SEAL PROPERTY SUBDIVISION

Transportation Impact Analysis

Hardin Valley Road

Knoxville, TN

A Transportation Impact Analysis for the Seal Property Subdivision

Submitted to

Knoxville-Knox County Planning

Revised July 27, 2020
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FMA Project No. 592.006

Submitted By:

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Executive Summary

Ball Homes, LLC is proposing a residential development (i.e. Seal Property Subdivision) with single-family housing located in Knox County. The project is located south of the intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road, east of Creekside Manor Lane, and west of Marietta Church Road. The full buildout of the development will consist of 265 single family lots. Construction is proposed to take place this year and this study assumes full build out for the development will occur in 2023.

The main driveway connection is located at the proposed roundabout at the intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road. The main driveway connection will have a 10 foot wide curbed median, a roadway width of 18 feet and total width of 46 feet. A second driveway connection is proposed along Hardin Valley Road 770 feet east of the proposed roundabout.

In order to maintain or provide an acceptable level-of-service for each of the intersections studied, some recommendations are presented.

Hickory Creek Road at Hardin Valley Road
The background and full buildout traffic conditions at the proposed roundabout intersection will operate at a LOS A during both the AM and PM peak hours. The addition of the driveway to the proposed roundabout at Hickory Creek Road, Hardin Valley Road and E Gallaher Ferry Road will only cause a minor increase in delay to the intersection; therefore there are no recommended improvements.

Hardin Valley Road at Muddy Creek Lane
As a part of the Seal Property Subdivision the driveway connection (Road "A") will tie into the existing intersection of Hardin Valley Road at Muddy Creek Lane. The full buildout traffic conditions for the eastbound and westbound left turning movements operate at a LOS A during both the AM and PM peak hours, the northbound approach (Road "A") operates at a LOS B during both the AM and PM peak hours and the southbound approach (Muddy Creek Lane) will operate at a LOS C during both the AM and PM peak hours after the completion of the Seal Property Subdivision.

After the completion of the Seal Property Subdivision neither an eastbound right turn lane nor a westbound left turn lane are warranted at the intersection of Hardin Valley Road at Muddy Creek Lane / driveway connection (Road "A").

1 Introduction

1.1 Project Description

This report provides a summary of a transportation impact analysis that was performed for the Seal Property Subdivision. The project is located south of the intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road, east of Creekside Manor Lane, and west of Marietta Church Road. The location of the site is shown in Figure 1.

The full build out of the development will consist of 265 single family lots. Construction is proposed to take place this year, and this study assumes full build out for the development will occur in 2023.

The existing intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road will be replaced by a proposed roundabout designed by others. The roundabout is expected to be completed prior to the construction of the main driveway connection and the subdivision Road "A" will tie directly into the proposed roundabout. The driveway connection will have a 10 foot wide curbed median, a roadway width of 18 feet and total width of 46 feet. A second driveway connection is proposed along Hardin Valley Road 770 feet east of the proposed roundabout. The proposed site layout including the roundabout is shown in Figure 2.

The purpose of this study is to evaluate the impacts to the traffic conditions caused by the proposed development.

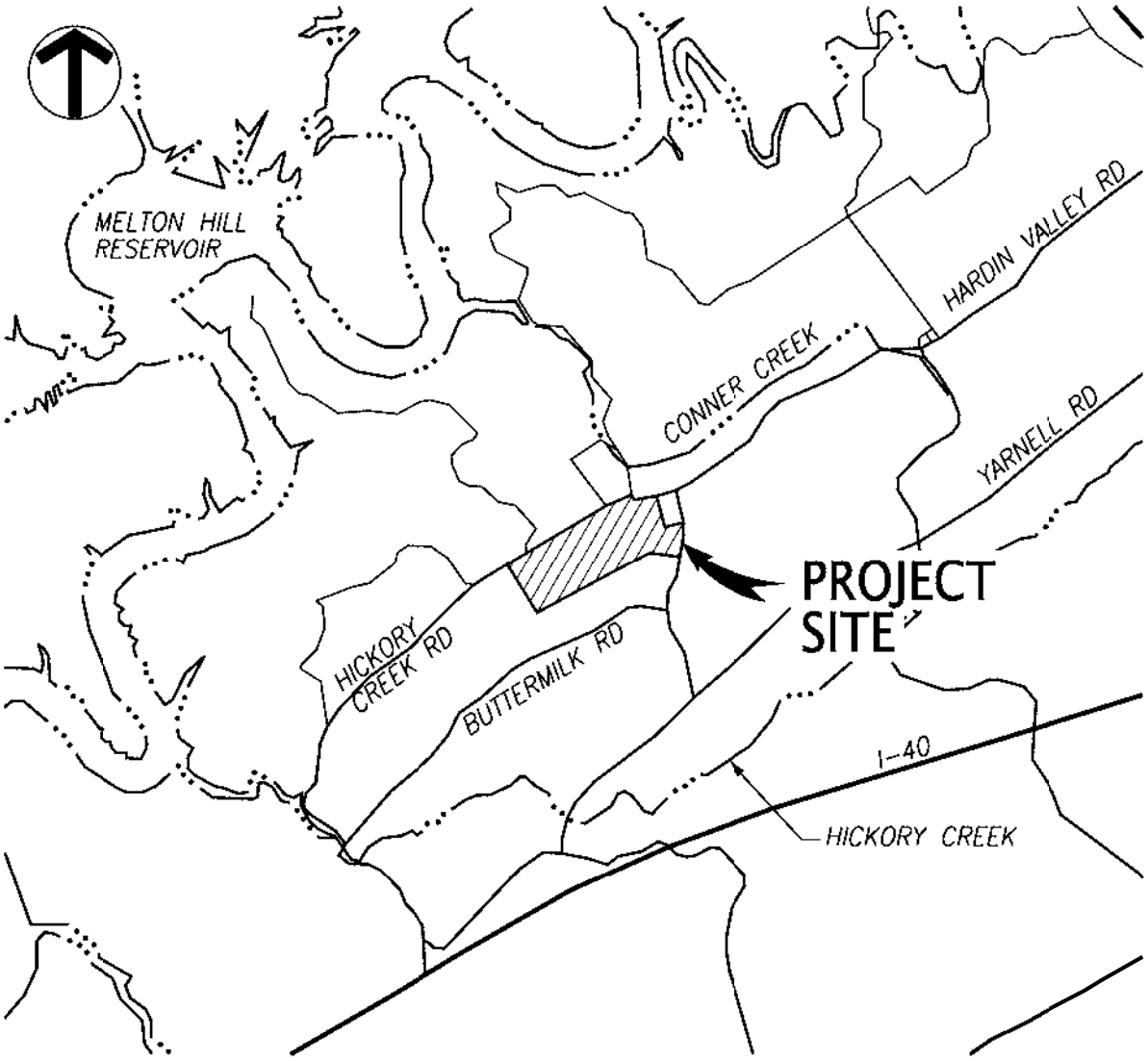


Figure 1: Location Map

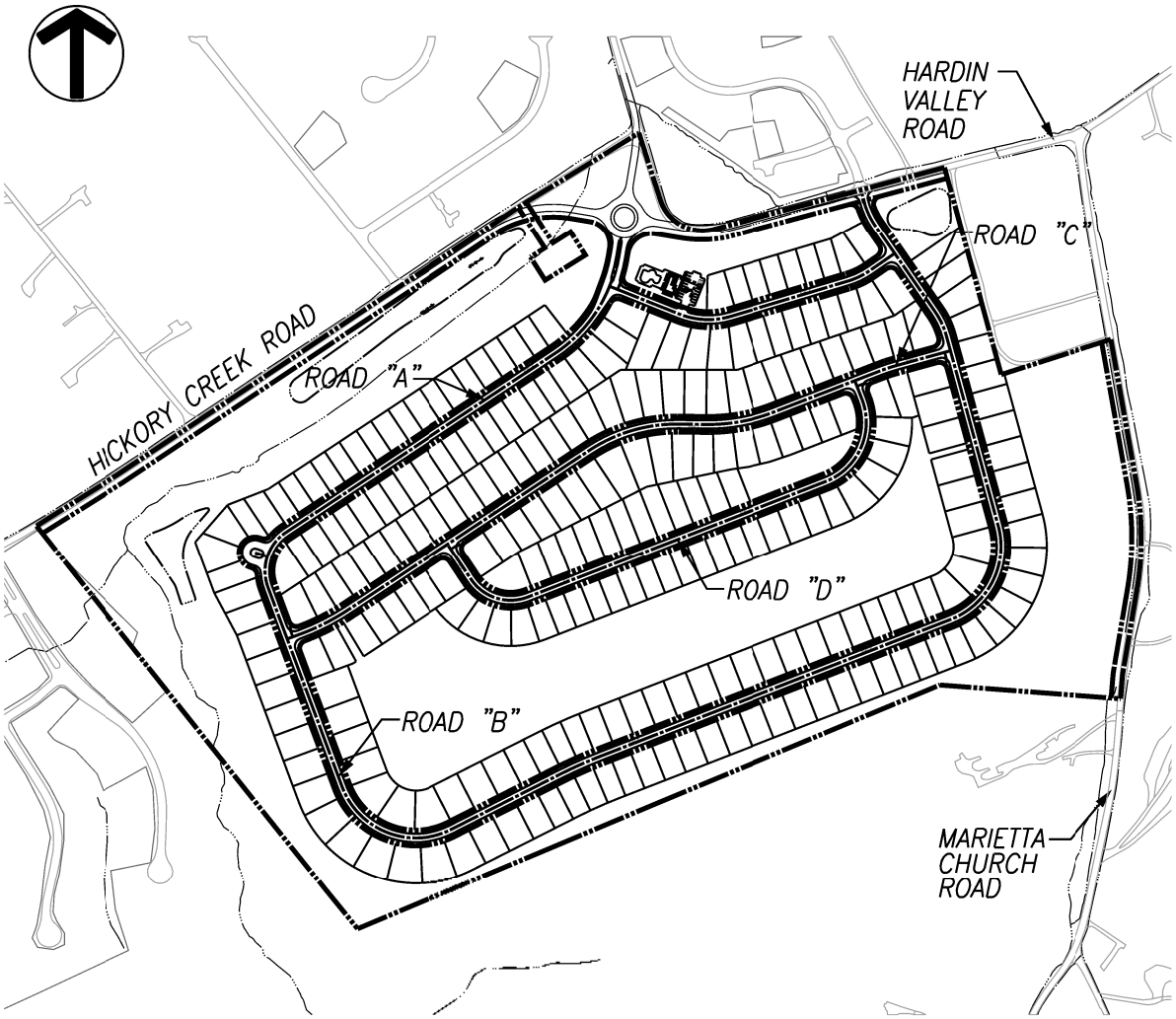


Figure 2: Site Plan

1.2 Existing Site Conditions

Hardin Valley Road at the intersection of Hickory Creek Road is a two-lane road. The Knoxville-Knox County Planning Commission classifies Hardin Valley Road as a Minor Arterial with a 70 feet right-of-way per the Major Road Plan. The posted speed limit on Hardin Valley Road is 40 mph.

Hickory Creek Road at the intersection with Hardin Valley Road is a two-lane road. The Knoxville-Knox County Planning Commission classifies Hickory Creek Road as a Minor Arterial with a 60 feet right-of-way per the Major Road Plan. The posted speed limit on Hickory Creek Road is 40 mph.

E Gallaher Ferry Road at the intersection with Hickory Creek Road is a two-lane road. The Knoxville-Knox County Planning Commission classifies E Gallaher Ferry Road as a Major Collector with a 60 feet right-of-way per the Major Road Plan. The posted speed limit on E Gallaher Ferry Road is 30 mph.

Marietta Church Road at the intersection with Hardin Valley Road is a two-lane road. The Knoxville-Knox County Planning Commission classifies Marietta Church Road as a Minor Collector with a 60 feet right-of-way per the Major Road Plan. The posted speed limit on Marietta Church Road is 30 mph.

There are no existing sidewalks or designated bike lanes along Hardin Valley Road, Hickory Creek Road, E Gallaher Ferry Road or Marietta Church Road in the vicinity of the proposed development.

An aerial photo of the existing intersection is included in Attachment 1.

2 Existing Traffic Volumes

Due to the altered traffic patterns from COVID-19 FMA did not collect any new turning movement counts for the Seal Property Subdivision transportation impact analysis.

As part of a different transportation analysis Cannon & Cannon, Inc. (CCI) conducted a peak hour turning movement count at the intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road on Thursday November 1, 2018 from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. The AM peak hour occurred between 7:15 a.m. and 8:15 a.m. with an AM peak volume of 375 vehicles and an AM peak hour factor of 0.93. The PM peak hour occurred between 5:00 p.m. and 6:00 p.m. with a PM peak hour volume of 442 vehicles and a PM peak hour factor of 0.90. The CCI peak hour turning movement count is included in Attachment 2.

In order to calculate existing traffic conditions FMA estimated growth rate from the 2018 turning movement count to the projected existing 2020 traffic conditions. The growth rate was determined by analyzing nearby traffic counts provided by the Knoxville Regional Transportation Planning Organization (TPO) in the vicinity of the proposed development. Traffic counts located on Hardin Valley Road, E Gallaher Ferry Road and Marietta Church Road had an average growth rate of approximately 5%. The ADT trend line growth charts are included in Attachment 3. Figure 3 shows the projected 2020 traffic volumes including both the AM and PM peak hour traffic volumes at the intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road.

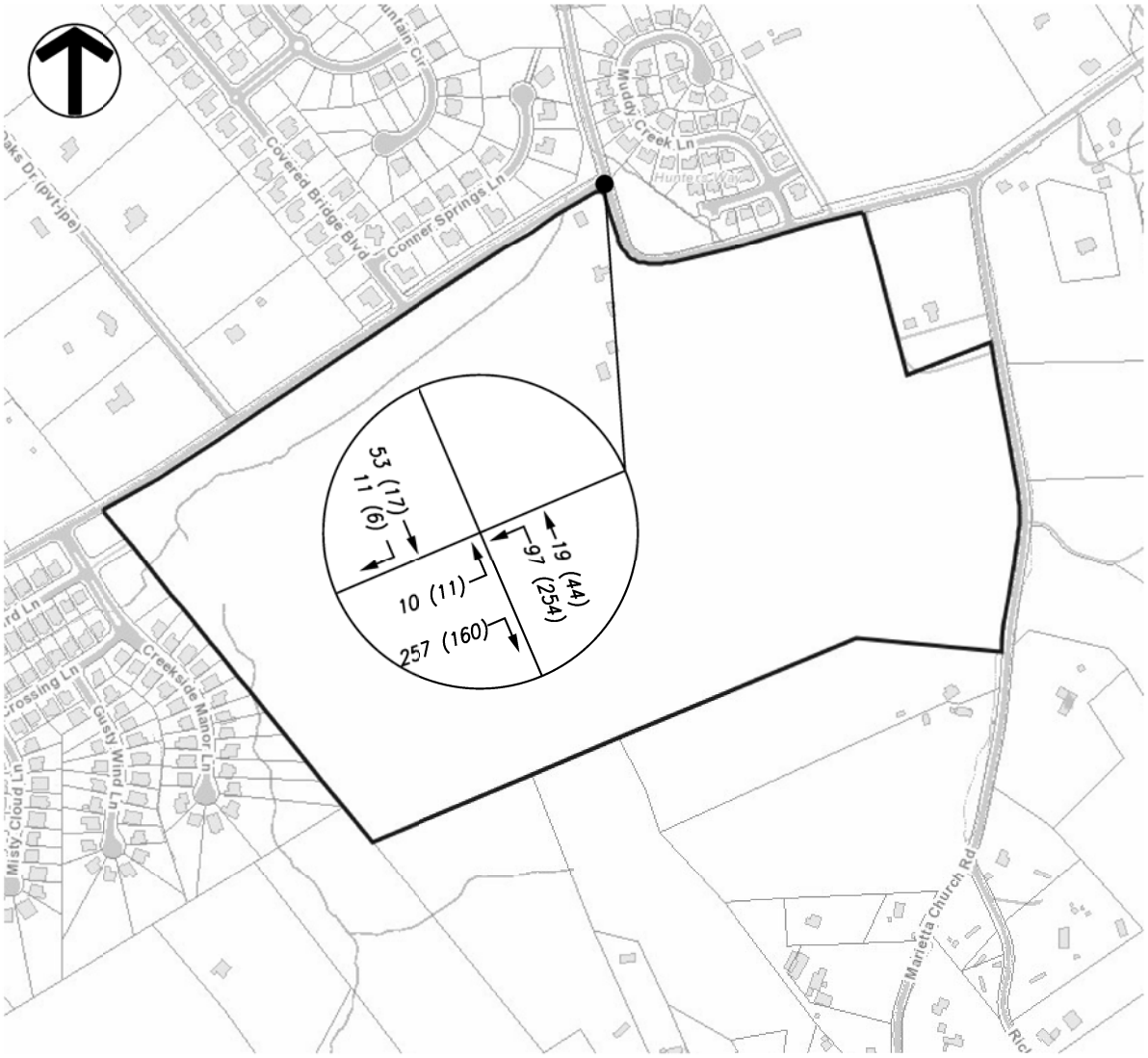


Figure 3: 2020 Existing Peak Hour Traffic

2.1 Hunters Way Subdivision

Hunters Way Subdivision is an existing subdivision located on Hardin Valley Road between Hickory Creek Road and Marietta Church Road. Hunters Way Subdivision has 40 existing single family homes.

