

Traffic Impact Study  
Lexi Landing Subdivision  
on Cate Road  
Knox County, Tennessee

May 12, 2003



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## EXECUTIVE SUMMARY

This report summarizes a traffic impact study that was prepared for the proposed Lexi Landing subdivision, to be located on Cate Road in north central Knox County. The study did not identify significant traffic volume related impacts, but did identify several other issues which will require some action. These are listed and discussed below:

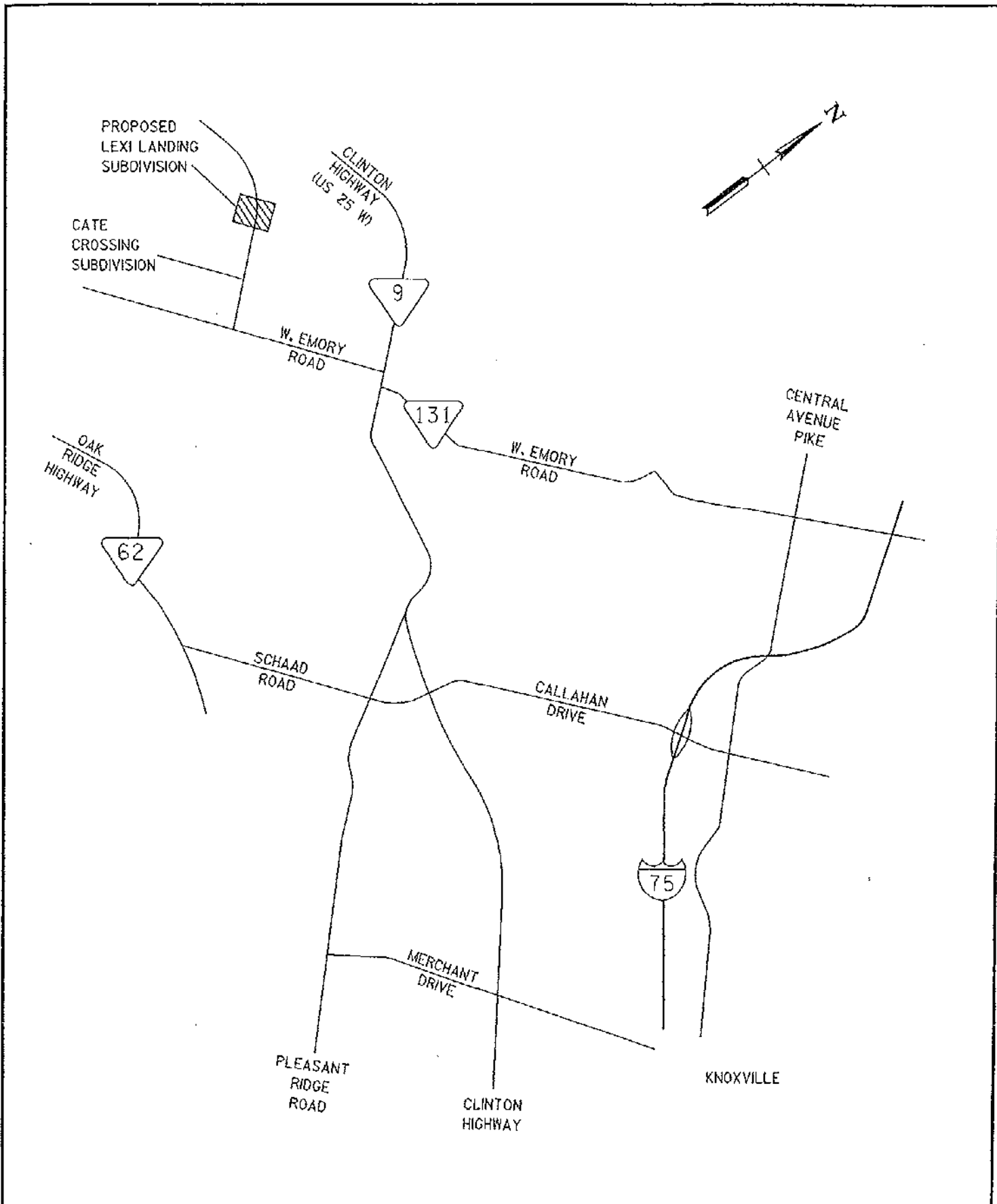
1. In accordance with Knox County requirements, the existing 16 foot Cate Road pavement will need to be widened to 18 feet, from the existing Cate Crossing subdivision entrance to the proposed entrance to Lexi Landing. This is a distance of approximately 0.45 miles. This widening is proposed for the Westside of the pavement, and KUB has agreed to relocate power poles to provide a clear zone safety buffer.
2. Trees and brush will need to be cut down or trimmed along Cate Road in order to provide adequate intersection sight distance at the proposed intersection of Cate Road and the Lexi Landing roadways. This is a special concern in the northwest corner of this intersection.
3. An existing curve ahead advance warning sign for northbound traffic will need to be relocated approximately 50 feet to the north to make room for the east leg of the proposed intersection.
4. The existing Cate Road vertical curve at the proposed intersection needs to be evaluated during the subdivision construction plans design phase to insure safe sight distance to opposing traffic for vehicles turning left from Cate Road into the subdivision.

## INTRODUCTION AND PURPOSE OF STUDY

This report provides a summary of the traffic impact study that was performed for the proposed Lexi Landing subdivision to be located on Cate Road in north central Knox County. The project site is located just west of Clinton Highway and north of Emory Road. It is adjacent to the Anderson County line, and in fact about 24 lots will be located in Anderson County. FIGURE 1 is a location map that identifies the project site in relation to the roadways in the vicinity of the proposed subdivision.

The concept plan for this project proposes a subdivision of 207 lots at full build-out, with 44 located to the west of Cate Road and 163 to the east. The subdivision entrance will be at a new four-leg intersection on Cate Road, with the west leg serving the 44 lots to the west and the east leg serving the 163 lots to the east. This proposed intersection will be located approximately 0.70 mile north of Emory Road. FIGURE 2 provides a detailed layout of the proposed subdivision as shown on the concept plan.

