

Coco Palms

21585 Old State Road 4A
Cudjoe Key, Florida

TRAFFIC STUDY

prepared for:
Smith Hawks

KBP CONSULTING, INC.

January 2018
Revised July 2018

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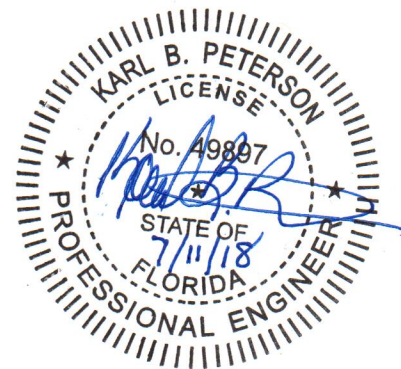
Traffic Study

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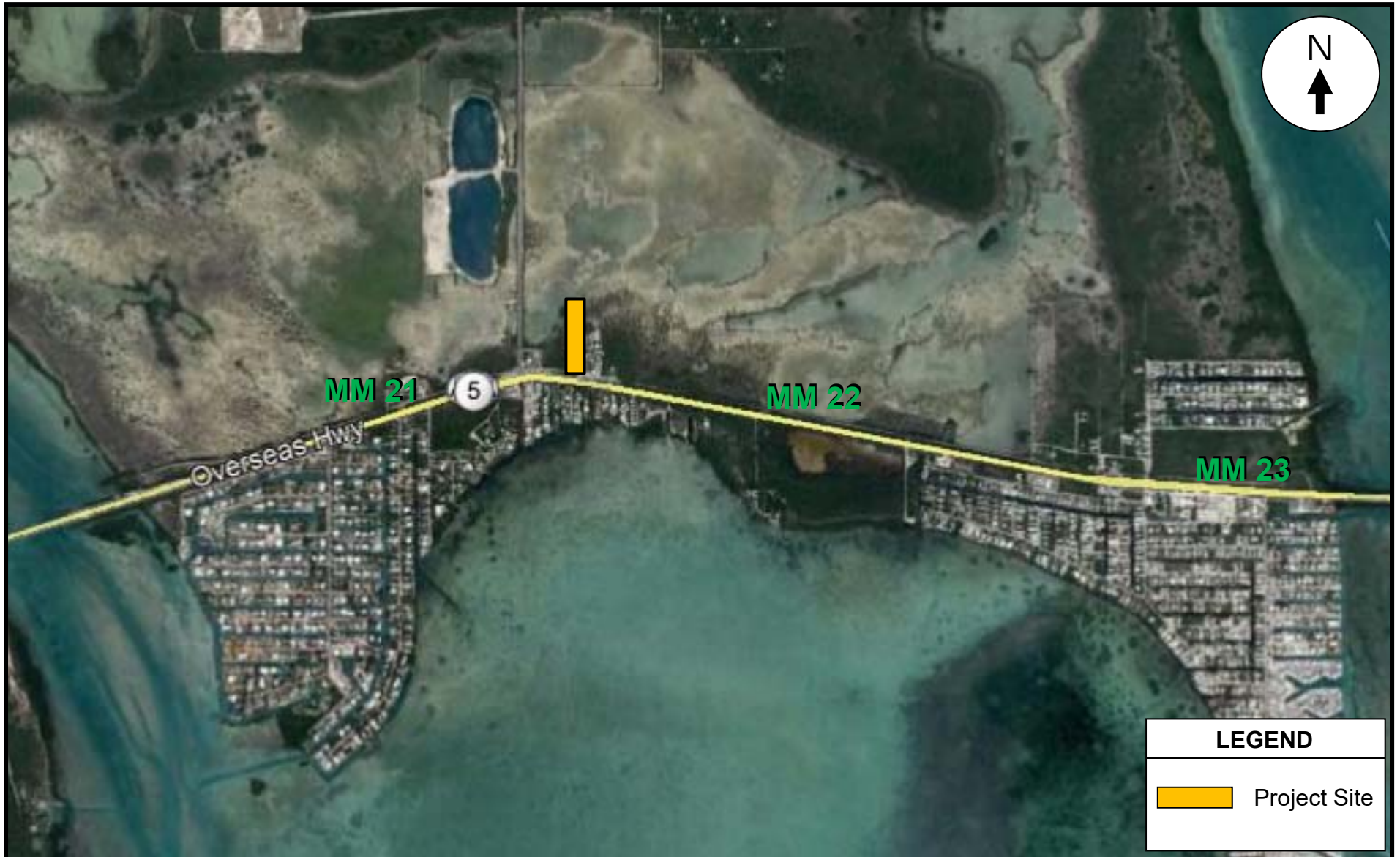
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INTRODUCTION