Due to the altered traffic patterns from COVID-19 FMA did not collect any new turning movement counts for the intersection of Muddy Creek Lane at Hardin Valley Road. FMA estimated the traffic generated at the intersection of Muddy Creek Lane at Hardin Valley Road using the *Trip Generation, 10th Edition,* published by the Institute of Transportation Engineers. Single- Family Detached Housing or Land Use 210 was used to calculate site trips for the subdivision using the fitted curve equations. The land use worksheets are included in Attachment 5 and a trip generation summary is shown in Table 2.1-1.

Table 2.1-1
Trip Generation Summary
Hunters Way Subdivision

Land Use	Density	Daily Trips	AM Peak Hour Enter	AM Peak Hour Exit	PM Peak Hour Enter	PM Peak Hour Exit
Single-Family Detached Housing (LUC 210)	40 Lots	448	8	25	26	16

FMA assumed the directional distribution of the traffic generated by the Hunters Way Subdivision was determined using the existing traffic volumes along Hardin Valley Road. FMA assumed that 90% of traffic would enter/exit from Hardin Valley Road, 10% of traffic would enter/exit from Hickory Creek Road.

The thru traffic on Hardin Valley Road was estimated from Figure 3: 2020 Existing Peak Hour Traffic derived from the Cannon & Cannon, Inc. (CCI) turning movement count.

Figure 4 shows the combined existing peak hour traffic at the intersection of Hardin Valley Road at Muddy Creek Lane.

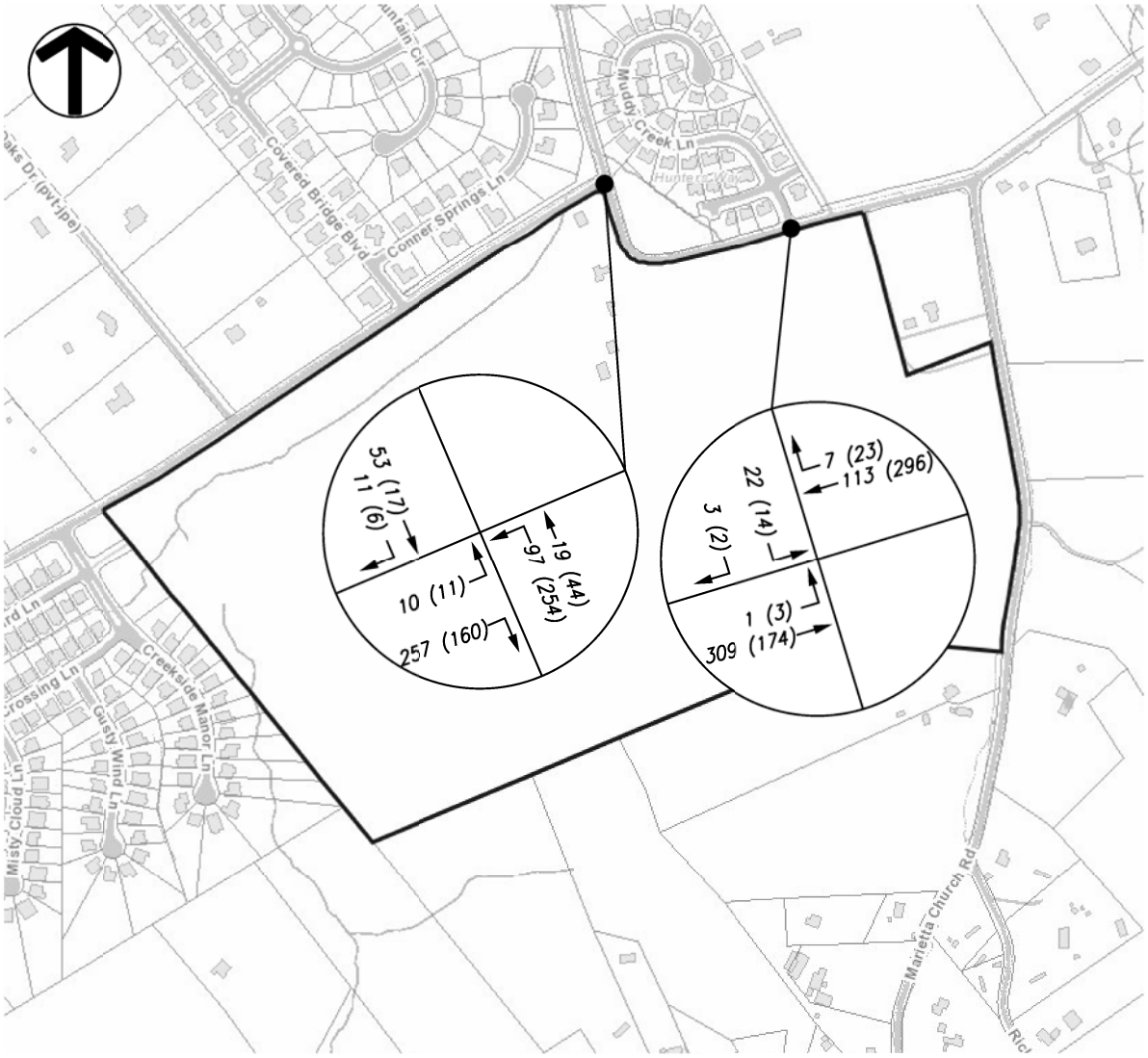


Figure 4: 2020 Combined Existing Peak Hour Traffic

3 Background Growth

The Knoxville Regional Transportation Planning Organization (TPO) maintains count stations in the vicinity of the proposed development.

Knoxville TPO count station ID 093M353 is located on Hardin Valley Road east of Marietta Church Road. The annual growth rate for this station over the last thirteen years is approximately 5.91% and the 2016 ADT was 5,340 vehicles per day.

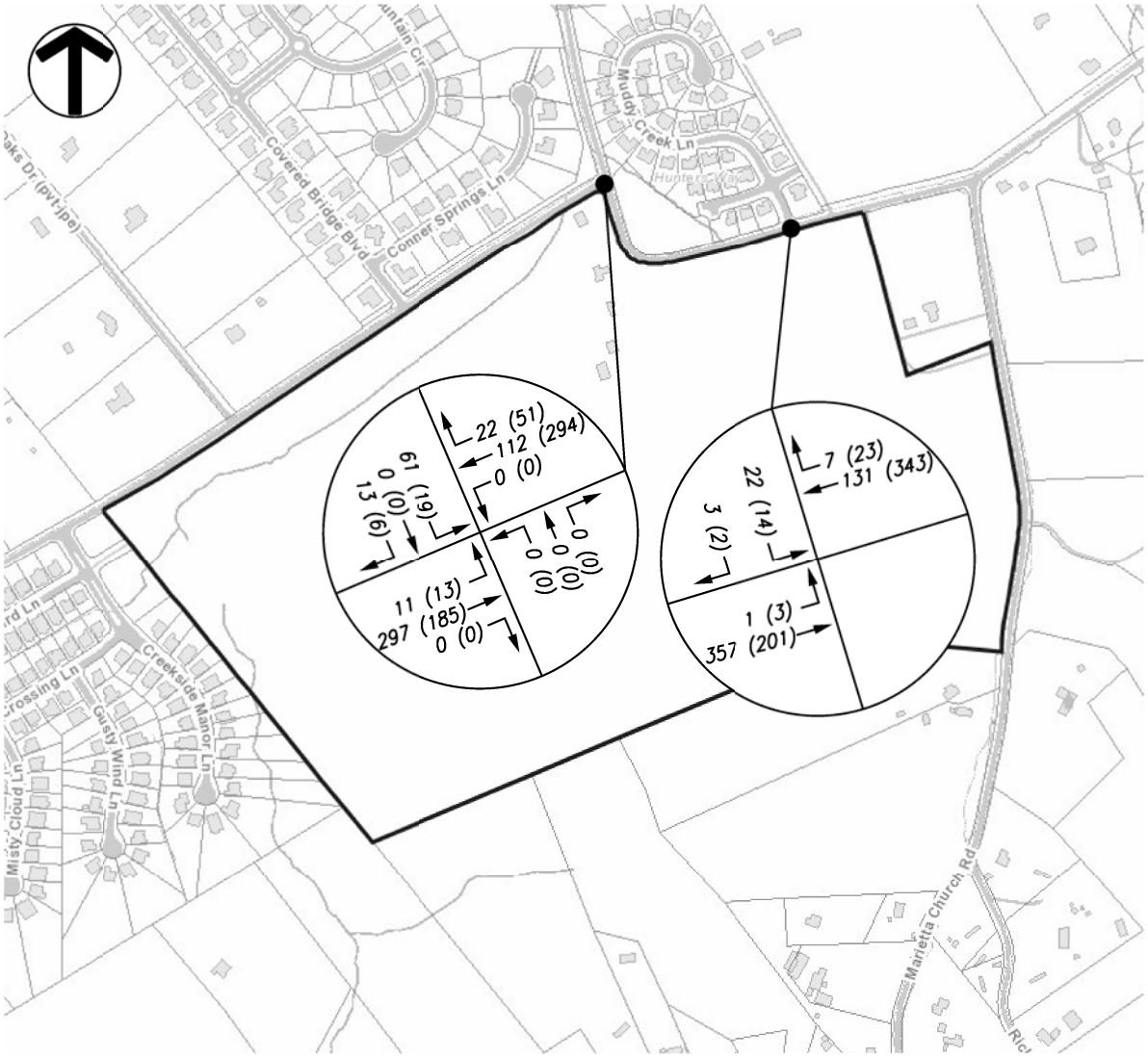
Knoxville TPO count station ID 093M279 is located on E Gallaher Ferry Road north of Hardin Valley Road. The annual growth rate for this station over the last sixteen years is approximately 4.48% and the 2017 ADT was 790 vehicles per day.

Knoxville TPO count station ID 093M275 is located on Marietta Church Road south of Hardin Valley Road. The annual growth rate for this station over the last sixteen years is approximately 4.51% and the 2017 ADT was 1670 vehicles per day.

For the purpose of this study, an annual growth rate of 5.0% was assumed for the intersection of Hickory Creek Road at Hardin Valley Road and Hardin Valley Road at Muddy Creek Lane until full occupancy is reached in 2023. Attachment 3 shows the trend line growth charts for the TPO count station.

The proposed roundabout at the intersection of Hickory Creek Road, Hardin Valley Road and E Gallaher Ferry Road is currently in the design phase and is expected to be completed prior to the installation of the driveway connection. FMA assumed that the proposed roundabout project will be completed by the year 2023.

Figure 5 demonstrates the projected background peak hour volumes at the intersection of Hickory Creek Road at Hardin Valley Road and Hardin Valley Road at Muddy Creek Lane after applying the background growth rate to the existing conditions.



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 5: 2023 Background Peak Hour Traffic

3.1 Vining Mill Subdivision

The Vining Mill Subdivision is located on Hardin Valley Road east of the intersection of Marietta Church Road in Knox County. This residential development is currently under construction and as of June 2020 there are 28 single-family homes completed out of the 190 single-family lots planned for the full buildout of the subdivision.

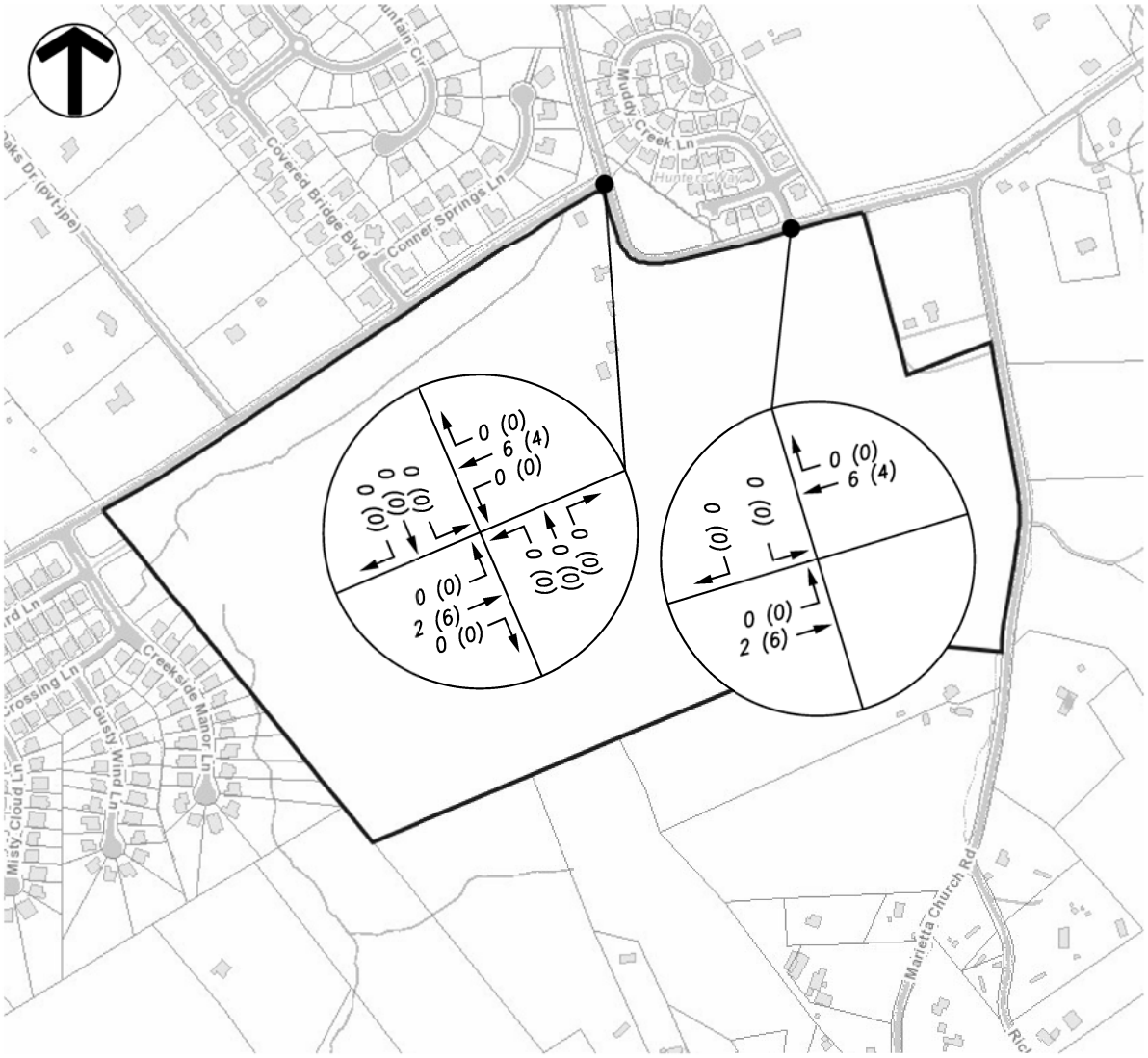
The existing main subdivision entrance is located on Hardin Valley Road 1,685 feet east of the intersection of Marietta Church Road and a second driveway connection is proposed on Marietta Church Road 1,050 feet south of the intersection with Hardin Valley Road. As of June 2020 Boston Ivy Lane has been built with a temporary cul-de-sac, English Ivy Lane has been built with a temporary cul-de-sac and the second driveway connection to Marietta Church Road has not been built.

AJAX Engineering conducted a traffic impact study for the Vining Mill Subdivision in January 2017. The trip generation for the Vining Mill Subdivision includes 190 single-family detached houses. The estimated new site trips as stated in the "Vining Mill Subdivision Traffic Impact Study" is 1,896 daily trips, 143 trips during the AM peak hour and 188 trips during the PM peak hour. The trip distribution for the site trips is 90% of traffic entering/exiting from the direction of Pellissippi Parkway (SR162), 5% of traffic entering/exiting from Marietta Church Road and 5% of traffic entering/exiting from Hickory Creek Road. Figure 2a "Proposed Plan Layout Vining Mill", Figure 5 "Vining Mill Subdivision Directional Distribution of Generated Traffic for Vining Mill" and Figure 6 "Vining Mill Subdivision Traffic Assignment of Generated Traffic for Vining Mill" are included in Attachment 3.

The 2018 turning movement count was completed prior to the construction of the Vining Mill Subdivision; therefore, the additional traffic from the construction of 28 single-family homes was considered in order to get an accurate depiction of the existing 2020 turning movement count. The additional traffic on Hickory Creek Road from the 28 single-family homes was considered negligible at 1 vehicle or less during the AM and PM peak hours so was not added to the existing traffic count shown on Figure 3.

The total additional traffic on Hickory Creek Road from the full buildout of the Vining Mill Subdivision is 6 trips eastbound and 2 trips westbound during the AM peak hour and 4 trips eastbound and 6 trips westbound during the PM peak hour as shown on Figure 6 "Vining Mill Subdivision Traffic Assignment of Generated Traffic for Vining Mill".

