Traffic & Mobility Consultants

MEMORANDUM

June 2, 2022

Re: Beazer SR 426 Townhomes
Access Analysis
Seminole County, Florida
Project № 22120

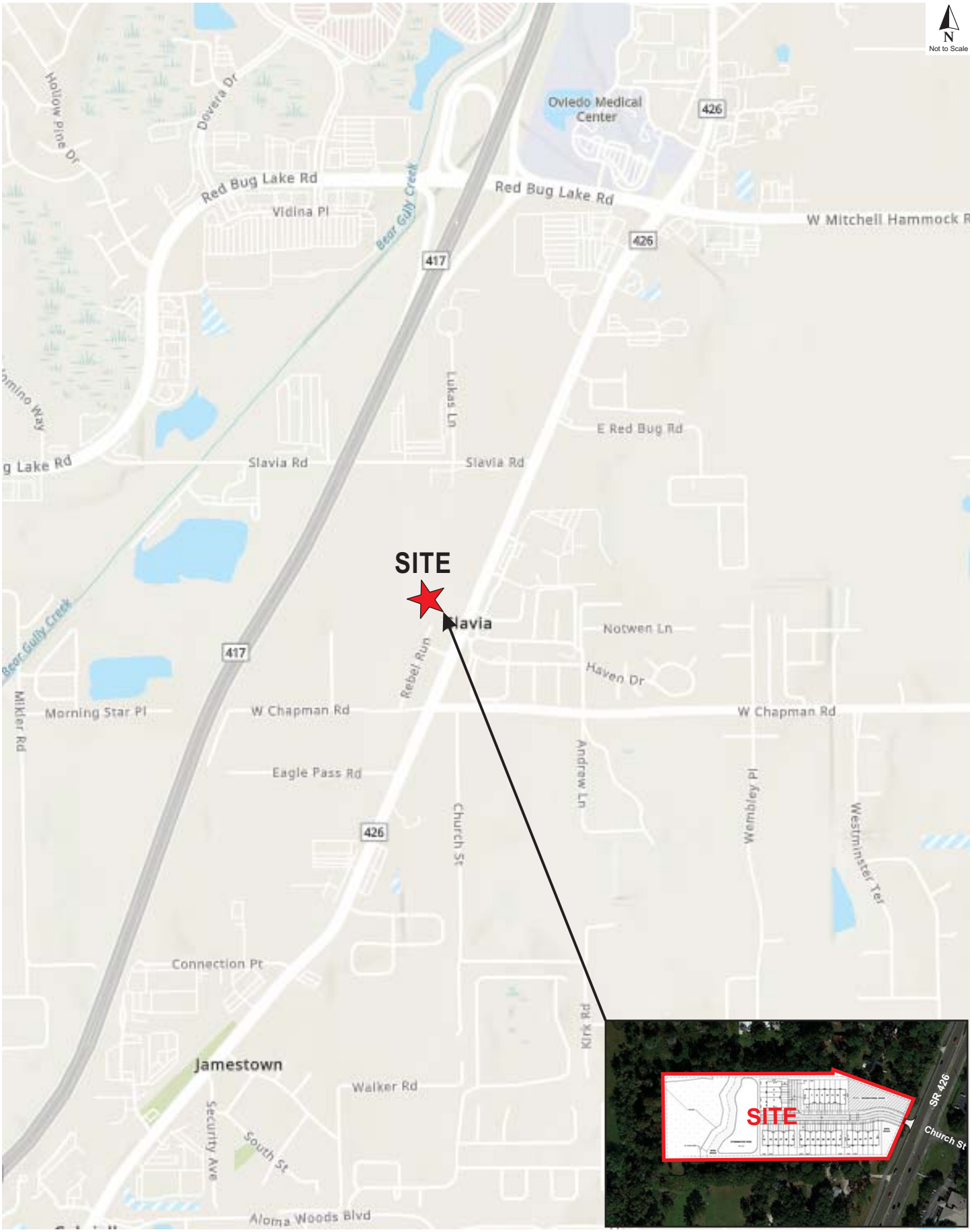
Introduction

The following access analysis was prepared to ensure the suitability of the proposed site access driveway to maintain level of service (LOS) standards on SR 426, and to determine the necessary off-site road improvements for the proposed Beazer SR 426 development.

The development consists of 33 townhome dwelling units. A copy of the preliminary site plan is provided in the **Attachments**. The ±6.91-acre site is located at 2028 W SR 426, in Seminole County, Florida, as depicted in **Figure 1.** Access to the site is proposed via one (1) full access driveway on SR 426, as shown on the site plan.

