THE WOODS AT CHOTO ROAD

Traffic Impact Study
Choto Road
Knoxville, TN

A Traffic Impact Study for the Proposed The Woods at Choto Road Subdivision

Submitted to

Knoxville – Knox County Metropolitan Planning Commission

Revised June 29, 2017
May 26, 2017
FMA Project No. 592.002

Submitted By:

FULGHUM MACINDOE & ASSOCIATES, INC.

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ATTACHMENTS

Executive Summary

Ball Homes is proposing a residential development with single family homes in Knox County. The project is located on Choto Road east of the intersection of S Northshore Drive and Choto Road. The development will consist of 89 single family homes. Construction is proposed to take place this year and this study assumes full build out for the development will occur in 2020.

There are two access roads entering the proposed development. Access road #1 will tie into the existing intersection of Choto Road and Choto Meadows Lane and access road #2 will connect to Choto Road approximately 480 feet east of the intersection of Choto Road and Choto Meadows Lane. The proposed lane configuration for both access roads is a single lane out of the development.

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

Choto Road @ Choto Meadows Lane/Access Road #1
At the intersection of Choto Road and Choto Meadows Lane/Access Road #1, the overall intersection operates at a LOS A and will continue to operate at a LOS A after the completion of The Woods at Choto Road Subdivision.

An eastbound right turn lane or a westbound left turn lane is not warranted at the intersection of Choto Road and Choto Meadows Lane/Access Road #1.

Choto Road @ Access Road #2
At the intersection of Choto Road and Access Road #2, the overall intersection operates at a LOS A after the completion of The Woods at Choto Road Subdivision.

An eastbound right turn lane or a westbound left turn lane is not warranted at the intersection of Choto Road and Access Road #2.

1 Introduction

1.1 Project Description

This report provides a summary of a traffic impact study that was performed for the proposed The Woods at Choto Road Subdivision on Choto Road. The project site is located on Choto Road east of the intersection of S Northshore Drive and Choto Road in Knox County. The location of the site is shown in Figure 1.

The proposed The Woods at Choto Road Subdivision will consist of 89 single family lots. Full Buildout is expected to occur within three years, or by the year 2020. The proposed site layout is shown in Figure 2.

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

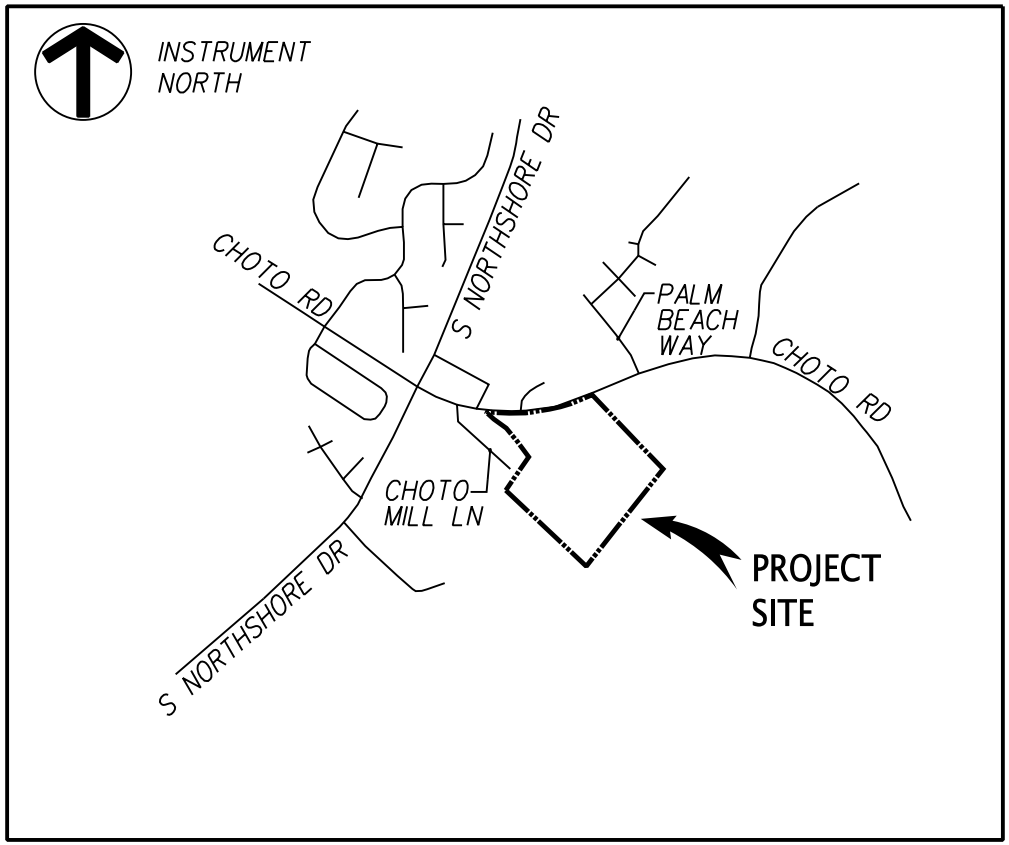
1.2 Existing Site Conditions

The proposed subdivision site access will tie into Choto Road with two separate access roads. The Access Road #1 will line up with the existing Choto Meadows Lane and Access Road #2 is approximately 480 feet east of the intersection of Choto Road and Choto Meadows Lane and approximately 590 feet west of the intersection of Choto Road and Palm Beach Way.

During a site visit it was determined that Choto Road is a two-lane road at the proposed project entrance. The Knoxville-Knox County Metropolitan Planning Commission classifies Choto Road between S Northshore Drive to Early Morning Lane as a minor collector per the Major Road Plan. The posted speed limit on Choto Road is 30 mph. The intersection sight distance at the proposed Access Road #1 and Access Road #2 were both measured to be in excess of 300-ft east and west of the intersections.

Palm Beach Way is a two-lane road and has a posted speed limit of 20 mph. The Knoxville-Knox County Metropolitan Planning Commission does not list a classification for Palm Beach Way per the Major Road Plan; therefore it is considered a local street.

FIGURE 1



LOCATION MAP
(NOT TO SCALE)

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LOCATION MAP

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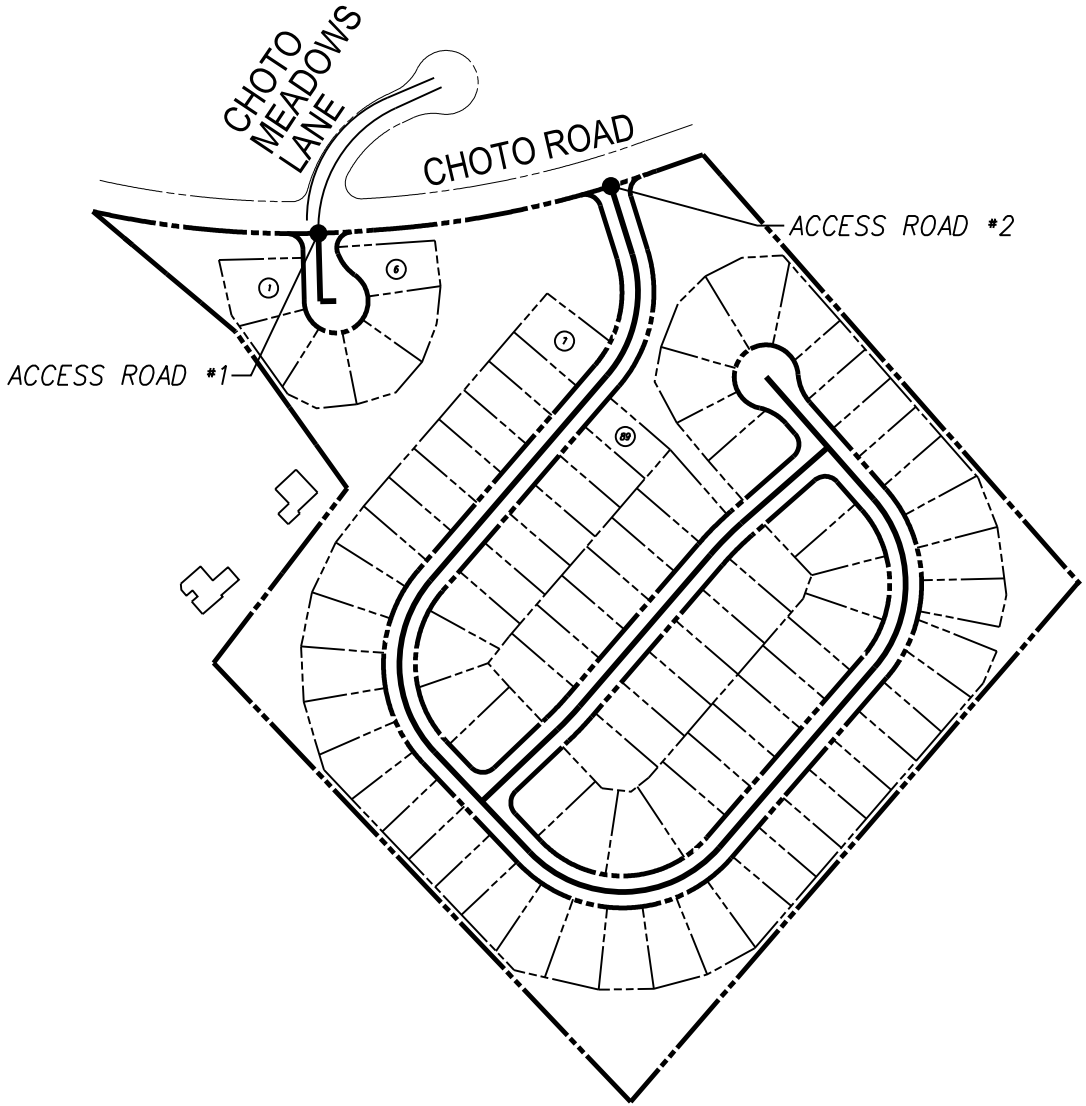
FIGURE 2