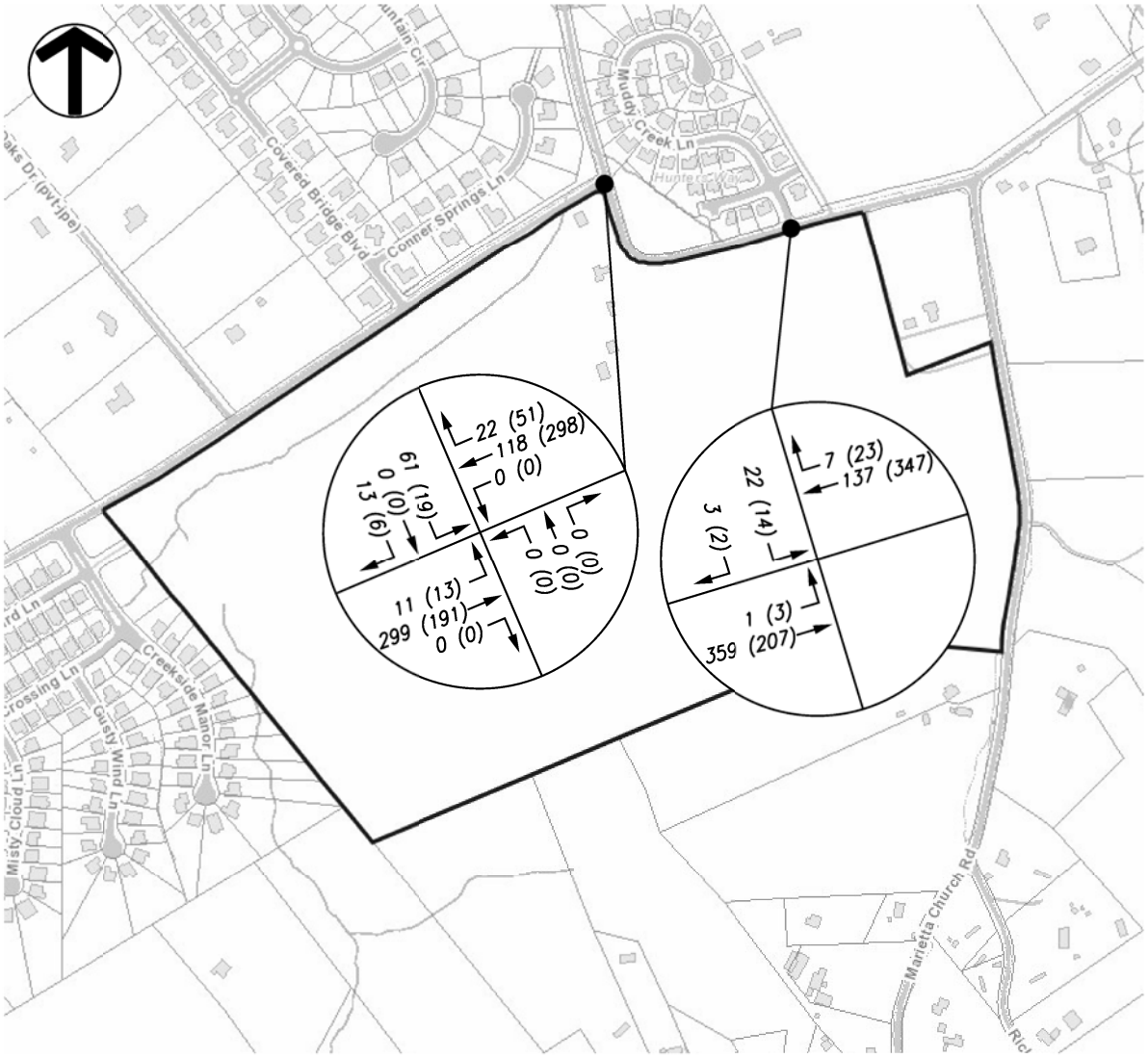
Figure 6 shows the Vining Mill Subdivision peak hour site trips and Figure 7 shows the 2023 background traffic including the trips from the Vining Mill Subdivision.



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 6: Vining Mill Subdivision Peak Hour Site Trips



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 7: 2023 Combined Background Peak Hour Traffic

4 Trip Generation and Trip Distribution

The Seal Property Subdivision proposes 265 single family lots. Single- Family Detached Housing or Land Use 210 was used to calculate site trips for the subdivision using the fitted curve equations from the *Trip Generation, 10th Edition,* published by the Institute of Transportation Engineers. The land use worksheets are included in Attachment 5.

The total trips generated by the full buildout of the Seal Property Subdivision was estimated to be 2,549 daily trips. The estimated trips are 193 trips during the AM peak hour and 259 trips during the PM peak hour. A trip generation summary is shown in Table 4-1.

Table 4-1
Seal Property Subdivision
Trip Generation Summary

Land Use	Density	Daily Trips	AM Peak Hour Enter	AM Peak Hour Exit	PM Peak Hour Enter	PM Peak Hour Exit
Single-Family Detached Housing (LUC 210)	265 Lots	2549	48	145	163	96

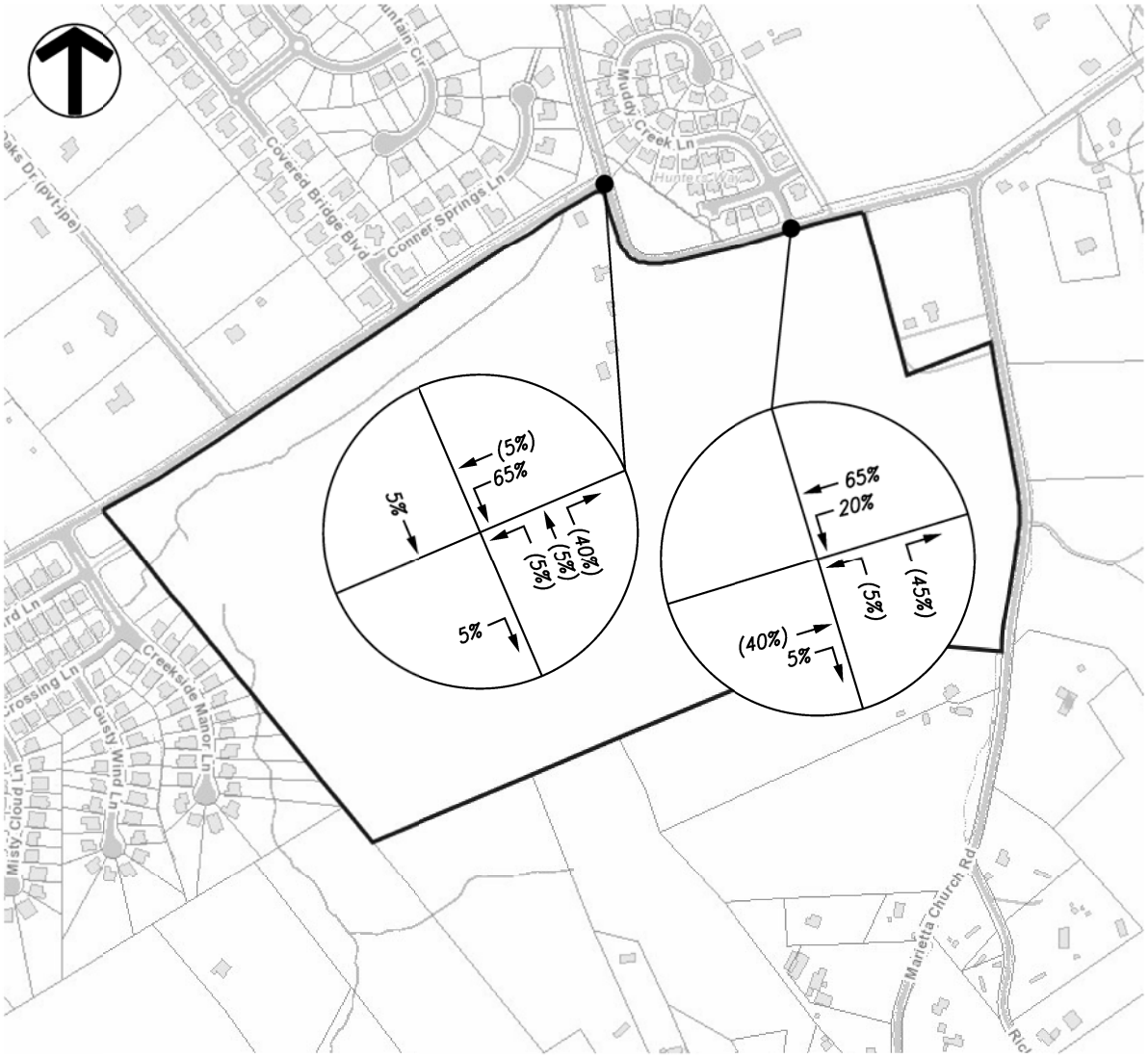
The existing distribution of traffic at the intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road is 60% eastbound, 25% northbound and 15% southbound during the AM peak hour and 35% eastbound, 60% northbound and 5% southbound during the PM peak hour.

The directional distribution of the traffic generated by the Seal Property Subdivision was determined using the existing traffic volumes along Hardin Valley Road in combination with the concept plan layout. FMA assumed that 85% of traffic would enter/exit from Hardin Valley Road, 10% of traffic would enter/exit from Hickory Creek Road and 5% of traffic would enter/exit from E Gallaher Ferry Road.

The subdivision traffic will enter / exit using both the roundabout and the intersection of Hardin Valley Road at the driveway connection (Road "A"). FMA assumed that 25% of the proposed site traffic would enter from the intersection Hardin Valley Road at the driveway connection (Road "A") and 75% of the proposed site traffic would enter via the roundabout. FMA assumed that 50% of the proposed site traffic would exit from the intersection of Hardin Valley Road at the driveway connection (Road "A") and 50% of the proposed site traffic would exit via the roundabout.

Figure 8 shows the peak hour trip distribution and Figure 9 shows the peak hour site trips for the Seal Property Subdivision.

Figure 10 shows the combined peak hour traffic after the full buildout of the subdivision.



LEGEND:

← 50% (50%) TRIP DISTRIBUTION ENTERING (EXITING)

Figure 8: Peak Hour Trip Distribution

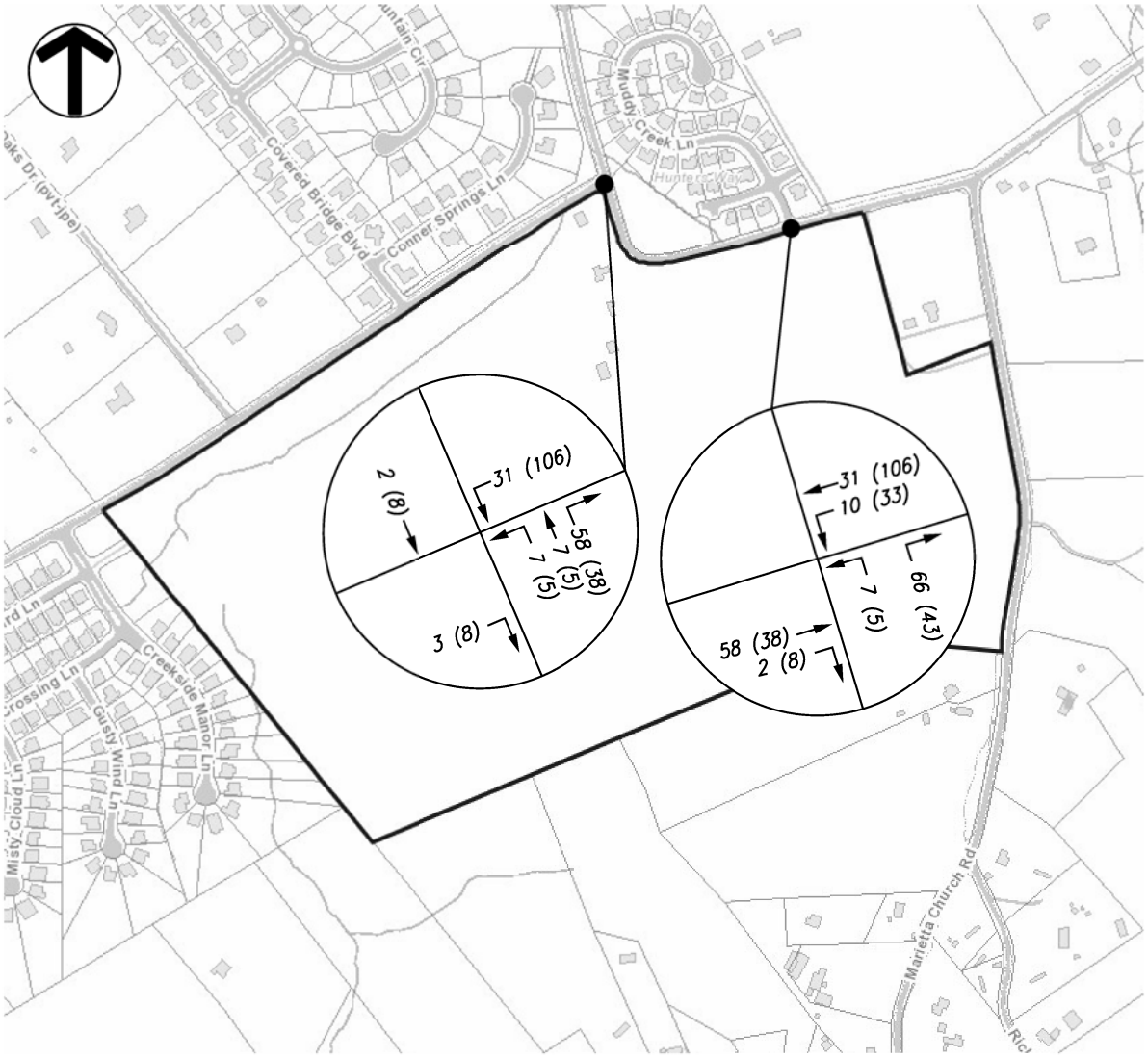
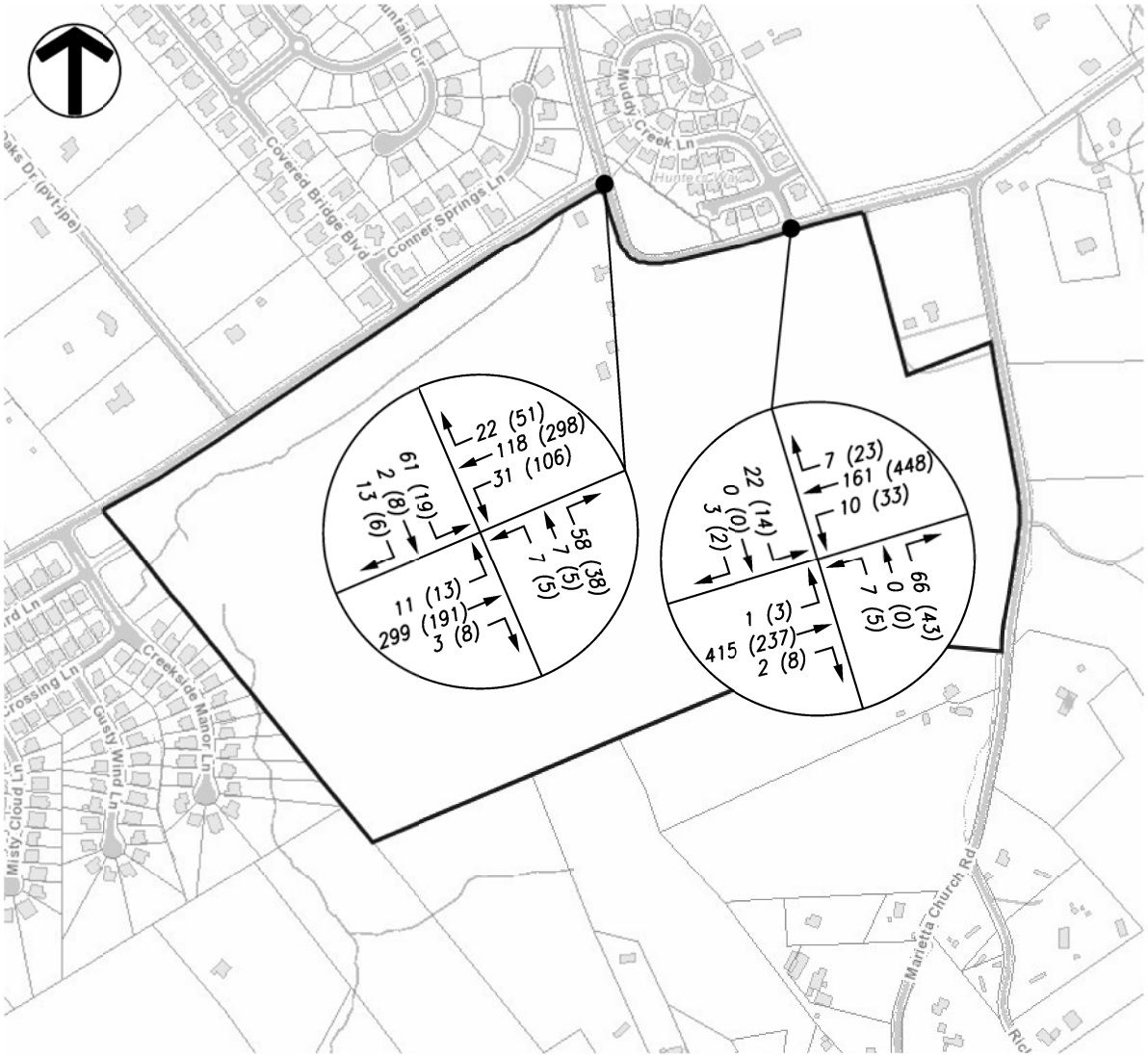


Figure 9: Seal Property Subdivision Peak Hour Site Trips



LEGEND:

← 5 (16) TURNING MOVEMENT VOLUME AM (PM)

Figure 10: 2023 Full Buildout Peak Hour Traffic

5 Projected Capacity and Level of Service

The existing intersections of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road and Hardin Valley Road at Muddy Creek Lane are both two-way stop controlled intersections. During the background and full buildout conditions the intersection of Hickory Creek at Hardin Valley Road / E Gallaher Ferry Road will be replaced by a proposed roundabout designed by others.

