4-M-22-RZ / 4-G-22-SP
TIL Version 2
3/21/2022

March 21, 2022

Mr. Mike Conger
Knoxville-Knox County Planning
400 Main Street, Suite 403
Knoxville, TN 37902

Re: Traffic Letter for 7921 Thompson School Road

Dear Mr. Conger:

I-75 Land Partners, LLC is proposing a residential development at 7921 Thompson School Road in Knoxville, Tennessee. The total area of development is 95 acres and the property is currently zoned A (Agricultural and Estate). The developer plans to rezone the entire property to Planned Residential with a density of 3.2 units/acre or 300 single family lots. A preliminary site plan was not included with the rezoning application. Construction is proposed to take place this year and this analysis assumes full build out for the development will occur in 2027.

7921 Thompson School Road is located approximately 535 feet north of the intersection of Karnes Drive and Thompson School and approximately 1,000 feet south of the intersection of Lett Road. For the purpose of this traffic impact letter the Thompson School Road Subdivision was assumed to have a single driveway connection located near the center of the property at the existing single family driveway connection.

The purpose of this traffic analysis is to perform general segment-level capacity and geometric assessment of adjoining roadways per the Growth Policy Plan.

Existing Site Conditions

Thompson School Road is a two-lane road. The road width was measured by Knox County Engineering and Public Works and varies between 19 and 20 feet between the property line and Karnes Drive. The Knoxville-Knox County Planning Commission classifies Thompson School Road between Wood Road and E. Emory Road as a Major Collector with a 60 feet right-of-way per the Major Road Plan. The posted speed limit on Thompson School Road is 30 mph. Thompson School Road has no existing sidewalks or designated bike lanes in the vicinity of the proposed development. An aerial photo of the proposed driveway location is included in the attachments.

Karnes Drive is a two-lane road that provides access to residential properties. The road width was measured by Knox County Engineering and Public Works and varies between 15.5 feet and 16 feet between Barker Road and Thompson School Road. The Knoxville-Knox County Planning Commission does not classify Karnes Drive; therefore, it is considered a local street. The posted speed limit on Karnes Drive is 30 mph. An aerial

photo of the existing intersection of Thompson School Road at Karnes Drive is included in the attachments.

A copy of the road width measurements performed by Knox County Engineering and Public Works Staff is included in the attachments.

The Knoxville Area Transit (KAT) does not operate in the vicinity of the proposed development.

Traffic Volumes
FMA conducted a peak hour turning movement count at the unsignalized intersection of Thompson School Road and Karnes Drive on Wednesday February 16, 2022. The AM peak hour occurred between 7:00 a.m. and 8:00 a.m. with an AM PHF (peak hour factor) of 0.86. The PM peak hour occurred between 3:30 p.m. and 4:30 p.m. with a PM PHF of 0.80. The traffic data collected is included in the attachments.

Background Growth
The annual growth rate for the TDOT station #47000519 between 2016 and 2020 is approximately –2.18% and the 2020 ADT was 2,972 vehicles per day. In order to calculate traffic for the background year 2027, FMA assumed an annual growth rate of 2%. The projected 2027 ADT for Thompson School Road was 3,414 vehicles per day. Figure 1: 2022 Existing Peak Hour Traffic, Figure 2: 2027 Background Peak Hour Traffic and the ADT trend line growth charts are included in the attachments.

TDOT Roadway Projects
The Tennessee Department of Transportation is currently in the preliminary engineering stage on a road widening project between East Emory Road (SR-33) to near SR-331. The scope of work includes adding two lanes with a median or center turn lane, including bicycle and pedestrian facilities. This project had a proposed letting date of the 4th quarter of 2026.

Trip Generation
FMA evaluated the trip generation for both the existing and proposed zoning. The trip generation was calculated using the fitted curve equations provided from the *Trip Generation, 11th Edition,* published by the Institute of Transportation Engineers. Single-Family Detached Housing or Land Use 210 was used to calculate the daily trips, along with AM and PM peak hour trips. The land use worksheets are included in the attachments. A trip generation summary is shown below in Table 1 – Trip Generation Summary.

Table 1 - Trip Generation Summary
7921 Thompson School Road

Land Use	Density	Daily Trips	AM Peak Hour Enter	AM Peak Hour Exit	PM Peak Hour Enter	PM Peak Hour Exit
Existing – Agricultural & Estates Zoning – (1.0 Unit/Acre)						
Single-Family Detached Housing (LUC 210)	95 lots	963	18	50	60	35
Proposed – Planned Residential Zoning – (3.2 Units/Acre)						
Single-Family Detached Housing (LUC 210)	300 lots	2,772	53	149	176	103

The total number of new trips generated by the proposed residential development at 7921 Thompson School Road is estimated to be 2,772 new daily trips, 202 trips during the AM peak hour and 279 trips during the PM peak hour.

The existing 95-acre property is currently undeveloped. The rezoning of the property from Agricultural & Estates (1.0 Unit/Acre) to Planned Residential Zoning (3.2 Units/Acre) will increase the zoning density and the number of trips generated. The difference between the existing zoning (963 new trips) and the proposed zoning (2,772 new trips) will result in an additional 1,809 new daily trips, 134 trips during the AM peak hour and 184 trips during the PM peak hour.

Trip Distribution
The directional distribution of the new trips generated by the proposed subdivision on Thompson School Road was determined using existing traffic volumes at the intersection of Thompson School Road at Karnes Drive. FMA assumed that 70% of traffic would enter/exit from E Emory Road (SR 33), 20% of traffic would enter/exit from Karnes Drive towards Gibbs Schools and 10% would enter/exit from Thompson School Road north of the subdivision. Figure 3: Peak Hour Trip Distribution, Figure 4: Peak Hour Site Traffic and Figure 5: 2027 Full Buildout Site Traffic are included in the attachments.

The existing traffic count at the intersection of Thompson School Road at Karnes Drive shows evidence that traffic in the area is using Karnes Drive as a "cut-thru" to access Tazewell Pike (SR 131) and the Gibbs Schools. The trip distribution estimated that 20% of the subdivision traffic would enter/exit using Karnes Drive, adding approximately 41 trips during the AM peak hour and 56 trips during the PM peak hour to Karnes Drive.

Driveway Connection
The subdivision layout and driveway location are still under consideration as of March 2022. For the purpose of this traffic impact letter the Thompson School Road Subdivision

was assumed to have a single driveway connection located near the center of the property at the existing single family driveway connection**.** The approximate location of the driveway location is shown on the aerial photo for 7921 Thompson School Road.

The standard practice for a residential subdivision with 150 or more lots is to require at least two access points to provide alternative access opportunities in the event that one access is blocked by a fallen tree, crash, or other. The Thompson School Road Subdivision proposes 300 single family lots; therefore, FMA recommends that either a boulevard entrance or a roadway connection to the nearby subdivision at Bill Keaton Drive be considered to provide alternate means of access if one side is blocked.

Roadway Capacity and Level of Service

Roadway segment capacities for the existing, 2027 background and 2027 full buildout conditions were analyzed using a generalized Florida criterion for an urbanized area. A capacity of 12,480 vpd for Thompson School Road was determined for a two-lane undivided roadway with no left-turn lanes. The capacity for a two-lane undivided roadway is 15,600 vpd and was reduced by 20% to 12,480 vpd without left turn lanes. The FDOT Table 4-1 "Generalized Annual Average Daily Volumes for Florida's Urbanized Areas" is included in the attachments. The Knoxville-Knox County Planning department provided guidance in determining level-of-service for the overall segment-level capacity using the volume-to-capacity ratios. Table 2 – LOS for V/C Ratios is included below.

