#### TRAFFIC IMPACT ANALYSIS

# Delray Garden Center (3827 West Atlantic Avenue) Delray Beach, FL

Prepared for: CB Delray Gardens LLC Delray Beach, Florida

Prepared by:

• MacKenzie

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### **EXECUTIVE SUMMARY**

MacKenzie Engineering and Planning, Inc. performed an analysis of the traffic impacts resulting from the proposed project site located at 3827 West Atlantic Avenue, Delray Beach, Florida (PCN: 12-43-46-18-00-000-7080).

The applicant proposes to construct 12 single family dwelling units (DU).

The proposed project is expected to generate the following net new external trips:

• 120 daily, 9 AM peak hour (2 in, 7 out), and 13 PM peak hour (8 in, 5 out) trips.

The proposed project is expected to generate the following cumulative weekday driveway trips:

• 120 daily, 9 AM peak hour (2 in, 7 out), and 13 PM peak hour (8 in, 5 out) trips.

Because the project generates fewer than 20 gross peak hour trips, a PBC traffic study is not required.



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Property ID Card

Site Plan



### INTRODUCTION

This analysis has been prepared to evaluate traffic impacts resulting from the proposed development of 12 single family homes located at 3827 West Atlantic Avenue, Delray Beach, Florida (PCN: 12-43-46-18-00-000-7080). A buildout year of 2022 is proposed for the project. Figure 1 illustrates the site location.

MacKenzie Engineering & Planning, Inc. was retained to prepare a traffic impact analysis for the project. This document presents the methodology used and the findings of the traffic impact analysis. The analysis was conducted in accordance with the requirements of the Countywide Traffic Performance Standards of Palm Beach County and the Land Development Regulations of the City of Delray Beach. The analysis used current data available from Palm Beach County.







### INVENTORY AND PLANNING DATA

The traffic data used in this analysis were obtained from Palm Beach County. The data included:

- Historic Traffic Count Data
- Roadway geometrics
- PBC Trip Generation Rates

Covelli Design Associates Inc. provided project development information.

# **PROJECT TRAFFIC**

#### Traffic Generation

#### **Proposed Site**

The proposed development consists of 12 single family homes.

The daily and peak hour traffic generation for the development uses the trip generation rates published by Palm Beach County for Land Use 210 (Single Family Detached). Table 1 presents the proposed project's trip generation.

The proposed project is expected to generate the following net new external trips:

• 120 daily, 9 AM peak hour (2 in, 7 out), and 13 PM peak hour (8 in, 5 out) trips.

The proposed project is expected to generate the following cumulative weekday driveway trips:

• 120 daily, 9 AM peak hour (2 in, 7 out), and 13 PM peak hour (8 in, 5 out) trips.



Table 1. Trip Generation

Delray Garden Center													
Trip Generation													
Land Use			Intensity	Daily		AM Pe	ak Hour	K Hour PM Peak Hour					
				Trips	Total	In	Out	Total	In	Out			
Proposed Site Traffic													
Single Family D	Detached		12 DU	120	9	2	7	13	8	5			
	120	9	2	7	13	8	5						
NET CHAN	GE IN TRI	IPS (FOR	THE PURPOSES OF CONCURRENCY)	120	9	2	7	13	8	5			
NI	GE IN DI	RIVEWAY VOLUMES	120	9	2	7	13	8	5				
Note: Trip generation was calculated using the following data:													
	Pass-by		AM Pe	ak Hour		PM P	eak Hour						
Land Use	IT E Code	ITE Code Unit Daily Rate			in/out	F	Rate/Equation	in/out	F	Rate/Equation			
Single Family Detached	210	DU	10	0% 25/75 0.74 63/37 Ln(T				Ln(T)	= 0.96  Ln(X) + 0.2				

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# Internal Capture

This site contains no internal capture traffic.

#### Pass-by Trip Capture

No pass-by capture was applied to the trip generation.

### Radius of Impact

The radius of impact of this project is directly accessed link.

### TRAFFIC DISTRIBUTION

Traffic distribution and assignment was determined using engineering judgment, trip lengths based on the uses and from a review of the roadway network. The overall distribution is summarized by general directions and is depicted below:

EAST	-	75 percent
WEST	-	25 percent

# TRAFFIC ASSIGNMENT

The distributed external trips for the project were assigned to the roadway network within the radius of influence. The project assignment is illustrated in Figure 2. The radius of development influence is based on the number of net external trips generated by the development. Based on the net traffic generation at the end of buildout, it was determined that the maximum radius of development influence for Test 1 and Test 2 of the Traffic Performance Standards is the directly accessed link.