The analysis evaluates the capacity of the proposed driveway on SR 426 to accommodate the projected traffic for buildout traffic conditions. Additionally, the analysis evaluates the need for ingress turn lanes at the project driveway, including left and right turn lane warrants.

Data used in the analysis consisted of site plan/development information provided by the project engineers, PM peak hour intersection traffic volumes obtained by Traffic & Mobility Consultants LLC (TMC). Other pertinent traffic data was obtained from Seminole County, Florida Department of Transportation (FDOT), and the Institute of Transportation Engineers.



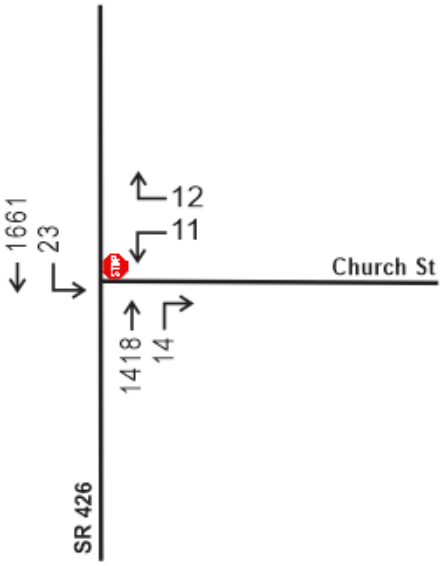
TMC
Traffic & Mobility Consultants

Site Location Map
Beazer SR 426
22120

Figure
1

Existing Traffic

Existing turning movement volumes at the intersection of SR 426 and Church Street were collected during the PM peak hours on May 24, 2022. The intersection volumes were collected during the off-peak season. A seasonal adjustment factor of 1.04 was applied. The raw turning movement volumes and *Peak Season Factor Category Report* used in the analysis are included in the **Attachments**. The existing PM peak hour intersection volumes are displayed below.



Projected Traffic

A trip generation of the proposed development was calculated using information published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual, 11th Edition*. The resulting trip generation calculation is summarized in **Table 1**. Detailed ITE sheets are included in the **Attachments**.

Table 1
Trip Generation Analysis

ITE Code	Land Use	Size	Daily		PM Peak Hour			
			Rate	Trips	Rate	Total	Enter	Exit
220	Multifamily Townhomes	33 DU	8.69	288	1.05	35	22	13

Trip Generation analysis based on ITE Trip Generation Manual, 11th Edition.

The proposed development is projected to generate 288 daily trips of which 35 trips occur during the PM peak hour.

Trip Distribution

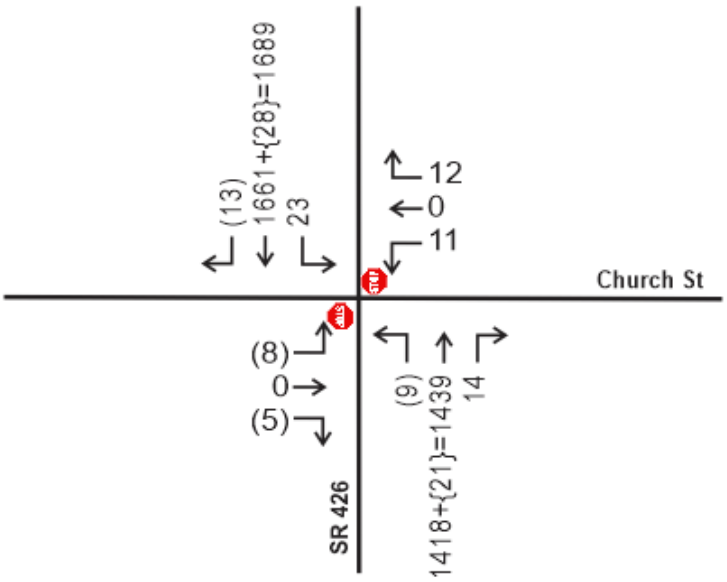
A trip distribution pattern was estimated based on existing travel patterns and knowledge of the local network. The estimated trip distribution was assigned to SR 426 as follows:

To/from north on SR 426 – 60%
To/from south on SR 426 – 40%

Intersection Analysis

A capacity analysis of the study intersection/project access on SR 426 was conducted using the methods of the *Highway Capacity Manual, 6th Edition (HCM)* as applied in the *Synchro* analytical tool utilizing the projected traffic volumes at the study driveway. The analysis was performed by adding existing traffic volumes, Seminole County's committed trips and the project trips at buildout to assess the net impact of the proposed development on the operation of the intersection.

