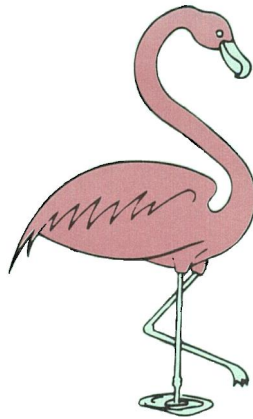


SANDY OAKS SUBDIVISION TRAFFIC STUDY

NASSAU COUNTY, FLORIDA

April 2022



BUCKHOLZ TRAFFIC



**BUCKHOLZ TRAFFIC
3585 KORI ROAD
JACKSONVILLE, FLORIDA 32257
(904) 886-2171 jwbuckholz@aol.com**

April 5, 2022

Mr. Jeffrey C. White
SEDA New Homes
2120 Corporate Square Boulevard / Suite 3
Jacksonville, Florida 32216

Re: Sandy Oaks Subdivision Traffic Study

Dear Mr. White:

Attached is the requested traffic study. If there are any questions or comments regarding this study, please contact me.

Sincerely,

Jeffrey W. Buckholz, P.E., PTOE
Principal

This item has been digitally signed and sealed by Jeffrey W. Buckholz, P.E. on 4/5/22. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

INTRODUCTION

This proposed residential development will contain 93 single family homes and will be located at the end of Brooker Road north of Roses Bluff Road approximately 1.5 miles west of Chester Road in Nassau County, Florida. Access to the site will be provided via Brooker Road which will be paved from Roses Bluff Road to the site entrance. Roses Bluff Road is a two lane undivided roadway with a posted speed limit of 35 mph. Figure 1 shows the site location and surrounding road network while Appendix A contains the proposed site plan. The development is expected to be complete and fully occupied by the end of 2026. Consequently, 2026 was chosen as the design year for this study.

EXISTING TRAFFIC VOLUMES

2022 weekday peak period manual turning movement counts were conducted by Buckholz Traffic personnel at the Roses Bluff Road/Brooker Road intersection and the Roses Bluff Road/Bell River Estates Road intersection. These counts, which are provided in Appendix B, were conducted during the weekday AM peak period (6:30 ó 8:30 AM) and the weekday PM peak period (3:30 ó 5:30 PM) with school in session. The data was recorded at 15-minute intervals and includes a separate tabulation for trucks. Figure 2 summarizes the weekday peak hour counts.

Appendix C provides daily traffic volumes from the nearest FDOT traffic counting station to the site.

TRIP GENERATION

Trip generation calculations were carried out using the 11th edition of ITE's Trip Generation Manual and referencing land use code 210 (Single Family Housing). Table 1 contains the daily, AM peak hour, and PM peak hour trip generation calculations for the development. During an average weekday the development is expected to generate 944 trips (472 entering and 472 exiting) with 70 trips (18 entering and 52 exiting) occurring during the AM peak hour and 93 trips (59 entering and 34 exiting) occurring during the PM peak hour. All of these trips will be new trips.

SITE TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

Weekday AM and PM peak hour site trips were directionally distributed as shown in Figure 3 using engineering judgment.

FUTURE TRAFFIC VOLUMES

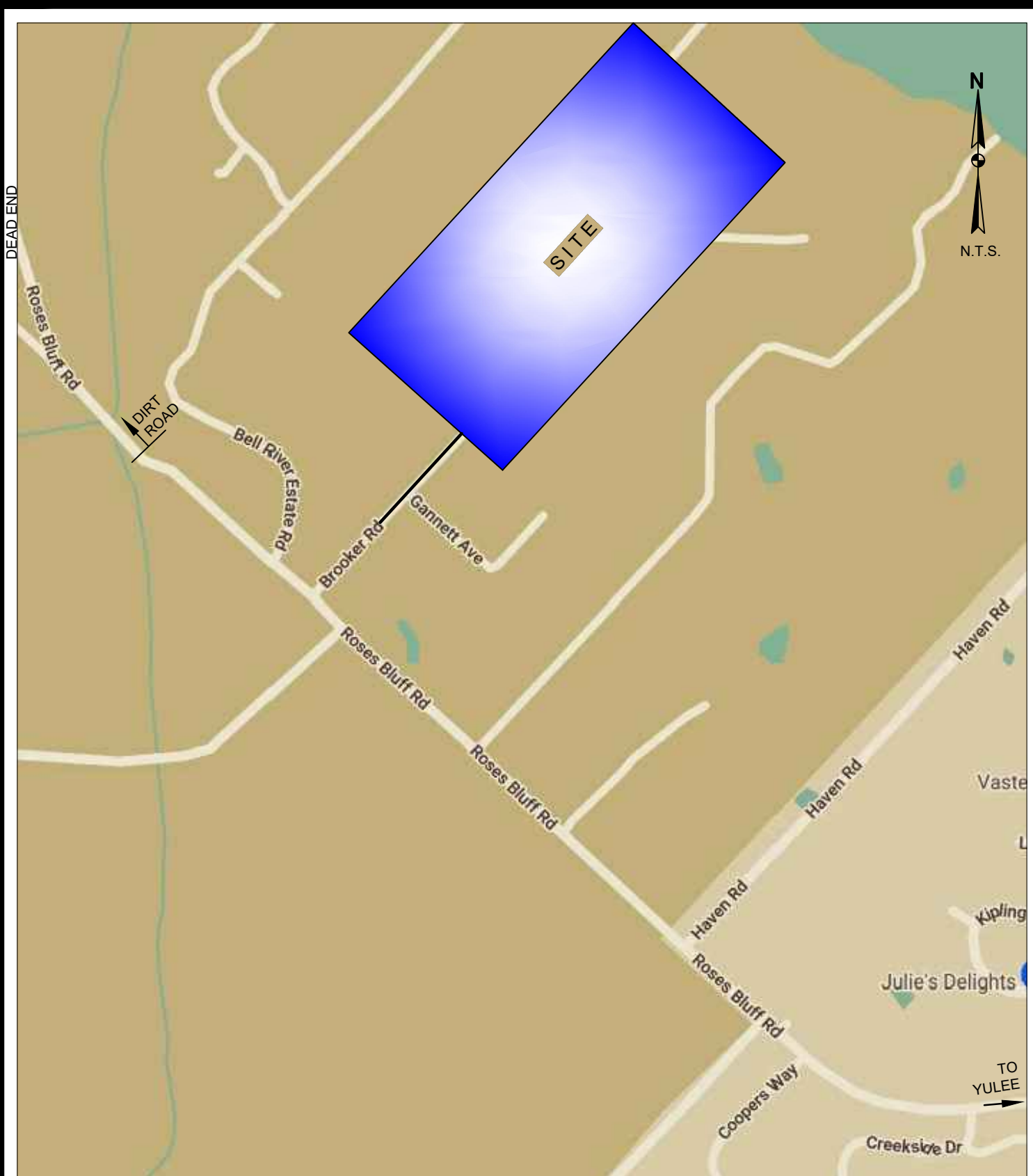
The expected weekday 2026 peak hour background (No Build) traffic volumes and total (Build) traffic volumes at the Roses Bluff Road/Brooker Road intersection are graphically depicted in Figures 4 and 5. The No Build traffic volumes were obtained by multiplying the existing traffic volumes by a seasonal adjustment factor (1.03) and then by a 2.5% annual growth rate. This growth rate was established via a linear regression analysis of recent FDOT daily traffic volumes near the site (see graph C-1 in Appendix C). The 2026 Build traffic volumes were then obtained by adding the traffic generated by the new development to the 2026 No Build traffic volumes.

