Traffic Impact Study

Briar Towne Subdivision
Knoxville, Tennessee

CCI Project File No. 00801-0000

January 7, 2008

Prepared for:

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EXECUTIVE SUMMARY

This report provides a summary of the traffic impact study that was performed for a proposed residential development to be located off Asheville Highway (US 11E / SR 9) in East Knox County. The project site lies approximately one-half mile west of Brakebill Road.

The current plans for this proposed subdivision development provide for a maximum of 115 single family residential dwelling units at full build-out. The development entrance will be a new three-leg intersection on Asheville Highway located approximately one-half mile west of Brakebill Road.

The purpose of this study was the evaluation of the traffic operational and safety impact of the proposed development upon the adjacent portion of Asheville Highway. Of particular interest was the intersection of the site entrance roadway with Asheville Highway, regarding intersection capacity, sight distance and turn lane geometry. In addition, the adjacent intersection of Asheville Highway and Brakebill Road was of interest regarding intersection capacity. This evaluation was performed assuming full build-out of all units of the subdivision, with existing and background growth conditions also evaluated for purposes of comparison.

A primary conclusion of this study is that traffic generated by the proposed development will result in acceptable impacts on traffic operational conditions in the project area. Additional conclusions were that intersection corner sight distance will be adequately provided at the proposed development entrance intersection, and that the construction of some turn lanes will be warranted at this intersection. The following summarizes these turn lane recommendations:

1) Construct a westbound seventy-five foot left-turn storage lane with appropriate length bay taper in the Asheville Highway median.

2) Construct an eastbound seventy-five foot right-turn storage lane with appropriate length bay taper.

3) Construct separate northbound left and right turn lanes, with minimum storage length of 75 feet, exiting the proposed development.

INTRODUCTION AND PURPOSE OF STUDY

This report provides a summary of the traffic impact study that was performed for a proposed residential development to be located off Asheville Highway (US 11E / SR 9) in East Knox County. The project site lies approximately one-half mile west of Brakebill Road. FIGURE 1 is a location map that identifies the project site in relation to the roadways in the vicinity of the proposed development.

The current plans for this proposed subdivision development provide for a maximum of 115 single family residential dwelling units at full build-out. FIGURE 2 is a copy of the concept plan for this project. The development entrance will be a new three-leg intersection on Asheville Highway located approximately one-half mile west of Brakebill Road.

The purpose of this study was the evaluation of the traffic operational and safety impact of the proposed development upon the adjacent portion of Asheville Highway. Of particular interest was the intersection of the site entrance roadway with Asheville Highway, regarding intersection capacity, site distance and turn lane geometry. In addition, the adjacent intersection of Asheville Highway and Brakebill Road was of interest regarding intersection capacity. This evaluation was performed assuming full build-out of all units of the subdivision, with existing and background growth conditions also evaluated for purposes of comparison.

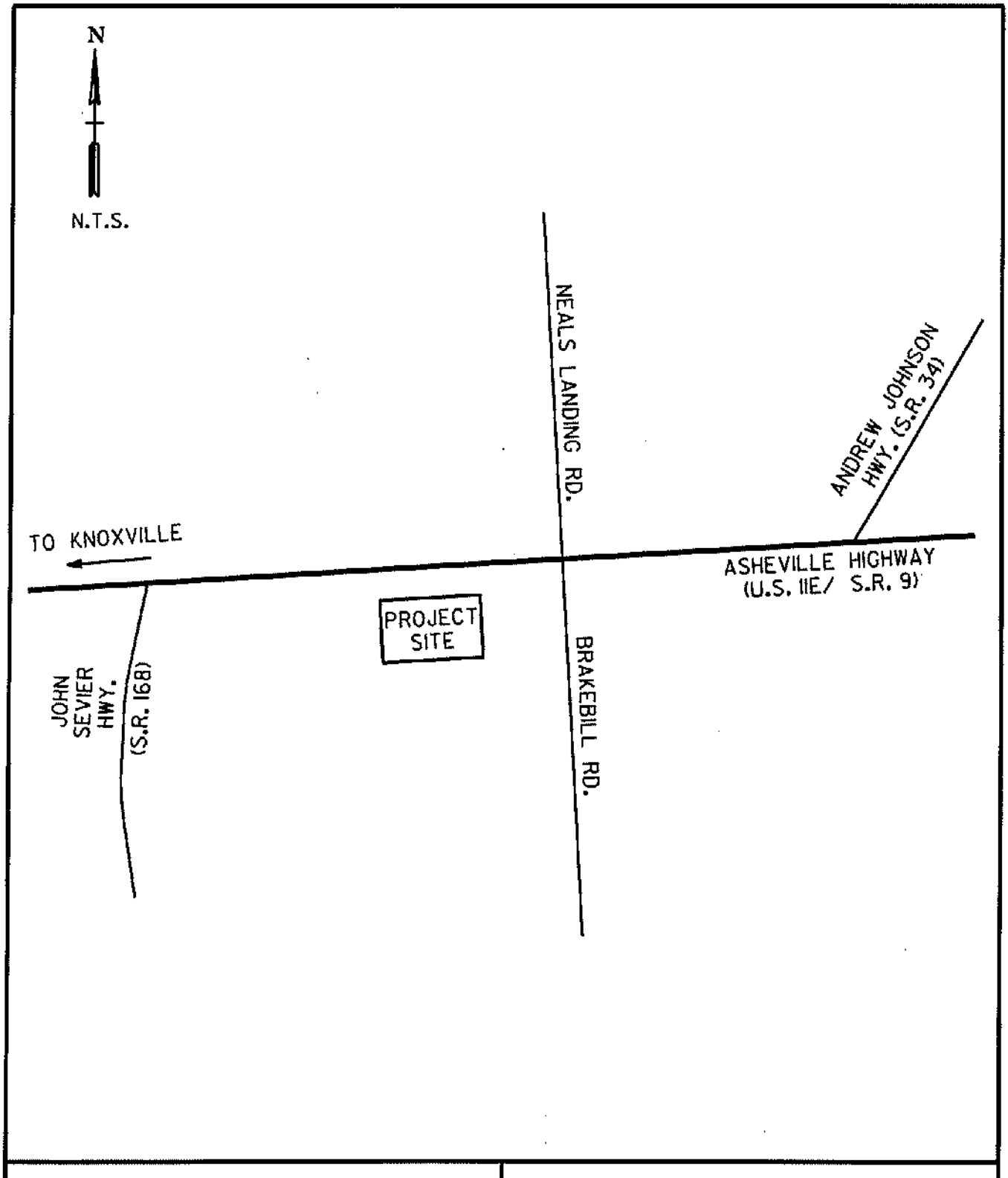

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FIGURE 1
PROJECT LOCATION MAP

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY

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N.T.S.

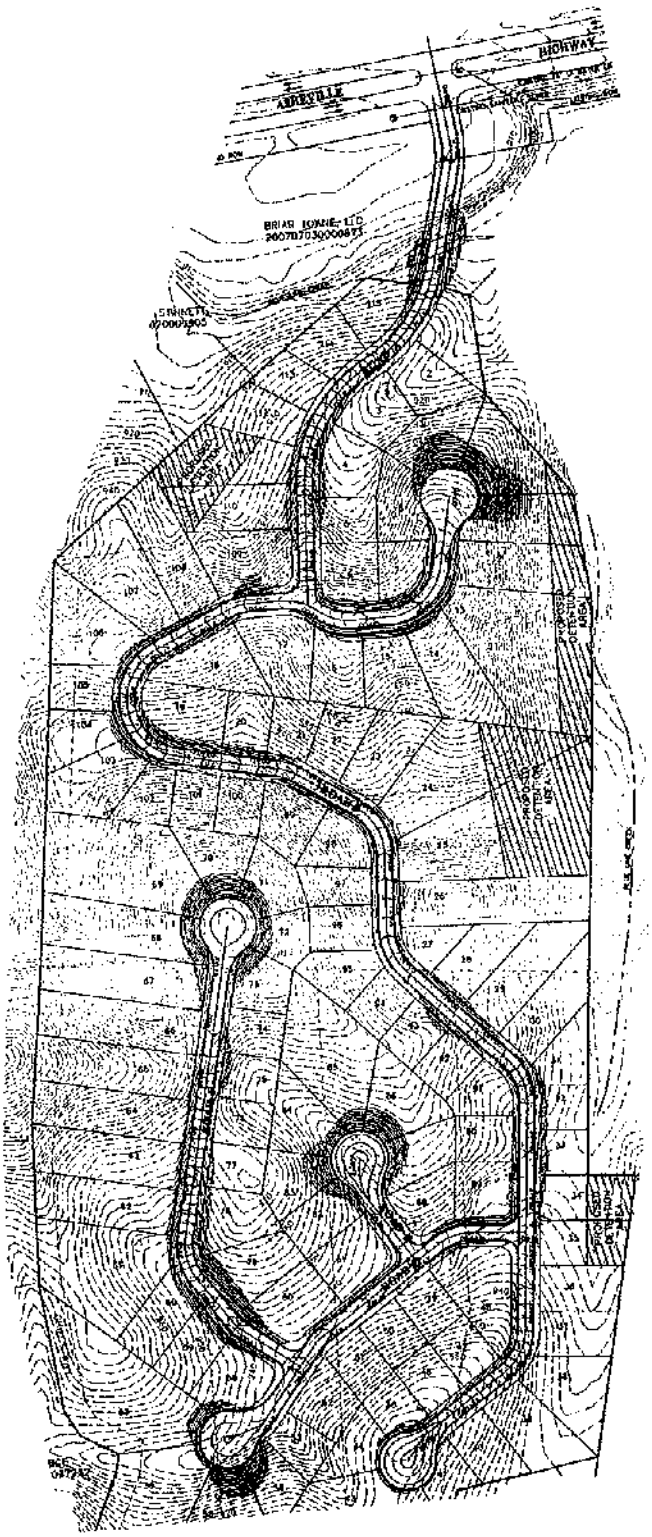

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FIGURE 2
SITE DEVELOPMENT PLAN

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY

Existing Roadway Conditions

Asheville Highway (US 11E / SR 9) is a multi-lane Arterial state highway that is maintained by the Tennessee Department of Transportation (TDOT). The roadway consists of a four-lane divided section with two travel lanes and paved shoulders in each direction separated by a grass median. The speed limit is currently posted as 55 mph.

