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TIS Version 2
10/19/2026

VALERIANO PROPERTY SUBDIVISION TRAFFIC IMPACT STUDY

ANDREW JOHNSON HIGHWAY (US 11E)
KNOX COUNTY, TN

ARDURRA PROJECT NO. 02004-0001.000

PREPARED FOR:
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405 Montbrook Lane
Knoxville, TN 37919
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SUBMITTED BY
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Revised
October 19
2026

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1 EXECUTIVE SUMMARY

This report provides a summary of a traffic impact study that was performed for a proposed residential development to be located along Andrew Johnson Highway (US 11E) within the Trentville community of Knox County, TN. The project site is located northeast of the intersection of Asheville Highway (US 25W) at Andrew Johnson Highway (US 11E). The conceptual plan for this project, Valeriano Property Subdivision, proposes a total of 117 Single Family Lots.

The conceptual plan shows one site access onto Andrew Johnson Highway (US 11E) at an existing median opening located approximately 860 feet east of Pleasant Hill Road and 3,640 feet west of N Ruggles Ferry Pike.

The purpose of this study was the evaluation of the traffic operational and safety impacts of the proposed residential development upon roadways in the vicinity of the site. Of particular interest in this study is the proposed development access at Andrew Johnson Highway (US 11E). Appropriate intersection evaluations were conducted at this location in order to determine the anticipated impacts and to establish recommended measures to mitigate these impacts. These evaluations included trip generation, trip distribution, capacity analyses, turn lane warrant analyses and sight distance assessments.

The primary conclusion of this study is that traffic generated from the proposed residential development will have minor impacts on delay at the intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road. Under the proposed conditions evaluated, the Andrew Johnson Highway (US 11E) at Pleasant Hill Road intersection was found to operate at a LOS “C” or better, while the proposed site access (Road “A”) was found to operate at a LOS “D” or better.

The following list is a summary of the improvements that are recommended to be implemented with the construction of this project:

1. Install STOP sign at unsignalized Site Access (Road “A”) at Andrew Johnson Highway (US 11E).

2. A southbound left turn lane on Andrew Johnson Highway (US 11E) is warranted per the TDOT Highway System Access Manual during combined conditions as a result of traffic from the proposed development. Ardurra recommends that a left turn lane be installed with a minimum recommended queue storage length of 50 feet and a bay taper length of 220 feet.

3. Widen the existing median opening. The recommended minimum median opening per TDOT standard drawings is 48 feet.

4. Ardurra recommends that the radius of curvature at the proposed Site Access (Road “A”) at Andrew Johnson Highway (US 11E) be increased to 40 feet to accommodate a single-unit truck at a minimum.

5. Any future improvements to the intersection need to be reviewed, coordinated and approved by the Tennessee Department of Transportation.

2 INTRODUCTION & PURPOSE OF STUDY

This report provides a summary of a traffic impact study that was performed for a proposed residential development to be located along Andrew Johnson Highway (US 11E) within the Trentville Community in Knox County, TN. The project site is located northeast of the intersection of Asheville Highway (US 25W) at Andrew Johnson Highway (US 11E). FIGURE 1 is a location map identifying the major roadways in the vicinity of the site.

FIGURE 1
LOCATION MAP

The conceptual plan for this project, Valeriano Property Subdivision, proposes a residential development with 117 single-family lots. The project is to have one site access onto Andrew Johnson Highway (US 11E) at an existing median opening located approximately 860 feet east of Pleasant Hill Road and 3,640 feet west of N Ruggles Ferry Pike. A Conceptual Site Plan which details the proposed site configuration can be found in APPENDIX A.

The purpose of this study was the evaluation of the traffic operational and safety impacts of the proposed residential development upon roadways in the vicinity of the site. Of particular interest in this study is the proposed development access at Andrew Johnson Highway (US 11E). Appropriate intersection evaluations were conducted at this location to determine the anticipated impacts and to establish recommended measures to mitigate these impacts. These evaluations included trip generation, trip distribution, capacity analyses, turn lane warrant analyses and sight distance assessments.

3 EXISTING CONDITIONS

EXISTING ROADWAY CONDITIONS

According to the Knoxville-Knox County Major Road Plan Andrew Johnson Highway (US 11E) is a Major Arterial with a 120-foot right-of-way between Asheville Highway (US 25W) and the Jefferson County Line and provides east-west access in Knox County. Andrew Johnson Highway carries traffic to and from both residential and commercial areas. In the vicinity of the proposed development, the roadway consists of two 12-foot through travel lanes in each direction with a 32-foot grass median. The are 10-foot shoulders and rumble strips on both eastbound and westbound travel lanes. The speed limit on Andrew Johnson Highway (US 11E) is posted as 55 mph. The 2025 ADT on Andrew Johnson Highway (US 11E) was 17,390 vpd. The existing median cut has an approximate width of 26 feet at the proposed location of the subdivision site access.

Pleasant Hill Road is not classified by the Knoxville-Knox County Major Road Plan; therefore, it is considered a Local Street. The posted speed limit on Pleasant Hill Road is 25 mph.

EXISTING SITE CONDITIONS

The total site acreage for this project consists of approximately 28.86 acres located northeast of the intersection of Asheville Highway (US 25W) at Andrew Johnson Highway (US 11E). Knoxville is located to the west and Jefferson County is located to the east of the proposed site. The site is primarily bordered by general agricultural and residential land uses with some commercial land uses south near the intersection of Asheville Highway (US 25W) at Andrew Johnson Highway (US 11E).

The existing site is located in the vicinity of Carter Elementary School with access to Strawberry Plains Pike and Carter Middle School and Carter High School with access to North Carter School Road.

The Parent Responsibility Zone (PRZ) for Knox County Schools is an area around the school where the parent is responsible for providing transportation and the student is not eligible for school bus service. The Elementary School PRZ is one (1) mile from the school, and the Middle and High School PRZ is one-half (1.5) miles from the school by the shortest route on a publicly maintained road. The proposed subdivision will be in the Parent Responsibility Zone for both Carter Middle School and Carter High School but not Carter Elementary School.

FIGURE 2
EXISTING SITE CONDITIONS

EXISTING TRAFFIC DATA

Existing traffic data was gathered for this study. Annual average daily traffic data (AADT) collected by TDOT along Andrew Johnson Highway (US 11E) in the area of the proposed development were utilized. Two count stations, one located on Andrew Johnson Highway (US 11E) near the intersection with Pleasant Hill Road and one located on Andrew Johnson Highway (US 11E) near the Jefferson County Line, were felt to have relevance for this study. The most currently available data from these count stations is contained in TABLE 1.

In addition to the available AADT data, an intersection turning movement traffic count was performed to determine the current AM and PM peak hour operating volumes at the intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road. The traffic count was conducted in September 2026. The raw data traffic count summary sheets are contained in APPENDIX A.

TABLE 1
ANNUAL AVERAGE DAILY TRAFFIC COUNT SUMMARY

COUNT YEAR	TDOT COUNT STATION 47000060 AJ HWY (US 11E) AT PLEASANT HILL RD	TDOT COUNT STATION 47000218 AJ HWY (US 11E) AT JEFFERSON CO LINE
2025	17,390	14,648
2024	18,915	14,347
2023	17,946	14,907
2022	18,196	16,988
2021	17,282	18,274
2020	17,162	15,538
2019	19,327	17,916
2018	19,099	17,115
2017	18,622	19,341
2016	19,644	18,597
2015	18,271	18,133
2014	18,016	16,472
2013	18,587	17,134
2012	18,506	16,466
2011	17,934	16,603
2010	18,210	16,307

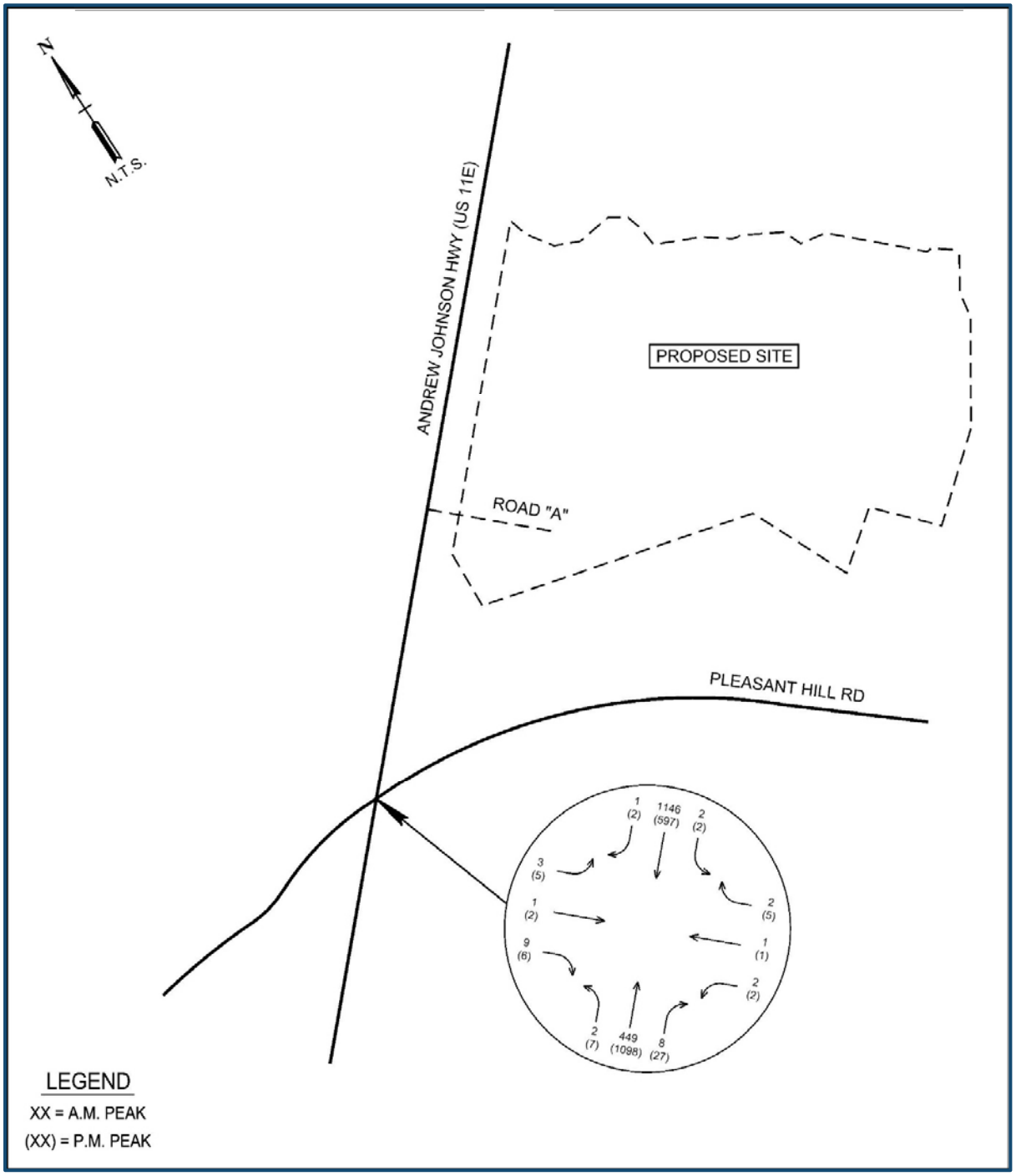


FIGURE 3
2026 EXISTING TRAFFIC VOLUMES

EXISTING CAPACITY ANALYSES / LEVELS-OF-SERVICE

Capacity analyses employing the methods of the Highway Capacity Manual (7th Edition) were conducted for the existing study intersection. The analyses were performed with the 2026 existing traffic volumes and existing intersection traffic control and lane configurations. The intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road was found to operate at a Level-of-Service (LOS) "C" during the both the AM and PM peak hours with approach delays of 18.0 seconds and 17.9 seconds, respectively.

The EVALUATIONS section of this report may be referenced for tabular summaries and discussion of these analyses, while more detailed summaries are presented on the computer printouts contained in APPENDIX C.

4 BACKGROUND CONDITIONS

BACKGROUND TRAFFIC GROWTH

To determine traffic volumes resulting solely from background traffic growth to year 2031, it was necessary to establish an annual growth rate for existing traffic. The ADT values previously discussed, as well as knowledge of the area, were used to determine an approximate annual growth rate. Based on the available data, a background annual growth rate of 1.0% was assumed. Existing volumes from the intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road were grown by 1.0% every year from the year 2026, when the counts were conducted, to the year 2031.

The background traffic volumes shown on FIGURE 4 represent the Year 2031 background growth conditions without traffic related to the proposed development.

