



**Randall Blvd
and Oil Well Rd**
CORRIDOR STUDY

**Draft
Appendices
for
Corridor Alternatives
Analysis Report**

Prepared for



May 2019



D R A F T

Appendices for Corridor Alternatives Analysis Report

for the

Randall Boulevard and Oil Well Road Corridor Study

Prepared for

Collier County

April 25, 2019, revised May 3, 2019



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Appendix A
Collier MPO LRTP Excerpts



COLLIER 2040

Long Range Transportation Plan
FINAL REPORT



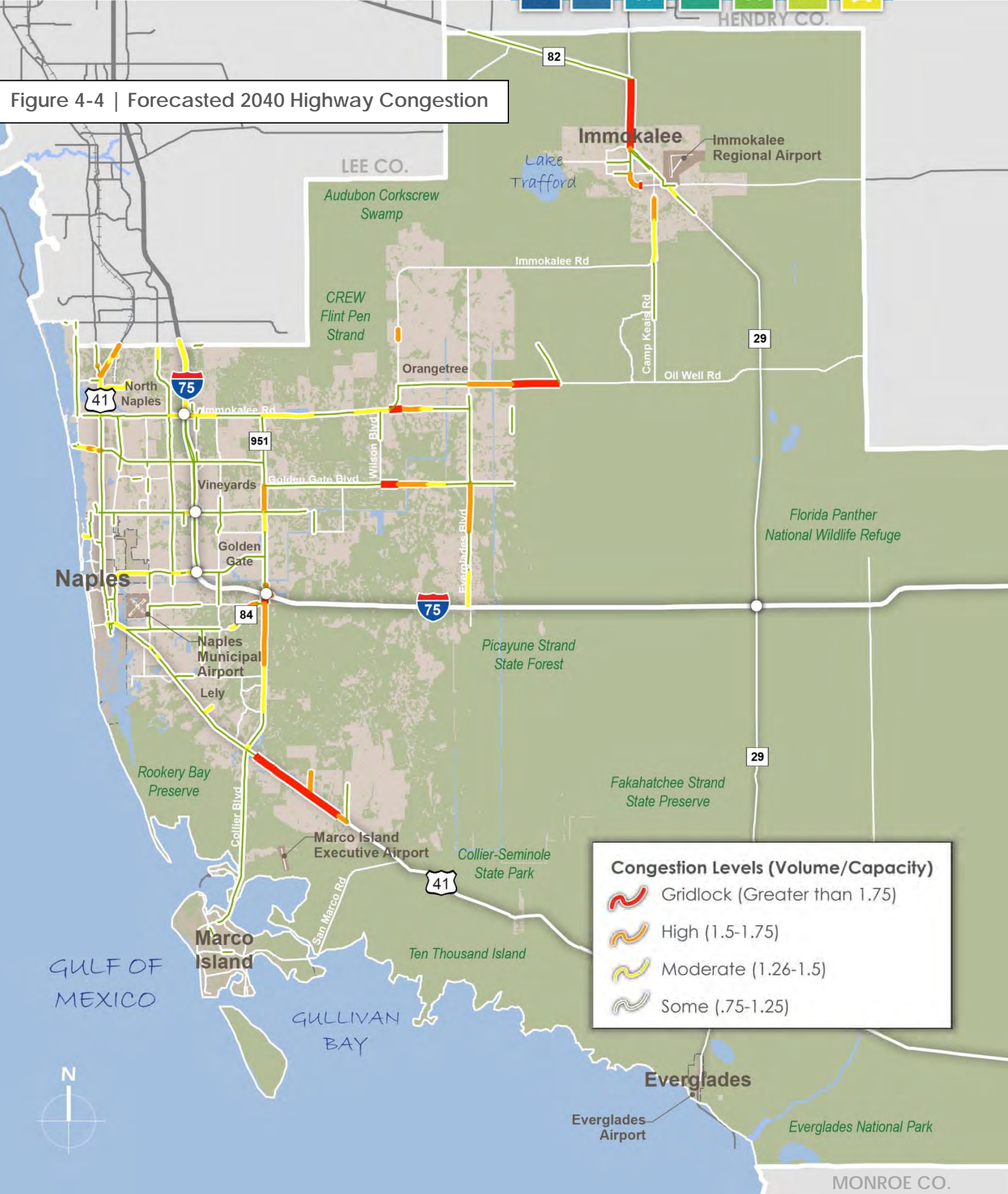
We Plan so that Tomorrow's Horizon
is as Inspirational as Today's

DECEMBER 2015







HENDRY CO.

Figure 4-4 | Forecasted 2040 Highway Congestion



Congestion Levels (Volume/Capacity)

-  Gridlock (Greater than 1.75)
-  High (1.5-1.75)
-  Moderate (1.26-1.5)
-  Some (.75-1.25)





2040 LRTP Amendment Adoption Report

Approved May 25, 2018

2040 Cost Feasible Plan - Summary of Funded Projects Grouped by Funding Source with Costs Shown in Future Year of Expenditure (YOE) in Millions of Dollars

CF#	Facility	From	To	# of Existing Lanes	Project Length (Miles)	Project Type	CST PDC	2021-2025			2026-2030			2031-2040			Project Totals	2041-2050 YOE CST	
								PE	ROW	CST	PE	ROW	CST	PE	ROW	CST			
43	SR 29	North of SR 82	Collier/Hendry Line	2	2.4	2-Lane Roadway to 4 Lanes with Paved Shoulders (Includes milling and resurfacing of existing pavement)	\$7.89			\$10.02						\$10.02			
60	SR 29	I-75 (SR 93)	Oil Well Rd	2	10.2	2-Lane Roadway to 4 Lanes with Paved Shoulders (Includes milling and resurfacing of existing pavement)	n/a						\$6.19	\$3.63		\$9.82			
4	I-75	Collier Blvd (CR 951)				Interchange, Single Point Urban	\$41.40			\$55.87						\$55.87			
35	SR 82	Gator Slough	SR 29	2	3.2	2-Lane Roadway to 4 Lanes	\$34.54			\$34.54						\$34.54			
	TMA BOX (20%) Bridges						n/a			\$4.66		\$4.66			\$9.34	\$18.66			
	TMA BOX (40%) Pathways (Bike/Ped)						n/a			\$9.32		\$9.32			\$18.67	\$37.31			
	TMA BOX (40%) CMP						n/a			\$9.32		\$9.32			\$18.67	\$37.31			
2	Golden Gate Parkway	I-75				(New) 2-Lane Ramp	\$2.00	\$0.59		\$2.54						\$3.13			
3	Pine Ridge Rd	I-75				Intersection Traffic Signalization	\$5.00	\$0.80		\$6.35						\$7.15			
7	Immokalee Rd	I-75 interchange				Intersection Traffic Signalization	\$2.75	\$0.51		\$3.49						\$4.00			
12	Old US 41	US 41 (SR 45)	Lee/Collier County Line	2	1.5	2-Lane Roadway to 4 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$15.03	\$2.72				\$22.55				\$25.27			
18	SR 84 (Davis Blvd)	Airport Pulling Rd	Santa Barbara Blvd	4	3	4-Lane Roadway to 6 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter with Inside Paved Shoulder (Includes milling and resurfacing of existing pavement)	\$33.11			\$6.85				\$77.66		\$84.51	\$82.78		
19a	Critical Needs Intersection (Randall Blvd at Immokalee Road)	Immokalee Road	8th Street			Interim At-Grade Intersection improvements, including 4-laning to 8th Street;	\$4.00			\$5.08						\$5.08			
21	US 41	Goodlette Rd		N/A		Intersection	\$2.00	\$0.37		\$2.54						\$2.91			
41	SR 951 (Collier Blvd)	South of Manatee Rd	North of Tower Rd	4	1	4-Lane Roadway to 6 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$13.35	\$2.02				\$20.03				\$22.05			
15	US 41 (SR 90) (Tamiami Trail East)	Greenway Rd	6 L Farm Rd	2	2.6	2-Lane Roadway to 4 Lanes with Outside Paved Shoulders (Includes milling and resurfacing of existing pavement)	\$21.83			\$6.01				\$25.59	\$41.70	\$73.30			
9	US 41 (SR 90) (Tamiami Trail East)	Collier Blvd (SR 951)				Single Point Urban Interchange (SPUI) - Mainline Over Crossroad	\$44.14					\$10.30				\$10.30	\$110.35		
5	CR 951 (Collier Blvd)	Golden Gate Canal	Green Blvd	4	2	4-Lane Roadway to 6 Lanes with Sidewalk, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$30.00	\$3.66		\$38.10						\$41.76			
19b	Critical Needs Intersection (Randall Blvd at Immokalee Road)	Immokalee Road	8th Street			Ultimate intersection improvement	\$31.00						\$4.68		\$53.48	\$58.16			
13a / 14p	Vanderbilt Beach Rd	CR 951 (Collier Blvd)	16th St	0 & 2	7	Expand from 0 & 2 lanes to building 3 lanes of a six lane footprint from Collier Blvd to Wilson Blvd and 2 lanes from Wilson to 16th St	\$67.60			\$67.60						\$67.60			
40	Airport Pulling Rd	Vanderbilt Beach Rd	Immokalee Rd	4	2	4-Lane Roadway to 6 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$5.00	\$1.22		\$6.35						\$7.57			
25	Oil Well Rd/CR 858	Everglades Blvd	Oil Well Grade Rd	2	3.9	2-Lane Roadway to 4 Lanes with Outside Paved Shoulders (Includes milling and resurfacing of existing pavement)	\$20.00					\$30.00				\$30.00			
16	Randall Boulevard	8th Street	Everglades Blvd	2	3.4	4 lane divided to 6 lane divided (includes corridor study to determine preferred alignment)	\$25.50	\$6.22	\$5.76			\$25.73		\$9.25		\$46.96	\$63.74		
65	Randall Boulevard	Everglades Blvd	Desoto Blvd	2	1.84	2-Lane Roadway to 6 Lanes with Outside Paved Shoulder (includes corridor study to determine preferred alignment)	\$27.32	\$5.81						\$32.03		\$37.84	\$68.29		
74	Randall Boulevard	Desoto Blvd	Big Cypress Parkway	0	0.25	New 6-Lane Roadway with Outside Paved Shoulder (includes corridor study to determine preferred alignment)	\$5.79	\$0.69						\$3.78		\$4.47	\$14.47		
75	Randall Boulevard	Big Cypress Parkway	Oil Well Road	0	1.6	New 6-Lane Roadway with Outside Paved Shoulder (includes corridor study to determine preferred alignment)	\$20.65	\$4.11						\$24.22		\$28.33	\$51.62		
33	Veterans Memorial Blvd	Livingston Road	US 41	2	2.9	2-Lane Undivided Roadway with Sidewalks, Bike Lanes and Curb & Gutter	\$8.00	\$1.95	\$1.08			\$12.00				\$15.03			
20	Immokalee Rd	Camp Keais Rd	Carver St	2	2.5	2-Lane Roadway to 4 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$25.04			\$5.24	\$23.01	\$37.56				\$65.81			
56	Benfield Road	City Gate Boulevard North	Lords Way	0	3.9	2 lane roadway in a 4 lane footprint	\$56.47	\$1.83		\$20.69				\$21.21		\$43.72	\$141.16		
29	Wilson Boulevard/Black Burn Road	Wilson Boulevard	End of Haul Road	0	2.6	2 lane roadway in a 4 lane footprint	\$29.31	\$0.61		\$6.90				\$30.70		\$38.20	\$73.28		
13b	Vanderbilt Beach Road Ext	16th St	Desoto	0	3.7	2 lane roadway in a 4 lane footprint	\$35.00									\$0.00	\$188.05		
51	Wilson Blvd.	Golden Gate Blvd.	Immokalee Rd.	2	3.3	2-Lane Roadway to 4 Lanes	\$23.36	\$2.85				\$21.47			\$44.63	\$68.94			
73	Little League Rd. Ext.	SR-82	Westclox St.	0	3.7	New 2-lane roadway	\$28.02			\$3.86				\$17.05	\$53.52	\$74.42			
13a / 14p	Vanderbilt Beach Road Ext	Collier Boulevard	16th St	2 & 0	7	Add remaining 3 lanes	\$48.05								\$91.78	\$91.78			
34	Camp Keais Road	Immokalee Road	Pope John Paul Blvd.	2	2.6	2-Lane Roadway to 4 Lanes with Outside Paved Shoulder (Includes milling and resurfacing of existing pavement)	\$10.00			\$2.76					\$19.10	\$21.86			
36	Vanderbilt Beach Road	Airport Road	US 41	4	2.1	4-Lane Roadway to 6 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$4.00			\$3.10		\$6.00				\$9.10			
32	Immokalee Rd (CR 846)	SR 29	Airpark Blvd	2	0.4	2-Lane Roadway to 4 Lanes with Sidewalks, Bike Lanes, and Curb & Gutter (Includes milling and resurfacing of existing pavement)	\$4.06			\$3.10				\$4.69	\$7.75	\$15.55			
								\$731.21	\$35.95	\$6.84	\$255.77	\$58.50	\$70.21	\$151.43	\$21.17	\$249.81	\$358.64	\$1,208.32	\$793.74