PM peak hour committed trips were calculated by multiplying daily trips from the County database by K (0.09) and D (0.568). The results of the analysis of peak hour conditions are summarized in **Table 2**. The committed trip data obtained from Seminole County and the detailed background *HCM* analysis worksheets are provided in the **Attachments.** The projected PM peak hour intersection volumes are shown below.



Background+{Committed}+(Project)=Total

Table 2
Intersection Analysis

Intersection	Traffic Control	EB			WB			NB			SB		
		Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
W. SR 426 & Church St/ Project Access	TWSC	53.6	F	0.16	35.6	E	0.14	15.7	C	0.03	13.7	B	0.06

Delays expressed in sec/veh

The analysis of intersection operations reveals that the intersection of SR 426 and Church Street/ Project Access Driveway is projected to experience slight delays on the eastbound left turn movement due to the traffic volumes on SR 426. It should be noted that the driveway is projected to operate within its capacity with a volume to capacity (V/C) ratio of 0.16.

Turn Lane Analysis

SR 426 is a 4-lane divided roadway with a posted speed limit of 45 mph. Based on FDOT guidance provided in Table 27 of the *Access Management Guidebook*, included in the **Attachments**, right turn deceleration lanes should be considered at driveways on multilane roadways where the right turn volumes exceed 80 to 125 vehicles per hour (vph). The projected southbound right turn volume is 13 vph; therefore, a right turn lane is not warranted or necessary to serve the proposed driveway.

The existing northbound left turn lane is approximately 330 feet long, which is adequate to serve the projected volume of 9 vph on the northbound left turn movement.