Figure 2. Traffic Assignment





# TEST ONE - PART I (INTERSECTION ANALYSIS)

### TEST ONE - PART II (LINK EVALUATION)

#### TEST TWO - PART I (LINK EVALUATION)

Because no roadways are significantly impacted by the project (Exhibits 3), the project satisfies concurrency.



# DRIVEWAYS

The project proposes a right-in/right-out driveway to Delray Garden Center to accommodate the 12 DU single family as shown in Figure 3. Based on project traffic volumes, the driveway does not require an ingress lane. Figure 3 displays the projected driveway volumes.







### CONCLUSION

MacKenzie Engineering and Planning, Inc. performed an analysis of the traffic impacts resulting from the proposed project site located at 3827 West Atlantic Avenue, Delray Beach, Florida (PCN: 12-43-46-18-00-000-7080).

The applicant proposes to construct 12 single family dwelling units (DU).

The proposed project is expected to generate the following net new external trips:

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The proposed project is expected to generate the following cumulative weekday driveway trips:

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Because the project generates fewer than 20 gross peak hour trips, a PBC traffic study is not required.



### **APPENDICES**

Exhibit 1. Trip Generation Exhibit 2. Peak Hour One-Way Link Analysis

PBC Traffic Data:

- Trip Generation Rates
- Article 12. Table 12.B.2.C-1 1A: LOS D Link Service Volumes
- Article 12. Table 12.B.2.C-4 2A: LOS E Link Service Volumes
- Article 12. Table 12.B.2.D-7 3A. Radius of Development Influence

Property ID Card

Site Plan

	EXHIBIT 1												
	Delray Garden Center												
Trip Generation													
Land Use			Intensity	Daily		AM Pe	ak Hour		PM P	eak Hour			
				Trips	Total	In	Out	Total	In	Out			
<b>Proposed Site Traffic</b>													
Single Family D	etached		12 DU	120	9	2	7	13	8	5			
		Subtotal		120	9	2	7	13	8	5			
NET CH.	ANGE IN T	TRIPS (FO	OR THE PURPOSES OF CONCURRENCY)	120	9	2	7	13	8	5			
	NGE IN I	DRIVEWAY VOLUMES	120	9	2	7	13	8	5				
Note: Trip generation was calculated using the following data:													
	Pass-by		AM Pe	ak Hour		PM P	eak Hour						
Land Use	ITE Code	Unit	Daily Rate	Rate	ate in/out Rate/Equation in/out Rate/Eq			Rate/Equation					
Single Family Detached	210	DU	10	0%	25/75		0.74	63/37	Ln(T)	= 0.96  Ln(X) + 0.2			

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EXHIBIT 2 - PM PEAK HOUR Delray Garden Center PEAK HOUR ONE-WAY LINK ANALYSIS PM												
Roadway From	То	Exi Number	sting LOS 'D'	Comr Number	nitted LOS 'D'	Percent Project Assignment	PM Pea Projec	ak Hour t Trips	PM Pea Signif	ak Hour icance	Signif Impa	ficant act ?
		Of Lanes	Capacity	Of Lanes	Capacity	in/out	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Atlantic Ave												
Barwick Rd	U-Turn	6LD	2,680	6LD	2,680	25%	2	1	0.1%	0.0%	No	No
U-Turn	Project Site	6LD	2,680	6LD	2,680	25%/75%	11		0.4%		No	
Project Site	Homewood Blvd	6LD	2,680	6LD	2,680	25%/75%	11		0.4%		No	
U-Turn	Project Site	6LD	2,680	6LD	2,680	100%		17		0.6%		No
Project Site	Homewood Blvd	6LD	2,680	6LD	2,680	100%		17		0.6%		No
Homewood Blvd	Congress Ave	6LD	2,680	6LD	2,680	75%	4	6	0.15%	0.2%	No	No

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# Palm Beach County Trip Generation Rates