The purpose of this study was the evaluation of the traffic operational and safety impact of the proposed development upon the adjacent portion of Cate Road. Of particular interest was the proposed intersection of Cate Road with the subdivision main entrance roadways.



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**FIGURE 1**  
LOCATION MAP

**LEXI LANDING SUBDIVISION**  
TRAFFIC IMPACT STUDY



SCALE : 1" = 300'

ANDERSON CO.

KNOX CO.

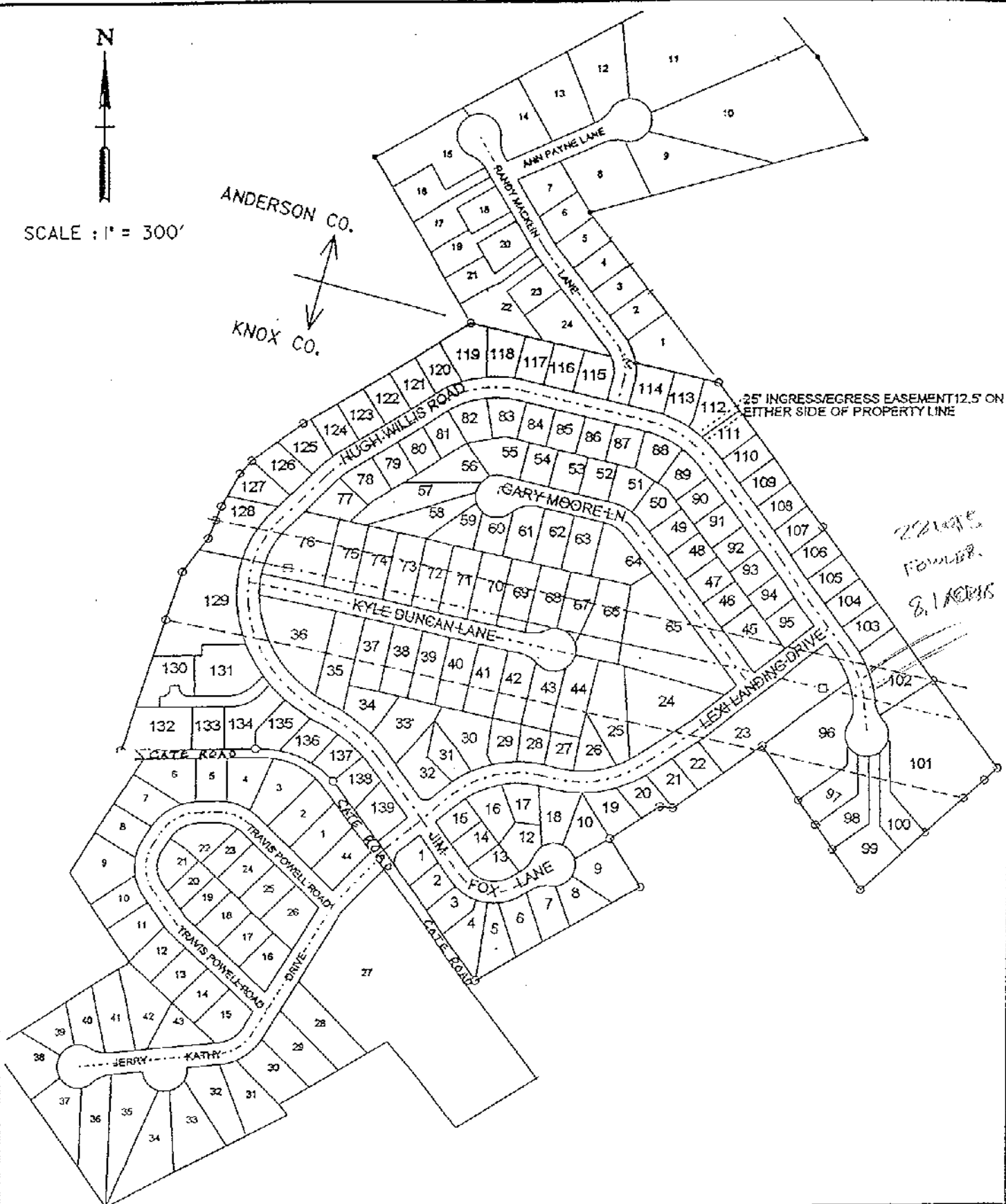


FIGURE 2  
SITE PLAN



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LEXI LANDING SUBDIVISION  
TRAFFIC IMPACT STUDY

## EXISTING CONDITIONS

### Existing Roadway Conditions

Cate Road, which is the road with the subdivision access intersection, is a two-lane roadway with a very narrow pavement width of approximately 16 feet. It is a Knox County maintained facility and is classified by the Metropolitan Planning Commission (MPC) as a local roadway, although as subdivisions are developed in this area, it is functioning more and more as a collector roadway. The posted speed limit is 30 MPH and the roadway is not striped for separate lanes due to its narrow width and low traffic volumes. Beginning at the next intersection to the south, Cate Road and Cate Crossing subdivision, the roadway has been widened all the way to Emory Road by the addition of 2 feet to the west side pavement.