Table 2 – LOS for Volume to Capacity Ratios

V/C > 1.0 = LOS "F"
V/C > 0.85 = LOS "E"
V/C > 0.70 = LOS "D"
V/C > 0.50 = LOS "C"
V/C > 0.25 = LOS "B"
V/C < 0.25 = LOS "A"

The capacity, V/C ratio and LOS for the roadway segments including the existing, background and full buildout conditions for both the existing Agricultural and Estates Zoning and proposed Planned Residential Zoning are shown below in Table 3 – Roadway Segments.

Table 3 - Roadway Segments
Level of Service (LOS) Summary

	Capacity	ADT	V/C	Delay (sec)/LOS
Thompson School Road (2022 Existing)	12,480	2,972	0.24	LOS A
Thompson School Road (2027 Background)	12,480	3,414	0.27	LOS B
Thompson School Road (2027 Existing Zoning – 95 lots)	12,480	4,281	0.34	LOS B
Thompson School Road (2027 Full Buildout – 300 lots)	12,480	5,909	0.47	LOS B

Sight Distance
The minimum required sight distance for a road with a posted speed limit of 30 mph is 300 feet in each direction in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020. FMA recommends that the sight distance at the proposed intersection of Thompson School Road at the driveway connection (Road "A") be measured at 15 feet from the edge of pavement looking both directions in order to ensure that the proposed driveway location meets the minimum required sight distance per the subdivision regulations.

Conclusion and Recommendations
The rezoning of the property from a combination of Commercial and Agricultural & Estates to Planned Residential Zoning (3.2 Units/Acre) will increase the zoning density and the number of trips generated. The difference between the existing zoning (963 new trips) and the proposed rezoning (2,772 new trips) will result in an additional 1,809 new daily trips, 134 trips during the AM peak hour and 184 trips during the PM peak hour.

Thompson School Road segment capacity is currently operating at an acceptable LOS A. Thompson School Road is expected to operate at an acceptable LOS B after the rezoning to Planned Residential (3.2 Units/Acre) and the construction of the subdivision at 7921 Thompson School Road with 300 proposed single family lots; Therefore, the proposed development will not unreasonably impair traffic flow in the traffic analysis zone along Thompson School Road.

The width of Karnes Drive varies between 15.5 feet and 16 feet. The minimum recommended pavement width for a local road with a 30 mph design speed and a low volume ADT is 18 feet per AASHTO's A Policy on Geometric Design of Highways and Street. FMA did not identify any locations where spot improvements might be necessary, but the existing roadway width does not meet the minimum recommended pavement width.

The existing signage on Karnes Drive includes a speed limit sign in each direction and a "W1-6" horizontal rectangular sign with a large horizontal arrow pointing to the left for eastbound traffic approaching the horizontal curve. FMA recommends any improvements to Karnes Drive between Thompson School Road and Barker Road including road/shoulder widening, resurfacing, increased signage, etc. be coordinated with Knox County Engineering and Public Works.

The Thompson School Road Subdivision proposes a single driveway connection for 300 single family lots; therefore, FMA recommends that either a boulevard entrance or a roadway connection to the nearby subdivision at Bill Keaton Drive be considered to provide alternate means of access if one side is blocked.

The subdivision layout and design shall be in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020.

I hope that this is helpful. Please contact me if you have any questions.

Thank you,

Addie Kirkham, P.E.

Enclosure: Attachments

Attachments

7921 Thompson School Road

Printed: 2/24/2022 at 7:59:03 AM

0 100 200 400

ft

Knoxville - Knox County - KUB Geographic Information System

Thompson School Road at Karnes Drive

Printed: 2/24/2022 at 7:57:25 AM

0 25 50 100

ft

Knoxville - Knox County - KUB Geographic Information System

Project: Thompson School Road Subdivison
Intersection: Thompson School Road at Karnes Drive
Date Conducted: Wednesday February 16, 2022

	Thompson School Road Southbound			Karnes Drive Westbound			Thompson School Road Northbound			
Start	Left	Thru	Total	Left	Right	Total	Thru	Right	Total	Int. Total
7:00 AM	0	14	14	7	0	7	2	19	21	42
7:15 AM	2	18	20	10	0	10	2	36	38	68
7:30 AM	2	12	14	15	0	15	6	25	31	60
7:45 AM	1	5	6	41	2	43	5	11	16	65
Total	5	49	54	73	2	75	15	91	106	235
8:00 AM	1	7	8	9	0	9	3	22	25	42
8:15 AM	0	7	7	17	2	19	1	8	9	35
8:30 AM	0	8	8	7	0	7	2	4	6	21
8:45 AM	0	6	6	4	1	5	3	2	5	16
Total	1	28	29	37	3	40	9	36	45	114
2:00 PM	0	3	3	3	0	3	4	2	6	12
2:15 PM	1	7	8	3	0	3	4	7	11	22
2:30 PM	2	7	9	5	0	5	6	7	13	27
2:45 PM	1	1	2	4	0	4	11	10	21	27
Total	4	18	22	15	0	15	25	26	51	88
3:00 PM	1	6	7	4	2	6	7	6	13	26
3:15 PM	0	5	5	7	1	8	8	5	13	26
3:30 PM	0	10	10	36	0	36	10	4	14	60
3:45 PM	0	4	4	37	0	37	8	8	16	57
Total	1	25	26	84	3	87	33	23	56	169
4:00 PM	1	8	9	9	2	11	17	4	21	41
4:15 PM	0	6	6	4	2	6	13	9	22	34
4:30 PM	1	4	5	2	1	3	16	5	21	29
4:45 PM	1	9	10	0	0	0	8	5	13	23
Total	3	27	30	15	5	20	54	23	77	127
5:00 PM	1	8	9	5	0	5	17	4	21	35
5:15 PM	0	8	8	7	1	8	7	5	12	28
5:30 PM	0	9	9	4	0	4	18	7	25	38
5:45 PM	1	7	8	5	0	5	18	4	22	35
Total	2	32	34	21	1	22	60	20	80	136
Grand Total	16	179	195	245	14	259	196	219	415	869
Approach %	8.2	91.8		94.6	5.4		47.2	52.8		
Total %	1.8	20.6	22.4	28.2	1.6	29.8	22.6	25.2	47.8	

Project: Thompson School Road Subdivision
Intersection: Thompson School Road at Karnes Drive
Date Conducted: Wednesday February 16, 2022

AM Peak Hour	7:00 AM - 8:00 AM	235
PM Peak Hour	3:30 PM - 4:30 PM	192

	Thompson School Road Southbound			Karnes Drive Westbound			Thompson School Road Northbound			
Start	Left	Thru	Total	Left	Right	Total	Thru	Right	Total	Int. Total
Peak Hour Analysis from 7:00 AM to 9:00 AM										
AM Peak Hour begins at 7:00 AM										
7:00 AM	0	14	14	7	0	7	2	19	21	42
7:15 AM	2	**18**	20	10	0	10	2	**36**	38	**68**
7:30 AM	**2**	12	14	15	0	15	**6**	25	31	60
7:45 AM	1	5	6	**41**	**2**	43	5	11	16	65
Total Volume	5	49	54	73	2	75	15	91	106	235
Future (2% over 5 yrs)	6	54		81	2		17	100		259
PHF	0.63	0.68		0.45	0.25		0.63	0.63		0.86
Peak Hour Analysis from 2:00 PM to 6:00 PM										
PM Peak Hour begins at 3:30 PM										
3:30 PM	0	**10**	10	36	0	36	10	4	14	**60**
3:45 PM	0	4	4	**37**	0	37	8	8	16	57
4:00 PM	**1**	8	9	9	**2**	11	**17**	4	21	41
4:15 PM	0	6	6	4	2	6	13	**9**	22	34
Total Volume	1	28	29	86	4	90	48	25	73	192
Future (2% over 5 yrs)	1	31		95	4		53	28		212
PHF	0.25	0.70		0.58	0.50		0.71	0.69		0.80