Coco Palms is an existing residential community located on the north side of Overseas Highway / US 1 on Cudjoe Key, Monroe County, Florida. The subject site is located at 21585 Old State Road 4A (near Mile Marker 21.5) and contains 17 affordable residential dwelling units. A Project Location Map is presented in Figure 1 on the following page.

The proposed plan for this property is to provide up to 16 additional deed restricted affordable residential dwelling units. KBP Consulting, Inc. has been retained by Smith Hawks to conduct a traffic impact study for this project. This study addresses the anticipated trip generation characteristics of the project, the current operating conditions of the surrounding roadway network, the anticipated project traffic impacts along Overseas Highway / US 1 by mile marker, and site access.



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Project Location Map

FIGURE 1
Coco Palms
Cudjoe Key, Florida

INVENTORY

Existing Land Use and Access

The size of the subject site is approximately 3.5 acres and, as mentioned previously, the subject site contains 17 affordable residential dwelling units. Vehicular access to this site is provided by 1 (one) full access driveway on Old State Road 4A.

Proposed Land Use and Access

The subject site is proposed to be developed with up to 16 additional deed restricted affordable residential dwelling units. The total number of residential dwelling units for this site would be up to 33. And, for the purposes of performing this traffic impact analysis, the project is planned to be completed by the year 2020.

EXISTING CONDITIONS

This section of the report addresses the existing roadway network in the study area and current traffic conditions.

Existing Roadway Network

Overseas Highway / US 1 through the study area is a two-lane undivided principal arterial roadway (one eastbound lane, one westbound lane, and turn lanes at major intersections). Old State Road 4A is a two-lane local roadway that serves as a frontage road to Overseas Highway / US 1.

Existing Traffic Conditions

The Florida Department of Transportation (FDOT) maintains a traffic count station within the immediate proximity of the project site. FDOT Count Station #900108 is located 2,000 feet north of the Kemp Channel Bridge near Mile Marker 24. Traffic volumes recorded over the last (published) five (5) year period at this station is summarized in Table 1. The data collected at this station indicates that volumes have been generally steady during the previous five (5) years with a modest increase in 2017. Appendix A contains the historical traffic data obtained from FDOT.

Table 1	
Coco Palms	
Average Annual Daily Traffic (AADT)	
Overseas Highway / US 1 - Cudjoe Key, Florida	
Year	AADT
	Station #900108
2017	19,100
2016	15,300
2015	16,800
2014	16,800
2013	15,900
2012	16,500

*Station #900108 - 2,000' North of the Kemp Channel Bridge
Compiled by: KBP Consulting, Inc. (July 2018)*

TRIP GENERATION

The trip generation for this project was determined using the trip generation information published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual (10th Edition)*. Based upon this information, the daily, AM peak hour, and PM peak hour trip generation rates for the proposed development are as follows:

Single-Family Detached Housing – ITE Land Use #210

- ❑ Daily (wt. avg.): $T = 9.33 (X)$
where T = number of trips and X = number of dwelling units
- ❑ AM Peak Hour: $T = 0.71 (X) + 4.80$ (25% in / 75% out)
- ❑ PM Peak Hour: $\ln(T) = 0.96 \ln(X) + 0.20$ (63% in / 37% out)

Table 2 below presents the trip generation analysis for the Coco Palms residential project.