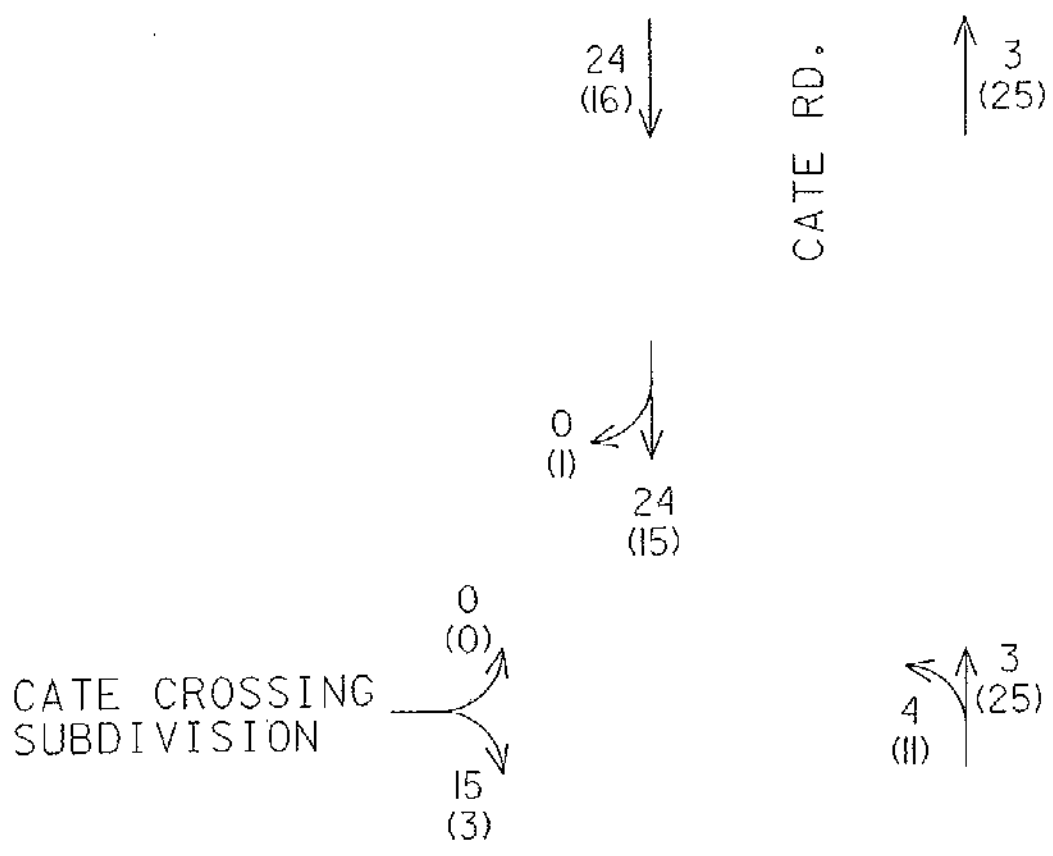
### Existing Traffic Data

No traffic count stations for collecting average daily traffic data (ADT) are located on Cate Road. However, a traffic count was conducted for this project at the next intersection to the south. This was the intersection of Cate Road with the new Cate Crossing Subdivision, which is currently under development. The raw data results of this A.M. and P.M. peak period traffic count are shown in the APPENDIX. The volumes from the north leg of this counted intersection were assumed as the existing-background traffic volumes for this study.

The aforementioned traffic counts were conducted for the peak 2 hours in the morning (7-9 A.M.) and the peak 2 hours in the afternoon (4-6 P.M.). The peak consecutive 1 hour volumes within these longer count periods were established, and are the analysis volumes used in this study. FIGURE 3 displays this Existing Background Traffic Data, which is the raw count data adjusted to an average weekday basis using adjustment factors developed by the University of Tennessee Transportation Research Center.

### Level of Service Evaluation

Intersection Capacity Analyses employing the methods of the Highway Capacity Manual (HCM 2000) were used to evaluate the proposed study intersection of Cate Road and the Lexi Landing access roadway. However, since this intersection will not exist until the subdivision is constructed, such analyses were not possible for existing conditions. It should be noted that due to the low existing traffic volumes, Cate Road almost certainly currently operates at a Level of Service "A". Please see the following section for an explanation and discussion of Level of Service concepts.



TOP NO. - A.M. PEAK HOUR (7:00 - 8:00 A.M.)  
(BOTTOM NO.) - P.M. PEAK HOUR (4:45 P.M. - 5:45 P.M.)

NOTE:  
THE DATA SHOWN ARE THE RAW TRAFFIC COUNT DATA  
TIMES A FACTOR TO ADJUST TO AN AVERAGE WEEKDAY  
VOLUME FROM COUNTS TAKEN IN MAY. SEE  
APPENDIX FOR RAW COUNT DATA AND FACTORS.  
(FACTORS DEVELOPED BY THE UNIVERSITY OF  
TENNESSEE TRANSPORTATION RESEARCH CENTER.)



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**FIGURE 3**  
EXISTING BACKGROUND TRAFFIC DATA

LEXI LANDING SUBDIVISION  
TRAFFIC IMPACT STUDY



Level of Service Concepts

In a general sense, a roadway is similar to a pipeline or other material carrying conduit in that it has a certain capacity for the amount of material (vehicles) that it can efficiently carry. As the number of vehicles in a given time period gradually increases, the quality of traffic flow gradually decreases. On roadway sections this results in increasing turbulence in the traffic stream, and at intersections it results in increasing stops and delay. As the volumes begin to approach the capacity of the facility, these problems rapidly magnify, with resulting serious levels of congestion, stops, delay, excess fuel consumption, pollutant emissions, etc.

The Federal Highway Administration has published the Year 2000 Highway Capacity Manual (HCM2000), which establishes theoretical techniques to quantify the capacity conditions on all types of roadways, intersections, ramps, pedestrian facilities, etc. A basic concept that is applicable to most of these techniques is the idea of level of service (LOS). This concept establishes a rating system that quantifies the quality of traffic flow, as perceived by motorists and/or passengers. The general system is similar to a school grade scale, and is outlined as follows:

Level of Service (LOS)	General Quality of Traffic Flow	Description of Corresponding Conditions
A	Excellent	Roadways – Free flow, high maneuverability Intersections – Very few stops, very low delay
B	Very Good	Roadways – Free flow, slightly lower maneuverability Intersections – Minor stops, low delay
C	Good	Roadways – Stable flow, restricted maneuverability Intersections – Significant stops, significant delay
D	Fair	Roadways – Marginally stable flow, congestion seriously restricts maneuverability Intersections – High stops, long but tolerable delay
E	Poor	Roadways – Unstable flow*, lower operating speeds, congestion severely restricts maneuverability Intersections – All vehicles stop, very long queues and very long intolerable delay
F	Very Poor	Roadways – Forced flow, stoppages may be lengthy, congestion severely restricts maneuverability Intersections – All vehicles stop, extensive queues and extremely long intolerable delay

\*Unstable flow is such that minor fluctuations or disruptions can result in rapid degradation to LOS F.

