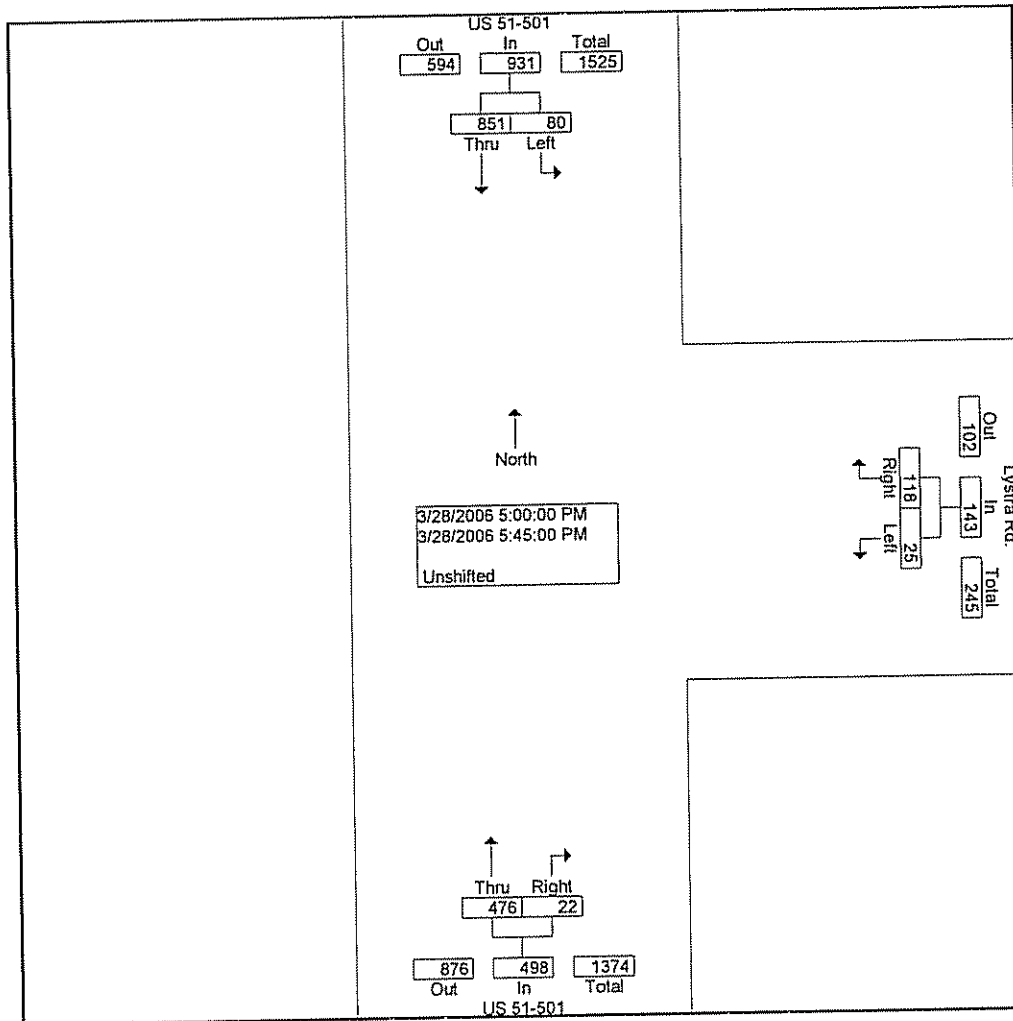


US 15-501 at Lystra Road  
Chatham County, NC

Date: March 28, 2006  
Counter: JAG  
Weather: Clear

File Name : 15501Lystra  
Site Code : 00260152  
Start Date : 3/28/2006  
Page No : 3

Start Time	US 51-501 From South				US 51-501 From North				Lystra Rd. From East				App. Total	Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total		
Peak Hour From Intersection	12:45 PM to 05:45 PM - Peak 1 of 1													
05:00 PM	22	476	0	498	0	851	80	931	118	0	25	143	0	1572
Volume	22	476	0	498	0	851	80	931	118	0	25	143	0	1572
Percent	4.4	95.6	0.0	100.0	0.0	91.4	8.6	100.0	82.5	0.0	17.5	100.0	0.0	100.0
05:15 Volume	9	139	0	148	0	225	19	244	32	0	7	39	0	431
Peak Factor	9	139	0	148	0	225	19	244	32	0	7	39	0	431
High Int.	05:15 PM													
Volume	9	139	0	148	0	225	19	244	37	0	5	42	0	0.912
Peak Factor	9	139	0	148	0	225	19	244	37	0	5	42	0	0.912
				0.841				0.954				0.851		