Project Phase	Inflation Factors		
	2021-2025	2026-2030	2031-2040
PE/PD&E	1.219	1.379	1.561
ROW	1.44	1.838	2.345
CST	1.27	1.5	1.91

	2021-2025			2026-2030			2031-2040			Remaining Balance
	Revenue	Spent	Remaining	Revenue	Spent	Remaining	Revenue	Spent	Remaining	
TMA	\$23.32	\$23.29	\$0.03	\$23.32	\$23.29	\$0.03	\$46.64	\$46.69	-\$0.05	\$0.01
OA	\$55.60	\$58.10	-\$2.50	\$52.60	\$42.58	\$10.02	\$115.10	\$144.95	-\$29.85	-\$22.33
SIS	\$100.43	\$100.43	\$0.00	\$0.00	\$0.00	\$0.00	\$9.82	\$9.82	\$0.00	\$0.00
County	\$106.82	\$106.07	\$0.75	\$201.66	\$201.41	\$0.25	\$430.84	\$417.87	\$12.97	\$13.97

Notes: Design phases funded by OA not included in totals
#56 and #29 are only partial ROW & Mitigation costs

RLSA STATUS MAP (NOV. 2017)

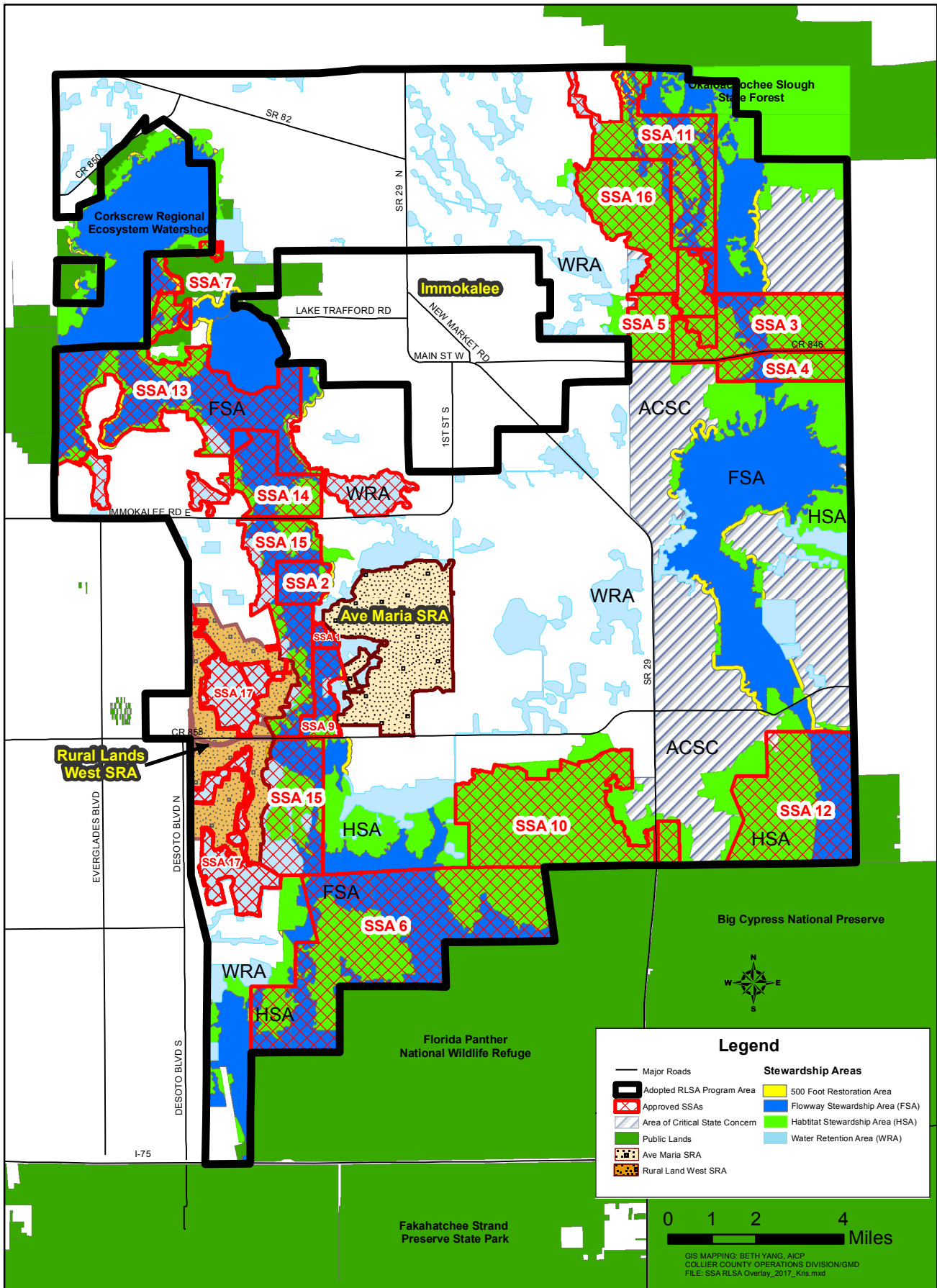
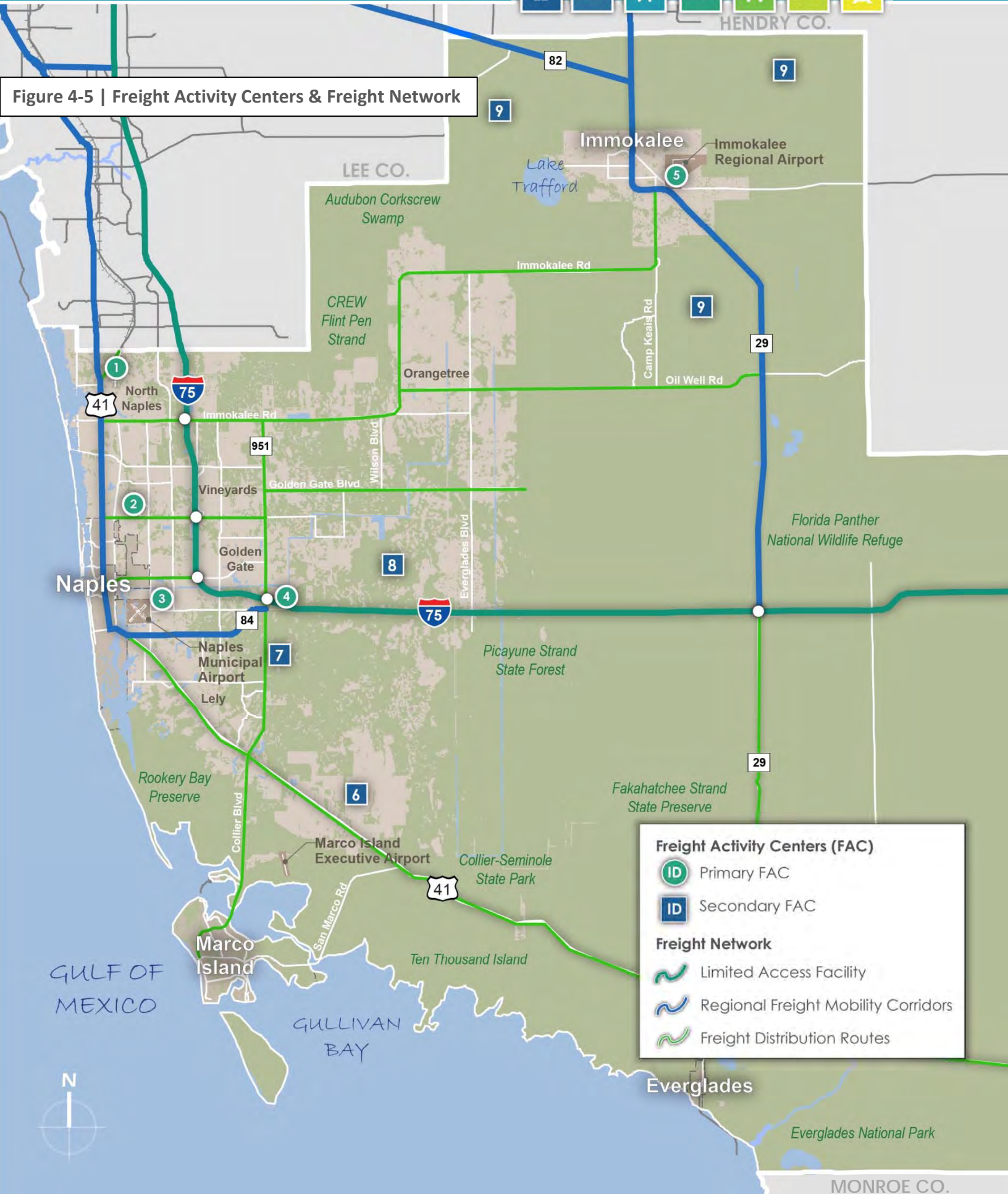




Figure 4-5 | Freight Activity Centers & Freight Network



Freight Activity Centers (FAC)