Unsignalized intersection capacity analyses were performed using the Highway Capacity Software (HCS7) for the AM and PM peak hours to evaluate the traffic conditions at the intersections of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road and Hardin Valley Road at Muddy Creek Lane / Driveway Connection (Road "A").

Roundabout intersection capacity analyses were performed using the Highway Capacity Software (HCS7) for the AM and PM peak hours to evaluate the traffic conditions at the proposed intersection of Hickory Creek at Hardin Valley Road / E Gallaher Ferry Road for the background and full buildout conditions.

The results from the analyses are expressed with a term "level of service" (LOS), which is based on the amount of delay experienced at the intersection. The LOS index ranges from LOS A, indicating excellent traffic conditions with minimal delay, to LOS F indicating very congested conditions with excessive delay. LOS D generally is considered the minimum acceptable condition in urban areas. The existing, background and full buildout HCS7 worksheets are included in Attachments 6, 7 and 8.

Table 5-1 shows the results of the capacity analyses.

Table 5-1
Intersection Analysis
Level of Service (LOS) Summary

		Delay (sec)/LOS
Hardin Valley Road @ Hickory Creek Road (Existing 2020)		
AM Peak	EB Approach	10.2 / B
	NB Left Turn	7.5 / A
PM Peak	EB Approach	9.8 / A
	NB Left Turn	7.8 / A

Hardin Valley Road @ Muddy Creek Lane (Existing 2020)		
AM Peak	EB Left Turn	7.5 / A
	SB Approach	11.5 / B
PM Peak	EB Left Turn	8.0 / A
	SB Approach	12.1 / B
Hardin Valley Road @ Hickory Creek Road (Background 2023)		
AM Peak	Intersection	4.5 / A
PM Peak	Intersection	4.8 / A
Hardin Valley Road @ Muddy Creek Lane (Background 2023)		
AM Peak	EB Left Turn	7.5 / A
	SB Approach	12.1 / B
PM Peak	EB Left Turn	8.1 / A
	SB Approach	12.9 / B
Hardin Valley Road @ Hickory Creek Road (Full Buildout 2023)		
AM Peak	Intersection	4.8 / A
PM Peak	Intersection	5.7 / A
Hardin Valley Road @ Muddy Creek Lane / Road "A" (Full Buildout 2023)		
AM Peak	EB Left Turn	7.6 / A
	WB Left Turn	8.3 / A
	NB Approach	12.3 / B
	SB Approach	16.6 / C
PM Peak	EB Left Turn	8.4 / A
	WB Left Turn	7.9 / A
	NB Approach	10.9 / B
	SB Approach	19.4 / C

6 Turn Lane Warrant Analysis

The intersection of Hardin Valley Road at the driveway connection (Road "A") was evaluated to determine if a right turn lane or a left turn lane are warranted. The Knox County Department of Engineering and Public Works handbook, "Access Control and Driveway Design Policy," was used to analyze the information. Neither an eastbound right turn lane nor a westbound left turn lane on Hardin Valley Road is warranted. The turn lane warrant worksheets and analysis are included in Attachment 9.

7 Conclusions and Recommendations

7.1 Hickory Creek Road @ Hardin Valley Road

The existing conditions at the two-way stop controlled intersection of Hickory Creek Road at Hardin Valley Road / E Gallaher Ferry Road and the background and full conditions at the proposed roundabout were analyzed using the Highway Capacity Software (HCS7).

The existing traffic conditions for the eastbound approach (Hickory Creek Road) operate at a LOS B during the AM peak hour and a LOS A during the PM Peak hour and the northbound left turn (Hardin Valley Road) operates at a LOS A during both the AM and PM peak hours.

The background and full buildout traffic conditions at the proposed roundabout intersection will operate at a LOS A during both the AM and PM peak hours.

The unsignalized intersection capacity analyses shows a 95% queue length at the full buildout of approximately two car lengths for the eastbound approach during the AM peak hour and two car lengths for the westbound approach during the PM peak hour; therefore the existing storage at the intersection is adequate and no change is necessary.

Hickory Creek Road is classified as a Minor Arterial per the Major Road Plan. The minimum intersection spacing required on an arterial is 400 feet per the "Knoxville-Knox County Subdivision Regulations" as amended through February 13, 2020. The proposed driveway connection is located approximately 915 feet east of the intersection of Hickory Creek Road at Covered Bridge Boulevard. This driveway connection exceeds the typical minimum separation on a Minor Arterial; therefore, no change is necessary.

7.2 Hardin Valley Road at Muddy Creek Lane

The existing, background and full buildout conditions at the unsignalized intersection of Hardin Valley Road at Muddy Creek Lane were analyzed using the Highway Capacity Software (HCS7).

The existing traffic conditions for the eastbound left turn movement (Hardin Valley Road) currently operate at a LOS A during both the AM and PM peak hours and the southbound approach (Muddy Creek Lane) operates at a LOS B during both the AM and PM peak hours.

The background traffic conditions for the eastbound left turn movement (Hardin Valley Road) currently operate at a LOS A during both the AM and PM peak hours and the southbound approach (Muddy Creek Lane) operates at a LOS B during both the AM and PM peak hours.

As a part of the Seal Property Subdivision the driveway connection (Road "A") will tie into the existing intersection of Hardin Valley Road at Muddy Creek Lane. The full buildout traffic conditions for the eastbound and westbound left turning movements operate at a LOS A during both the AM and PM peak hours, the northbound approach (Road "A") operates at a LOS B during both the AM and PM peak hours and the southbound approach (Muddy Creek Lane) will operate at a LOS C during both the AM and PM peak hours after the completion of the Seal Property Subdivision.

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 Seal Property Subdivision has one proposed driveway entrance/exit at the Hickory Creek Road, Hardin Valley road and E Gallaher Ferry Road roundabout and a second driveway connection onto Hardin Valley Road. The two access points in combination with the subdivision layout should provide adequate accessibility.

After the completion of the Seal Property Subdivision neither an eastbound right turn lane nor a westbound left turn lane are warranted at the intersection of Hardin Valley Road at Muddy Creek Lane / driveway connection (Road "A").

The minimum required sight distance for a road with a posted speed limit of 45 mph is 450 feet in each direction in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020. FMA measured the sight distance at the existing intersection of Hardin Valley Road at Muddy Creek Lane in July 2020. At 15 feet from the edge of pavement the sight distance is greater than 600 feet eastbound and 580 feet westbound.

Hardin Valley Road is classified as a Minor Arterial per the Major Road Plan. The minimum intersection spacing required on an arterial is 400 feet per the "Knoxville-Knox County Subdivision Regulations" as amended through February 13, 2020. The proposed driveway connection (Road "A") is located approximately 770 feet east of the proposed roundabout and 705 feet west of the intersection with Marietta Church Road. This driveway connection exceeds the typical minimum separation on a Minor Arterial; therefore, no change is necessary.

7.3 Subdivision Roads

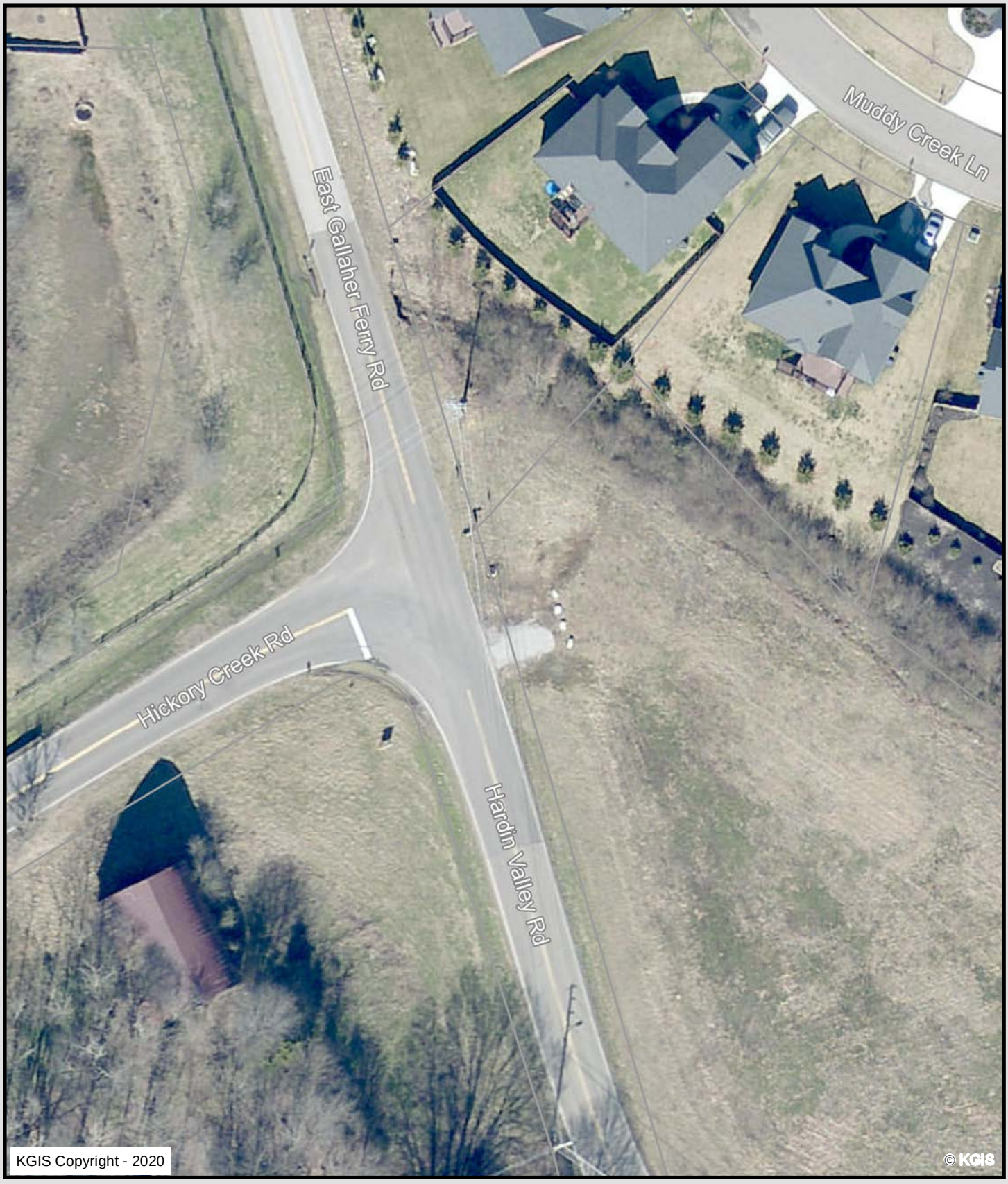
Road "A", Road "B", Road "C" and Road "D" will have a width of 26 feet in accordance with the "Knoxville-Knox County Subdivision Regulations" amended through February 13, 2020.

The minimum required sight distance for the internal subdivision Road "A", Road "B", Road "C" and Road "D" will be 250 feet in each direction in accordance with the "Knoxville-Knox County Subdivision Regulations" as amended through February 13, 2020. The sight triangles for the intersections of the internal subdivision roads are provided in Attachment 10.

Sight triangles are used to provide adequate sight distance for a stopped driver on the minor approach to enter or cross the major roadway. Any object (i.e. buildings, hedges, trees, walls, fences, etc.) within the sight triangle that would obstruct the driver's view of an approaching vehicle should be removed or modified. FMA recommends any necessary landscaping that may be involved to maintain the clear sight triangles and comply with Knox County Engineering and Public Works requirements.

Any required sight distance easements for the internal subdivision intersections of Road "A", Road "B", Road "C", and Road "D" should be coordinated with Knox County Engineering and Public Works and included on the final design drawings prior to construction of the subdivision.

Attachment 1
Aerial Photo



Hickory Creek at Hardin Valley

Knoxville - Knox County - KUB Geographic Information System

Printed: 6/9/2020 at 11:40:40 AM

0 25 50 100

ft

Attachment 2
CCI Traffic Counts

Project ID: 18-10026-001
Location: Hardin Valley Rd/E Gallaher Ferry Rd & Hickory Creek Rd
City: Knoxville

Day: Thursday
Date: 11/01/2018

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Hardin Valley Rd/E Gallaher Ferry Rd Northbound						Hardin Valley Rd/E Gallaher Ferry Rd Southbound						Hickory Creek Rd Eastbound						Hickory Creek Rd Westbound						
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
7:00 AM	13	2	0	0	0	15	0	10	1	0	0	11	1	0	57	0	0	58	0	0	0	0	0	0	84
7:15 AM	19	1	0	0	0	20	0	12	1	0	0	13	0	0	51	0	0	51	0	0	0	0	0	0	94
7:30 AM	24	1	0	0	0	25	0	11	3	0	0	14	2	0	59	0	0	62	0	0	0	0	0	0	101
7:45 AM	29	8	0	0	0	37	0	10	4	0	0	14	5	0	53	0	0	58	0	0	0	0	0	0	109
Total	85	12	0	0	0	97	0	43	9	0	0	52	8	0	220	0	0	239	0	0	0	0	0	0	388
8:00 AM	16	7	0	0	0	23	0	15	2	0	0	17	2	0	59	0	0	61	0	0	0	0	0	0	101
8:15 AM	25	1	0	0	0	26	0	6	1	0	0	7	1	0	47	0	0	48	0	0	0	0	0	0	81
8:30 AM	26	4	0	0	0	30	0	16	2	0	0	18	1	0	28	0	0	29	0	0	0	0	0	0	77
8:45 AM	26	3	0	0	0	28	0	7	1	0	0	8	0	0	29	0	0	29	0	0	0	0	0	0	65
Total	93	15	0	0	0	107	0	44	6	0	0	50	4	0	163	0	0	167	0	0	0	0	0	0	324
BREAK																									
4:00 PM	47	4	0	0	0	51	0	4	1	0	0	5	1	0	37	0	0	38	0	0	0	0	0	0	94
4:15 PM	45	11	0	0	0	56	0	3	0	0	0	3	2	0	32	0	0	34	0	0	0	0	0	0	93
4:30 PM	49	7	0	0	0	56	0	7	0	0	0	7	2	0	35	0	0	37	0	0	0	0	0	0	100
4:45 PM	36	5	0	0	0	41	0	5	0	0	0	5	2	0	25	0	0	27	0	0	0	0	0	0	73
Total	177	27	0	0	0	204	0	19	1	0	0	20	7	0	129	0	0	136	0	0	0	0	0	0	360
5:00 PM	53	12	0	0	0	65	0	2	1	0	0	3	1	0	45	0	0	46	0	0	0	0	0	0	114
5:15 PM	66	12	0	0	0	80	0	5	1	0	0	6	2	0	36	0	0	38	0	0	0	0	0	0	124
5:30 PM	65	8	0	0	0	73	0	3	1	0	0	4	3	0	38	0	0	41	0	0	0	0	0	0	118
5:45 PM	44	8	0	0	0	52	0	5	2	0	0	7	4	0	26	0	0	30	0	0	0	0	0	0	89
Total	230	40	0	0	0	270	0	15	5	0	0	20	10	0	145	0	0	155	0	0	0	0	0	0	445
Grand Total	584	94	0	0	0	678	0	121	21	0	0	142	29	0	668	0	0	697	0	0	0	0	0	0	1517
Approh %	86.1	13.9	0.0	0.0	0.0		0.0	85.2	14.8	0.0	0.0		4.2	0.0	95.8	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	38.5	6.2	0.0	0.0	0.0	44.7	0.0	8.0	1.4	0.0	0.0	9.4	1.9	0.0	44.0	0.0	0.0	45.9	0.0	0.0	0.0	0.0	0.0	0.0	
Cars, PU, Vans	557	92	0	0	0	649	0	120	20		0	140	27	0	631	0		658	0	0	0		0	0	1447
% Cars, PU, Vans	95.4	97.9	0.0	0.0	0.0	95.7	0.0	99.2	95.2	0.0	0.0	98.6	93.1	0.0	94.5	0.0	0.0	94.4	0.0	0.0	0.0	0.0	0.0	0.0	95.4
Heavy Trucks	27	2	0	0		29	0	1	1	0		2	2	0	37	0		39	0	0	0	0		0	70
%Heavy Trucks	4.6	2.1	0.0	0.0	0.0	4.3	0.0	0.8	4.8	0.0	0.0	1.4	6.9	0.0	5.5	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	4.6

Project ID: 18-10026-001
Location: Hardin Valley Rd/E Gallaher Ferry Rd & Hickory Cr
City: Knoxville