BACKGROUND CAPACITY ANALYSES / LEVELS-OF-SERVICE

Appropriate capacity analyses as described in the Existing Conditions section of this report were conducted utilizing the Year 2031 background volumes shown in FIGURE 4. Under Year 2031 background conditions, without traffic related to the proposed development, the intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road was found to operate at a Level-of-Service (LOS) “C” during both the AM and PM peak hours with an approach delay of 19.0 seconds and 18.9 seconds, respectively.

The EVALUATIONS section of this report may be referenced for tabular summaries and discussion of these analyses, while more detailed summaries are presented on the computer printouts contained in APPENDIX C.

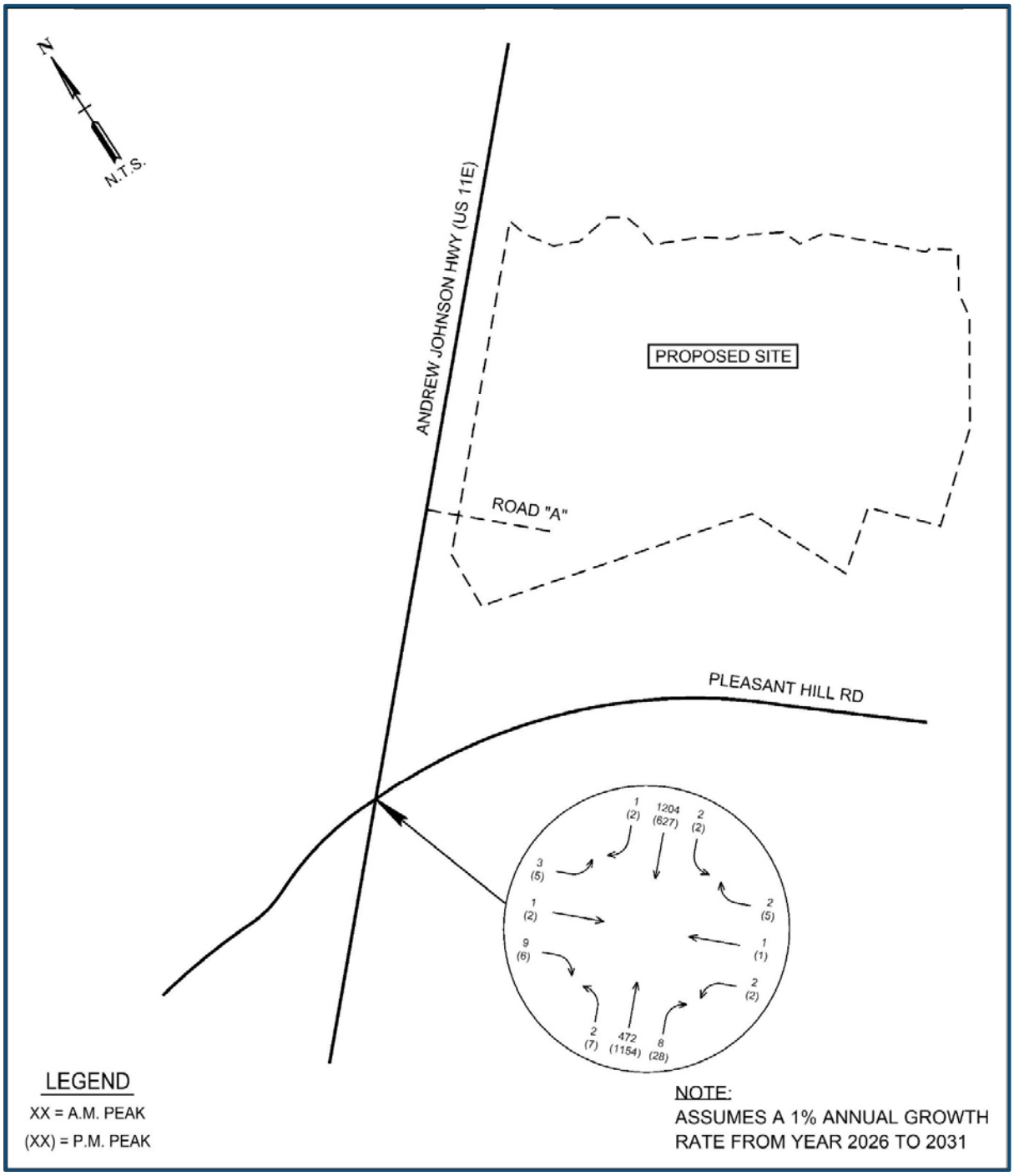


FIGURE 4
2031 BACKGROUND TRAFFIC VOLUMES

5 FUTURE CONDITIONS

TRIP GENERATION

In order to estimate the expected traffic volumes to be generated by the proposed development, the procedures recommended by the Institute of Transportation Engineers were utilized. Trip generation rates developed by the Institute of Transportation Engineers (Trip Generation, 12th Edition) were utilized to generate the estimated trips for the proposed development. The generated traffic volumes were determined based on the data for the weekday, AM peak hour and PM peak hour. Fitted curve equations were used for the trip generation calculations. Based on standard practices, if the "R-squared" value is 0.75 or greater the fitted curve equation is used for trip generation, otherwise the average rate is used. TABLE 2 provides a summary of the expected newly generated traffic for the development. More detailed information is contained in APPENDIX B.

TABLE 2
TRIP GENERATION SUMMARY

LAND USE	ITE CODE	SIZE	WEEKDAY (TRIPS/DAY)	AM PEAK HOUR (TRIPS/HR)	PM PEAK HOUR (TRIPS/HR)
Single-Family Detached	210	117 Lots			
Entering Trips			605	23	69
Exiting Trips			605	61	42
Total			1210	84	111

TRIP DISTRIBUTION AND ASSIGNMENT

FIGURE 5 provides a summary of the trip distribution patterns assumed for this study. These patterns were based on the existing traffic patterns derived from the traffic counts and knowledge of the area. FIGURE 6 provides a summary of the anticipated trips associated with the proposed development as assigned to the study intersection utilizing the trip generation data from TABLE 2 and the distribution patterns shown on FIGURE 5.

FIGURE 7 represents the 2031 combined traffic data with anticipated trips from the proposed development. The volumes shown in FIGURE 7 are the combined volumes used in the analysis of the future conditions.

FUTURE CAPACITY ANALYSES / LEVELS-OF-SERVICE

Capacity analyses as described in the Existing Conditions section of this report were conducted for 2031, full build-out conditions utilizing the Year 2031 combined volumes shown in FIGURE 7.

Under 2031 combined conditions, the intersection of Andrew Johnson Highway (US 11E) and the proposed site access (Road "A") was found to operate at a LOS "C" during the AM peak hour and at a LOS "D" in the PM peak hour with an approach delay of 16.1 seconds and 26.4 seconds, respectively. The intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road was found to operate at a LOS "C" during both the AM and PM peak hours with an approach delay of 19.7 and 19.6 seconds, respectively.

The EVALUATIONS section of this report may be referenced for tabular summaries and discussion of these analyses, while more detailed summaries are presented on the computer printouts contained in APPENDIX C.