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SITE PLAN

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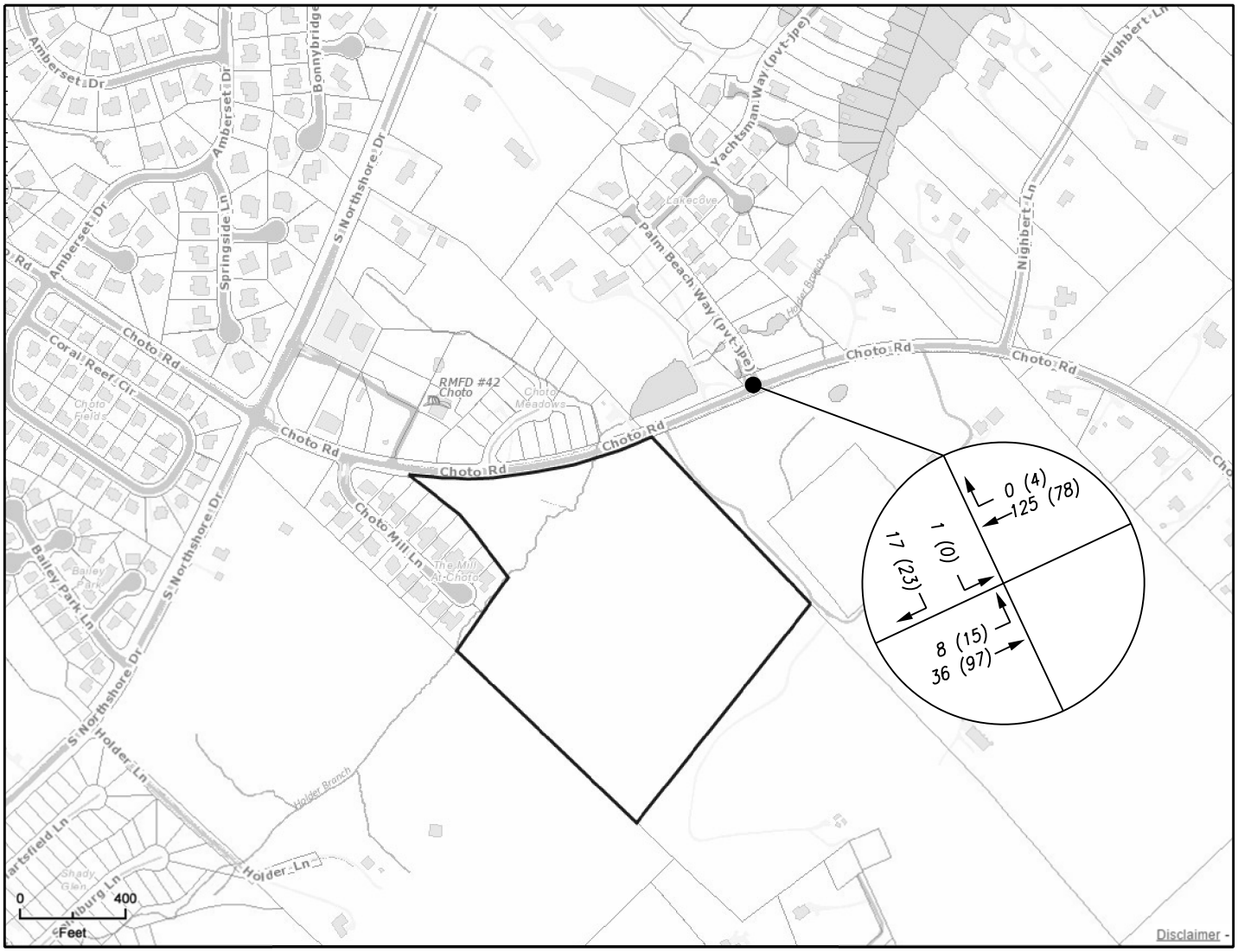
2 Existing Traffic Volumes

FMA conducted a turning movement count at the intersection of Choto Road and Palm Beach Way on Wednesday May 17, 2017. The existing volumes including the AM and PM peak hour traffic volumes at the count location is shown in Figure 3, and the count data collected is included in Attachment 1.

The current AM peak hour and PM peak hour were determined using the turning movement count that FMA conducted. The AM peak hour occurred between 7:00 am and 8:00 am, and the PM peak hour occurred between 4:15 pm and 5:15 pm.



LEGEND:

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

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2017 EXISTING PEAK HOUR TRAFFIC

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3 Background Growth

The Tennessee Department of Transportation (TDOT) maintains count station #000362 on Choto Road west the intersection of S Northshore Drive and Choto Road. The annual traffic growth rate for this station between 2000 and 2015 is approximately 3.57%.

For the purpose of this study, an annual growth rate of 4.0% for traffic at the intersection of Choto Road and Palm Beach Way was assumed until full occupancy is reached in 2020. Attachment 2 shows the trend line growth charts for the TDOT count station.

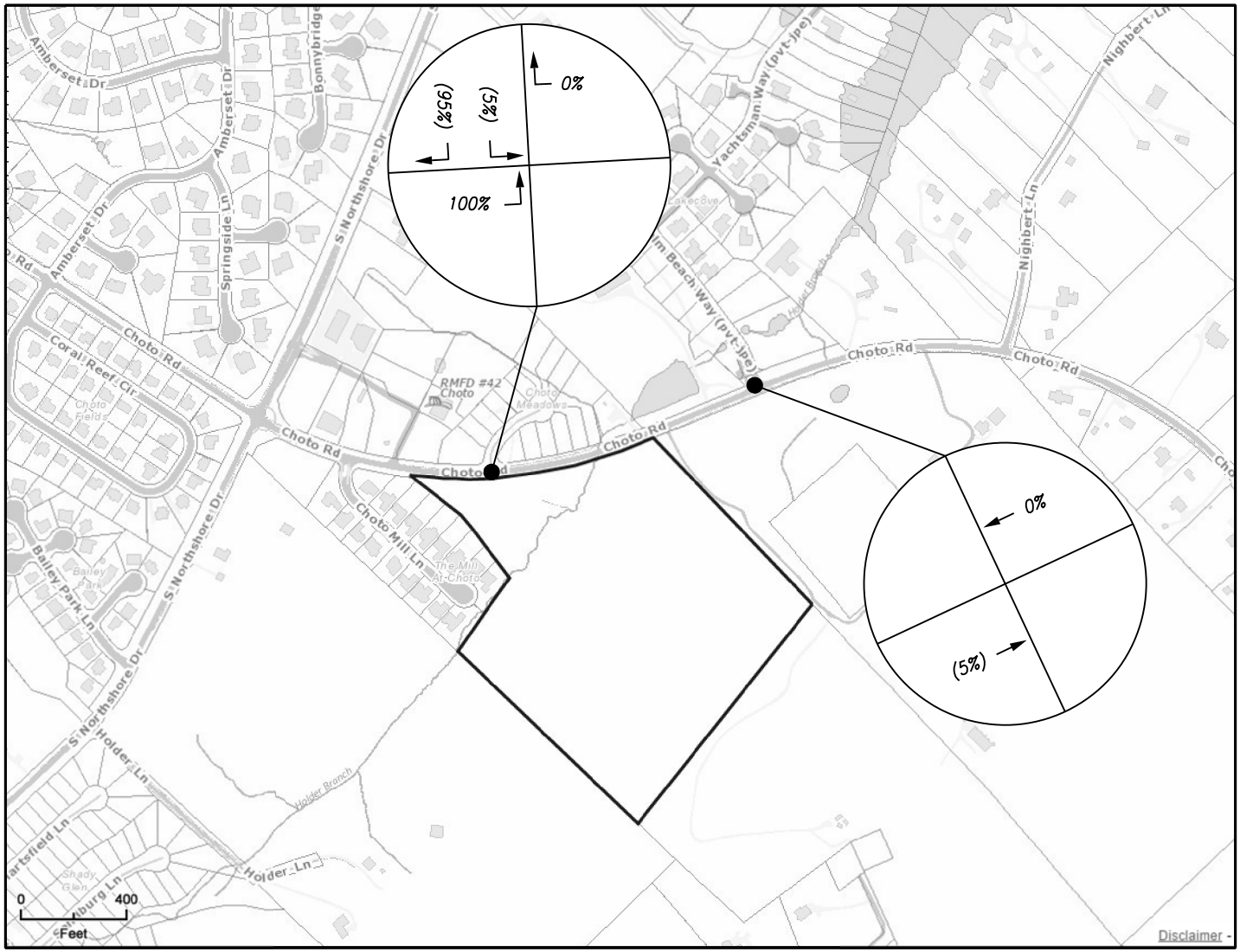
In addition to the background growth, the trips from the new Choto Meadows Subdivision located at the intersection of Choto Road and Choto Meadows Lane were calculated and included in the projected background peak hour traffic. Choto Meadows Subdivision has 13 lots and is currently under construction. Single-Family Detached Housing or Land Use 210 was used to calculate site trips for the proposed Choto Meadows Subdivision using the fitted curve equations from *Trip Generation, 9th Edition,* published by the Institute of Transportation Engineers. The land use worksheets are included in Attachment 3 and a trip generation summary is shown in Table 3-1.

Table 3-1
Choto Meadows Subdivision
Trip Generation Summary

	Single-Family Detached Housing (Land Use 210)				
	Total New Trips	% Entering	%Exiting	Number Entering	Number Exiting
Weekday	161	50	50	81	81
A.M. Peak	19	25	75	5	14
P.M. Peak	17	63	37	11	6

The directional distribution of the traffic generated by the Choto Meadows Subdivision was determined using the traffic data collected for the existing conditions. The trip distribution for Choto Meadows Subdivision is shown in Figure 4 and Figure 5.

Figure 6 demonstrates the projected background peak hour volumes at the intersection after applying both the background growth rate and the inclusion of the additional trips from the Choto Meadows Subdivision to the existing conditions.



