

November 5, 2015

Ms. Tarren Barrett  
Transportation Engineer  
Knoxville-Knox County MPC  
City/County Building, Suite 403  
400 Main Street  
Knoxville, TN 37902

RE: Lovelace Road and Hickory Creek Road Subdivision – Traffic Impact Evaluation Letter  
Knox County, Tennessee

Dear Ms. Barrett:

This letter is provided in order to summarize a traffic impact evaluation that was conducted for the referenced proposed subdivision. Traffic volumes, pavement width, roadway geometry and corner sight distance along Hickory Creek Road in the vicinity of the proposed project were all included as part of this evaluation. Hickory Creek Road is the roadway where the subdivision access is proposed, and the study section of this roadway is the portion located east of Lovelace Road.

#### Traffic Volumes

A traffic count was conducted on the study section of Hickory Creek Road in early November 2015. A sheet summarizing this count is attached, which indicates that the 24 hour volume counted was 2210 vehicles per day. Applying ADT correction factors for the two days that this count covered (Tuesday November 3 and Wednesday November 4), the estimated 2015 ADT is 2056 vehicles. Expanding this ADT to the estimated full project build-out year of 2020, by applying a growth rate of 5.0 percent per year for a 5 year period, yields an estimated year 2020 background traffic ADT of 2624.

The proposed project includes a maximum of 72 single-family detached housing units. Utilizing the fitted curve equation from the *ITE Trip Generation Manual, 9<sup>th</sup> Edition* (Code 210, page 296), the estimated number of newly generated weekday trips is 776. Assuming 80 percent of the subdivision traffic will orient east on Hickory Creek Road from the project site, this yields an estimated number of new trips on the study section of roadway of 621.

Combining the year 2020 estimated ADT of 2624 with the estimated subdivision generated trips of 621, the future year estimated ADT on the study section of roadway, Hickory Creek Road to the east of Lovelace Road, is 3245. This is the ADT that will be expected on this section of roadway when the proposed subdivision project is fully built-out and occupied.

Pavement Width

The existing pavement on Hickory Creek Road was measured to be at least 20 feet wide along the study section of roadway, and includes a striped centerline and two edgelines. In accordance with the *Knox County, Tennessee Strategic Transportation Plan Needs Assessment Report, December 2014*, the recommended maximum ADT for a 20 foot width road is 4000 vehicles. Therefore, given the year 2020 estimated ADT of 3224 with full project build-out, the existing pavement width of Hickory Creek Road appears adequate for the proposed development.

Roadway Geometry and Corner Sight Distance

Hickory Creek Road in the study area possesses a relatively straight horizontal alignment and vertically it generally conforms to the rolling terrain, possessing a series of vertical hillcrests. The speed limit on Hickory Creek Road is 40 mph. Therefore, the required corner sight distance for the proposed subdivision entrance is a minimum of 400 feet. If the subdivision street intersection is located at or in close proximity to one of the vertical hillcrests, then the required corner sight distance appears attainable.

Conclusions

It is the primary conclusion of this evaluation that the existing pavement width and geometry of Hickory Creek Road in the study area are adequate for the proposed development. This conclusion is supported by both the existing and projected traffic volumes, as well as the ability to provide the required corner sight distance for the proposed subdivision entrance intersection.

Please do not hesitate to contact me with any questions or if you require additional information.

Sincerely,



Alan L. Childers, P.E.  
Vice President

Attachments

cc: David Harbin



# Basic Volume Summary: Hickory Creek Road

Between Lovelace Road and W. Gallaher Ferry Road

Grand Total For Data From: 14:30 - 11/03/2015 To: 15:14 - 11/04/2015

Lane *	Total Count	# Of Days	ADT	Avg. Period	Avg. Hour	AM Total & Percent	PM Total & Percent
#1.	1195 (52.4%)	1.03	1159	12.1	48.3	358 (30.0%)	837 (70.0%)
#2.	1084 (47.6%)	1.03	1051	10.9	43.8	504 (46.5%)	580 (53.5%)
ALL	2279	1.03	2210	23.0	92.1	862 (37.8%)	1417 (62.2%)

Lane	Peak AM Hour	Date	Peak AM Factor	Peak PM Hour	Date	Peak PM Factor
#1.	10:45 = 80	11/04/2015	0.800	16:45 = 132	11/03/2015	0.868
#2.	07:15 = 128	11/04/2015	0.780	17:00 = 88	11/03/2015	0.880

\* Lane #1 is Westbound, #2 is Eastbound

Total 24 hour Count = 2210

TDOT Variation Factor Adjustment:

• Tuesday (11/3) -  $1159 \times 0.94 = 1089$

• Wednesday (11/4) -  $1051 \times 0.92 = 967$

Estimated ADT (2015) = 2056

Apply 5 years of growth at 5%/year:

•  $2056 \times 1.05^5 = 2624$

(Estimated ADT in Year 2020)

Single Family Detached Housing (ITE Code 210)

(Lovelace Road at Hickory Creek Subdivision)

Trips with fitted curve equation

Trip Ends on a Weekday:

$$\ln(T) = 0.92 \ln(x) + 2.72$$

where  $X = 72$  (max) dwelling units

$T = 776$  Total Trips

(388 enter, 388 exit)

(See attached sheet from ITE Trip Gen. Manual)