Existing Traffic Data

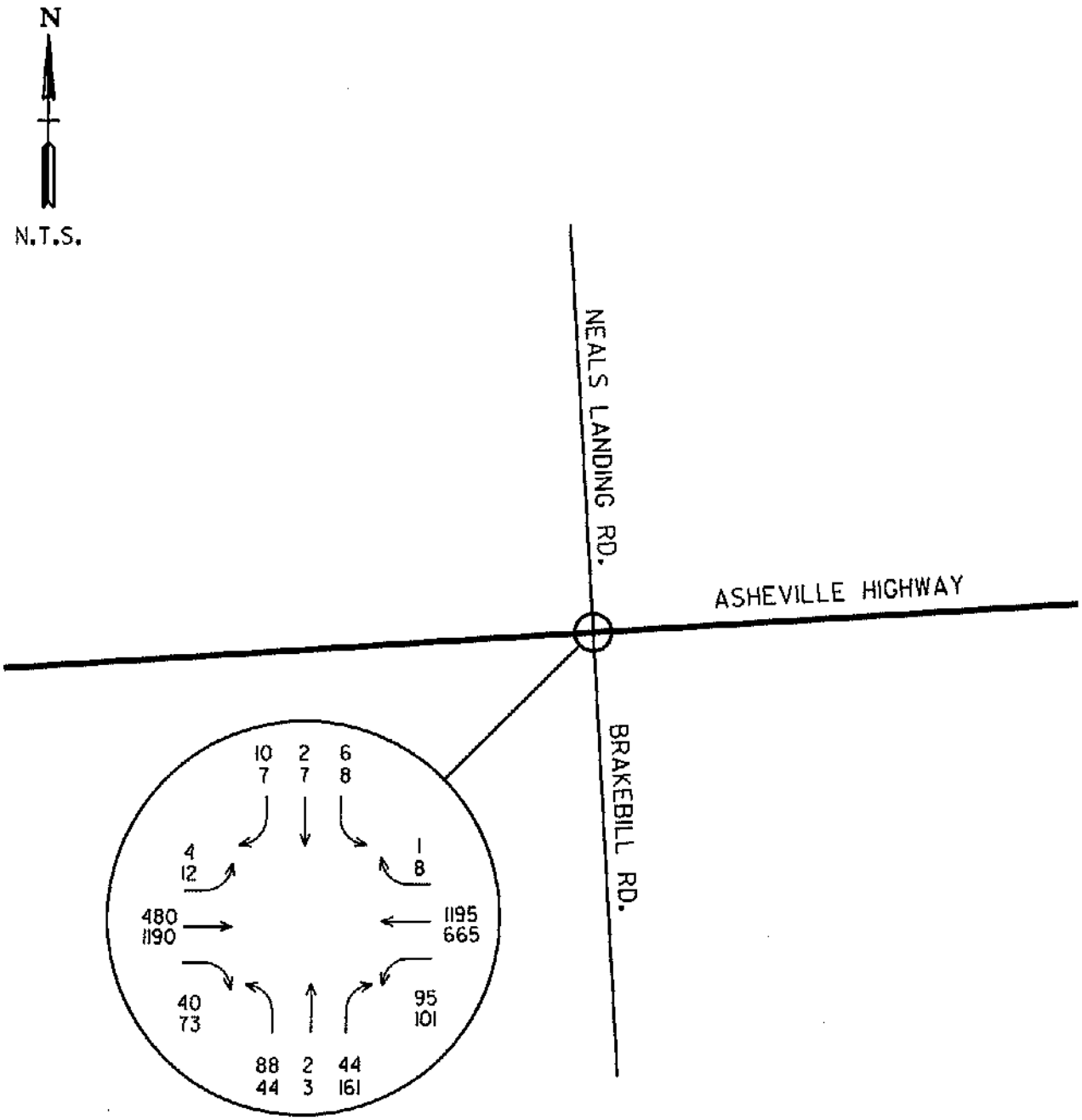
Two traffic count stations for collecting average daily traffic data (ADT) are located on Asheville Highway near the project area. The most recent data from these stations was provided by the Tennessee Department of Transportation, with resulting ADTs shown in TABLE 1.

TABLE 1
AVERAGE DAILY TRAFFIC COUNT SUMMARY

Count Year	ASHEVILLE HIGHWAY EAST OF I-40 (TDOT STA. 385)	ASHEVILLE HIGHWAY EAST OF BRAKEBILL (TDOT STA. 58)
2007	36193	22162
2006	34847	23452
2005	39355	23997
2004	35975	24672

In order to collect more refined data, and to establish a basis for trip distribution patterns, turning movement traffic counts were collected at the existing signalized intersection of Asheville Highway and Brakebill Road on December 18, 2007. These counts were conducted during the A.M. and P.M. peak traffic hours. Raw data count summaries are contained in the APPENDIX.

In addition to helping establish trip distribution patterns, these turning movement counts were used to establish the existing traffic volumes for this study, as displayed on FIGURE 3. These volumes are the count data adjusted to an average weekday basis using adjustment factors developed by the University of Tennessee Transportation Research Center (See APPENDIX). The year 2008 is considered the base year for this study. Since the intersection turning movement counts were conducted during the latter part of December 2007 they will be used as the 2008 existing volumes.



VOLUME LEGEND

TOP NUMBER - AM PEAK HOUR (7:15 - 8:15 A.M.)
BOTTOM NUMBER - PM PEAK HOUR (5:00 - 6:00 P.M.)

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

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FIGURE 3
EXISTING TRAFFIC VOLUMES (2008)

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY

Existing Level-of-Service Evaluation

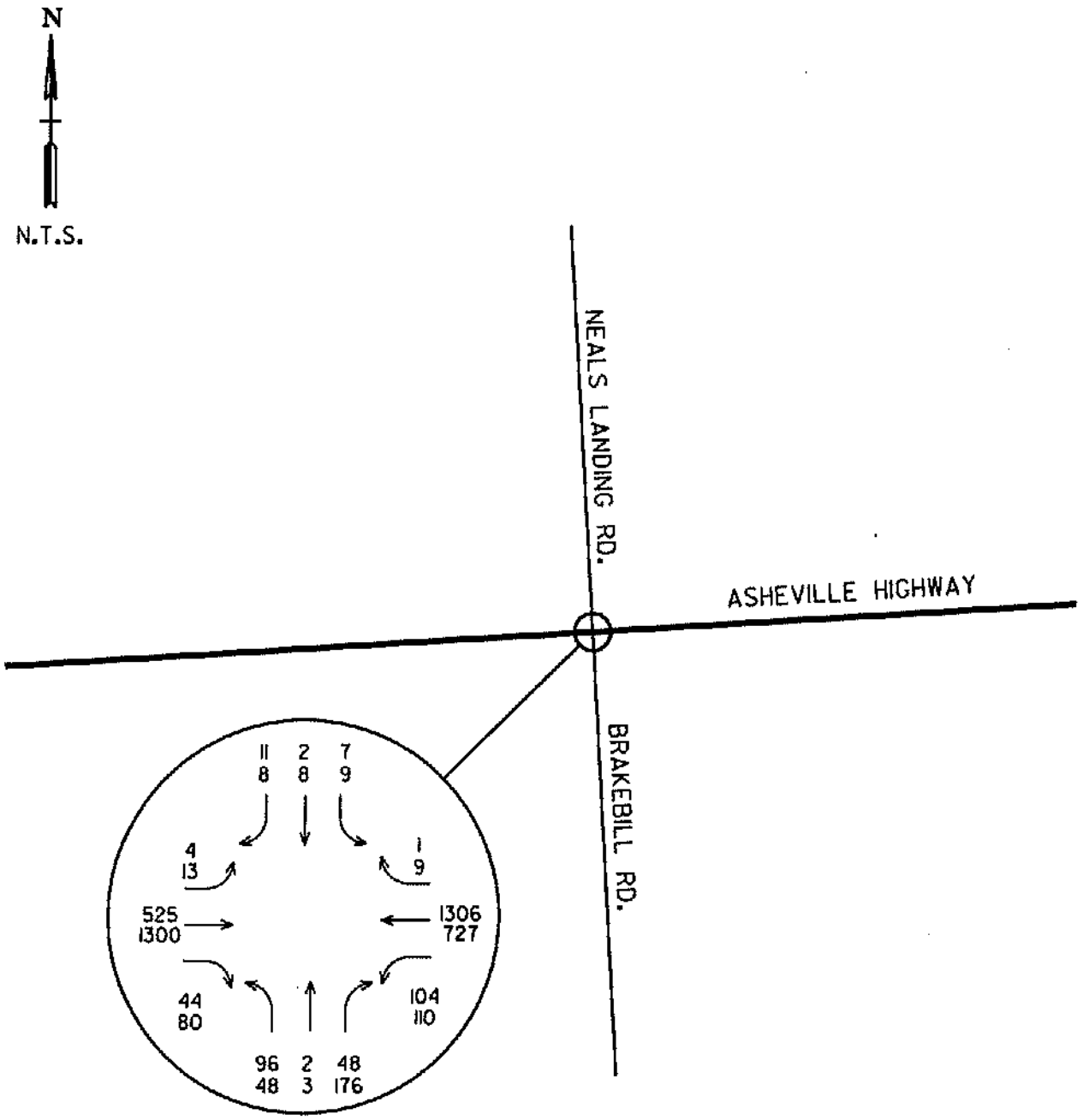
Intersection Capacity Analyses employing the methods of the Highway Capacity Manual (HCM 2000) were used to evaluate the intersection of Asheville Highway and Brakebill Road for the existing roadway and traffic conditions. The results indicate that the intersection is currently operating at an average level-of-service of "B" during both peak hours. The results are summarized in detail on printouts contained in the APPENDIX. Also see the APPENDIX for a discussion of Intersection Capacity and Level of Service Concepts.

Background Traffic Growth

The anticipated time for full build-out of the proposed development is estimated as 3 years, with the project beginning in 2008. Therefore, year 2011 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 2011, it was necessary to establish an annual growth rate for existing traffic. The ADT values given previously in TABLE 1, along with engineering judgment, were used to arrive at a rate of 3.0 percent for this development. FIGURE 4 contains the background traffic volumes that would result from this 3.0 percent annual growth to year 2011.

Background Level of Service Evaluation

Intersection Capacity Analyses employing the methods of the Highway Capacity Manual (HCM 2000) were again used to evaluate the study intersection of Asheville Highway and Brakebill Road for the background (2011) traffic conditions, shown on FIGURE 4. The results indicate that the intersection will be expected to operate at an average level-of-service of "B" during both peak hours, if the proposed development is not constructed. The results are summarized in detail on printouts contained in the APPENDIX. Also see the APPENDIX for a discussion of intersection capacity and level-of-service concepts.



VOLUME LEGEND

TOP NUMBER - AM PEAK HOUR (7:15 - 8:15 A.M.)
BOTTOM NUMBER - PM PEAK HOUR (5:00 - 6:00 P.M.)
VOLUMES INCLUDE APPROPRIATE GROWTH FACTOR APPLIED TO EXISTING TRAFFIC VOLUMES (2007).

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FIGURE 4
BACKGROUND TRAFFIC VOLUMES (2011)
EXISTING ROADWAY LAYOUT

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY

Trip Generation

In order to estimate the expected traffic volumes to be generated by full build-out of the proposed development, the data and procedures of *Trip Generation, Seventh Edition* (Institute of Transportation Engineers, 2003) were utilized. The generated traffic volumes were determined based on the total weekday, morning, and evening peak hour of adjacent street traffic trip generation rates for single-family detached housing (Land Use Code 210, Volume 2, pages 269 to 271). As noted earlier in this report, the anticipated maximum number of units upon full build-out is 115, which was used to determine the number of new trips generated. TABLE 2 summarizes the number and directional split of entering and exiting trips for the proposed development.