PEAK HOURS

Day: Thursday
Date: 11/01/2018

AM

	Hardin Valley Rd/E Gallaher Ferry Rd Northbound					Hardin Valley Rd/E Gallaher Ferry Rd Southbound					Hickory Creek Rd Eastbound					Hickory Creek Rd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App Total	Left	Thru	Rgt	Uturn	App Total	Left	Thru	Rgt	Uturn	App Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
7:15 AM	19	1	0	0	20	0	12	1	0	13	0	0	61	0	61	0	0	0	0	0	94
7:30 AM	24	1	0	0	25	0	11	3	0	14	2	0	60	0	62	0	0	0	0	0	101
7:45 AM	29	8	0	0	37	0	10	4	0	14	5	0	53	0	58	0	0	0	0	0	109
8:00 AM	16	7	0	0	23	0	15	2	0	17	2	0	59	0	61	0	0	0	0	0	101
Total Volume	88	17	0	0	105	0	48	10	0	58	9	0	233	0	242	0	0	0	0	0	405
% App. Total	83.8	16.2	0.0	0.0	100	0.0	82.8	17.2	0.0	100	3.7	0.0	96.3	0.0	100	0.0	0.0	0.0	0.0	0	
PHF					0.709					0.853					0.976						0.929
Cars, PU, Vans	82	16	0	0	98	0	48	9	0	57	8	0	212	0	220	0	0	0	0	0	375
% Cars, PU, Vans	93.2	94.1	0.0	0.0	93.3	0.0	100.0	90.0	0.0	98.3	88.9	0.0	91.0	0.0	90.9	0.0	0.0	0.0	0.0	0.0	92.6
Heavy Trucks	6	1	0	0	7	0	0	1	0	1	1	0	21	0	22	0	0	0	0	0	30
%Heavy Trucks	6.8	5.9	0.0	0.0	6.7	0.0	0.0	10.0	0.0	1.7	11.1	0.0	9.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	7.4

PM

	Hardin Valley Rd/E Gallaher Ferry Rd Northbound					Hardin Valley Rd/E Gallaher Ferry Rd Southbound					Hickory Creek Rd Eastbound					Hickory Creek Rd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App Total	Left	Thru	Rgt	Uturn	App Total	Left	Thru	Rgt	Uturn	App Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
5:00 PM	53	12	0	0	65	0	2	1	0	3	1	0	45	0	46	0	0	0	0	0	114
5:15 PM	68	12	0	0	80	0	5	1	0	6	2	0	36	0	38	0	0	0	0	0	124
5:30 PM	65	8	0	0	73	0	3	1	0	4	3	0	38	0	41	0	0	0	0	0	118
5:45 PM	44	8	0	0	52	0	5	2	0	7	4	0	26	0	30	0	0	0	0	0	88
Total Volume	230	40	0	0	270	0	15	5	0	20	10	0	145	0	155	0	0	0	0	0	445
% App. Total	85.2	14.8	0.0	0.0	100	0.0	75.0	25.0	0.0	100	6.5	0.0	93.5	0.0	100	0.0	0.0	0.0	0.0	0	
PHF					0.844					0.714					0.842						0.897
Cars, PU, Vans	229	39	0	0	268	0	15	5	0	20	10	0	144	0	154	0	0	0	0	0	442
% Cars, PU, Vans	99.6	97.5	0.0	0.0	99.3	0.0	100.0	100.0	0.0	100.0	100.0	0.0	99.3	0.0	99.4	0.0	0.0	0.0	0.0	0.0	99.3
Heavy Trucks	1	1	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
%Heavy Trucks	0.4	2.5	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.7

Project: Hickory Creek Subdivision
Intersection: Hardin Valley Rd/E Gallaher Ferry Rd at Hickory Creek Rd
Date Conducted: November 1, 2018

AM Peak Hour	7:15 AM - 8:15 AM	405
PM Peak Hour	5:00 PM - 6:00 PM	445

	Hardin Valley/E Gallaher Ferry Northbound				Hardin Valley/E Gallaher Ferry Southbound				Hickory Creek Road Westbound				Hickory Creek Road Eastbound				
Start	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
Peak Hour Analysis from 7:00 AM to 9:00 AM																	
AM Peak Hour begins at 7:15 AM																	
7:15 AM	19	1	0	20	0	12	1	13	0	0	**61**	61	0	0	0	0	94
7:30 AM	24	1	0	**25**	0	11	3	**14**	2	0	60	**62**	0	0	0	0	101
7:45 AM	**29**	**8**	0	37	0	10	**4**	14	**5**	0	53	58	0	0	0	0	**109**
8:00 AM	16	7	0	23	0	**15**	2	17	2	0	59	61	0	0	0	0	101
Total Volume	88	17	0	105	0	48	10	58	9	0	233	242	0	0	0	0	405
Existing (5% over 2 yrs)	97	19	0		0	53	11		10	0	257		0	0	0		447
Future (5% over 5 yrs)	112	22	0		0	61	13		11	0	297		0	0	0		517
PHF	0.76	0.53	-		-	0.80	0.63		0.45	-	0.95		-	-	-		0.93
Peak Hour Analysis from 2:30 PM to 6:00 PM																	
PM Peak Hour begins at 5:00 PM																	
5:00 PM	53	**12**	0	65	0	2	1	3	1	0	**45**	**46**	0	0	0	0	114
5:15 PM	**68**	12	0	80	0	**5**	1	6	2	0	36	38	0	0	0	0	**124**
5:30 PM	65	8	0	**73**	0	3	1	**4**	3	0	38	41	0	0	0	0	118
5:45 PM	44	8	0	52	0	5	2	7	**4**	0	26	30	0	0	0	0	89
Total Volume	230	40	0	270	0	15	5	20	10	0	145	155	0	0	0	0	445
Existing (5% over 2 yrs)	254	44	0		0	17	6		11	0	160		0	0	0		491
Future (5% over 5 yrs)	294	51	0		0	19	6		13	0	185		0	0	0		568
PHF	0.85	0.83	-		-	0.75	0.63		0.63	-	0.81		-	-	-		0.90

Attachment 3
Vining Mill Subdivision

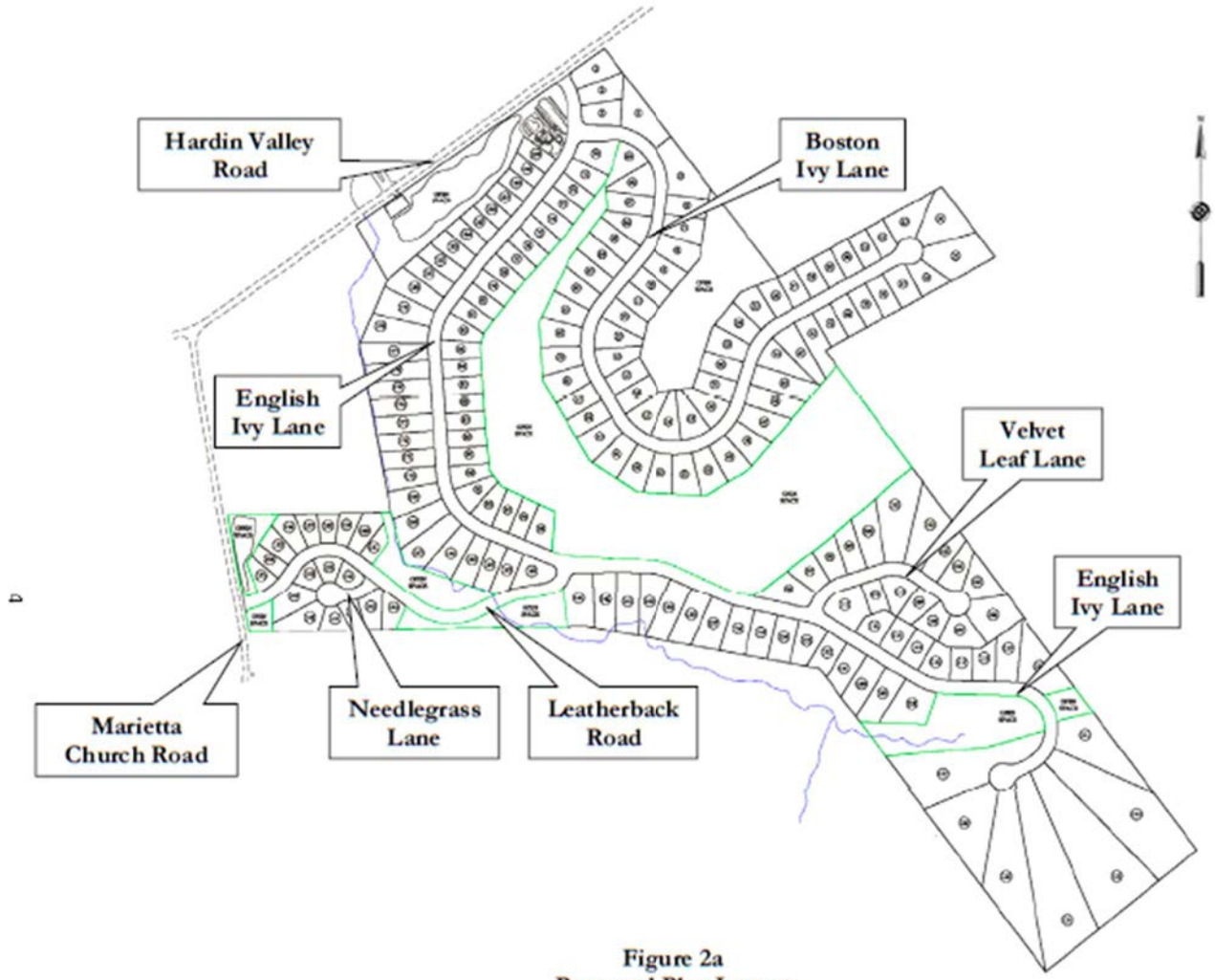
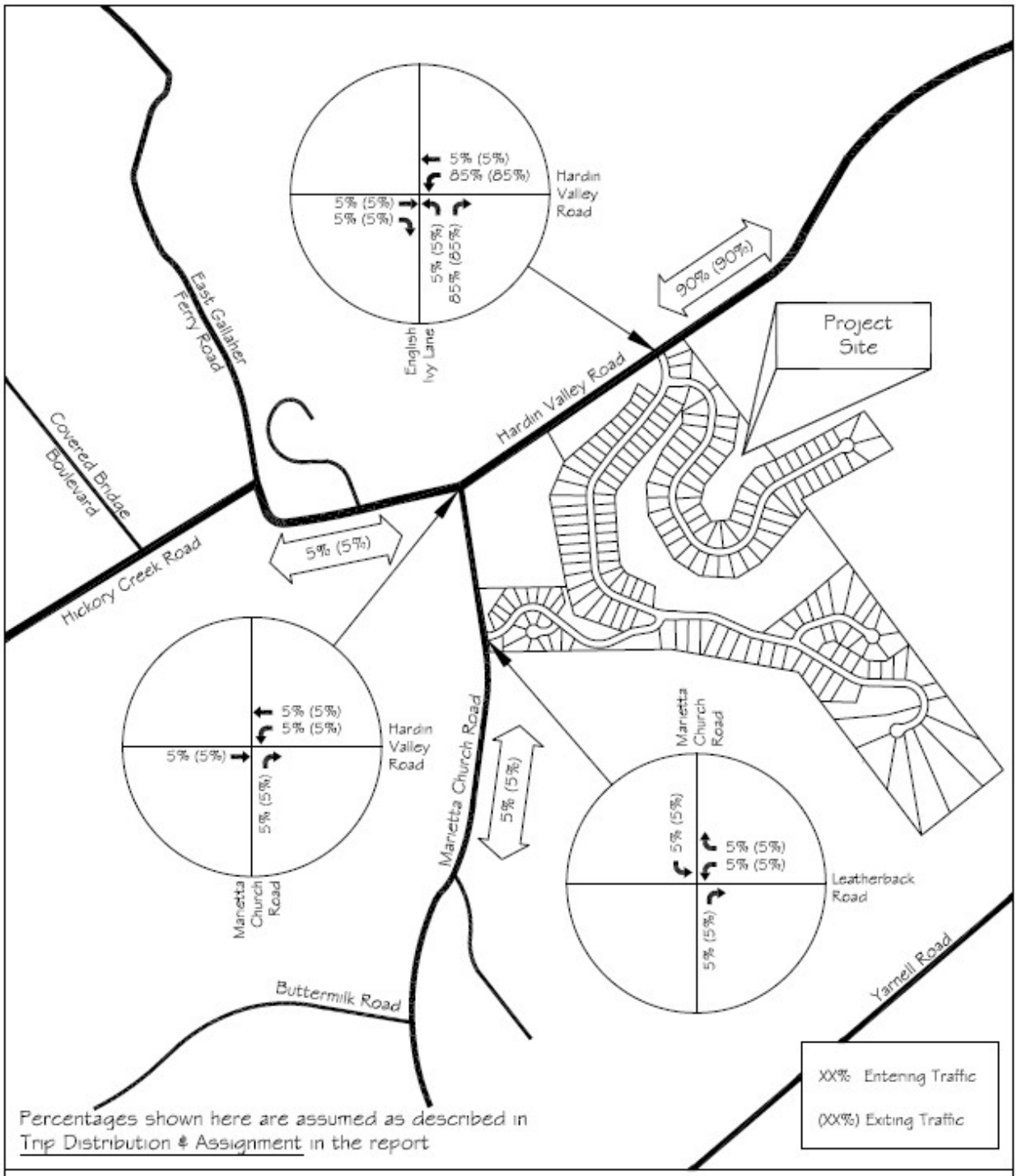


Figure 2a
Proposed Plan Layout
Vining Mill



AJAX ENGINEERING
11812 Black Road
Knoxville, TN 37932
Phone: (865) 556-0042
Email: ajaxengineering@gmail.com

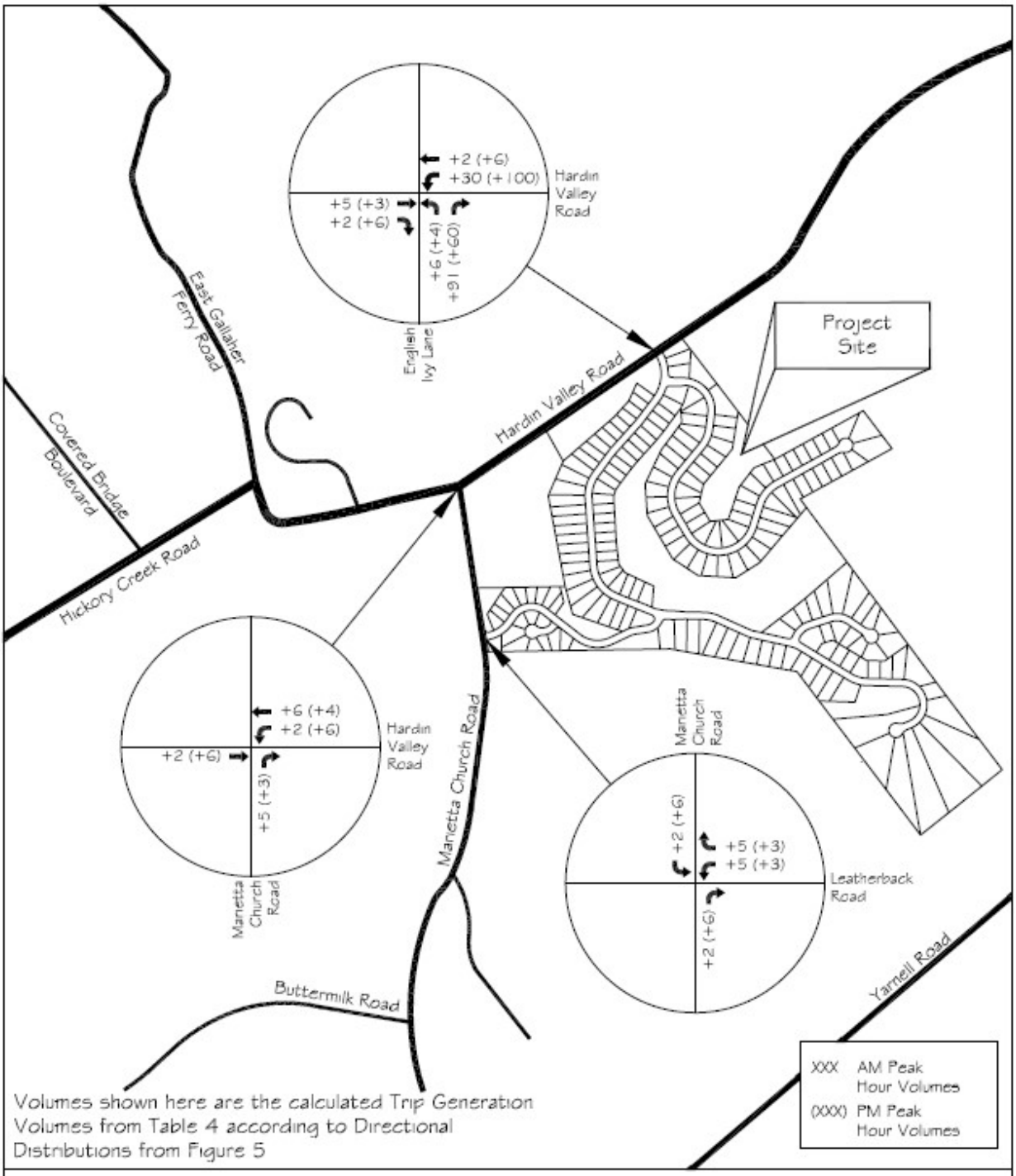
NOT TO SCALE

NORTH

FIGURE 5

Vining Mill Subdivision

Directional Distribution of Generated Traffic for Vining Hill



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11812 Black Road
Knoxville, TN 37932
Phone: (865) 556-0042
Email: ajaxengineering@gmail.com