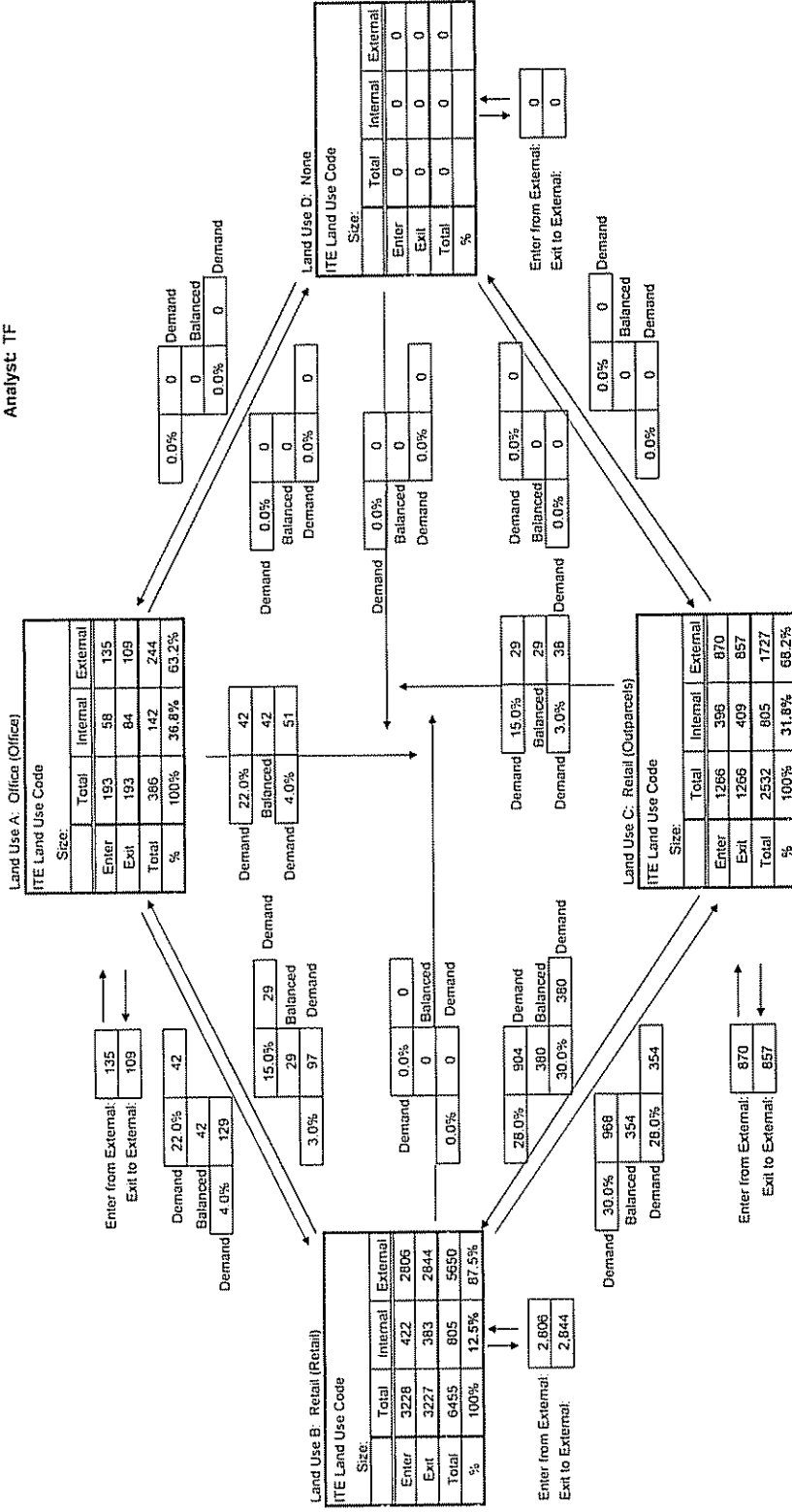
# **Trip Generation**

Polks Centre Trip Generation											
Land Use	Intensity	Daily	Daily In	Daily Out	AM Peak Hour			PM Peak Hour			
					Total	In	Out	Total	In	Out	
710 General Office Building	20,000 s.f.	386	193	193	52	46	6	30	5	25	
820 General Retail	92,500 s.f.	6,455	3,228	3,227	149	91	58	595	286	309	
932 High-Turnover (Sit-Down) Restaurant	7,500 s.f.	954	477	477	86	45	41	82	50	32	
912 Drive-in Bank	4 lanes	1,578	789	789	78	45	33	204	102	102	
<b>Subtotal</b>		<b>9,373</b>	<b>4,687</b>	<b>4,686</b>	<b>365</b>	<b>227</b>	<b>138</b>	<b>911</b>	<b>443</b>	<b>468</b>	
<i>Internal Capture</i>											
General Office Building		39	20	19	0	0	0	3	1	2	
General Retail		646	323	323	0	0	0	59	29	30	
High-Turnover (Sit-Down) Restaurant		95	47	48	0	0	0	8	5	3	
Drive-in Bank		158	79	79	0	0	0	20	10	10	
<b>Internal Capture</b>	<b>10.00%</b>	<b>938</b>	<b>469</b>	<b>469</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>45</b>	<b>45</b>	
<i>Pass-By Capture</i>											
General Retail	AM 0% PM 34%	1,822	911	911	0	0	0	182	87	95	
High-Turnover (Sit-Down) Restaurant	0% 43%	318	159	159	0	0	0	32	19	12	
Drive-in Bank	0% 47%	865	432	432	0	0	0	86	43	43	
Pass-By Capture Subtotal		3,005	1,503	1,503	0	0	0	301	150	151	
<i>Adjacent Street Traffic</i>											
10% Adjacent Street Traffic		14,900	1,490	1,490	280	140	140	298	149	149	
<b>Pass-By Total</b>	<b>32.71%</b>	<b>2,980</b>	<b>1,490</b>	<b>1,490</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>298</b>	<b>149</b>	<b>149</b>	
<b>Net New External Trips</b>		<b>5,455</b>	<b>2,728</b>	<b>2,727</b>	<b>365</b>	<b>227</b>	<b>138</b>	<b>523</b>	<b>249</b>	<b>274</b>	

**ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET**  
 (Source: Chapter 7, ITE Trip Generation Handbook, October 1998)

For reference only

Project Number: 012726001  
 Project Name: Polks Centre  
 Scenario: Daily  
 Analysts Period: Daily  
 Analyst: TF

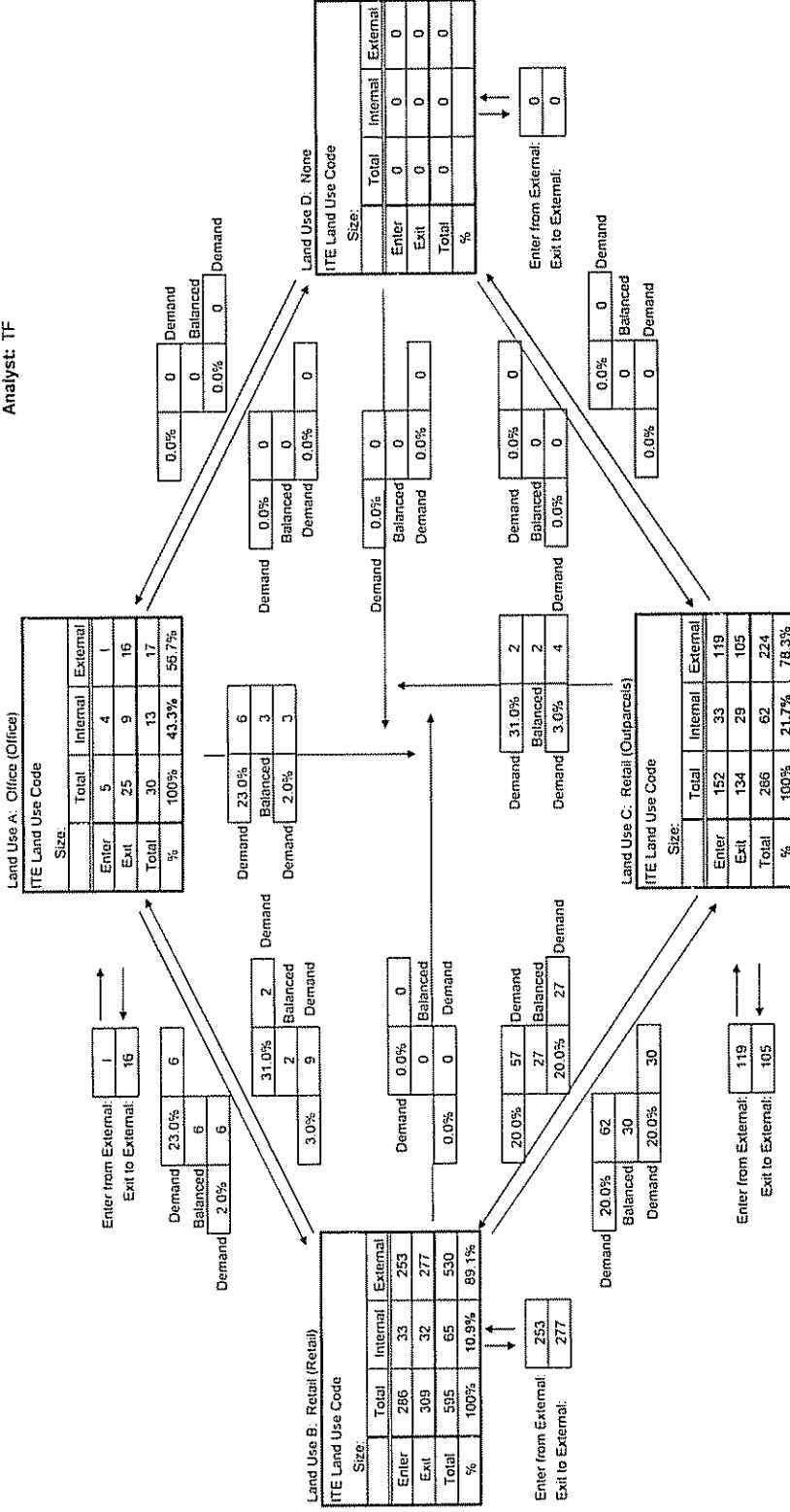


Overall Internal Capture = 18.69%

**ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET**  
 (Source: Chapter 7, ITE Trip Generation Handbook, October 1998)