Table 2 Coco Palms Trip Generation Analysis Overseas Highway / US 1 - Cudjoe Key, Florida								
Land Use	Size	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
<i>Existing</i>								
Single-Family Housing	17 DU	159	4	13	17	12	7	19
<i>Proposed</i>								
Single-Family Housing	33 DU	308	7	21	28	22	13	35
Difference (Proposed - Existing)	16 DU	149	3	8	11	10	6	16

*Compiled by: KBP Consulting, Inc. (July 2018).
Source: ITE Trip Generation Manual (10th Edition).*

As indicated in Table 2 above, the maximum proposed development intensity (i.e. 33 dwelling units) at Coco Palms is anticipated to generate 308 daily vehicle trips, 28 AM peak hour vehicle trips (7 inbound and 21 outbound), and 35 PM peak hour vehicle trips (22 inbound and 13 outbound). When considering the existing residential development on this site (i.e. 17 dwelling units), this represents an increase of 149 net new daily vehicle trips, 11 net new AM peak hour vehicle trips, and 16 net new PM peak hour vehicle trips.

TRIP DISTRIBUTION

A trip distribution analysis was performed based on the nearby population areas (as documented in the Monroe County Traffic Report Guidelines Manual), the existing transportation network, and the location of the subject project. All of the project-related trips are anticipated to access Overseas Highway / US 1. Table 3 below summarizes the anticipated trip distribution for the Coco Palms residential project.

Table 3 Coco Palms Project Trip Distribution Overseas Highway / US 1 - Cudjoe Key, Florida	
Direction	Distribution (%)
North	0%
South	0%
East (US 1 North)	35%
West (US 1 South)	65%

Source: KBP Consulting, Inc. (July 2018).

TRAFFIC IMPACT ANALYSES

This section of the report is divided into two parts: 1) link analysis, and 2) Overseas Highway / US 1 impacts by mile marker.

Link Analysis

The link analysis compares the maximum number of reserve trips on Overseas Highway / US 1 through Cudjoe Key (per Monroe County's Level of Service and Reserve Capacity Table) with the project's traffic impacts. Based upon a 65% / 35% trip distribution, the project will add a maximum of 97 daily trips (65% of additional daily trips) to Segment Number 6 (Cudjoe). According to Monroe County's Level of Service and Reserve Capacity Table (see Appendix B), Segment Number 6 has 3,188 trips of reserve capacity. Therefore, Overseas Highway / US 1 through Cudjoe Key has excess capacity to absorb the maximum impacts generated by the Coco Palms residential project.

US 1 Impacts by Mile Marker

For this project, it was assumed that the maximum trip length will be approximately 30 miles to the east and 20 miles to the west. The average trip length was assumed to be half of the maximum trip length; or 15 miles to the east and 10 miles to the west. Based upon these trip length assumptions, the Overseas Highway / US 1 segments identified in Monroe County's Traffic Report Guidelines, and the traffic assignment discussed previously, an estimate of the number of primary trips by segment on Overseas Highway / US 1 was performed. Table 4 summarizes the number of primary trips by segment on Overseas Highway / US 1 (Arterial Trip Assignment). As indicated in this table, this project will add approximately 149 daily trips.