LEGEND:

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

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CHOTO MEADOWS S/D
AM PEAK HOUR
TRIP DISTRIBUTION

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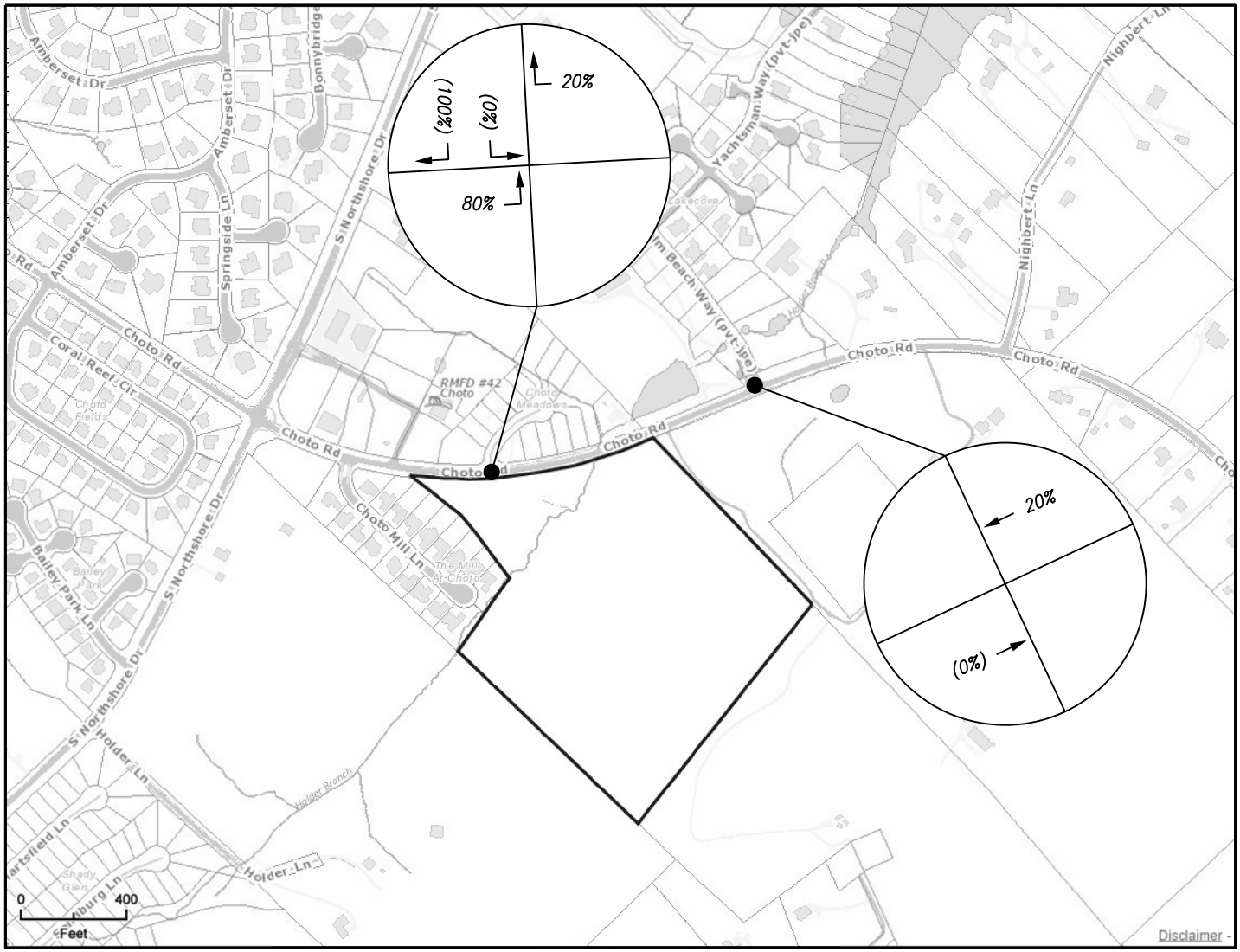

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CHOTO MEADOWS S/D
PM PEAK HOUR
TRIP DISTRIBUTION

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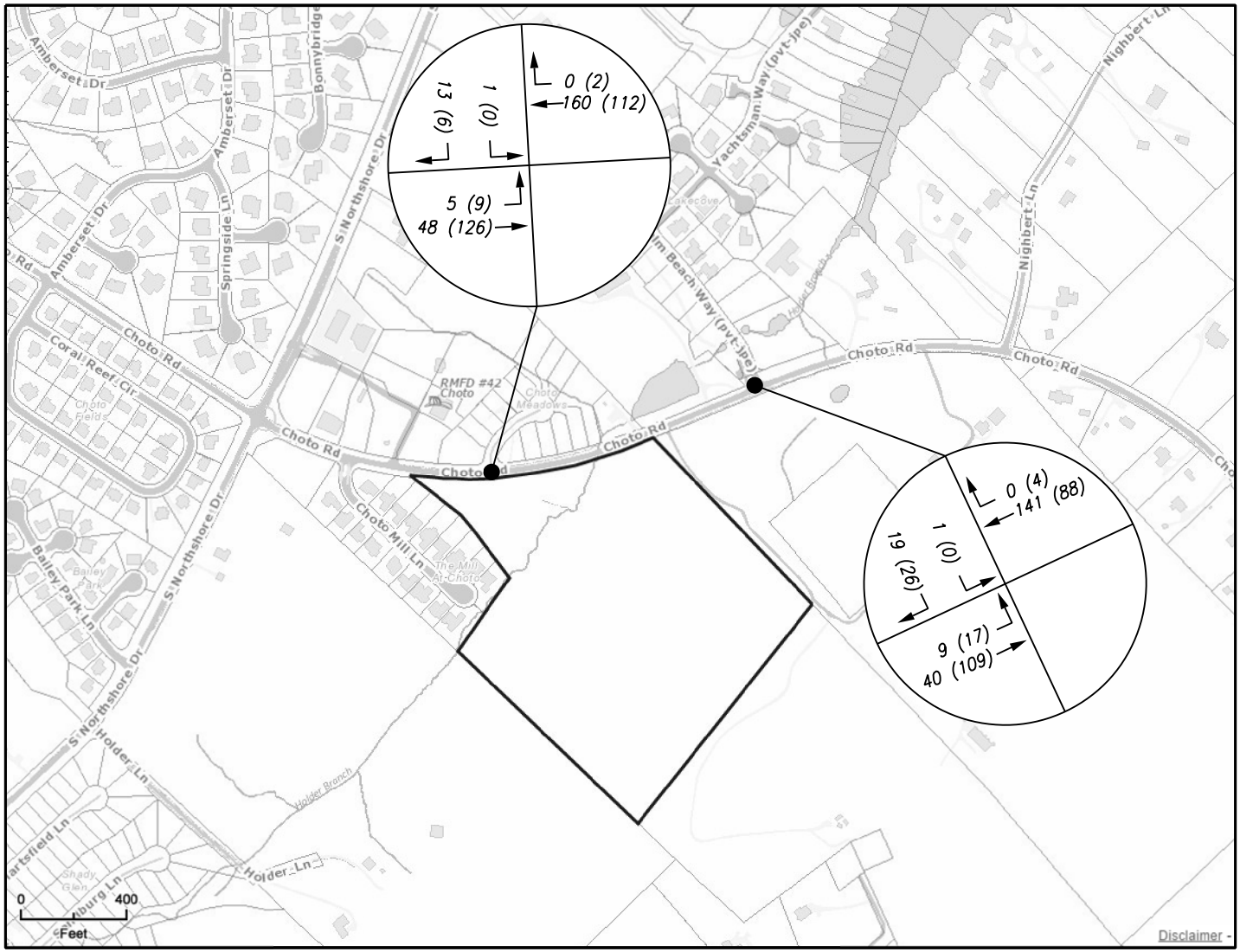

LEGEND:

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

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2020 BACKGROUND PEAK HOUR TRAFFIC

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4 Trip Generation and Trip Distribution

Single-Family Detached Housing or Land Use 210 was used to calculate site trips for the proposed single family housing using the fitted curve equations from *Trip Generation, 9th Edition,* published by the Institute of Transportation Engineers. The land use worksheets are included in Attachment 3.

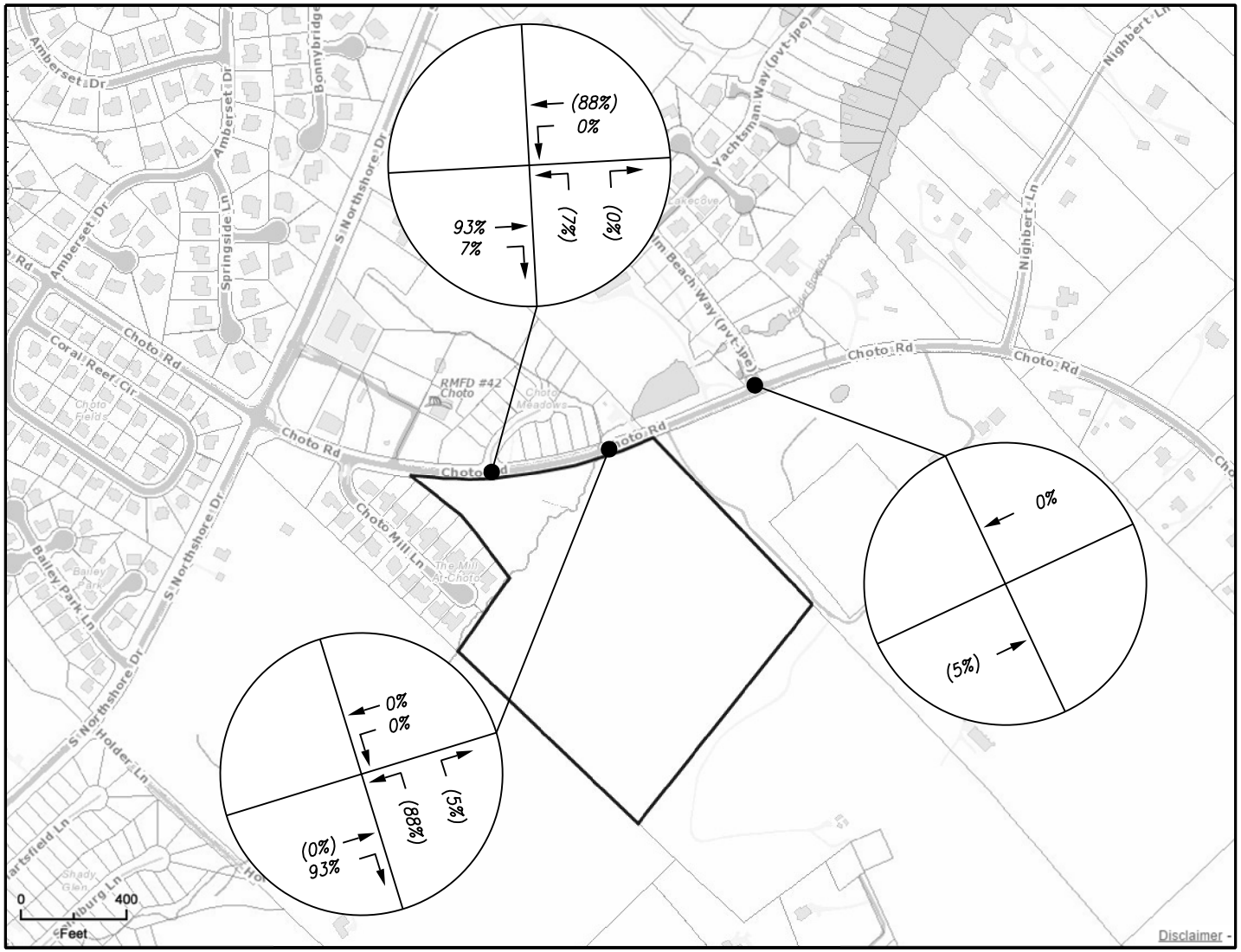
The total number of trips generated by The Woods at Choto Road subdivision was estimated to be 943 daily trips. The estimated trips are 72 trips during the AM peak hour and 95 trips during the PM peak hour. A trip generation summary is shown in Table 4-1.