For reference only

Project Number: 012726001  
 Project Name: Polks Centre  
 Scenario: PM  
 Analysis Period: PM Peak  
 Analyst: TF



Category	Land Use				Total
	A	B	C	D	
Enter	1	253	105	0	359
Exit	16	277	119	0	412
Total	17	530	224	0	771
Single Use					
Trip Gen Estimate	30	595	286	0	911

Overall Internal Capture = 15.37%

# Intersection Spreadsheets



**Polks Centre Traffic Impact Analysis  
Chatham County, NC**

**INTERSECTION VOLUME DEVELOPMENT**

**US 15/501 at Lystra Road  
AM PEAK HOUR**

Description	US 15/501 Northbound			U-Turn	US 15/501 Southbound			- Eastbound			Lystra Road Westbound		
	Left	Through	Right		Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/23/06)	0	877	22	0	119	314	0	0	0	0	18	0	116
Balancing Adjustment	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing 2006 Traffic	0	877	22	0	119	314	0	0	0	0	18	0	116
Background Growth Factor (3% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
Background Growth	0	109	3	0	15	39	0	0	0	0	2	0	15
Approved Development													
Briar Chapel	0	347	52	0	4	382	0	0	0	0	44	0	1
Chatham Downs	0	15	12	0	56	0	0	0	0	0	33	0	22
Legend Oaks	0	4	0	0	4	12	0	0	0	0	0	0	1
Williams Corner	0	280	21	0	28	29	0	0	0	0	96	0	12
Total Approved Development Traffic	0	646	85	0	92	423	0	0	0	0	173	0	36
Background Traffic	0	1,632	110	0	226	776	0	0	0	0	193	0	167
Diverted Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
2010 Background Traffic	0	1,632	110	0	226	776	0	0	0	0	193	0	167
Project Traffic													
Percent Assignment	0%	30%	0%	0%	10%	30%	0%	0%	0%	0%	0%	0%	10%
Direction		in			out	out							in
New Project Traffic	0	68	0	0	14	41	0	0	0	0	0	0	23
<b>2010 Buildout Total</b>	<b>0</b>	<b>1,700</b>	<b>110</b>	<b>0</b>	<b>240</b>	<b>817</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>193</b>	<b>0</b>	<b>190</b>

**PM PEAK HOUR**

Description	US 15/501 Northbound			U-Turn	US 15/501 Southbound			- Eastbound			Lystra Road Westbound		
	Left	Through	Right		Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/23/06)	0	476	22	0	80	851	0	0	0	0	25	0	118
Balancing Adjustment	0	0	0	0	0	26	0	0	0	0	0	0	0
Existing 2006 Traffic	0	476	22	0	80	877	0	0	0	0	25	0	118
Background Growth Factor (3% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
Background Growth	0	59	3	0	10	109	0	0	0	0	3	0	15
Approved Development													
Briar Chapel	0	374	43	0	2	374	0	0	0	0	46	0	4
Briar Chapel (Pass-By Capture)	0	-15	0	0	0	-34	0	0	0	0	0	0	0
Chatham Downs	0	51	27	0	129	0	0	0	0	0	110	0	71
Chatham Downs (Pass-By Capture)	0	-9	9	0	44	-44	0	0	0	0	37	0	27
Legend Oaks	0	14	0	0	3	9	0	0	0	0	0	0	4
Williams Corner	0	193	15	0	19	88	0	0	0	0	289	0	35
Williams Corner (Pass-By Capture)	0	0	0	0	0	-1	0	0	0	0	0	0	0
Total Approved Development Traffic	0	608	94	0	197	392	0	0	0	0	482	0	141
Background Traffic	0	1,143	119	0	287	1,378	0	0	0	0	510	0	274
Diverted Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
2010 Background Traffic	0	1,143	119	0	287	1,378	0	0	0	0	510	0	274
Project Traffic													
Percent Assignment	0%	30%	0%	0%	10%	30%	0%	0%	0%	0%	0%	0%	10%
Direction		in			out	out							in
New Project Traffic	0	75	0	0	27	82	0	0	0	0	0	0	25
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>1,218</b>	<b>119</b>	<b>0</b>	<b>314</b>	<b>1,460</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>510</b>	<b>0</b>	<b>299</b>

**Polks Centre Traffic Impact Analysis  
Chatham County, NC**

**INTERSECTION VOLUME DEVELOPMENT**

**US 15-501 at Polks Landing Road/Williams Corner South Driveway  
AM PEAK HOUR**

Description	US 15-501 Northbound			US 15-501 Southbound			Polks Landing Road Eastbound			Williams Corner South Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/28/06)	6	961	0	5	384	8	47	0	9	0	0	0
Balancing Adjustment	0	26	0	0	40	0	0	0	0	0	0	0
Existing 2006 Traffic	6	987	0	5	424	8	47	0	9	0	0	0
Background Growth Factor (3% per year)	0.000	0.126	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	124	0	0	54	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	37	0	0	56	0	0	0	0	0	0	0
Legend Oaks	0	5	0	0	16	0	0	0	0	0	0	0
Williams Corner	0	187	105	0	57	0	0	0	0	0	0	44
Total Approved Development Traffic	0	577	105	0	515	0	0	0	0	0	0	44
Background Traffic	6	1,688	105	5	993	8	47	0	9	0	0	44
Diverted Traffic	-6	6	0	-5	0	-4	-47	0	0	0	0	0
2010 Background Traffic	0	1,694	105	0	993	4	0	0	9	0	0	44
Project Traffic												
Percent Assignment	0%	40%	0%	0%	40%	0%	0%	0%	0%	0%	0%	0%
Direction		in			out							
New Project Traffic	0	91	0	0	55	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>1,785</b>	<b>105</b>	<b>0</b>	<b>1,048</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>44</b>

**PM PEAK HOUR**

Description	US 15-501 Northbound			US 15-501 Southbound			Polks Landing Road Eastbound			Williams Corner South Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes (3/28/06)	17	483	0	3	948	38	18	0	9	0	0	0
Balancing Adjustment	0	94	0	0	0	0	0	0	0	0	0	0
Existing 2006 Traffic	17	577	0	3	948	38	18	0	9	0	0	0
Background Growth Factor (3% per year)	0.000	0.126	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	72	0	0	119	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	122	0	0	129	0	0	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	18	0	0	0	0	0	0	0	0	0	0
Legend Oaks	0	18	0	0	12	0	0	0	0	0	0	0
Williams Corner	0	156	72	0	107	0	0	0	0	0	0	131
Williams Corner (Pass-By Capture)	0	-59	59	0	-1	0	0	0	0	0	0	57
Total Approved Development Traffic	0	618	131	0	589	0	0	0	0	0	0	188
Background Traffic	17	1,267	131	3	1,656	38	18	0	9	0	0	188
Diverted Traffic	-17	17	0	-3	0	-19	-18	0	0	0	0	0
2010 Background Traffic	0	1,284	131	0	1,656	19	0	0	9	0	0	188
Project Traffic												
Percent Assignment	0%	40%	0%	0%	40%	0%	0%	0%	0%	0%	0%	0%
Direction		in			out							
New Project Traffic	0	100	0	0	109	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>1,384</b>	<b>131</b>	<b>0</b>	<b>1,765</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>188</b>