Table 4
Coco Palms
Arterial Trip Assignment Summary (Overseas Highway / US 1)
Overseas Highway / US 1 - Cudjoe Key, Florida

Project:	Coco Palms Residential	US 1	Mile Marker: 21.5
Location:	Cudjoe Key	ITE	Land Use
		Category:	210
Type of Development:	Residential	Daily Trip	
		Generation	
		Rate / Formula:	9.33 trips/DU
Project Size:	33 Single-Family Dwelling Units (17 Existing Single Family Dwelling Units and Up To 16 Additional Single Family Dwelling Units)		
Average Trip Length:	15 Miles East / 10 Miles West		

Total Daily Trips	Percent Primary Trips	US 1 Segment Number	Percent Directional Split	% Impact Based On Trip Length	Project Generated Daily Trips	2017 Reserve Capacity
		3	65%	0%	0	1,341
		4	65%	30%	29	4,034
		5	65%	65%	63	7,944
149	100%	6	65% / 35%	100%	97	3,188
		7	35%	90%	47	1,639
		8	35%	75%	39	2,133
		9	35%	70%	37	2,504
		10	35%	45%	23	1,295
		11	35%	20%	10	6,723
		12	35%	0%	0	3,603

Source: Monroe County.

Compiled by: KBP Consulting, Inc. (July 2018).

SUMMARY & CONCLUSIONS

Based upon the results of the analyses performed for the Coco Palms residential project, the proposed maximum development potential of 33 residential dwelling units will not have an adverse impact on the operating characteristics of Overseas Highway / US 1, nor will it inhibit the safe flow of traffic traveling through Cudjoe Key. Overseas Highway / US 1 has adequate capacity to accommodate the traffic impacts generated by the project.

APPENDIX A

FDOT Historic Traffic Data

FLORIDA DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION STATISTICS OFFICE
 2017 HISTORICAL AADT REPORT

COUNTY: 90 - MONROE

SITE: 0108 - SR 5/US-1, 2000' N OF KEMP CHANNEL BR @ MM 24

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2017	19100 C	N 9600	S 9500	9.00	53.90	9.10
2016	15300 C	N 7700	S 7600	9.50	54.90	7.60
2015	16800 C	N 8300	S 8500	9.50	54.30	7.20
2014	16800 C	N 8400	S 8400	9.50	55.20	9.20
2013	15900 C	N 7900	S 8000	9.50	54.80	9.30
2012	16500 C	N 8200	S 8300	9.50	55.00	8.60
2011	15400 C	N 7300	S 8100	9.50	55.10	8.70
2010	15900 C	N 7900	S 8000	10.26	56.84	9.10
2009	17900 C	N 8900	S 9000	10.23	56.56	8.30
2008	16400 C	N 8400	S 8000	10.45	54.98	10.90
2007	17500 C	N 8600	S 8900	10.00	55.10	11.30
2006	17600 C	N 9200	S 8400	10.08	55.69	9.80
2005	15800 C	N 7900	S 7900	10.40	55.70	9.30
2004	16200 C	N 8100	S 8100	10.00	56.00	8.60
2003	16500 C	N	S	10.10	56.30	9.30
2002	14200 C	N 7100	S 7100	10.00	54.20	6.10