TABLE 2

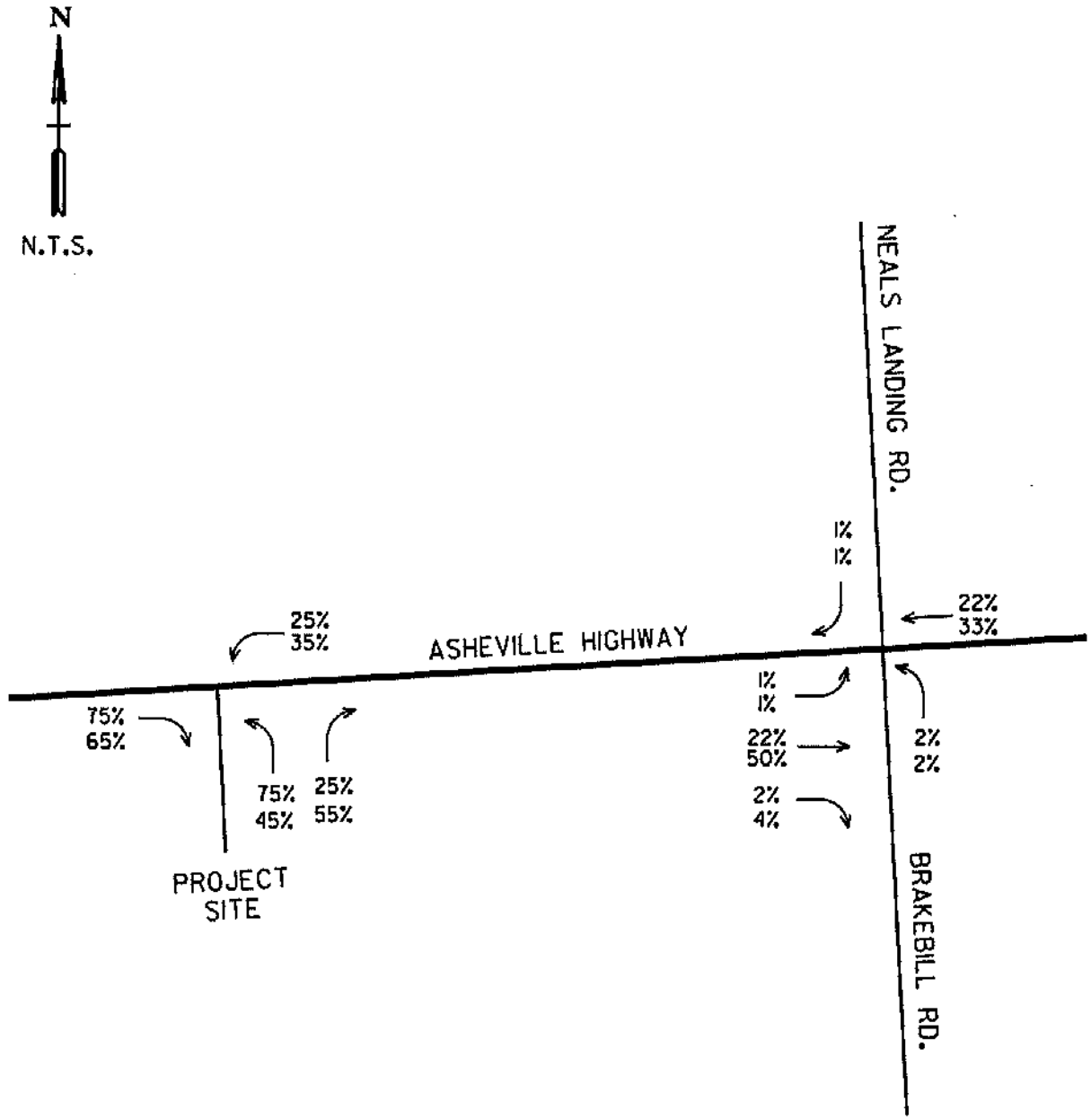
TRIP GENERATION SUMMARY

(RATES FOR SINGLE FAMILY DETACHED HOUSING – I.T.E. CODE 210)

SINGLE FAMILY DETACHED HOUSING – 115 UNITS					
	Total New Trips	% Entering	% Exiting	Number Entering	Number Exiting
Weekday	1,182	50%	50%	591	591
A.M. Peak	90	25%	75%	23	67
P.M. Peak	122	63%	37%	77	45

Trip Distribution

FIGURE 5 provides a summary of the trip distribution patterns developed for the study intersections, which were derived from the existing traffic patterns. In addition, FIGURE 6 provides the generated traffic volumes as assigned to the local roadway network in accordance with these distribution patterns. FIGURE 7 shows the combined year 2011 volumes reflecting the existing traffic, the background traffic growth, and the newly generated traffic from the proposed development. These are the volumes used in the analysis of full build-out conditions.



DISTRIBUTION PATTERN LEGEND

TOP NUMBER - AM PEAK PERCENT (7:15 - 8:15 A.M.)
BOTTOM NUMBER - PM PEAK PERCENT (5:00 - 6:00 P.M.)

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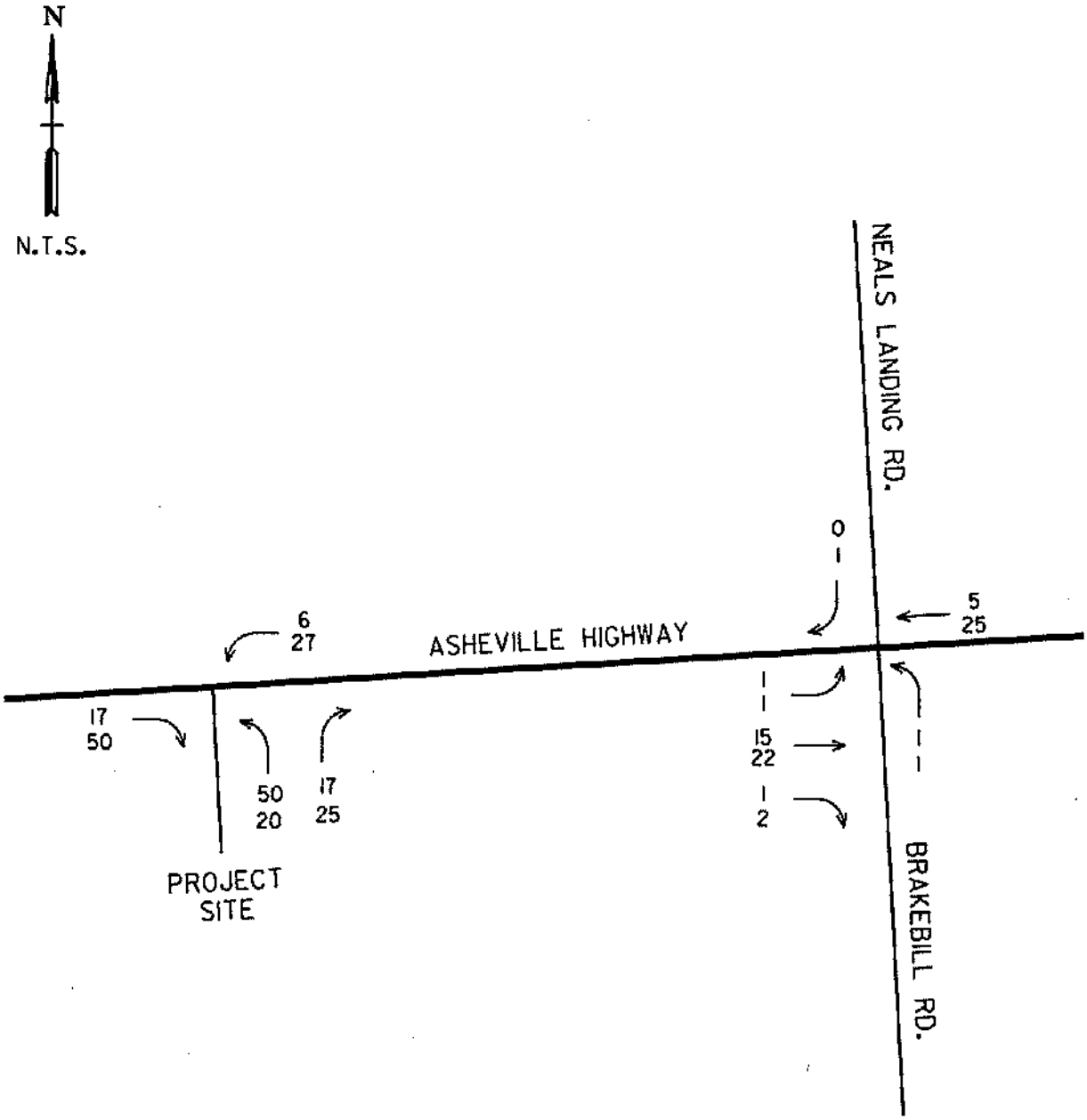
FIGURE 5
TRIP DISTRIBUTION PATTERNS

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY



VOLUME LEGEND

TOP NUMBER - AM PEAK HOUR (7:15 - 8:15 A.M.)
BOTTOM NUMBER - (PM) PEAK HOUR (5:00 - 6:00 P.M.)

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FIGURE 6
GENERATED TRIPS

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY

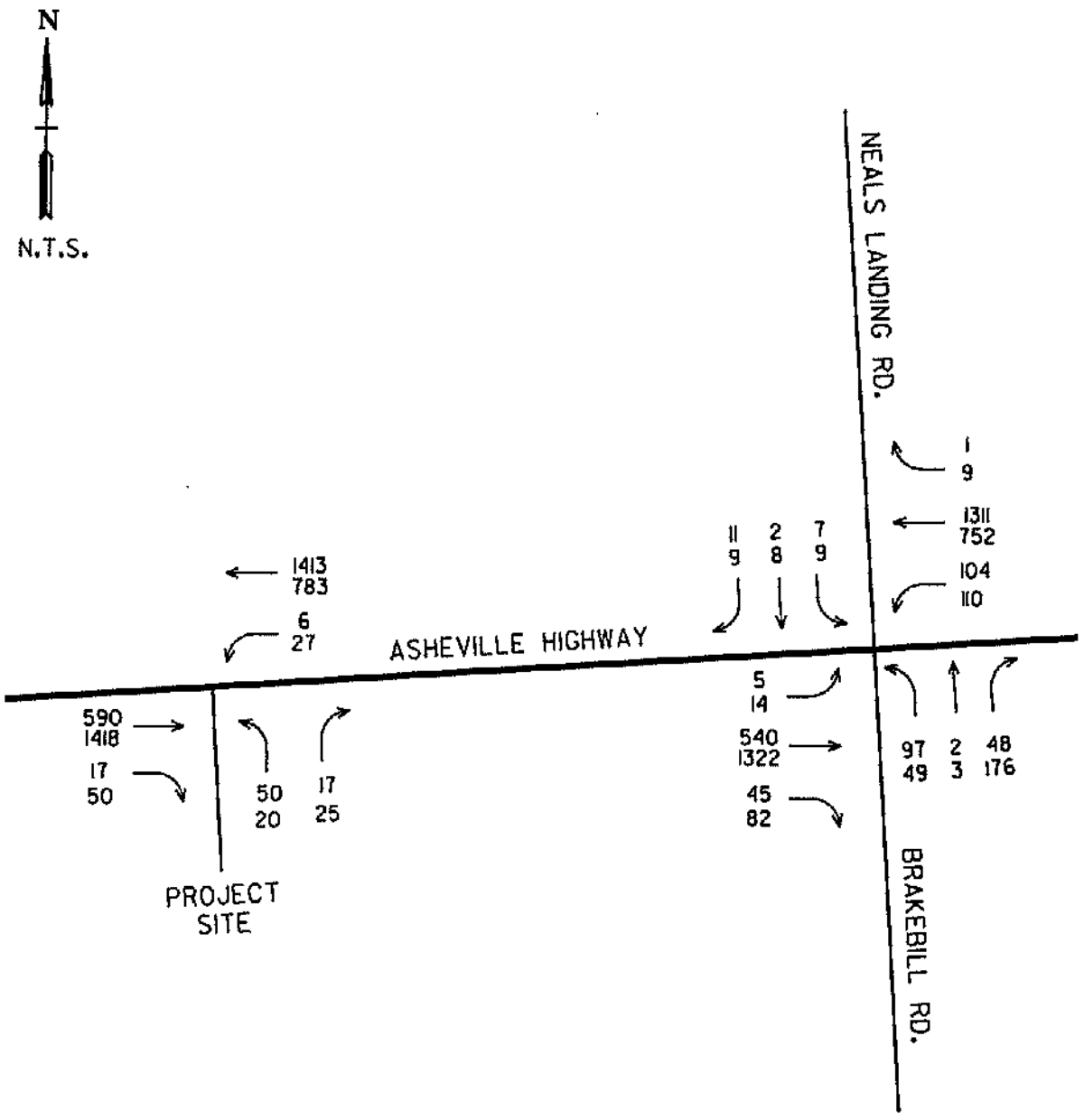

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FIGURE 7
COMBINED TRAFFIC VOLUMES (2011)

BRIAR TOWNE SUBDIVISION
TRAFFIC IMPACT STUDY

Future Level-of-Service Evaluation

Intersection Capacity Analyses employing the methods of the Highway Capacity Manual were used to evaluate the intersections of Asheville Highway with Brakebill Road and the proposed site entrance, for the year 2011 combined traffic volume conditions (FIGURE 7). The results indicate that with the existing intersection turn lane geometry, the Brakebill intersection will be expected to continue to operate at average levels-of-service no worse than "B" during both peak hours. The results for the proposed site entrance indicate that it will be expected to operate with the critical side street movements at average levels-of-service no worse than "C" during the peak hours. These results are summarized in Table 3 and in detail on printouts contained in the APPENDIX.