Polks Centre Traffic Impact Analysis  
Chatham County, NC

**INTERSECTION VOLUME DEVELOPMENT**

US 15-501 at Holly Ridge Road Ext./Williams Corner Center Driveway  
AM PEAK HOUR

Description	US 15-501 Northbound			US 15-501 Southbound			Holly Ridge Road Ext Eastbound			Williams Corner Center Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes	0	1,008	0	0	397	0	0	0	0	0	0	0
Balancing Adjustment	0	26	0	0	40	0	0	0	0	0	0	0
Existing 2006 Traffic	0	1,034	0	0	437	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.000	0.126	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	130	0	0	54	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	37	0	0	56	0	0	0	0	0	0	0
Legend Oaks	0	5	0	0	16	2	1	0	0	0	0	0
Williams Corner	0	175	56	168	28	0	0	7	0	29	3	44
Total Approved Development Traffic	0	565	56	168	486	2	1	7	0	29	3	44
Background Traffic	0	1,729	56	168	977	2	1	7	0	29	3	44
Diverted Traffic	6	-47	0	5	-9	4	47	0	0	0	0	0
2010 Background Traffic	6	1,682	56	173	968	6	48	7	0	29	3	44
Project Traffic												
Percent Assignment	40%	0%	0%	0%	0%	50%	50%	5%	40%	0%	5%	0%
Direction	in				in		out	out	out		in	
New Project Traffic	91	0	0	0	0	114	69	7	55	0	11	0
<b>2010 Buildout Total</b>	<b>97</b>	<b>1,682</b>	<b>56</b>	<b>173</b>	<b>968</b>	<b>120</b>	<b>117</b>	<b>14</b>	<b>55</b>	<b>29</b>	<b>14</b>	<b>44</b>

PM PEAK HOUR

Description	US 15-501 Northbound			US 15-501 Southbound			Holly Ridge Road Ext Eastbound			Williams Corner Center Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed Volumes	0	501	0	0	989	0	0	0	0	0	0	0
Balancing Adjustment	0	94	0	0	0	0	0	0	0	0	0	0
Existing 2006 Traffic	0	595	0	0	989	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.000	0.126	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	75	0	0	124	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	122	0	0	129	0	0	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	18	0	0	0	0	0	0	0	0	0	0
Legend Oaks	0	18	0	0	12	1	2	0	0	0	0	0
Williams Corner	0	248	39	116	19	0	0	5	0	88	9	131
Williams Corner (Pass-By Capture)	0	-31	29	50	-50	0	0	0	0	49	0	29
Total Approved Development Traffic	0	738	68	166	452	1	2	5	0	137	9	160
Background Traffic	0	1,408	68	166	1,565	1	2	5	0	137	9	160
Diverted Traffic	17	-18	0	3	-22	19	18	0	0	0	0	0
2010 Background Traffic	17	1,390	68	169	1,543	20	20	5	0	137	9	160
Project Traffic												
Percent Assignment	40%	0%	0%	0%	0%	50%	50%	5%	40%	0%	5%	0%
Direction	in				in		out	out	out		in	
New Project Traffic	100	0	0	0	0	125	137	14	109	0	12	0
Pass-By Traffic	77	-77	0	0	-72	72	77	0	72	0	0	0
<b>2010 Buildout Total</b>	<b>194</b>	<b>1,313</b>	<b>68</b>	<b>169</b>	<b>1,471</b>	<b>217</b>	<b>234</b>	<b>19</b>	<b>181</b>	<b>137</b>	<b>21</b>	<b>160</b>

**Polks Centre Traffic Impact Analysis  
Chatham County, NC**

**US 15-501 at Williams Corner North Driveway  
AM PEAK HOUR**

Description	US 15-501 Northbound			US 15-501 Southbound			- Eastbound			Williams Corner North Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2006 Traffic	0	1,034	0	0	437	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.000	0.126	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	130	0	0	54	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	37	0	0	56	0	0	0	0	0	0	0
Legend Oaks	0	0	6	7	18	0	0	0	0	0	0	38
Williams Corner	0	99	119	133	196	0	0	0	0	0	0	38
Total Approved Development Traffic	0	484	125	140	656	0	0	0	0	0	0	76
Background Traffic	0	1,648	125	140	1,147	0	0	0	0	0	0	76
Diverted Traffic	0	0	0	0	0	0	0	0	0	0	0	0
2010 Background Traffic	0	1,648	125	140	1,147	0	0	0	0	0	0	76
Project Traffic												
Percent Assignment	0%	50%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%
Direction		out			in							
New Project Traffic	0	69	0	0	114	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>1,717</b>	<b>125</b>	<b>140</b>	<b>1,261</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>76</b>

**PM PEAK HOUR**

Description	US 15-501 Northbound			US 15-501 Southbound			- Eastbound			Williams Corner North Driveway Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2006 Traffic	0	595	0	0	989	0	0	0	0	0	0	0
Background Growth Factor (3% per year)	0.000	0.126	0.000	0.000	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	75	0	0	124	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	122	0	0	129	0	0	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	18	0	0	0	0	0	0	0	0	0	0
Legend Oaks	0	0	20	23	13	0	0	0	0	0	0	26
Williams Corner	0	298	82	92	135	0	0	0	0	0	0	113
Williams Corner (Pass-By Capture)	0	-2	0	0	0	0	0	0	0	0	0	0
Total Approved Development Traffic	0	799	102	115	619	0	0	0	0	0	0	139
Background Traffic	0	1,469	102	115	1,732	0	0	0	0	0	0	139
Diverted Traffic	0	0	0	0	0	0	0	0	0	0	0	0
2010 Background Traffic	0	1,469	102	115	1,732	0	0	0	0	0	0	139
Project Traffic												
Percent Assignment	0%	50%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%
Direction		out			in							
New Project Traffic	0	137	0	0	125	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>1,606</b>	<b>102</b>	<b>115</b>	<b>1,857</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>139</b>