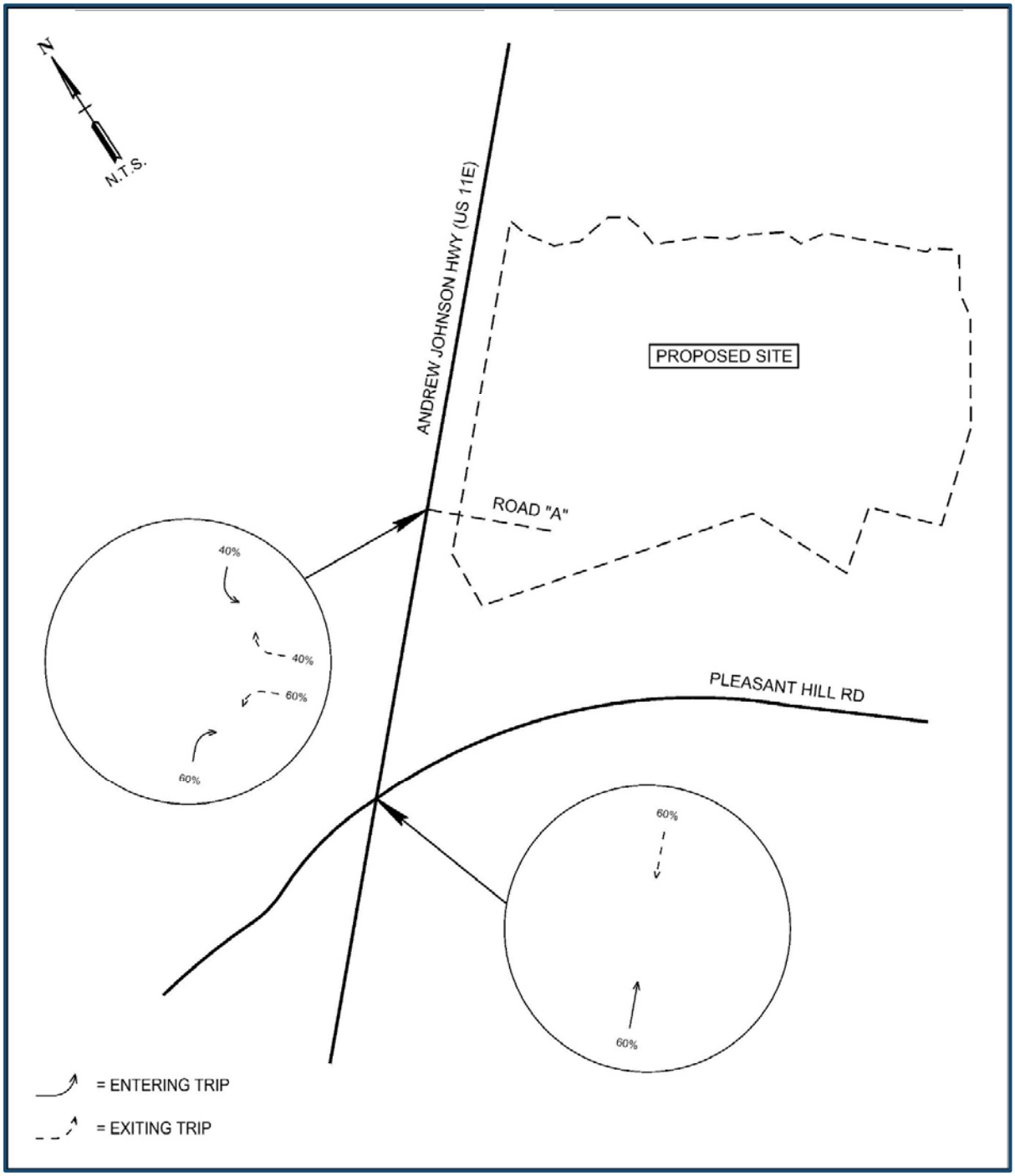


FIGURE 5
TRIP DISTRIBUTION PATTERNS

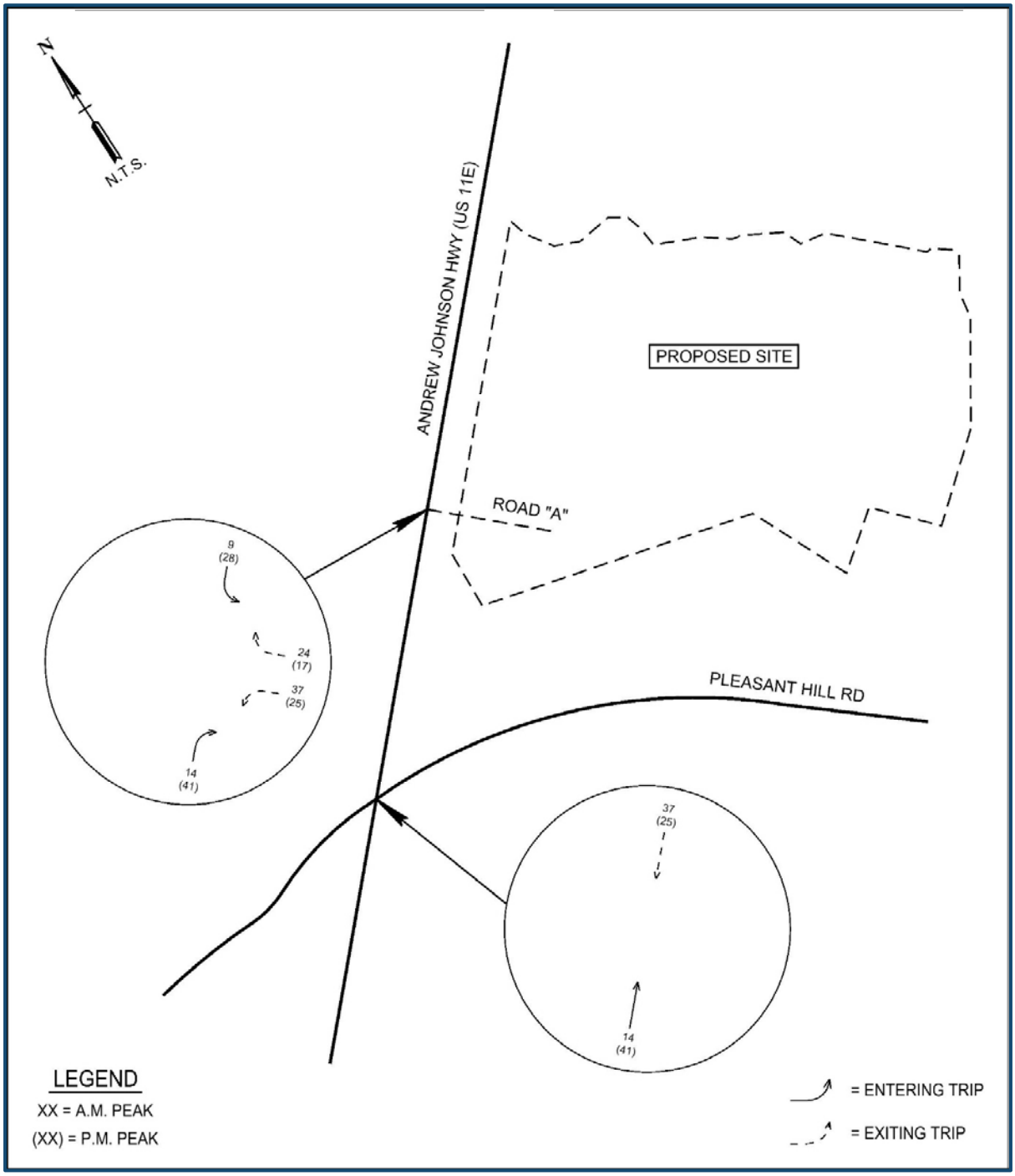


FIGURE 6
TRIP ASSIGNMENT

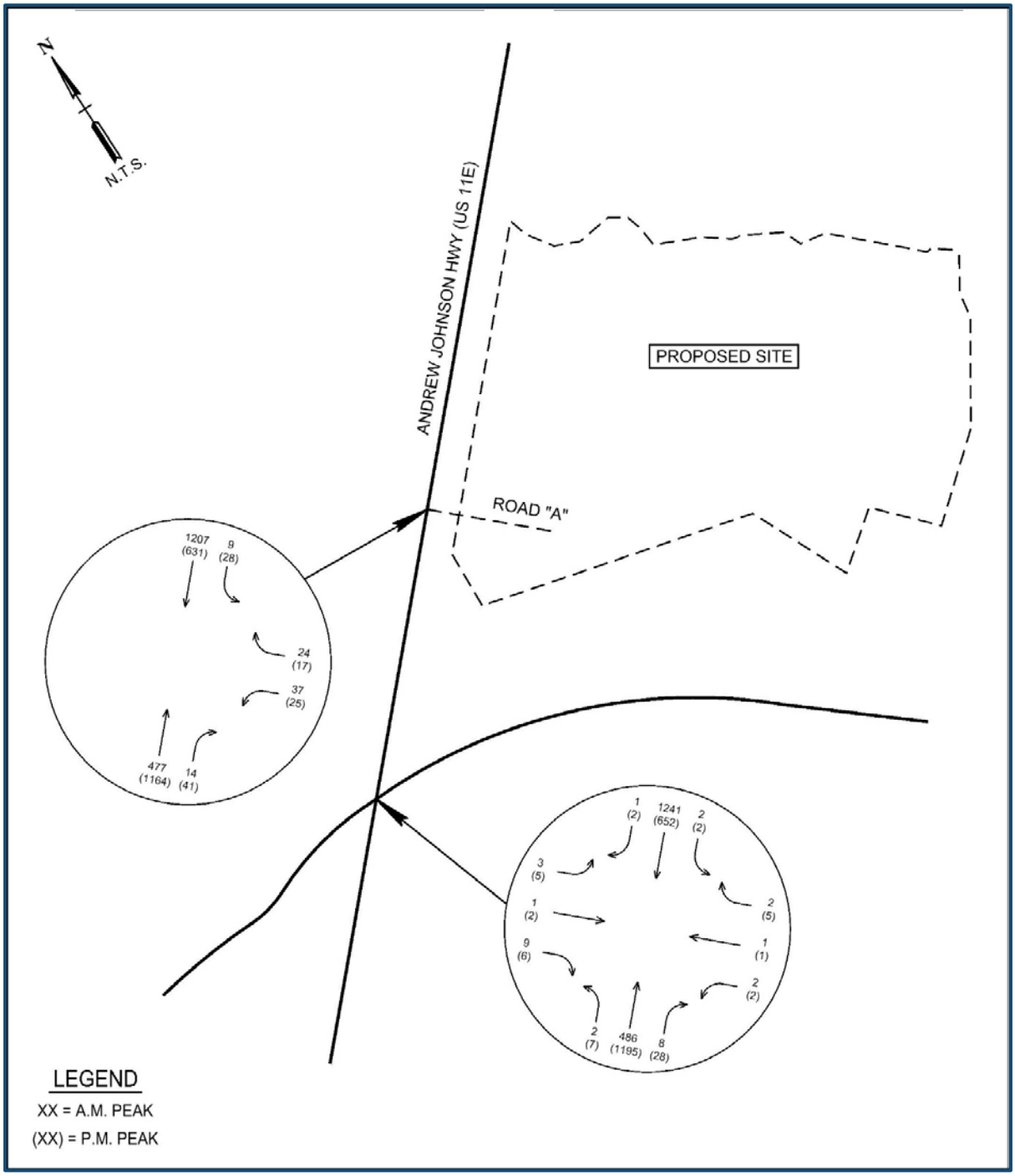


FIGURE 7
2031 COMBINED TRAFFIC VOLUMES

6 EVALUATIONS

INTERSECTION CAPACITY ANALYSES

TABLE 3
CAPACITY ANALYSIS SUMMARY

INTERSECTION	TIME PERIOD	YEAR 2026 EXISTING (LOS/DELAY)	YEAR 2031 BACKGROUND (LOS/DELAY)	YEAR 2031 COMBINED (LOS/DELAY)
Andrew Johnson Highway at Pleasant Hill Road (SIDE STREET STOP)[1]	A.M. P.M.	C 18.0 C 17.9	C 19.0 C 18.9	C 19.7 C 19.6
Andrew Johnson Highway at Site Access Road "A" (SIDE STREET STOP)[1]	A.M. P.M.	- -	- -	C 16.1 D 26.4
Andrew Johnson Highway at Site Access Road "A" with **Southbound Left-Turn Lane** (SIDE STREET STOP)[1]	A.M. P.M.	- -	- -	C 16.1 D 26.3

[1]SIDE STREET STOP CONTROL – Level-of-Service and Average Vehicular Delay (seconds) for side street approach utilizing HCM methodology.

The results summarized in TABLE 3 indicate that a LOS "D" or better can be anticipated at Andrew Johnson Highway (US 11E) at the proposed roadway (Road "A") under the future evaluated conditions. The anticipated delay for the intersection of Andrew Johnson Highway (US 11E) when the southbound left-turn lane is added will be approximately 16.1 seconds in the AM peak hour and 26.3 seconds in the PM Peak hour. The anticipated delay for the intersection of Andrew Johnson Highway (US 11E) and Pleasant Hill Road will be approximately 19.7 seconds during the AM peak hour and 19.6 seconds during the PM peak hour.

TURN LANE ASSESSMENT

The proposed site access was reviewed using TDOT's Highway System Access Manual guidelines for the need of a northbound right-turn lane on Andrew Johnson Highway (US 11E) and a southbound left turn lane on Andrew Johnson Highway (US 11E). Combined conditions were evaluated as part of the assessment with the following results:

- Build-out Traffic
  - Andrew Johnson Highway (US 11E) at Proposed Site Access (Road "A")
    - Left Turn Warrant – AM Peak: **Met** / PM Peak: **Met**
    - Right Turn Warrant – AM Peak: Not Met / PM Peak: **Met**

TDOT recommends that turn lanes be installed when turn lane warrants are met during both the AM or PM peak hours at existing and proposed intersections. As indicated above, a volume-based left-turn lane is warranted at the proposed intersection of Andrew Johnson Highway (US 11E) at the proposed roadway (Road "A"). The turn lane warrant analyses worksheets are in APPENDIX D.

TURN LANE DESIGN

The left turn lane for the intersection of Andrew Johnson Highway (US 11E) was designed using the 2031 combined traffic volumes and the standards outlined in TDOT's Highway System Access Manual (HSAM) Volumes 3: Geometric Design Criteria and AASHTO's A Policy on Geometric Design of Highways and Streets, 7th edition.

Per Table 3-11: Lane Change and Deceleration the recommended lane change and deceleration distance for a roadway with a speed limit of 55 mph is 505 feet. Using Table 3-12: Queue Storage Length for Exclusive Left-Turn Lanes at Unsignalized Intersection, the minimum queue storage length for a turn lane is 50 feet. Therefore, the total recommended turn lane length at Andrew Johnson Highway (US 11E) at the proposed roadway (Road "A") is 555 feet per the TDOT Highway System Access Manual.

The recommended bay taper length for a roadway with a design speed of 55 mph and a lane width of 12 feet is 220 feet.

SITE ACCESS IMPROVEMENTS

Presently, the existing median opening adjacent to the proposed entrance (Road "A") is 26 feet long. Per TDOT Standard Drawing RP-DHO-1, the minimum design of a median opening for a 32-foot wide median should be a minimum of 48 feet. Therefore, it is recommended that the length of the existing median opening should be extended to a minimum of 48 feet.

Per Table 3-15: Required Intersection or Street Driveways Radius of Curvature (R) the minimum required radius at the intersection of Andrew Johnson Highway (US 11E) at the proposed roadway (Road "A") is 25 feet for a passenger vehicle and 40 feet for a Single-Unit Truck, Bus or WB 40 Tractor Trailer or larger.

SIGHT DISTANCE ASSESSMENT

Intersection sight distance was reviewed for the proposed site access at Andrew Johnson Highway (US 11E). The posted speed limit on Andrew Johnson Highway (US 11E) is 55 mph. Based on AASHTO "A Policy of Geometric Design of Highways and Streets" and TDOT's Standard Drawing "RD11-SD-5", the minimum stopping sight distance is 495 feet for a 55-mph roadway and the intersection sight distance is 530 feet for a right turning vehicle and 610 for a left turning vehicle.

Intersection sight distance was assessed via field measurements at the proposed site access to Andrew Johnson Highway (US 11E) in September 2026. The measurements were taken looking left and right from a point 15 feet from the edge of the major road and measured with a driver eye height of 3.5 feet and an object height of 3.5 feet above the driving surface of the major road.

The field measurements indicate that the intersection of Andrew Johnson Highway (US 11E) at the proposed site access (Road "A") has adequate sight distance looking both left and right along Andrew Johnson Highway (US 11E). The sight distance observed from the field measurements can be seen in FIGURE 8.

Looking left along Andrew Johnson Highway (US 11E) from the proposed site access.
Approx. Sight Distance: 950 ft

Looking right along Andrew Johnson Highway (US 11E) from the proposed site access.
Approx. Sight Distance: 1,000+ ft

FIGURE 8
SIGHT DISTANCE ASSESSMENT

7 CONCLUSIONS & RECOMMENDATIONS

The primary conclusion of this study is that traffic generated from the proposed residential development will have minor impacts on delay at the intersection of Andrew Johnson Highway (US 11E) at Pleasant Hill Road. Under the proposed conditions evaluated, the Andrew Johnson Highway (US 11E) at Pleasant Hill Road intersection was found to operate at a LOS "C" or better, while the proposed site access (Road "A") was found to operate at a LOS "D" or better.

The following list is a summary of the improvements that are recommended to be implemented with the construction of this project:

1. Install STOP sign at unsignalized Site Access (Road "A") at Andrew Johnson Highway (US 11E).

2. A southbound left turn lane on Andrew Johnson Highway (US 11E) is warranted per the TDOT Highway System Access Manual during combined conditions as a result of traffic from the proposed development. Ardurra recommends that a left turn lane be installed with a minimum recommended queue storage length of 50 feet and a bay taper length of 220 feet.