TABLE 3

CAPACITY ANALYSES SUMMARY

Intersection	Time Period	Year 2007 Existing	Year 2010 Background	Year 2010 Combined
Asheville Hwy @ Brakebill Rd	A.M.	B 10.5	B 11.3	B 11.4
SIGNALIZED[1]	P.M.	B 14.7	B 16.8	B 17.3
Asheville Hwy @ Site Entrance	A.M.			C 16.2
UNSIGNALIZED[2]	P.M.			C 24.7

Results reflect Level-of-Service and Average Vehicular Delay (seconds) as follows:

[1]SIGNALIZED - Intersection Average Values (all movements)
[2]UNSIGNALIZED - Side Street (project entrance) approach average values (left and right turn movements)
See the APPENDIX for detailed computed print-out summaries and discussion of Level-of-Service concepts.

Intersection Sight Distance and Roadway Geometry

1) Intersection Corner Sight Distance for Proposed Development Intersection:

The proposed project development entrance on Asheville Highway was evaluated for corner sight distance assuming a design speed of 65 mph. This assumed design speed was based on the existing posted speed limit of 55 mph with a 10 mph safety factor added. This results in a required minimum sight distance in accordance with Knox County regulations of 650 feet. Field reviews indicate that this requirement will be met at this intersection, as available sight distance was measured well in excess of 650 feet looking both directions from the future subdivision entrance.

2) Roadway Geometry for Proposed Development Intersection:

Turn lane warrant analyses were conducted for the intersection of Asheville Highway at the proposed site entrance under proposed development conditions. These analyses employed Tables 6A and 6B from the Knox County Access Control and Driveway Design Policy, which are based on turn lane warrants developed by Harmelink. The results were that a westbound left-turn lane and an eastbound right-turn lane are anticipated to be warranted at the proposed site entrance under combined traffic conditions during the P.M. Peak Hour. Copies of Tables 6A and 6B are located in the APPENDIX for review.

CONCLUSIONS AND RECOMMENDATIONS

A primary conclusion of this study is that traffic generated by the proposed development will result in acceptable impacts on traffic operational conditions in the project area. This was illustrated in the capacity analyses summary presented in TABLE 3. Additional conclusions were that intersection corner sight distance will be adequately provided at the proposed development entrance intersection, and that the construction of some turn lanes will be warranted at this intersection. The following summarizes these turn lane recommendations:

1) Construct a westbound seventy-five foot left-turn storage lane with appropriate length bay taper in the Asheville Highway median.

2) Construct an eastbound seventy-five foot right-turn storage lane with appropriate length bay taper.

3) Construct separate northbound left and right turn lanes, with minimum storage length of 75 feet, exiting the proposed development.

APPENDIX

CAPACITY AND 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.

Another measure of intersection capacity that is often used in the evaluation of intersection operations is the volume to capacity (V/C) ratio. This ratio is defined as "the ratio of flow rate to capacity", and is a good measure of how much of an intersection's available capacity has been used up by the analysis volumes. Conversely, it also provides an indication of the reserve capacity available for future growth in traffic volumes.

The Intersection Capacity Utilization (ICU) is another measure that expresses a value similar to the V/C ratio. Specifically, the ICU method "sums the amount of the time required to serve all movements at saturation for a given cycle length and divides by that reference cycle length." The ICU is considered a more accurate measure of volume to capacity conditions for a signalized intersection, primarily because it accounts for the effects of the signal timing on intersection capacity.

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Intersection: Asheville Hwy @ Brakebill
Date: 12/18/07
Counted By: Don Burnett
Weather: Clear

File Name : Asheville_Brakebill_12_18_07
Site Code : 00000000
Start Date : 12/18/2007
Page No : 1

Groups Printed- 1 - Unshifted

	BRAKEBILL ROAD Southbound					ASHEVILLE HWY Westbound					BRAKEBILL ROAD Northbound					ASHEVILLE HWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.02	1.02	1.02	1.02		1.02	1.02	1.02	1.02		1.02	1.02	1.02	1.02		1.02	1.02	1.02	1.02		
04:00 PM	0	1	4	0	5	28	182	0	0	210	10	3	31	0	44	0	234	9	0	243	502
04:15 PM	0	1	0	0	1	29	175	0	0	204	17	2	31	0	50	3	271	14	0	288	543
04:30 PM	1	0	0	0	1	29	148	2	0	179	17	1	38	0	56	2	258	16	0	276	512
04:45 PM	3	4	1	0	8	31	148	2	0	181	12	0	40	0	52	5	253	17	0	275	516
Total	4	6	5	0	15	117	653	4	0	774	56	6	140	0	202	10	1016	56	0	1082	2073
05:00 PM	4	0	1	0	5	21	167	3	0	191	13	2	42	0	57	1	288	17	0	306	559
05:15 PM	0	1	4	0	5	26	164	1	0	191	13	1	47	0	61	6	358	19	0	383	639
05:30 PM	1	2	1	0	4	23	186	2	0	211	6	0	32	0	38	0	291	20	0	311	564
05:45 PM	0	1	4	0	5	32	151	2	0	185	12	1	22	0	35	9	264	18	0	291	516
Total	5	4	10	0	19	102	668	8	0	778	44	4	143	0	191	16	1201	74	0	1291	2278
*** BREAK ***																					
07:00 AM	1	2	3	0	6	17	254	1	0	272	29	1	9	0	39	1	65	2	0	68	385
07:15 AM	2	1	3	0	6	20	326	0	0	346	21	1	9	0	31	0	118	7	0	125	508
07:30 AM	3	0	4	0	7	30	327	1	0	358	28	0	13	0	41	4	112	7	0	123	529
07:45 AM	0	1	2	0	3	22	311	0	0	333	26	1	8	0	35	0	128	10	0	138	508
Total	6	4	12	0	22	89	1218	2	0	1309	104	3	39	0	146	5	423	26	0	454	1930
08:00 AM	1	0	1	0	2	23	231	0	0	254	13	0	14	0	27	0	122	16	0	138	421
08:15 AM	1	0	1	0	2	22	242	0	0	264	10	0	12	0	22	3	86	17	0	106	394
08:30 AM	1	0	3	0	4	17	240	1	0	258	7	0	10	0	17	1	110	4	0	115	394
08:45 AM	0	0	3	0	3	19	181	1	0	201	13	0	6	0	19	1	109	10	0	120	343
Total	3	0	8	0	11	81	894	2	0	977	43	0	42	0	85	5	427	47	0	479	1552
Grand Total	18	14	35	0	67	389	3433	16	0	3838	247	13	364	0	624	36	3067	203	0	3306	7833
Apprch %	26.9	20.9	52.2	0.0		10.1	89.4	0.4	0.0		39.6	2.1	58.3	0.0		1.1	92.8	6.1	0.0		
Total %	0.2	0.2	0.4	0.0	0.9	5.0	43.8	0.2	0.0	49.0	3.2	0.2	4.6	0.0	8.0	0.5	39.1	2.6	0.0	42.2	

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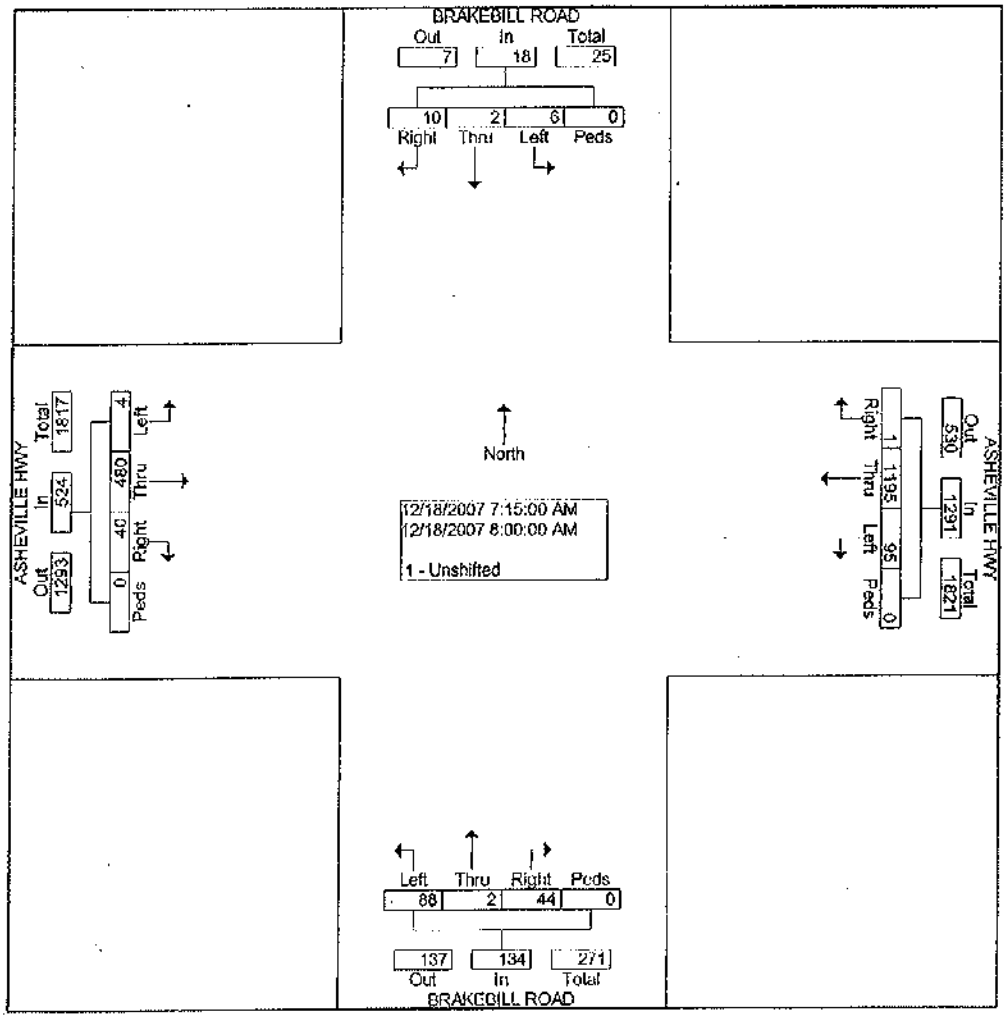
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Intersection	07:15 AM																				
Volume	6	2	10	0	18	95	1195	1	0	1291	88	2	44	0	134	4	480	40	0	524	1966
Percent	33.3	11.1	55.6	0.0		7.4	92.6	0.1	0.0		65.7	1.5	32.8	0.0		0.8	91.6	7.6	0.0		
07:30 Volume	3	0	4	0	7	30	327	1	0	358	28	0	13	0	41	4	112	7	0	123	529
Peak Factor																					0.929
High Int.	07:30 AM					07:30 AM					07:30 AM					07:45 AM					
Volume	3	0	4	0	7	30	327	1	0	358	28	0	13	0	41	0	128	10	0	138	
Peak Factor					0.643					0.902					0.817					0.949	