**Polks Centre Traffic Impact Analysis  
Chatham County, NC**

**Holly Ridge Road/Holly Ridge Road Ext. at Polks Landing Road  
AM PEAK HOUR**

Description	Holly Ridge Road <u>Northbound</u>			Holly Ridge Road Ext. <u>Southbound</u>			Polks Landing Road <u>Eastbound</u>			Polks Landing Road <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2006 Traffic	0	0	39	0	0	0	0	17	0	10	4	0
Background Growth Factor (3% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	0	0	0	0	0	0	0	0	0	0	0
Approved Development												
Briar Chapel	0	0	0	0	0	0	0	0	0	0	0	0
Chatham Downs	0	0	0	0	0	0	0	0	0	0	0	0
Legend Oaks	0	0	0	0	0	0	0	0	0	0	0	0
Williams Corner	0	5	0	0	2	1	2	0	0	0	0	0
Total Approved Development Traffic	0	5	0	0	2	1	2	0	0	0	0	0
Background Traffic	0	5	39	0	2	1	2	17	0	10	4	0
Diverted Traffic	0	33	-33	0	7	3	14	-14	0	-7	-3	0
2010 Background Traffic	0	38	6	0	9	4	16	3	0	3	1	0
Project Traffic												
Percent Assignment	0%	5%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Direction		in			out							
New Project Traffic	0	11	0	0	7	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>49</b>	<b>6</b>	<b>0</b>	<b>16</b>	<b>4</b>	<b>16</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>0</b>

**PM PEAK HOUR**

Description	Holly Ridge Road <u>Northbound</u>			Holly Ridge Road Ext. <u>Southbound</u>			Polks Landing Road <u>Eastbound</u>			Polks Landing Road <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2006 Traffic	0	0	19	0	0	0	0	8	0	37	18	0
Background Growth Factor (3% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Background Growth	0	0	0	0	0	0	0	0	0	0	0	0
Approved Development												
Briar Chapel	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0
Chatham Downs (Pass-By Capture)	0	0	0	0	0	0	0	0	0	0	0	0
Legend Oaks	0	0	0	0	0	0	0	0	0	0	0	0
Williams Corner	0	4	0	0	6	3	1	0	0	0	0	0
Williams Corner (Pass-By Capture)	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Development Traffic	0	4	0	0	6	3	1	0	0	0	0	0
Background Traffic	0	4	19	0	6	3	1	8	0	37	18	0
Diverted Traffic	0	13	-13	0	24	12	5	-5	0	-24	-12	0
2010 Background Traffic	0	17	6	0	30	15	6	3	0	13	6	0
Project Traffic												
Percent Assignment	0%	5%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Direction		in			out							
New Project Traffic	0	12	0	0	14	0	0	0	0	0	0	0
Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0
<b>2010 Buildout Total</b>	<b>0</b>	<b>29</b>	<b>6</b>	<b>0</b>	<b>44</b>	<b>15</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>13</b>	<b>6</b>	<b>0</b>

**Synchro Output:**  
**Existing (2006) 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)	100	0	250		175	250	
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)	1770	1583	1863	3539	1583	1770	3539
Flt Permitted	0.950					0.167	
Satd. Flow (perm)	1770	1583	1863	3539	1583	311	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		64			24		
Link Speed (mph)	45			55			55
Link Distance (ft)	1499			725			743
Travel Time (s)	22.7			9.0			9.2
Volume (vph)	18	116	0	877	22	119	314
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)	20	129	0	974	24	132	349
Turn Type		pm+ov	Perm		pm+ov	pm+pt	
Protected Phases	8	1		2	8	1	6
Permitted Phases		8	2		2	6	
Detector Phases	8	1	2	2	8	1	6
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	14.0
Minimum Split (s)	23.5	13.6	23.1	23.1	23.5	13.6	23.1
Total Split (s)	32.0	28.0	60.0	60.0	32.0	28.0	88.0
Total Split (%)	27%	23%	50%	50%	27%	23%	73%
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)	11.0	17.5		37.0	48.1	53.0	56.2
Actuated g/C Ratio	0.15	0.26		0.58	0.66	0.79	0.88
v/c Ratio	0.07	0.28		0.48	0.02	0.27	0.11
Uniform Delay, d1	28.6	8.6		9.5	0.0	1.9	2.0
Delay	23.1	7.1		9.1	1.5	2.3	1.9
LOS	C	A		A	A	A	A
Approach Delay	9.3			8.9			2.0
Approach LOS	A			A			A

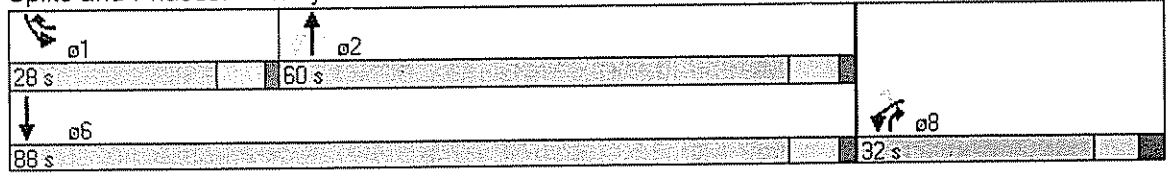


Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	3	11		62	0	0	0
Queue Length 95th (ft)	25	50		198	5	28	31
Internal Link Dist (ft)	1419			645			663
50th Up Block Time (%)							
95th Up Block Time (%)							
Turn Bay Length (ft)	100				175	250	
50th Bay Block Time %							
95th Bay Block Time %							
Queuing Penalty (veh)							

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 64.1  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.48  
 Intersection Signal Delay: 6.9  
 Intersection Capacity Utilization: 52.6%  
 Intersection LOS: A  
 ICU Level of Service: A

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







Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations	↖	↗	↖	↑↑	↘	↑↑	↗
Sign Control	Stop			Free		Free	
Grade	0%			0%		0%	
Volume (veh/h)	47	9	6	987	5	424	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	52	10	7	1097	0	471	9
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)		2					
Median type	None						
Median storage (veh)							
Upstream signal (ft)				743			
pX, platoon unblocked	0.83				0.00		
vC, conflicting volume	1033	236	480		0		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	832	236	480		0		
tC, single (s)	6.8	6.9	4.1		0.0		
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2		0.0		
p0 queue free %	79	99	99		0		
cM capacity (veh/h)	253	766	1079		0		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	62	7	548	548	236	236	9	0
Volume Left	52	7	0	0	0	0	0	0
Volume Right	10	0	0	0	0	0	9	0
cSH	302	1079	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.21	0.01	0.32	0.32	0.14	0.14	0.01	0.00
Queue Length (ft)	19	0	0	0	0	0	0	0
Control Delay (s)	20.8	8.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	A						
Approach Delay (s)	20.8	0.1			0.0			
Approach LOS	C							

Intersection Summary								
Average Delay			0.8					
Intersection Capacity Utilization			42.0%		ICU Level of Service			A

**Synchro Output:**  
**Existing (2006) 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)	100	0	250		175	250	
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)	1770	1583	1863	3539	1583	1770	3539
Flt Permitted	0.950					0.331	
Satd. Flow (perm)	1770	1583	1863	3539	1583	617	3539
Right Turn on Red		Yes			Yes		
Satd. Flow (RTOR)		131			24		
Link Speed (mph)	45			55			55
Link Distance (ft)	1499			725			743
Travel Time (s)	22.7			9.0			9.2
Volume (vph)	25	118	0	476	22	80	877
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)	28	131	0	529	24	89	974
Turn Type		pm+ov	Perm		pm+ov	pm+pt	
Protected Phases	8	1		2	8	1	6
Permitted Phases		8	2		2	6	
Detector Phases	8	1	2	2	8	1	6
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	14.0
Minimum Split (s)	23.5	13.6	23.1	23.1	23.5	13.6	23.1
Total Split (s)	39.0	31.0	50.0	50.0	39.0	31.0	81.0
Total Split (%)	33%	26%	42%	42%	33%	26%	68%
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)	11.3	18.2		30.6	42.5	46.6	49.6
Actuated g/C Ratio	0.17	0.30		0.52	0.63	0.76	0.85
v/c Ratio	0.09	0.23		0.29	0.02	0.13	0.33
Uniform Delay, d1	25.3	0.0		9.0	0.0	2.2	2.8
Delay	17.5	2.0		9.2	1.8	3.0	2.8
LOS	B	A		A	A	A	A
Approach Delay	4.8			8.9			2.9
Approach LOS	A			A			A

