Table 4-1
The Woods at Choto Road Subdivision
Trip Generation Summary

	Single-Family Detached Housing (Land Use 210)				
	Total New Trips	% Entering	%Exiting	Number Entering	Number Exiting
Weekday	943	50	50	472	472
A.M. Peak	72	25	75	18	54
P.M. Peak	95	63	37	60	35

The directional distribution of the traffic generated by The Woods at Choto Road Subdivision was determined using the traffic data collected for the existing conditions. Figure 4 and Figure 5 was applied to The Woods at Choto Road Subdivision using the two access points in proportion to the number of lots served by each. The trip distribution for The Woods at Choto Road Subdivision is shown in Figure 7 and Figure 8.

Using the trip distribution the trips generated from The Woods at Choto Road Subdivision are shown in Figure 9. Figure 10 shows the combined peak hour traffic from the background growth and the full build out of The Woods at Choto Road Subdivision.



LEGEND:

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

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AM PEAK HOUR TRIP DISTRIBUTION

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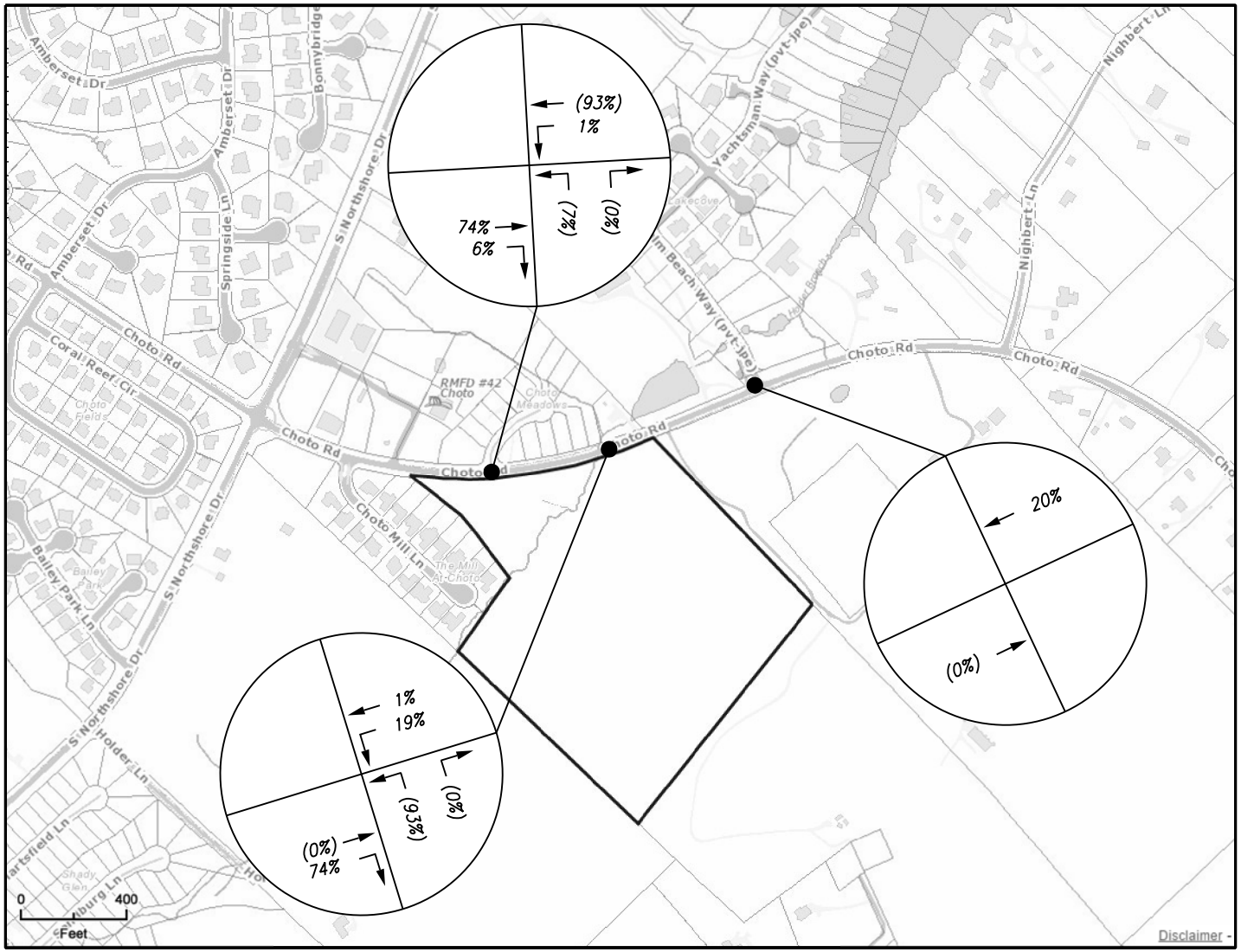

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PM PEAK HOUR TRIP DISTRIBUTION

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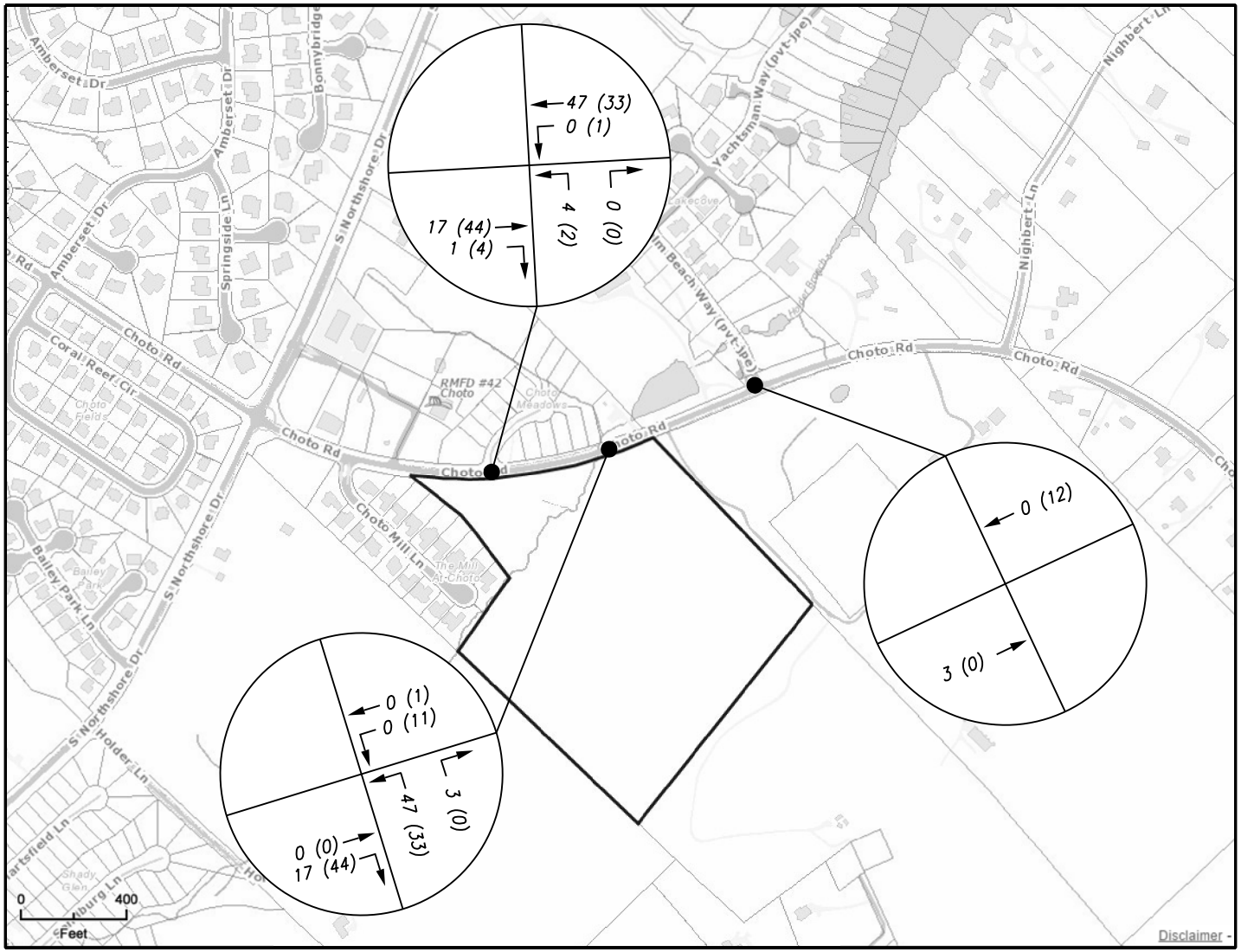

LEGEND:

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

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PEAK HOUR SUBDIVISION TRAFFIC

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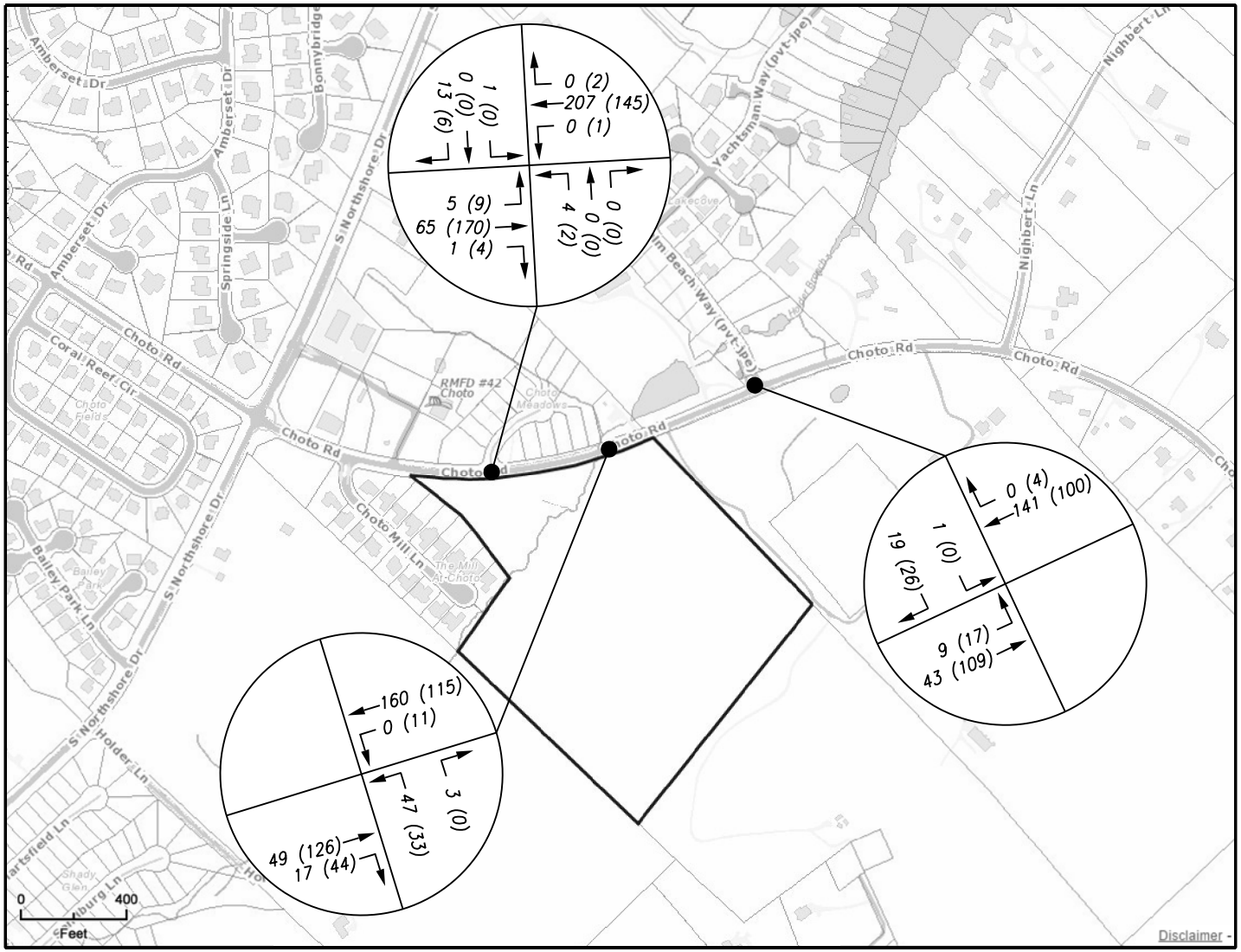