NOT TO SCALE

NORTH

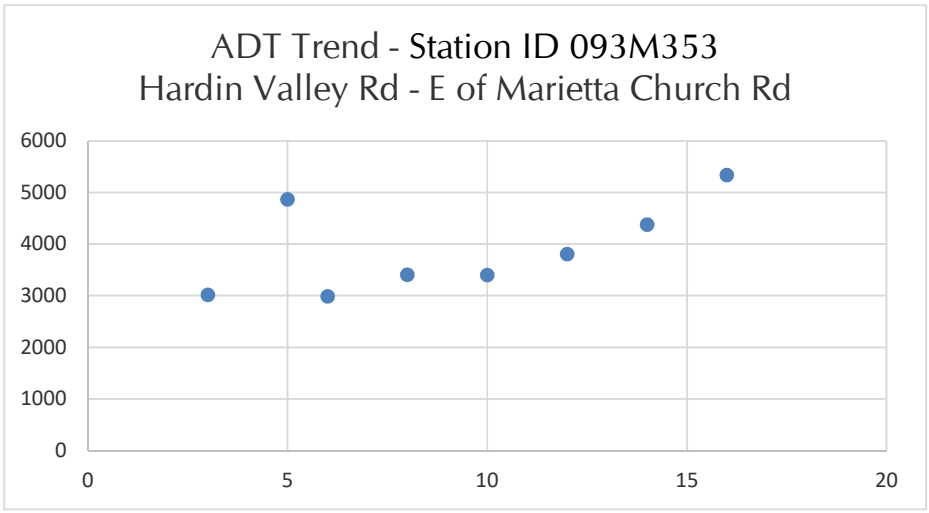
FIGURE 6

Vining Mill Subdivision

Traffic Assignment of Generated Traffic for Vining Hill

Attachment 4
ADT Trends

Year	Adjusted Average Daily Traffic
2001	
2002	
2003	3020
2004	
2005	4871
2006	2990
2007	
2008	3410
2009	
2010	3400
2011	
2012	3810
2013	
2014	4380
2015	
2016	5340
2017	
2018	

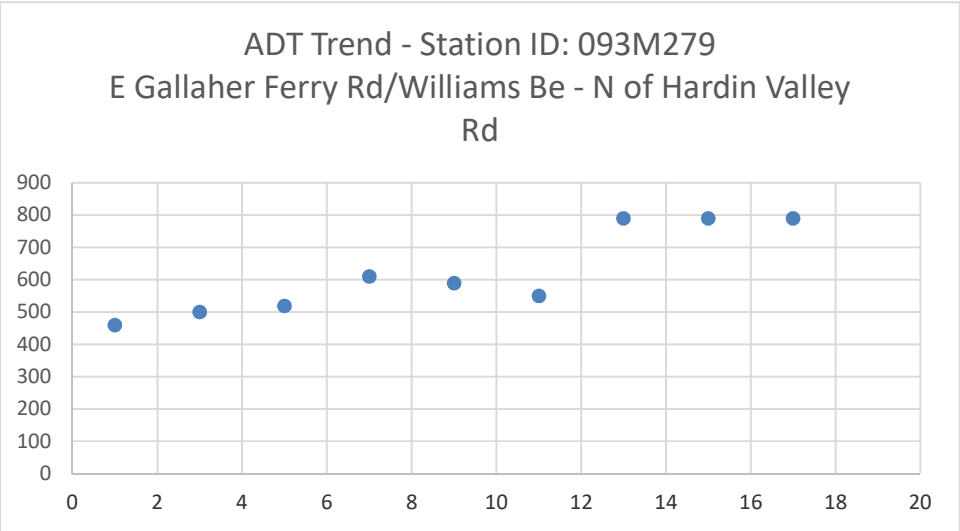


Most Recent Trend Line Growth

Year	ADT
2003	3020
2016	5340

Annual Percent Growth	**5.91%**

Year	Adjusted Average Daily Traffic
2001	460
2002	
2003	500
2004	
2005	519
2006	
2007	610
2008	
2009	590
2010	
2011	550
2012	
2013	790
2014	
2015	790
2016	
2017	790
2018	

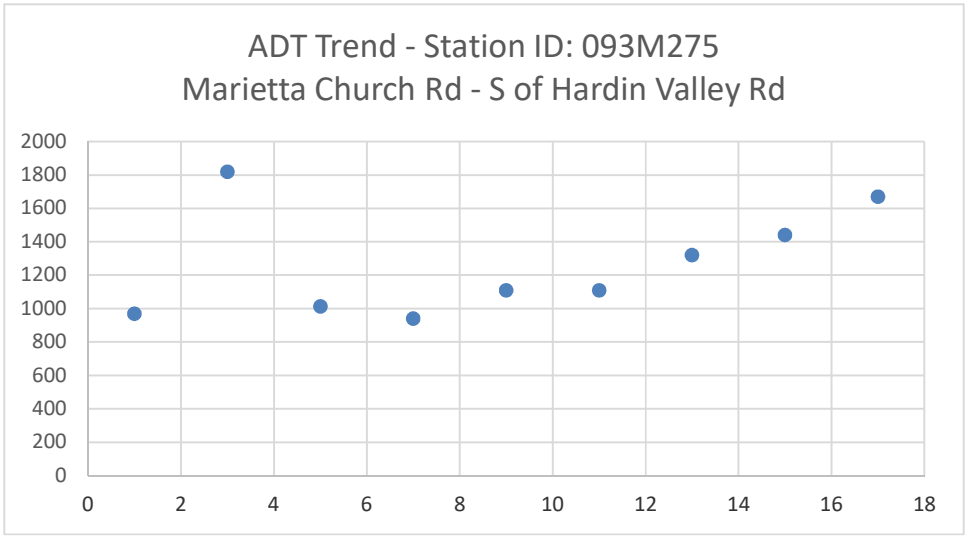


Most Recent Trend Line Growth

Year	ADT
2001	460
2017	790

Annual Percent Growth	**4.48%**

Year	Adjusted Average Daily Traffic
2001	970
2002	
2003	1820
2004	
2005	1014
2006	
2007	940
2008	
2009	1110
2010	
2011	1110
2012	
2013	1320
2014	
2015	1440
2016	
2017	1670
2018	



Most Recent Trend Line Growth

Year	ADT
2001	970
2017	1670

Annual Percent Growth	**4.51%**

Attachment 5
Trip Generation

Project: Seal Property Subdivision
Date Conducted: 6/9/2020

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

Average Daily Traffic
$Ln(T) = 0.92Ln(X) + 2.71$
$Ln(T) = 0.92Ln(269) + 2.71$
$T = 2584$

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
$T = 0.71(X) + 4.80$
$T = 0.71(269) + 4.80$
$T = 196$

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
$Ln(T) = 0.96Ln(X) + 0.20$
$Ln(T) = 0.96Ln(269) + 0.20$
$T = 263$

		Percent		Number	
Time Period	Total Trips	Enter	Exit	Enter	Exit
Weekday (24 hours)	2584	50%	50%	1292	1292
AM Peak Hour	196	25%	75%	49	147
PM Peak Hour	263	63%	37%	166	97

Project: Hunters Way Subdivision
Date Conducted: 7/27/2020

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

Average Daily Traffic

$Ln(T) = 0.92Ln(X) + 2.71$
$Ln(T) = 0.92Ln(40) + 2.71$
$T = 448$

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

$T = 0.71(X) + 4.80$
$T = 0.71(40) + 4.80$
$T = 33$

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

$Ln(T) = 0.96Ln(X) + 0.20$
$Ln(T) = 0.96Ln(40) + 0.20$
$T = 42$

Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	448	50%	50%	224	224
AM Peak Hour	33	25%	75%	8	25
PM Peak Hour	42	63%	37%	26	16

Single-Family Detached Housing
(210)

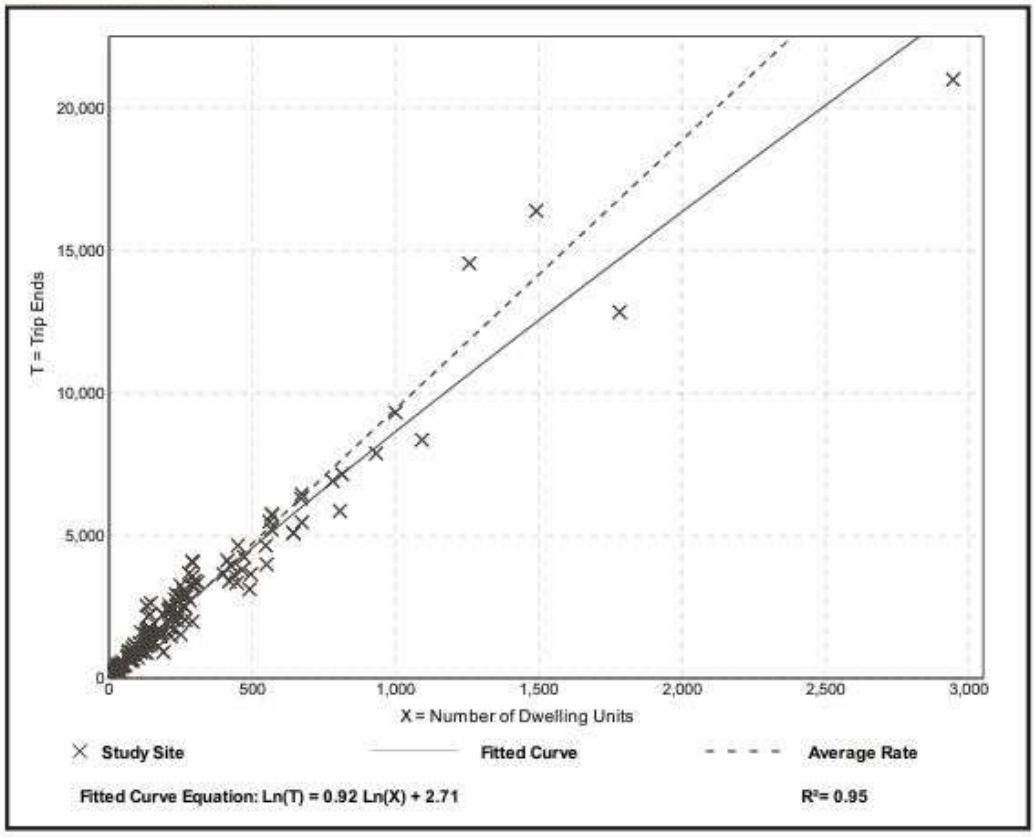
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



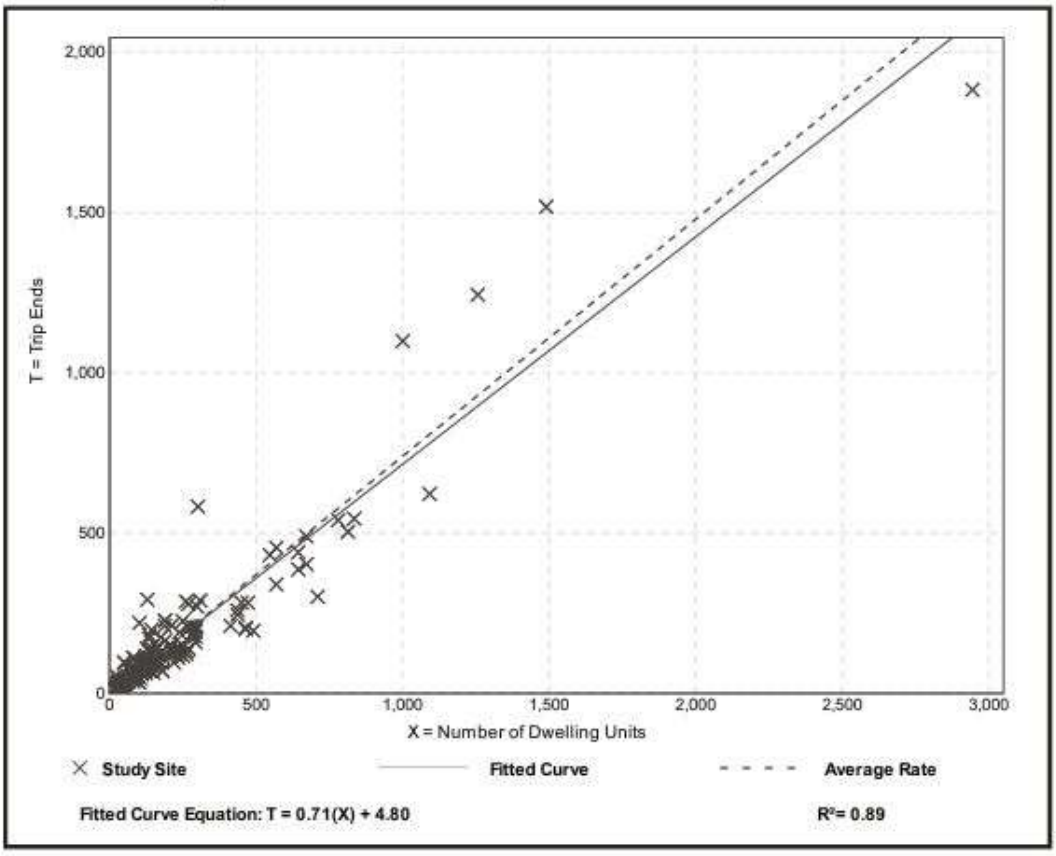
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	173
Avg. Num. of Dwelling Units:	219
Directional Distribution:	25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



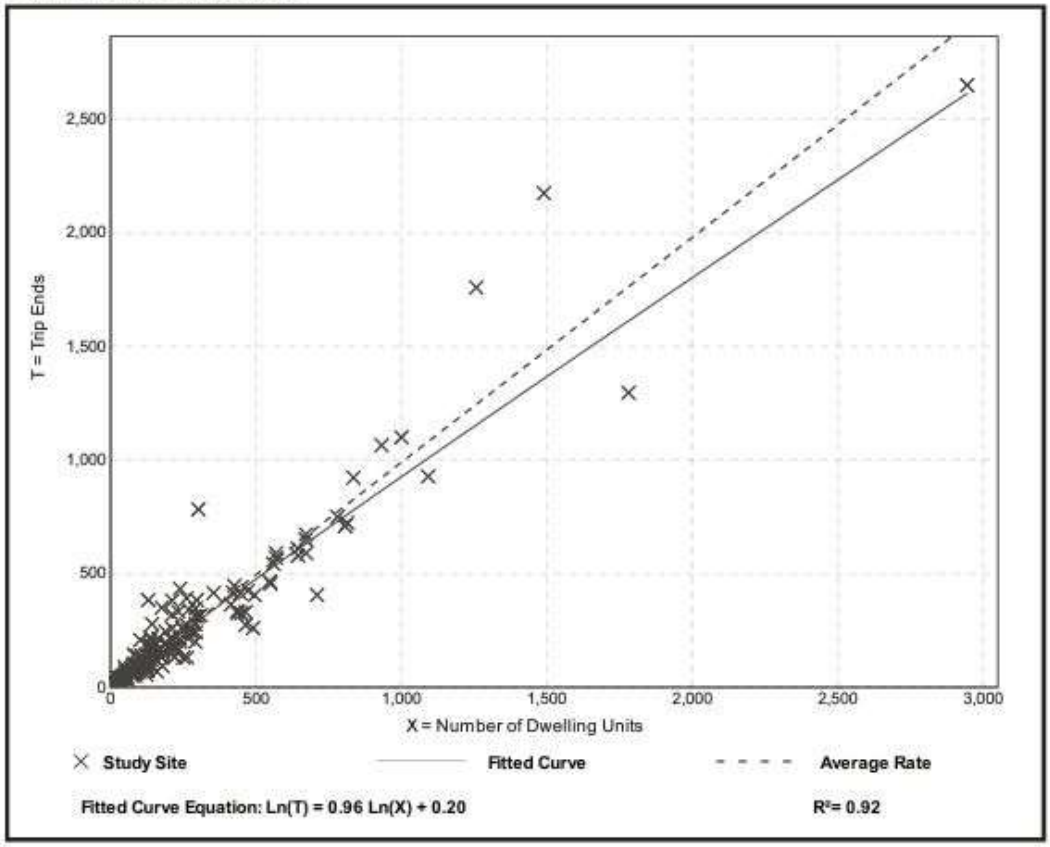
Single-Family Detached Housing
(210)

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:	190
Avg. Num. of Dwelling Units:	242
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