## PROPOSED CONDITIONS

### Background Traffic Growth

The anticipated time for full build-out of the Lexi Landing subdivision is 5 years. Therefore, year 2008 was established as the appropriate design/analysis year for this study. In order to determine traffic volumes resulting solely from background traffic growth to year 2008, it was necessary to establish an annual growth rate for existing traffic. The Knox County Department of Engineering and Public Works was consulted on the matter, and it was determined that growth rates are typically 2 to 6 percent for locations such as this. With the existing volumes very low, and thus the potential for higher rates given only a few new residential units, the 6 percent growth rate was assumed. FIGURE 4 contains the background traffic volumes that would result from a 6 percent growth from year 2003 to 2008.

### Trip Generation

In order to estimate the expected traffic volumes to be generated by full build-out of the proposed Lexi Landing subdivision, the data and procedures of *Trip Generation, Sixth Edition* (Institute of Transportation Engineers, 1997) were utilized. The generated traffic volumes were determined based on the total weekday morning, and evening peak hour of adjacent street traffic regression equations for single-family detached housing development (Land Use Code 210, Volume 1, pages 263 to 265). As noted earlier in this report, the anticipated number of units upon full build-out is 44 on the west side of Catc Road and 163 on the east side, which was used to determine the number of new trips generated. TABLES 1 and 2 summarize the number and directional split of entering and exiting trips for peak periods.



CATE RD.

LEXI  
LANDING  
WEST

LEXI  
LANDING  
EAST

32  
(21)

4  
(34)

VOLUME  
LEGEND  
AM  
(PM)



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**FIGURE 4**  
PEAK HOUR TRAFFIC VOLUMES  
BACKGROUND TRAFFIC - YEAR 2008

LEXI LANDING SUBDIVISION  
TRAFFIC IMPACT STUDY

TABLE 1					
TRIP GENERATION SUMMARY – WESTSIDE					
WESTSIDE SECTION OF SUBDIVISION – 44 LOTS					
	Total New Trips	% Entering	% Exiting	Number Entering	Number Exiting
Weekday	487	50%	50%	244	244
A.M. Peak	40	25%	75%	10	30
P.M. Peak	51	64%	36%	33	18

TABLE 2					
TRIP GENERATION SUMMARY – EASTSIDE					
EASTSIDE SECTION OF SUBDIVISION – 163 LOTS					
	Total New Trips	% Entering	% Exiting	Number Entering	Number Exiting
Weekday	1625	50%	50%	813	813
A.M. Peak	124	25%	75%	31	93
P.M. Peak	167	64%	36%	107	60

### Trip Distribution

As mentioned previously, all Lexi Landing subdivision traffic will use the two proposed access roadways forming the new intersection on Cate Road as their means of access to the area street system. FIGURE 5 provides a summary of the trip generation patterns developed for this intersection, which were based on the existing patterns at the nearby (0.45 mile south) intersection of Cate Road and the Cate Crossing subdivision. Because these intersections will be in close proximity and along the same roadway, it was assumed that their trip distribution patterns would be very similar. In addition, FIGURE 5 also provides the generated traffic volumes as assigned to the local roadway network in accordance with these patterns. FIGURE 6 shows the combined year 2005 volumes reflecting the existing traffic, the background traffic growth, and the newly generated traffic from Lexi Landing subdivision at full build-out. These are the volumes used in the analysis of full build-out conditions.

( 3% OF TRIPS ORIENTED NORTH )



CATE ROAD

0 (1)      1 (3)

LEXI LANDING WEST

LEXI LANDING EAST

GENERATED TRIPS WEST SIDE		
	ENTER	EXIT
AM	10	30
PM	33	18

GENERATED TRIPS EAST SIDE		
	ENTER	EXIT
AM	31	93
PM	107	60

10 (32)      30 (104)

( 97% OF TRIPS ORIENTED SOUTH )

VOLUME LEGEND

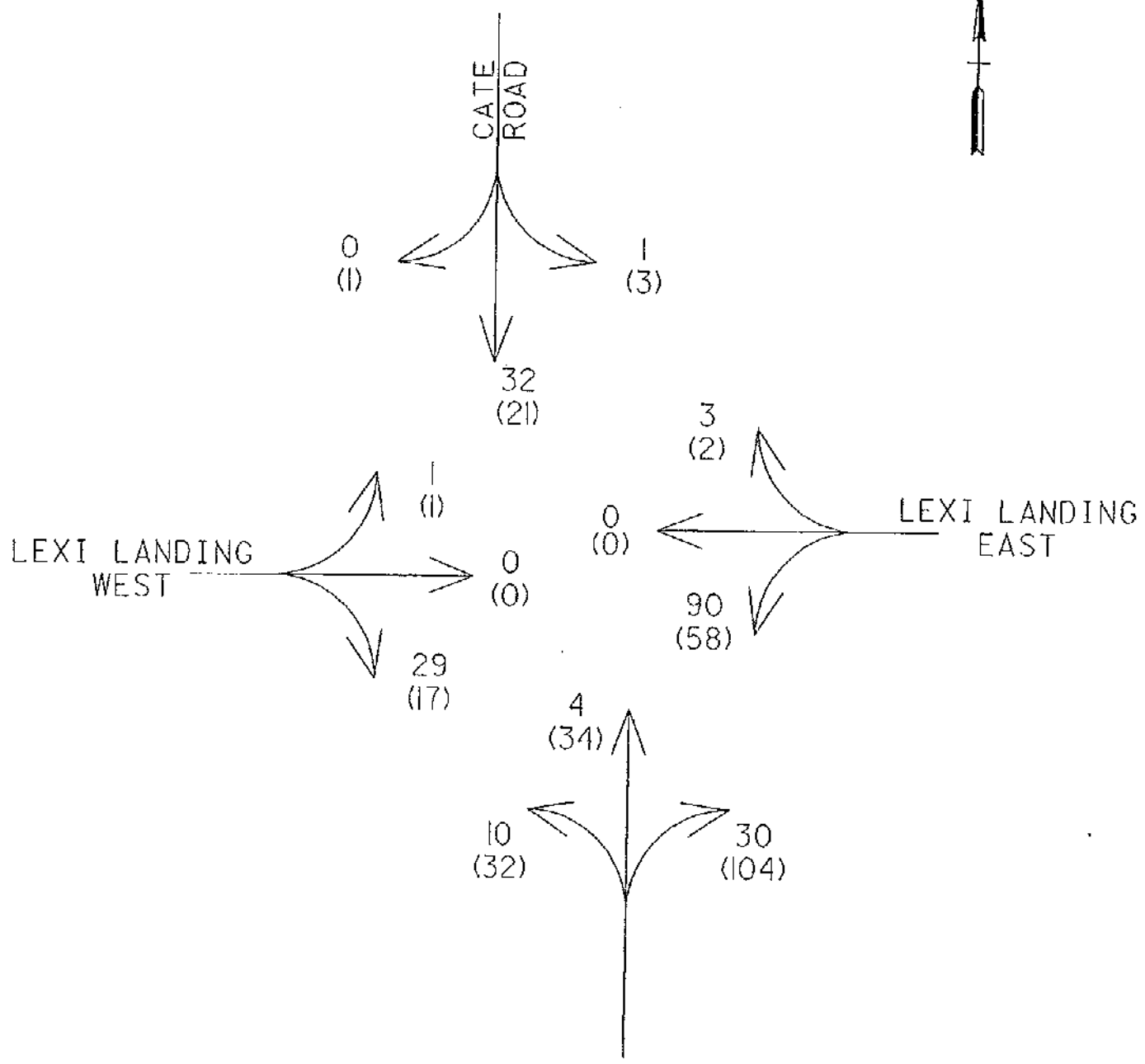
AM  
(PM)