LEGEND:

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

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2020 PEAK HOUR TRAFFIC
FULL BUILDOUT

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5 Projected Capacity and Level of Service

Unsignalized intersection capacity analyses were performed for the AM and PM peak hours to evaluate the traffic conditions at the intersections of Choto Road and Palm Beach Way, the intersection of Choto Road and Choto Meadows Lane/Access Road #1 and the intersection of Choto Road and Access Road #2.

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

Table 5-1

Intersection Analysis
Level of Service (LOS) Summary

		Delay (sec)/LOS
Choto Road @ Palm Beach Way (Existing 2017)		
AM Peak	Intersection	7.6 / A
PM Peak	Intersection	7.7 / A
Choto Road @ Choto Meadows Lane (Background 2020)		
AM Peak	Intersection	7.7 / A
PM Peak	Intersection	7.8 / A
Choto Road @ Palm Beach Way (Background 2020)		
AM Peak	Intersection	7.7 / A
PM Peak	Intersection	7.8 / A
Choto Road @ Choto Meadows Lane (Full Buildout 2020)		
AM Peak	Intersection	8.2 / A
PM Peak	Intersection	8.2 / A

Choto Road @ Access Road #2 (Full Buildout 2020)		
AM Peak	Intersection	8.0 / A
PM Peak	Intersection	8.0 / A
Choto Road @ Palm Beach Way (Full Buildout 2020)		
AM Peak	Intersection	7.7 / A
PM Peak	Intersection	7.9 / A

6 Turn Lane Warrant Analysis

The intersection of Choto Road and Choto Meadows Lane/Access Road #1 and the intersection of Choto Road and Access Road #2 were evaluated to determine if an eastbound right turn lane or a westbound left turn lane on Choto Road was warranted. The Knox County Department of Engineering and Public Works handbook, "Access Control and Driveway Design Policy," was used to analyze the information. No turn lane warrants are met at either the intersection of Choto Road and Choto Meadows Lane/Access Road #1 or the intersection of Choto Road and Access Road #2 during the AM or PM peak hours. The turn lane warrant worksheets and analysis are included in Attachment 7.

7 Conclusions and Recommendations

7.1 Choto Road @ Palm Beach Way

At the intersection of Choto Road and Palm Beach Way, the overall intersection operates at a LOS A and will continue to operate at a LOS A after the completion of The Woods at Choto Road Subdivision.

7.2 Choto Road @ Choto Meadows Lane/Access Road #1

At the intersection of Choto Road and Choto Meadows Lane/Access Road #1, the overall intersection operates at a LOS A and will continue to operate at a LOS A after the completion of The Woods at Choto Road Subdivision. The unsignalized intersection capacity analyses shows a 95% queue length for the northbound

approach of less than one car length during both the AM and PM peak hours; therefore, the proposed geometry of one 13 foot lane exiting the subdivision will be adequate.

The minimum required sight distance for a road with a posted speed limit of 30 mph is 300 feet in each direction in accordance with the "Minimum Subdivision Regulations" for Knoxville and Knox County. The proposed intersection of Choto Road and the Access Road #1 has a measured sight distance that exceeds 300 feet east and west of the intersection, which meets the requirement. The approximate sight distance is 500 feet east and 600 feet west of the intersection. FMA recommends any landscaping be installed so as to maintain the sight distance and continue to comply with Knox County Engineering & Public Works requirements.

An eastbound right turn lane or a westbound left turn lane is not warranted at the intersection of Choto Road and Choto Meadows Lane/Access Road #1.

7.3 Choto Road @ Access Road #2

At the intersection of Choto Road and Access Road #2, the overall intersection operates at a LOS A after the completion of The Woods at Choto Road Subdivision. The unsignalized intersection capacity analyses shows a 95% queue length for the northbound approach of less than one car length during both the AM and PM peak hours; therefore, the proposed geometry of one 13 foot lane exiting the subdivision will be adequate.

The minimum required sight distance for a road with a posted speed limit of 30 mph is 300 feet in each direction in accordance with the "Minimum Subdivision Regulations" for Knoxville and Knox County. The proposed intersection of Choto Road and the Access Road #2 has a measured sight distance that exceeds 300 feet east and west of the intersection, which meets the requirement. The approximate sight distance is 700 feet east and 600 feet west of the intersection. FMA recommends any landscaping be installed so as to maintain the sight distance and continue to comply with Knox County Engineering & Public Works requirements.

An eastbound right turn lane or a westbound left turn lane is not warranted at the intersection of Choto Road and Access Road #2.

Choto Road is classified as a minor collector. The minimum intersection spacing required for a collector is 300 feet per the "Minimum Subdivision Regulations" for Knoxville and Knox County. The nearest road intersection to the proposed Access Road #2 is currently 480 feet east at the intersection of Choto Road and Choto

Meadows Lane. This intersection exceeds the typical minimum separation of 300 feet between roads on a collector; therefore, no change is necessary.

Attachment 1
Traffic Counts

Attachment 1
Traffic Counts

Project: The Woods at Choto Road
Date Conducted: 05/17/2017

	Choto Road Eastbound			Choto Road Westbound			Palm Beach Way Southbound			
Start	Left	Thru	Total	Thru	Right	Total	Left	Right	Total	Int. Total
7:00 AM	2	5	7	34	0	34	0	5	5	46
7:15 AM	2	5	7	33	0	33	0	6	6	46
7:30 AM	3	9	12	33	0	33	0	2	2	47
7:45 AM	1	17	18	25	0	25	1	4	5	48
Total	8	36	44	125	0	125	1	17	18	187
8:00 AM	2	17	19	18	0	18	0	5	5	42
8:15 AM	5	11	16	23	0	23	0	4	4	43
8:30 AM	6	21	27	25	0	25	0	2	2	54
8:45 AM	2	15	17	14	0	14	0	0	0	31
Total	15	64	79	80	0	80	0	11	11	170
3:00 PM	6	14	20	25	0	25	1	2	3	48
3:15 PM	2	21	23	21	0	21	0	5	5	49
3:30 PM	3	35	38	19	1	20	0	1	1	59
3:45 PM	5	21	26	19	0	19	0	1	1	46
Total	16	91	107	84	1	85	1	9	10	202
4:00 PM	7	24	31	16	0	16	0	3	3	50
4:15 PM	6	20	26	21	0	21	0	4	4	51
4:30 PM	2	20	22	20	0	20	0	4	4	46
4:45 PM	5	26	31	16	1	17	0	6	6	54
Total	20	90	110	73	1	74	0	17	17	201
5:00 PM	2	31	33	21	3	24	0	9	9	66
5:15 PM	0	20	20	22	0	22	0	3	3	45
5:30 PM	4	20	24	19	1	20	0	3	3	47
5:45 PM	4	33	37	15	0	15	0	2	2	54
Total	10	104	114	77	4	81	0	17	17	212
Grand Total	69	385	454	439	6	445	2	71	73	972
Approach %	15.2	84.8		98.7	1.3		2.7	97.3		
Total %	7.1	39.6	46.7	45.2	0.6	45.8	0.2	7.3	7.5	

Project: The Woods at Choto Road
Date Conducted: 5/17/2017

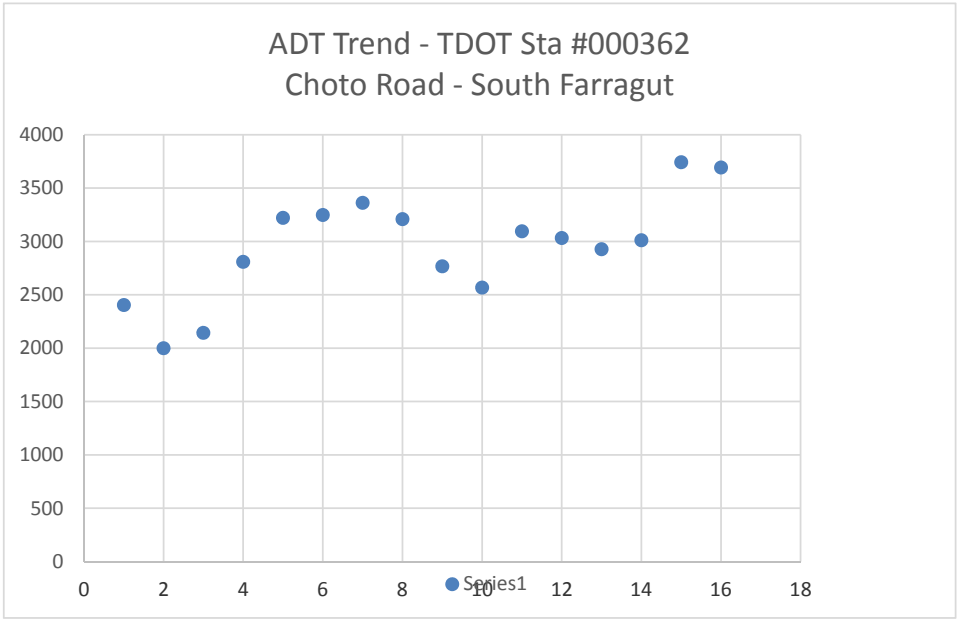
AM Peak Hour	7:00 AM - 8:00 AM	187
PM Peak Hour	4:15 PM - 5:15 PM	217