			ITE					AM Peak Hour		PM Peak Hour
C	Cat.	Landuse	Code	Unit	<b>Daily Rate/Equation</b>	Pass-By %	In/Out	Rate/Equation	In/Out	Rate/Equation
		Light Industrial	110	1000 S.F.	4.96	10%	88/12	0.7	13/87	0.63
	ial	Warehouse	150	1000 S.F.	1.74	10%	77/23	0.17	27/73	0.19
	ustr	Flex Space - IND FLU	PBC	1000 S.F.	7.86	10%	64/36	1.53	40/60	1.21
	Ind	Flex Space - COM FLU	PBC	1000 S.F.	29.67	45%	72/28	2.12	40/60	2.67
		Mini-Warehouse/SS	151	1000 S.F.	1.51	10%	60/40	0.1	47/53	0.17
		Single Family Detached	210	Dwelling Unit	10	0%	25/75	0.74	63/37	Ln(T) = 0.96 Ln(X) + 0.20
	_	Multifamily Low-Rise Housing upto 2 story (Apartment/Condo/TH)	220	Dwelling Unit	7.32	0%	23/77	0.46	63/37	0.56
	dentia	Multifamily Mid-Rise Housing 3-10 story (Apartment/Condo/TH)	221	Dwelling Unit	5.44	0%	26/74	0.36	61/39	0.44
	tesi	55+ SF Detached	251	Dwelling Unit	4.27	0%	33/67	0.24	61/39	0.30
	æ	55+ SF Attached	252	Dwelling Unit	3.7	0%	35/65	0.2	55/45	0.26
		Congregate Care Facility	253	Dwelling Unit	2.02	0%	60/40	0.07	53/47	0.18
		Assisted Living Facility	254	Beds	2.6	0%	63/37	0.19	38/62	0.26
	Ldg	Hotel	310	Rooms	8.36	10%	59/41	0.47	51/49	0.6
	ec	Movie Theater	444	Seats	1.76	5%	N/A	0	55/45	0.09
	Ř	Health Club	492	1000 S.F.	32.93	5%	50/50	1.41	57/43	3.53
		Elementary School	520	Students	1.89	0%	54/46	0.67	48/52	0.17
		Middle/Junior School	522	Students	2.13	0%	54/46	0.58	49/51	0.17
	lal	High School	530	Students	2.03	0%	67/33	0.52	48/52	0.14
	tior	Private School (K-8)	534	Students	Use Private K-12 rate	0%	55/45	0.91	46/54	0.26
	titu	Private School (K-12)*	536	Students	2.48	0%	61/39	0.80	43/57	0.17
	lns	Church/Synagogue <sup>a</sup>	560	1000 S.F.	6.95	5%	60/40	0.33	45/55	0.49
		Day Care	565	Students	4.09	50%	53/47	0.78	47/53	0.79
		Library	590	1000 S.F.	72.05	10%	71/29	1	48/52	8.16
	þę	Hospital	610	1000 S.F.	10.72	10%	68/32	0.89	32/68	0.97
	ž	Nursing Home	620	Beds	3.06	10%	72/28	0.17	33/67	0.22
		General Office (>5,000 SF GFA)	710	1000 S.F.	Ln(T) = 0.97 Ln(X) + 2.50	10%	86/14	Ln(T) = 0.94(X) + 26.49	16/84	1.15
	ė	Small Office Building (<=5,000 SF GFA)	712	1000 S.F.	16.19	10%	83/18	1.92	32/68	2.45
	ffic	Medical Office	720	1000 S.F.	34.8	10%	78/22	2.78	28/72	3.46
	0	Medical Office (Reduced) <sup>b</sup>	PBC	1000 S.F.	17.4	10%	78/22	1.39	28/72	1.73
L		Government Office	730	1000 S.F.	22.59	10%	75/25	3.34	25/75	1.71

(May be used immediately, but must be used in traffic studies submited to the County on or after 4/15/2019)

#### Table 12.B.2.C-3 1C: LOS D Speed Thresholds

Urban Street Class	1	1	111					
Range of Free Flow Speeds (FFS)	55 to 45 miles per hour	45 to 35 miles per hour	35 to 30 miles per hour					
Typical FFS	50 miles per hour	40 miles per hour	35 miles per hour					
LOS	Average Travel Speed (Miles p	er Hour)						
D	Greater than 21 to 27	Greater than 17 to 22	Greater than 14 to 18					
Note:			-					
Speed values refer to a "range" of values that will achieve LOS D. For example speeds greater than 21 but less than or equal to 27 miles per hour will all be LOS D for a Class Lroadway.								