- Primary FAC
- Secondary FAC

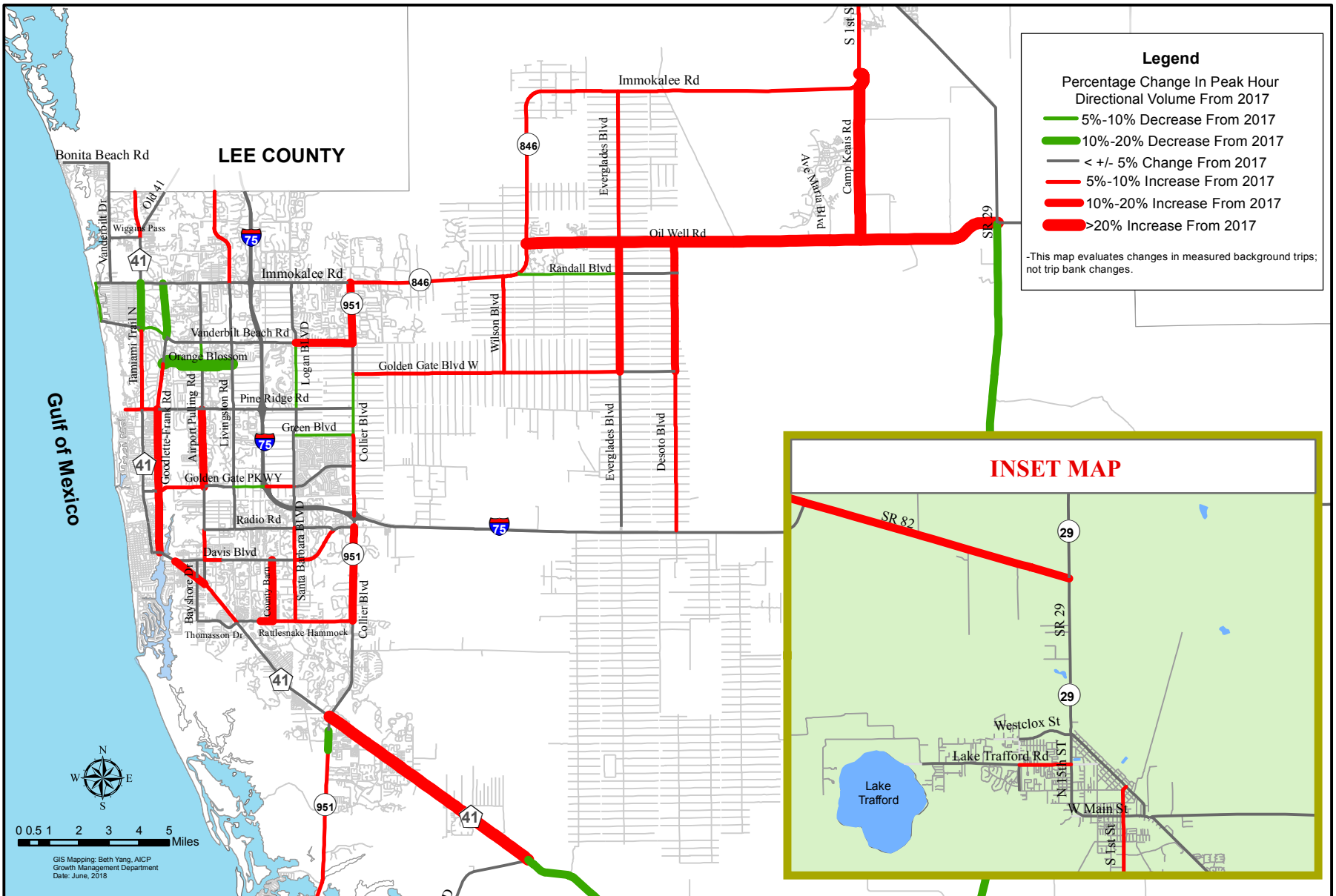
Freight Network

- Limited Access Facility
- Regional Freight Mobility Corridors
- Freight Distribution Routes

Appendix B

Traffic

ATTACHMENT C



Percentage Change In Peak Hour Directional Volume From 2017

Growth Management Department
Transportation Planning

GIS Mapping: Beth Yang, AICP
Growth Management Department
Date: June, 2016

Attachment "F"

Collier County 2016 Annual Update and Inventory Report (AUIR) Based on Adopted LOS, Trip Bank and Traffic Counts

ID#	CIE#	Proj#	Road#	Link	From	To	Exist Road	Cnt. Sta.	Min Sid	Peak Dir	Peak Hour Service Volume	2016 Peak Hour Volume	2017 Peak Hour Volume	2018 Peak Hour Volume	2017 Actual To Volume	2017 Percent Variation To Volume	2017 Trip Bank	1/7th Trip Bank	2017 1/7th Trip Bank	1/7th TB 2017 Volume	Ver. B 2018 Trip Bank	2018 1/7th Trip Bank	2018 1/7th Trip Bank	1/7th TB 2018 Volume	1/7th TB 2018 Remain. Capacity	1/7th TB 2018 V/C	L O S	Traffic Count Year Expected	1/7th Trip Bank Year Expected	
1.0		99910	CR31	Airport Road	Immokalee Road	Vanderbilt Beach Road	4D	554	D	N	2,200	1230	1240	1220	(20)	-1.61%	10	0	10	1250	25	0	25	1245	955	56.6%	C			
2.1	55	62031	CR31	Airport Road	Vanderbilt Beach Road	Orange Blossom Drive	6D	599	E	N	3,000	1950	1970	1810	(160)	-8.12%	70	0	70	2040	66	0	66	1876	1124	62.5%	C			
2.2	55	62031	CR31	Airport Road	Orange Blossom Drive	Pine Ridge Road	6D	503	E	N	3,000	1830	1860	1770	(90)	-4.84%	94	0	94	1954	54	0	54	1824	1176	60.8%	C			
3.0	39	60121	CR31	Airport Road	Pine Ridge Road	Golden Gate Parkway	6D	502	E	N	3,000	1770	1980	2330	350	17.68%	7	0	7	1987	14	0	14	2344	656	78.1%	D			
4.0		99906	CR31	Airport Road	Golden Gate Parkway	Radio Road	6D	533	E	N	2,800	2060	2290	2310	20	0.87%	18	0	18	2308	22	0	22	2332	468	83.3%	D		2028	
5.0	3	66031	CR31	Airport Road	Radio Road	Davis Boulevard	6D	553	E	N	2,800	2040	2100	2230	130	6.19%	17	0	17	2117	11	0	11	2241	559	80.0%	D			
6.0	3	66031	CR31	Airport Road	Davis Boulevard	US 41 (Tamiami Trail)	6D	552	E	S	2,700	1590	1610	1650	40	2.48%	10	0	10	1620	73	2	75	1725	975	63.9%	C			
7.0		99911		Baysshore Drive	US 41 (Tamiami Trail)	Thomasson Drive	4D	521	D	S	1,800	600	650	620	(30)	-4.62%	45	0	45	695	116	2	118	738	1062	41.0%	B			
8.0	31	60021	CR 865	Bonita Beach Road	West of Vanderbilt Drive	Hickory Boulevard	4D	653	D	E	1,900	1050	1070	1060	(10)	-0.93%	0	0	0	1070	0	0	0	1060	840	55.8%	C			
9.0				Carson Road	Lake Trafford Road	Immokalee Drive	2U	610	D	N	600	310	320	330	10	3.13%	0	0	0	320	0	0	0	330	270	55.0%	C			
10.0	33	60101		County Barn Road	Davis Boulevard	Rattlesnake Hammock Road	2U	519	D	S	900	320	326	380	54	16.42%	65	0	65	391	123	1	124	504	396	56.0%	C			
11.0		99912		CR 29	US 41 (Tamiami Trail)	Everglades City	2U	582A	D	S	1,000	100	190	160	(30)	-15.79%	0	0	0	190	0	0	0	160	840	16.0%	B			
12.0		99912		CR 29	US 41 (Tamiami Trail)	Airport Road	6D	558	E	E	2,700	1520	1500	1610	60	3.87%	33	0	33	1583	56	0	56	1666	1034	61.7%	C			
13.0	48	60161	SR84	Davis Boulevard	Airport Road	Lakewood Boulevard	4D	559	D	E	2,000	1550	1500	1580	80	5.33%	4	0	4	1504	0	0	0	1580	420	79.0%	D			
14.0	49	60161	SR84	Davis Boulevard	Lakewood Boulevard	County Barn Road	4D	658	D	E	2,000	1530	1610	1670	60	3.73%	61	0	61	1671	61	0	61	1731	209	86.6%	D		2026	
15.0	83	60161	SR84	Davis Boulevard	County Barn Road	Santa Barbara Boulevard	4D	558	D	E	2,200	1460	1440	1460	20	1.39%	144	0	144	1584	196	0	196	1656	544	75.3%	D			
16.1	83		SR84	Davis Boulevard	Santa Barbara Boulevard	Radio Road	6D	560	D	E	3,300	650	700	740	20	3.09%	24	139	163	863	86	139	225	2335	29.2%	B				
16.2	83		SR84	Davis Boulevard	Collier Boulevard	Collier Boulevard	6D	601	D	E	3,300	1050	1080	1120	40	3.70%	34	214	248	1328	82	214	296	1416	1884	62.9%	B			
17.0	62	63041	CR876	Golden Gate Boulevard	Collier Boulevard	Wilson Boulevard	4D	531	D	E	2,300	1660	1600	1710	110	6.88%	0	0	0	1600	0	0	0	1710	590	74.3%	C			
18.0		99913	CR886	Golden Gate Parkway	US 41 (Tamiami Trail)	Goodlette-Frank Road	6D	530	E	E	2,300	1210	1230	1230	0	0.00%	13	0	13	1243	13	0	13	1243	1657	46.0%	B			
19.0	5	60027C	CR886	Golden Gate Parkway	Goodlette-Frank Road	Airport Road	6D	507	E	E	3,300	2780	2710	2930	220	8.12%	5	0	5	2715	5	0	5	2935	365	88.9%	D		2024	
20.1	74	60006	CR886	Golden Gate Parkway	Airport Road	Livingston Road	6D	508	E	E	3,300	2280	2200	2290	90	4.09%	0	0	0	2290	0	0	0	12	2302	998	69.8%	C		
20.2	74	60006	CR886	Golden Gate Parkway	Livingston Road	Livingston Road	6D	691	E	E	3,300	2890	2770	2610	(160)	-5.78%	1	0	1	2770	0	0	0	2610	690	79.1%	D			
21.0	74	60027	CR886	Golden Gate Parkway	I-75	Santa Barbara Boulevard	6D	509	E	E	3,300	1980	1960	2140	180	9.18%	14	0	14	1974	14	0	14	2154	1146	65.3%	C			
22.0		99916	CR886	Golden Gate Parkway	Santa Barbara Boulevard	Collier Boulevard	4D	605	D	E	1,800	1450	1550	1610	60	3.87%	59	8	67	1617	43	8	51	1661	139	92.3%	D		2023	
23.0	19	68041	CR851	Goodlette-Frank Road	Immokalee Road	Vanderbilt Beach Road	2U	594	D	N	1,000	860	930	820	(110)	-11.83%	15	0	15	945	46	0	46	866	134	86.6%	D		2026	
24.1	65	60134	CR851	Goodlette-Frank Road	Vanderbilt Beach Road	Orange Blossom Drive	4D	595	E	N	2,400	1340	1350	1370	20	1.48%	73	0	73	1423	73	0	73	1443	957	60.1%	C			
24.2	65	60134	CR851	Goodlette-Frank Road	Orange Blossom Drive	Pine Ridge Road	6D	581	E	N	2,400	1530	1550	1680	130	8.39%	0	0	0	1550	0	0	0	1680	720	70.0%	C			
25.0	88	60005	CR851	Goodlette-Frank Road	Pine Ridge Road	Golden Gate Parkway	6D	505	E	N	3,000	1850	1890	2220	330	17.46%	0	0	0	1890	0	0	0	2220	780	74.0%	C			
26.0		99917	CR851	Goodlette-Frank Road	Golden Gate Parkway	US 41 (Tamiami Trail)	6D	504	E	N	2,700	2250	2190	2480	290	13.24%	0	0	0	2190	0	0	0	2480	220	91.9%	D	2023	2023	
27.0	87	68055		Green Boulevard	Santa Barbara Boulevard	Collier Boulevard	2U	642	D	E	900	720	730	680	(50)	-6.85%	0	0	0	730	0	0	0	680	220	75.6%	D			
29.0		66011		Gulfshore Drive	111th Avenue	Vanderbilt Beach Road	2U	583A	D	N	800	230	235	220	(10)	-4.22%	0	0	0	235	0	0	0	220	580	27.5%	B			
30.1	37	65061	CR951	Collier Boulevard	Immokalee Road	Vanderbilt Beach Road	6D	655	E	N	3,000	1450	1520	1680	160	10.53%	273	174	447	1967	419	128	547	2227	773	74.2%	C			
30.2	37	65061	CR951	Collier Boulevard	Vanderbilt Beach Road	Golden Gate Parkway	6D	584	E	S	3,000	1200	1220	1220	0	0.00%	48	38	86	1306	79	39	118	1338	1662	44.6%	B			
31.1	85	68056	CR951	Collier Boulevard	Golden Gate Parkway	Pine Ridge Road	6D	536	D	N	3,000	1867	1904	1780	(124)	-6.51%	26	16	42	1946	48	30	78	1858	1142	61.9%	C			
31.2	85	68056	CR951	Collier Boulevard	Pine Ridge Road	Green Boulevard	6D	536	D	N	3,000	1867	1904	1780	(124)	-6.51%	32	12	44	1948	38	22	60	1840	1160	61.3%	C			
32.1	76	65062	CR951	Collier Boulevard	Green Boulevard	Golden Gate Parkway	4D	525	D	N	2,300	1370	1410	1500	90	6.38%	27	0	27	1437	27	0	27	1527	773	66.4%	C			
32.2	76	68056B	CR951	Collier Boulevard	Golden Gate Parkway	Golden Gate Main Canal	4D	607	D	N	2,300	1250	1260	1370	110	8.73%	53	162	215	1475	55	162	217	1587	713	69.0%	C			
32.3	76	68056B	CR951	Collier Boulevard	Golden Gate Main Canal	I-75	8D	607	E	N	3,600	1250	1260	1370	110	8.73%	55	258	313	1573	66	258	324	1694	1906	47.1%	B			
33.0	61	60092	SR951	Collier Boulevard	I-75	Davis Boulevard	8D	573	E	N	3,600	2810	2820	2960	140	4.96%	12	347	359	1379	13	277	290	3250	350	90.3%	D		2024	
34.0	86	60001	CR951	Collier Boulevard	Davis Boulevard	Rattlesnake Hammock Road	6D	602	E	N	3,000	1490	1400	1660	260	18.57%	141	377	518	1918	209	297	506	2166	834	72.2%	C			
35.0	86	60001	CR951	Collier Boulevard	Rattlesnake Hammock Road	US 41 (Tamiami Trail)	6D	603	E	N	3,200	1770	1860	1900	40	2.15%	102	245	347	2207	195	143	338	2238	962	69.9%	C			
36.1	12	64041	SR951	Collier Boulevard	US 41 (Tamiami Trail)	Wal-Mart Driveway	6D	557	E	N	2,500	1581	1500	1530	30	2.00%	26	183	209	1709	111	127	238	1768	743	70.7%	C			
36.2			SR951	Collier Boulevard	Wal-Mart Driveway	Manatee Road	4D	557	D	N	2,000	1734	1769	1530	(239)	-13.49%	29	108	137	1906	123	104	227	1757	242	87.9%	D		2026	
37.0	12	64041	SR951	Collier Boulevard	Manatee Road	Mainsail Drive	4D	627	D	N	2,200	1560	1670	1770	100	5.99%	0	103	103	1773	68	103	171	1941	259	88.2%	D		2024	
38.0	51	64041																												