	Choto Road Eastbound			Choto Road Westbound			Palm Beach Way Southbound			
Start	Left	Thru	App. Total	Thru	Right	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis from 7:00 AM to 9:00 AM										
AM Peak Hour begins at 7:00 AM										
7:00 AM	2	5	7	**34**	0	34	0	5	5	46
7:15 AM	2	5	7	33	0	33	0	**6**	6	46
7:30 AM	**3**	9	12	33	0	33	0	2	2	47
7:45 AM	1	**17**	18	25	0	25	**1**	4	5	**48**
Total Volume	8	36	44	125	0	125	1	17	18	187
Future (4% over 3 yrs)	9	40		141	0		1	19		210
PHF	0.67	0.53		0.92	-		0.25	0.71		0.97
Peak Hour Analysis from 3:00 PM to 6:00 PM										
PM Peak Hour begins at 4:15 PM										
4:15 PM	**6**	20	26	**21**	0	21	0	4	4	51
4:30 PM	2	20	22	20	0	20	0	4	4	46
4:45 PM	5	26	31	16	1	17	0	6	6	54
5:00 PM	2	**31**	33	21	**3**	24	0	**9**	9	**66**
Total Volume	15	97	112	78	4	82	0	23	23	217
Future (4% over 3 yrs)	17	109		88	4		0	26		244
PHF	0.63	0.78		0.93	0.33		-	0.64		0.82

Attachment 2
ADT Trends

Attachment 2
ADT Trends

	Year	Adjusted Average Daily Traffic
1	2000	2405
2	2001	2000
3	2002	2143
4	2003	2809
5	2004	3221
6	2005	3249
7	2006	3363
8	2007	3210
9	2008	2768
10	2009	2568
11	2010	3096
12	2011	3033
13	2012	2927
14	2013	3012
15	2014	3743
16	2015	3694



Most Recent Trend Line Growth

Year	ADT
2000	2405
2015	3694

Annual Percent Growth	3.57%

Attachment 3
Trip Generation

Project: Existing Choto Meadows Subdivision **Attachment 3**
Date Conducted: 5/18/2017 **Trip Generation**

Single-Family Detached Housing - 13 Units
(Land Use 210)

Average Daily Traffic
Ln(T) = 0.92 Ln(X) + 2.72
Ln(T) = 0.92 Ln(13 units) + 2.72
T = 161

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
T = 0.70(X) + 9.74
T = 0.70(13 units) + 9.74
T = 19

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
Ln(T) = 0.90 Ln(X) +0.51
Ln(T) = 0.90 Ln(13 units) +0.51
T = 17

Time Period	Total Trips	Percent		Number	
		Enter	Exit	Enter	Exit
Weekday (24 hours)	161	50%	50%	81	81
AM Peak Hour	19	25%	75%	5	14
PM Peak Hour	17	63%	37%	11	6

Project: Woods at Choto Rd **Attachment 3**
Date Conducted: 5/17/2017 **Trip Generation**

Single-Family Detached Housing - 89 Units
(Land Use 210)

Average Daily Traffic
Ln(T) = 0.92 Ln(X) + 2.72
Ln(T) = 0.92 Ln(89 units) + 2.72
T = 943

Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.
T = 0.70(X) + 9.74
T = 0.70(89 units) + 9.74
T = 72

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.
Ln(T) = 0.90 Ln(X) +0.51
Ln(T) = 0.90 Ln(89 units) +0.51
T = 95

		Percent		Number	
Time Period	Total Trips	Enter	Exit	Enter	Exit
Weekday (24 hours)	943	50%	50%	472	472
AM Peak Hour	72	25%	75%	18	54
PM Peak Hour	95	63%	37%	60	35

Single-Family Detached Housing
(210)

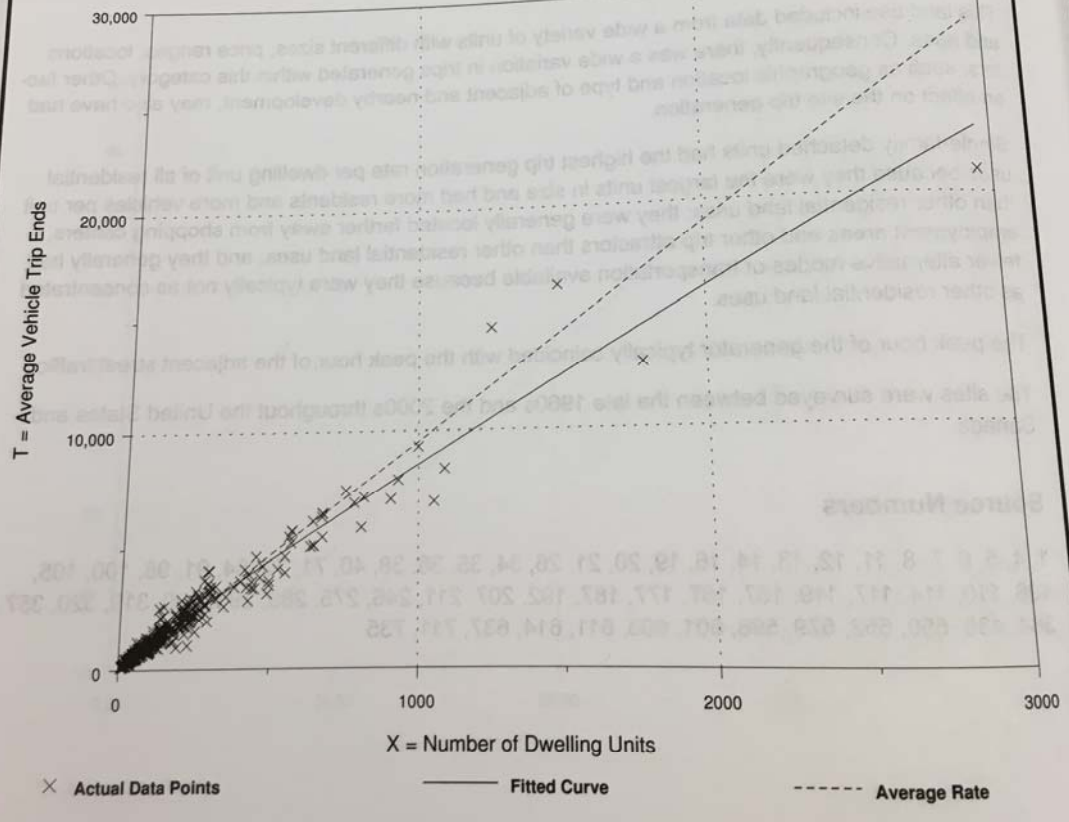
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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

Trip Generation per Dwelling Unit

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

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.92\ Ln(X) + 2.72$

$R^2 = 0.95$

Single-Family Detached Housing
(210)

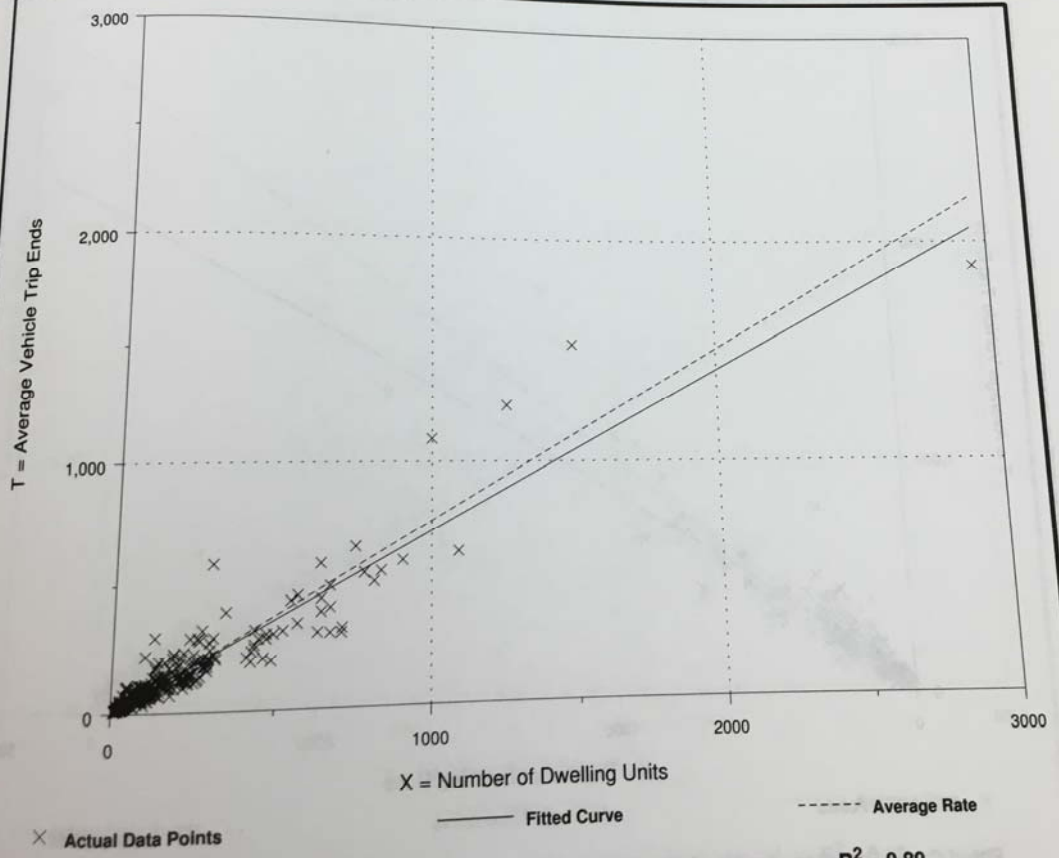
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 292
Avg. Number of Dwelling Units: 194
Directional Distribution: 25% entering, 75% exiting

Trip Generation per Dwelling Unit

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

Data Plot and Equation



$R^2 = 0.89$

Fitted Curve Equation: $T = 0.70(X) + 9.74$

Single-Family Detached Housing
(210)