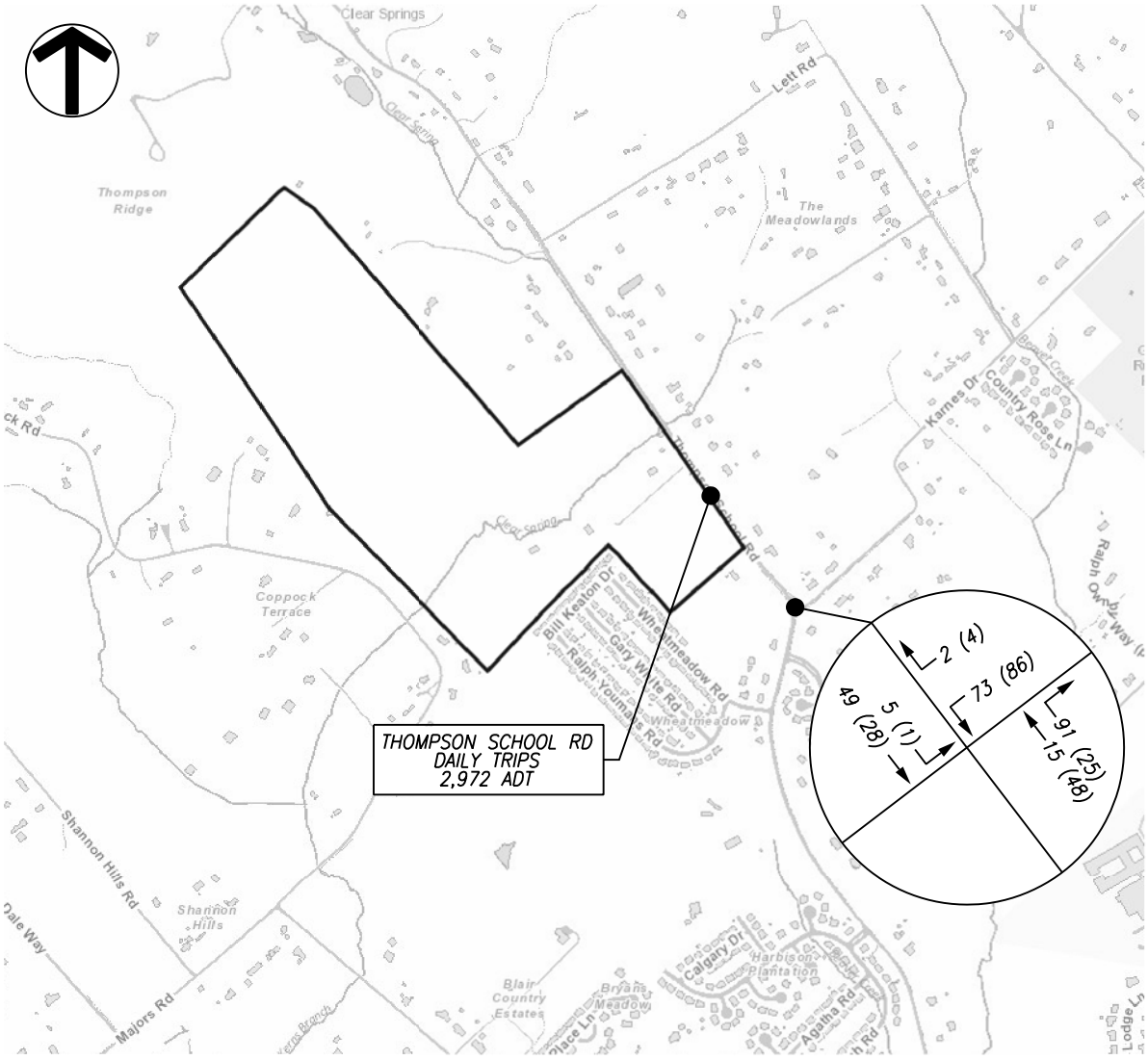
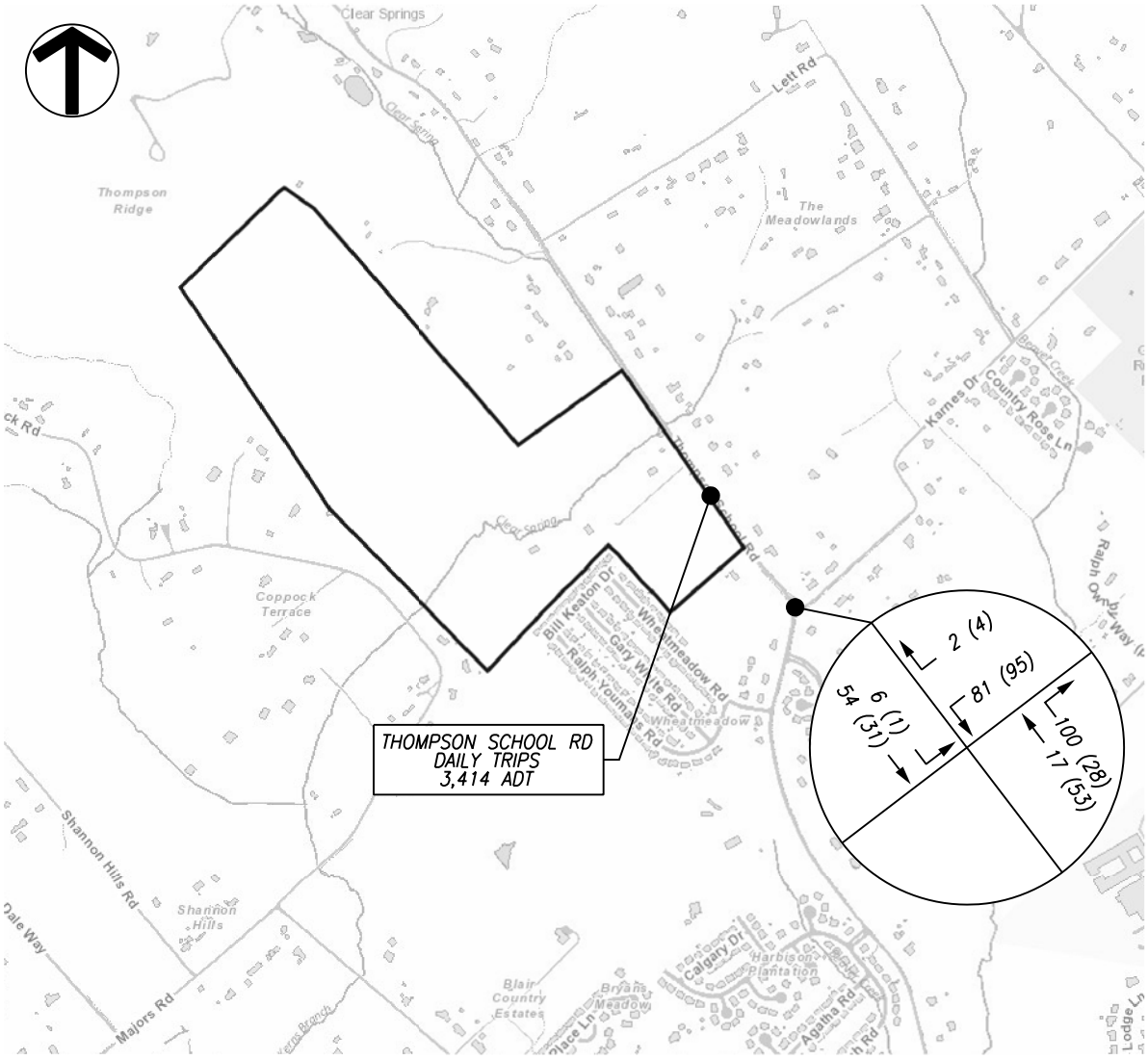