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**FIGURE 5**  
TRIP DISTRIBUTION PATTERNS AND ASSIGNMENT OF GENERATED TRAFFIC

LEXI LANDING SUBDIVISION  
TRAFFIC IMPACT STUDY



VOLUME  
LEGEND  
AM  
(PM)

NOTE: VOLUMES SHOWN ARE  
PROJECTED FULL BUILD-OUT  
VOLUMES FOR YEAR 2008.



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**FIGURE 6**  
COMBINED VOLUMES FOR ANALYSIS

LEXI LANDING SUBDIVISION  
TRAFFIC IMPACT STUDY

### Proposed Level-of-Service

Unsignalized intersection capacity analyses were conducted utilizing the combined traffic volumes of FIGURE 6, at the proposed intersection of Cate Road and the Lexi Landing Subdivision access roadways. The results indicate that all traffic movements are expected to operate at level-of-service "A", except for the westbound approach during the P.M. peak hour, which is expected to operate at level-of-service "B". These results are summarized on the "Two-Way Stop Control Summary" printouts contained in the APPENDIX.

### Intersection Sight Distance and Other Issues

A field review was conducted to identify any sight distance problems, geometric problems or other issues of concern that could impact the proposed subdivision. The results of this review are summarized below:

#### 1) Sight Distance for Vehicles Exiting the Proposed Subdivision:

Looking left (south) from a STOP position on the westbound (eastside) subdivision roadway, the sight distance is approximately 750 feet. Looking right (north) from the same STOP position, the sight distance is approximately 315 feet.

Looking left (north) from a STOP position on the eastbound (westside) subdivision roadway, the sight distance is approximately 220 feet. Looking right (south) from the same STOP position, the sight distance is approximately 750 feet.

The posted speed limit on Cate Road is 30 mph. However, when establishing the required sight distance, it is good practice to consider higher speeds where appropriate. Therefore, it is recommended that sight distance be provided for 40 mph (400 feet) looking south. Looking north, there is a sharp curve about 220 feet from the intersection, which tends to reduce approach speeds. Therefore, it is recommended that sight distance be provided for 30 mph (300 feet) looking north.

Based on the above information, there is an existing sight distance problem looking north. However, the source of the restricted sight distance is trees and brush located on the westside subdivision property. Therefore, the cutting down and trimming of these trees and brush will provide the required sight distance

#### 2) Sight Distance for Vehicles Entering the Proposed Subdivision:

The proposed subdivision intersection is to be located at the high-point of an abrupt vertical curve. Although this location is good for the sight distance exiting the subdivision, it may create potential sight restrictions for traffic entering the subdivision. Specifically, vehicles making left turns to enter



the subdivision, especially northbound, may not see oncoming traffic in the dips preceding the crest. Further evaluation of the severity of this concern, and possible remedial measures, should be evaluated in the project design phase.

3) Auxiliary Lanes for Proposed Subdivision Intersection:

Left and right turn lane warrant analyses were conducted for the proposed subdivision intersection. These analyses employed Tables 4A and 4B from the *Knox County Access Control and Driveway Design Policy* (Knox County Department of Engineering and Public Works, March 1998). The results were that the anticipated traffic volumes are not sufficient to satisfy the minimum requirements to even use these tables. Therefore, auxiliary turn lanes are not warranted. Copies of Tables 4A and 4B are located in the APPENDIX for review.

4) Widening of Cate Road to a Minimum Width:

As indicated earlier in this report, Cate Road is approximately 16 feet wide, which is less than the 18 feet minimum width required by Knox County. Therefore, the developer will be required by Knox County to widen Cate Road from the Cate Crossing subdivision entrance to the proposed Lexi Landing intersection, a distance of approximately 0.45 miles. This widening will take place on the west side of existing pavement. This will require a setting-back of the power poles that exist, along a portion of this proposed widening, in order to provide an adequate "clear-zone" safety factor. This has been discussed with the Knoxville Utilities Board, who has agreed to set-back these poles when they upgrade their facilities along Cate Road to serve the proposed subdivision.

5) Adequacy of Internal Subdivision Roadways on Eastside:

Some concern was expressed by the Knox County Engineering and Public Works staff as to the adequacy of a single access point for the eastside portion of the subdivision, which is planned for 163 lots. While this is a large number of units to be served by one access point, the internal subdivision is laid out into essentially a loop. This will help distribute and divide volumes as they enter the subdivision. The only section of roadway carrying all the traffic is the short block immediately inside the subdivision, as shown on FIGURE 2. With the intersection capacity results being as good as they are, significant problems with a single access point are not anticipated.