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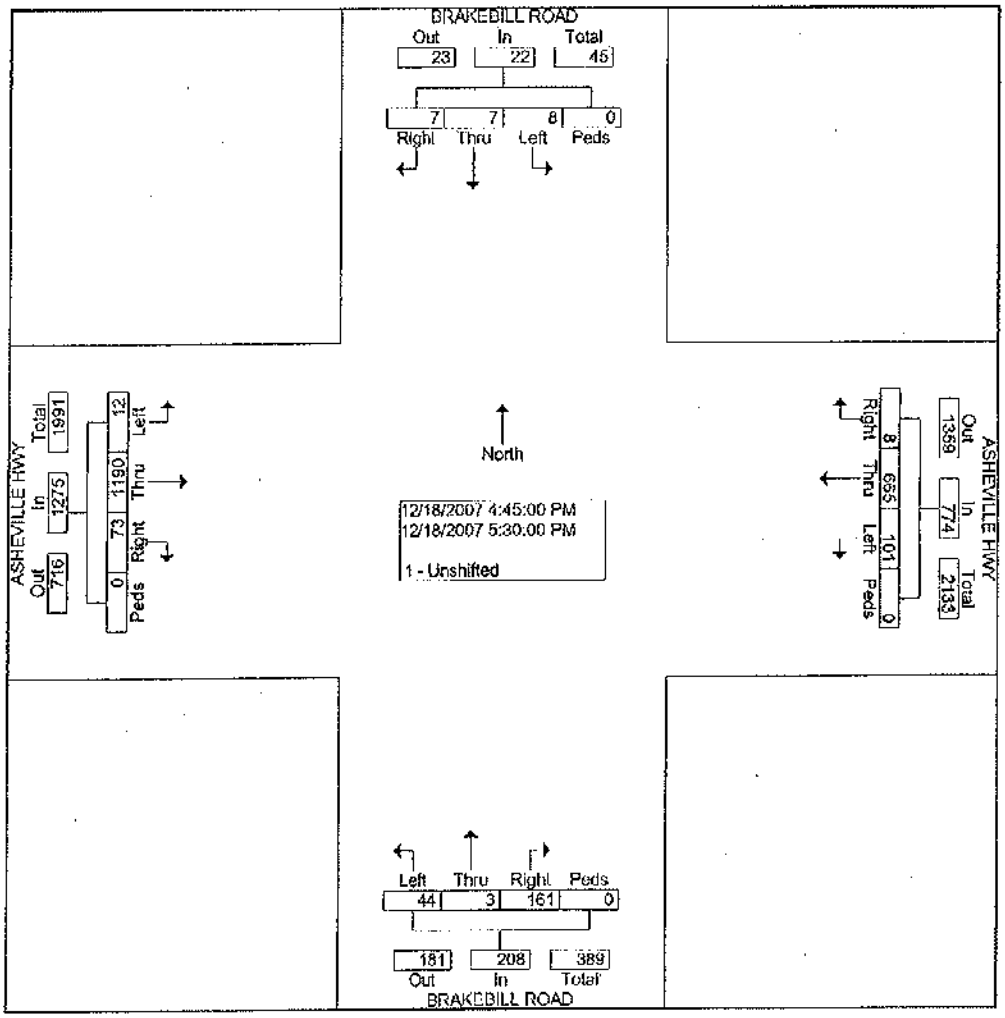
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:45 PM																				
Volume	8	7	7	0	22	101	665	8	0	774	44	3	161	0	208	12	1190	73	0	1275	2278
Percent	36.4	31.8	31.8	0.0		13.0	85.9	1.0	0.0		21.2	1.4	77.4	0.0		0.9	93.3	5.7	0.0		
05:15 Volume	0	1	4	0	5	26	164	1	0	191	13	1	47	0	61	6	358	19	0	383	639
Peak Factor																					0.891
High Int.	04:45 PM					05:30 PM					05:15 PM					05:15 PM					
Volume	3	4	1	0	8	23	186	2	0	211	13	1	47	0	61	6	358	19	0	383	
Peak Factor					0.688					0.917					0.852					0.832	



TRAFFIC VOLUME ADJUSTMENT FACTORS TO BE USED WITH "TRAFFIC SIGNAL WARRANT ANALYSIS – VOLUME WARRANTS" [1]

Prepared and Distributed by the *Tennessee Transportation Assistance Program*

TABLE A

Month/Day of Week Urban Area Adjustment Factors [2] – Average Day

(Multiply actual count by given factor to obtain estimated average day volumes for a similar time period [3])

	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	1.35	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	0.88	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	1.09	1.11	1.10	1.04	1.06	1.07	1.11	1.11	1.16	1.15

TABLE B

Month/Day of Week Urban Area Adjustment Factors [2] – Average Weekday

(Multiply actual count by given factor to obtain estimated average weekday volumes for a similar time period [3])

	January	February	March	April	May	June	July	August	September	October	November	December
Monday	1.13	1.06	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	0.99	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	0.98	0.98	1.00	1.01	1.01
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

Month/Day of Week Urban Area Adjustment Factors [2] – Average Friday

(Multiply actual count by given factor to obtain estimated average Friday volumes for a similar time period [3])

	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	1.06	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	1.06	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	0.96	0.98	0.97	0.97	1.00	1.07	1.00

Notes: 1. "Traffic Signal Warrant Analysis – Volume Warrants" is a Lotus® 1–2–3® 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 1986 through 1992 data)

TABLEs B & C – Developed by T. Darcy Sullivan, P.E. based on TABLE A data

Traffic Stations

Rec	Station Number	County	Location	Year	Annual Average Daily Count	Remarks	Route Number	Route Name	Is Station Out?
1	000385	Knox	NORTH OF I-40 & NEAR SR-168	2007	36193		SR009	SR-9	N
2	000385	Knox	NORTH OF I-40 & NEAR SR-168	2006	34847		SR009	SR-9	N
3	000385	Knox	NORTH OF I-40 & NEAR SR-168	2005	39355		SR009	SR-9	N
4	000385	Knox	NORTH OF I-40 & NEAR SR-168	2004	35975	AADT LESS THAN EXPECTED VALUE BASED ON PREVIOUS YEARS DATA	SR009	SR-9	N
5	000385	Knox	NORTH OF I-40 & NEAR SR-168	2003	39984	EST - CONSTR	SR009	SR-9	N
6	000385	Knox	NORTH OF I-40 & NEAR SR-168	2002	39337	EST	SR009	SR-9	N
7	000385	Knox	NORTH OF I-40 & NEAR SR-168	2001	36626		SR009	SR-9	N
8	000385	Knox	NORTH OF I-40 & NEAR SR-168	2000	39055		SR009	SR-9	N
9	000385	Knox	NORTH OF I-40 & NEAR SR-168	1999	37345		SR009	SR-9	N
10	000385	Knox	NORTH OF I-40 & NEAR SR-168	1998	38118		SR009	SR-9	N
11	000385	Knox	NORTH OF I-40 & NEAR SR-168	1997	36067		SR009	SR-9	N
12	000385	Knox	NORTH OF I-40 & NEAR SR-168	1996	34418		SR009	SR-9	N
13	000385	Knox	NORTH OF I-40 & NEAR SR-168	1995	36698		SR009	SR-9	N
14	000385	Knox	NORTH OF I-40 & NEAR SR-168	1994	34897		SR009	SR-9	N
15	000385	Knox	NORTH OF I-40 & NEAR SR-168	1993	32688		SR009	SR-9	N
16	000385	Knox	NORTH OF I-40 & NEAR SR-168	1992	34053		SR009	SR-9	N
17	000385	Knox	NORTH OF I-40 & NEAR SR-168	1991	33416		SR009	SR-9	N
18	000385	Knox	NORTH OF I-40 & NEAR SR-168	1990	30439		SR009	SR-9	N
19	000385	Knox	NORTH OF I-40 & NEAR SR-168	1989	31067		SR009	SR-9	N
20	000385	Knox	NORTH OF I-40 & NEAR SR-168	1988	34011		SR009	SR-9	N
21	000385	Knox	NORTH OF I-40 & NEAR SR-168	1987	27713		SR009	SR-9	N
22	000385	Knox	NORTH OF I-40 & NEAR SR-168	1986	25783	1ST YR COUNT	SR009	SR-9	N

Counts indicate fluctuating trend + & −

use 3.0% annual growth.

BB 12/27/07

h c ffc e e b e h

Traffic Stations

Rec	Station Number	County	Location	Year	Annual Average Daily Count	Remarks	Route Number	Route Name	Is Station Out?
1	000058	Knox	EAST OF KNOXVILLE	2007	22162		SR009	SR-9	N
2	000058	Knox	EAST OF KNOXVILLE	2006	23462		SR009	SR-9	N
3	000058	Knox	EAST OF KNOXVILLE	2005	23997		SR009	SR-9	N
4	000058	Knox	EAST OF KNOXVILLE	2004	24672	EST	SR009	SR-9	N
5	000058	Knox	EAST OF KNOXVILLE	2003	23260		SR009	SR-9	N
6	000058	Knox	EAST OF KNOXVILLE	2002	21629		SR009	SR-9	N
7	000058	Knox	EAST OF KNOXVILLE	2001	24717		SR009	SR-9	N
8	000058	Knox	EAST OF KNOXVILLE	2000	22589		SR009	SR-9	N
9	000058	Knox	EAST OF KNOXVILLE	1999	24859		SR009	SR-9	N
10	000058	Knox	EAST OF KNOXVILLE	1998	23662		SR009	SR-9	N
11	000058	Knox	EAST OF KNOXVILLE	1997	24840		SR009	SR-9	N
12	000058	Knox	EAST OF KNOXVILLE	1996	24313		SR009	SR-9	N
13	000058	Knox	EAST OF KNOXVILLE	1995	25491		SR009	SR-9	N
14	000058	Knox	EAST OF KNOXVILLE	1994	36595	NEW BUSINESS	SR009	SR-9	N
15	000058	Knox	EAST OF KNOXVILLE	1993	20873		SR009	SR-9	N
16	000058	Knox	EAST OF KNOXVILLE	1992	21100		SR009	SR-9	N
17	000058	Knox	EAST OF KNOXVILLE	1991	20297		SR009	SR-9	N
18	000058	Knox	EAST OF KNOXVILLE	1990	20985		SR009	SR-9	N
19	000058	Knox	EAST OF KNOXVILLE	1989	21369		SR009	SR-9	N
20	000058	Knox	EAST OF KNOXVILLE	1988	21550		SR009	SR-9	N
21	000058	Knox	EAST OF KNOXVILLE	1987	20102		SR009	SR-9	N
22	000058	Knox	EAST OF KNOXVILLE	1986	17909		SR009	SR-9	N
23	000058	Knox	EAST OF KNOXVILLE	1985	19260		SR009	SR-9	N

h e ff c e e b e h

Single-Family Detached Housing
(210)