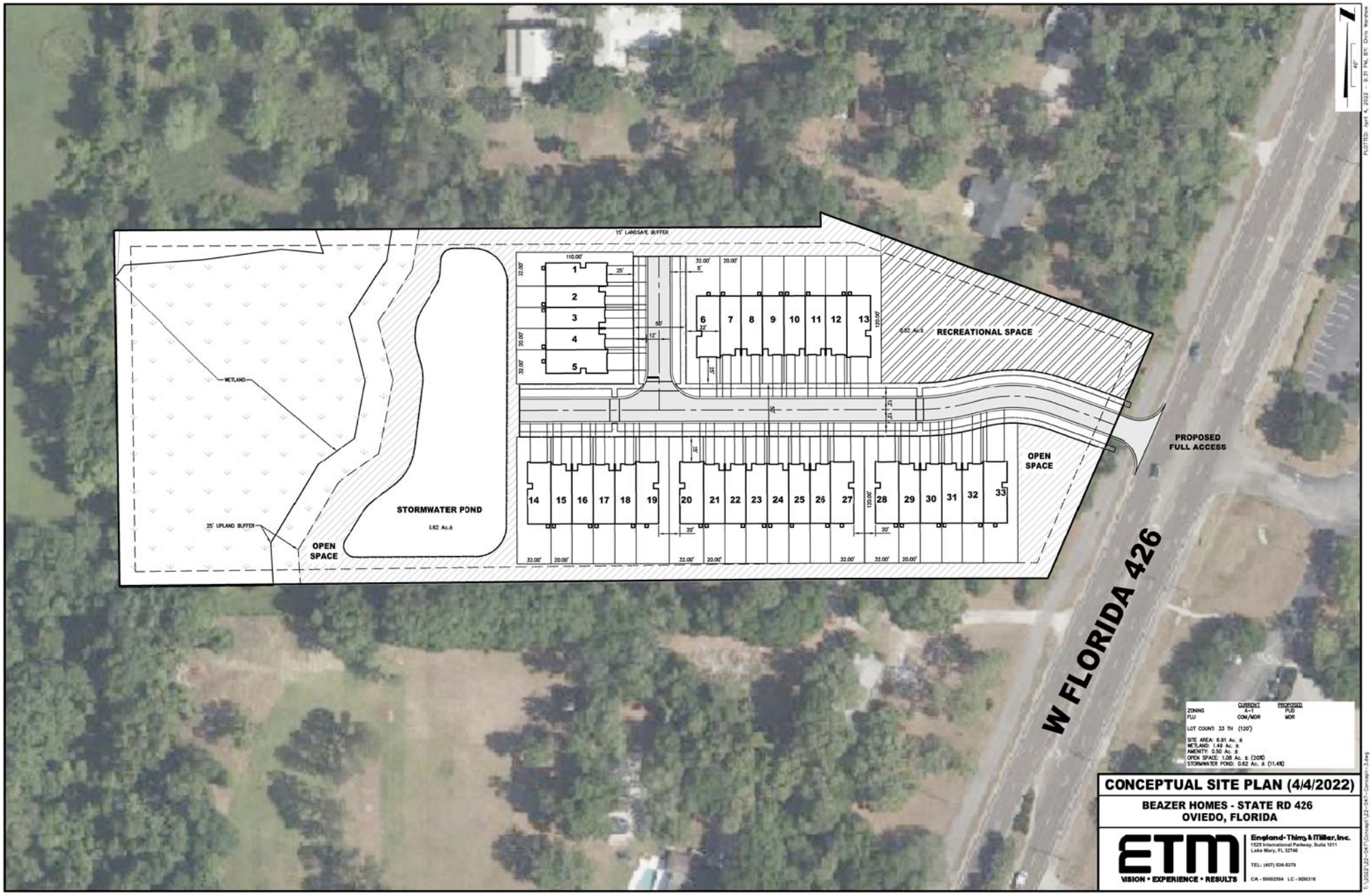
Conclusion

This analysis was performed to evaluate operation and suitability of the proposed Beazer SR 426 development access driveway on SR 426 in Seminole County, Florida.

The results of this traffic analysis are summarized as follows:

- The project is estimated to generate 288 daily trips of which 35 trips occur during the PM peak hour.
- The project access driveway is projected to operate at an adequate level of service (LOS) at project buildout.
- A southbound right turn lane is not warranted to serve the project driveway on SR 426.
- The existing 330-foot northbound left turn lane is adequate to serve the project driveway.
- The proposed driveway is projected to operate within its capacity with a V/C ratio of 0.16.

Attachments

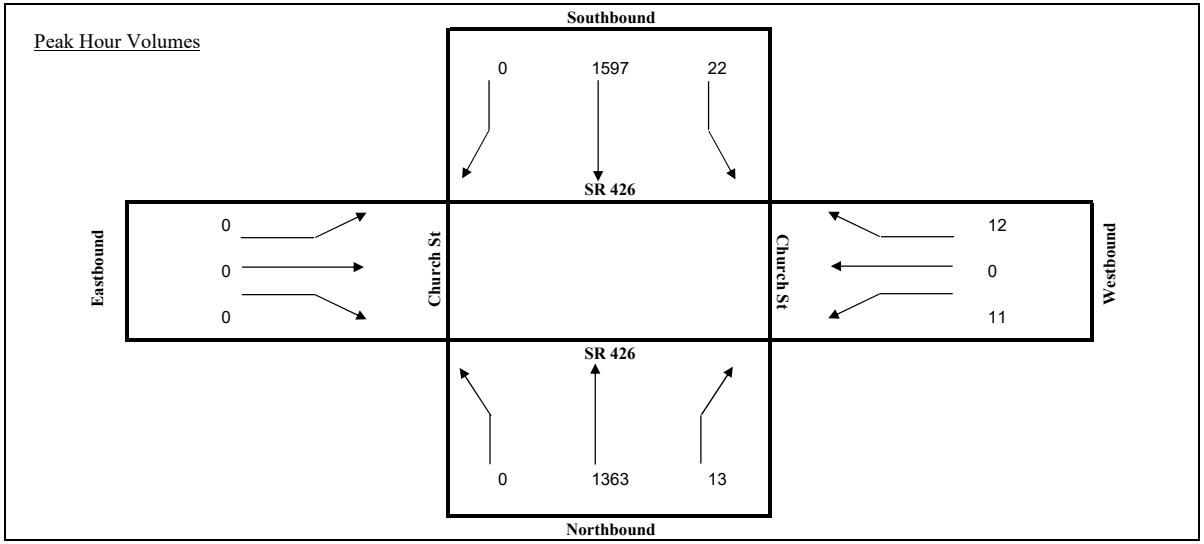

15' LANDSAPE BUFFER
WETLAND
25' UPLAND BUFFER
OPEN SPACE
STORMWATER POND
0.62 Ac.±
RECREATIONAL SPACE
0.62 Ac.±
OPEN SPACE
PROPOSED FULL ACCESS
W FLORIDA 426
ZONING A-1 PLD
FLU COM/MDR MDR
LOT COUNT: 33 TH (120')
SITE AREA: 6.91 Ac. ±
WETLAND: 1.49 Ac. ±
AMENITY: 0.50 Ac. ±
OPEN SPACE: 1.08 Ac. ± (20%)
STORMWATER POND: 0.62 Ac. ± (11.4%)
CONCEPTUAL SITE PLAN (4/4/2022)
BEAZER HOMES - STATE RD 426
OVIEDO, FLORIDA
ETM
VISION • EXPERIENCE • RESULTS
England-Thim & Miller, Inc.
1520 International Parkway, Suite 1011
Lake Mary, FL 32746
TEL: (407) 536-5379
CA - 00002594 LC - 0006316