ID#	CIE#	Proj#	Road#	Link	From	To	Exist Road	Cnt. Sta.	Min Sid	Peak Dir	Service Volume	2016 Peak Hour Volume	2017 Peak Hour Volume	2018 Peak Hour Volume	2017 Actual To Volume	2017 Percent Variation To Volume	2017 Trip Bank	2017 1/7th Trip Bank	2017 Total Trip Bank	1/7th TB 2017 Volume	Ver. B 2018 Trip Bank	2018 1/7th Trip Bank	2018 Total Trip Bank	1/7th TB 2018 Volume	1/7th TB 2018 Remain. Capacity	1/7th TB V/C	L O S	Traffic Count Year Expected Deficient	1/7th Trip Bank Year Expected Deficient		
63.0		9924	CR896	Seagate Drive	Crayton Road	US 41 (Tamiami Trail)	4D	511	D	E	1,700	970	970	1060	90	9.28%	0	0	0	970	0	0	0	1060	640	62.4%	C				
64.0	14	69042	CR896	Pine Ridge Road	US 41 (Tamiami Trail)	Goodlette-Frank Road	6D	512	E	E	2,800	1870	1860	1990	130	6.99%	6	0	6	1866	6	0	6	1996	804	71.3%	C				
65.0	14	69042	CR896	Pine Ridge Road	Goodlette-Frank Road	Shirley Street	6D	514	E	W	2,800	1940	1970	1980	10	0.51%	1	0	1	1971	6	0	6	1986	814	70.9%	C				
66.0	14	69042	CR896	Pine Ridge Road	Shirley Street	Airport Road	6D	515	E	E	2,800	2250	2390	2470	80	3.35%	52	0	52	2442	24	0	24	2494	306	89.1%	D		2024		
67.1	41	60111	CR896	Pine Ridge Road	Airport Road	Livingston Road	6D	526	E	E	3,000	2660	2550	2610	60	2.35%	35	0	35	2585	29	0	29	2639	361	88.0%	D		2025		
67.2	41	60111	CR896	Pine Ridge Road	Livingston Road	I-75	6D	628	E	E	3,000	2950	2990	3030	40	1.34%	103	0	103	3093	112	0	112	3142	(142)	104.7%	F	Existing	Existing		
68.0	41	99007	CR896	Pine Ridge Road	I-75	Livingston Road	6D	600	E	E	2,800	2130	2120	2190	70	3.30%	1	0	1	2121	1	0	1	2191	609	78.3%	D				
69.0	15	65032	CR856	Radio Road	Airport Road	Livingston Road	4D	544	D	E	1,800	1120	1180	1180	0	0.00%	15	0	15	1195	3	0	3	1183	617	65.7%	C				
70.0	15	65033	CR856	Radio Road	Livingston Road	Santa Barbara Boulevard	4D	527	D	E	1,800	1110	1130	1170	40	3.54%	26	0	26	1156	6	0	6	1176	624	65.3%	C				
71.0	16	65031	CR856	Radio Road	Santa Barbara Boulevard	Davis Boulevard	4D	685	D	W	1,800	580	630	640	10	1.59%	0	85	85	715	57	85	142	782	1018	43.4%	B				
72.0	17	65021	CR864	Rattlesnake Hammock Road	US 41 (Tamiami Trail)	Charlemagne Boulevard	4D	516	D	W	1,800	1010	1010	1030	20	1.98%	0	55	55	1065	132	11	143	1173	627	65.2%	C				
73.0	17	65021	CR864	Rattlesnake Hammock Road	Charlemagne Boulevard	County Barn Road	4D	517	D	W	1,800	700	740	830	90	12.16%	0	48	48	788	108	11	119	949	851	52.7%	B				
74.0	17	65021	CR864	Rattlesnake Hammock Road	County Barn Road	Santa Barbara Boulevard	4D	534	D	W	1,900	670	700	760	60	8.57%	0	40	40	740	69	18	87	847	1053	44.6%	B				
75.0	77	60169	CR864	Rattlesnake Hammock Road	Santa Barbara Boulevard	Collier Boulevard	6D	518	E	W	2,900	490	490	530	40	8.16%	56	115	171	661	95	75	170	700	2200	24.1%	B				
76.0	56	62081B		Santa Barbara Boulevard	Green Boulevard	Golden Gate Parkway	4D	529	D	N	2,100	1240	1270	1240	(30)	-2.36%	0	0	0	1270	0	0	0	1240	860	59.0%	C				
77.0	56	62081A		Santa Barbara Boulevard	Golden Gate Parkway	Radio Road	6D	528	E	N	3,100	1780	1810	1880	70	3.87%	54	0	54	1864	54	0	54	1934	1166	62.4%	C				
78.0	56	62081A		Santa Barbara Boulevard	Radio Road	Davis Boulevard	6D	537	E	N	3,100	1290	1350	1450	100	7.41%	213	0	213	1563	221	0	221	1671	1429	53.9%	C				
79.0				Santa Barbara Boulevard	Davis Boulevard	Rattlesnake-Hammock Road	6D	702	E	S	3,100	930	890	950	60	6.74%	112	0	112	1002	139	0	139	1089	2011	35.1%	B				
80.0		SR29	SR 29	US 41 (Tamiami Trail)	CR 837 (Janes Scenic Dr)	CR 837 (Janes Scenic Dr)	2U	615A	D	N	900	90	150	130	(20)	-13.33%	0	0	0	150	0	0	0	130	770	14.4%	B				
81.0		SR29	SR 29	CR 837 (Janes Scenic Dr)	I-75	I-75	2U	615A	D	N	900	90	150	130	(20)	-13.33%	0	0	0	150	0	0	0	130	770	14.4%	B				
82.0		SR29	SR 29	I-75	Oil Well Road	Oil Well Road	2U	615A	D	N	900	90	150	130	(20)	-13.33%	8	61	69	219	51	34	85	215	685	23.9%	B				
83.0		SR29	SR 29	Oil Well Road	CR 29A South	CR 29A South	2U	665A	D	N	900	380	410	410	0	0.00%	0	0	0	410	54	30	84	494	406	54.9%	C				
84.0		SR29	SR 29	CR 29A South	9th Street	9th Street	4D	664	D	W	1,700	600	600	620	20	3.33%	12	0	12	612	94	37	131	751	949	44.2%	B				
85.0		SR29	SR 29	9th Street	CR 29A North	CR 29A North	2U	663	D	S	900	620	620	630	10	1.61%	21	0	21	641	72	24	96	726	174	80.7%	D				
86.0		SR29	SR 29	CR 29A North	SR 82	SR 82	2U	663	D	S	900	620	620	630	10	1.61%	0	0	0	620	50	23	73	703	197	71.1%	D				
87.0		SR29	SR 29	Hendry County Line	SR 82	SR 82	2U	591A	D	S	800	350	360	370	10	2.78%	0	0	0	360	7	4	11	381	419	47.6%	B				
88.0		SR82	SR 82	Lee County Line	SR 29	SR 29	2U	661A	D	S	800	710	650	740	90	13.85%	8	0	8	658	41	17	58	798	2	99.8%	C	2022	2019		
91.0	43	US41	US41	Tamiami Trail East	Davis Boulevard	Airport Road	6D	545	E	E	2,900	1580	1700	1920	220	12.94%	23	47	70	1770	124	2	126	2046	854	70.6%	C				
92.0	47	US41	US41	Tamiami Trail East	Airport Road	Rattlesnake Hammock Road	6D	604	E	E	2,900	2240	2300	2460	160	6.96%	13	248	261	2561	281	92	373	2833	67	97.6%	C				
93.0	46	US41	US41	Tamiami Trail East	Rattlesnake Hammock Road	Triangle Boulevard	6D	572	E	E	3,000	1960	1860	1940	80	4.30%	15	329	344	2204	474	158	632	2572	428	85.7%	D				
94.0	US41	Tamiami Trail East		Triangle Boulevard	Collier Boulevard	6D 571 E E	3,000	15	0	1630	1700	80	4.94%	0	203	203	1823	325	117	442	2142	858	71.4%	C							
95.0	US41	Tamiami Trail East		Collier Boulevard	Greenway Road	6D 608 D D	2,000	6	0	2,000	690	770	270	990	28.57%	220	34	2857%	241.53	1010	384	305	564.53	1550.3	1346	50.1%	B	864	56.8%	C	
95.3	US41	US41	US41	Tamiami Trail East	Joseph Lane	San Marco Drive	2U	608	D	E	1,075	670	770	990	220	28.57%	53	4	57	827	84	1	85	1075	0	100.0%	F	2021	2019		
96.0	US41	US41	US41	Tamiami Trail East	San Marco Drive	SR 29	2U	617A	D	E	1,000	140	240	200	(40)	-16.67%	0	0	0	240	0	0	0	200	800	20.0%	B				
97.0	US41	US41	US41	Tamiami Trail East	SR 29	Dade County Line	2U	616A	D	E	1,000	150	210	170	(40)	-19.05%	0	0	0	210	0	0	0	170	830	17.0%	B				
98.0	71	US41	US41	Tamiami Trail North	Lee County Line	Wiggins Pass Road	6D	546	E	N	3,100	1990	2090	2250	160	5.06%	97	8	105	2195	59	8	67	2317	783	74.7%	C				
99.0	50	US41	US41	Tamiami Trail North	Wiggins Pass Road	Imnokales Road	6D	554	E	N	3,100	2560	2890	3000	110	3.81%	29	8	37	2927	26	8	34	3034	66	92.9%	E	2020	2020		
100.0	45	US41	US41	Tamiami Trail North	Vanderbilt Beach Road	Vanderbilt Beach Road	6D	577	E	N	3,100	2280	2320	1920	(400)	-17.24%	18	0	18	2338	16	0	16	1936	1164	62.5%	C				
101.0	45	US41	US41	Tamiami Trail North	Vanderbilt Beach Road	Gulf Park Drive	6D	563	E	N	3,100	2300	2330	2460	130	5.58%	3	0	3	2333	1	0	1	2461	639	79.4%	D				
102.0	45	US41	US41	Tamiami Trail North	Pine Ridge Road	Pine Ridge Road	6D	562	E	N	3,100	1860	1900	2010	110	5.79%	2	0	2	1902	2	0	2	2012	1088	64.9%	C				
108.0				Thomasson Drive	Bayshore Drive	US 41 (Tamiami Trail)	2U	698	D	E	800	490	500	510	10	2.00%	41	53	94	594	105	4	109	619	181	77.4%	C				
109.0	42	65071	CR862	Vanderbilt Beach Road	Gulfshore Drive	US 41 (Tamiami Trail)	2U/4D	524	E	E	1,400	910	990	990	0	0.00%	0	0	0	990	0	0	0	990	410	70.7%	C				
110.1	23	67021	CR862	Vanderbilt Beach Road	US 41 (Tamiami Trail)	Goodlette-Frank Road	4D	646	D	E	1,900	1480	1540	1410	(130)	-8.44%	0	0	0	1540	7	0	7	1417	483	74.6%	C				
110.2	23	67021	CR862	Vanderbilt Beach Road	Goodlette-Frank Road	Airport Road	4D/6D	666	D	E	2,500	1700	1760	1750	(10)	-0.57%	0	0	0	1760	7	0	7	1757	743	70.3%	C				
111.1	63	63051	CR862	Vanderbilt Beach Road	Airport Road	Livingston Road	6D	579	E	W	3,000	1850	1910	1960	50	2.62%	0	0	0	1910	4	0	4	1964	1036	65.5%	C				
111.2	63	63051	CR862	Vanderbilt Beach Road	Livingston Road	Logan Blvd.	6D	668	E	E	3,000	2000	2150	2070	(