Figure 1: 2022 Existing Peak Hour Traffic

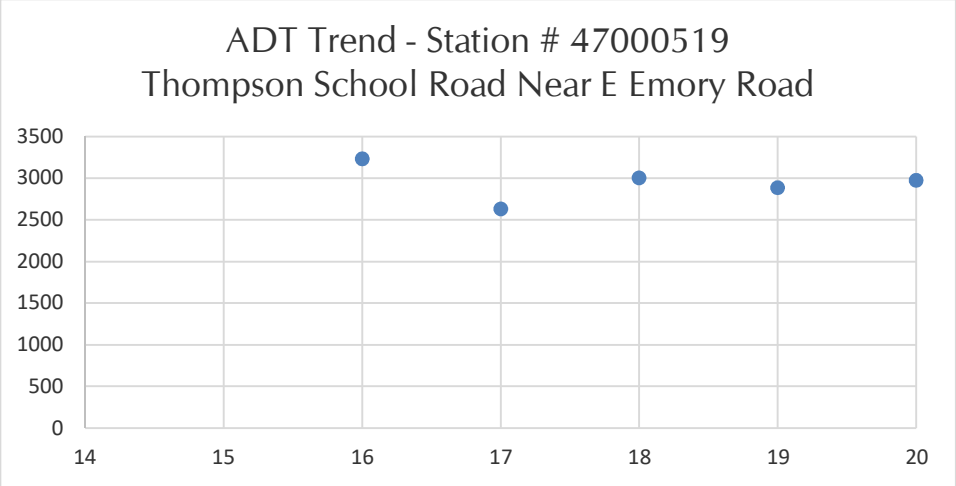


LEGEND:

← 123 (23) TURNING MOVEMENT VOLUME AM (PM)

Figure 2: 2027 Background Peak Hour Traffic

Year	Adjusted Average Daily Traffic
2001	
2002	
2003	
2004	
2005	
2006	
2007	
2008	
2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	3231
2017	2630
2018	3004
2019	2885
2020	2972



Most Recent Trend Line Growth

Year	ADT
2016	3231
2020	2972

Annual Percent Growth	**-2.18%**

Project: 7921 Thompson School Road
Date Conducted: 2/16/2022

Single-Family Detached Housing (LUC 210)
95 Single Family Lots

Average Daily Traffic
$Ln(T) = 0.92Ln(X) + 2.68$
$Ln(T) = 0.92Ln(95) + 2.68$
$T = 963$

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
$Ln(T) = 0.91Ln(X) + 0.12$
$Ln(T) = 0.91Ln(95) + 0.12$
$T = 68$

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
$Ln(T) = 0.94Ln(X) + 0.27$
$Ln(T) = 0.94Ln(95) + 0.27$
$T = 95$

Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	963	50%	50%	482	482
AM Peak Hour	68	26%	74%	18	50
PM Peak Hour	95	63%	37%	60	35

Project: 7921 Thompson School Road
Date Conducted: 2/16/2022

Single-Family Detached Housing (LUC 210)
300 Single Family Lots

Average Daily Traffic
$Ln(T) = 0.92Ln(X) + 2.68$
$Ln(T) = 0.92Ln(300) + 2.68$
$T = 2772$

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
$Ln(T) = 0.91Ln(X) + 0.12$
$Ln(T) = 0.91Ln(300) + 0.12$
$T = 202$

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
$Ln(T) = 0.94Ln(X) + 0.27$
$Ln(T) = 0.94Ln(300) + 0.27$
$T = 279$

Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	2772	50%	50%	1386	1386
AM Peak Hour	202	26%	74%	53	149
PM Peak Hour	279	63%	37%	176	103

Land Use: 210
Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077,1078, 1079

Single-Family Detached Housing
(210)

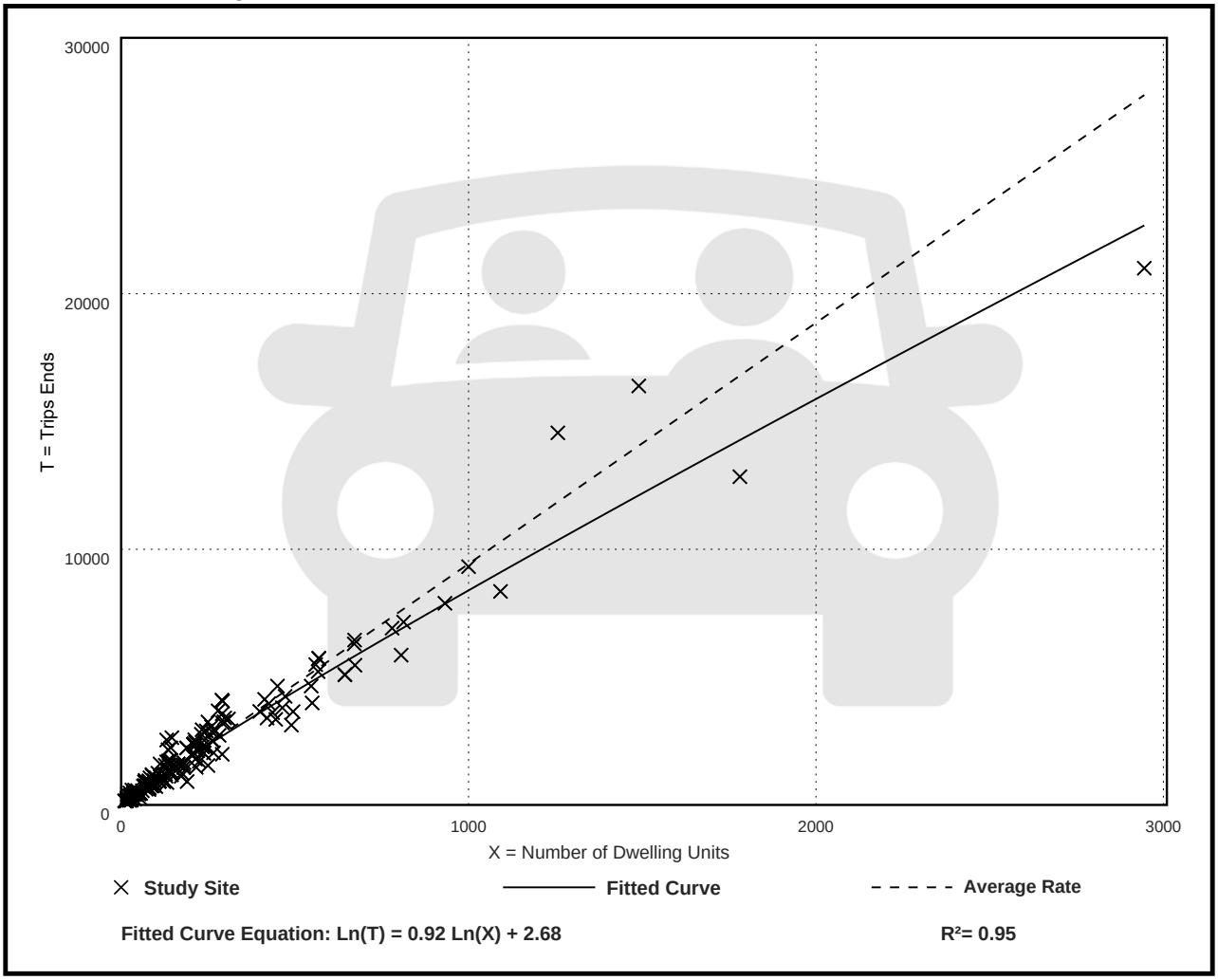
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.68