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

APPENDIX B

Monroe County Level of Service and Reserve Capacity Table

2017 LEVEL OF SERVICE AND RESERVE CAPACITY

SEGMENT	LENGTH (miles)	FACILITY TYPE	POSTED SPEED		ADJ. FOR SIGNAL (mph)	ADJUSTED LOS C CRITERIA (mph)	MEDIAN TRAVEL SPEED (mph)	LOS	RESERVE SPEED (mph)	2017		2015	
			Limits (mph)	Average (mph)						MAXIMUM RESERVE DAILY VOLUME (trips)	% ALLOCATION BELOW LOS C (trips)	MAXIMUM RESERVE DAILY VOLUME (trips)	% ALLOCATION BELOW LOS C (trips)
1 Stock Island (4.0 - 5.0)	1.10	4-L/D	30/45	42.8	N/A	22.0	29.4	B	7.4	1,348	N/A	1,986	N/A
2 Boca Chica (5.0- 9.0)	3.9	4-L/D	45/55	54.7	N/A	50.2	59.6	A	9.4	6,071	N/A	5,167	N/A
3 Big Coppitt (9.0- 10.5)	1.5	2-L/U	45/55	45.7	N/A	41.2	46.6	B	5.4	1,341	N/A	1,292	N/A
4 Saddlebunch (10.5- 16.5)	5.8	2-L/U	45/55	53.6	N/A	49.1	53.3	B	4.2	4,034	N/A	2,497	N/A
5 Sugarloaf (16.5- 20.5)	3.9	2-L/U	45	45.0	4.5	36.0	48.3	A	12.3	7,944	N/A	7,363	N/A
6 Cudjoe (20.5- 23.0)	2.5	2-L/U	45	45.0	N/A	40.5	48.2	A	7.7	3,188	N/A	2,650	N/A
7 Summerland (23.0- 25.0)	2.2	2-L/U	45	45.0	N/A	40.5	45.0	B	4.5	1,639	N/A	1,312	N/A
8 Ramrod (25.0- 27.5)	2.3	2-L/U	45	45.0	N/A	40.5	46.1	B	5.6	2,133	N/A	2,323	N/A
9 Torch (27.5- 29.5)	2.1	2-L/U	45	45.0	N/A	40.5	47.7	A	7.2	2,504	N/A	2,434	N/A
10 Big Pine (29.5- 33.0)	3.4	2-L/U	45	45.0	3.4	37.1	39.4	C	2.3	1,295	N/A	394	N/A
11 Bahia Honda (33.0- 40.0)	7.0	2-L/U (70%) 4-L/D (30%)	45/50/55	52.4	N/A	47.9	53.7	B	5.8	6,723	N/A	5,448	N/A
12 7-Mile Bridge (40.0- 47.0)	6.8	2-L/U	45/50/55	54.6	N/A	50.1	53.3	B	3.2	3,603	N/A	2,703	N/A
13 Marathon (47.0- 54.0)	7.3	2-L/U (13%) 4-L/D (87%)	35/45	42.3	N/A	22.0	37.9	A	15.9	19,221	N/A	19,221	N/A
14 Grassy (54.0- 60.5)	6.4	2-L/U	45/55	54.5	1.5	48.5	51.6	C	3.1	3,286	N/A	3,286	N/A
15 Duck (60.5- 63.0)	2.7	2-L/U	55	55.0	N/A	50.5	53.3	C	2.8	1,252	N/A	1,788	N/A
16 Long (63.0- 73.0)	9.9	2-L/U	40/45/50/55	53.4	N/A	48.9	50.5	C	1.5	2,459	N/A	5,902	N/A
17 L Matecumbe (73.0- 77.5)	4.5	2-L/U	50/55	54.0	N/A	49.5	49.8	C	0.3	224	N/A	(894)	967
18 Tea Table (77.5- 79.5)	2.2	2-L/U	45/55	54.1	N/A	49.6	47.6	D	-1.9	(692)	193	(401)	459
19 U Matecumbe (79.5- 84.0)	4.1	2-L/U	30/40/45	45.0	N/A	40.5	39.2	D	-1.3	(883)	522	1,494	N/A
20 Windley (84.0- 86.0)	1.9	2-L/U	30/40/45	45.0	N/A	40.5	41.0	C	0.5	157	N/A	378	N/A
21 Plantation (86.0- 91.5)	5.8	2-L/U	45	45.0	3.4	37.1	40.5	B	3.4	3,266	N/A	1,057	N/A
22 Tavemier (91.5- 99.5)	8.0	4-L/D	45/50	47.2	2.0	40.7	47.4	A	6.7	8,876	N/A	10,466	N/A
23 Key Largo (99.5- 106.0)	6.8	4-L/D	45	45.0	3.5	37.0	44.4	A	7.4	8,333	N/A	8,558	N/A
24 Cross (106.0- 112.5)	6.2	2-L/U	45/55	51.4	N/A	46.9	52.7	B	5.7	5,852	N/A	4,723	N/A
Overall	108.3					45.0	46.0	C	1.0	18,547			