Randall Blvd and Oil Well Rd Corridor Study - Network Alternative Analysis

Roadway	2040 PSWT Volumes						Area Type	No-Build					Alternative 1					Alternative 2					Alternative 3					Alternative 4					Alternative 2 +									
	No-Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 2+		2045 AADT	Lanes	LOS D SV	Vol/Cap	LOS	2045 AADT	Lanes	LOS D SV	Vol/Cap	LOS	2045 AADT	Lanes	LOS D SV	Vol/Cap	LOS	2045 AADT	Lanes	LOS D SV	Vol/Cap	LOS	2045 AADT	Lanes	LOS D SV	Vol/Cap	LOS	2045 AADT	Lanes	LOS D SV	Vol/Cap	LOS					
Immokalee Rd																																										
West of Wilson Blvd	56706	58992	59077	58373	58367	57452	U	56139	6	53910	1.04	F	58402	6	53910	1.08	F	58486	6	53910	1.08	F	57789	6	53910	1.07	F	57783	6	53910	1.07	F	56877	6	53910	1.06	F	71411	6	53910	1.32	F
Wilson Blvd to Randall Blvd	78425	83292	84208	84121	84243	72132	U	77641	6	53910	1.44	F	82459	6	53910	1.53	F	83366	6	53910	1.55	F	83280	6	53910	1.54	F	83401	6	53910	1.55	F	71411	6	53910	1.32	F					
Randall Blvd to Oil Well Rd	57385	36426	51507	51553	51543	45630	U	56811	6	53910	1.05	F	36062	6	53910	0.67	C	50992	6	53910	0.95	C	51037	6	53910	0.95	C	51028	6	53910	0.95	C	45174	6	53910	0.84	C					
Randall Blvd																																										
Immokalee Rd to 8th St	28209	51571	39263	39116	39305	32476	U	27927	4	35820	0.78	C	51055	6	53910	0.95	C	38870	6	53910	0.72	C	38725	6	53910	0.72	C	38912	6	53910	0.72	C	32151	6	53910	0.60	C					
8th St to 16th St	26698	57458	44404	44023	44373	33352	U	26431	2	15930	1.66	F	56883	6	53910	1.06	F	43960	6	53910	0.82	C	43583	6	53910	0.81	C	43929	6	53910	0.81	C	33018	6	53910	0.61	C					
16th St to "S" Connector	17938	46063	30942	30796	30988	17109	U	17759	2	15930	1.11	F	45602	6	53910	0.85	C	30633	6	53910	0.57	C	30488	6	53910	0.57	C	30678	6	53910	0.57	C	16938	6	53910	0.31	C					
"S" Connector to Everglades Blvd	17938	24315	30942	30796	30988	17109	U	17759	2	15930	1.11	F	24072	4	35820	0.67	C	30633	6	53910	0.57	C	30488	6	53910	0.57	C	30678	6	53910	0.57	C	16938	4	35820	0.47	C					
Everglades Blvd to Desoto Blvd	14051	19468	21616	21283	21353	11166	T	13910	2	15930	0.87	C	19273	4	31950	0.60	C	21400	6	48150	0.44	C	21070	6	48150	0.44	C	21139	6	48150	0.44	C	11054	4	48150	0.23	C					
Desoto Blvd to Oil Well Rd	n/a	15538	17574	17292	17245	11595	T	n/a	n/a	n/a	n/a	n/a	15383	4	31950	0.48	C	17398	6	48150	0.36	C	17119	6	48150	0.36	C	17073	6	48150	0.35	C										
Desoto Blvd to Big Cypress	n/a																																									
Oil Well Rd																																										
Immokalee Rd to "S" Connector	41904	24013	38689	38851	38787	33914	U	41485	4	35820	1.16	F	23773	4	35820	0.66	C	38302	4	35820	1.07	D	38462	4	35820	1.07	F	38399	4	35820	1.07	F	33575	4	35820	0.94	D					
"S" Connector to Everglades Blvd	42146	43852	37226	37535	37318	33259	U	41725	4	35820	1.16	F	43413	6	53910	0.81	D	36854	4	35820	1.03	F	37160	4	35820	1.04	F	36945	4	35820	1.03	F	32926	4	35820	0.92	D					
Everglades Blvd to Desoto Blvd	37923	38048	35919	36735	36337	31550	T	37544	6	48150	0.78	C	37668	6	48150	0.78	C	35560	6	48150	0.74	C	36368	6	48150	0.76	C	35974	6	48150	0.75	C	31550	6	48150	0.66	C					
Desoto Blvd to Randall Blvd Ext	39511	40649	40835	41180	41315		T	39116	6	48150	0.81	C	40243	6	48150	0.84	C	40427	6	48150	0.84	C	40768	6	48150	0.85	C	40902	6	48150	0.85	C										
Randall Blvd Ext to Oil Well Grade Rd	47162	49824	49340	49391	49471		T	46690	6	48150	0.97	C	49326	6	48150	1.02	F	48847	6	48150	1.01	F	48897	6	48150	1.02	F	48976	6	48150	1.02	F										
Desoto Blvd to Big Cypress	39511					29978	T	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	29678	6	48150	0.62	C					
Big Cypress to Oil Well Grade Rd	47162					29787	T	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	29489	6	48150	0.61	C					
Everglades Blvd																																										
Randall Blvd to Oil Well Rd	10414	5190	12332	12481	12881	13688	T	10310	2	14580	0.71	C	5138	2	14580	0.35	C	12209	4	35500	0.34	C	12356	4	31950	0.39	C	12752	6	48150	0.26	C	13551	4	31950	0.42	C					
Randall Blvd to VBR Ext						14847	T																										14699	4	31950	0.46	C					
Desoto Blvd																																										
Randall Blvd to Oil Well Rd	10034	3451	4227	4712	4142	2819	T	9934	2	14580	0.68	C	3416	2	14580	0.23	C	4185	2	14580	0.29	C	4665	4	31950	0.15	C	4101	2	14580	0.28	C	2791	2	14580	0.19	C					
"S" Connector																																										
Randall Blvd to Oil Well Rd	n/a	26046	n/a	n/a	n/a	n/a	T	n/a	n/a	n/a	n/a	n/a	28651	4	35820	0.80	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a					
Big Cypress Parkway																																										
Randall to Oil Well Rd	n/a	n/a	n/a	n/a	n/a	34337	T	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	33994	4	31950	1.06	F					
Randall Blvd to VBR Extension	n/a	n/a	n/a	n/a	n/a	26625	T	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26359	4	31950	0.83	C					
VBR Extension																																										
to Wilson	n/a	n/a	n/a	n/a	n/a	51964	U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	51444	6	53910	0.95	C					
Wilson to 8th	n/a	n/a	n/a	n/a	n/a	40351	U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39947	4	35820	1.12	F					
8th to 16th	n/a	n/a	n/a	n/a	n/a	40449	U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	40045	4	35820	1.12	F					
16th to Everglades Blvd	n/a	n/a	n/a	n/a	n/a	36071	U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	35710	4	35820	1.00	F					
Everglades Blvd to Desoto Blvd	n/a	n/a	n/a	n/a	n/a	27789	T	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	27511	4	31950	0.86	C					
Desoto Blvd to Big Cypress	n/a	n/a	n/a	n/a	n/a	23535	T	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23300	4	31950	0.73	C					
Collier Blvd																																										
VBR to Immokalee Road	n/a	n/a	n/a	n/a	n/a	51964	U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	42811	6	53910	0.79	C					