TURNING MOVEMENT COUNT ANALYSIS

AUTOS & TRUCKS

Intersection (N/S): SR 426
Intersection (E/W): Church St
Date: 5/24/2022

		SR 426			SR 426			Church St			Church St			
		NB			SB			EB			WB			
Start	End	L	T	R	L	T	R	L	T	R	L	T	R	TOTAL
4:00 PM	4:15 PM	0	296	1	3	303	0	0	0	0	3	0	3	609
4:15 PM	4:30 PM	0	281	3	10	315	0	0	0	0	3	0	1	613
4:30 PM	4:45 PM	0	300	4	15	355	0	0	0	0	3	0	7	684
4:45 PM	5:00 PM	0	327	5	9	389	0	0	0	0	7	0	4	741
5:00 PM	5:15 PM	0	352	5	7	414	0	0	0	0	3	0	3	784
5:15 PM	5:30 PM	0	340	2	4	412	0	0	0	0	1	0	3	762
5:30 PM	5:45 PM	0	344	1	2	382	0	0	0	0	0	0	2	731
5:45 PM	6:00 PM	0	322	2	3	361	0	0	0	0	1	0	1	690
Total for:	4:00 PM	5:00 PM	0	1204	13	37	1362	0	0	0	0	16	0	15	2647
Total for:	5:00 PM	6:00 PM	0	1358	10	16	1569	0	0	0	0	5	0	9	2967
Tota Peak Hour:	4:45 PM	5:45 PM	0	1363	13	22	1597	0	0	0	0	11	0	12	3018
Overall PHF:	0.96														



2020 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 7700 SEMINOLE COUNTYWIDE

MOCF: 0.93

WEEK	DATES	SF	PSCF
* 1	01/01/2020 - 01/04/2020	0.99	1.06
* 2	01/05/2020 - 01/11/2020	0.94	1.01
* 3	01/12/2020 - 01/18/2020	0.90	0.97
* 4	01/19/2020 - 01/25/2020	0.89	0.96
* 5	01/26/2020 - 02/01/2020	0.88	0.95
* 6	02/02/2020 - 02/08/2020	0.86	0.92
* 7	02/09/2020 - 02/15/2020	0.85	0.91
* 8	02/16/2020 - 02/22/2020	0.88	0.95
* 9	02/23/2020 - 02/29/2020	0.92	0.99
*10	03/01/2020 - 03/07/2020	0.95	1.02
*11	03/08/2020 - 03/14/2020	0.98	1.05
*12	03/15/2020 - 03/21/2020	1.02	1.10
*13	03/22/2020 - 03/28/2020	1.08	1.16
14	03/29/2020 - 04/04/2020	1.15	1.24
15	04/05/2020 - 04/11/2020	1.22	1.31
16	04/12/2020 - 04/18/2020	1.29	1.39
17	04/19/2020 - 04/25/2020	1.23	1.32
18	04/26/2020 - 05/02/2020	1.17	1.26
19	05/03/2020 - 05/09/2020	1.12	1.20
20	05/10/2020 - 05/16/2020	1.06	1.14
21	05/17/2020 - 05/23/2020	1.05	1.13
22	05/24/2020 - 05/30/2020	1.04	1.12
23	05/31/2020 - 06/06/2020	1.03	1.11
24	06/07/2020 - 06/13/2020	1.02	1.10
25	06/14/2020 - 06/20/2020	1.01	1.09
26	06/21/2020 - 06/27/2020	1.01	1.09
27	06/28/2020 - 07/04/2020	1.02	1.10
28	07/05/2020 - 07/11/2020	1.03	1.11
29	07/12/2020 - 07/18/2020	1.04	1.12
30	07/19/2020 - 07/25/2020	1.03	1.11
31	07/26/2020 - 08/01/2020	1.03	1.11
32	08/02/2020 - 08/08/2020	1.03	1.11
33	08/09/2020 - 08/15/2020	1.03	1.11
34	08/16/2020 - 08/22/2020	1.02	1.10
35	08/23/2020 - 08/29/2020	1.02	1.10
36	08/30/2020 - 09/05/2020	1.02	1.10
37	09/06/2020 - 09/12/2020	1.02	1.10
38	09/13/2020 - 09/19/2020	1.02	1.10
39	09/20/2020 - 09/26/2020	1.01	1.09
40	09/27/2020 - 10/03/2020	1.00	1.08
41	10/04/2020 - 10/10/2020	0.98	1.05
42	10/11/2020 - 10/17/2020	0.97	1.04
43	10/18/2020 - 10/24/2020	0.98	1.05
44	10/25/2020 - 10/31/2020	0.98	1.05
45	11/01/2020 - 11/07/2020	0.99	1.06
46	11/08/2020 - 11/14/2020	0.99	1.06
47	11/15/2020 - 11/21/2020	1.00	1.08
48	11/22/2020 - 11/28/2020	0.99	1.06
49	11/29/2020 - 12/05/2020	0.99	1.06
50	12/06/2020 - 12/12/2020	0.99	1.06
51	12/13/2020 - 12/19/2020	0.99	1.06
52	12/20/2020 - 12/26/2020	0.94	1.01
53	12/27/2020 - 12/31/2020	0.90	0.97