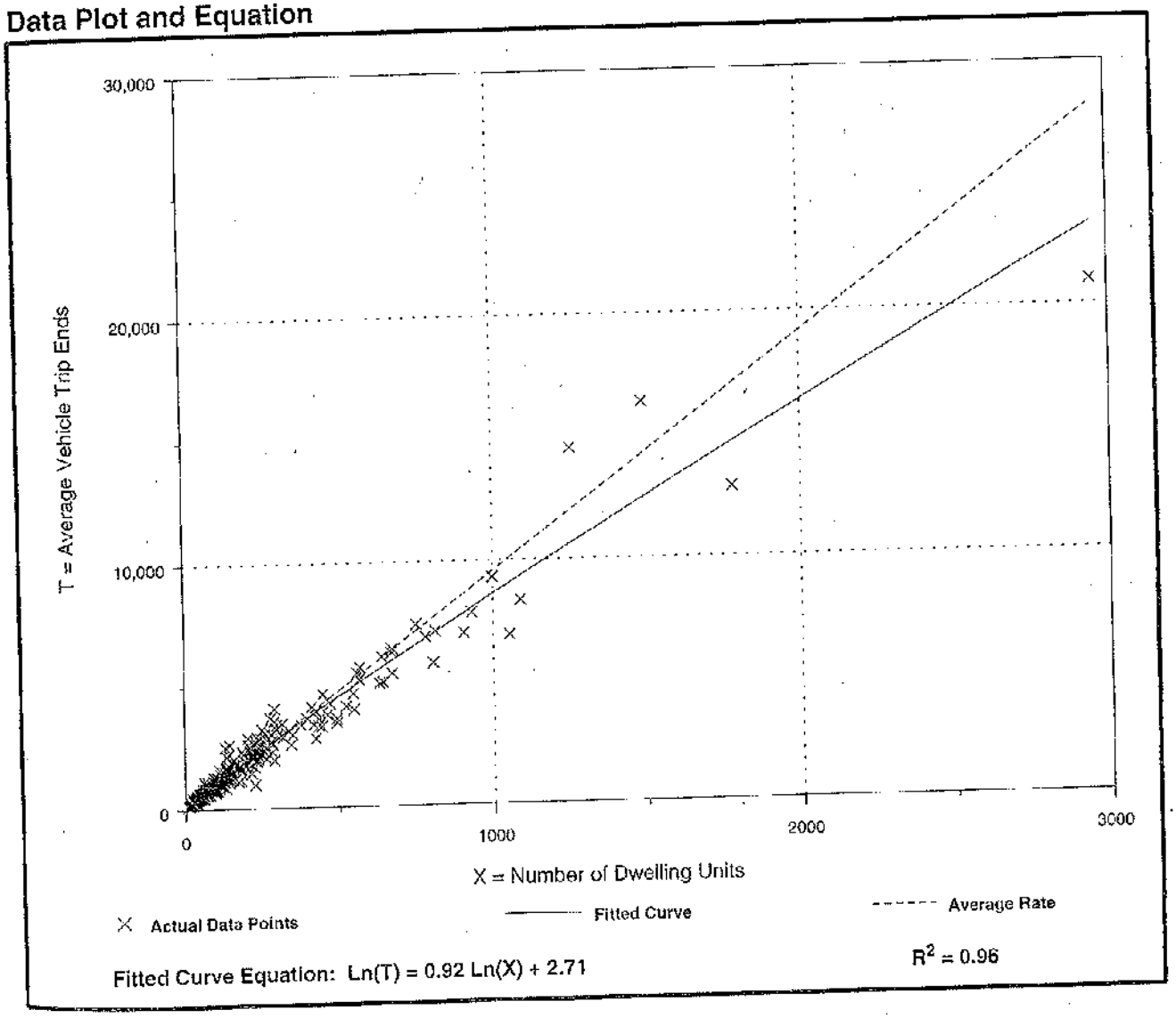
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Number of Studies: 350
Avg. Number of Dwelling Units: 197
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.57	4.31 - 21.85	3.69

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.71

R^2 = 0.96

Single-Family Detached Housing
(210)

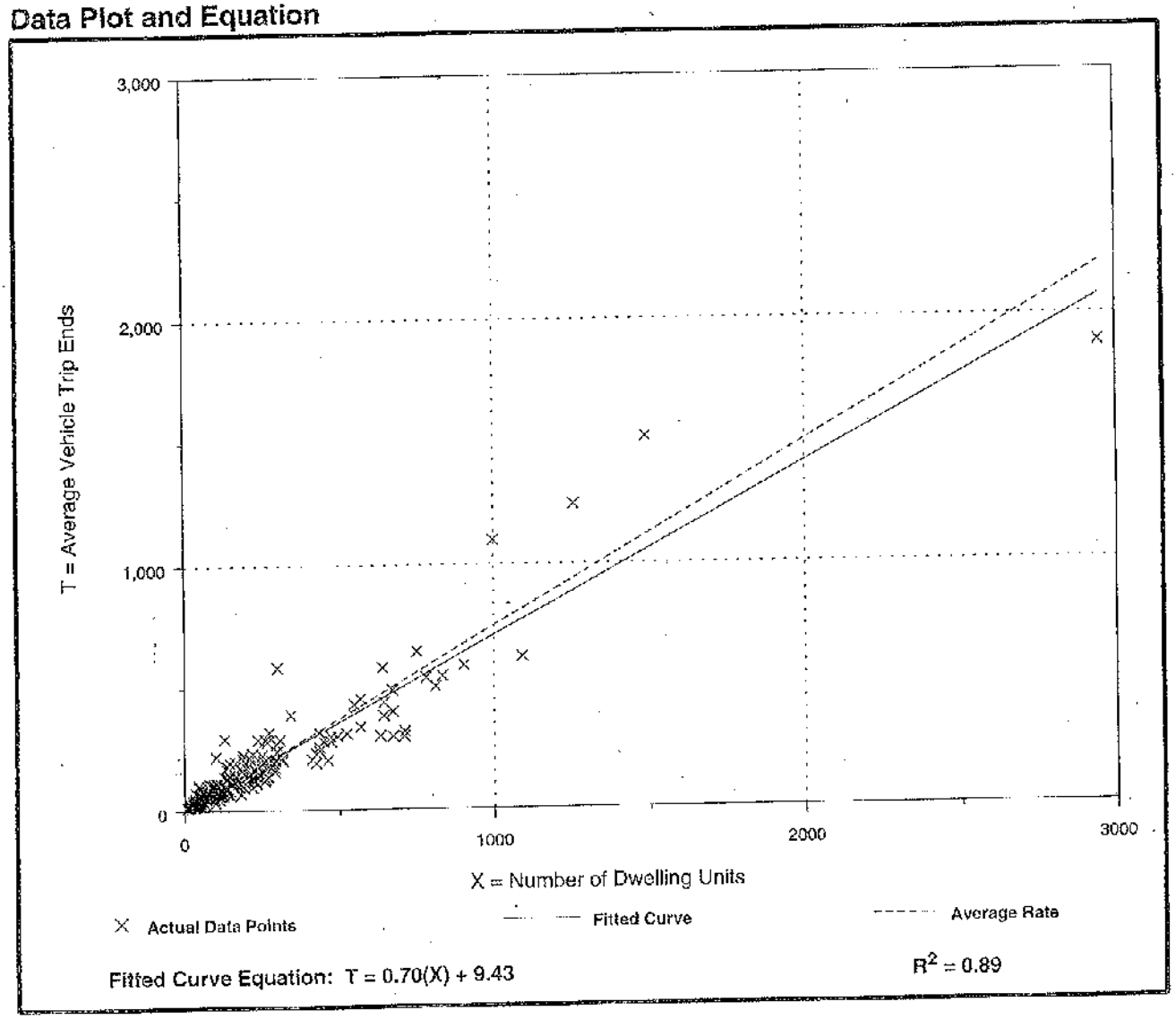
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 274
Avg. Number of Dwelling Units: 201
Directional Distribution: 25% entering, 75% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.75	0.33 - 2.27	0.90

Data Plot and Equation



Fitted Curve Equation: T = 0.70(X) + 9.43

$R^2 = 0.89$

Single-Family Detached Housing
(210)

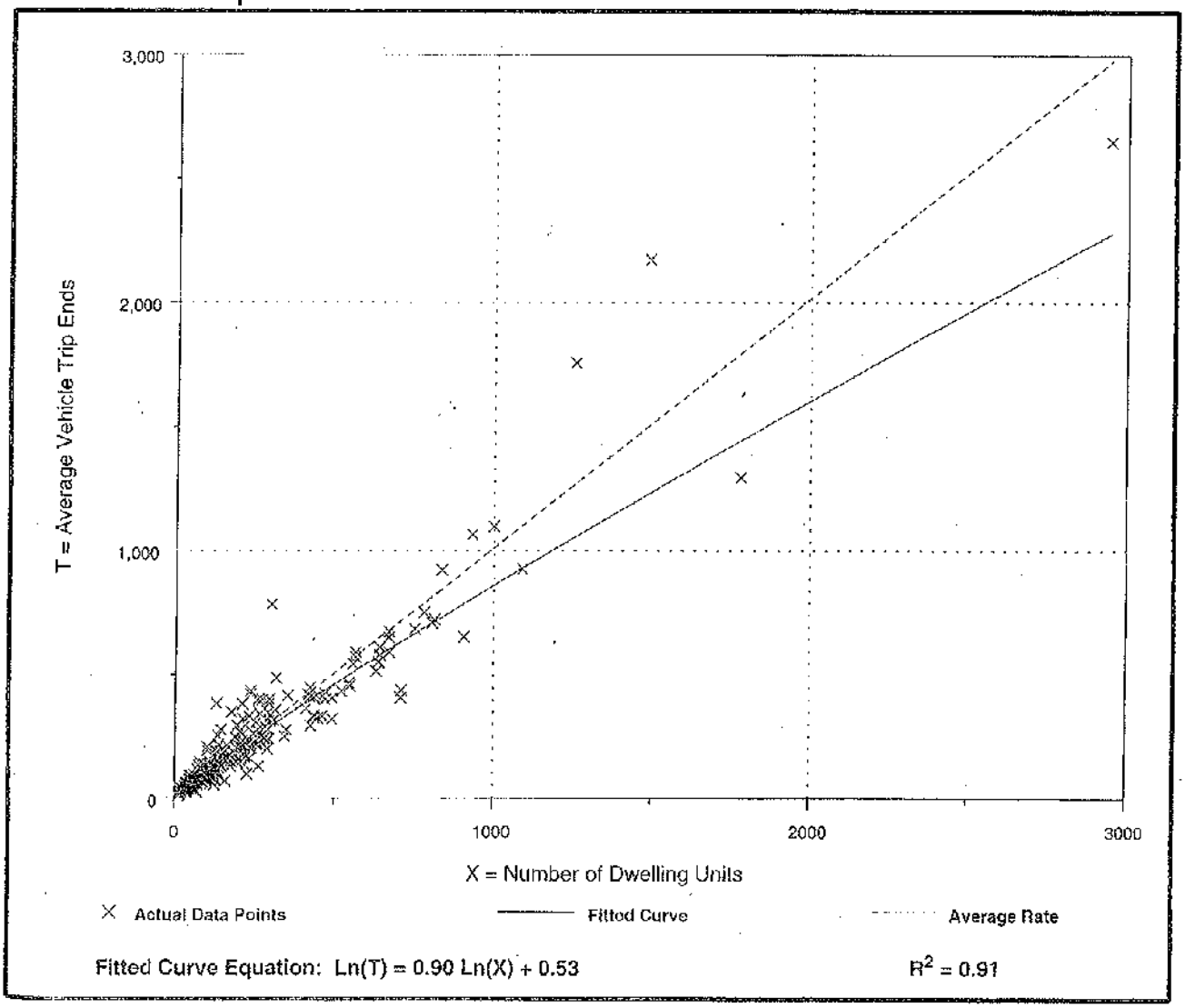
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 302
Avg. Number of Dwelling Units: 214
Directional Distribution: 63% entering, 37% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
1.01	0.42 - 2.98	1.05

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.90 Ln(X) + 0.53 R^2 = 0.91

Trip Generation

Single-Family Detached Housing (210)