Attachment 6
Intersection Worksheets – Existing AM/PM Peaks

HCS7 Two-Way Stop-Control Report

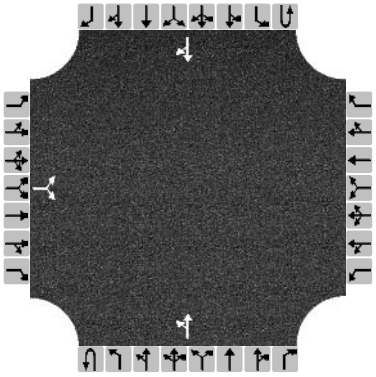
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	6/11/2020
Analysis Year	2020
Time Analyzed	Existing AM Peak
Intersection Orientation	North-South
Project Description	592.006 - Seal Property Subdivision

Site Information

Intersection	Hickory Creek at Hardin V
Jurisdiction	Knox County
East/West Street	Hickory Creek Road
North/South Street	Hardin Valley/E Gallaher
Peak Hour Factor	0.93
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume, V (veh/h)		10		257						97	19				53	11
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			287							104						
Capacity, c (veh/h)			981							1531						
v/c Ratio			0.29							0.07						
95% Queue Length, Q_{95} (veh)			1.2							0.2						
Control Delay (s/veh)			10.2							7.5						
Level of Service, LOS			B							A						
Approach Delay (s/veh)		10.2								6.4						
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

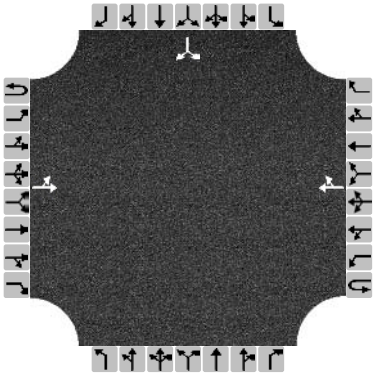
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	7/28/2020
Analysis Year	2020
Time Analyzed	Existing AM Peak
Intersection Orientation	East-West
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hardin Valley at Muddy C
Jurisdiction	Knox County
East/West Street	Hardin Valley Road
North/South Street	Muddy Creek Lane
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		1	309				113	7						22		3
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													27	
Capacity, c (veh/h)		1453													581	
v/c Ratio		0.00													0.05	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		7.5													11.5	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		0.0												11.5		
Approach LOS														B		

HCS7 Two-Way Stop-Control Report

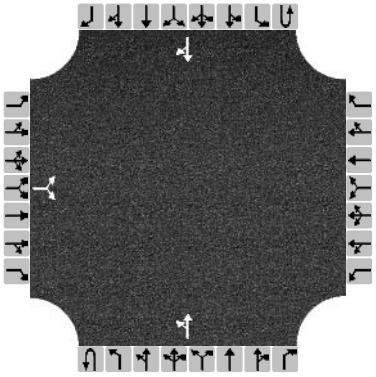
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	6/11/2020
Analysis Year	2020
Time Analyzed	Existing PM Peak
Intersection Orientation	North-South
Project Description	592.006 - Seal Property Subdivision

Site Information

Intersection	Hickory Creek at Hardin V
Jurisdiction	Knox County
East/West Street	Hickory Creek Road
North/South Street	Hardin Valley/E Gallaher
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume, V (veh/h)		11		160						254	44				17	6
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			190							282						
Capacity, c (veh/h)			942							1587						
v/c Ratio			0.20							0.18						
95% Queue Length, Q_{95} (veh)			0.8							0.6						
Control Delay (s/veh)			9.8							7.8						
Level of Service, LOS			A							A						
Approach Delay (s/veh)	9.8								6.8							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

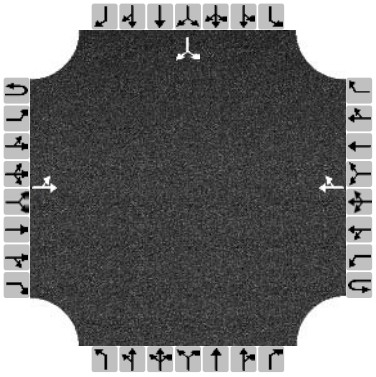
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	7/28/2020
Analysis Year	2020
Time Analyzed	Existing PM Peak
Intersection Orientation	East-West
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hardin Valley at Muddy C
Jurisdiction	Knox County
East/West Street	Hardin Valley Road
North/South Street	Muddy Creek Lane
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		3	174				296	23						14		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													17	
Capacity, c (veh/h)		1211													526	
v/c Ratio		0.00													0.03	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		8.0													12.1	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		0.1												12.1		
Approach LOS														B		

Attachment 7
Intersection Worksheets – Background AM/PM Peaks

HCS7 Roundabouts Report

General Information

Analyst	Addie Kirkham
Agency or Co.	FMA
Date Performed	6/11/2020
Analysis Year	2023
Time Analyzed	Background AM Peak
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hickory Creek at Hardin Valley
E/W Street Name	Hickory Creek Road / Hardin Valley Road
N/S Street Name	E Gallaher Ferry / Driveway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.93
Jurisdiction	Knox County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	11	299	0	0	0	118	22	0	0	0	0	0	61	0	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{PCE}), pc/h	0	12	328	0	0	0	129	24	0	0	0	0	0	67	0	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		340			153			0			81	
Entry Volume veh/h		333			150			0			79	
Circulating Flow (v_c), pc/h		67			12			407			129	
Exiting Flow (v_{ex}), pc/h		395			143			36			0	
Capacity (c_{pce}), pc/h		1289			1363			911			1210	
Capacity (c), veh/h		1264			1336			893			1186	
v/c Ratio (x)		0.26			0.11			0.00			0.07	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.2			3.6			4.0			3.6	
Lane LOS		A			A			A			A	
95% Queue, veh		1.1			0.4			0.0			0.2	
Approach Delay, s/veh	5.2			3.6						3.6		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	4.5						A					

HCS7 Two-Way Stop-Control Report

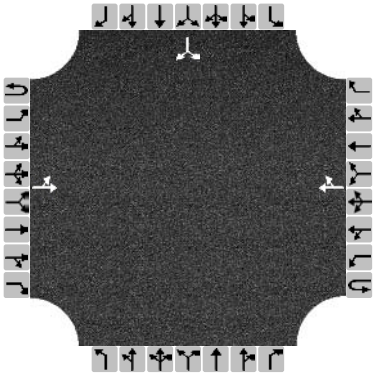
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	7/28/2020
Analysis Year	2023
Time Analyzed	Background AM Peak
Intersection Orientation	East-West
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hardin Valley at Muddy C
Jurisdiction	Knox County
East/West Street	Hardin Valley Road
North/South Street	Muddy Creek Lane
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		1	357				131	7						22		3
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													27	
Capacity, c (veh/h)		1430													531	
v/c Ratio		0.00													0.05	
95% Queue Length, Q_{95} (veh)		0.0													0.2	
Control Delay (s/veh)		7.5													12.1	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		0.0												12.1		
Approach LOS														B		

HCS7 Roundabouts Report

General Information

Analyst	Addie Kirkham
Agency or Co.	FMA
Date Performed	6/11/2020
Analysis Year	2023
Time Analyzed	Background PM Peak
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hickory Creek at Hardin Valley
E/W Street Name	Hickory Creek Road / Hardin Valley Road
N/S Street Name	E Gallaher Ferry / Driveway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.90
Jurisdiction	Knox County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	13	191	0	0	0	298	51	0	0	0	0	0	19	0	6
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{PCE}), pc/h	0	15	216	0	0	0	338	58	0	0	0	0	0	22	0	7
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		231			396			0			29	
Entry Volume veh/h		226			388			0			28	
Circulating Flow (v_c), pc/h		22			15			253			338	
Exiting Flow (v_{ex}), pc/h		238			345			73			0	
Capacity (c_{pce}), pc/h		1349			1359			1066			978	
Capacity (c), veh/h		1323			1332			1045			958	
v/c Ratio (x)		0.17			0.29			0.00			0.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			5.3			3.4			4.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.6			1.2			0.0			0.1	
Approach Delay, s/veh	4.1			5.3						4.0		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	4.8						A					

HCS7 Two-Way Stop-Control Report

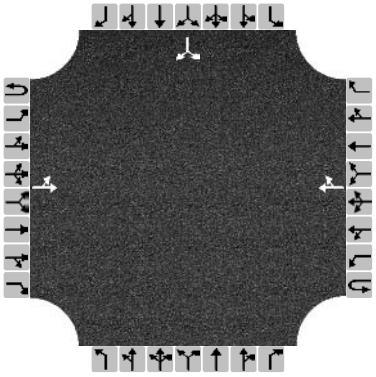
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	7/28/2020
Analysis Year	2023
Time Analyzed	Background PM Peak
Intersection Orientation	East-West
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hardin Valley at Muddy C
Jurisdiction	Knox County
East/West Street	Hardin Valley Road
North/South Street	Muddy Creek Lane
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume, V (veh/h)		3	201				343	23						14		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													17	
Capacity, c (veh/h)		1160													474	
v/c Ratio		0.00													0.04	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		8.1													12.9	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		0.1												12.9		
Approach LOS														B		

Attachment 8
Intersection Worksheets – Full Buildout AM/PM Peaks

HCS7 Roundabouts Report

General Information

Analyst	Addie Kirkham
Agency or Co.	FMA
Date Performed	7/27/2020
Analysis Year	2023
Time Analyzed	Full Buildout AM Peak
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hickory Creek at Hardin Valley
E/W Street Name	Hickory Creek Road / Hardin Valley Road
N/S Street Name	E Gallaher Ferry / Driveway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.93
Jurisdiction	Knox County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	11	299	3	0	31	118	22	0	7	7	58	0	61	2	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{PCE}), pc/h	0	12	328	3	0	34	129	24	0	8	8	64	0	67	2	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		343			187			80			83	
Entry Volume veh/h		336			183			78			81	
Circulating Flow (v_c), pc/h	103			28			407			171		
Exiting Flow (v_{ex}), pc/h	459			151			44			39		
Capacity (c_{pce}), pc/h		1242			1341			911			1159	
Capacity (c), veh/h		1218			1315			893			1136	
v/c Ratio (x)		0.28			0.14			0.09			0.07	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.5			3.9			4.9			3.8	
Lane LOS		A			A			A			A	
95% Queue, veh		1.1			0.5			0.3			0.2	
Approach Delay, s/veh	5.5			3.9			4.9			3.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.8						A					

HCS7 Two-Way Stop-Control Report

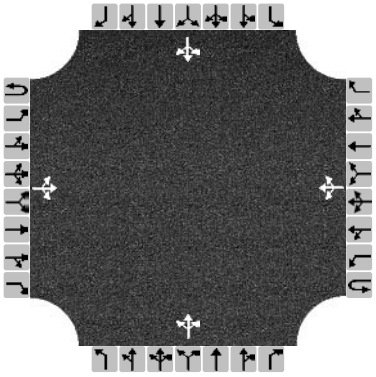
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	7/28/2020
Analysis Year	2023
Time Analyzed	Full Buildout AM Peak
Intersection Orientation	East-West
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hardin Valley at Muddy C
Jurisdiction	Knox County
East/West Street	Hardin Valley Road
North/South Street	Muddy Creek / Driveway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		1	415	2		10	161	7		7	0	66		22	0	3
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				11					80				27	
Capacity, c (veh/h)		1391				1107					572				337	
v/c Ratio		0.00				0.01					0.14				0.08	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.5				0.3	
Control Delay (s/veh)		7.6				8.3					12.3				16.6	
Level of Service, LOS		A				A					B				C	
Approach Delay (s/veh)		0.0				0.6				12.3				16.6		
Approach LOS										B				C		

HCS7 Roundabouts Report

General Information

Analyst	Addie Kirkham
Agency or Co.	FMA
Date Performed	7/27/2020
Analysis Year	2023
Time Analyzed	Full Buildout PM Peak
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hickory Creek at Hardin Valley
E/W Street Name	Hickory Creek Road / Hardin Valley Road
N/S Street Name	E Gallaher Ferry / Driveway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.90
Jurisdiction	Knox County

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	13	191	8	0	106	298	51	0	5	5	38	0	19	8	6
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{PCE}), pc/h	0	15	216	9	0	120	338	58	0	6	6	43	0	22	9	7
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		240			516			55			38	
Entry Volume veh/h		235			506			54			37	
Circulating Flow (v_c), pc/h	151			27			253			464		
Exiting Flow (v_{ex}), pc/h	281			351			79			138		
Capacity (c_{pce}), pc/h		1183			1343			1066			860	
Capacity (c), veh/h		1160			1316			1045			843	
v/c Ratio (x)		0.20			0.38			0.05			0.04	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			6.4			3.9			4.7	
Lane LOS		A			A			A			A	
95% Queue, veh		0.8			1.8			0.2			0.1	
Approach Delay, s/veh	4.9			6.4			3.9			4.7		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	5.7						A					

HCS7 Two-Way Stop-Control Report

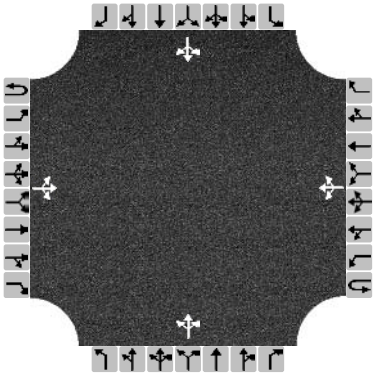
General Information

Analyst	Addie Kirkham
Agency/Co.	FMA
Date Performed	7/28/2020
Analysis Year	2023
Time Analyzed	Full Buildout PM Peak
Intersection Orientation	East-West
Project Description	592.006 Seal Property Subdivision

Site Information

Intersection	Hardin Valley at Muddy C
Jurisdiction	Knox County
East/West Street	Hardin Valley Road
North/South Street	Muddy Creek Lane
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		3	237	8		33	448	23		5	0	43		14	0	2
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3				36					52				17	
Capacity, c (veh/h)		1053				1296					660				267	
v/c Ratio		0.00				0.03					0.08				0.06	
95% Queue Length, Q_{95} (veh)		0.0				0.1					0.3				0.2	
Control Delay (s/veh)		8.4				7.9					10.9				19.4	
Level of Service, LOS		A				A					B				C	
Approach Delay (s/veh)		0.1				0.8				10.9				19.4		
Approach LOS										B				C		

Attachment 9
Turn Lane Warrant Analysis

Project: Seal Property Subdivision

Hardin Valley Road at at Driveway Connection VOLUMES

LEFT TURN	Opposing	Thru	LT	LT MAX	Warrant Met
AM	418	168	10	70	NO
PM	248	471	33	40	NO

Hardin Valley Road at Driveway Connection VOLUMES

RIGHT TURN	Thru	RT	RT MAX	Warrant Met
AM	416	2	149	NO
PM	240	8	349	NO

TABLE 5A

LEFT-TURN LANE VOLUME THRESHOLDS FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH

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

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	100 - 149	150 - 199	200 - 249	250 - 299	300 - 349	350 - 399
100 - 149 150 - 199	250 200	180 140	140 105	110 90	80 70	70 60
200 - 249 250 - 299	160 130	115 100	85 75	75 65	65 60	55 50
300 - 349 350 - 399	110 100	90 80	70 65	60 55	55 50	45 40
400 - 449 450 - 499	90 80	70 AM Peak 10 LT 65	[illegible]	50 45	45 40	35 30
500 - 549 550 - 599	70 65	60 55	45 40	35 35	35 30	25 25
600 - 649 650 - 699	60 55	45 35	35 35	30 30	25 25	25 20
700 - 749 750 or More	50 45	35 35	30 25	25 25	20 20	20 20

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	=/ > 600
100 - 149 150 - 199	70 60	60 55	50 45	45 40	40 35	35 30
200 - 249 250 - 299	55 50	50 45	40 PM Peak 33 LT 35	[illegible]	30 30	30 30
300 - 349 350 - 399	45 40	40 35	35 30	30 25	25 25	25 20
400 - 449 450 - 499	35 30	30 25	30 25	25 20	20 20	20 20
500 - 549 550 - 599	25 25	25 20	20 20	20 20	20 20	15 15
600 - 649 650 - 699	25 20	20 20	20 20	20 20	20 20	15 15
700 - 749 750 or More	20 20	20 20	20 20	15 15	15 15	15 15