3. Widen the existing median opening. The recommended minimum median opening per TDOT standard drawings is 48 feet.

4. Ardurra recommends that the radius of curvature at the proposed Site Access (Road "A") at Andrew Johnson Highway (US 11E) be increased to 40 feet to accommodate a single-unit truck at a minimum.

5. Any future improvements to the intersection need to be reviewed, coordinated and approved by the Tennessee Department of Transportation.

APPENDIX A | TRAFFIC DATA
APPENDIX B | TRIP GENERATION
APPENDIX C | CAPACITY ANALYSES
APPENDIX D | TURN LANE WARRANT EVALUATIONS

APPENDIX A | TRAFFIC DATA

NOTE:
THREE DAYS PRIOR TO ANY EARTHWORK OR CONSTRUCTION
CONTRACTOR MUST CONTACT:
TENNESSEE ONE-CALL
1-800-351-1111
RECORD AND SAVE YOUR CONFIRMATION NUMBER.

NOTE:

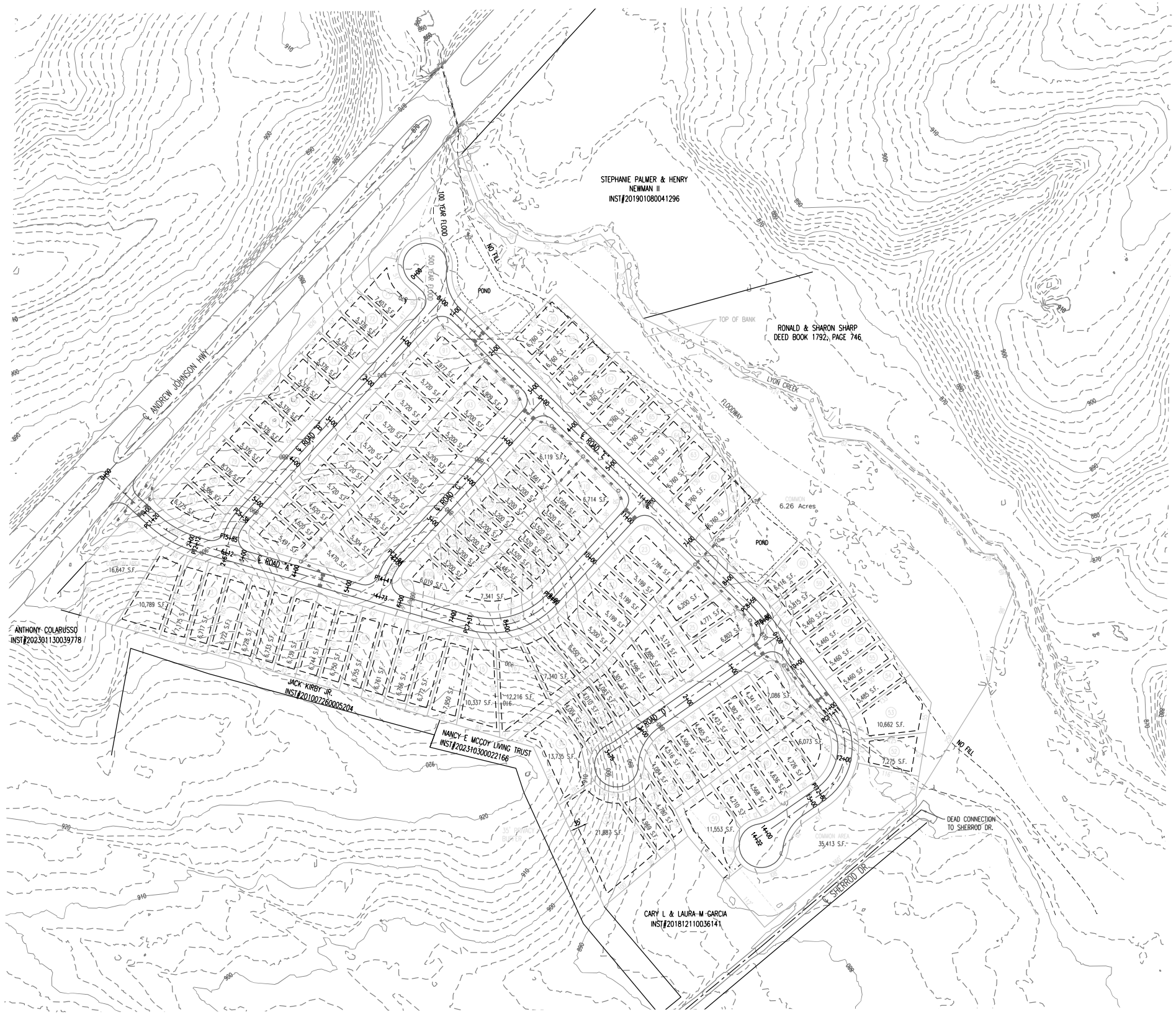
CONTRACTOR TO NOTIFY ENGINEER BEFORE START OF CONSTRUCTION

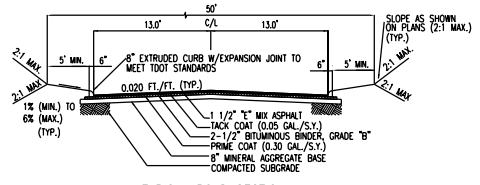
NOTE:

CONTRACTOR IS RESPONSIBLE FOR ALL TRENCH SAFETY

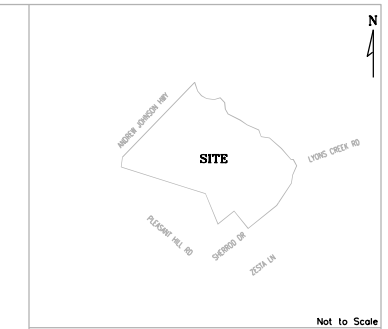
CONTRACTOR SHALL SHORE AND BRACE ALL OPEN CUT TRENCHES AS REQUIRED BY STATE AND FEDERAL LAWS AND LOCAL ORDINANCES; TO CONFORM WITH RECOMMENDATIONS SET FORTH IN AGC MANUAL OF ACCIDENT PREVENTION IN CONSTRUCTION; TO PROTECT LIFE, PROPERTY, OR WORK; TO AVOID EXCESSIVELY WIDE CUTS IN UNSTABLE MATERIAL.

OSHA RULES SHALL BE ABIDED BY.





TYPICAL ROAD SECTION
THRU 50' ROAD
"PUBLIC ROAD"

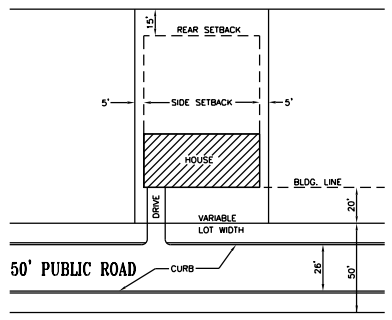


Not to Scale

LOCATION MAP

NOTES:

1. ALL DIMENSIONS ARE SCALED AND SUBJECT TO CHANGE ON THE FINAL PLAT.
2. A 10' DRAINAGE, UTILITY AND CONSTRUCTION EASEMENT EXISTS INSIDE ALL EXTERIOR LOT LINES AND ROAD LINES, 5' EACH SIDE OF INTERIOR ROAD LINES.
3. A 15' UTILITY EASEMENT EXISTS 7.5' EACH SIDE OF CENTERLINE OF SANITARY SEWER AS INSTALLED.
4. THIS PROPERTY CONTAINS APPROXIMATELY 28.30 ACRES SUBDIVIDED INTO 117 SINGLE FAMILY LOTS & 4 COMMON AREAS.
5. THIS PROPERTY IS ZONED PR.
6. ALL ROAD PROFILES ARE BASED ON LIDAR CONTOURS.
7. UTILITIES:
   WATER: NORTHEAST KNOX UTILITY DISTRICT
   SEWER: KUB
   ELECTRIC: KUB
   GAS: KUB
   TELEPHONE: BELL SOUTH
8. GEOTECHNICAL ENGINEER SHALL CERTIFY THE SLOPE STABILITY ON ALL FILL SLOPES.
9. BUILDING SETBACKS ARE AS FOLLOWS:
   FRONT- 20'
   REAR- 15'
   SIDE- 5'
10. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE AND ARE BASED ON AVAILABLE INFORMATION. CONTRACTOR IS RESPONSIBLE TO FIELD LOCATE ALL UTILITIES, BOTH HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
11. ALTERNATE DESIGN STANDARDS APPROVED BY KNOX COUNTY ENGINEERING ARE AS FOLLOWS:
    a. INTERSECTION GRADE FROM 1.00% TO 2.35% STA. 9+75 TO STA. 11+33 ROAD "A".
    b. INTERSECTION GRADE FROM 1.00% TO 3.00% STA. 0+45 TO STA. 5+99 ROAD "B".
    c. INTERSECTION GRADE FROM 1.00% TO 3.00% STA. 0+13 TO STA. 1+00 ROAD "C".
    d. INTERSECTION GRADE FROM 1.00% TO 3.00% STA. 3+50 TO STA. 4+60 ROAD "C".
    e. INTERSECTION GRADE FROM 1.00% TO 3.00% STA. 0+13 TO STA. 2+00 ROAD "D".
12. ALTERNATIVE DESIGN STANDARDS APPROVED BY KNOXVILLE/KNOX PLANNING ARE AS FOLLOWS:
    a. REDUCE THE HORIZONTAL CURVE RADIUS FROM 250' TO 200' @ STA. 1+50 ROAD "A".
    b. REDUCE THE HORIZONTAL CURVE RADIUS FROM 250' TO 150' @ STA. 8+25 ROAD "A".
    c. REDUCE THE HORIZONTAL CURVE RADIUS FROM 250' TO 105' @ STA. 11+75 ROAD "E".
13. MINIMUM FLOOR ELEVATION FOR LOTS 52-60 IS 868.80. MINIMUM FLOOR ELEVATION FOR LOTS 61-70 IS 868.20.



TYPICAL LOT LAYOUT
DETACHED HOMES

OWNER/DEVELOPER

REECE VALERIANO
405 MONTBROOK LN
KNOXVILLE, TN 37919
PHONE: (868) 202-8832

BATSON, HIMES, NORVELL & POE
REGISTERED ENGINEERS & LAND SURVEYORS
4334 PAPERMILL DRIVE
KNOXVILLE, TENNESSEE 37909
PHONE: (865) 588-6472
FAX: (865) 588-6473
email@bhn-p.com

DESIGNED DBH
DRAWN SEW
CHECKED DBH

NO.	DATE	REVISION	APPR.	NO.	DATE	REVISION	APPR.

SCALE
HORIZONTAL: 1"= 100'
VERTICAL: 2' INTERVAL

DATE
9/15/26

DEED REFERENCES: DEED BK 1751, PG 454
DEED BK 1799, PG 803

0' 100' 200' 300' 400'
1"=100'

CONCEPT PLAN FOR
VALIARIANO PROPERTY ON
ANDREW JOHNSON HWY
TAX MAP 62 PARCEL 97 & TAX MAP 63, PARCELS 49.08 & 49.04?8TH CIVIL DISTRICT,
KNOX COUNTY, TENNESSEE?