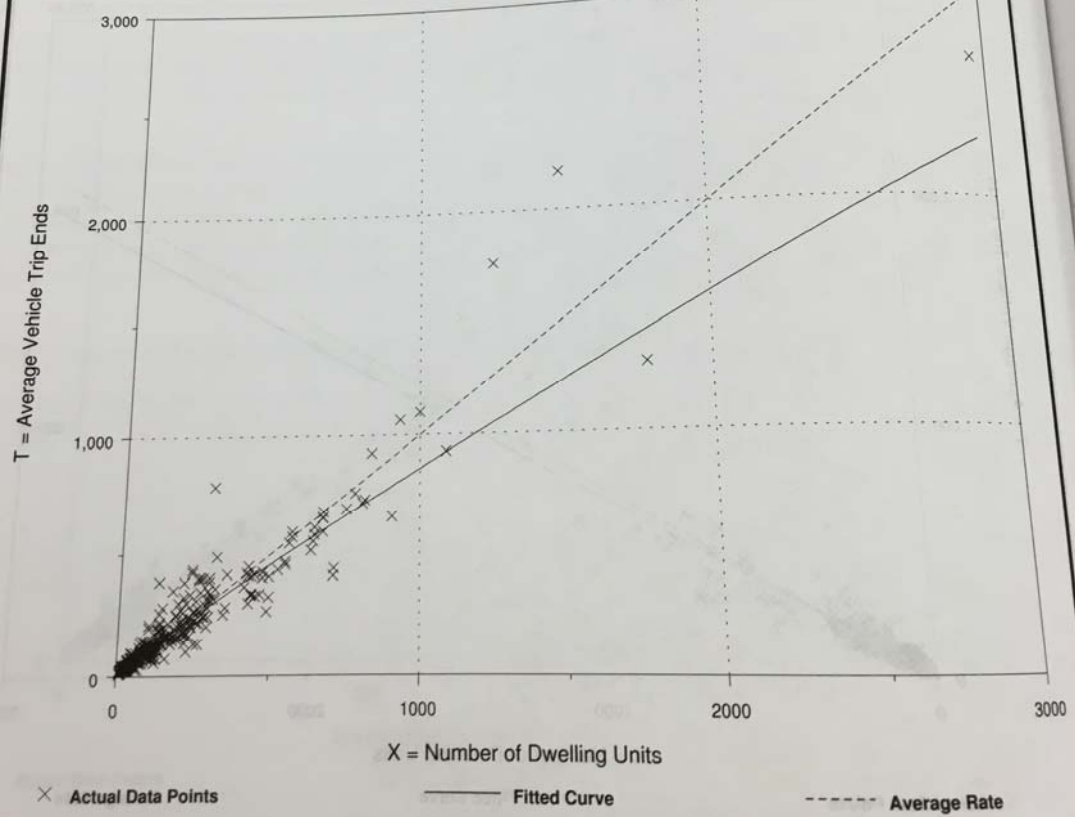
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 321
Avg. Number of Dwelling Units: 207
Directional Distribution: 63% entering, 37% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
1.00	0.42 - 2.98	1.05

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.90\ Ln(X) + 0.51$

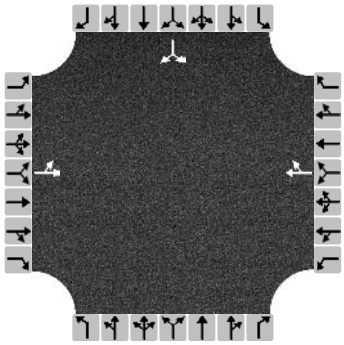
$R^2 = 0.91$

Attachment 4
Intersection Worksheets
Existing AM/PM Peaks

HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Palm Beach Way
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2017	North/South Street	Palm Beach Way
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Existing AM Peak		
Project Description	592.002 The Woods At Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	8	36			125	0				1		17
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	48			136						20		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.043			0.121						0.017		
Final Departure Headway, hd (s)	4.14			4.02						3.77		
Final Degree of Utilization, x	0.055			0.152						0.020		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.14			2.02						1.77		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	48			136						20		
Capacity	870			896						956		
95% Queue Length, Q_{95} (veh)	0.2			0.5						0.1		
Control Delay (s/veh)	7.4			7.7						6.8		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	7.4			7.7						6.8		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.6						A					

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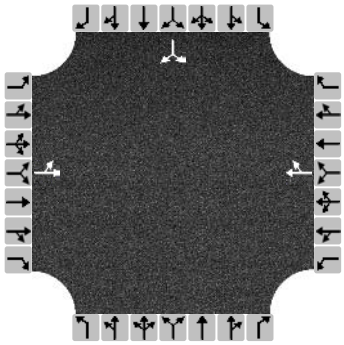
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Palm Beach Way
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2017	North/South Street	Palm Beach Way
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.82
Time Analyzed	Existing PM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	15	97			78	4				0		23
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	137			100						28		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.121			0.089						0.025		
Final Departure Headway, hd (s)	4.11			4.09						3.84		
Final Degree of Utilization, x	0.156			0.114						0.030		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.11			2.09						1.84		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	137			100						28		
Capacity	875			880						939		
95% Queue Length, Q_{95} (veh)	0.6			0.4						0.1		
Control Delay (s/veh)	7.9			7.6						7.0		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	7.9			7.6						7.0		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.7						A					

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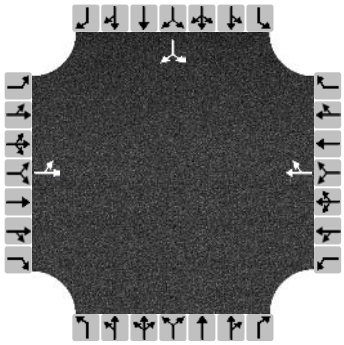
Attachment 5
Intersection Worksheets
Background AM/PM Peaks

HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Choto Meadows Ln
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Choto Meadows Lane
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Background AM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	5	48			160	0				1		13
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	58			174						15		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.051			0.155						0.014		
Final Departure Headway, hd (s)	4.14			4.02						3.88		
Final Degree of Utilization, x	0.066			0.194						0.016		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.14			2.02						1.88		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	58			174						15		
Capacity	869			896						928		
95% Queue Length, Q_{95} (veh)	0.2			0.7						0.0		
Control Delay (s/veh)	7.4			8.0						6.9		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	7.4			8.0						6.9		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.8						A					

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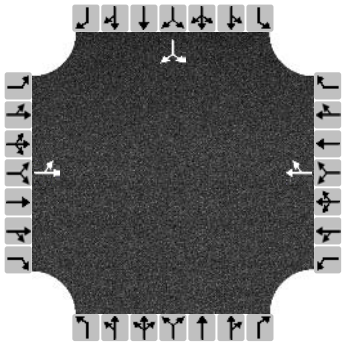
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Choto Meadows Ln
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Choto Meadows Lane
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Background PM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	9	126			112	2				0		6
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	147			124						7		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.130			0.110						0.006		
Final Departure Headway, hd (s)	4.08			4.07						3.90		
Final Degree of Utilization, x	0.166			0.140						0.007		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.08			2.07						1.90		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	147			124						7		
Capacity	883			884						923		
95% Queue Length, Q_{95} (veh)	0.6			0.5						0.0		
Control Delay (s/veh)	7.9			7.7						6.9		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	7.9			7.7						6.9		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.8						A					

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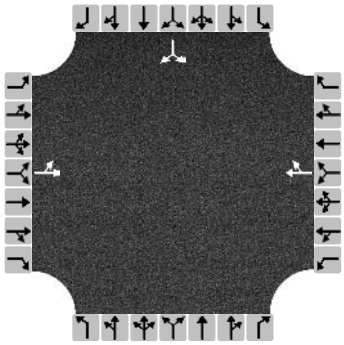
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Palm Beach Way
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Palm Beach Way
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Background AM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	9	40			141	0				1		19
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	53			153						22		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.047			0.136						0.019		
Final Departure Headway, hd (s)	4.16			4.03						3.81		
Final Degree of Utilization, x	0.062			0.172						0.023		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.16			2.03						1.81		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	53			153						22		
Capacity	866			894						945		
95% Queue Length, Q_{95} (veh)	0.2			0.6						0.1		
Control Delay (s/veh)	7.4			7.9						6.9		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	7.4			7.9						6.9		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.7			A								

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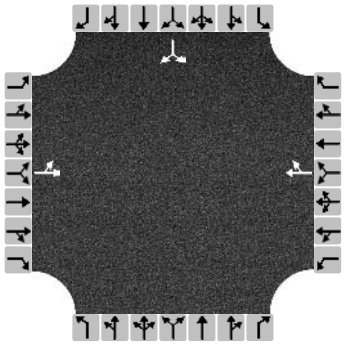
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Palm Beach Way
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Palm Beach Way
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.82
Time Analyzed	Background PM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	17	109			88	4				0		26
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	154			112						32		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.137			0.100						0.028		
Final Departure Headway, hd (s)	4.14			4.12						3.90		
Final Degree of Utilization, x	0.177			0.128						0.034		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.14			2.12						1.90		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	154			112						32		
Capacity	871			873						923		
95% Queue Length, Q_{95} (veh)	0.6			0.4						0.1		
Control Delay (s/veh)	8.0			7.7						7.0		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	8.0			7.7						7.0		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.8						A					

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Attachment 6
Intersection Worksheet
Full Buildout AM/PM Peaks

HCS7 All-Way Stop Control Report

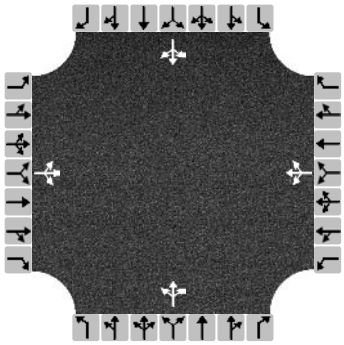
General Information

Analyst	ALK
Agency/Co.	FMA
Date Performed	5/22/2017
Analysis Year	2020
Analysis Time Period (hrs)	0.25
Time Analyzed	Full Buildout AM Peak
Project Description	592.002 The Woods at Choto

Site Information

Intersection	Choto @ Choto Meadows Ln
Jurisdiction	Knox County
East/West Street	Choto Road
North/South Street	Choto Meadows Lane
Peak Hour Factor	0.92

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	5	65	1	0	207	0	4	0	0	1	0	13
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	77			225			4			15		
Percent Heavy Vehicles	2			2			2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.069			0.200			0.004			0.014		
Final Departure Headway, hd (s)	4.19			4.05			4.80			4.04		
Final Degree of Utilization, x	0.090			0.253			0.006			0.017		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	2.19			2.05			2.80			2.04		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	77			225			4			15		
Capacity	858			888			751			891		
95% Queue Length, Q_{95} (veh)	0.3			1.0			0.0			0.1		
Control Delay (s/veh)	7.6			8.4			7.8			7.1		
Level of Service, LOS	A			A			A			A		
Approach Delay (s/veh)	7.6			8.4			7.8			7.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	8.2						A					