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

TABLE 5B

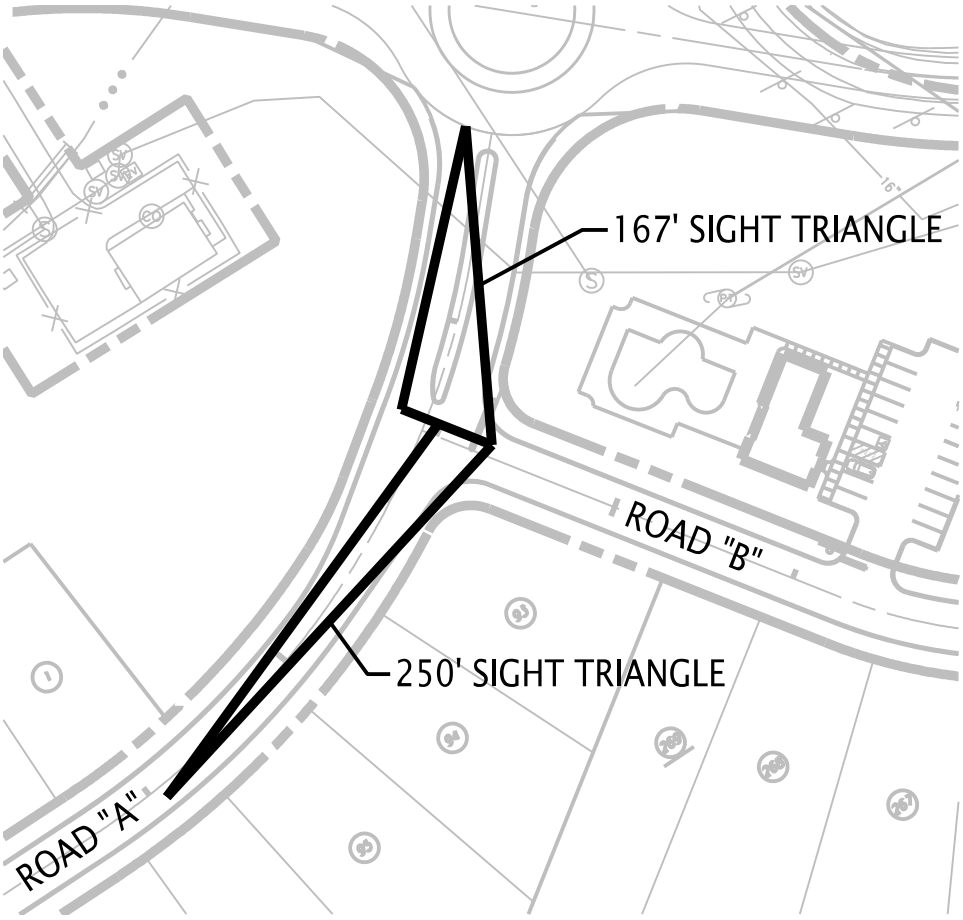
RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH

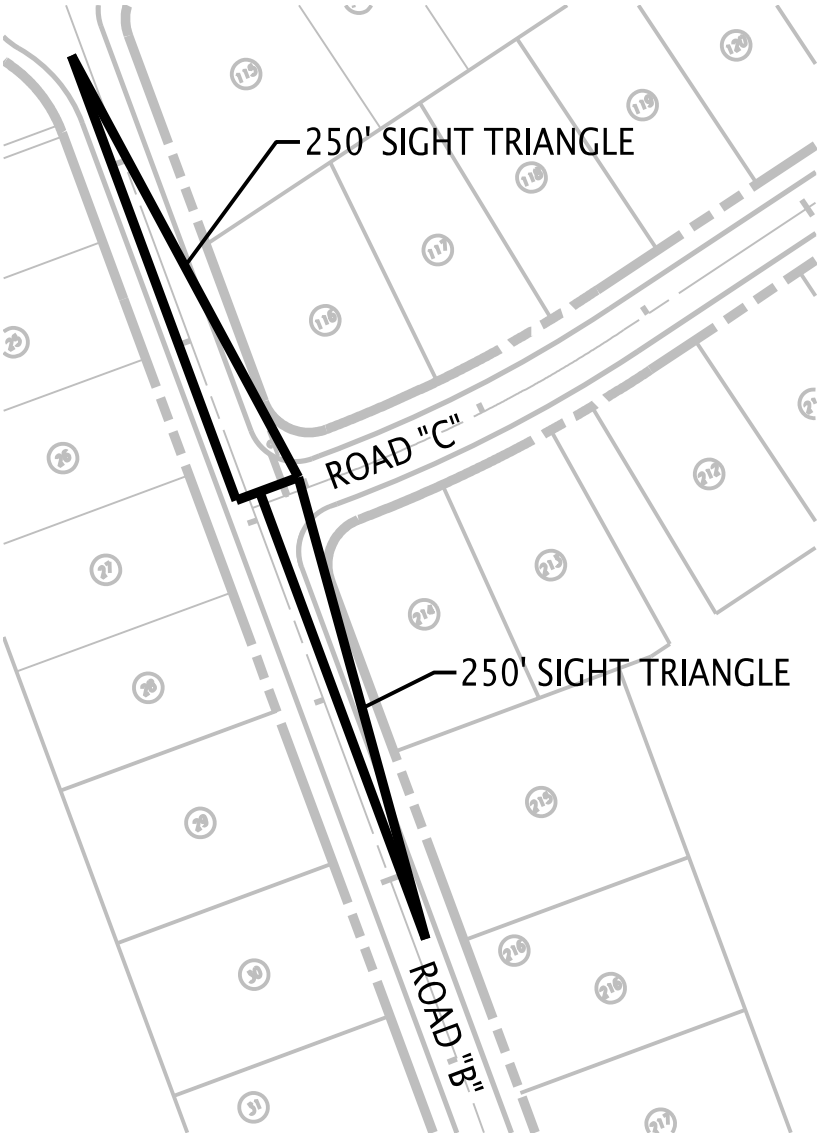
RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	< 100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99			PM Peak 8 RT			
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes Yes
300 - 349 350 - 399			Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

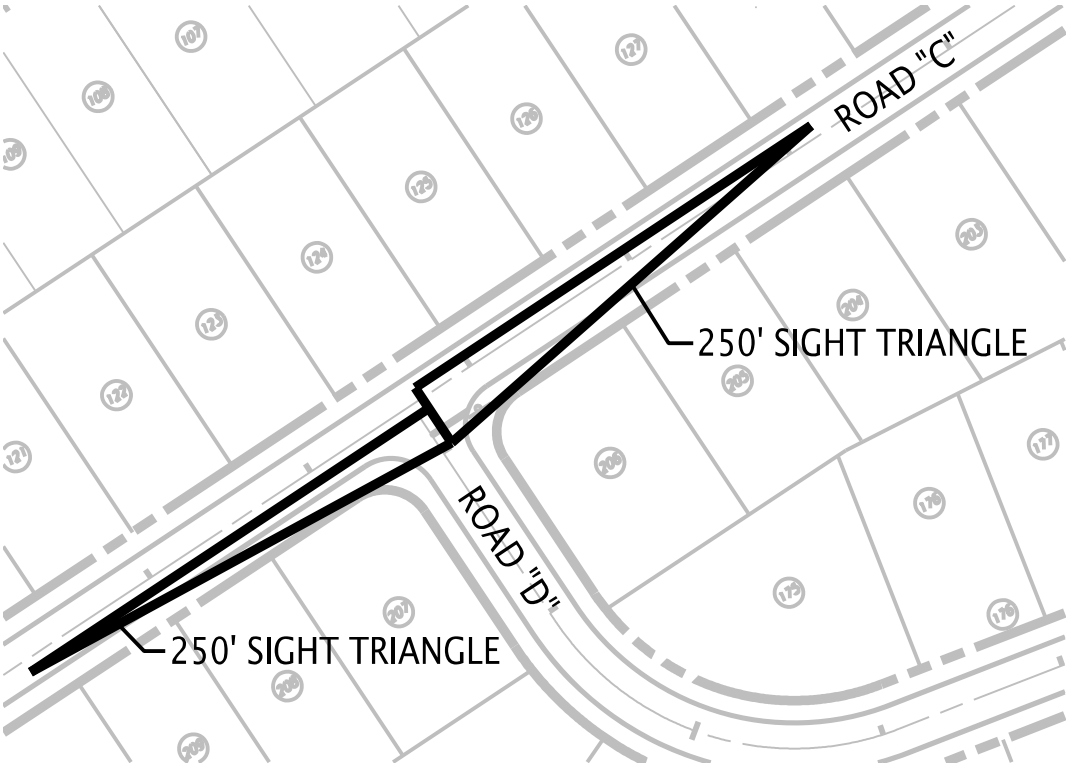
RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99		AM Peak 2 RT		Yes	Yes Yes	Yes Yes
100 - 149 150 - 199		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

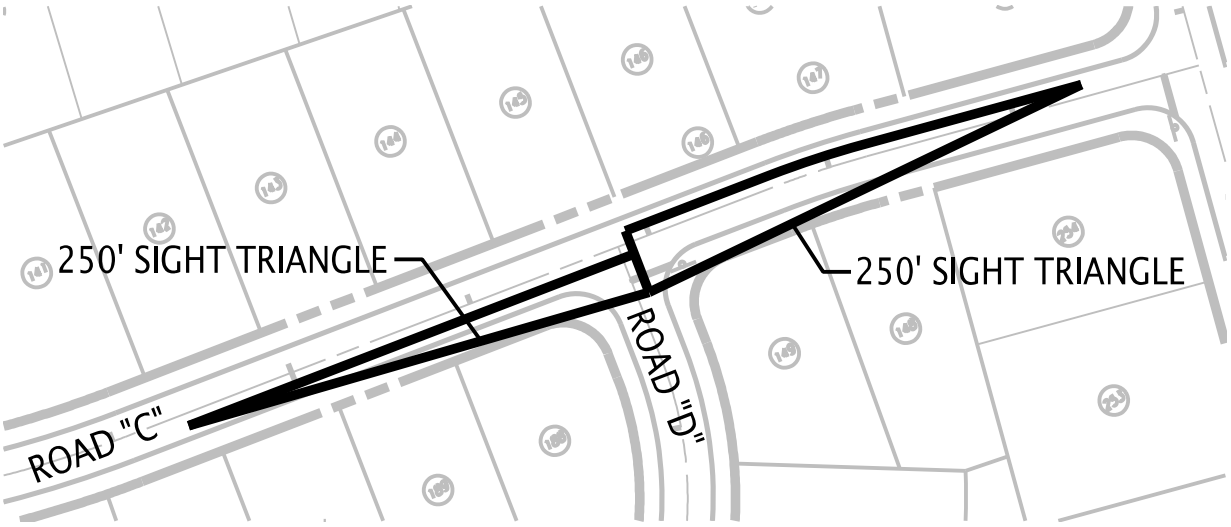
* Or through volume only if a left-turn lane exists.

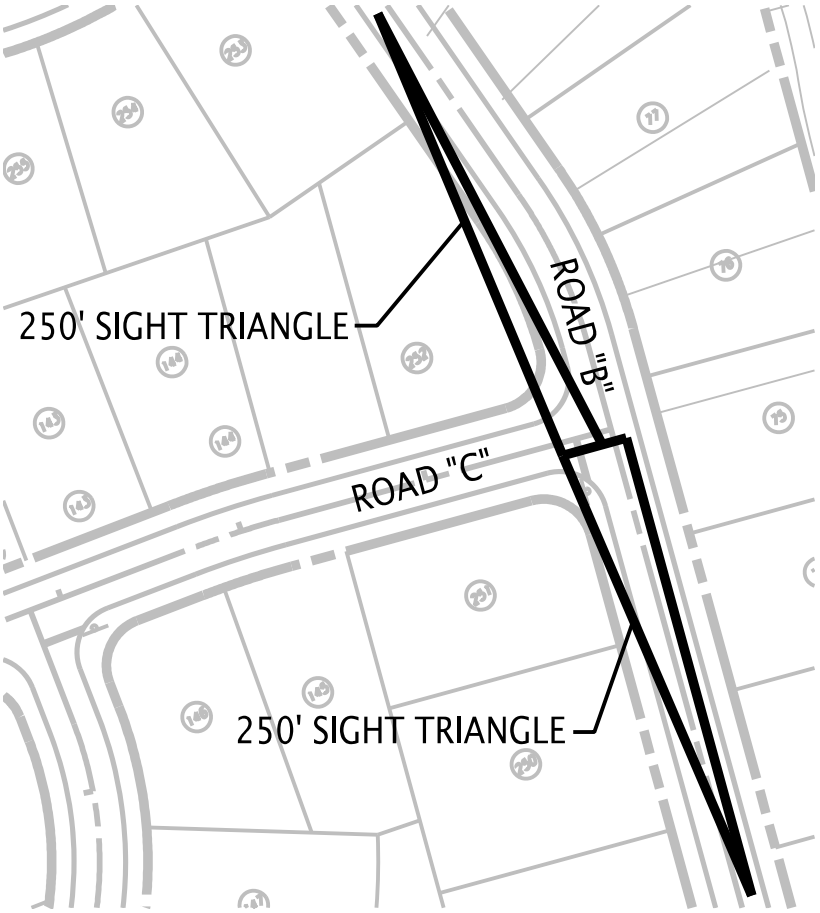
Attachment 10
Sight Triangles

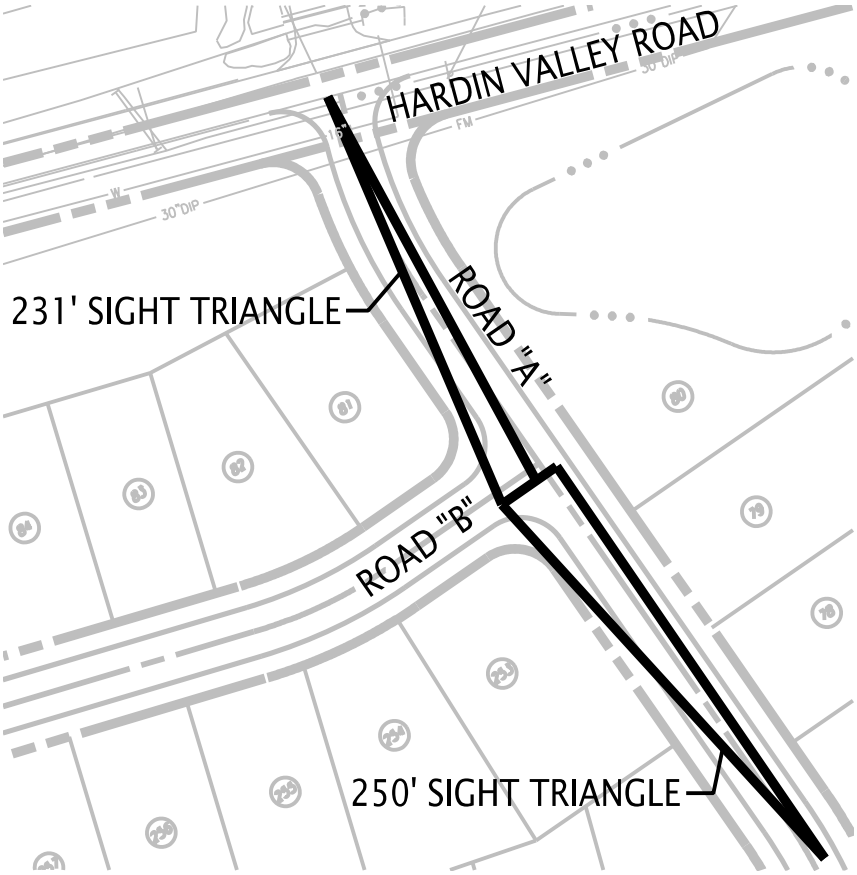

167' SIGHT TRIANGLE
ROAD "B"
250' SIGHT TRIANGLE
ROAD "A"


250' SIGHT TRIANGLE
ROAD "C"
250' SIGHT TRIANGLE
ROAD "B"


ROAD "C"
250' SIGHT TRIANGLE
ROAD "D"
250' SIGHT TRIANGLE


250' SIGHT TRIANGLE
250' SIGHT TRIANGLE
ROAD "D"
ROAD "C"


250' SIGHT TRIANGLE
ROAD "B"
ROAD "C"
250' SIGHT TRIANGLE


HARDIN VALLEY ROAD
231' SIGHT TRIANGLE
ROAD "A"
ROAD "B"
250' SIGHT TRIANGLE

Date: July 27, 2020

Project Name: Sealy Property Subdivision

To: Knoxville-Knox County Planning

Subject: TIS Review for Sealy Property Subdivision (8-SC-20-C / 8-E-20-UR)

Dear Knoxville-Knox County Planning staff,

The following comment response document is submitted to address comments dated July 21, 2020:

1. **Reviewer Comment:** The TIA scope determination form indicated that the applicant must look at two access points for the subdivision, not only the single access point as shown in the site plan and analyzed in the TIS. Please reevaluate the TIS with two access points. Please revise Section 6.2 first paragraph of the TIS in relation to this issue. Even though there is a boulevard located at the single proposed access currently, this does not preclude a requirement of a second access given the number of units and surrounding traffic patterns that must be evaluated by the jurisdiction. There are 3-2 access options to the applicant and they are as follow:
    a. Connection to the stub-out of Creekside Manor Subdivision
    b. Connection to Hickory Creek Road
    c. Connection to Hardin Valley Road

    Response: The site layout was revised to include a second driveway connection to Hardin Valley Road.

2. **Reviewer Comment:** Page 6, please provide a revised site plan to include the parcel lines around the whole parcel.

    Response: Revised Figure 2: Site Plan per the updated subdivision layout and added the property lines.

3. **Reviewer Comment:** Page 7, please include Marietta Church Road as a separate paragraph since the property has frontage along this road as well.

    Response: Added a separate paragraph for the existing site conditions along Marietta Church Road.

4. **Reviewer Comment:** Page 12 second paragraph, revise "1,685" to "1,685 feet".

    Response: Revised to "1,685 feet"

5. **Reviewer Comment:** Please evaluate sight distance within the study given the sight triangles presented at the back of the TIS and at the access points for the subdivision.

   Response: Evaluated sight distance at the intersection of Hardin Valley Road at driveway connection (Road "A") and added a more detailed explanation of the sight triangles.

6. **Reviewer Comment:** Page 21 (end), there looks to be another section (6.3) needed for internal roads of the subdivision.

   Response: Added Section 6.3 Subdivision Roads.

Sincerely,

Addie Kirkham, P.E.