25890-C

SHEET 1
OF
2 SHEET(S)

Q:\25890\25890-C(EMAIL).DWG

Prepared by National Data & Surveying Services

US 11E/SR 34/Andrew Johnson Hwy & Pleasant Hill Rd

Peak Hour Turning Movement Count

ID: 26-190043-001
City: Knoxville

Day: Tuesday
Date: 9/15/2026

PEAK HOURS

AM	07:00 AM - 08:00 AM
NOON	01:00 PM - 02:00 PM
PM	04:45 PM - 05:45 PM

COUNT PERIODS

AM	7:00 AM - 10:00 AM
NOON	10:00 AM - 02:00 PM
PM	2:00 PM - 07:00 PM

SOUTHBOUND — US 11E/SR 34/Andrew Johnson Hwy

AM	1	1146	2	0	454
NOON	4	499	2	0	548
PM	2	597	2	1	1109

EASTBOUND — Pleasant Hill Rd

AM	NOON	PM	
4	9	10	
0	0	0	0
3	1	5	0
1	3	2	1
9	10	6	0

WESTBOUND — Pleasant Hill Rd

PM	NOON	AM	
5	4	2	0
1	0	1	1
2	6	2	0
0	0	0	0
31	12	11	

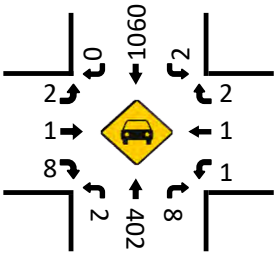
NORTHBOUND — US 11E/SR 34/Andrew Johnson Hwy

PM	609	4	7	1098	27
NOON	521	6	5	543	7
AM	1161	4	2	449	8

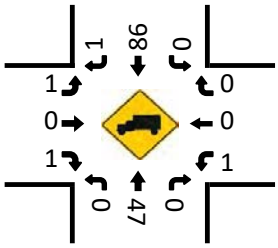
CONTROL: 2-Way Stop(EB/WB)

	AM	NOON	PM
TEV	1630	1090	1759
PHF	0.92	0.97	0.94

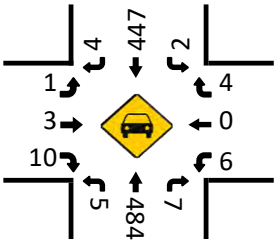
Cars (AM)



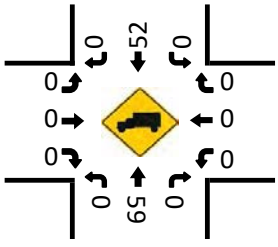
HT (AM)



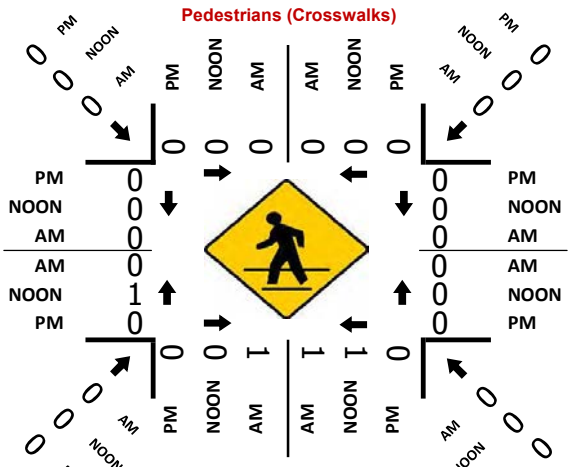
Cars (NOON)



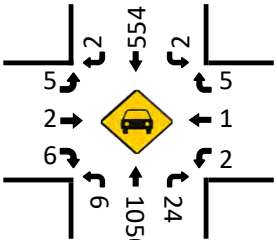
HT (NOON)



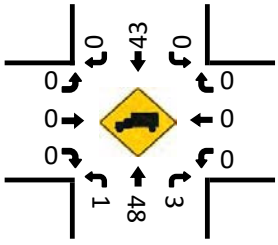
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: US 11E/SR 34/Andrew Johnson Hwy & Pleasant Hill Rd
City: Knoxville
Control: 2-Way Stop(EB/WB)

Project ID: 26-190043-001
Date: 9/15/2026

Data - Total

NS/EW Streets:	US 11E/SR 34/Andrew Johnson Hwy				US 11E/SR 34/Andrew Johnson Hwy				Pleasant Hill Rd				Pleasant Hill Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	84	1	0	2	280	0	0	1	0	1	0	0	0	0	0	369
7:15 AM	0	118	0	1	0	316	0	0	1	1	2	0	1	1	0	0	441
7:30 AM	1	123	2	1	0	274	1	0	0	0	5	0	0	0	1	0	408
7:45 AM	1	124	5	2	0	276	0	0	1	0	1	0	1	0	1	0	412
8:00 AM	1	89	2	1	1	187	0	0	0	0	3	0	0	0	1	0	285
8:15 AM	1	100	2	1	0	233	0	0	0	0	0	0	2	0	1	0	340
8:30 AM	1	136	1	2	0	163	0	0	0	0	0	0	1	0	0	0	304
8:45 AM	0	116	1	1	1	157	0	0	1	0	1	0	2	0	0	0	280
9:00 AM	0	91	2	1	0	153	0	1	0	0	1	0	0	0	0	0	249
9:15 AM	0	118	0	2	0	168	0	0	0	0	1	0	0	0	0	0	289
9:30 AM	4	118	1	2	0	154	0	0	0	0	2	0	1	0	0	0	282
9:45 AM	2	120	0	1	0	130	0	0	0	0	2	0	1	0	0	0	256
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	11	1337	17	15	4	2491	1	1	4	1	19	0	9	1	4	0	3915
APPROACH %'s :	0.80%	96.88%	1.23%	1.09%	0.16%	99.76%	0.04%	0.04%	16.67%	4.17%	79.17%	0.00%	64.29%	7.14%	28.57%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	2	449	8	4	2	1146	1	0	3	1	9	0	2	1	2	0	1630
PEAK HR FACTOR :	0.500	0.905	0.400	0.500	0.250	0.907	0.250	0.000	0.750	0.250	0.450	0.000	0.500	0.250	0.500	0.000	0.924
	0.877				0.909				0.650				0.625				

NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
10:00 AM	0	114	0	1	0	138	2	0	1	0	2	0	0	0	0	0	258
10:15 AM	0	113	1	1	1	125	1	0	1	0	3	0	0	0	1	0	247
10:30 AM	1	90	4	0	0	140	0	0	1	0	4	0	0	0	2	0	242
10:45 AM	1	109	0	1	0	126	0	0	2	0	3	0	1	0	0	0	243
11:00 AM	0	108	2	1	0	144	0	2	0	0	0	0	0	0	1	0	258
11:15 AM	1	131	1	3	0	131	0	0	0	0	1	0	0	0	0	0	268
11:30 AM	2	125	1	0	0	131	0	0	1	1	4	0	1	0	0	0	266
11:45 AM	3	102	2	0	0	126	1	0	0	2	3	0	0	1	0	0	240
12:00 PM	1	124	2	0	1	112	0	0	0	0	2	0	0	1	0	0	243
12:15 PM	0	133	2	1	2	138	2	0	0	0	0	0	1	0	1	0	280
12:30 PM	2	123	1	2	3	137	0	0	1	1	1	0	1	0	0	0	272
12:45 PM	1	125	3	3	1	124	0	0	1	0	1	0	0	0	1	0	260
1:00 PM	2	118	1	0	2	119	2	0	1	1	2	0	2	0	3	0	253
1:15 PM	1	148	3	1	0	118	0	0	0	1	2	0	3	0	1	0	278
1:30 PM	1	135	1	1	0	134	2	0	0	1	5	0	1	0	0	0	281
1:45 PM	1	142	2	4	0	128	0	0	0	0	1	0	0	0	0	0	278
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	1940	26	19	10	2071	10	2	9	7	34	0	10	2	10	0	4167
APPROACH %'s :	0.85%	96.90%	1.30%	0.95%	0.48%	98.95%	0.48%	0.10%	18.00%	14.00%	68.00%	0.00%	45.45%	9.09%	45.45%	0.00%	
PEAK HR :	01:00 PM - 02:00 PM																TOTAL
PEAK HR VOL :	5	543	7	6	2	499	4	0	1	3	10	0	6	0	4	0	1090
PEAK HR FACTOR :	0.625	0.917	0.583	0.375	0.250	0.931	0.500	0.000	0.250	0.750	0.500	0.000	0.500	0.000	0.333	0.000	0.970
	0.917				0.928				0.583				0.500				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
2:00 PM	2	157	1	1	1	162	1	0	0	0	2	0	1	0	1	0	329
2:15 PM	1	165	3	1	0	141	0	0	1	0	1	0	0	0	1	0	314
2:30 PM	1	142	3	1	0	140	0	0	0	0	5	0	0	0	0	0	292
2:45 PM	2	195	2	2	0	141	1	0	1	1	2	0	0	0	3	0	350
3:00 PM	1	184	8	0	0	121	0	0	1	0	0	0	1	0	1	0	317
3:15 PM	1	213	5	1	1	161	2	0	0	0	3	0	0	0	2	0	389
3:30 PM	3	248	1	2	1	159	0	0	2	0	2	0	0	1	1	0	420
3:45 PM	3	257	3	3	0	162	2	0	0	0	3	0	1	0	1	0	435
4:00 PM	3	267	2	1	3	141	0	0	1	0	4	0	0	0	0	0	422
4:15 PM	0	291	2	1	0	159	1	0	1	0	0	0	0	0	0	0	455
4:30 PM	0	267	2	1	0	141	0	0	1	1	0	0	0	0	0	0	413
4:45 PM	1	251	9	0	1	162	0	0	1	2	2	0	0	0	0	0	429
5:00 PM	4	270	2	0	0	145	2	0	0	0	3	0	0	1	2	0	429
5:15 PM	1	297	9	3	0	150	0	0	3	0	0	0	1	0	2	0	466
5:30 PM	1	280	7	1	1	140	0	1	1	0	1	0	1	0	1	0	435
5:45 PM	3	262	11	4	1	110	0	0	0	0	2	0	1	0	3	0	397
6:00 PM	1	228	5	2	1	136	0	0	0	0	0	0	1	0	1	0	375
6:15 PM	2	170	2	1	1	116	0	0	1	2	3	0	0	0	1	0	299
6:30 PM	1	154	3	0	1	101	0	0	0	1	2	0	1	1	0	0	265
6:45 PM	1	137	4	1	1	79	1	0	0	0	1	0	1	1	1	0	228
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	32	4435	84	26	13	2767	10	1	14	7	36	0	9	4	21	0	7459
APPROACH %'s :	0.70%	96.90%	1.84%	0.57%	0.47%	99.14%	0.36%	0.04%	24.56%	12.28%	63.16%	0.00%	26.47%	11.76%	61.76%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	7	1098	27	4	2	597	2	1	5	2	6	0	2	1	5	0	1759
PEAK HR FACTOR :	0.438	0.924	0.750	0.333	0.500	0.921	0.250	0.250	0.417	0.250	0.500	0.000	0.500	0.250	0.625	0.000	0.944
	0.916				0.923				0.650				0.667				

APPENDIX B | TRIP GENERATION

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 215), and higher than those for senior adult housing—single-family (Land Use 251). (Source 1008)

Additional Data

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in Alabama, Arizona, British Columbia (CAN), California, Delaware, Illinois, Kentucky, Massachusetts, Minnesota, Montana, New Jersey, New York, North Carolina, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Vermont, and West Virginia.

Source Numbers

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, 1204, 1221, 1225, 1236, 1251, 1265, 1267

Single-Family Detached Housing
(210)

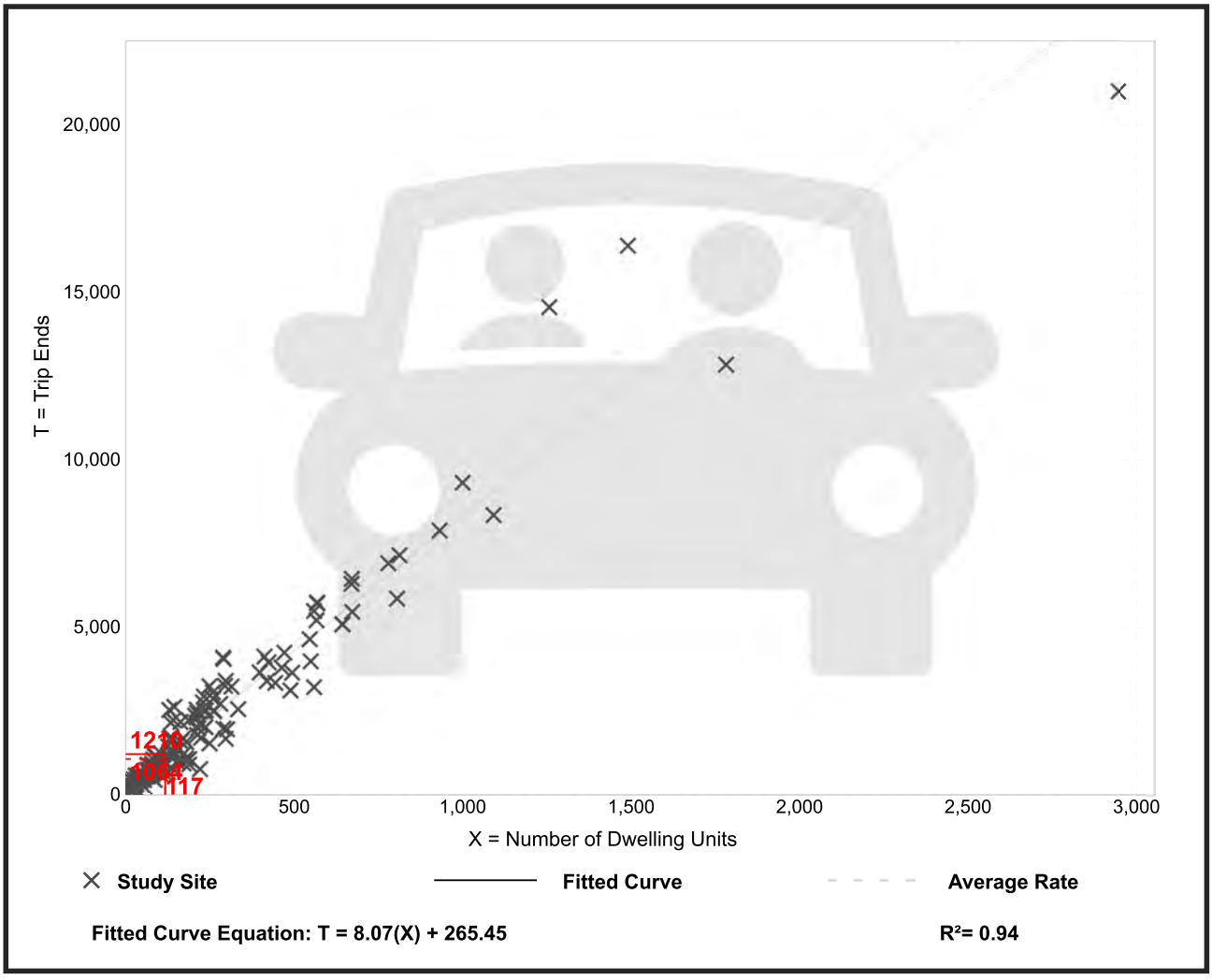
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 155
Avg. Num. of Dwelling Units: 261
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.09	3.47 - 23.80	2.29