TURN LANE EVALUATION

A formal analysis was made to determine if a right turn lane is warranted on westbound Roses Bluff Road at Brooker Road. The methodology contained in NCHRP Report 279 was used to conduct this analysis. As is indicated in Figure 6, right turn volumes under expected 2026 Build conditions will not be high enough to warrant an exclusive right turn lane at this location. This result is supported by NCHRP Report 420 which requires 80 right turns per hour to warrant a right turn lane on a 2-lane roadway with a posted speed of 45 mph or less.

UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS

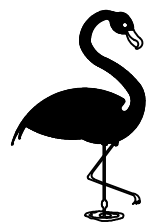
The Roses Bluff Road/Brooker Road intersection was analyzed using the two-way stop control methodology contained in Chapter 20 of the Sixth Edition of the Highway Capacity Manual. Table 2 summarizes the capacity analysis results under 2026 Build conditions. The supporting calculations are provided in Appendix D. Under 2026 Build conditions, all minor movements at this intersection are expected to operate at level of service A with minimal queuing and a volume-to-capacity ratio of well less than one during both weekday peak hours.



Buckholz Traffic

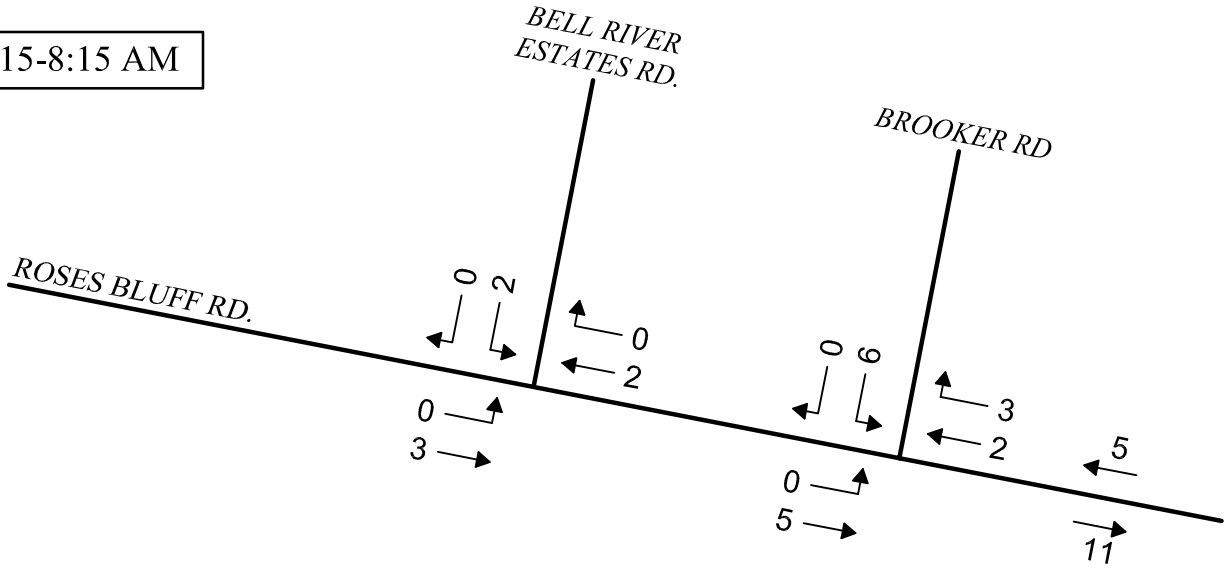
FIGURE 1

SITE LOCATION

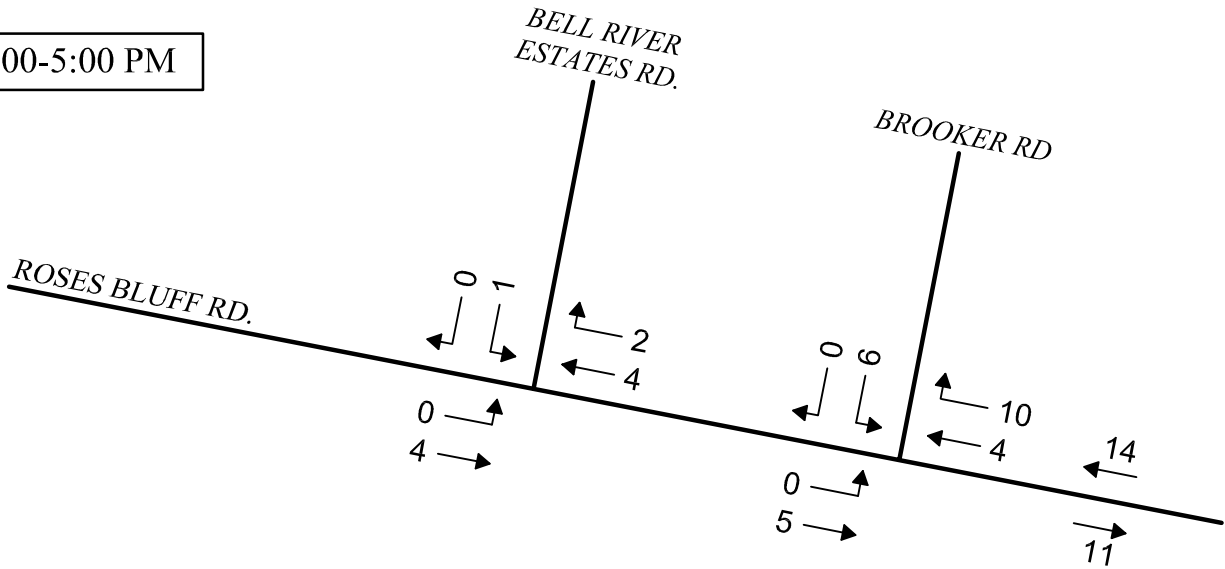




7:15-8:15 AM



4:00-5:00 PM



Buckholz Traffic

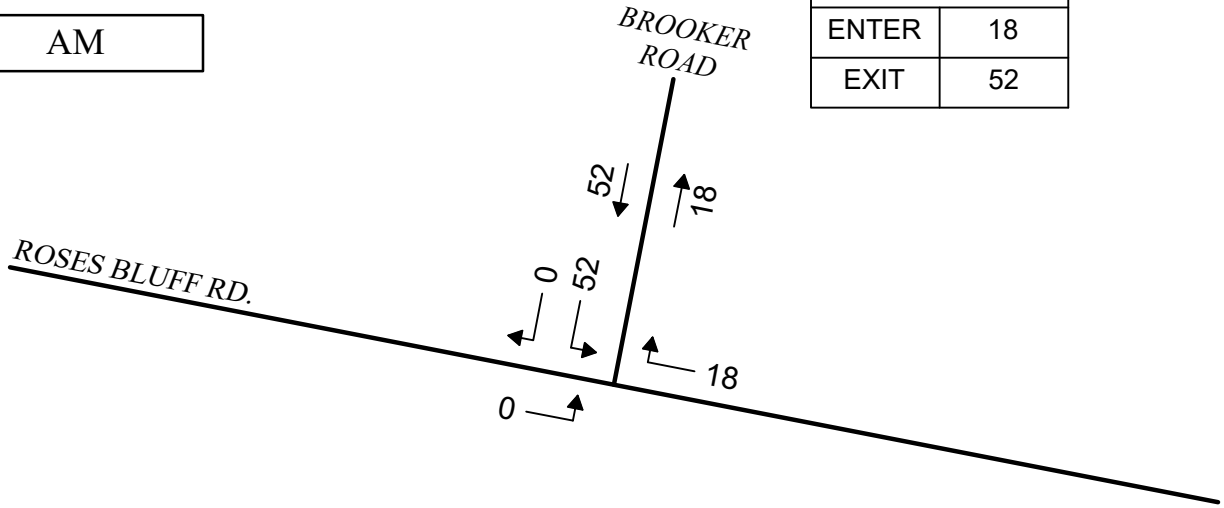
FIGURE 2

TRAFFIC
COUNTS

WEEKDAY PEAK HOURS



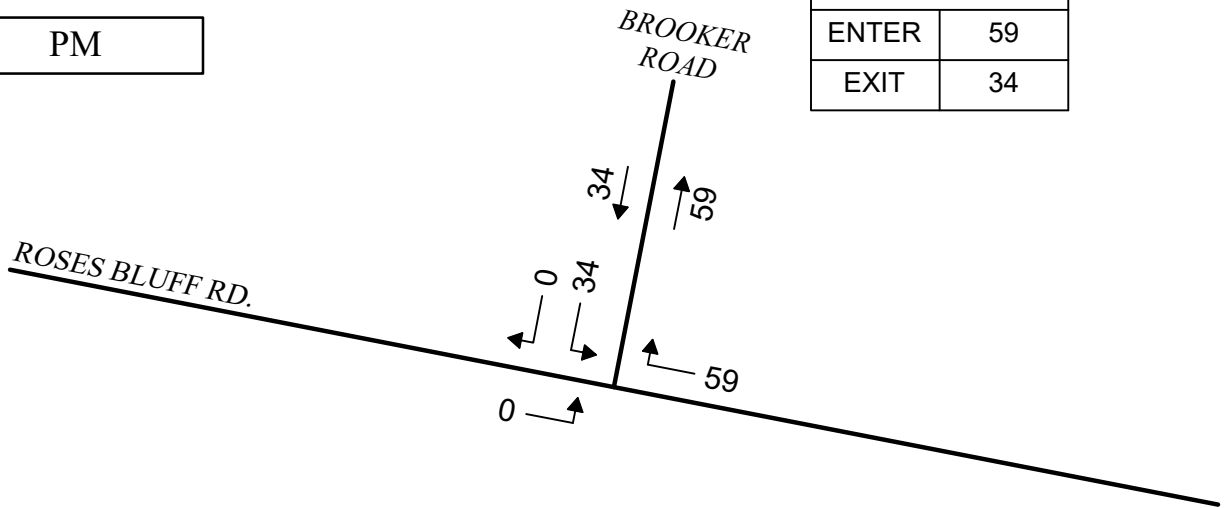
AM



TOTAL TRIPS	
ENTER	18
EXIT	52



PM



TOTAL TRIPS	
ENTER	59
EXIT	34

FIGURE 3

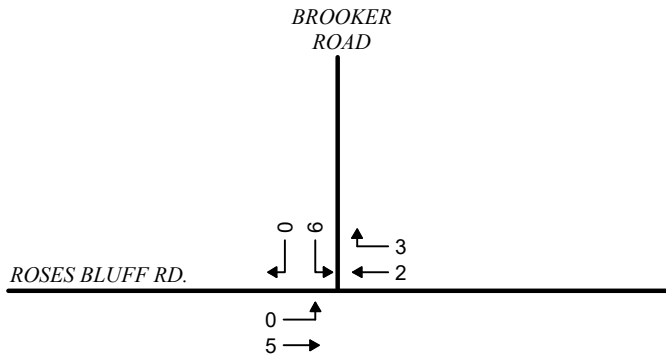