R^2= 0.95

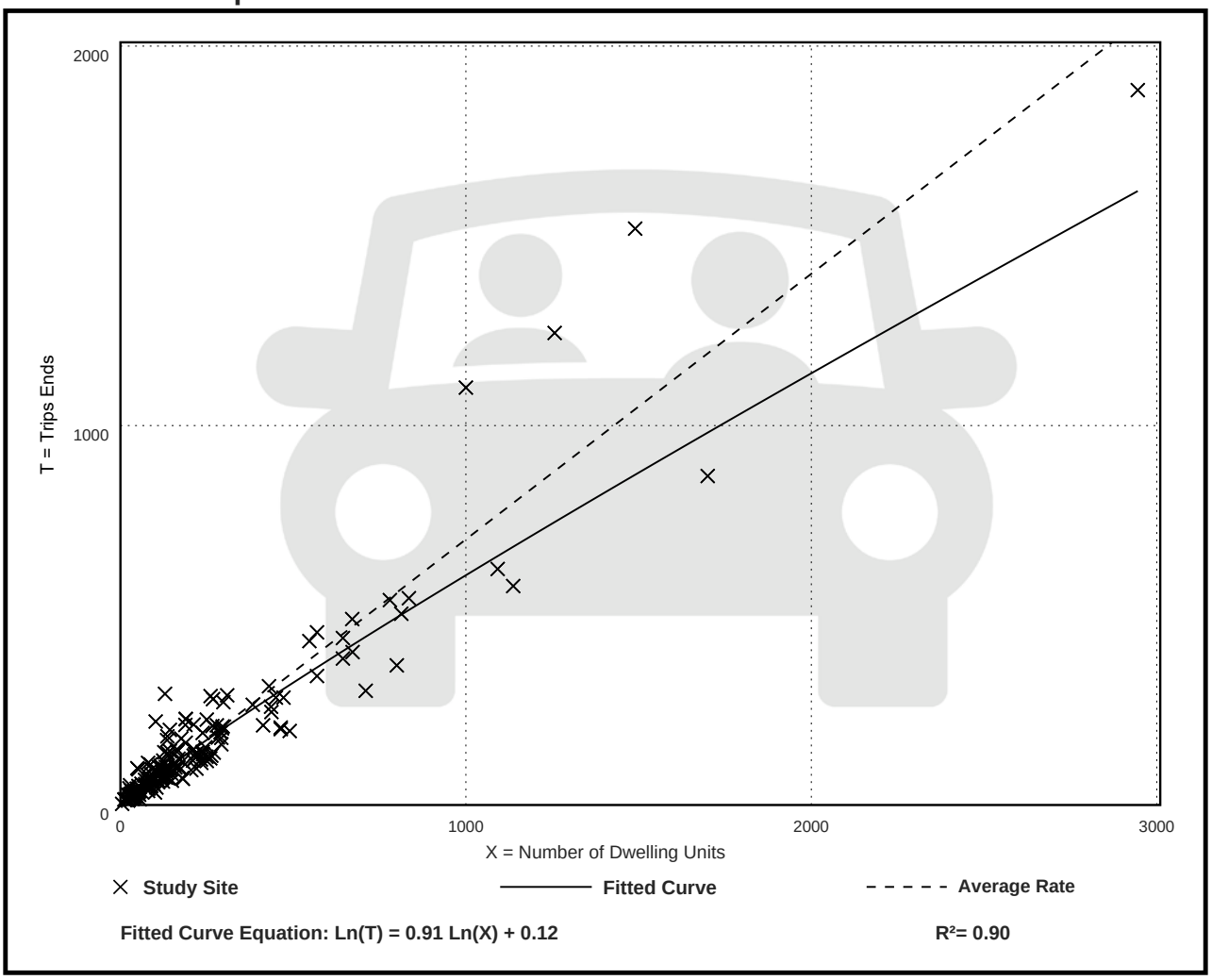
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



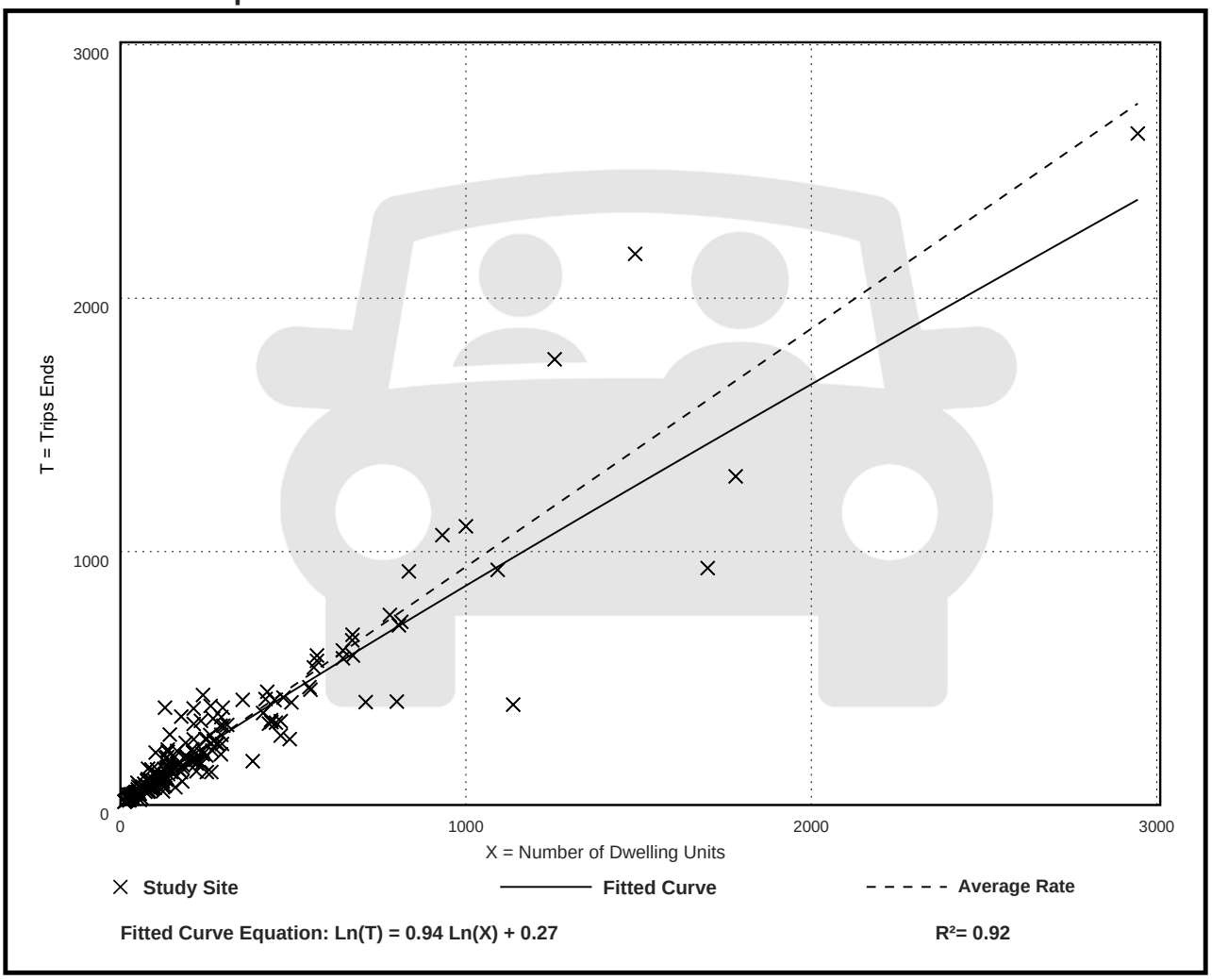
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