Data Plot and Equation



Trip Gen Manual, 12th Edition • Institute of Transportation Engineers

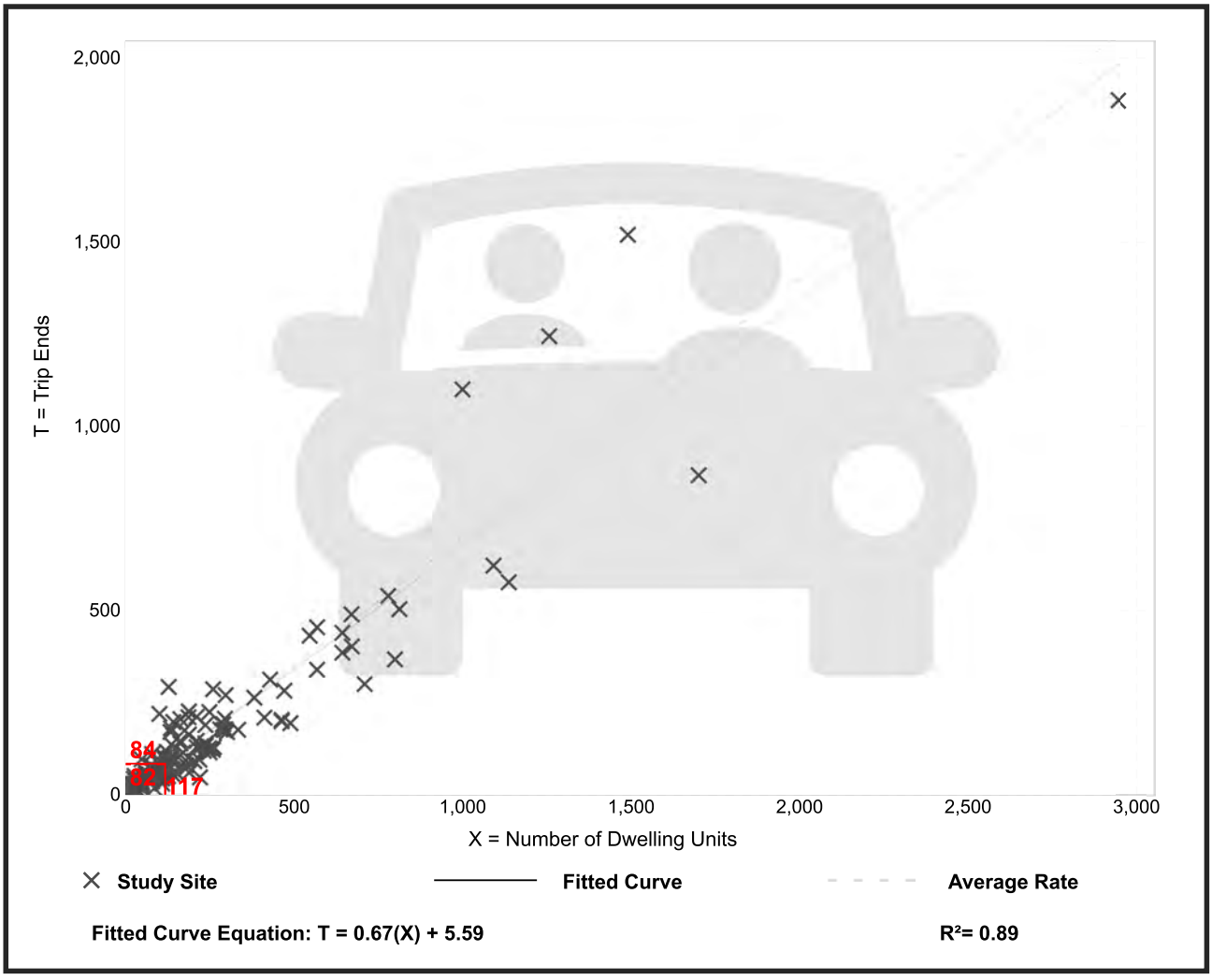
Single-Family Detached Housing
(210)

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: 153
Avg. Num. of Dwelling Units: 239
Directional Distribution: 27% entering, 73% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.22 - 2.27	0.26

Data Plot and Equation



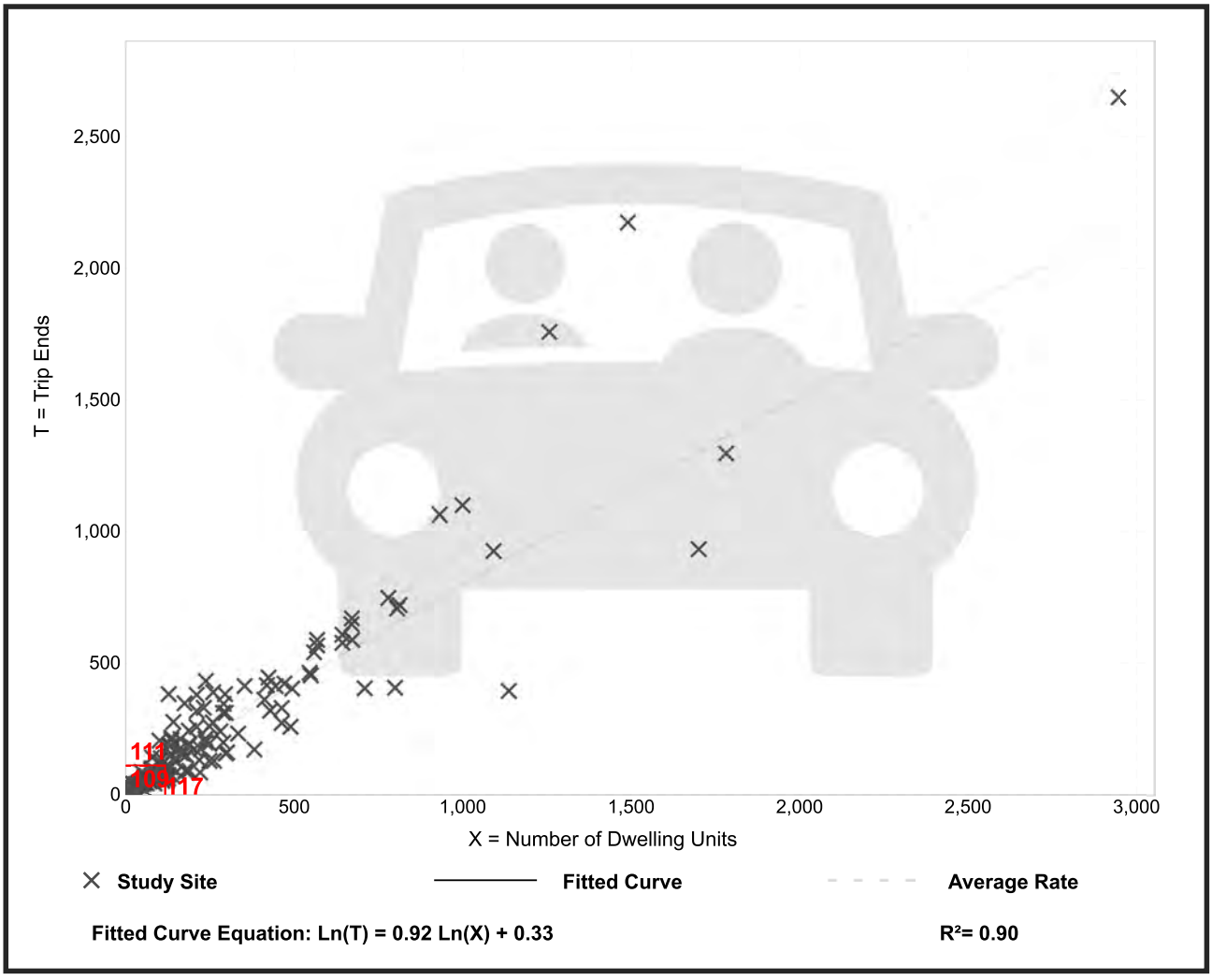
Single-Family Detached Housing
(210)

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: 166
Avg. Num. of Dwelling Units: 266
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.93	0.35 - 2.98	0.33

Data Plot and Equation



Project: Valeriano Property Subdivision
Date Conducted: 9/23/26

Single-Family Detached Housing (210)
117 Lots

Average Daily Traffic
T = 8.07(X) + 265.45
T = 8.07(117) + 265.45
T =1210

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
T = 0.67(X) + 5.59
T = 0.67(117) + 5.59
T = 84

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
Ln(T) = 0.90Ln(X) + 0.33
Ln(T) = 0.90Ln(117) + 0.33
T = 111

Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	1210	50%	50%	605	605
AM Peak Hour	84	27%	73%	23	61
PM Peak Hour	111	62%	38%	69	42