Lane Group	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	4	0		28	0	0	0
Queue Length 95th (ft)	25	22		101	5	22	102
Internal Link Dist (ft)	1419			645			663
50th Up Block Time (%)							
95th Up Block Time (%)							
Turn Bay Length (ft)	100				175	250	
50th Bay Block Time %							
95th Bay Block Time %							
Queuing Penalty (veh)							

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 58.6  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.33  
 Intersection Signal Delay: 4.9  
 Intersection Capacity Utilization: 56.9%  
 Intersection LOS: A  
 ICU Level of Service: A

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













ρ1	ρ2	
31 s	50 s	
ρ6	ρ8	
81 s	39 s	

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Sign Control	Stop			Free		Free	
Grade	0%			0%		0%	
Volume (veh/h)	18	9	17	577	3	948	38
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	20	10	19	641	0	1053	42
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)		2					
Median type	None						
Median storage (veh)							
Upstream signal (ft)				743			
pX, platoon unblocked	0.94				0.00		
vC, conflicting volume	1412	527	1096		0		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1375	527	1096		0		
tC, single (s)	6.8	6.9	4.1		0.0		
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2		0.0		
p0 queue free %	84	98	97		0		
cM capacity (veh/h)	125	496	633		0		

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	30	19	321	321	527	527	42	0
Volume Left	20	19	0	0	0	0	0	0
Volume Right	10	0	0	0	0	0	42	0
cSH	187	633	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.03	0.19	0.19	0.31	0.31	0.02	0.00
Queue Length (ft)	14	2	0	0	0	0	0	0
Control Delay (s)	30.4	10.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B						
Approach Delay (s)	30.4	0.3			0.0			
Approach LOS	D							

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization	40.8%	ICU Level of Service	A

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

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	325	250		175	400	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Satd Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.950	
Satd Flow (perm)	3433	1583	3539	1583	1770	3539
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		55			55
Link Distance (ft)	834		725			743
Travel Time (s)	12.6		9.0			9.2
Volume (vph)	193	190	1700	110	240	817
Confl Peds (#/hr)						
Confl Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Lane Group Flow (vph)	214	211	1889	122	267	908
Turn Type		pm+ov		pm+ov	Prot	
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Detector Phases	8	1	2	8	1	6
Minimum Initial (s)	7.0	7.0	14.0	7.0	7.0	14.0
Minimum Split (s)	23.5	13.6	23.1	23.5	13.6	23.1
Total Split (s)	24.0	30.0	86.0	24.0	30.0	116.0
Total Split (%)	17%	21%	61%	17%	21%	83%
Yellow Time (s)	4.5	5.1	5.1	4.5	5.1	5.1
All-Red Time (s)	3.0	1.5	2.0	3.0	1.5	2.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	Coord	None	None	Coord
Act Effct Green (s)	16.2	45.3	84.8	105.9	24.2	113.9
Actuated g/C Ratio	0.12	0.32	0.61	0.76	0.17	0.81
v/c Ratio	0.54	0.41	0.88	0.10	0.88	0.32
Uniform Delay, d1	58.5	37.0	23.3	4.5	56.5	3.3
Delay	58.1	36.7	27.1	4.7	67.1	3.2
LOS	E	D	C	A	E	A
Approach Delay	47.5		25.8			17.8
Approach LOS	D		C			B



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	96	148	745	27	253	81
Queue Length 95th (ft)	136	218	918	44	#398	122
Internal Link Dist (ft)	754		645			663
50th Up Block Time (%)			8%			
95th Up Block Time (%)			14%			
Turn Bay Length (ft)	325	250		175	400	
50th Bay Block Time %			31%			
95th Bay Block Time %			35%			
Queuing Penalty (veh)			40			

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 121 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 25.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.6%  
 ICU Level of Service D  
 # 95th percentile volume exceeds capacity, queue may be longer  
 Queue shown is maximum after two cycles

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

φ1	φ2		
30 s	86 s		
φ6		φ8	
116 s		24 s	



























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)	0	0	9	0	0	44	0	1785	105	0	1048	4
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)	0	0	10	0	0	49	0	1983	117	0	1164	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								743			730	
pX, platoon unblocked	0.61	0.61	0.83	0.61	0.61	0.52	0.83			0.52		
vC, conflicting volume	2205	3264	582	2576	3152	992	1169			2100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1495	3240	291	2105	3056	67	998			2192		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	90	100			100		
cM capacity (veh/h)	47	6	585	18	7	512	572			124		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	10	49	992	992	117	582	582	4
Volume Left	0	0	0	0	0	0	0	0
Volume Right	10	49	0	0	117	0	0	4
cSH	585	512	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.10	0.58	0.58	0.07	0.34	0.34	0.00
Queue Length (ft)	1	8	0	0	0	0	0	0
Control Delay (s)	11.3	12.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	B						
Approach Delay (s)	11.3	12.8	0.0			0.0		
Approach LOS	B	B						

Intersection Summary		
Average Delay		0.2
Intersection Capacity Utilization	66.5%	ICU Level of Service
		B

Polks Centre  
3. Holly Ridge Road Extension & US 15-501

Buildout 2010 AM Scenario  
6/14/2006

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	175		100	200		100	275		100	300		150
Storage Lanes	2		1	1		1	1		1	1		1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd Flow (prot)	3433	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd Flow (perm)	3433	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Right Turn on Red			No			No			No			No
Satd Flow (RTOR)												
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		708			623			730			847	
Travel Time (s)		16.1			14.2			9.0			10.5	
Volume (vph)	117	14	55	29	14	44	97	1682	56	173	968	120
Confl Peds (#/hr)												
Confl Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	130	16	61	32	16	49	108	1869	62	192	1076	133
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2		6	6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	7
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	23.0	14.0	14.0	23.0	14.0	14.0	23.0	14.0	14.0	23.0	14.0
Total Split (s)	21.0	25.0	31.0	19.0	23.0	24.0	31.0	72.0	19.0	24.0	65.0	21.0
Total Split (%)	15%	18%	22%	14%	16%	17%	22%	51%	14%	17%	46%	15%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Coord	None	None	Coord	None
Act Effct Green (s)	12.5	10.6	25.8	11.3	9.4	24.4	15.8	88.1	104.4	18.4	90.7	108.2
Actuated g/C Ratio	0.09	0.08	0.18	0.08	0.07	0.17	0.11	0.63	0.75	0.13	0.65	0.77
v/c Ratio	0.42	0.11	0.21	0.22	0.13	0.18	0.54	0.84	0.05	0.83	0.47	0.11
Uniform Delay, d1	60.2	62.8	46.0	61.5	65.4	45.7	58.6	23.9	6.3	59.2	14.7	5.1
Delay	59.9	59.5	46.1	60.2	61.5	46.1	73.8	14.6	1.6	68.7	14.6	5.5
LOS	E	E	D	E	E	D	E	B	A	E	B	A
Approach Delay		55.8			53.3			17.3			21.2	
Approach LOS		E			D			B			C	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	58	14	52	28	14	40	104	101	2	172	211	20
Queue Length 95th (ft)	91	38	80	62	39	71	m121	#1040	m5	#297	412	66
Internal Link Dist (ft)		628			543			650			767	
50th Up Block Time (%)												
95th Up Block Time (%)								10%				
Turn Bay Length (ft)	175		100	200		100	275		100	300		150
50th Bay Block Time %												
95th Bay Block Time %								13%		3%	14%	
Queuing Penalty (veh)								97		8	14	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 20 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 21.8  
 Intersection LOS: C  
 Intersection Capacity Utilization: 85.2%  
 ICU Level of Service: D  
 # 95th percentile volume exceeds capacity, queue may be longer  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal