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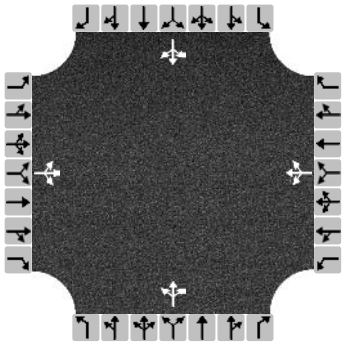
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Choto Meadows Ln
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Choto Meadows Lane
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Full Buildout PM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	9	170	4	1	145	2	4	0	0	0	0	6
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	199			161			4			7		
Percent Heavy Vehicles	2			2			2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.177			0.143			0.004			0.006		
Final Departure Headway, hd (s)	4.11			4.14			4.91			4.10		
Final Degree of Utilization, x	0.227			0.185			0.006			0.007		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, ts (s)	2.11			2.14			2.91			2.10		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	199			161			4			7		
Capacity	876			870			734			878		
95% Queue Length, Q_{95} (veh)	0.9			0.7			0.0			0.0		
Control Delay (s/veh)	8.3			8.1			7.9			7.1		
Level of Service, LOS	A			A			A			A		
Approach Delay (s/veh)	8.3			8.1			7.9			7.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	8.2						A					

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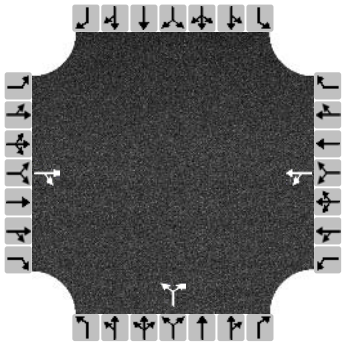
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Access Road #2
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Access Road #2
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Full Buildout AM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		49	17	0	160		47		3			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	TR			LT			LR					
Flow Rate, v (veh/h)	72			174			54					
Percent Heavy Vehicles	2			2			2					

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20					
Initial Degree of Utilization, x	0.064			0.155			0.048					
Final Departure Headway, hd (s)	4.08			4.14			4.61					
Final Degree of Utilization, x	0.081			0.200			0.070					
Move-Up Time, m (s)	2.0			2.0			2.0					
Service Time, ts (s)	2.08			2.14			2.61					

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	72			174			54					
Capacity	881			870			781					
95% Queue Length, Q_{95} (veh)	0.3			0.7			0.2					
Control Delay (s/veh)	7.4			8.2			8.0					
Level of Service, LOS	A			A			A					
Approach Delay (s/veh)	7.4			8.2			8.0					
Approach LOS	A			A			A					
Intersection Delay, s/veh | LOS	8.0						A					

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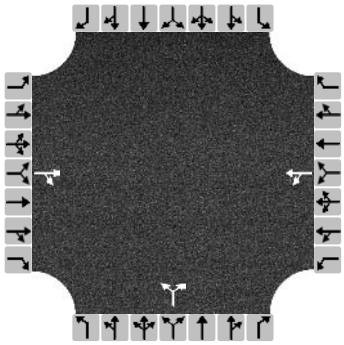
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Access Road #2
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Access Road #2
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Full Buildout PM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume		126	44	11	115		33		0			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	TR			LT			LR					
Flow Rate, v (veh/h)	185			137			36					
Percent Heavy Vehicles	2			2			2					

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20					
Initial Degree of Utilization, x	0.164			0.122			0.032					
Final Departure Headway, hd (s)	4.01			4.22			4.81					
Final Degree of Utilization, x	0.206			0.160			0.048					
Move-Up Time, m (s)	2.0			2.0			2.0					
Service Time, ts (s)	2.01			2.22			2.81					

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	185			137			36					
Capacity	899			854			749					
95% Queue Length, Q_{95} (veh)	0.8			0.6			0.2					
Control Delay (s/veh)	8.0			8.0			8.0					
Level of Service, LOS	A			A			A					
Approach Delay (s/veh)	8.0			8.0			8.0					
Approach LOS	A			A			A					
Intersection Delay, s/veh | LOS	8.0						A					

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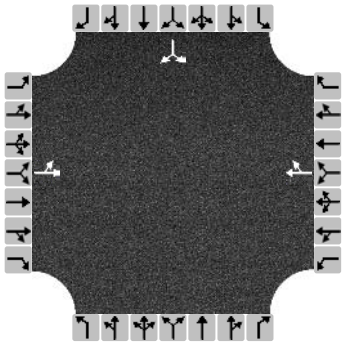
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Palm Beach Way
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Palm Beach Way
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Full Buildout AM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	9	43			141	0				1		19
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	57			153						22		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.050			0.136						0.019		
Final Departure Headway, hd (s)	4.16			4.03						3.82		
Final Degree of Utilization, x	0.065			0.172						0.023		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.16			2.03						1.82		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	57			153						22		
Capacity	866			893						943		
95% Queue Length, Q_{95} (veh)	0.2			0.6						0.1		
Control Delay (s/veh)	7.4			7.9						6.9		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	7.4			7.9						6.9		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.7			A								

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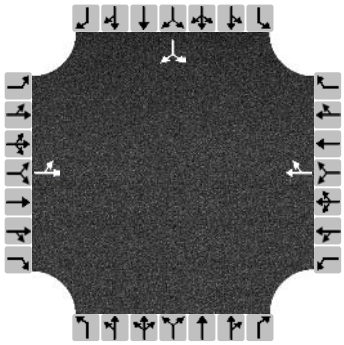
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	ALK	Intersection	Choto @ Palm Beach Way
Agency/Co.	FMA	Jurisdiction	Knox County
Date Performed	5/22/2017	East/West Street	Choto Road
Analysis Year	2020	North/South Street	Palm Beach Way
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.82
Time Analyzed	Full Buildout PM Peak		
Project Description	592.002 The Woods at Choto		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	17	109			100	4				0		26
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	154			127						32		
Percent Heavy Vehicles	2			2						2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.137			0.113						0.028		
Final Departure Headway, hd (s)	4.15			4.13						3.93		
Final Degree of Utilization, x	0.177			0.145						0.035		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, ts (s)	2.15			2.13						1.93		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	154			127						32		
Capacity	868			872						916		
95% Queue Length, Q_{95} (veh)	0.6			0.5						0.1		
Control Delay (s/veh)	8.0			7.8						7.1		
Level of Service, LOS	A			A						A		
Approach Delay (s/veh)	8.0			7.8						7.1		
Approach LOS	A			A						A		
Intersection Delay, s/veh | LOS	7.9			A								

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Attachment 7
Turn Lane Warrant Analysis

Attachment 7
Turn Lane Warrant Analysis

Project: The Woods at Choto Subdivision

Choto Road VOLUMES
at Choto Meadows Lane

LEFT TURN	Opposing	Thru	LT	LT MAX	Warrant Met
AM	71	207	0	185	NO
PM	183	147	1	245	NO

Choto Road VOLUMES
at Choto Meadows Lane

RIGHT TURN	Thru	RT	RT MAX	Warrant Met
AM	70	1	599	NO
PM	179	4	499	NO

Choto Road VOLUMES
at Access Road #2

LEFT TURN	Opposing	Thru	LT	LT MAX	Warrant Met
AM	66	160	0	235	NO
PM	170	115	11	245	NO

Choto Road VOLUMES
at Access Road #2

RIGHT TURN	Thru	RT	RT MAX	Warrant Met
AM	49	17	599	NO
PM	126	44	499	NO

Choto Meadows Lane

TABLE 4A

LEFT-TURN LANE VOLUME THRESHOLDS FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

(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	300 245	235 200	185 160	145 130	120 110	100 90
200 - 249 250 - 299	205 175	170 150	140 125	115 105	100 90	80 70
300 - 349 350 - 399	155 135	135 120	110 100	95 85	80 70	65 60
400 - 449 450 - 499	120 105	105 90	90 80	75 70	65 60	55 50
500 - 549 550 - 599	95 85	80 70	70 65	65 60	55 50	50 45
600 - 649 650 - 699	75 70	65 60	60 55	55 50	45 40	40 35
700 - 749 750 or More	65 60	55 50	50 45	45 40	35 35	30 30

PM Peak
1 LT

AM Peak
0 LT

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149 150 - 199	100 90	80 75	70 65	60 55	55 50	50 45
200 - 249 250 - 299	80 70	72 65	460 55	55 50	50 45	45 40
300 - 349 350 - 399	65 60	60 55	50 50	50 45	45 40	40 40
400 - 449 450 - 499	55 50	50 45	45 45	45 40	40 35	35 35
500 - 549 550 - 599	50 45	45 40	40 40	40 35	35 35	35 35
600 - 649 650 - 699	40 35	35 35	35 35	35 30	35 30	30 30
700 - 749 750 or More	30 30	30 30	30 30	30 30	30 30	30 30

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

Choto Meadows Lane

TABLE 4B
RIGHT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

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	AM Peak 1 RT	PM Peak 4 RT				
100 - 149 150 - 199						
200 - 249 250 - 299						Yes
300 - 349 350 - 399				Yes	Yes Yes	Yes Yes
400 - 449 450 - 499			Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599		Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99					Yes	Yes Yes
100 - 149 150 - 199			Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	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.

Choto Rd @
Access Road #2

TABLE 4A

LEFT-TURN LANE VOLUME THRESHOLDS
FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

(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	300 245	235 200	185 160	145 130	120 110	100 90
200 - 249 250 - 299	205 175	170 150	140 125	115 105	100 90	80 70
300 - 349 350 - 399	155 135	135 120	110 100	95 85	80 70	65 60
400 - 449 450 - 499	120 105	105 90	90 80	75 70	65 60	55 50
500 - 549 550 - 599	95 85	80 70	70 65	65 60	55 50	50 45
600 - 649 650 - 699	75 70	65 60	60 55	55 50	45 40	40 35
700 - 749 750 or More	65 60	55 50	50 45	45 40	35 35	30 30

PM Peak
11 LT

AM Peak
0 LT

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149 150 - 199	100 90	80 75	70 65	60 55	55 50	50 45
200 - 249 250 - 299	80 70	72 65	460 55	55 50	50 45	45 40
300 - 349 350 - 399	65 60	60 55	50 50	50 45	45 40	40 40
400 - 449 450 - 499	55 50	50 45	45 45	45 40	40 35	35 35
500 - 549 550 - 599	50 45	45 40	40 40	40 35	35 35	35 35
600 - 649 650 - 699	40 35	35 35	35 35	35 30	35 30	30 30
700 - 749 750 or More	30 30	30 30	30 30	30 30	30 30	30 30

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

Choto Rd @ Access Road #2

TABLE 4B

RIGHT-TURN LANE VOLUME THRESHOLDS FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 35 MPH OR LESS

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	AM Peak 17 RT	PM Peak 44 RT				
100 - 149 150 - 199						
200 - 249 250 - 299						Yes
300 - 349 350 - 399				Yes	Yes Yes	Yes Yes
400 - 449 450 - 499			Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599		Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99					Yes	Yes Yes
100 - 149 150 - 199			Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	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.