APPENDIX C | CAPACITY ANALYSES

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	9	2	1	2	2	449	8	2	1146	1
Future Vol, veh/h	3	1	9	2	1	2	2	449	8	2	1146	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	190	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	63	63	63	88	88	88	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	8	8	8	8	8	8
Mvmt Flow	5	2	14	3	2	3	2	510	9	2	1259	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1525	1788	630	1154	1784	260	1260	0	0	519	0	0
Stage 1	1264	1264	-	519	519	-	-	-	-	-	-	-
Stage 2	260	524	-	635	1265	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.26	-	-	4.26	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.28	-	-	2.28	-	-
Pot Cap-1 Maneuver	81	80	424	152	81	739	516	-	-	1002	-	-
Stage 1	179	239	-	508	531	-	-	-	-	-	-	-
Stage 2	722	528	-	433	239	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	79	80	424	145	80	739	516	-	-	1002	-	-
Mov Cap-2 Maneuver	168	213	-	331	212	-	-	-	-	-	-	-
Stage 1	179	238	-	506	528	-	-	-	-	-	-	-
Stage 2	713	526	-	415	238	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	18	14.91	0.05	0.01
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	516	-	-	297	371	1002	-	-
HCM Lane V/C Ratio	0.004	-	-	0.067	0.021	0.002	-	-
HCM Ctrl Dly (s/v)	12	-	-	18	14.9	8.6	-	-
HCM Lane LOS	B	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	6	2	1	5	7	1098	27	2	597	2
Future Vol, veh/h	5	2	6	2	1	5	7	1098	27	2	597	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	190	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	67	67	67	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	8	8	8	8	8	8
Mvmt Flow	8	3	9	3	1	7	8	1193	29	2	649	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1267	1892	326	1554	1879	611	651	0	0	1223	0	0
Stage 1	654	654	-	1223	1223	-	-	-	-	-	-	-
Stage 2	613	1238	-	330	655	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.26	-	-	4.26	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.28	-	-	2.28	-	-
Pot Cap-1 Maneuver	126	69	670	77	71	436	892	-	-	534	-	-
Stage 1	422	461	-	190	250	-	-	-	-	-	-	-
Stage 2	447	246	-	657	461	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	121	68	670	74	70	436	892	-	-	534	-	-
Mov Cap-2 Maneuver	307	210	-	175	213	-	-	-	-	-	-	-
Stage 1	420	459	-	188	248	-	-	-	-	-	-	-
Stage 2	433	244	-	641	459	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	15.17	17.94	0.06	0.04
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	892	-	-	374	290	534	-	-
HCM Lane V/C Ratio	0.009	-	-	0.053	0.041	0.004	-	-
HCM Ctrl Dly (s/v)	9.1	-	-	15.2	17.9	11.8	-	-
HCM Lane LOS	A	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	9	2	1	2	2	472	8	2	1204	1
Future Vol, veh/h	3	1	9	2	1	2	2	472	8	2	1204	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	190	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	63	63	63	88	88	88	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	8	8	8	8	8	8
Mvmt Flow	5	2	14	3	2	3	2	536	9	2	1323	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1602	1878	662	1212	1874	273	1324	0	0	545	0	0
Stage 1	1328	1328	-	545	545	-	-	-	-	-	-	-
Stage 2	274	550	-	667	1329	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.26	-	-	4.26	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.28	-	-	2.28	-	-
Pot Cap-1 Maneuver	71	71	404	138	71	725	487	-	-	979	-	-
Stage 1	164	223	-	490	517	-	-	-	-	-	-	-
Stage 2	709	514	-	415	222	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	69	70	404	131	71	725	487	-	-	979	-	-
Mov Cap-2 Maneuver	153	199	-	315	197	-	-	-	-	-	-	-
Stage 1	163	222	-	488	514	-	-	-	-	-	-	-
Stage 2	701	512	-	397	222	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	18.98	15.44	0.05	0.01
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	487	-	-	277	353	979	-	-
HCM Lane V/C Ratio	0.005	-	-	0.072	0.023	0.002	-	-
HCM Ctrl Dly (s/v)	12.4	-	-	19	15.4	8.7	-	-
HCM Lane LOS	B	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	6	2	1	5	7	1154	28	2	627	2
Future Vol, veh/h	5	2	6	2	1	5	7	1154	28	2	627	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	190	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	67	67	67	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	8	8	8	8	8	8
Mvmt Flow	8	3	9	3	1	7	8	1254	30	2	682	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1330	1987	342	1631	1973	642	684	0	0	1285	0	0
Stage 1	687	687	-	1285	1285	-	-	-	-	-	-	-
Stage 2	643	1300	-	347	688	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.26	-	-	4.26	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.28	-	-	2.28	-	-
Pot Cap-1 Maneuver	113	60	654	67	62	417	866	-	-	505	-	-
Stage 1	403	446	-	174	234	-	-	-	-	-	-	-
Stage 2	428	230	-	642	445	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	60	654	64	61	417	866	-	-	505	-	-
Mov Cap-2 Maneuver	292	196	-	161	199	-	-	-	-	-	-	-
Stage 1	401	444	-	173	231	-	-	-	-	-	-	-
Stage 2	414	228	-	626	443	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	15.72	18.87	0.05	0.04
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	866	-	-	356	271	505	-	-
HCM Lane V/C Ratio	0.009	-	-	0.056	0.044	0.004	-	-
HCM Ctrl Dly (s/v)	9.2	-	-	15.7	18.9	12.2	-	-
HCM Lane LOS	A	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	9	2	1	2	2	486	8	2	1241	1
Future Vol, veh/h	3	1	9	2	1	2	2	486	8	2	1241	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	190	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	63	63	63	88	88	88	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	8	8	8	8	8	8
Mvmt Flow	5	2	14	3	2	3	2	552	9	2	1364	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1650	1935	682	1248	1931	281	1365	0	0	561	0	0
Stage 1	1369	1369	-	561	561	-	-	-	-	-	-	-
Stage 2	281	566	-	687	1369	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.26	-	-	4.26	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.28	-	-	2.28	-	-
Pot Cap-1 Maneuver	65	65	392	130	65	716	469	-	-	966	-	-
Stage 1	154	213	-	479	508	-	-	-	-	-	-	-
Stage 2	702	506	-	403	213	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	64	65	392	123	65	716	469	-	-	966	-	-
Mov Cap-2 Maneuver	145	190	-	305	189	-	-	-	-	-	-	-
Stage 1	154	212	-	477	506	-	-	-	-	-	-	-
Stage 2	693	503	-	385	212	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	19.66	15.8	0.05	0.01
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	469	-	-	266	341	966	-	-
HCM Lane V/C Ratio	0.005	-	-	0.075	0.023	0.002	-	-
HCM Ctrl Dly (s/v)	12.7	-	-	19.7	15.8	8.7	-	-
HCM Lane LOS	B	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	24	477	14	9	1207
Future Vol, veh/h	37	24	477	14	9	1207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	88	88	91	91
Heavy Vehicles, %	2	2	8	8	8	8
Mvmt Flow	40	26	542	16	10	1326

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1233	279	0	0	558	0
Stage 1	550	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.26	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.28	-
Pot Cap-1 Maneuver	169	718	-	-	969	-
Stage 1	542	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	166	718	-	-	969	-
Mov Cap-2 Maneuver	301	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	455	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	16.11	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	390	27	-
HCM Lane V/C Ratio	-	-	0.17	0.01	-
HCM Ctrl Dly (s/v)	-	-	16.1	8.8	0.1
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	6	2	1	5	7	1195	28	2	652	2
Future Vol, veh/h	5	2	6	2	1	5	7	1195	28	2	652	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	-	190	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	67	67	67	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	8	8	8	8	8	8
Mvmt Flow	8	3	9	3	1	7	8	1299	30	2	709	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1380	2059	355	1690	2045	665	711	0	0	1329	0	0
Stage 1	714	714	-	1329	1329	-	-	-	-	-	-	-
Stage 2	665	1345	-	360	715	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.26	-	-	4.26	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.28	-	-	2.28	-	-
Pot Cap-1 Maneuver	104	54	641	61	55	403	846	-	-	484	-	-
Stage 1	388	433	-	163	222	-	-	-	-	-	-	-
Stage 2	415	218	-	631	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	100	54	641	58	55	403	846	-	-	484	-	-
Mov Cap-2 Maneuver	280	186	-	151	190	-	-	-	-	-	-	-
Stage 1	387	431	-	162	220	-	-	-	-	-	-	-
Stage 2	401	217	-	614	431	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	16.16	19.6	0.05	0.04
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	846	-	-	342	258	484	-	-
HCM Lane V/C Ratio	0.009	-	-	0.058	0.046	0.004	-	-
HCM Ctrl Dly (s/v)	9.3	-	-	16.2	19.6	12.5	-	-
HCM Lane LOS	A	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	17	1164	41	28	631
Future Vol, veh/h	25	17	1164	41	28	631
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	88	88	91	91
Heavy Vehicles, %	2	2	8	8	8	8
Mvmt Flow	27	18	1323	47	31	693

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1754	685	0	0	1369	0
Stage 1	1346	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.26	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.28	-
Pot Cap-1 Maneuver	76	391	-	-	467	-
Stage 1	207	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	70	391	-	-	467	-
Mov Cap-2 Maneuver	163	-	-	-	-	-
Stage 1	207	-	-	-	-	-
Stage 2	587	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	26.42	0	1.51
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	213	153	-
HCM Lane V/C Ratio	-	-	0.214	0.066	-
HCM Ctrl Dly (s/v)	-	-	26.4	13.2	1
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	24	477	14	9	1207
Future Vol, veh/h	37	24	477	14	9	1207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	88	88	91	91
Heavy Vehicles, %	2	2	8	8	8	8
Mvmt Flow	40	26	542	16	10	1326

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1233	279	0	0	558	0
Stage 1	550	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.26	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.28	-
Pot Cap-1 Maneuver	169	718	-	-	969	-
Stage 1	542	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	167	718	-	-	969	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	458	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	16.06	0	0.06
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	391	969	-
HCM Lane V/C Ratio	-	-	0.169	0.01	-
HCM Ctrl Dly (s/v)	-	-	16.1	8.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	17	1164	41	26	631
Future Vol, veh/h	25	17	1164	41	26	631
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	88	88	91	91
Heavy Vehicles, %	2	2	8	8	8	8
Mvmt Flow	27	18	1323	47	29	693

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1750	685	0	0	1369	0
Stage 1	1346	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.26	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.28	-
Pot Cap-1 Maneuver	77	391	-	-	467	-
Stage 1	207	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	72	391	-	-	467	-
Mov Cap-2 Maneuver	164	-	-	-	-	-
Stage 1	207	-	-	-	-	-
Stage 2	604	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	26.27	0	0.52
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	214	467	-
HCM Lane V/C Ratio	-	-	0.213	0.061	-
HCM Ctrl Dly (s/v)	-	-	26.3	13.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

APPENDIX D | TURN LANE WARRANT EVALUATIONS

2031 Combined Andrew Johnson Highway (US 11E) at Road "A"
AM Peak Major Roadway Volumes: 854 Veh
AM Left Turn: 9 Veh
PM Peak Major Roadway Volumes: 932 Veh
PM Left Turn: 28 Veh

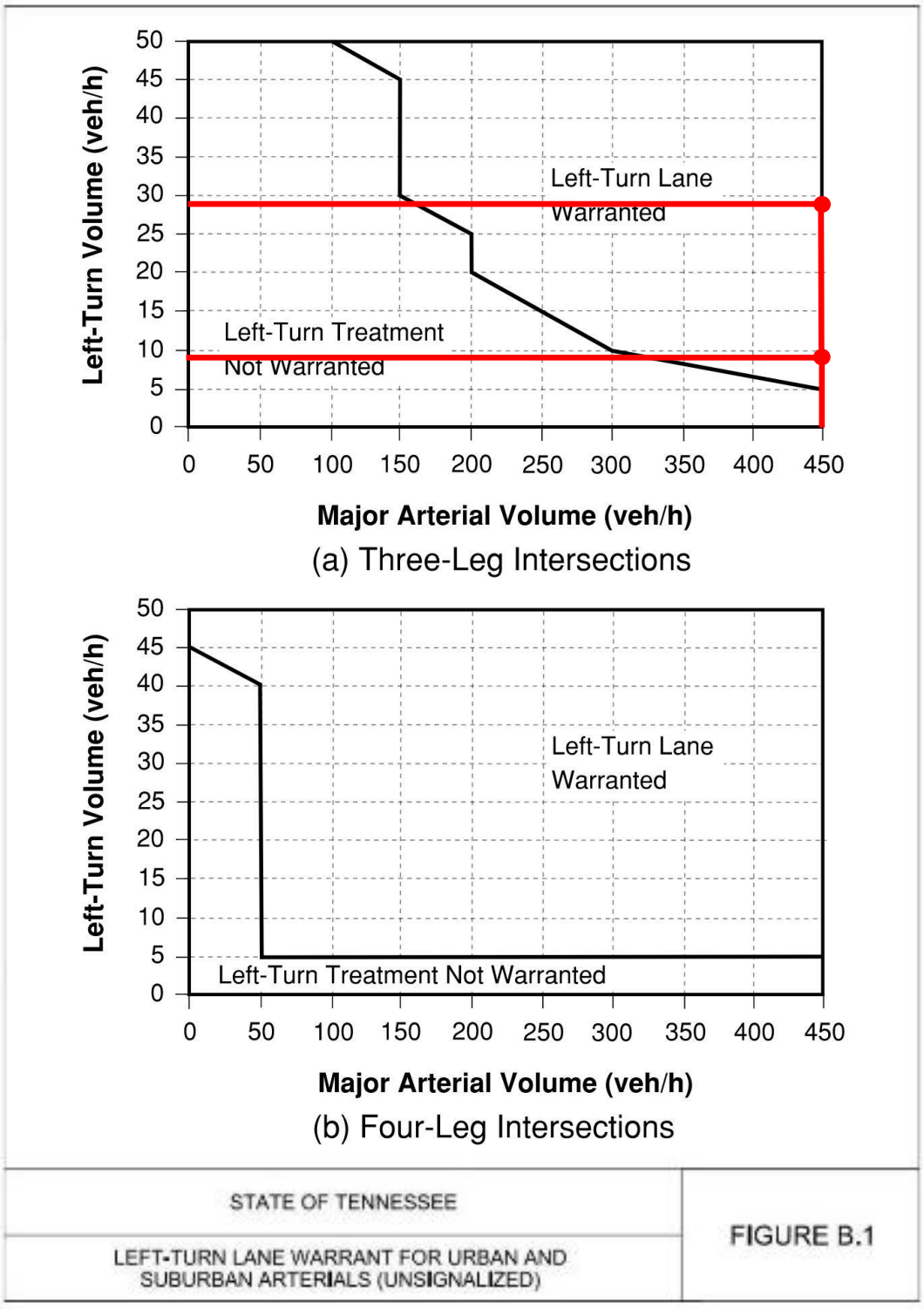


Figure B.1: Left-Turn Lane Warrant for Urban and Suburban Arterials (Unsignalized)