## CONCLUSIONS AND RECOMMENDATIONS

It is the primary conclusion of this traffic impact study that no significant traffic volume related impact will result from the development of the Lexi Landing subdivision. However, several other issues were identified which will require some action. These are listed and discussed below:

1. In accordance with Knox County requirements, the existing 16 foot Cate Road pavement will need to be widened to 18 feet, from the existing Cate Crossing subdivision entrance to the proposed entrance to Lexi Landing. This is a distance of approximately 0.45 miles. This widening is proposed for the Westside of the pavement, and KUB has agreed to relocate power poles to provide a clear zone safety buffer.
2. Trees and brush will need to be cut down or trimmed along Cate Road in order to provide adequate intersection sight distance at the proposed intersection of Cate Road and Lexi Landing. This is a special concern in the northwest corner of this intersection.
3. An existing curve ahead advance warning sign for northbound traffic will need to be relocated approximately 50 feet to the north to make room for the east leg of the proposed intersection.
4. The existing Cate Road vertical curve at the proposed intersection needs to be evaluated during the subdivision construction plans design phase to insure safe sight distance to opposing traffic for vehicles turning left from Cate Road into the subdivision.

APPENDIX

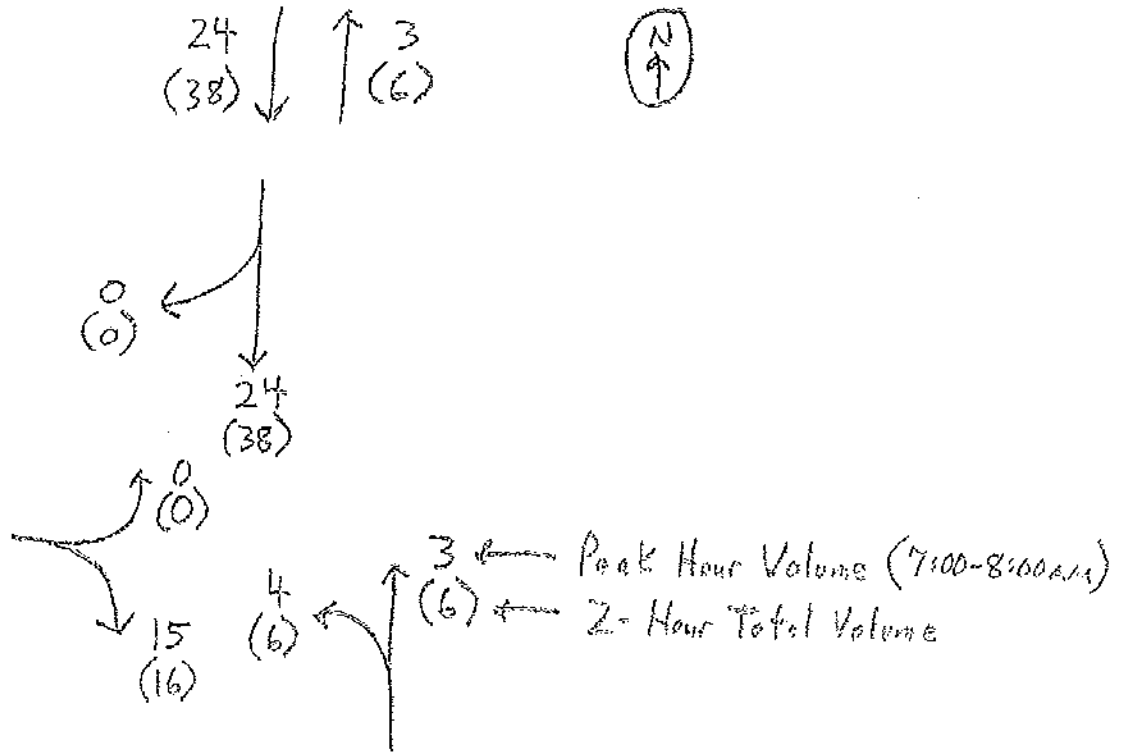
# AM Peak Traffic Count

File Name : untitled1  
 Site Code : 00000000  
 Start Date : 05/07/2003  
 Page No : 1

Groups Printed- Group 1

Start Time	CATE ROAD From North				From East				CATE ROAD From South				CATE CROSSING From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	4	0	0	0	0	0	0	0	2	1	0	4	0	0	0	11
07:15 AM	0	8	0	0	0	0	0	0	0	1	0	0	7	0	0	0	16
07:30 AM	0	5	0	0	0	0	0	0	0	0	1	0	1	0	0	0	7
07:45 AM	0	7	0	0	0	0	0	0	0	0	2	0	3	0	0	0	12
<b>Total</b>	<b>0</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>46</b>
08:00 AM	0	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5
08:15 AM	0	4	0	0	0	0	0	0	0	0	1	0	1	0	0	0	6
08:30 AM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5
08:45 AM	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4
<b>Total</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>
<b>Grand Total</b>	<b>0</b>	<b>38</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>66</b>
Apprch %	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	100.0	0.0	0.0	0.0	
Total %	0.0	57.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	9.1	0.0	24.2	0.0	0.0	0.0	