SITE TRAFFIC ASSIGNMENT

WEEKDAY PEAK HOURS

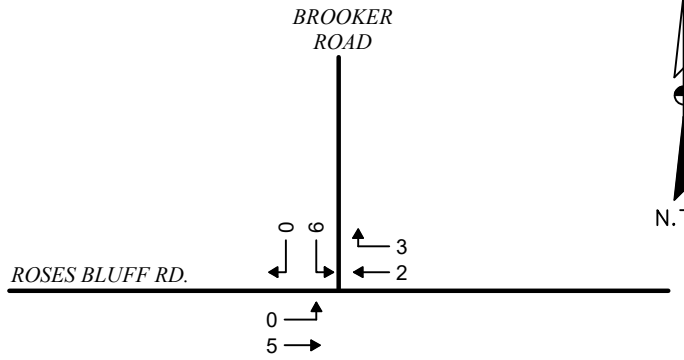


Buckholz Traffic

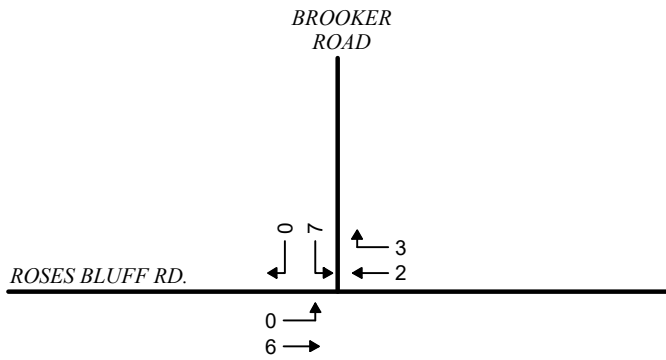
FIG_04.dwg Date: 04-04-22 T: 14:21 By: tmeiacruz



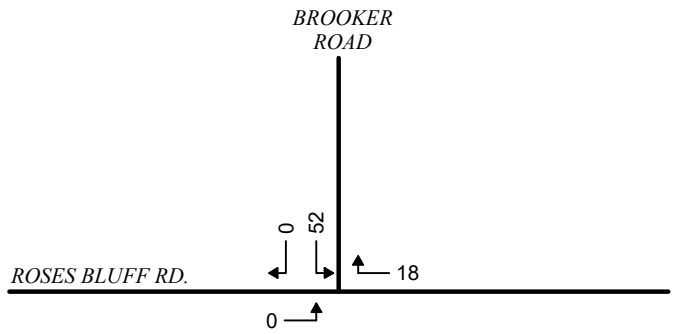
EXISTING TRAFFIC
03/08/22
7:15-8:15 AM



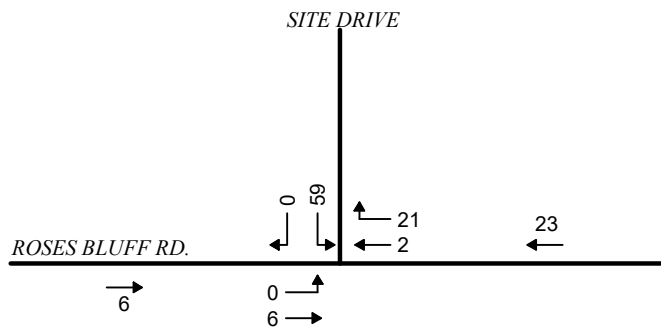
2022 SEASONALLY ADJUSTED TRAFFIC
FDOT SEASONAL CORRECTION FACTOR = 1.03



2026 NO BUILD TRAFFIC
AVERAGE ANNUAL GROWTH RATE = 2.5% (GF=1.10)



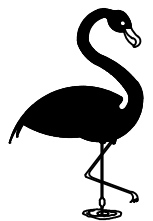
SITE TRAFFIC



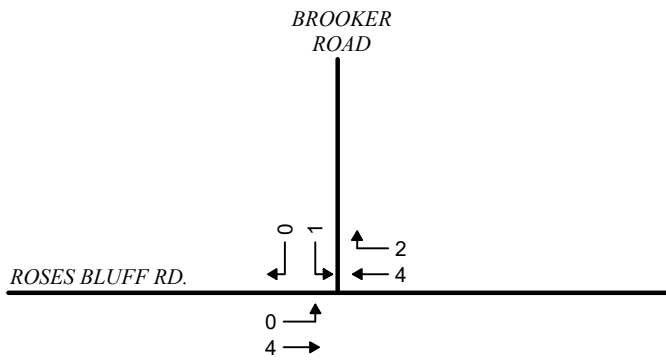
2026 BUILD TRAFFIC

Buckholz Traffic

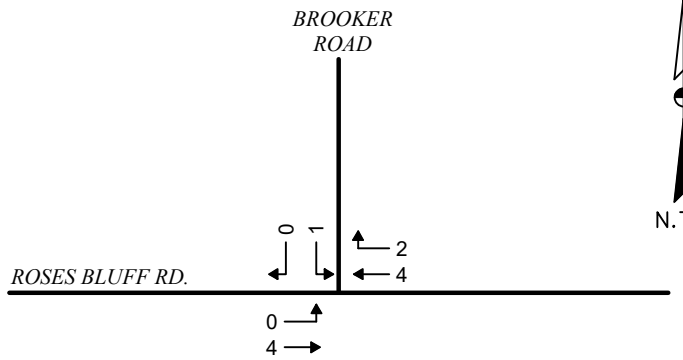
FIGURE 4
2026 BUILD TRAFFIC
ROSES BLUFF RD. /
BROOKER ROAD
WEEKDAY AM PEAK HOUR



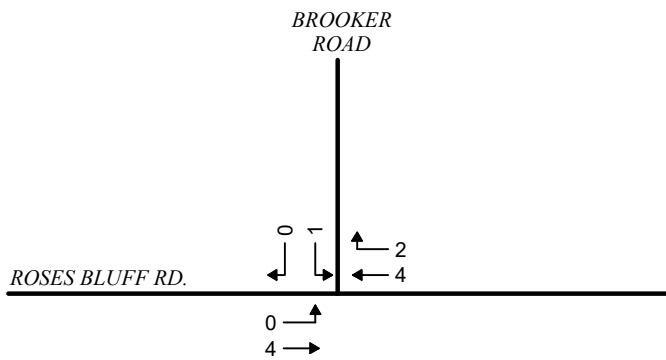
FIG_05.dwg Date: 04-04-22 T: 14:24 By: tmelacruz