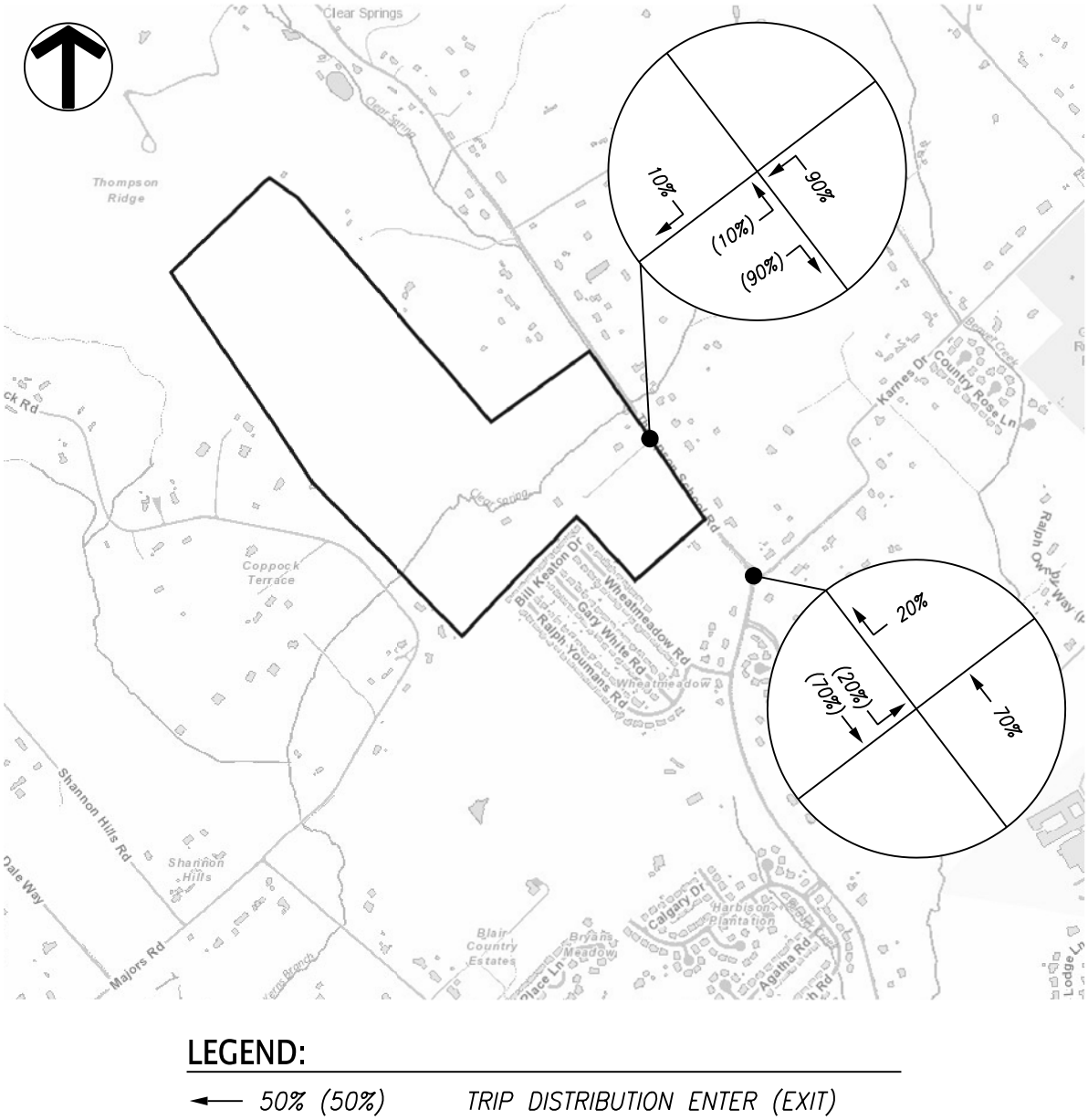


Figure 3: Peak Hour Trip Distribution

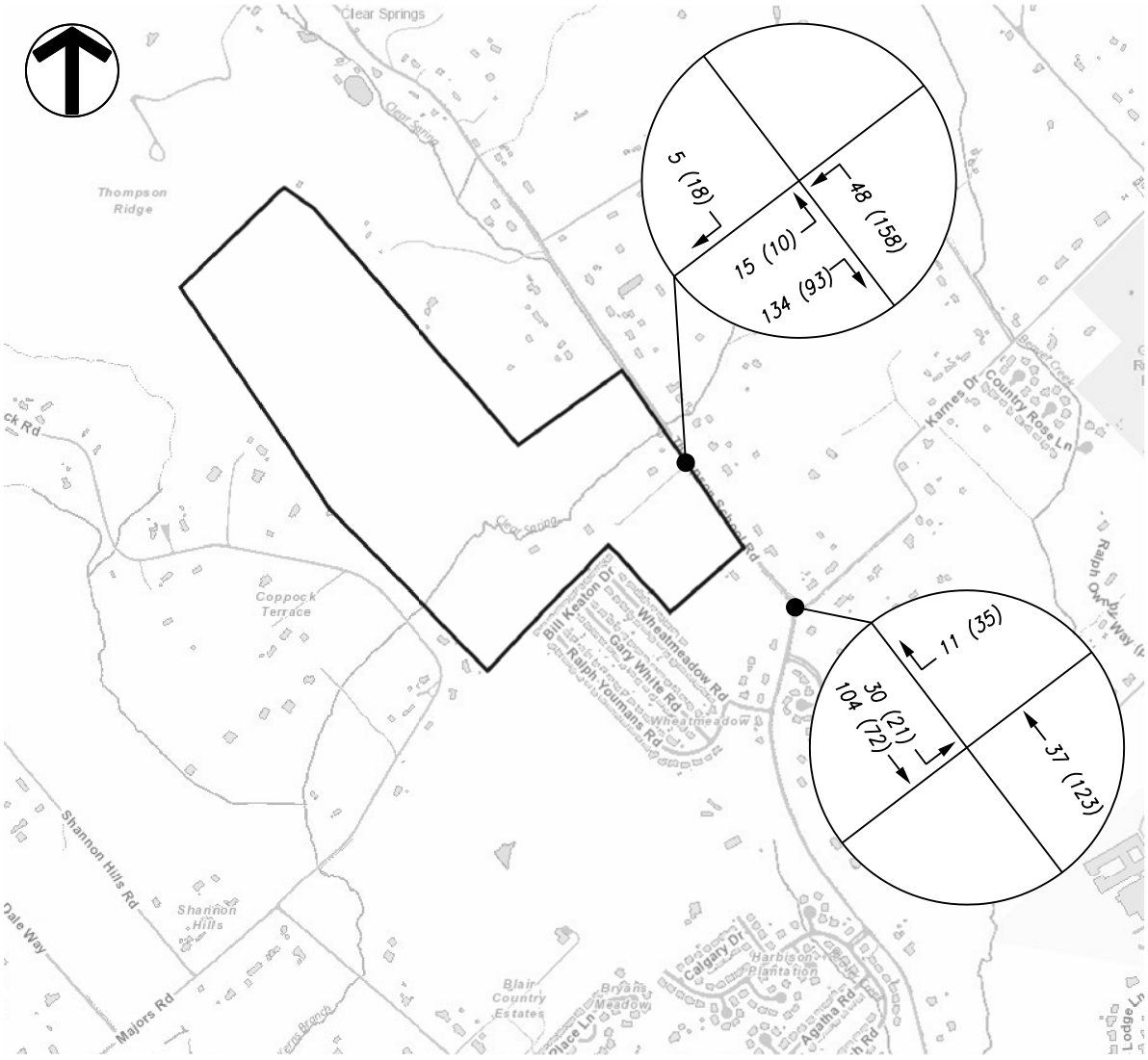


Figure 4: Peak Hour Site Traffic

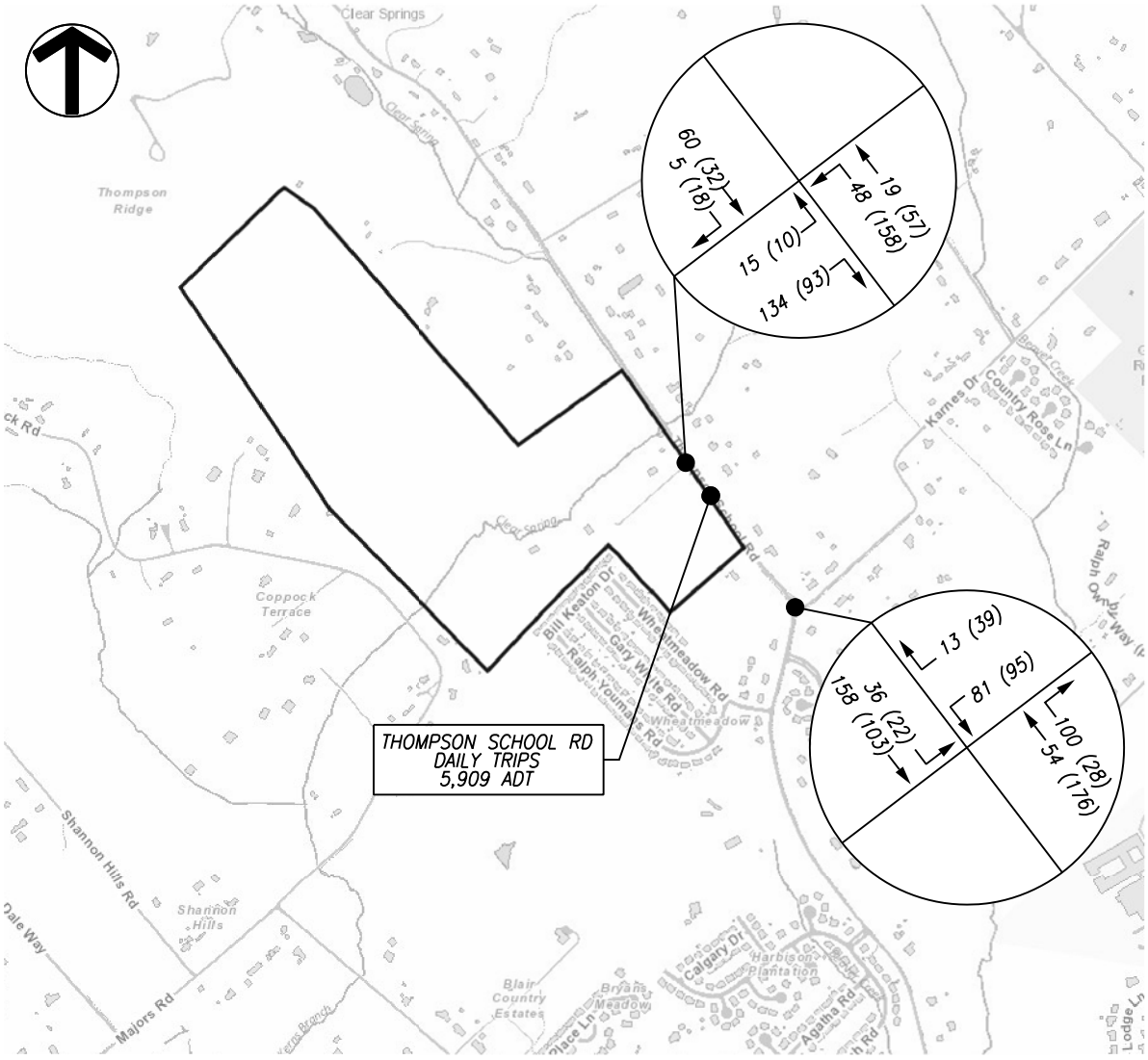


Figure 5: 2027 Full Buildout Site Traffic

TABLE 4 - 1
GENERALIZED **ANNUAL AVERAGE DAILY** VOLUMES FOR FLORIDA'S **URBANIZED AREAS***

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	2,000	7,000	13,800	19,600	27,000
4	Divided	20,400	33,000	47,800	61,800	70,200
6	Divided	30,500	49,500	71,600	92,700	105,400

STATE TWO-WAY ARTERIALS

Class I (>0.00 to 1.99 signalized intersections per mile)

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	**	4,200	13,800	16,400	16,900
4	Divided	4,800	29,300	34,700	35,700	***
6	Divided	7,300	44,700	52,100	53,500	***
8	Divided	9,400	58,000	66,100	67,800	***

Class II (2.00 to 4.50 signalized intersections per mile)

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	**	1,900	11,200	15,400	16,300
4	Divided	**	4,100	26,000	32,700	34,500
6	Divided	**	6,500	40,300	49,200	51,800
8	Divided	**	8,500	53,300	63,800	67,000

Class III (more than 4.5 signalized intersections per mile and not within primary city central business district of an urbanized area over 750,000)

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	**	**	5,300	12,600	15,500
4	Divided	**	**	12,400	28,900	32,800
6	Divided	**	**	19,500	44,700	49,300
8	Divided	**	**	25,800	58,700	63,800

Class IV (more than 4.5 signalized intersections per mile and within primary city central business district of an urbanized area over 750,000)

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	**	**	5,200	13,700	15,000
4	Divided	**	**	12,300	30,300	31,700
6	Divided	**	**	19,100	45,800	47,600
8	Divided	**	**	25,900	59,900	62,200

NON-STATE ROADWAYS

Major City/County Roadways

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	**	**	9,100	14,600	15,600
4	Divided	**	**	21,400	31,100	32,900