2045 AADT = 2040 PSWT * 90% MOCF * 110%
 Below Level of Service (LOS) Target
 Volume to Capacity Ratio (Vol/Cap) > .9

TECHNICAL MEMORANDUM
TRAFFIC FORECAST MODELING

RANDALL BLVD AND OIL WELL RD
CORRIDOR STUDY

COLLIER COUNTY, FLORIDA

April 2019

Traffic Forecast Modeling Technical Memorandum
RANDALL BLVD AND OIL WELL RD CORRIDOR STUDY
Collier County, Florida

Introduction

This Technical Memorandum presents the details of the Model Traffic Forecasts developed in support of a traffic study in the vicinity of Randall Blvd and Oil Well Rd in Collier County, Florida. A map showing the study area is shown below.

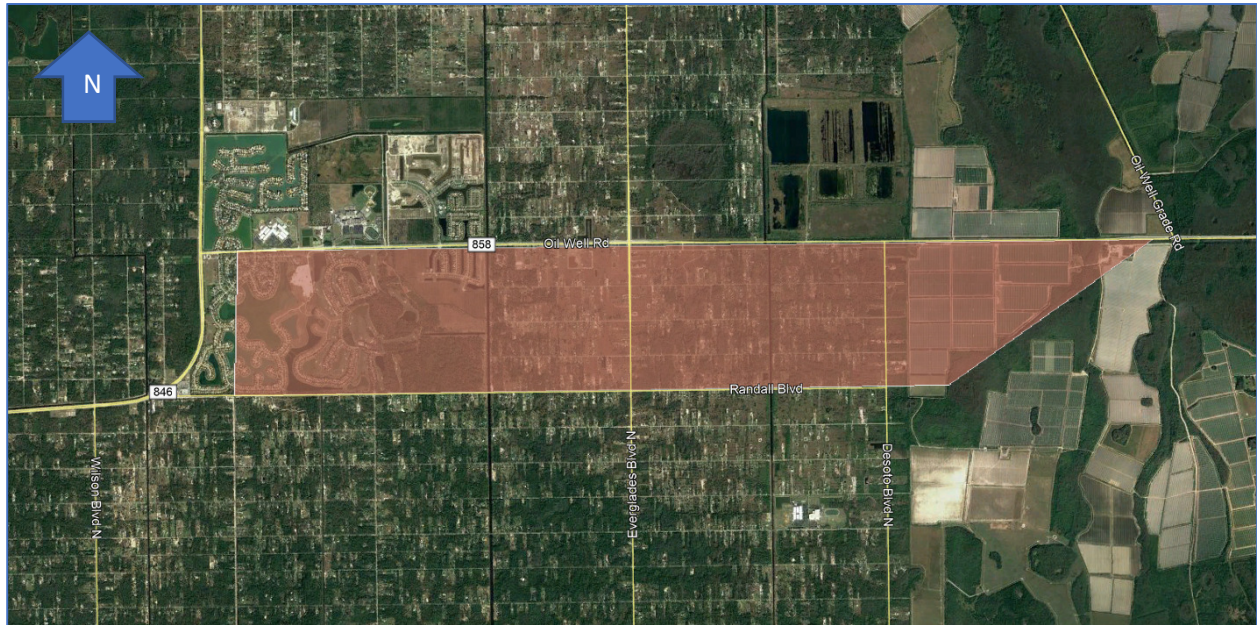
This effort involved conducting a sub-area base year (2010) validation refinement for the study area, development of a refined forecast (2040) No-Build model, as well as five Build corridor improvement alternatives.

The traffic model applied for this study was based on the current adopted District 1 Cost Feasible 2040 Regional Planning Model (D1RPM v1.0.3). The D1RPM is a travel demand forecasting tool developed by FDOT District 1, in conjunction with the six District MPO/TPOs in support of their current 2040 Long Range Transportation Plans (LRTP). This model was adopted by the Collier County MPO for use in developing traffic forecasts within the County.

Model Sub-Area Validation

The original 2010 base year model validation was refined for the project study area to ensure that the base year model is replicating 2010 traffic conditions and counts. The model refinement was performed by using the guidelines identified in "FDOT Project Traffic Forecasting Handbook". Validation criteria including volume over count (v/c) ratios were used to assess the accuracy of the base year model.

Study Area Map



The following network revisions were incorporated into the 2010 Base Year model as part of the sub-area validation effort:

- Add Screenline 83 to links with counts within study area
- Oil Well Grade Rd from Oil Well Rd to Immokalee Rd – Facility Type (FT) 46 to FT 49
- TAZ 2250, 1966 - revise loading
- Correct 8th and 16th alignment (2010 and 2040)
- Update count to FDOT count - Randall Blvd E of Immokalee Rd
- Wilson Rd from Golden Gate Blvd to Immokalee Rd - FT 33 to FT 31
- Correct location of traffic count on Everglades Blvd from Immokalee Rd to Oil Well Rd
- TAZ 1975 - revise centroid loading
- Golden Gate Blvd, first line east of Wilson Blvd - Area Type (AT) 51 to AT 33
- Oil Well Rd from Camp Keais Dr to SR 29 - FT 46 to FT 45

These revisions resulted in acceptable validation performance for the study area. The following table and plot show the resulting level of validation for the refined sub-area model.

REFINED VALIDATION

SL	ROADWAY	AT	FT	ANODE	BNODE	VOLUME	COUNT	V/C
83	CR 846 (Immokalee Rd)	51	35	23739	27168	2163	3,015	0.72
83	CR 846 (Immokalee Rd)	31	23	23998	26177	15,431	18,795	0.82
83	CR 846 (Immokalee Rd)	33	23	24027	26823	16,451	14,369	1.14
83	CR 846 (Immokalee Rd)	31	23	26177	23998	15,288	18,795	0.81
83	CR 846 (Immokalee Rd)	31	23	26177	26301	18,312	17,575	1.04
83	CR 846 (Immokalee Rd)	31	23	26301	26177	18,386	17,575	1.05
83	CR 846 (Immokalee Rd)	33	23	26823	24027	16,480	14,369	1.15
83	CR 846 (Immokalee Rd)	51	23	26823	26855	17,215	15,570	1.11
83	CR 846 (Immokalee Rd)	51	23	26855	26823	17,256	15,570	1.11
83	CR 846 (Immokalee Rd)	51	35	26919	26924	2,352	2,598	0.91
83	CR 846 (Immokalee Rd)	51	35	26924	26919	2,342	2,598	0.90
83	CR 846 (Immokalee Rd)	51	23	26936	26945	8,802	8,458	1.04
83	CR 846 (Immokalee Rd)	51	23	26945	26936	8,807	8,458	1.04
83	CR 846 (Immokalee Rd)	51	35	27163	27168	2,126	2,814	0.76
83	CR 846 (Immokalee Rd)	51	35	27168	23739	2,173	3,015	0.72
83	CR 846 (Immokalee Rd)	51	35	27168	27163	2114	2814	0.75
83	CR 858	51	31	26936	27050	5,947	5,709	1.04
83	CR 858	51	31	27050	26936	5,952	5,709	1.04
83	CR 858 (Oil Well Rd)	51	35	27223	27250	1712	2944	0.58
83	CR 858 (Oil Well Rd)	51	35	27250	27223	1,710	2,944	0.58
83	CR 862 (Vanderbilt Beach Blvd)	31	23	23957	26213	10,781	11,282	0.96
83	CR 862 (Vanderbilt Beach Blvd)	31	23	26213	23957	10,742	11,282	0.95
83	CR 876	33	23	26952	26830	9,731	8,864	1.10
83	CR 876 (Everglades Blvd)	51	47	24198	27180	4,997	3,410	1.47
83	CR 876 (Everglades Blvd)	51	46	27170	27171	4329	3189	1.36
83	CR 876 (Everglades Blvd)	51	46	27171	27170	4329	3189	1.36
83	CR 876 (Everglades Blvd)	51	46	27179	27180	2,756	3,145	0.88
83	CR 876 (Everglades Blvd)	51	47	27180	24198	4,997	3,410	1.47
83	CR 876 (Everglades Blvd)	51	46	27180	27179	2,672	3,145	0.85
83	CR 951 (Collier Blvd)	31	23	26177	26181	8,969	12,784	0.70
83	CR 951 (Collier Blvd)	31	23	26181	26177	8,753	12,784	0.68
83	CR 951 (Collier Blvd)	31	23	26213	26218	12,675	12,449	1.02
83	CR 951 (Collier Blvd)	31	23	26218	26213	12,512	12,449	1.01
83	CR 951 (Collier Blvd)	31	23	26224	26227	16,696	18,182	0.92
83	CR 951 (Collier Blvd)	31	23	26227	26224	16,626	18,182	0.91
83	Desoto Blvd	51	47	23821	24210	1,266	1,020	1.24
83	Desoto Blvd	51	47	24210	23821	1,308	1,020	1.28
83	Desoto Blvd	51	47	24210	24214	2,083	1,165	1.79
83	Desoto Blvd	51	47	24214	24210	2,083	1,165	1.79
83	Golden Gate Blvd	31	23	26223	26294	13,745	13,068	1.05
83	Golden Gate Blvd	31	23	26294	26223	13,649	13,068	1.04
83	Golden Gate Blvd	33	23	26771	26830	10,546	10,802	0.98
83	Golden Gate Blvd	33	23	26830	26771	10,504	10,802	0.97
83	Golden Gate Blvd	33	23	26830	26952	9,785	8,864	1.10
83	Randall Blvd	51	43	23797	26875	6,604	7,102	0.93
83	Randall Blvd	51	43	26875	23797	7,630	7,102	1.07
83	Wilson Blvd	51	46	23813	26830	225	199	1.13
83	Wilson Blvd	51	46	24019	26823	378	703	0.54
83	Wilson Blvd	51	46	26823	24019	379	703	0.54
83	Wilson Blvd	51	46	26823	26825	2,707	3,147	0.86
83	Wilson Blvd	51	46	26825	26823	2,696	3,147	0.86
83	Wilson Blvd	51	46	26827	26830	2,162	3,602	0.60
83	Wilson Blvd	51	46	26830	23813	225	199	1.13
83	Wilson Blvd	51	46	26830	26827	2,150	3,602	0.60