#### Table 12.B.2.C-4 2A: LOS E- Link Service Volumes

				Peak Hour, Peak Direction				
			Peak Hour			Uninterrupted		
Facility Type		ADT	Two Way	Class I	Class II	Flow		
2 lanes undivided (1)	2L	16,200	1,570	880	860	1,440		
2 lanes one-way	2LO	21,100		2,350	2,240			
3 lanes two-way	3L	16,200	1,570	880	860			
3 lanes one-way	3LO							
		31,900		3,530	3,400			
4 lanes undivided (1)	4L	33,300	3,230	1,860	1,780	3,570		
4 lanes divided	4LD	35,100	3,400	1,960	1,870	3,760		
5 lanes two-way	5L	35,100	3,400	1,960	1,870			
6 lanes divided	6LD	53,100	5,150	2,940	<mark>2,830</mark>	5,650		
8 lanes divided	8LD	70,900	6,880	3,940	3,780			
4 lanes expressway	4LX	79,400	7,300		4,0	20		
6 lanes expressway	6LX	122,700	11,290		6,2	00		
8 lanes expressway	8LX	166,000	15,270		8,4	00		
10 lanes expressway	10LX	209,200	19,250		10,5	580		
[Ord. 2005 - 002] [Ord	. 2007-013	] [Ord. 2010-02	2]					
Notes:								
Based on the 200	Based on the 2009 FDOT Quality/ LOS Handbook							
1. Service volumes	for "undiv	vided" roadway	s assume excl	usive left tu	rn lanes are	provided at signalized		
intersections. If t	here are n	o left turn lanes,	reduce these v	alues by 20	percent.			

#### Table 12.B.2.C-5 2B: LOS E Intersection Thresholds

LOS Critical Movement HCM Operational Analysis									
E 1500 Greater than 55.0 to 80.0 Seconds of delay									
Note:	Note:								
The delay identifies seconds of delay greater than 55.0 and less than or equal to 80.0.									

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Table 12.0.2.0-0 20: E00 E opeca Thresholds										
Urban Street Class	I		<mark>  </mark>		111					
Range of Free Flow Speeds (FFS)	55 to 45 miles per	r hour	45 to 35 miles	per hour	35 to 30 miles per hour					
Typical FFS	50 miles per hour		40 miles per ho	our	35 miles per hour					
LOS	Average Travel S	Average Travel Speed (Miles per Hour)								
E	Greater than 16 to 21	Greater th	nan 13 to 17	Greater than	n 10 to 14					
Note:										
Speed values refer to but less than or equa	o a "range" of value I to 27 miles per ho	es that wil our will all	ll achieve LOS be LOS D for a	D. For exam Class I road	nple speeds greater than 21 lway.					

#### Table 12.B.2.C-6 2C: LOS E Speed Thresholds

#### D. Radius of Development Influence/Project Significance

Table 12.B.2.D-7, 3A represents the Radius of Development Influence for the specific volume of the proposed Project's Net Trips. [Ord. 2006-043] [Ord. 2007-013]

Table 40 D 0 D 7		and a mark that the second
Table 12.B.2.D-7	3A: Radius of D	evelopment influence

Net External Peak Hour		Two-Way Trip Generation	Radius	
<mark>1</mark>	<mark>thru</mark>	20	Directly accessed link(s)	
21	thru	50	0.5 miles	
51	thru	100	1 mile	
101	thru	500	2 miles	
501	thru	1,000	3 miles	
1,001	thru	2,000	4 miles	
2,001	and	Up	5 miles	
[Ord, 2005-002] [Ord, 2006-043] [Ord, 2007-013] [Ord, 2010-022]				

#### Table 12.B.2.D-9 3C -Test One Levels of Significance

<b>Y</b>		
Facility	All Links (except I-95 and the Turnpike)	I-95/Turnpike
Significance Level	one percent LOS D within Radius, five percent LOS D outside Radius	five percent LOS D
[Ord. 2006–043]		

#### Table 12.B.2.D-10 3D - Test Two Levels of Significance

		_
Facility	All Links (except I-95 and the Turnpike) I-95/Turnpike	
Significance Level	three percent LOS E within Radius, five five percent LOS E percent LOS E outside Radius	
[Ord. 2006– 043]		

- For Test 1, a Project must address those Links within the Radius of Development Influence on which its Net Trips are greater than one percent of the LOS D of the Link affected on a peak hour peak direction basis AND those Links outside the Radius of Development Influence on which its Net Trips are greater than five percent of the LOS D of the Link affected on a peak hour peak direction basis up to the limits set forth in Table 12.B.2.C-1 1A: LOS D Link Service Volumes. Provided, in all cases, I-95 and Florida's Turnpike shall be addressed only if Net Trips on these facilities are greater than five percent of the LOS D of the Link affected on a peak hour peak direction basis up to the limits set forth in Table 12.B.2.C-1 1A: LOS D Link Service Volumes. [Ord. 2006-043] [Ord. 2007-013] [Ord. 2010-022]
- 2. For Test 2, a Project must address those Links within the Radius of Development Influence on which its Net Trips are greater than three percent of the LOS E of the Link affected on a peak hour peak direction basis up to the limits set forth in Table 12.B.2.C-4, 2.A: LOS E Link Service Volumes AND those Links outside the Radius of Development Influence on which its Net Trips are greater than five percent of the LOS E of the Link affected on a peak hour peak direction basis up to the limits set forth in Table 12.B.2.C-4, 2.A: LOS E Link Service Volumes AND those Links outside the Radius of Development Influence on which its Net Trips are greater than five percent of the LOS E of the Link affected on a peak hour peak direction basis up to the limits set forth in Table 12.B.2.C-4, 2.A: LOS E Link Service Volumes. Provided, in all cases, I-95 and Florida's Turnpike shall be addressed only if Net Trips on these facilities are greater than five percent of the LOS E of the Link affected on a peak hour peak direction basis up to the limits set forth in Table 12.B.2.C-4, 2.A: LOS E Link Service Volumes. [Ord. 2006-043] [Ord. 2007-013] [Ord. 2010-022]