* PEAK SEASON

Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

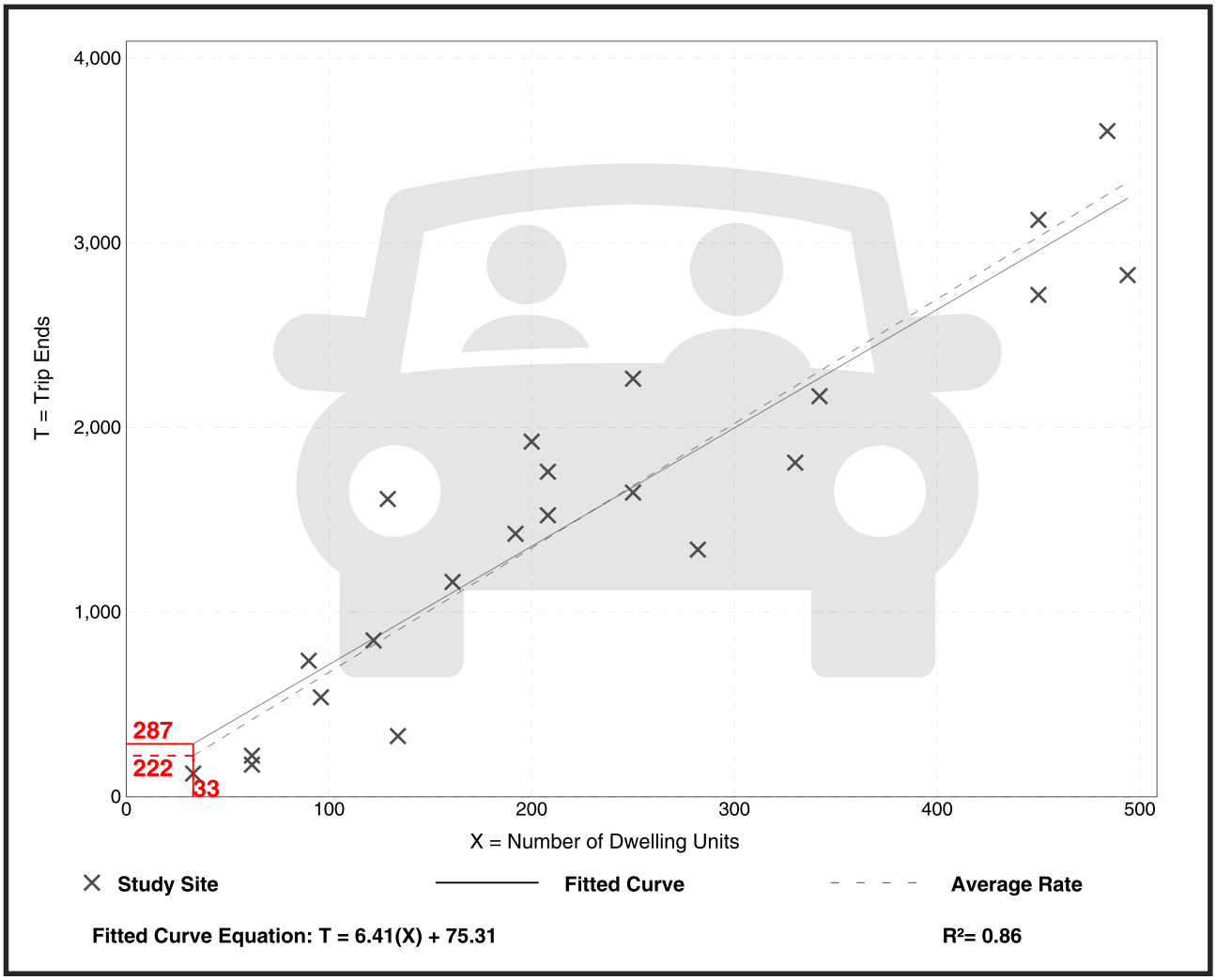
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 229
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