115 Dwelling Units

- Weekday p. 269

$Ln(T) = 0.92\ Ln(115) + 2.71$

T = 1,182

50% entering: 591

50% exiting: 591

- AM Peak p. 270

$T = 0.70(115) + 9.43$

T = 90

25% entering: 23

75% exiting: 67

- PM Peak p. 271

$Ln(T) = 0.90\ Ln(115) + 0.53$

T = 122

63% entering: 77

37% exiting: 45

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	480	40	95	1195	1	88	2	44	6	2	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	240		85	125		0	0		0
Storage Lanes	1		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.856			0.922	
Flt Protected	0.950			0.950			0.950				0.984	
Satd. Flow (prot)	1770	3497	0	1770	3539	1583	1770	1595	0	0	1690	0
Flt Permitted	0.172			0.393			0.745				0.876	
Satd. Flow (perm)	320	3497	0	732	3539	1583	1388	1595	0	0	1504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				1		47			11	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1000			1243			751			761	
Travel Time (s)		12.4			15.4			17.1			17.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	4	516	43	102	1285	1	95	2	47	6	2	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	559	0	102	1285	1	95	49	0	0	19	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0	20.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	26.0		12.0	26.0	26.0	14.0	14.0		14.0	14.0	
Total Split (s)	12.0	33.0	0.0	12.0	33.0	33.0	15.0	15.0	0.0	15.0	15.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	20.0%	55.0%	55.0%	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%
Maximum Green (s)	6.0	27.0		6.0	27.0	27.0	9.0	9.0		9.0	9.0	
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	1.5		2.0	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Act Effct Green (s)	29.9	26.8		33.4	33.9	33.9	8.7	8.7			8.7	
Actuated g/C Ratio	0.58	0.52		0.64	0.65	0.65	0.17	0.17			0.17	
v/c Ratio	0.01	0.31		0.17	0.55	0.00	0.41	0.16			0.07	
Control Delay	4.2	10.8		5.1	9.5	6.0	27.2	9.7			15.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	4.2	10.8		5.1	9.5	6.0	27.2	9.7			15.6	
LOS	A	B		A	A	A	C	A			B	
Approach Delay		10.8			9.1			21.3			15.6	
Approach LOS		B			A			C			B	
Queue Length 50th (ft)	1	62		11	110	0	27	1			2	

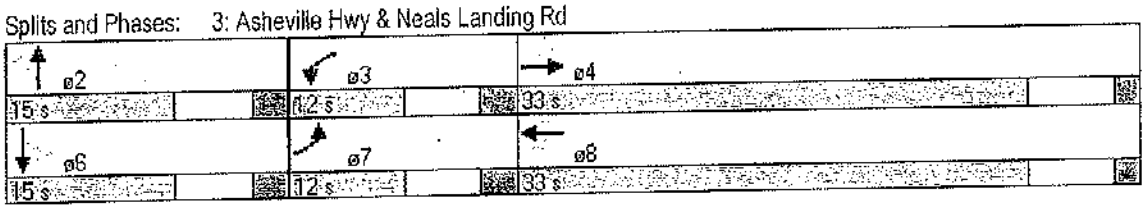
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	3	95		25	278	2	72	25			19	
Internal Link Dist (ft)		920			1163			671			681	
Turn Bay Length (ft)	95			240		85	125					
Base Capacity (vph)	355	2098		595	2318	1037	245	320			275	
Starvation Cap Reductn	0	0		0	0	0	0	0			0	
Spillback Cap Reductn	0	0		0	0	0	0	0			0	
Storage Cap Reductn	0	0		0	0	0	0	0			0	
Reduced v/c Ratio	0.01	0.27		0.17	0.55	0.00	0.39	0.15			0.07	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 10.5
Intersection Capacity Utilization 64.6%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 3: Asheville Hwy & Neals Landing Rd



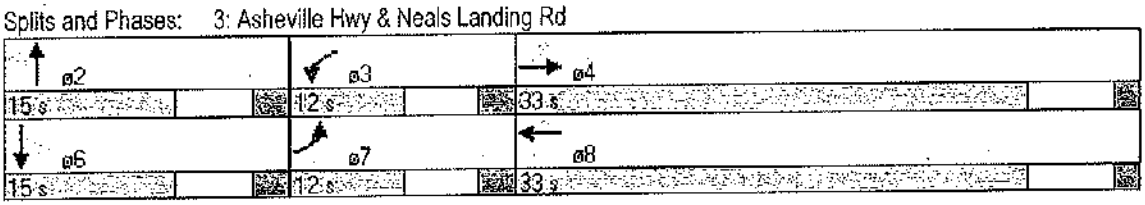
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	1190	73	101	665	8	44	3	161	8	7	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	240		85	125		0	0		0
Storage Lanes	1		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991				0.850		0.852			0.957	
Flt Protected	0.950			0.950			0.950				0.982	
Satd. Flow (prot)	1770	3507	0	1770	3539	1583	1770	1587	0	0	1751	0
Flt Permitted	0.368			0.112			0.741				0.814	
Satd. Flow (perm)	685	3507	0	209	3539	1583	1380	1587	0	0	1451	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				9		181			8	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1000			1243			751			761	
Travel Time (s)		12.4			15.4			17.1			17.3	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	13	1337	82	113	747	9	49	3	181	9	8	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	1419	0	113	747	9	49	184	0	0	25	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0	20.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	26.0		12.0	26.0	26.0	14.0	14.0		14.0	14.0	
Total Split (s)	12.0	33.0	0.0	12.0	33.0	33.0	15.0	15.0	0.0	15.0	15.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	20.0%	55.0%	55.0%	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%
Maximum Green (s)	6.0	27.0		6.0	27.0	27.0	9.0	9.0		9.0	9.0	
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	1.5		2.0	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Act Effct Green (s)	33.4	28.7		37.0	35.8	35.8	8.3	8.3			8.3	
Actuated g/C Ratio	0.57	0.49		0.63	0.61	0.61	0.14	0.14			0.14	
v/c Ratio	0.03	0.82		0.39	0.34	0.01	0.25	0.48			0.12	
Control Delay	4.1	19.5		10.2	7.1	4.6	26.3	9.5			19.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	4.1	19.5		10.2	7.1	4.6	26.3	9.5			19.4	
LOS	A	B		B	A	A	C	A			B	
Approach Delay		19.4			7.5			13.0			19.4	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	1	224		12	48	0	16	1			5	

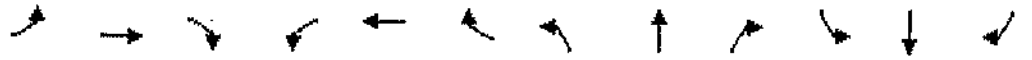
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	6	#367		39	132	6	42	47			23	
Internal Link Dist (ft)		920			1163			671			681	
Turn Bay Length (fl)	95			240		85	125					
Base Capacity (vph)	503	1728		292	2168	973	213	397			230	
Starvation Cap Reductn	0	0		0	0	0	0	0			0	
Spillback Cap Reductn	0	0		0	0	0	0	0			0	
Storage Cap Reductn	0	0		0	0	0	0	0			0	
Reduced v/c Ratio	0.03	0.82		0.39	0.34	0.01	0.23	0.46			0.11	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 14.7 Intersection LOS: B
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Asheville Hwy & Neals Landing Rd





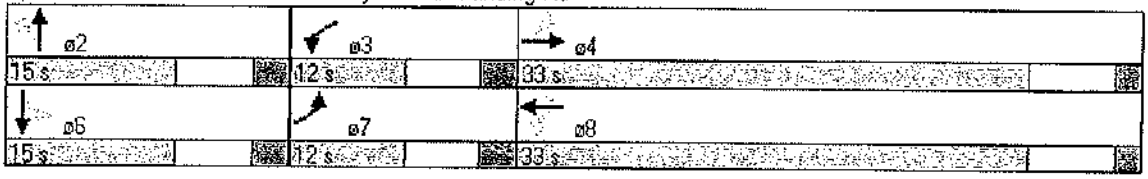
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	525	44	104	1306	1	96	2	48	7	2	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	240		85	125		0	0		0
Storage Lanes	1		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850		0.856			0.926	
Flt Protected	0.950			0.950			0.950				0.982	
Satd. Flow (prot)	1770	3497	0	1770	3539	1583	1770	1595	0	0	1694	0
Flt Permitted	0.139			0.368			0.743				0.858	
Satd. Flow (perm)	259	3497	0	685	3539	1583	1384	1595	0	0	1480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				1		52			12	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1000			1243			751			761	
Travel Time (s)		12.4			15.4			17.1			17.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	4	565	47	112	1404	1	103	2	52	8	2	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	612	0	112	1404	1	103	54	0	0	22	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0	20.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	26.0		12.0	26.0	26.0	14.0	14.0		14.0	14.0	
Total Split (s)	12.0	33.0	0.0	12.0	33.0	33.0	15.0	15.0	0.0	15.0	15.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	20.0%	55.0%	55.0%	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%
Maximum Green (s)	6.0	27.0		6.0	27.0	27.0	9.0	9.0		9.0	9.0	
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	1.5		2.0	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Act Effct Green (s)	29.9	26.8		33.4	33.9	33.9	8.7	8.7			8.7	
Actuated g/C Ratio	0.58	0.52		0.64	0.65	0.65	0.17	0.17			0.17	
v/c Ratio	0.01	0.34		0.20	0.61	0.00	0.44	0.17			0.09	
Control Delay	4.2	11.1		5.3	10.7	6.0	28.2	9.4			15.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	4.2	11.1		5.3	10.7	6.0	28.2	9.4			15.6	
LOS	A	B		A	B	A	C	A			B	
Approach Delay		11.1			10.3			21.7			15.7	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	1	70		12	127	0	29	1			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	3	105		27	#367	2	#78	27			20	
Internal Link Dist (ft)		920			1163			671			681	
Turn Bay Length (ft)	95			240		85	125					
Base Capacity (vph)	327	2098		570	2317	1037	244	324			271	
Starvation Cap Reductn	0	0		0	0	0	0	0			0	
Spillback Cap Reductn	0	0		0	0	0	0	0			0	
Storage Cap Reductn	0	0		0	0	0	0	0			0	
Reduced v/c Ratio	0.01	0.29		0.20	0.61	0.00	0.42	0.17			0.08	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 11.3 Intersection LOS: B
Intersection Capacity Utilization 68.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Asheville Hwy & Neals Landing Rd



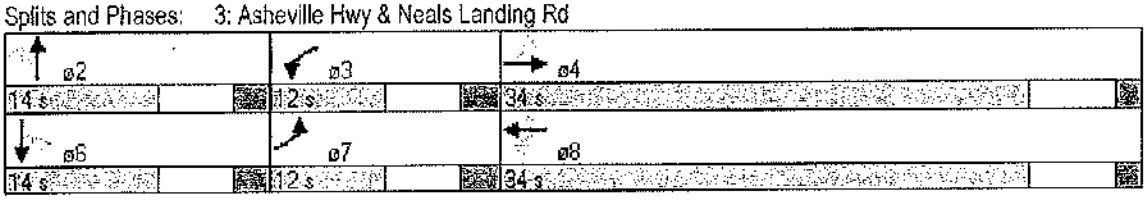
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	1300	80	110	727	9	48	3	176	9	8	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	240		85	125		0	0		0
Storage Lanes	1		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991				0.850		0.852			0.957	
Flt Protected	0.950			0.950			0.950				0.982	
Satd. Flow (prot)	1770	3507	0	1770	3539	1583	1770	1587	0	0	1751	0
Flt Permitted	0.344			0.111			0.739				0.706	
Satd. Flow (perm)	641	3507	0	207	3539	1583	1377	1587	0	0	1259	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				10		198			9	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1000			1243			751			761	
Travel Time (s)		12.4			15.4			17.1			17.3	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	15	1461	90	124	817	10	54	3	198	10	9	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	1551	0	124	817	10	54	201	0	0	28	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0	20.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	26.0		12.0	26.0	26.0	14.0	14.0		14.0	14.0	
Total Split (s)	12.0	34.0	0.0	12.0	34.0	34.0	14.0	14.0	0.0	14.0	14.0	0.0
Total Split (%)	20.0%	56.7%	0.0%	20.0%	56.7%	56.7%	23.3%	23.3%	0.0%	23.3%	23.3%	0.0%
Maximum Green (s)	6.0	28.0		6.0	28.0	28.0	8.0	8.0		8.0	8.0	
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	1.5		2.0	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Act Effct Green (s)	33.7	29.0		37.2	36.0	36.0	8.0	8.0			8.0	
Actuated g/C Ratio	0.58	0.50		0.64	0.62	0.62	0.14	0.14			0.14	
v/c Ratio	0.03	0.89		0.42	0.37	0.01	0.28	0.52			0.15	
Control Delay	3.8	23.0		11.0	7.0	4.2	27.9	10.0			20.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	3.8	23.0		11.0	7.0	4.2	27.9	10.0			20.6	
LOS	A	C		B	A	A	C	A			C	
Approach Delay		22.9			7.5			13.8			20.6	
Approach LOS		C			A			B			C	
Queue Length 50th (ft)	2	261		13	54	0	18	1			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	6	#412		45	142	7	47	50			26	
Internal Link Dist (ft)		920			1163			671			681	
Turn Bay Length (ft)	95			240		85	125					
Base Capacity (vph)	486	1748		293	2181	980	190	389			181	
Starvation Cap Reductn	0	0		0	0	0	0	0			0	
Spillback Cap Reductn	0	0		0	0	0	0	0			0	
Storage Cap Reductn	0	0		0	0	0	0	0			0	
Reduced v/c Ratio	0.03	0.89		0.42	0.37	0.01	0.28	0.52			0.15	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 16.8 Intersection LOS: B
Intersection Capacity Utilization 70.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Asheville Hwy & Neals Landing Rd