6	Divided	**	**	33,400	46,800	49,300

Other Signalized Roadways
(signalized intersection analysis)

Lanes	Divided	Level of Service A	B	C	D	E
2	Undivided	**	**	4,800	10,000	12,600
4	Divided	**	**	11,100	21,700	25,200

Source: Florida Department of Transportation 02/22/02
Systems Planning Office
605 Suwannee Street, MS 19
Tallahassee, FL 32399-0450
http://www11.myflorida.com/planning/systems/sm/los/default.htm

FREEWAYS

Interchange spacing ≥ 2 mi. apart

Lanes	Level of Service A	B	C	D	E
4	23,800	39,600	55,200	67,100	74,600
6	36,900	61,100	85,300	103,600	115,300
8	49,900	82,700	115,300	140,200	156,000
10	63,000	104,200	145,500	176,900	196,400
12	75,900	125,800	175,500	213,500	237,100

Interchange spacing < 2 mi. apart

Lanes	Level of Service A	B	C	D	E
4	22,000	36,000	52,000	67,200	76,500
6	34,800	56,500	81,700	105,800	120,200
8	47,500	77,000	111,400	144,300	163,900
10	60,200	97,500	141,200	182,600	207,600
12	72,900	118,100	170,900	221,100	251,200

BICYCLE MODE

(**Note**: Level of service for the bicycle mode in this table is based on roadway geometrics at 40 mph posted speed and traffic conditions, not number of bicyclists using the facility.) (Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/ Bicycle Lane Coverage	Level of Service A	B	C	D	E
0-49%	**	**	3,200	13,800	>13,800
50-84%	**	2,500	4,100	>4,100	***
85-100%	3,100	7,200	>7,200	***	***

PEDESTRIAN MODE

(**Note**: Level of service for the pedestrian mode in this table is based on roadway geometrics at 40 mph posted speed and traffic conditions, not number of pedestrians using the facility.) (Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	Level of Service A	B	C	D	E
0-49%	**	**	**	6,400	15,500
50-84%	**	**	**	9,900	19,000
85-100%	**	2,200	11,300	>11,300	***

BUS MODE (Scheduled Fixed Route)

(Buses per hour)

(**Note**: Buses per hour shown are only for the **peak hour** in the **single direction** of the higher traffic flow.)