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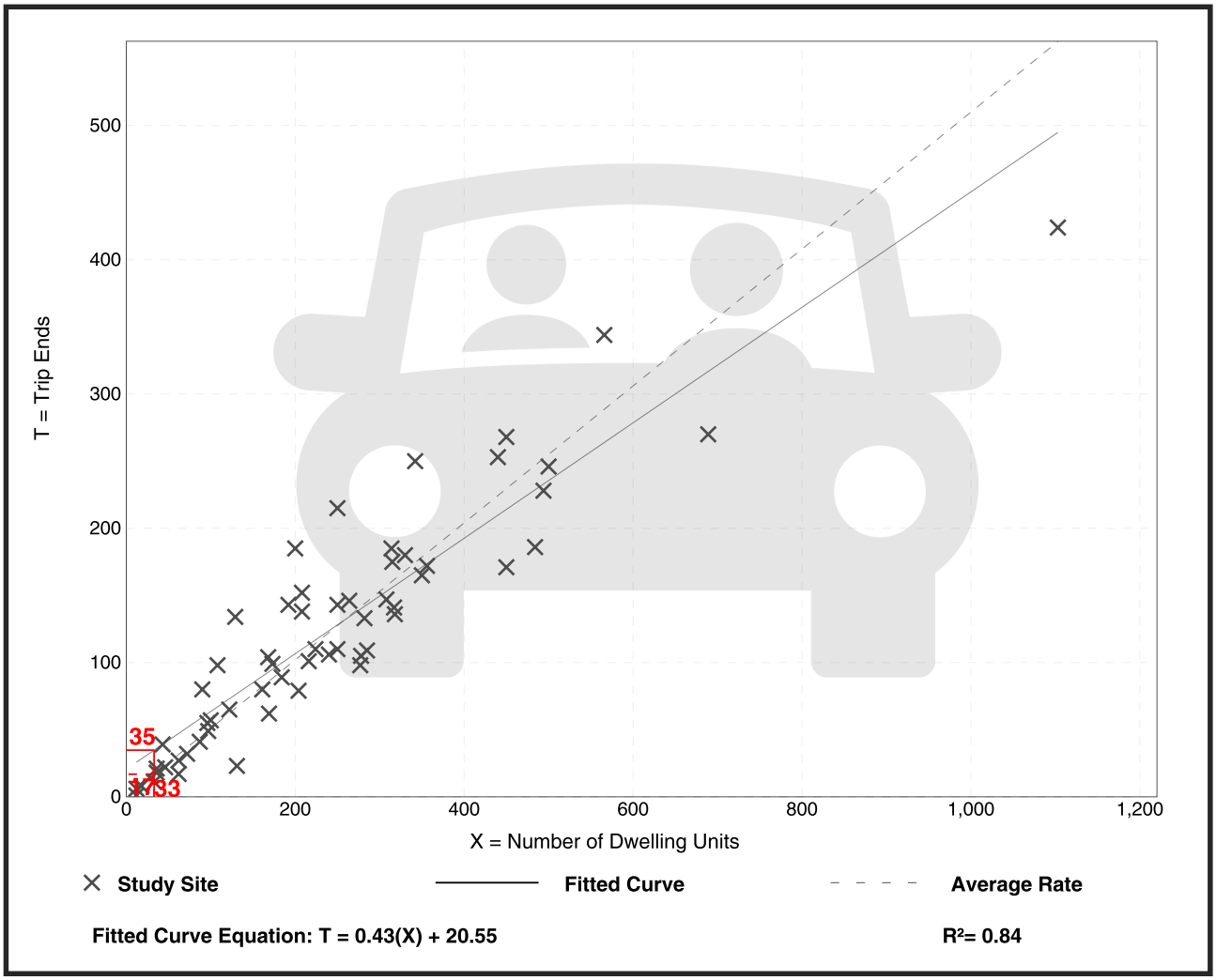
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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:	59
Avg. Num. of Dwelling Units:	241
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



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Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	11	12	0	1418	14	23	1661
Future Vol, veh/h	11	12	0	1418	14	23	1661
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	0	340	-	-	300	-
Veh in Median Storage, #	2	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	11	13	0	1477	15	24	1730

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	2398	746	1730	0	0	1492	0
Stage 1	1485	-	-	-	-	-	-
Stage 2	913	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	-	-	2.22	-
Pot Cap-1 Maneuver	28	356	112	-	-	446	-
Stage 1	174	-	-	-	-	-	-
Stage 2	352	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	26	356	112	-	-	446	-
Mov Cap-2 Maneuver	146	-	-	-	-	-	-
Stage 1	174	-	-	-	-	-	-
Stage 2	333	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	112	-	-	146	356	446	-
HCM Lane V/C Ratio	-	-	-	0.078	0.035	0.054	-
HCM Control Delay (s)	0	-	-	31.7	15.5	13.5	-
HCM Lane LOS	A	-	-	D	C	B	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.2	-