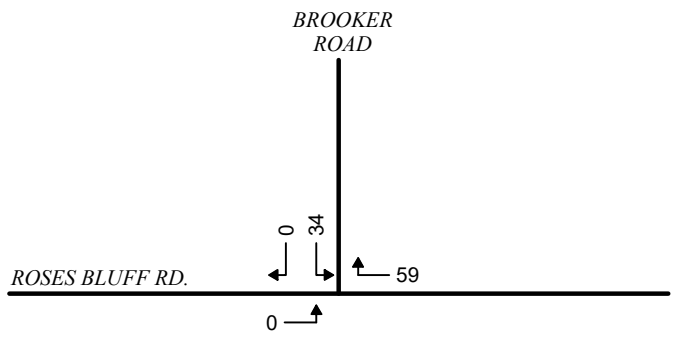
EXISTING TRAFFIC
03/09/22
4:00-5:00 PM



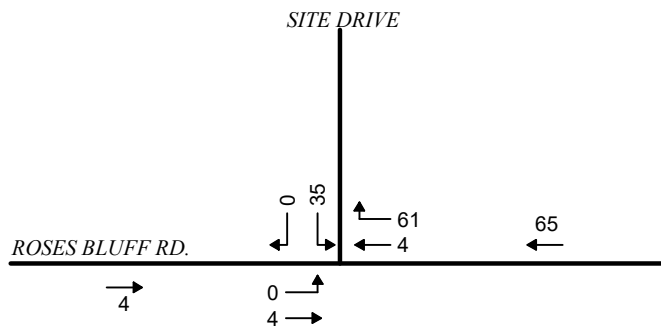
2022 SEASONALLY ADJUSTED TRAFFIC
FDOT SEASONAL CORRECTION FACTOR = 1.03



2026 NO BUILD TRAFFIC
AVERAGE ANNUAL GROWTH RATE = 2.5% (GF=1.10)



SITE TRAFFIC



2026 BUILD TRAFFIC

FIGURE 5

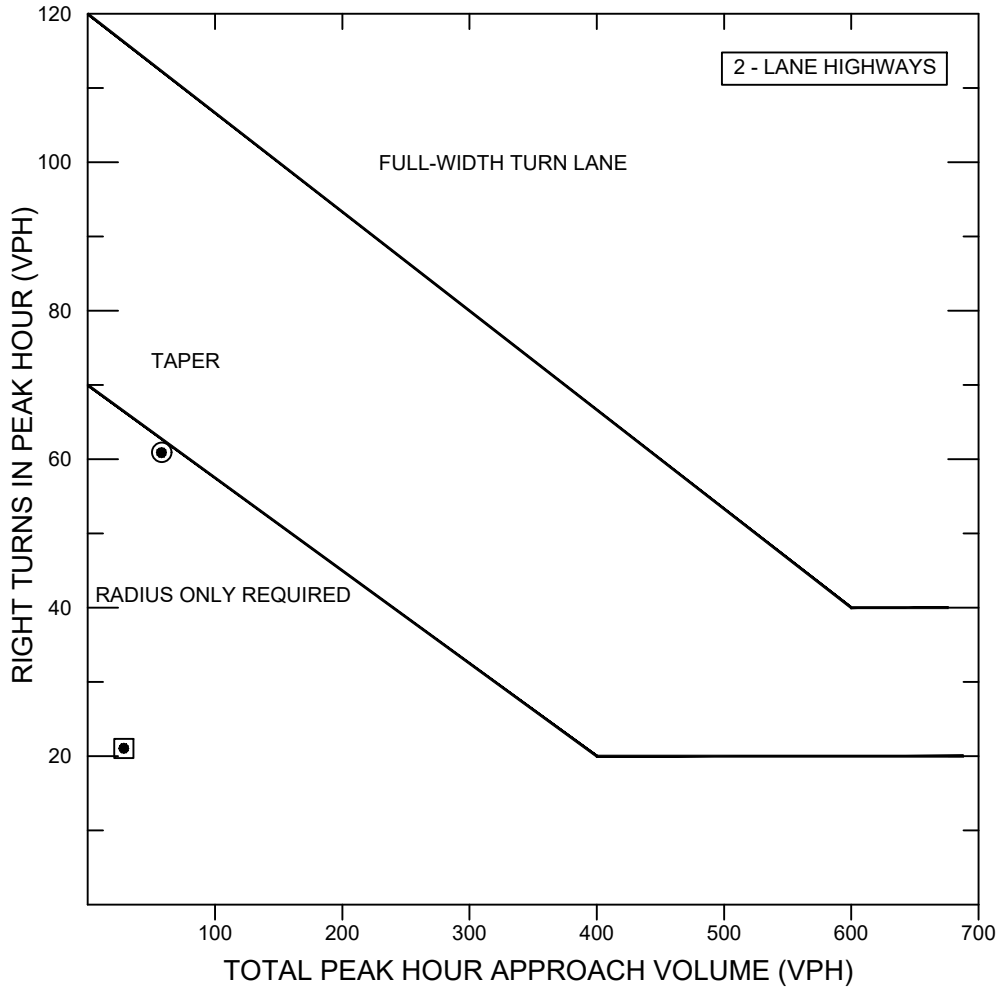
2026 BUILD TRAFFIC
ROSES BLUFF RD. /
BROOKER ROAD

WEEKDAY PM PEAK HOUR



Buckholz Traffic

WESTBOUND ROSES BLUFF ROAD @ BROOKER ROAD



NOMOGRAPH FOR RIGHT TURN LANES

SOURCE: TRANSPORTATION RESEARCH BOARD NCHRP REPORT #279

■ AM PEAK HOUR

V _A	23
V _R	21

● PM PEAK HOUR

V _A	65
V _R	61

NCHRP 420	
2-LANE	≤ 45 MPH

21 & 61 < 80 REQUIRED

FIGURE 6

RIGHT TURN
LANE ANALYSIS



TABLE 1

**TRIP GENERATION CALCULATIONS
TOTAL DEVELOPMENT**

SINGLE FAMILY DWELLING UNITS

Land Use Code 210

T = Number of Vehicle Trip Ends

X = Number of Dwelling Units = 93

<u>TIME PERIOD</u>	<u>TRIP GENERATION EQUATION</u>	<u>TOTAL TRIP ENDS</u>	<u>PERCENT ENTERING</u>	<u>PERCENT EXITING</u>	<u>TOTAL TRIP ENDS ENTERING</u>	<u>TOTAL TRIP ENDS EXITING</u>
WEEKDAY						
Daily	$\ln(T)=0.92\ln(X)+2.68$	944	50%	50%	472	472
AM Peak Hour	$\ln(T)=0.91\ln(X)+0.12$	70	26%	74%	18	52
PM Peak Hour	$\ln(T)=0.94\ln(X)+0.27$	93	63%	37%	59	34

SOURCE: Institute of Transportation Engineers, "Trip Generation", 11th Edition (2021)

BUCKHOLZ TRAFFIC

TABLE 2

UNSIGNALIZED INTERSECTION CAPACITY RESULTS

BROOKER ROAD / SITE DRIVE

2025 BUILD CONDITIONS	WEEKDAY AM PEAK HOUR			
Movement	LOS	Delay	v/c Ratio	95th % Queue (vehicles)
Eastbound Left Turn	A	7.3 sec/veh	0.00	1
Southbound Approach	A	9.0 sec/veh	0.09	1