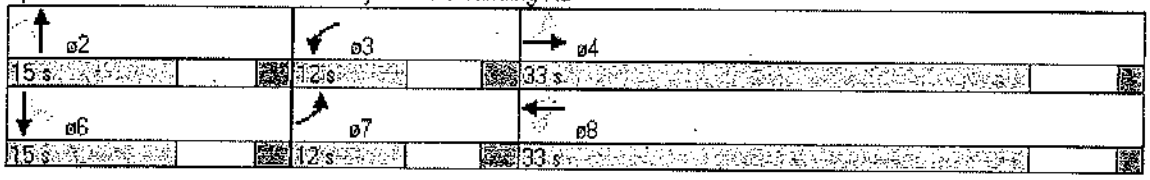
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	540	45	104	1311	1	97	2	48	7	2	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	240		85	125		0	0		0
Storage Lanes	1		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850		0.856			0.926	
Flt Protected	0.950			0.950			0.950				0.982	
Satd. Flow (prot)	1770	3500	0	1770	3539	1583	1770	1595	0	0	1694	0
Flt Permitted	0.139			0.360			0.743				0.858	
Satd. Flow (perm)	259	3500	0	671	3539	1583	1384	1595	0	0	1480	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				1		52			12	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1000			1243			751			761	
Travel Time (s)		12.4			15.4			17.1			17.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	5	581	48	112	1410	1	104	2	52	8	2	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	629	0	112	1410	1	104	54	0	0	22	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0	20.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	26.0		12.0	26.0	26.0	14.0	14.0		14.0	14.0	
Total Split (s)	12.0	33.0	0.0	12.0	33.0	33.0	15.0	15.0	0.0	15.0	15.0	0.0
Total Split (%)	20.0%	55.0%	0.0%	20.0%	55.0%	55.0%	25.0%	25.0%	0.0%	25.0%	25.0%	0.0%
Maximum Green (s)	6.0	27.0		6.0	27.0	27.0	9.0	9.0		9.0	9.0	
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	1.5		2.0	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Act Effct Green (s)	29.9	26.8		33.4	33.9	33.9	8.7	8.7			8.7	
Actuated g/C Ratio	0.58	0.52		0.64	0.65	0.65	0.17	0.17			0.17	
v/c Ratio	0.02	0.35		0.20	0.61	0.00	0.45	0.17			0.09	
Control Delay	4.4	11.2		5.3	10.7	6.0	28.3	9.4			15.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	4.4	11.2		5.3	10.7	6.0	28.3	9.4			15.6	
LOS	A	B		A	B	A	C	A			B	
Approach Delay		11.1			10.3			21.8			15.7	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	1	73		12	128	0	30	1			3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	3	108		27	#370	2	#79	27			20	
Internal Link Dist (ft)		920			1163			671			681	
Turn Bay Length (ft)	95			240		85	125					
Base Capacity (vph)	327	2099		563	2317	1037	244	324			271	
Starvation Cap Reductn	0	0		0	0	0	0	0			0	
Spillback Cap Reductn	0	0		0	0	0	0	0			0	
Storage Cap Reductn	0	0		0	0	0	0	0			0	
Reduced v/c Ratio	0.02	0.30		0.20	0.61	0.00	0.43	0.17			0.08	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 51.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 68.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Asheville Hwy & Neals Landing Rd



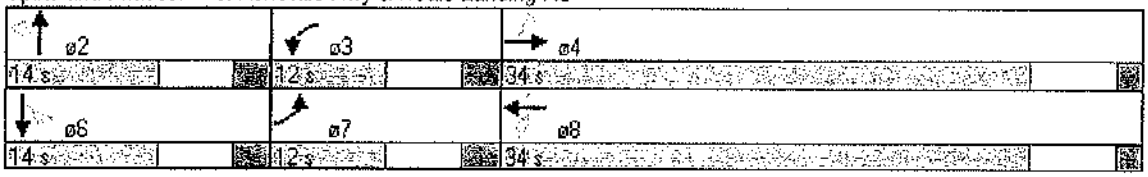
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	1322	82	110	752	9	49	3	176	9	8	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	95		0	240		85	125		0	0		0
Storage Lanes	1		0	1		1	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991				0.850		0.852			0.953	
Flt Protected	0.950			0.950			0.950				0.983	
Satd. Flow (prot)	1770	3507	0	1770	3539	1583	1770	1587	0	0	1745	0
Flt Permitted	0.334			0.110			0.738				0.707	
Satd. Flow (perm)	622	3507	0	205	3539	1583	1375	1587	0	0	1255	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				10		198			10	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		1000			1243			751			761	
Travel Time (s)		12.4			15.4			17.1			17.3	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	16	1485	92	124	845	10	55	3	198	10	9	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1577	0	124	845	10	55	201	0	0	29	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Detector Phase	7	4		3	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0	20.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	12.0	26.0		12.0	26.0	26.0	14.0	14.0		14.0	14.0	
Total Split (s)	12.0	34.0	0.0	12.0	34.0	34.0	14.0	14.0	0.0	14.0	14.0	0.0
Total Split (%)	20.0%	56.7%	0.0%	20.0%	56.7%	56.7%	23.3%	23.3%	0.0%	23.3%	23.3%	0.0%
Maximum Green (s)	6.0	28.0		6.0	28.0	28.0	8.0	8.0		8.0	8.0	
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	1.5		2.0	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Act Effct Green (s)	34.0	29.3		37.5	36.3	36.3	8.0	8.0			8.0	
Actuated g/C Ratio	0.58	0.50		0.64	0.62	0.62	0.14	0.14			0.14	
v/c Ratio	0.03	0.90		0.43	0.39	0.01	0.29	0.52			0.16	
Control Delay	3.9	24.0		11.2	7.1	4.2	28.1	10.0			20.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	3.9	24.0		11.2	7.1	4.2	28.1	10.0			20.3	
LOS	A	C		B	A	A	C	B			C	
Approach Delay		23.8			7.6			13.9			20.3	
Approach LOS		C			A			B			C	
Queue Length 50th (ft)	2	270		13	56	0	18	1			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	6	#424		45	147	7	47	50			26	
Internal Link Dist (ft)		920			1163			671			681	
Turn Bay Length (ft)	95			240		85	125					
Base Capacity (vph)	477	1755		291	2189	983	188	388			180	
Starvation Cap Reductn	0	0		0	0	0	0	0			0	
Spillback Cap Reductn	0	0		0	0	0	0	0			0	
Storage Cap Reductn	0	0		0	0	0	0	0			0	
Reduced v/c Ratio	0.03	0.90		0.43	0.39	0.01	0.29	0.52			0.16	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 58.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 17.3 Intersection LOS: B
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Asheville Hwy & Neals Landing Rd



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	BJH	Intersection	Asheville Hwy / Site Entrance
Agency/Co.	CCI	Jurisdiction	
Date Performed	12/27/2007	Analysis Year	2011
Analysis Time Period	Combined 2011 AM		

Project Description

East/West Street: Asheville Hwy	North/South Street: Site Entrance
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		590	17	6	1413	
Peak-Hour Factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Hourly Flow Rate, HFR (veh/h)	0	634	18	6	1519	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	2	1	1	2	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	50		17			
Peak-Hour Factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Hourly Flow Rate, HFR (veh/h)	53	0	18	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (veh/h)		6	53		18			
C (m) (veh/h)		944	327		685			
v/c		0.01	0.16		0.03			
95% queue length		0.02	0.58		0.08			
Control Delay (s/veh)		8.8	18.1		10.4			
LOS		A	C		B			
Approach Delay (s/veh)	--	--	16.2					
Approach LOS	--	--	C					

f e c e e g ch e c e g e

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	BJH	Intersection	Asheville Hwy / Site Entrance
Agency/Co.	CCI	Jurisdiction	
Date Performed	12/27/2007	Analysis Year	2011
Analysis Time Period	Combined 2011 PM		

Project Description

East/West Street: *Asheville Hwy* | North/South Street: *Site Entrance*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		1418	50	27	783	
Peak-Hour Factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Hourly Flow Rate, HFR (veh/h)	0	1593	56	30	879	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	2	1	1	2	0
Configuration		T	R	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	20		25			
Peak-Hour Factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Hourly Flow Rate, HFR (veh/h)	22	0	28	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	1	0	1	0	0	0
Configuration	L		R			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (veh/h)		30	22		28			
C (m) (veh/h)		397	143		334			
v/c		0.08	0.15		0.08			
95% queue length		0.24	0.54		0.27			
Control Delay (s/veh)		14.8	34.7		16.8			
LOS		B	D		C			
Approach Delay (s/veh)	--	--	24.7					
Approach LOS	--	--	C					

f e c e e g ch e c e g e

TABLE 6A

LEFT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 46 TO 55 MPH

(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 - 149 150 - 199	200 175	140 120	100 85	75 65	60 55	50 45
200 - 249 250 - 299	150 130	100 85	75 65	60 55	50 45	40 35
300 - 349 350 - 399	110 95	75 65	60 55	50 45	40 35	30 25
400 - 449 450 - 499	80 70	60 55	50 45	40 35	30 25	25 20
500 - 549 550 - 599	60 50	50 45	40 35	30 25	25 20	20 20
600 - 649 650 - 699	45 40	40 35	30 30	25 20	20 20	20 20
700 - 749 750 or More	35 35	35 35	25 25	20 20	20 15	15 15 PM

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	=/ > 600
100 - 149 150 - 199	50 45	45 40	40 35	35 30	30 30	25 25
200 - 249 250 - 299	40 35	35 35	30 30	25 25	25 25	20 20
300 - 349 350 - 399	30 25	30 25	25 25	25 20	20 20	20 AM 20
400 - 449 450 - 499	25 20	25 20	20 20	20 20	20 20	15 15
500 - 549 550 - 599	20 20	20 20	20 20	20 15	15 15	15 15
600 - 649 650 - 699	20 20	20 15	15 15	15 15	15 15	15 15
700 - 749 750 or More	15 15	15 15	15 15	15 15	15 15	15 15

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

AM
← 1415/2 = 707
← 6
→ 590/2 = 295
↘ 17

PM
← 783/2 = 392
← 27
→ 1418/2 = 709
↘ 50

Result Summary			
Peak Hr.	Volume Threshold	Estimated Volume	Result
AM	20	6	Not Met
PM	15	27	Met *

TABLE 6B

RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 46 TO 55 MPH

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				X AM		
100 - 149 150 - 199						Yes
200 - 249 250 - 299				Yes	Yes Yes	Yes Yes
300 - 349 350 - 399			Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		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

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	Yes Yes	Yes (Yes) PM
100 - 149 150 - 199	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes 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.

AM → 590/2=295 → 17

PM → 1418/2=709 → 50

Result *
Threshold Met for PM Peak Hour