RKEY	Roadway Name	From	To		
S1930	S.R. 419	U.S. 17-92	Edgemon Ave		
				Current Traffic Count	17,937
				Roadway Link Capacity	19,360
				Committed Trips	0
				Net Available Capacity	1,423
S2600	S.R. 426	Orange County Line	Hall Rd		
				Current Traffic Count	32,309
				Roadway Link Capacity	48,000
				Committed Trips	0
				Net Available Capacity	15,691
S2620	S.R. 426	Hall Rd	Tuskawilla Rd		
				Current Traffic Count	40,087
				Roadway Link Capacity	48,000
				Committed Trips	0
				Net Available Capacity	7,913
S2630	S.R. 426	Tuskawilla Rd	S.R. 417		
				Current Traffic Count	53,653
				Roadway Link Capacity	60,000
				Committed Trips	169
				Net Available Capacity	6,178
S2640	S.R. 426	S.R. 417	Dean Rd		
				Current Traffic Count	38,224
				Roadway Link Capacity	48,000
				Committed Trips	699
				Net Available Capacity	9,077
S2650	S.R. 426	Dean Rd	Chapman Rd		
				Current Traffic Count	29,271
				Roadway Link Capacity	48,000
				Committed Trips	2,687
				Net Available Capacity	16,042
S2660	S.R. 426	Chapman Rd	Red Bug Lake Rd		
				Current Traffic Count	30,129
				Roadway Link Capacity	48,000
				Committed Trips	1,913
				Net Available Capacity	15,958
S2670	S.R. 426	Red Bug Lake Rd	Winter Springs Blvd		
				Current Traffic Count	25,602
				Roadway Link Capacity	48,000
				Committed Trips	235
				Net Available Capacity	22,163
S2680	S.R. 426	Winter Springs Blvd	Lake Jessup Ave		
				Current Traffic Count	20,773
				Roadway Link Capacity	48,000
				Committed Trips	0
				Net Available Capacity	27,227

This information has been provided by Tony Nelson, P.E. at Seminole County Engineering and is current information as of the above referenced date.

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	0	5	11	0	12	9	1439	14	23	1689	13
Future Vol, veh/h	8	0	5	11	0	12	9	1439	14	23	1689	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	340	-	-	300	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	96	92	96	92	96	96	96	96	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	5	11	0	13	10	1499	15	24	1759	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2584	3348	887	2455	3348	757	1773	0	0	1514	0	0
Stage 1	1814	1814	-	1527	1527	-	-	-	-	-	-	-
Stage 2	770	1534	-	928	1821	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	13	8	287	16	8	350	347	-	-	437	-	-
Stage 1	81	128	-	123	178	-	-	-	-	-	-	-
Stage 2	359	177	-	288	127	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	12	7	287	15	7	350	347	-	-	437	-	-
Mov Cap-2 Maneuver	61	64	-	80	64	-	-	-	-	-	-	-
Stage 1	79	121	-	119	173	-	-	-	-	-	-	-
Stage 2	336	172	-	267	120	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	53.6	35.6	0.1	0.2
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	347	-	-	88	80	350	437	-	-
HCM Lane V/C Ratio	0.028	-	-	0.161	0.143	0.036	0.055	-	-
HCM Control Delay (s)	15.7	-	-	53.6	57.4	15.7	13.7	-	-
HCM Lane LOS	C	-	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.5	0.1	0.2	-	-

7.2

WHEN SHOULD WE BUILD RIGHT TURN LANES?

Exhibit 44
Recommended Guidelines for Exclusive Right Turn Lanes to Unsignalized* Driveway

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	**80-125** (see note 1)
Over 45 mph	**35-55** (see note 2)

*May not be appropriate for signalized locations where signal phasing plays an important role in determining the need for right turn lanes.

1. The lower threshold of 80 right turn vehicles per hour would be most used for higher volume (greater than 600 vehicles per hour, per lane in one direction on the major roadway) or two-lane roads where lateral movement is restricted. The 125 right turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with a large entry radius (50 feet or greater).

2. The lower threshold of 35 right turn vehicles per hour would be most appropriately used on higher volume two-lane roadways where lateral movement is restricted. The 55 right turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with large entry radius (50 feet or greater).

***Note*:** A posted speed limit of 45 mph may be used with these thresholds if the operating speeds are known to be over 45 mph during the time of peak right turn demand.

Note on Traffic projections: Projecting turning volumes is, at best, a knowledgeable estimate. Keep this in mind especially if the projections of right turns are close to meeting the guidelines. In that case, consider requiring the turn lane.