Splits and Phases. 3: Holly Ridge Road Extension & US 15-501

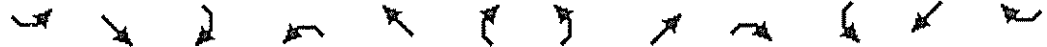
ø1	ø2	ø3	ø4
24 s	72 s	19 s	25 s
ø5	ø6	ø7	ø8
31 s	65 s	21 s	23 s



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑	↖	↘	↑↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	76	1717	125	140	1261
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	84	1908	139	156	1401
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)			847			
pX, platoon unblocked	0.53	0.53			0.53	
vC, conflicting volume	2919	954			2047	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3747	12			2089	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			0	
cM capacity (veh/h)	0	561			137	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	84	954	954	139	156	701	701
Volume Left	0	0	0	0	156	0	0
Volume Right	84	0	0	139	0	0	0
cSH	561	1700	1700	1700	137	1700	1700
Volume to Capacity	0.15	0.56	0.56	0.08	1.13	0.41	0.41
Queue Length (ft)	13	0	0	0	221	0	0
Control Delay (s)	12.6	0.0	0.0	0.0	180.1	0.0	0.0
Lane LOS	B				F		
Approach Delay (s)	12.6	0.0			18.0		
Approach LOS	B						

Intersection Summary			
Average Delay		7.9	
Intersection Capacity Utilization		69.7%	ICU Level of Service B















Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	3	0	3	1	0	0	49	6	0	16	4
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)	18	3	0	3	1	0	0	54	7	0	18	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1			3			60	47	3	81	47	1
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1			3			60	47	3	81	47	1
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	93	99	100	98	100
cM capacity (veh/h)	1622			1619			908	834	1080	848	834	1083

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	21	4	61	22
Volume Left	18	3	0	0
Volume Right	0	0	7	4
cSH	1622	1619	855	874
Volume to Capacity	0.01	0.00	0.07	0.03
Queue Length (ft)	1	0	6	2
Control Delay (s)	6.1	5.4	9.5	9.2
Lane LOS	A	A	A	A
Approach Delay (s)	6.1	5.4	9.5	9.2
Approach LOS			A	A

Intersection Summary			
Average Delay		8.6	
Intersection Capacity Utilization		15.0%	ICU Level of Service
			A

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

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	325	250		175	400	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3433	1583	3539	1583	1770	3539
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	45		55			55
Link Distance (ft)	797		725			743
Travel Time (s)	12.1		9.0			9.2
Volume (vph)	510	299	1218	119	314	1460
Confl. Peds (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Lane Group Flow (vph)	567	332	1353	132	349	1622
Turn Type		pm+ov		pm+ov	Prot	
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2		
Detector Phases	8	1	2	8	1	6
Minimum Initial (s)	7.0	7.0	14.0	7.0	7.0	14.0
Minimum Split (s)	23.5	13.6	23.1	23.5	13.6	23.1
Total Split (s)	34.0	40.0	66.0	34.0	40.0	106.0
Total Split (%)	24%	29%	47%	24%	29%	76%
Yellow Time (s)	4.5	5.1	5.1	4.5	5.1	5.1
All-Red Time (s)	3.0	1.5	2.0	3.0	1.5	2.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	Coord	None	None	Coord
Act Effct Green (s)	27.9	64.7	65.4	98.3	31.8	102.1
Actuated g/C Ratio	0.20	0.46	0.47	0.70	0.23	0.73
v/c Ratio	0.83	0.45	0.82	0.12	0.87	0.63
Uniform Delay, d1	53.7	25.6	32.3	6.8	52.1	9.5
Delay	54.6	25.2	34.9	7.5	45.0	17.6
LOS	D	C	C	A	D	B
Approach Delay	43.7		32.5			22.5
Approach LOS	D		C			C



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	255	191	582	39	315	557
Queue Length 95th (ft)	323	272	690	64	m400	649
Internal Link Dist (ft)	717		645			663
50th Up Block Time (%)			5%			
95th Up Block Time (%)						
Turn Bay Length (ft)	325	250		175	400	
50th Bay Block Time %			40%			23%
95th Bay Block Time %	2%	8%	43%		4%	24%
Queuing Penalty (veh)		22	54		18	80

**Intersection Summary**

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 125 (89%), Referenced to phase 2.NBT and 6.SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 30.3  
 Intersection LOS: C  
 Intersection Capacity Utilization: 85.4%  
 ICU Level of Service: D  
 m Volume for 95th percentile queue is metered by upstream signal

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

ρ1	ρ2	
40 s	66 s	
ρ6		ρ8
106 s		34 s





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)	0	0	9	0	0	188	0	1384	131	0	1765	19
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)	0	0	10	0	0	209	0	1538	146	0	1961	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)								743			730	
pX, platoon unblocked	0.75	0.75	0.58	0.75	0.75	0.67	0.58			0.67		
vC, conflicting volume	2939	3644	981	2528	3520	769	1982			1683		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1931	2874	253	1383	2708	162	1970			1527		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	63	100			100		
cM capacity (veh/h)	19	12	435	75	16	572	170			290		

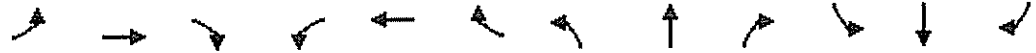
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	10	209	769	769	146	981	981	21
Volume Left	0	0	0	0	0	0	0	0
Volume Right	10	209	0	0	146	0	0	21
cSH	435	572	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.02	0.37	0.45	0.45	0.09	0.58	0.58	0.01
Queue Length (ft)	2	42	0	0	0	0	0	0
Control Delay (s)	13.5	14.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B	B						
Approach Delay (s)	13.5	14.9	0.0			0.0		
Approach LOS	B	B						

Intersection Summary		
Average Delay		0.8
Intersection Capacity Utilization	65.9%	ICU Level of Service B