Peak Hour



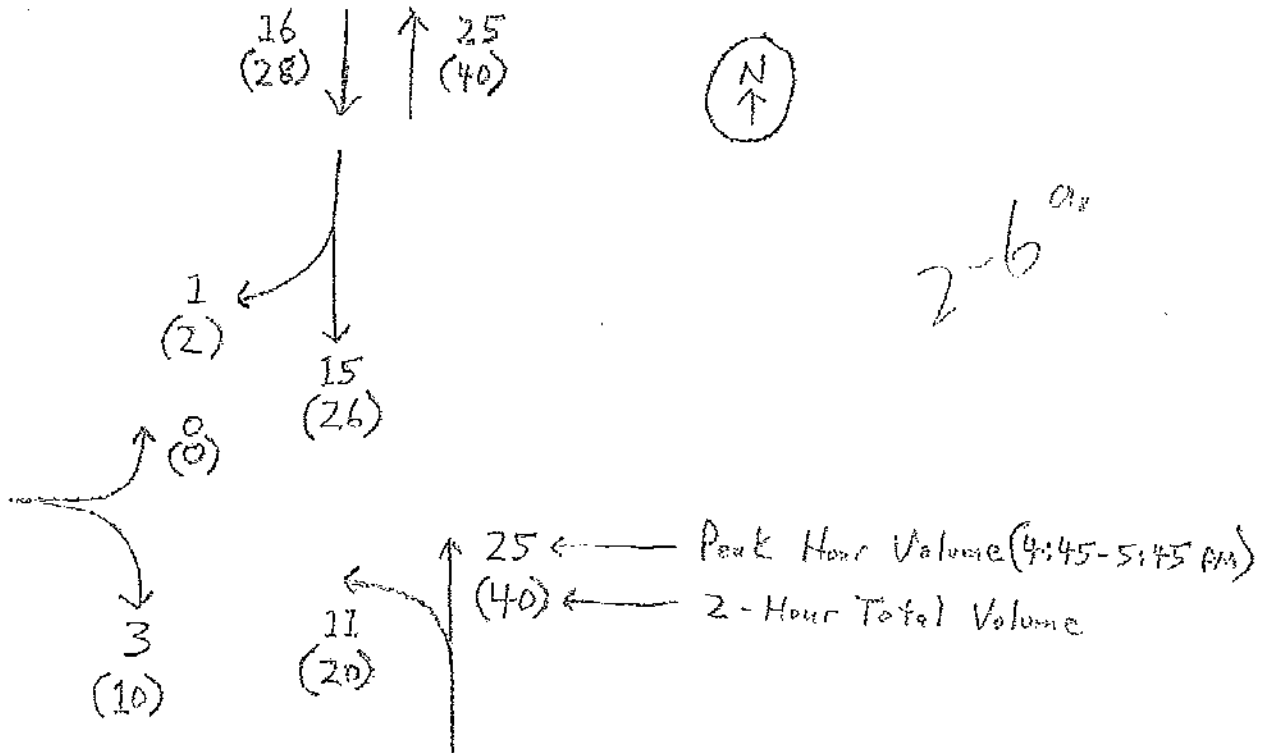
# PM Peak Traffic Count

File Name : untitled2  
 Site Code : 00000000  
 Start Date : 05/06/2003  
 Page No : 1

Groups Printed - Group 1

Start Time	CATE ROAD From North				From East				CATE ROAD From South				CATE CROSSING From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	0	3	0	0	0	0	0	0	0	6	1	0	0	0	0	0	10
04:15 PM	1	4	0	0	0	0	0	0	0	3	4	0	1	0	0	0	13
04:30 PM	0	2	0	0	0	0	0	0	0	2	2	0	6	0	0	0	12
04:45 PM	0	4	0	0	0	0	0	0	0	9	2	0	0	0	0	0	15
<b>Total</b>	<b>1</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>9</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>
05:00 PM	0	4	0	0	0	0	0	0	0	4	2	0	1	0	0	0	11
05:15 PM	0	4	0	0	0	0	0	0	0	6	5	0	1	0	0	0	16
05:30 PM	1	3	0	0	0	0	0	0	0	6	2	0	1	0	0	0	13
05:45 PM	0	2	0	0	0	0	0	0	0	4	2	0	0	0	0	0	8
<b>Total</b>	<b>1</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>11</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>48</b>
Grand Total	2	26	0	0	0	0	0	0	0	40	20	0	10	0	0	0	98
Approch %	7.1	92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	33.3	0.0	100.0	0.0	0.0	0.0	
Total %	2.0	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.8	20.4	0.0	10.2	0.0	0.0	0.0	

Peak  
hour  
4:45  
to  
5:45  
55 veh.



**TRAFFIC VOLUME ADJUSTMENT FACTORS TO BE USED WITH "TRAFFIC SIGNAL WARRANT ANALYSIS - VOLUME WARRANTS"**  
 Prepared and Distributed by the Tennessee Transportation Assistance Program

**TABLE A**  
 Monthly/Day of Week Urban Area Adjustment Factors<sup>1</sup> - Average Day  
 (Multiply actual count by given factor to obtain estimated average day volumes for a similar time period<sup>1</sup>)

	January	February	March	April	May	June	July	August	September	October	November	December
Sunday	1.60	1.49	1.40	1.37	1.34	1.25	1.30	1.32	1.35	1.36	1.37	1.48
Monday	1.04	1.00	0.97	0.94	0.93	0.91	0.92	0.93	0.94	0.96	0.96	1.03
Tuesday	1.00	0.99	0.95	0.94	0.93	0.91	0.91	0.92	0.93	0.94	0.96	0.97
Wednesday	1.01	0.99	0.95	0.92	0.92	0.90	0.91	0.92	0.93	0.94	0.95	0.94
Thursday	0.99	0.97	0.93	0.90	0.89	0.89	0.89	0.90	0.90	0.92	0.93	0.93
Friday	0.91	0.89	0.87	0.85	0.83	0.81	0.84	0.83	0.83	0.86	0.92	0.86
Saturday	1.22	1.15	1.08	1.11	1.10	1.04	1.03	1.07	1.11	1.11	1.16	1.15

**TABLE B**  
 Monthly/Day of Week Urban Area Adjustment Factors<sup>2</sup> - Average Weekday  
 (Multiply actual count by given factor to obtain estimated average weekday volumes for a similar time period<sup>1</sup>)

	January	February	March	April	May	June	July	August	September	October	November	December
Monday	1.13	1.08	1.05	1.02	1.01	0.99	1.00	1.01	1.02	1.06	1.06	1.12
Tuesday	1.08	1.07	1.03	1.02	1.01	0.99	0.99	1.00	1.01	1.02	1.04	1.05
Wednesday	1.09	1.07	1.03	1.00	1.00	0.98	0.98	1.00	1.01	1.02	1.03	1.02
Thursday	1.07	1.05	1.01	0.98	0.96	0.95	0.96	0.96	0.98	1.00	1.01	1.04
Friday	0.99	0.96	0.94	0.92	0.90	0.88	0.91	0.90	0.90	0.93	1.00	0.93

**TABLE C**  
 Monthly/Day of Week Urban Area Adjustment Factors<sup>3</sup> - Average Friday  
 (Multiply actual count by given factor to obtain estimated average Friday volumes for a similar time period<sup>1</sup>)

	January	February	March	April	May	June	July	August	September	October	November	December
Monday	1.21	1.17	1.13	1.10	1.09	1.06	1.07	1.09	1.10	1.14	1.14	1.20
Tuesday	1.17	1.16	1.11	1.10	1.09	1.05	1.06	1.07	1.09	1.10	1.12	1.13
Wednesday	1.18	1.16	1.11	1.07	1.07	1.05	1.05	1.07	1.09	1.10	1.11	1.10
Thursday	1.16	1.13	1.09	1.05	1.04	1.03	1.04	1.05	1.05	1.07	1.09	1.09
Friday	1.06	1.04	1.02	0.99	0.97	0.95	0.99	0.97	0.97	1.00	1.07	1.00

Notes: 1. "Traffic Signal Warrant Analysis - Volume Warrants" is a Lotus<sup>®</sup> 1-2-3<sup>™</sup> template distributed by the Tennessee Transportation Assistance Program (TTAP).  
 2. Factors should be applied to State highway and major street volumes only. They should not be applied to volumes on driveways (shopping centers, etc.) or minor streets.  
 3. Counts made on holidays should not be used as a basis for estimating average day, average weekday or average Friday volumes.