Assured Construction shall be considered completed as scheduled at the time of submittal of the Traffic Impact Study for the purpose of preparation of the study. Whether it is in fact Assured Construction and the timing of the Assured Construction shall be subject to the confirmation of the County Engineer. The Traffic Impact Study shall specifically identify the need for phasing based on Assured Construction. **[Ord. 2007-013]** 

#### Section 2 Conditions

The Concurrency Reservation or Site Specific Development Order shall contain such conditions as are necessary to ensure compliance with this Article. The Local Governments, including the legislative and administrative boards, the DRO and officials, issuing Concurrency Reservations or Site Specific Development Orders are authorized to, and shall, impose such conditions. The Local Governments including the legislative and administrative boards, the DRO, and officials shall require where necessary to ensure compliance with this Section that an Agreement be executed prior to the issuance of the Site Specific Development Order. Performance Security shall be required to ensure compliance with the conditions or performance under the Agreement or condition of approval. The Agreement or conditions of approval shall be binding on the owner, its successors, assigns, and heirs; and it, or notice thereof, shall be recorded in the Official Records of the Clerk of the Circuit Court in and for PBC, Florida.

#### CHAPTER D PROCEDURE

#### Section 1 Required Submission of Impact Study

#### A. Application Procedure

Prior to acceptance of any application for a Site Specific Development Order in the unincorporated area, or issuance of a Site Specific Development Order in the incorporated area, a non-refundable application fee established by the BCC from time to time to defray the actual cost for processing the application, shall be submitted along with the Traffic Impact Study or documentation sufficient to establish that the application is not subject to the standards of this Article.

In order to receive a time extension pursuant to Article 2.E, MONITORING, the applicant shall be required to submit either: [Ord. 2007-013]

- 1. A new Traffic Impact Study that meets the standards of this Article in effect at the time the extension is requested, or **[Ord. 2007-013]**
- Documentation sufficient to establish that the Project with the additional time provided by the extension meets the standards of this Article in effect at the time the extension is requested. [Ord. 2007-013]

#### B. Review by County Engineer

The County Engineer or Municipal Engineer, as applicable, shall review the information submitted pursuant to this Article and determine whether the proposed Project complies with this Article. In the unincorporated area the County Engineer shall coordinate with the Planning Division whether the Site Specific Development Order meets the other Concurrency Requirements of the Plan. The procedures set forth in the Adequate Public Facilities Chapter, shall control; except as to any appeals from this Article, in which case Article 12.F, APPEALS, of this Article shall control. Nothing herein or in the Adequate Public Facilities Chapter informal communication between the County Engineer and the Applicant or his agents. In the Unincorporated Area, a statement that an application for a Site Specific Development Order is being considered shall be sent to any Municipality within the proposed Project's Radius of Development Influence 30 days prior to the issuance of the Site Specific Development Order for all proposed Projects generating more than 100 Gross Peak Hour Trips. The statement shall be sent by U.S. Mail, or hand delivered.

#### C. No Study Needed

#### 1. Residential

New Residential Projects generating fewer than or equal to 20 Gross Peak Hour Trips based on PBCs adopted trip generation rates shall not be required to submit a Traffic Impact Study. The Net Trips shall be distributed over the Major Thoroughfare system by the County Engineer in accordance with generally accepted traffic engineering principles.

#### 2. Non-Residential

Non-residential Projects generating less than or equal to 20 Gross Peak Hour Trips based on PBCs adopted trip generation's rates shall not be required to submit a Traffic Impact Study. The Net Trips





10/23/2019





SITE

ATLANTIC AVE

Hamlet Drive

		NORTH
)	60	

GRAPHIC SCALE