Sidewalk Coverage	Level of Service A	B	C	D	E
0-84%	**	>5	≥4	≥3	≥2
85-100%	>6	>4	≥3	≥2	≥1

ARTERIAL/NON-STATE ROADWAY ADJUSTMENTS

DIVIDED/UNDIVIDED

(alter corresponding volume by the indicated percent)

Lanes	Median	Left Turns Lanes	Adjustment Factors
2	Divided	Yes	+5%
2	Undivided	No	-20%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

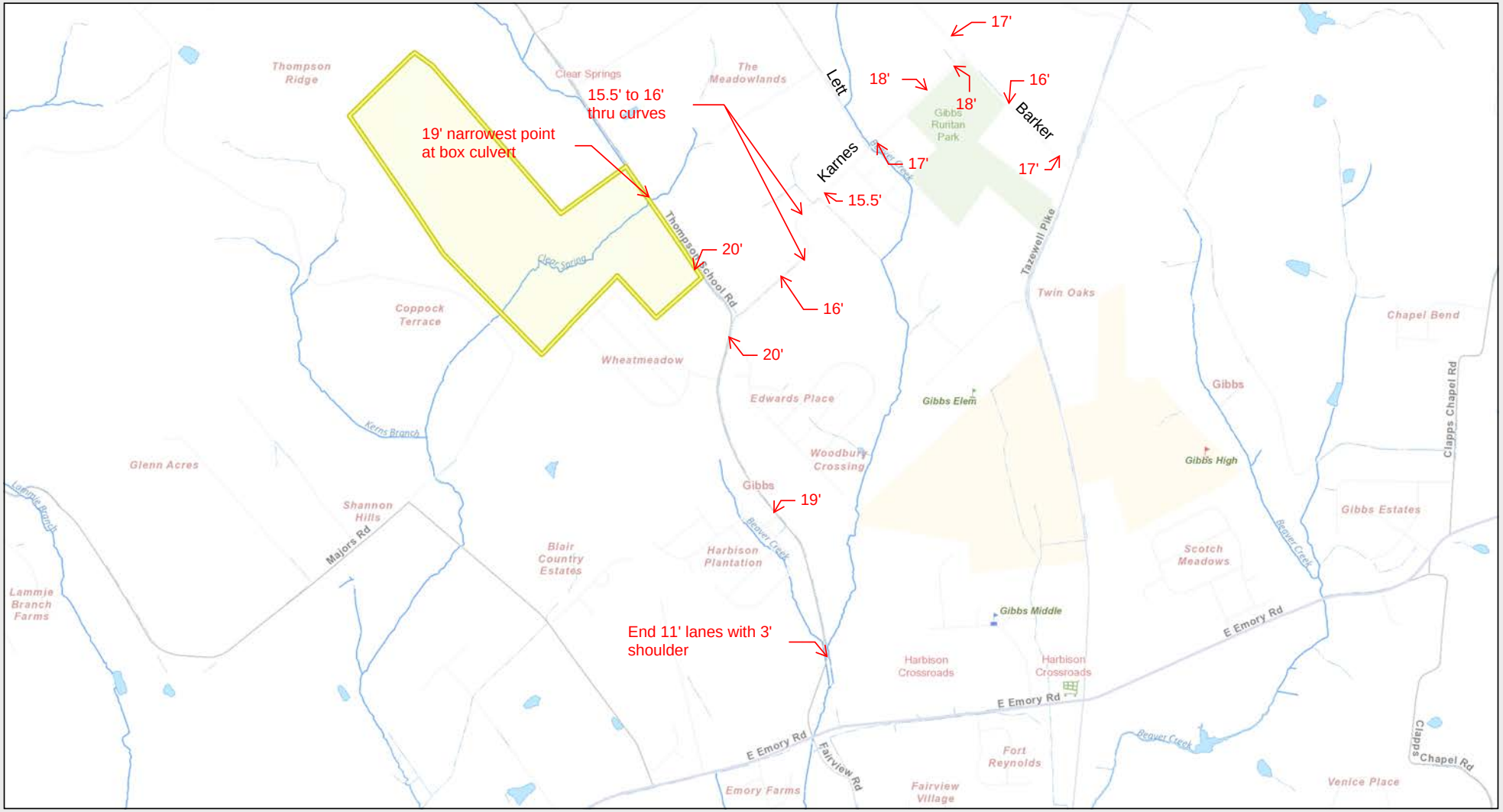
ONE-WAY FACILITIES

Decrease corresponding two-directional volumes in this table by 40% to obtain the equivalent one directional volume for one-way facilities.

*This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Values shown are two-way annual average daily volumes (based on K_{100} factors) for levels of service and are for the automobile/truck modes unless specifically stated. Level of service letter grade thresholds are probably not comparable across modes and, therefore, cross modal comparisons should be made with caution. Furthermore, combining levels of service of different modes into one overall roadway level of service is not recommended. The table's input value defaults and level of service criteria appear on the following page. Calculations are based on planning applications of the Highway Capacity Manual, Bicycle LOS Model, Pedestrian LOS Model and Transit Capacity and Quality of Service Manual, respectively for the automobile/truck, bicycle, pedestrian and bus modes.

**Cannot be achieved using table input value defaults.

***Not applicable for that level of service letter grade. For automobile/truck modes, volumes greater than level of service D become F because intersection capacities have been reached. For bicycle and pedestrian modes, the level of service letter grade (including F) is not achievable, because there is no maximum vehicle volume threshold using table input value defaults.



Title

Subtitle

Notes

0 500 1000 2000

Feet

Printed: 3/11/2022 10:26:15 AM

Date: March 21, 2022

Project Name: 7921 Thompson School Rd TIL

To: Knoxville-Knox County Planning

Subject: Traffic Letter Review for 7921 Thompson School Rd TIL Comments (4-M-22-RZ/4-G-22-SP)

Dear Knoxville-Knox County Planning staff,

The following comment response document is submitted to address comments dated March 14, 2022:

1. **Reviewer Comment:** Please update the road width information in the TIL based on the dimensions in the attached map that were collected in the field by Knox County EPW staff.

   Response: Updated the existing road width for Thompson School Road and Karnes Drive and added the road width measurements performed by Knox County Engineering and Public Works.

2. **Reviewer Comment:** Please show the location of the proposed driveway on the aerial photo in the attachments.

   Response: Added the following statement to the Traffic Letter. "The subdivision layout and driveway location are still under consideration as of March 2022. For the purpose of this traffic impact letter the Thompson School Road Subdivision was assumed to have a single driveway connection located near the center of the property at the existing single family driveway connection."

3. **Reviewer Comment:** A subdivision with more than 150 lots should generally provide more than one public road access. Please discuss options for providing secondary access or other measures to address this such as a boulevard entrance road that provides alternate means of access in one side is blocked.

   Response: Added the following statement to the Traffic Letter. "The Thompson School Road Subdivision proposes 300 single family lots; therefore, FMA recommends that either a boulevard entrance or a roadway connection to the nearby subdivision at Bill Keaton Drive be considered to provide alternate means of access if one side is blocked."

4. **Reviewer Comment:** The TDOT roadway project is not currently under construction as was stated in the TIL, instead it is still in the preliminary engineering stage – please correct this section.

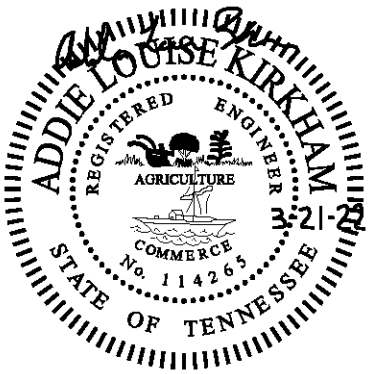
   Response: Revised "under construction" to "preliminary engineering stage"

5. **Reviewer Comment:** Please include further discussion regarding the potential for traffic using Karnes Drive and Barker Road from this development to access the Gibbs Schools. It is apparent from the existing traffic count peak periods and high distribution of volume on Karnes Drive as opposed to Thompson School Road that existing subdivisions are already using this as a "cut-thru". Discuss the potential additional total daily trips from this development and any particular locations that may need spot improvements such as lane/shoulder widening or signage to improve safety for existing and future traffic volumes.

   Response: Included a statement regarding additional traffic using Karnes Drive as a "cut-thru". Also added the following statements to the Traffic Letter under Conclusions and Recommendations. "FMA did not identify any locations where spot improvements might be necessary, but the existing roadway width does not meet the minimum recommended pavement width.

   FMA recommends any improvements to Karnes Drive between Thompson School Road and Barker Road including road/shoulder widening, resurfacing, increased signage, etc. be coordinated with Knox County Engineering and Public Works."

Sincerely,



Addie Kirkham, P.E.