Study Area 402,709 411,920 0.98

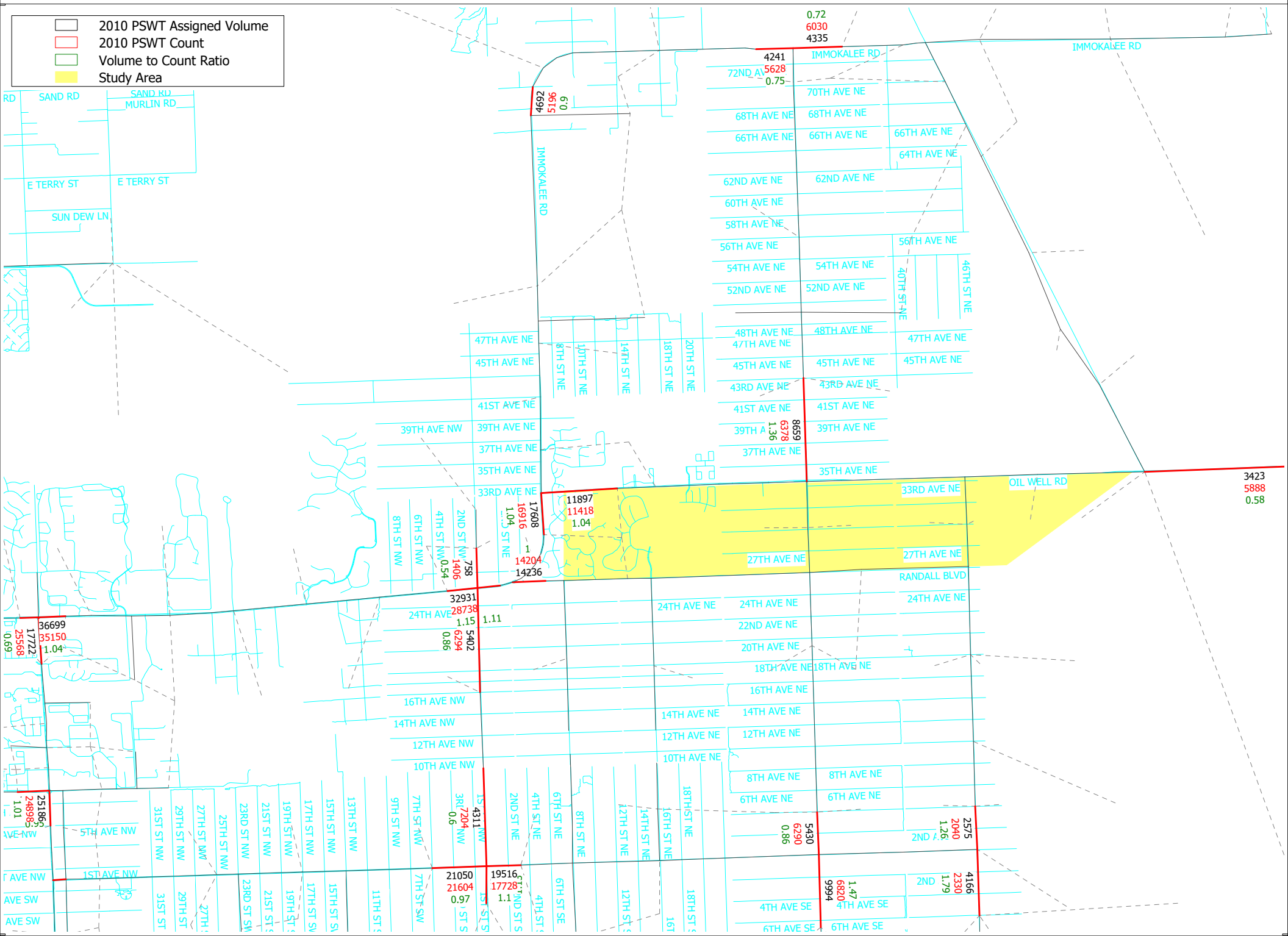
Randall Blvd 14,234 14,204 1.00

Immokalee Rd 165698 166388 1.00

Oil Well Rd 15,321 17,306 0.89

D1RPMv1.0.3 Refined 2010 Validation

2010 PSWT Assigned Volume
 2010 PSWT Count
 Volume to Count Ratio
 Study Area



Forecast No-Build Model Development

The No-Build Forecast Model network was developed by applying appropriate base year validation refinements to the 2040 LRTP Cost Feasible model network.

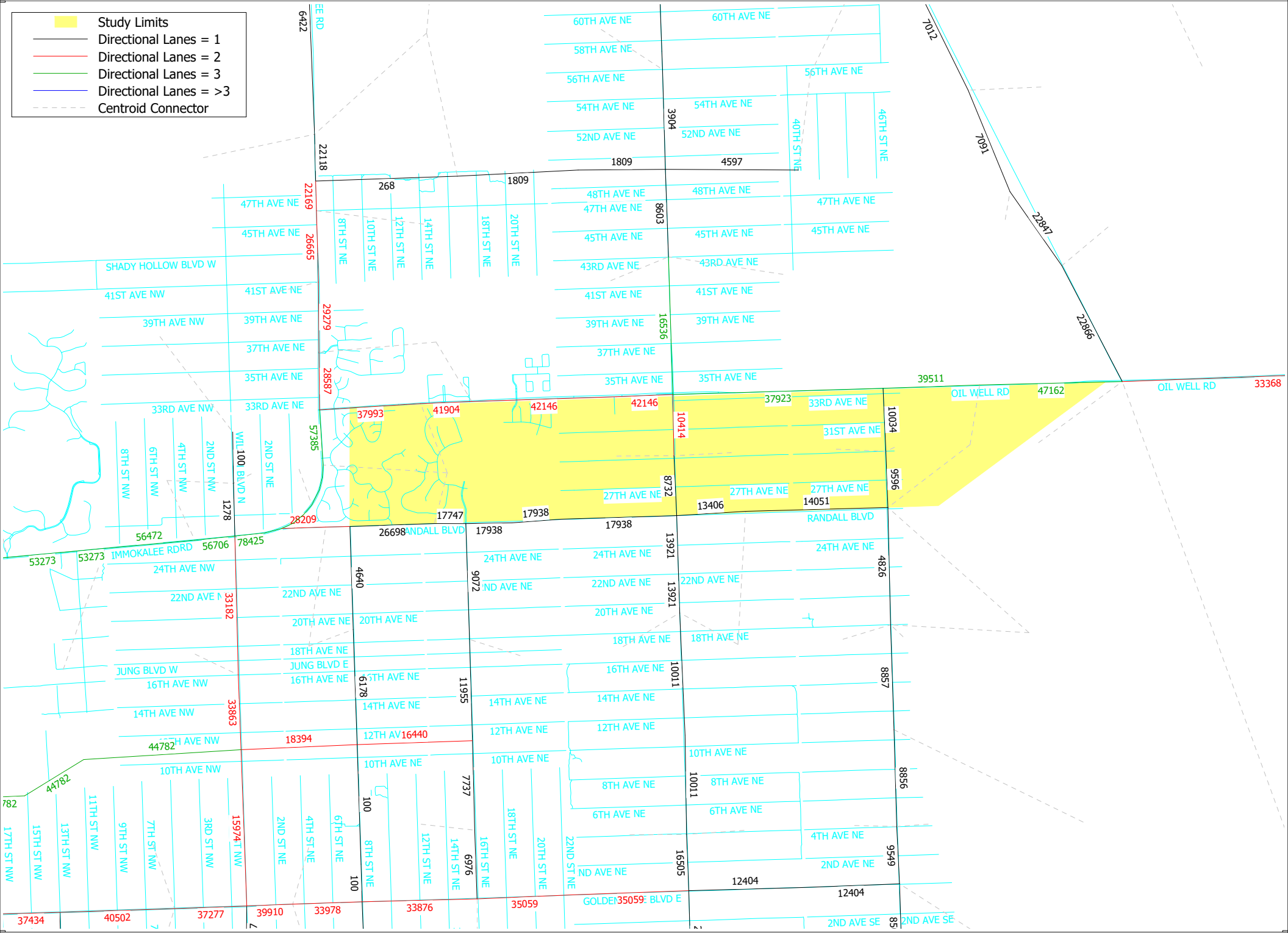
The 2040 model socioeconomic data was refined to include planned development within the study area based on input from Collier County. This resulted in increases in 2040 model commercial employment for TAZ 1975 (Shopping Center – Publix/CVS) from 40 to 182, and for TAZ 2088 (Randall Blvd Commercial Subdistrict) from 49 to 908.

The 2040 Cost Feasible model network coding was revised for Vanderbilt Beach Rd Extension, from east of Douglas St to 16th St, to reflect an uninterrupted flow facility (FT 23 to FT 22).

The following plot shows the resulting forecast No-Build 2040 Peak Season Weekday Traffic (PSWT) traffic volumes.