Source: TABLE A - Tennessee Department of Transportation (based on 1988 through 1992 data);  
 TABLES B & C - Developed by T. Dacy Sullivan, P.E. based on TABLE A data

**TWO-WAY STOP CONTROL SUMMARY**

<b>General Information</b>		<b>Site Information</b>	
Analyst	Chris Kirby	Intersection	Cate Rd & Lexi Landing
Agency/Co.	CCI	Jurisdiction	Knox County
Date Performed	05/09/2003	Analysis Year	2008
Analysis Time Period	AM Peak		

Project Description	Combined Volumes
East/West Street	Lexi Landing
North/South Street	Cate Rd
Intersection Orientation	North-South
Study Period (hrs)	0.25

**Vehicle Volumes and Adjustments**

Major Street	Northbound			Southbound		
	1	2	3	4	5	6
Movement	L	T	R	L	T	R
Volume	10	4	30	1	32	0
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Hourly Flow Rate, HFR	12	4	37	1	39	0
Percent Heavy Vehicles	3	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
	7	8	9	10	11	12
Movement	L	T	R	L	T	R
Volume	90	0	3	1	0	29
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Hourly Flow Rate, HFR	112	0	3	1	0	36
Percent Heavy Vehicles	3	3	3	3	3	3
Percent Grade (%)	0					
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

<b>Delay, Queue Length, and Level of Service</b>						
--	--	--	--	--	--	--

Approach	NB	SB	Westbound			Eastbound		
			7	8	9	10	11	12
Movement	1	4				10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	12	1		115			37	
C (m) (vph)	1565	1562		841			1025	
v/c	0.01	0.00		0.14			0.04	
95% queue length	0.02	0.00		0.47			0.11	
Control Delay	7.3	7.3		10.0-			8.6	
LOS	A	A		A			A	
Approach Delay	--	--		10.0-			8.6	
Approach LOS	--	--		A			A	

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**TWO-WAY STOP CONTROL SUMMARY**

<b>General Information</b>		<b>Site Information</b>	
Analyst	Chris Kirby	Intersection	Cate Rd & Lexi Landing
Agency/Co.	CCI	Jurisdiction	Knox County
Date Performed	05/09/2003	Analysis Year	2008
Analysis Time Period	PM Peak		

Project Description	Combined Volumes
East/West Street	Lexi Landing
North/South Street	Cate Rd
Intersection Orientation	North-South
Study Period (hrs)	0.25

**Vehicle Volumes and Adjustments**

Major Street	Northbound			Southbound		
	1	2	3	4	5	6
Movement	L	T	R	L	T	R
Volume	32	34	104	3	21	1
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Hourly Flow Rate, HFR	39	42	129	3	26	1
Percent Heavy Vehicles	3	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
	7	8	9	10	11	12
Movement	L	T	R	L	T	R
Volume	58	0	2	1	0	17
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Hourly Flow Rate, HFR	72	0	2	1	0	21
Percent Heavy Vehicles	3	3	3	3	3	3
Percent Grade (%)	0					
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	39	3		74			22	
C (m) (vph)	1580	1400		700			1026	
v/c	0.02	0.00		0.11			0.02	
95% queue length	0.08	0.01		0.35			0.07	
Control Delay	7.3	7.6		10.7			8.6	
LOS	A	A		B			A	
Approach Delay	--	--		10.7			8.6	
Approach LOS	--	--		B			A	

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TABLE 4A

LEFT-TURN LANE VOLUME THRESHOLDS  
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

(If the left-turn volume exceeds the table value a left -turn lane is needed)

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	100 - 149	150 - 199	200 - 249	250 - 299	300 - 349	350 - 399
100 - 149	300	235	185	145	120	100
150 - 199	245	200	160	130	110	90
200 - 249	205	170	140	115	100	80
250 - 299	175	150	125	105	90	70
300 - 349	155	135	110	95	80	65
350 - 399	135	120	100	85	70	60
400 - 449	120	105	90	75	65	55
450 - 499	105	90	80	70	60	50
500 - 549	95	80	70	65	55	50
550 - 599	85	70	65	60	50	45
600 - 649	75	65	60	55	45	40
650 - 699	70	60	55	50	40	35
700 - 749	65	55	50	45	35	30
750 or More	60	50	45	40	35	30

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149	100	80	70	60	55	50
150 - 199	90	75	65	55	50	45
200 - 249	80	72	60	55	50	45
250 - 299	70	65	55	50	45	40
300 - 349	65	60	50	50	45	40
350 - 399	60	55	50	45	40	40
400 - 449	55	50	45	45	40	35
450 - 499	50	45	45	40	35	35
500 - 549	50	45	40	40	35	35
550 - 599	45	40	40	35	35	35
600 - 649	40	35	35	35	35	30
650 - 699	35	35	35	30	30	30
700 - 749	30	30	30	30	30	30
750 or More	30	30	30	30	30	30

\* Or through volume only if a right-turn lane exists.

**TABLE 4B**  
**RIGHT-TURN LANE VOLUME THRESHOLDS**  
**FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS**

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299						Yes
300 - 349 350 - 399				Yes	Yes Yes	Yes Yes
400 - 449 450 - 499			Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599		Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99					Yes	Yes Yes
100 - 149 150 - 199			Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

\* Or through volume only if a left-turn lane exists.