2031 Combined Andrew Johnson Highway (US 11E) at Road "A"
AM Peak Major Roadway Volume: 477 Veh
AM Right Turn: 14 Veh
PM Peak Major Roadway Volume: 1164 Veh
PM Right Turn: 41 Veh

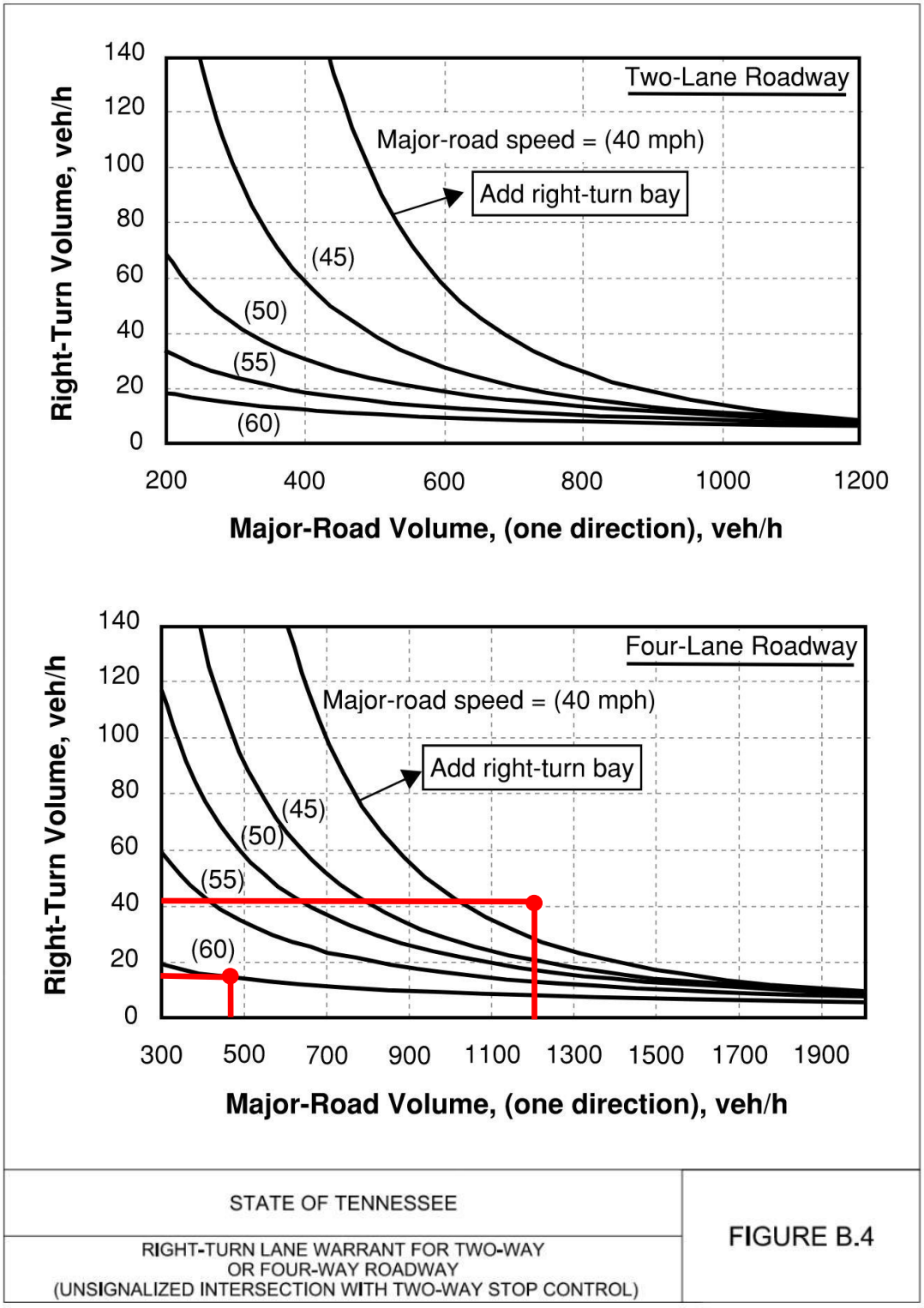


Figure B.4: Right-Turn Lane Warrant for Two-Way or Four-Way Roadway (Unsignalized Intersection with Two-Way Stop Control)

Study are available, assistance in determining storage lengths can be provided by the TDOT Region Traffic Office.

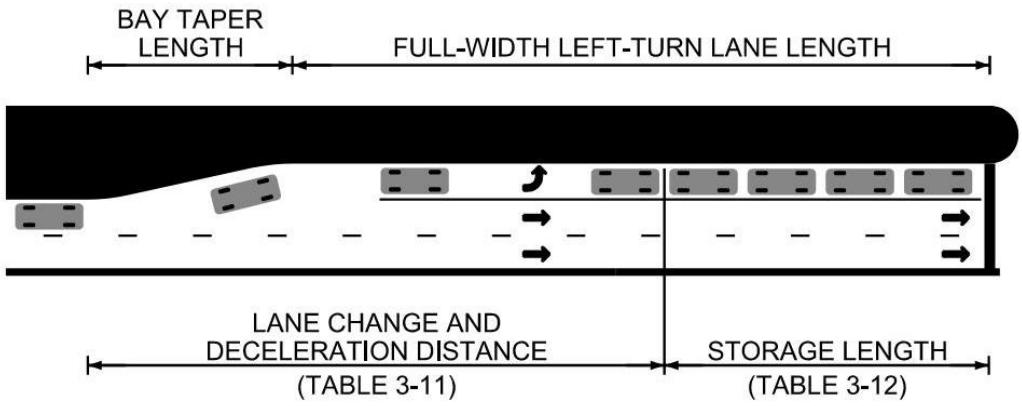


Figure 3-20: Functional Area, for an Exclusive Turn Lane.[27]

Table 3-11: Lane Change and Deceleration Distance[27]

Speed (MPH)	Lane Change and Deceleration Distance (ft)
20	70
25	105
30	150
35	205
40	265
45	340
50	415
55	505
60	600
65	700
70	815

Table 3-12: Queue Storage Length for Exclusive Left-Turn Lanes at Unsignalized Intersections[27]

Left-Turn Volume (veh/h)	Storage Length (ft)				
	Opposing Volume (veh/h)				
	200	400	600	800	1,000
40	50	50	50	50	50
60	50	50	50	50	50
80	50	50	50	50	75
100	50	50	50	75	75
120	50	50	75	75	100
140	50	50	75	100	125
160	50	75	75	100	150
180	50	75	75	125	150
200	50	75	100	125	200
220	75	75	100	150	225
240	75	75	125	150	275
260	75	100	125	175	325
280	75	100	125	200	400
300	75	100	150	225	525

[27] AASHTO, A Policy on Geometric Design of Highways and Streets 7th Edition, (2018)

Turn Lane Taper Rates

When median width is insufficient for inclusion of a left-turn lane, travel lanes approaching and departing form the cross street will need to be transitioned to create space for the turn lane at the intersection. Use the following equations and guidelines for acceptable minimum taper rates at these locations (reference Figure 3-21).

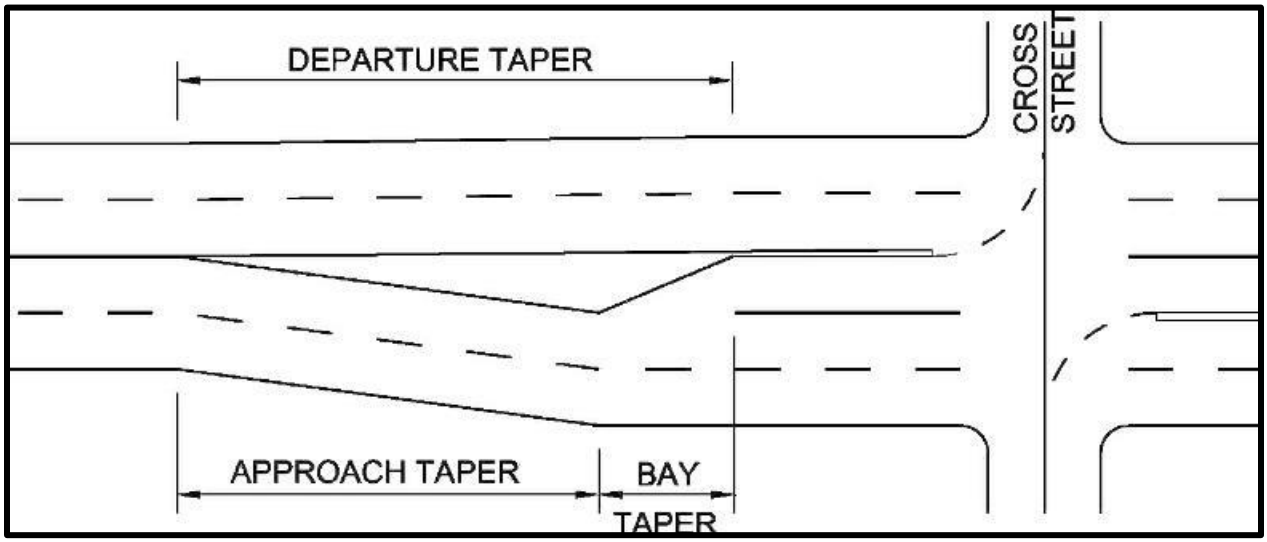


Figure 3-21: Turning Lane Taper Terminology

1) APPROACH TAPER

   a) $L = W \times S$, Speed ≥ 45 mph

   b) $L = \frac{WS^2}{60}$, Speed < 45mph

   Where L = Length of Taper in feet

   W = Width of Offset in feet

   S = Design Speed in miles per hour

2) BAY TAPER

   $L = \frac{WS}{3}$, L, W, S as defined for approach taper above.

   8:1 (Length : Width) Minimum Taper Rate for low speeds.

   15:1 (Length : Width) Maximum Taper rate for higher speeds.

L = (12 feet)(55 mph) / 3

L = 220 ft

3) DEPARTURE TAPER

   The departure taper begins at the end of the bay taper and ends at the beginning of the approach taper and cannot exceed the approach taper rate criteria.

ARDURRA

Date: October 19, 2026

To: Mike Conger, PE, Knoxville-Knox County Planning

Subject: Review Comments – TIS for Valeriano Property Subdivision (11-SC-26-C/11-F-26-DP)

Dear Knoxville-Knox County Planning Staff,

The following comment response document is submitted to address comments dated October 13, 2026:

1. **Reviewer Comment**: It is preferred that more definitive terminology is used for recommendations rather than using the word "consider" as with Recommendation #2 that begins with "Consider the installation of a southbound left turn lane…" The recommendation should reflect the fact that the TDOT turn lane warrants are met due to traffic directly attributable to the new development and be designated similarly as recommendations #1 and #3 that don't leave it somewhat open-ended as being necessary or not.

   Response: Updated the left turn lane warrant recommendations and removed the word "consider."

2. **Reviewer Comment**: Please provide additional clarification regarding the recommendation of the total turn lane length also described in Recommendation #2 in the report. It is not clear how the total length of 555 feet matches with the storage length of 50 feet and bay taper length of 220 feet – the provision of a figure such as the one in the TDOT HSAM (figure 3-20) with dimensions labeled would assist the reader's understanding of what is specifically being recommended. As a separate note, TDOT staff have indicated that the final parameters can be worked out in permitting stages on the design as these are often handled on a case-by-case situation based on various considerations and constraints for each turn lane's ultimate storage and taper length needs.

   Response: Revised to include on the minimum turn lane recommendations of a 50 foot storage length and a 220 feet bay taper length. Figure 3-20 is included in the Appendix.

3. **Reviewer Comment**: While the TIS notes that right turn lane warrants are not met it should still discuss appropriate entrance design features that may be needed to ensure

safe and efficient operations on a high speed facility such as Andrew Johnson Hwy. The final design/requirements will need to be worked out through TDOT permitting but the TIS should note initial site design recommendations for the site engineer such as providing an increased radius since the site plan does not call out the entrance radius but it appears to be the same as the internal development intersection radii of the base 25-foot requirement from the minimum subdivision regulations.

Response: Added the street driveway radius minimum and recommended per the TDOT HSAM to Section 6 Evaluations and recommended that the radius be designed to accommodate a SU Vehicle.

Sincerely,

Addie Kirkham

Addie Kirkham, P.E.