# Single-Family Detached Housing (210)

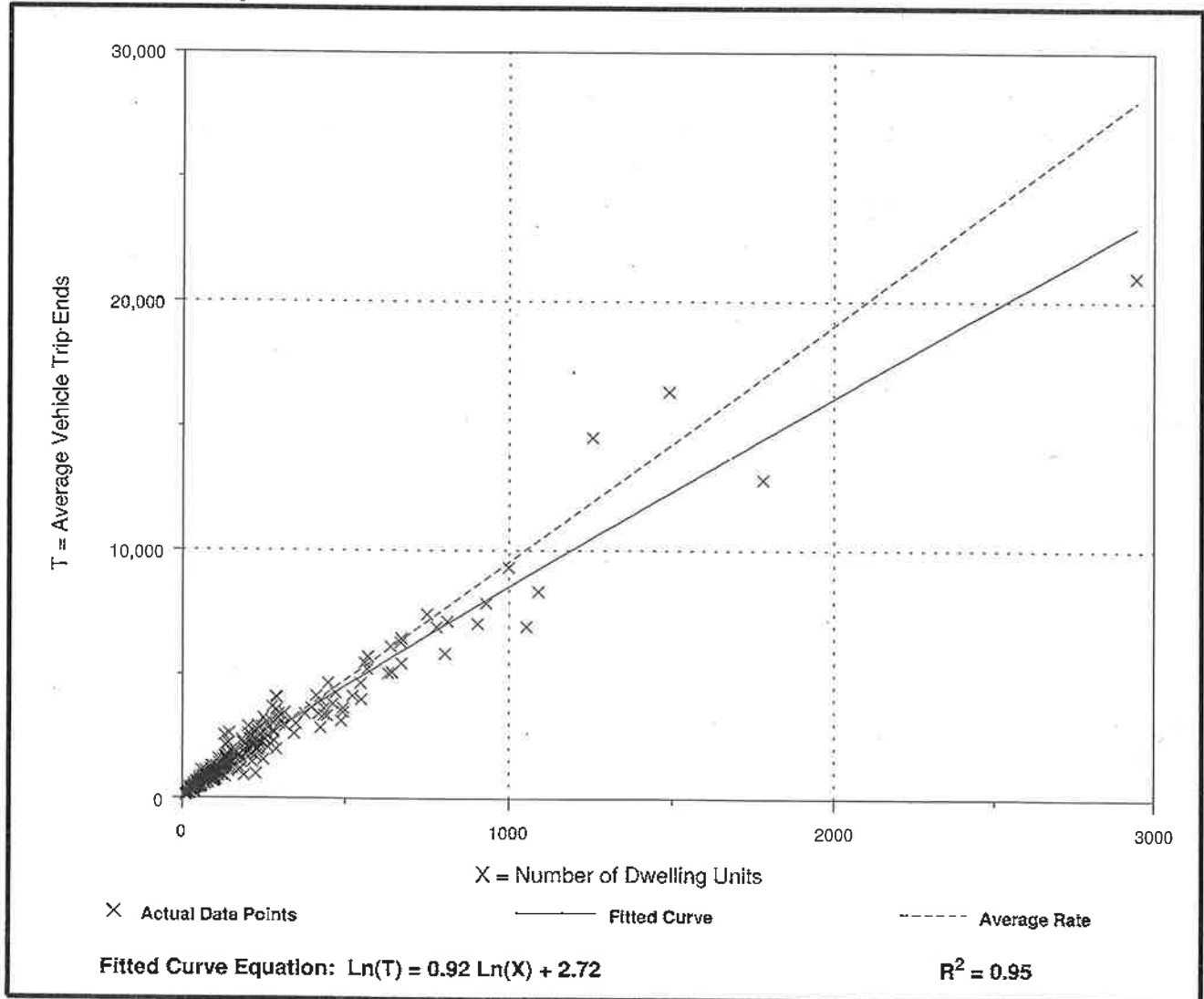
Average Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Number of Studies: 355  
Avg. Number of Dwelling Units: 198  
Directional Distribution: 50% entering, 50% exiting

## Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.52	4.31 - 21.85	3.70

## Data Plot and Equation





## Traffic History

Station #	County	Location	Route #
000135	Knox	HICKORY CR DR-NEAR LOUDON CO LINE	02422

### Record Year AADT

1	2014	1787
2	2013	1454
3	2012	1778
4	2011	1564
5	2010	1403
6	2009	1387
7	2008	1669
8	2007	1742
9	2006	1632
10	2005	1521
11	2004	1477
12	2003	1024
13	2002	1461
14	2001	1515
15	2000	1826
16	1999	1223
17	1998	1555
18	1997	1400
19	1996	1381
20	1995	1379
21	1994	1024
22	1993	1377
23	1992	991
24	1991	977
25	1990	1092
26	1989	967
27	1988	882

5 year annual growth  
 $\approx 5\%$  per year

Recommended Traffic Volumes by Pmnt. Width From  
"Knox County, Tennessee Strategic Transportation Plan  
Needs Assessment Report, December 2014"

<u>Pmnt Width</u>	<u>Recommended Max. ADT</u>
12'-16'	500
17'	1,000
18'	2,000
19'	3,000
20'	4,000
21'	5,000
22'	6,000
23'	7,000
24'	10,000