2025 BUILD CONDITIONS	WEEKDAY PM PEAK HOUR			
Movement	LOS	Delay	v/c Ratio	95th % Queue (vehicles)
Eastbound Left Turn	A	7.4 sec/veh	0.00	1
Southbound Approach	A	9.0 sec/veh	0.05	1

BUCKHOLZ TRAFFIC

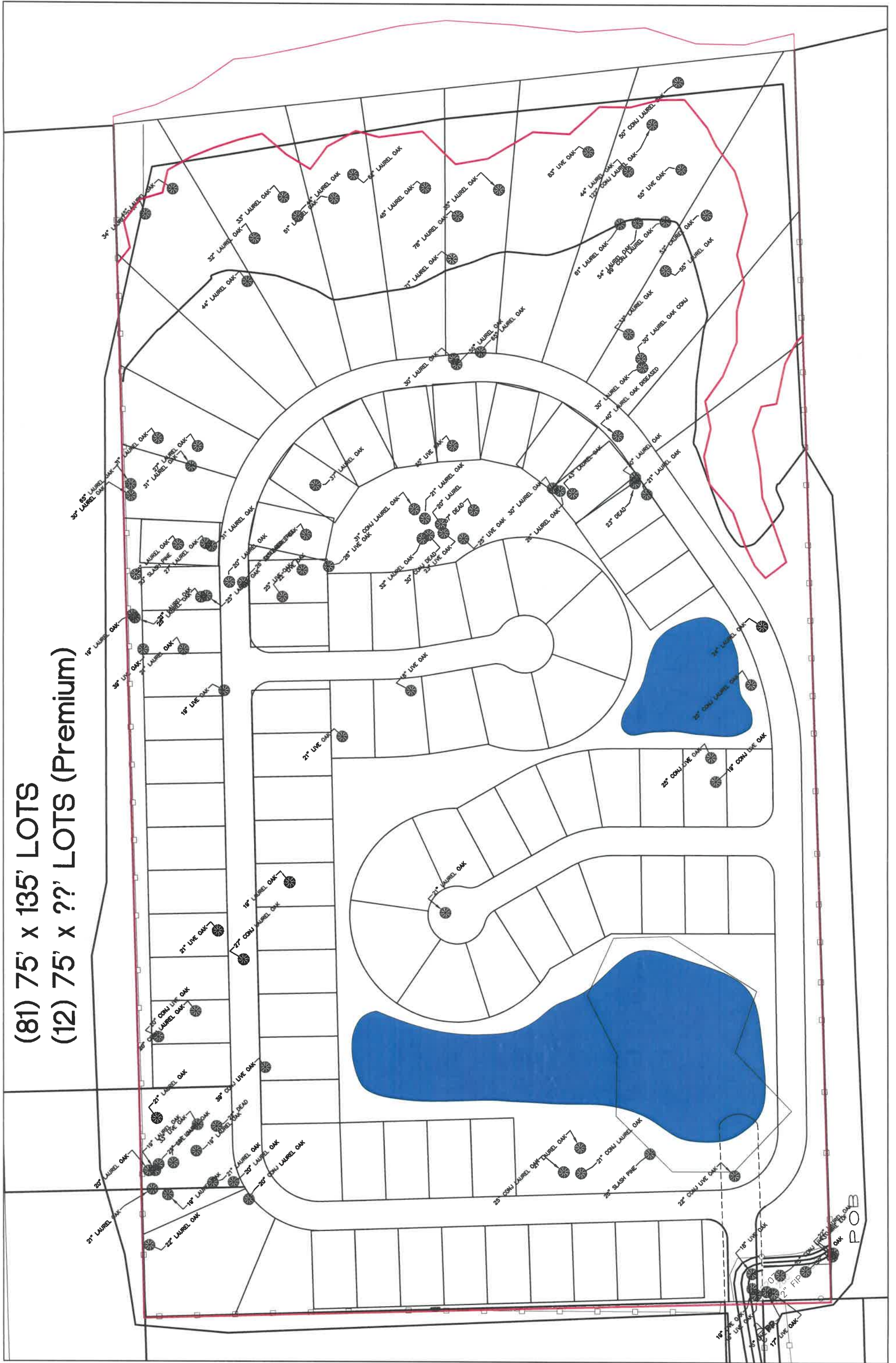
APPENDIX A

SITE PLAN





(81) 75' x 135' LOTS
(12) 75' x ??' LOTS (Premium)



APPENDIX B

TURNING MOVEMENT COUNTS



TABLE B-1
Roses Bluff Road / Brooker Road / Bell River Estates Road
TURNING MOVEMENT COUNTS - ALL VEHICLES

Tuesday, March 8, 2022

	US 17 / BROOKER ROAD					US 17 / BELL RIVER ESTATES ROAD				All	
	EB Thru	WB Right Turn	SB Left Turn	SB Right Turn	EB Left Turn	WB Thru	EB Left Turn	WB Right Turn	SB Left Turn		SB Right Turn
6:30-6:45 AM	1	0	2	0	0	0	0	0	0	0	3
6:45-7:00 AM	1	1	1	0	0	0	0	0	0	0	3
7:00-7:15 AM	0	0	0	0	0	1	0	0	0	0	1
7:15-7:30 AM	0	1	2	0	0	0	0	0	1	0	4
7:30-7:45 AM	0	1	0	0	0	0	0	0	0	0	1
7:45-8:00 AM	2	1	0	0	0	2	0	0	1	0	6
8:00-8:15 AM	1	0	4	0	0	0	0	0	0	0	5
8:15-8:30 AM	0	0	0	0	0	0	0	0	0	0	0
AM PEAK PERIOD:	5	4	9	0	0	3	0	0	2	0	23

AM PEAK HOUR:	3	3	6	0	0	2	0	0	2	0	16
7:15-8:15 AM											

PHF
0.67

Wednesday, March 9, 2022

	US 17 / BROOKER ROAD					US 17 / BELL RIVER ESTATES ROAD				All	
	EB Thru	WB Right Turn	SB Left Turn	SB Right Turn	EB Left Turn	WB Thru	EB Left Turn	WB Right Turn	SB Left Turn		SB Right Turn
3:30-3:45 PM	0	0	1	0	0	1	0	0	0	0	2
3:45-4:00 PM	0	2	0	0	0	0	0	1	0	0	3
4:00-4:15 PM	1	5	0	0	0	1	0	1	1	0	9
4:15-4:30 PM	1	1	3	0	0	0	0	0	0	0	5
4:30-4:45 PM	1	3	2	0	0	3	0	0	0	0	9
4:45-5:00 PM	1	1	1	0	0	0	0	1	0	0	4
5:00-5:15 PM	0	1	0	0	0	0	0	0	1	0	2
5:15-5:30 PM	1	2	1	0	0	0	0	0	0	0	4
PM PEAK PERIOD:	5	15	8	0	0	5	0	3	2	0	38