Polks Centre  
3: Holly Ridge Road Extension & US 15-501

Buildout 2010 PM Scenario  
6/14/2006

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	175		100	200		100	275		100	300		150
Storage Lanes	2		1	1		1	1		1	1		1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd Flow (prot)	3433	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd Flow (perm)	3433	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Right Turn on Red			No			No			No			No
Satd Flow (RTOR)												
Link Speed (mph)		30			25			55			55	
Link Distance (ft)		706			373			730			837	
Travel Time (s)		16.0			10.2			9.0			10.4	
Volume (vph)	234	19	181	137	21	160	194	1313	68	169	1471	217
Confl Peds (#/hr)												
Confl Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	260	21	201	152	23	178	216	1459	76	188	1634	241
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	1	5	2	3	1	6	7
Minimum Initial (s)	4.0	7.0	7.0	4.0	7.0	7.0	7.0	14.0	4.0	7.0	14.0	4.0
Minimum Split (s)	11.0	23.0	14.0	11.0	23.0	14.0	14.0	23.0	11.0	14.0	23.0	11.0
Total Split (s)	24.0	23.0	26.0	25.0	24.0	24.0	26.0	68.0	25.0	24.0	66.0	24.0
Total Split (%)	17%	16%	19%	18%	17%	17%	19%	49%	18%	17%	47%	17%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Coord	None	None	Coord	None
Act Effct Green (s)	17.1	9.5	29.3	17.8	10.2	28.0	20.4	79.9	102.7	18.4	77.8	100.0
Actuated g/C Ratio	0.12	0.07	0.21	0.13	0.07	0.20	0.15	0.57	0.73	0.13	0.56	0.71
v/c Ratio	0.62	0.16	0.61	0.68	0.17	0.56	0.84	0.72	0.07	0.81	0.83	0.21
Uniform Delay, d1	58.3	64.1	47.5	58.3	63.5	48.0	58.2	24.0	6.0	59.2	28.0	7.8
Delay	58.2	61.4	48.7	58.3	60.6	48.9	81.6	12.7	2.1	67.4	33.3	8.0
LOS	E	E	D	E	E	D	F	B	A	E	C	A
Approach Delay		54.4			53.7			20.8			33.4	
Approach LOS		D			D			C			C	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	117	18	158	133	20	139	200	577	5	168	700	80
Queue Length 95th (ft)	163	47	236	209	50	212	m#266	765	m11	#287	#910	123
Internal Link Dist (ft)		626			293			650			757	
50th Up Block Time (%)												
95th Up Block Time (%)								6%			11%	
Turn Bay Length (ft)	175		100	200		100	275		100	300		150
50th Bay Block Time %			30%			24%		8%			29%	
95th Bay Block Time %			44%	8%		41%	2%	11%			35%	
Queuing Penalty (veh)			104	8		57	9	61			146	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 20 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 32.4 Intersection LOS: C  
 Intersection Capacity Utilization 84.7% ICU Level of Service D  
 # 95th percentile volume exceeds capacity, queue may be longer  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal

**Splits and Phases: 3: Holly Ridge Road Extension & US 15-501**

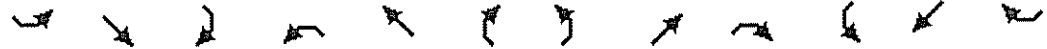
ø1	ø2	ø3	ø4
24 s	68 s	25 s	23 s
ø5	ø6	ø7	ø8
28 s	66 s	24 s	24 s



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↑↑	↘	↙	↑↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	139	1606	102	115	1857
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	154	1784	113	128	2063
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (ft)			837			
pX, platoon unblocked	0.68	0.68			0.68	
vC, conflicting volume	3072	892			1898	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3579	368			1849	
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	64			42	
cM capacity (veh/h)	1	427			220	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	154	892	892	113	128	1032	1032
Volume Left	0	0	0	0	128	0	0
Volume Right	154	0	0	113	0	0	0
cSH	427	1700	1700	1700	220	1700	1700
Volume to Capacity	0.36	0.52	0.52	0.07	0.58	0.61	0.61
Queue Length (ft)	41	0	0	0	81	0	0
Control Delay (s)	18.1	0.0	0.0	0.0	41.8	0.0	0.0
Lane LOS	C				E		
Approach Delay (s)	18.1	0.0			2.4		
Approach LOS	C						

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		67.2%	ICU Level of Service B



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	3	0	13	6	0	0	29	6	0	44	15
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)	7	3	0	14	7	0	0	32	7	0	49	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	7			3				93	52	3	75	52
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	7			3				93	52	3	75	52
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0
p0 queue free %	100			99				100	96	99	100	94
cM capacity (veh/h)	1614			1619				829	828	1080	874	828

Direction, Lane #	SE 1	NW 1	NE 1	SW 1
Volume Total	10	21	39	66
Volume Left	7	14	0	0
Volume Right	0	0	7	17
cSH	1614	1619	863	880
Volume to Capacity	0.00	0.01	0.05	0.07
Queue Length (ft)	0	1	4	6
Control Delay (s)	4.8	5.0	9.4	9.4
Lane LOS	A	A	A	A
Approach Delay (s)	4.8	5.0	9.4	9.4
Approach LOS			A	A

Intersection Summary			
Average Delay		8.4	
Intersection Capacity Utilization	15.3%		ICU Level of Service
			A

# Signal Warrant

# US 15-501 at Holly Ridge Road/Williams Corner Center Driveway

## TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

COUNT DATE: 3/22/2006

INTERSECTION NAME: US 15-501 at Holly Ridge Road/Williams Corner Center Driveway  
 INTERSECTION CONDITION: 2-way stop control

MAJOR STREET: US 15-501  
 MINOR STREET: Holly Ridge Road/Williams Corner Center Driveway

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N  
 65TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): Y

THRESHOLD VALUES	2004 MAJOR ST BOTH APPROACHES	HIGHEST HOUR MINOR ST HIGHEST APPROACH**	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant			WARRANT 2	WARRANT 3
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
06:00 AM TO 07:00 AM	805	16	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
07:00 AM TO 08:00 AM	1,176	117	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
08:00 AM TO 09:00 AM	1,213	54	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
09:00 AM TO 10:00 AM	1,036	23	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10:00 AM TO 11:00 AM	1,012	142	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
11:00 AM TO 12:00 PM	979	180	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12:00 PM TO 01:00 PM	1,063	182	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
01:00 PM TO 02:00 PM	955	167	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
02:00 PM TO 03:00 PM	1,097	172	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
03:00 PM TO 04:00 PM	1,337	210	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
04:00 PM TO 05:00 PM	1,350	232	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
05:00 PM TO 06:00 PM	1,463	234	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
06:00 PM TO 07:00 PM	1,099	185	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
07:00 PM TO 08:00 PM	729	121	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
08:00 PM TO 09:00 PM	569	105	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
09:00 PM TO 10:00 PM	427	72	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
TOTAL	15,256	2,228	12			12			12			11	10

\* Only existing traffic used for major street volumes  
 \*\* Existing left-turns at Polks Landing plus projected Polks Centre site traffic

WARRANT 1 – Eight-Hour Vehicular Volume Warrant

- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 – Four-Hour Vehicular Volume Warrant

WARRANT 3 – Peak Hour Warrant

H:\MS\2172001 Polks Centre\Signal\Signal\20051115\21 at Holly Ridge