PM PEAK HOUR:	4	10	6	0	0	4	0	2	1	0	27
4:00-5:00 PM											

PHF
0.75

BUCKHOLZ TRAFFIC

APPENDIX C

FDOT TRAFFIC DATA

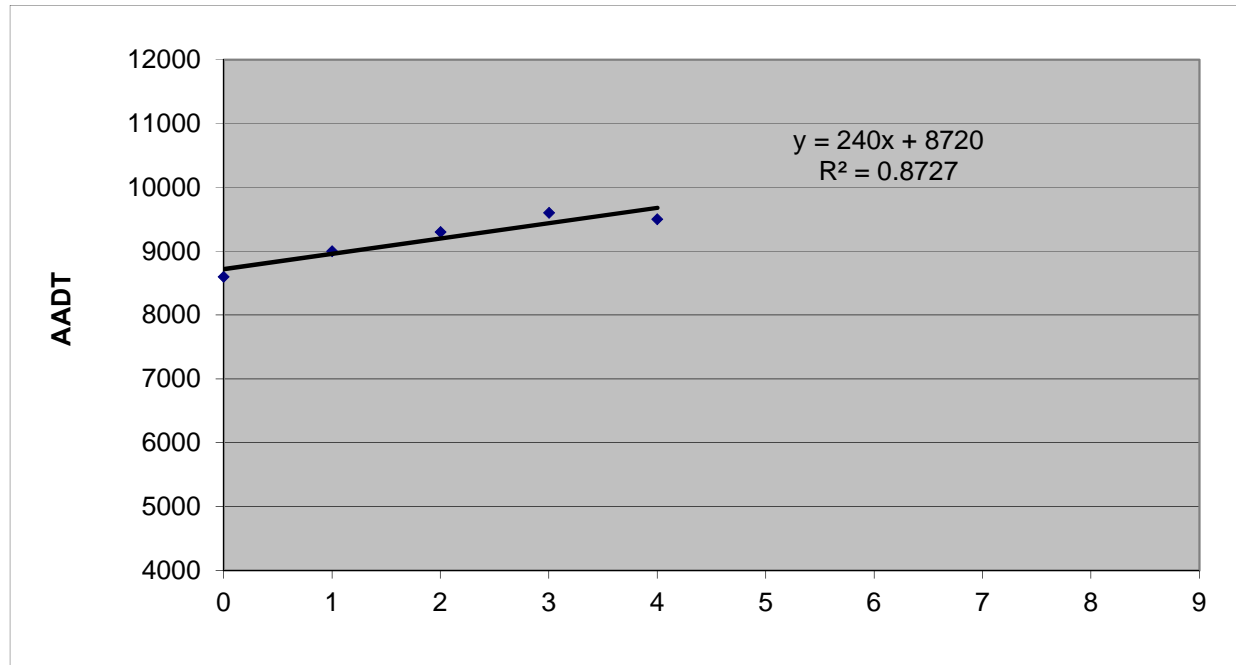


**TABLE C-1
LINEAR REGRESSION ANALYSIS**

Chester Road, North of Pages Dairy Road

<u>Year</u>	<u>X</u>	<u>Actual AADT (Y)</u>	<u>Predicted AADT</u>
2016	0	8600	8720
2017	1	9000	8960
2018	2	9300	9200
2019	3	9600	9440
2020	4	9500	9680
2021	5		9920
2022	6		10160
2023	7		10400
2024	8		10640
2025	9		10880

i = 2.5%



BUCKHOLZ TRAFFIC

FLORIDA DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION STATISTICS OFFICE
 2020 HISTORICAL AADT REPORT

COUNTY: 74 - NASSAU

SITE: 9113 - CHESTER RD. .1 MI N. OF PAGES DAIRY RD.

YEAR	AADT	DIRECTION 1		DIRECTION 2		*K FACTOR	D FACTOR	T FACTOR
2020	9500 R		0		0	9.00	53.70	4.60
2019	9600 T		0		0	9.00	54.30	3.40
2018	9300 S		0		0	9.00	54.50	4.50
2017	9000 F		0		0	9.00	55.10	4.00
2016	8600 C	N	0	S	0	9.00	56.00	5.90
2015	5000 R		0		0	9.00	55.30	3.50
2014	4900 T					9.00	55.10	4.30
2013	4800 S		0		0	9.00	56.90	4.10
2012	4700 F		0		0	9.00	54.70	4.50
2011	4700 C	N	0	S	0	9.00	55.80	4.20

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN

*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

2020 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
 CATEGORY: 7400 NASSAU COUNTYWIDE

WEEK	DATES	SF	MOCF: 0.95 PSCF
1	01/01/2020 - 01/04/2020	1.06	1.12
2	01/05/2020 - 01/11/2020	1.03	1.08
3	01/12/2020 - 01/18/2020	0.99	1.04
4	01/19/2020 - 01/25/2020	0.98	1.03
5	01/26/2020 - 02/01/2020	0.97	1.02
6	02/02/2020 - 02/08/2020	0.96	1.01
7	02/09/2020 - 02/15/2020	0.96	1.01
8	02/16/2020 - 02/22/2020	0.97	1.02
9	02/23/2020 - 02/29/2020	0.99	1.04
10	03/01/2020 - 03/07/2020	1.01	1.06
11	03/08/2020 - 03/14/2020	1.03	1.08
12	03/15/2020 - 03/21/2020	1.05	1.11
13	03/22/2020 - 03/28/2020	1.12	1.18
14	03/29/2020 - 04/04/2020	1.18	1.24
15	04/05/2020 - 04/11/2020	1.25	1.32
16	04/12/2020 - 04/18/2020	1.31	1.38
17	04/19/2020 - 04/25/2020	1.23	1.29
18	04/26/2020 - 05/02/2020	1.14	1.20
19	05/03/2020 - 05/09/2020	1.06	1.12
*20	05/10/2020 - 05/16/2020	0.97	1.02
*21	05/17/2020 - 05/23/2020	0.96	1.01
*22	05/24/2020 - 05/30/2020	0.95	1.00
*23	05/31/2020 - 06/06/2020	0.94	0.99
*24	06/07/2020 - 06/13/2020	0.93	0.98
*25	06/14/2020 - 06/20/2020	0.92	0.97
*26	06/21/2020 - 06/27/2020	0.92	0.97
*27	06/28/2020 - 07/04/2020	0.93	0.98
*28	07/05/2020 - 07/11/2020	0.94	0.99
*29	07/12/2020 - 07/18/2020	0.95	1.00
*30	07/19/2020 - 07/25/2020	0.96	1.01
*31	07/26/2020 - 08/01/2020	0.97	1.02
*32	08/02/2020 - 08/08/2020	0.98	1.03
33	08/09/2020 - 08/15/2020	1.00	1.05
34	08/16/2020 - 08/22/2020	1.00	1.05
35	08/23/2020 - 08/29/2020	1.00	1.05
36	08/30/2020 - 09/05/2020	1.00	1.05
37	09/06/2020 - 09/12/2020	1.00	1.05
38	09/13/2020 - 09/19/2020	1.00	1.05
39	09/20/2020 - 09/26/2020	1.00	1.05
40	09/27/2020 - 10/03/2020	0.99	1.04
41	10/04/2020 - 10/10/2020	0.99	1.04
42	10/11/2020 - 10/17/2020	0.99	1.04
43	10/18/2020 - 10/24/2020	1.00	1.05
44	10/25/2020 - 10/31/2020	1.01	1.06
45	11/01/2020 - 11/07/2020	1.02	1.07
46	11/08/2020 - 11/14/2020	1.03	1.08
47	11/15/2020 - 11/21/2020	1.04	1.09
48	11/22/2020 - 11/28/2020	1.04	1.09
49	11/29/2020 - 12/05/2020	1.05	1.11
50	12/06/2020 - 12/12/2020	1.06	1.12
51	12/13/2020 - 12/19/2020	1.06	1.12
52	12/20/2020 - 12/26/2020	1.03	1.08
53	12/27/2020 - 12/31/2020	0.99	1.04

* PEAK SEASON

27-FEB-2021 10:29:58

830UPD

2_7400_PKSEASON.TXT

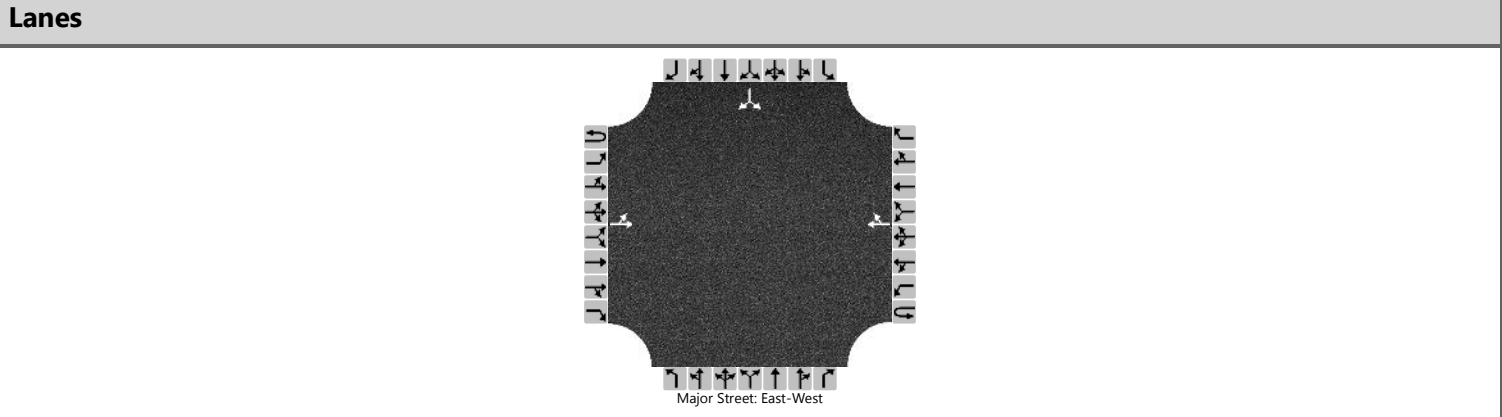
APPENDIX D

CAPACITY CALCULATIONS UNSIGNALIZED INTERSECTIONS



HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	J. Buckholz			Intersection	Roses Bluff Rd/Brooker Rd		
Agency/Co.	BUCKHOLZ TRAFFIC			Jurisdiction	Nassau County		
Date Performed	3/31/2022			East/West Street	Roses Bluff Road		
Analysis Year	2026			North/South Street	Brooker Road		
Time Analyzed	AM Peak Hr. BUILD Traffic			Peak Hour Factor	0.67		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	#22-1745						



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	6				2	21						59		0
Percent Heavy Vehicles (%)		0												2		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.42		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.52		3.30

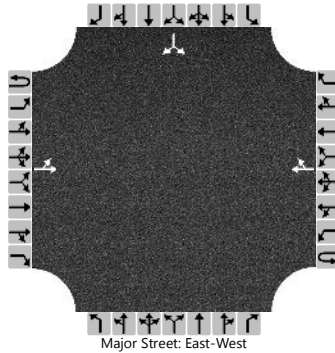
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0														88	
Capacity, c (veh/h)		1590														987	
v/c Ratio		0.00														0.09	
95% Queue Length, Q ₉₅ (veh)		0.0														0.3	
Control Delay (s/veh)		7.3														9.0	
Level of Service (LOS)		A														A	
Approach Delay (s/veh)		0.0												9.0			
Approach LOS		A												A			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	J. Buckholz			Intersection	Roses Bluff Rd/Brooker Rd		
Agency/Co.	BUCKHOLZ TRAFFIC			Jurisdiction	Nassau County		
Date Performed	3/31/2022			East/West Street	Roses Bluff Road		
Analysis Year	2026			North/South Street	Brooker Road		
Time Analyzed	PM Peak Hr. BUILD Traffic			Peak Hour Factor	0.75		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	#22-1745						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	4				4	61						35		0
Percent Heavy Vehicles (%)		0												2		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.42		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.52		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													47	
Capacity, c (veh/h)		1522													957	
v/c Ratio		0.00													0.05	
95% Queue Length, Q ₉₅ (veh)		0.0													0.2	
Control Delay (s/veh)		7.4													9.0	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.0												9.0			
Approach LOS													A			