D1RPM Study Area Model - No-Build PSWT Volumes (4-19-19)

- Study Limits
- Directional Lanes = 1
- Directional Lanes = 2
- Directional Lanes = 3
- Directional Lanes = >3
- Centroid Connector

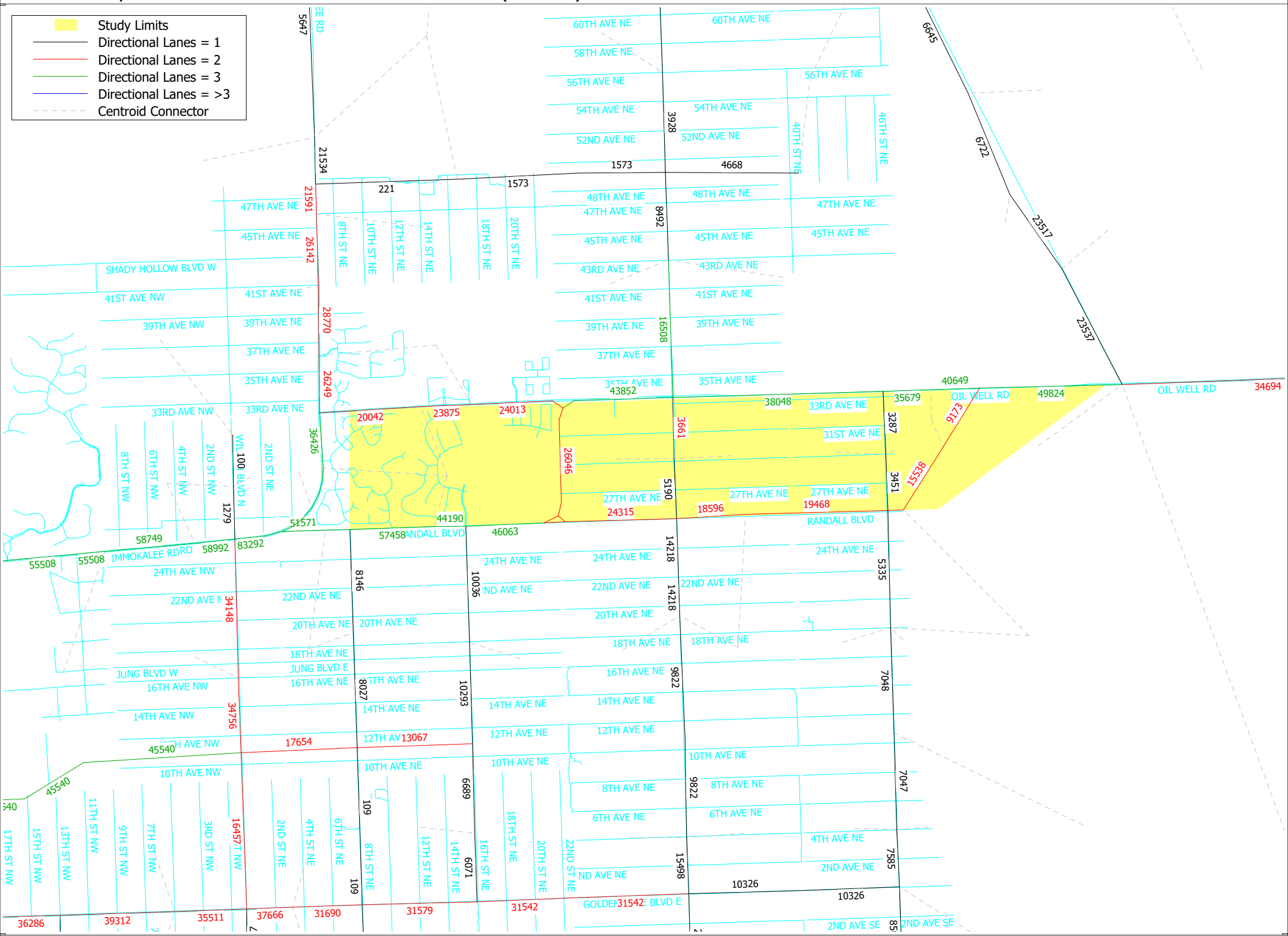


Forecast Build Alternative Model Development

2040 PSWT volumes and network geometry for the five defined Build Network Alternatives are shown in the following plots.

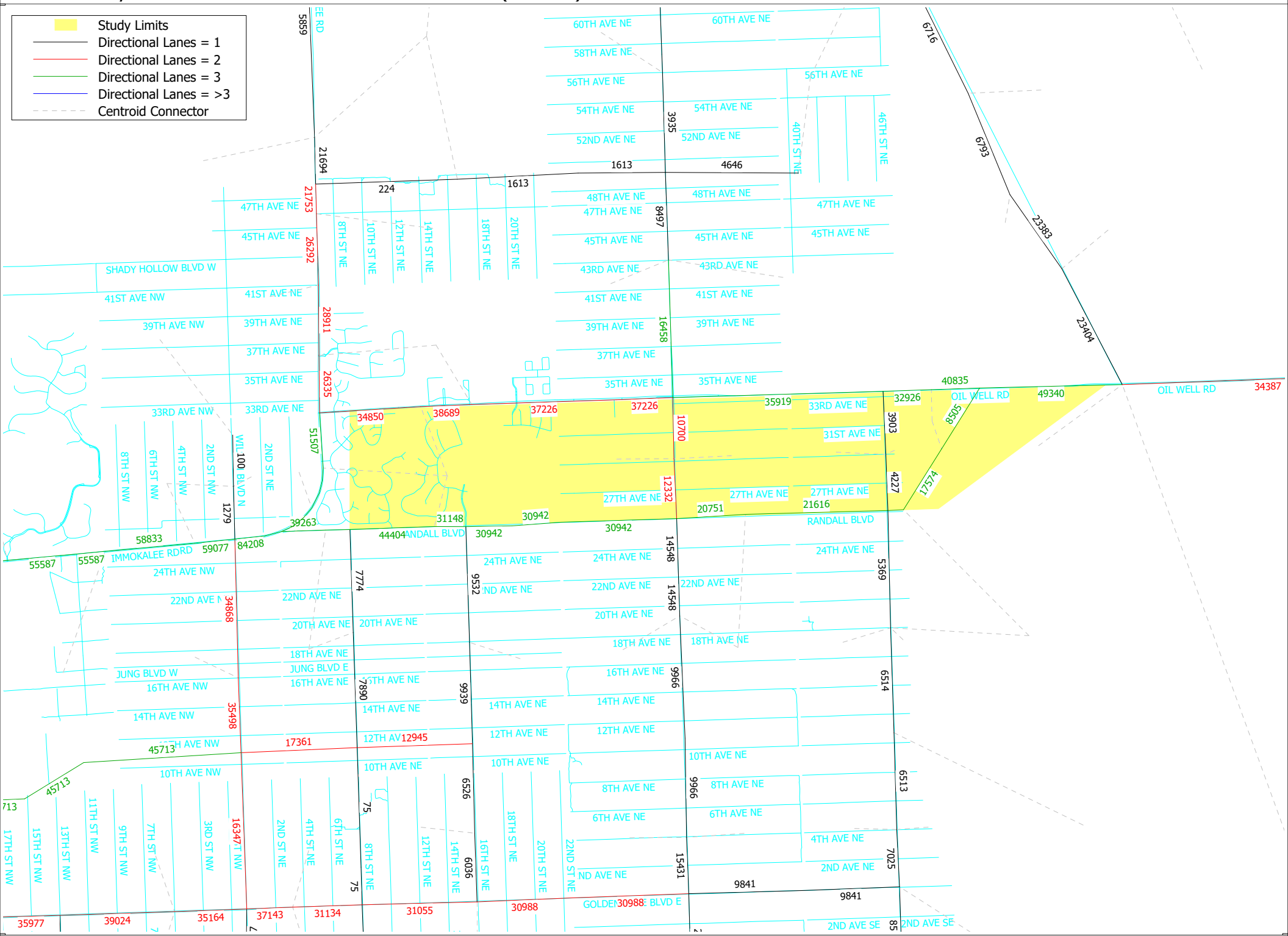
D1RPM Study Area Model - Alternative 1 PSWT Volumes (4-19-19)

- Study Limits
- Directional Lanes = 1
- Directional Lanes = 2
- Directional Lanes = 3
- Directional Lanes = >3
- Centroid Connector



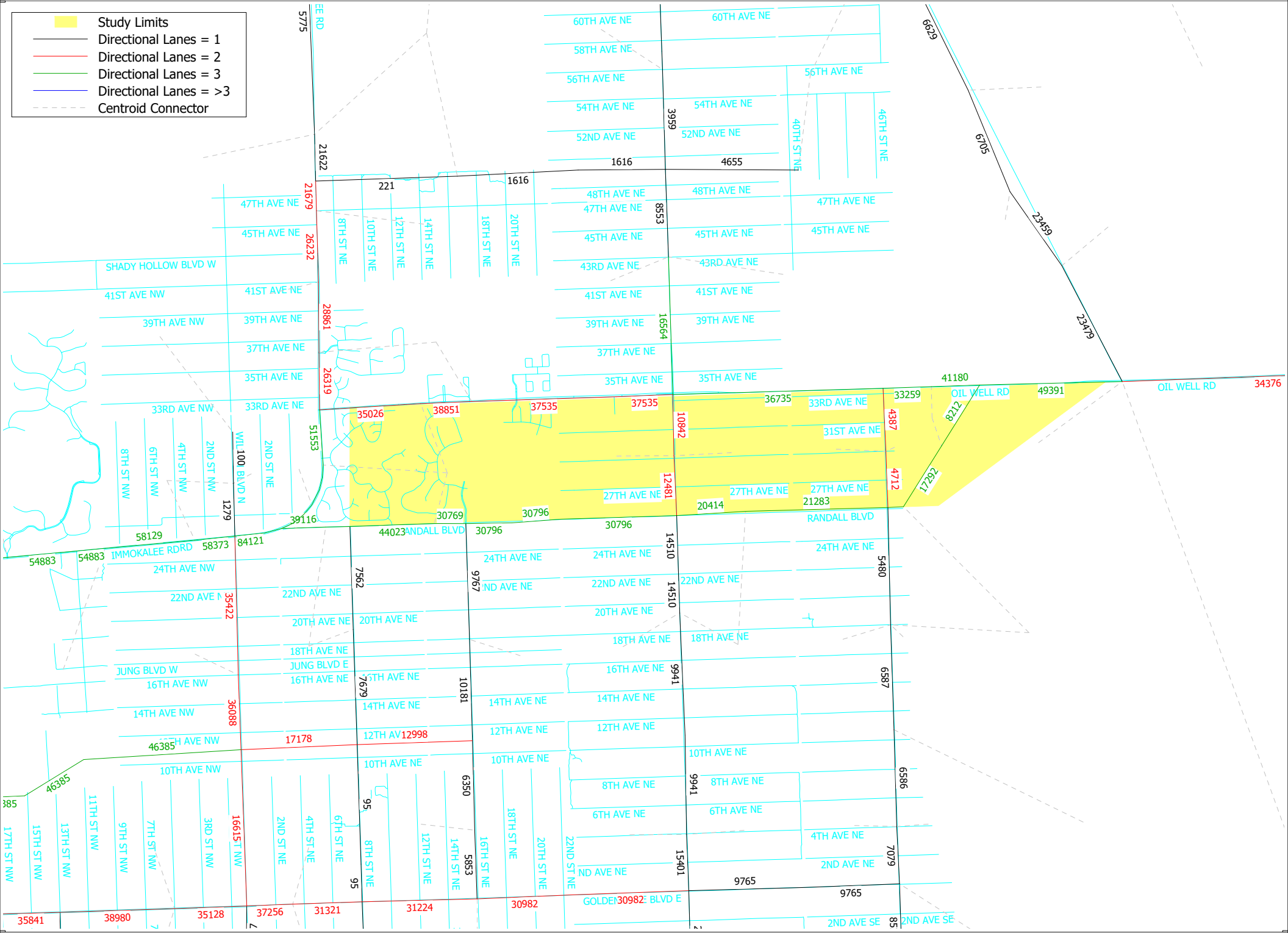
D1RPM Study Area Model - Alternative 2 PSWT Volumes (4-19-19)

- Study Limits
- Directional Lanes = 1
- Directional Lanes = 2
- Directional Lanes = 3
- Directional Lanes = >3
- Centroid Connector



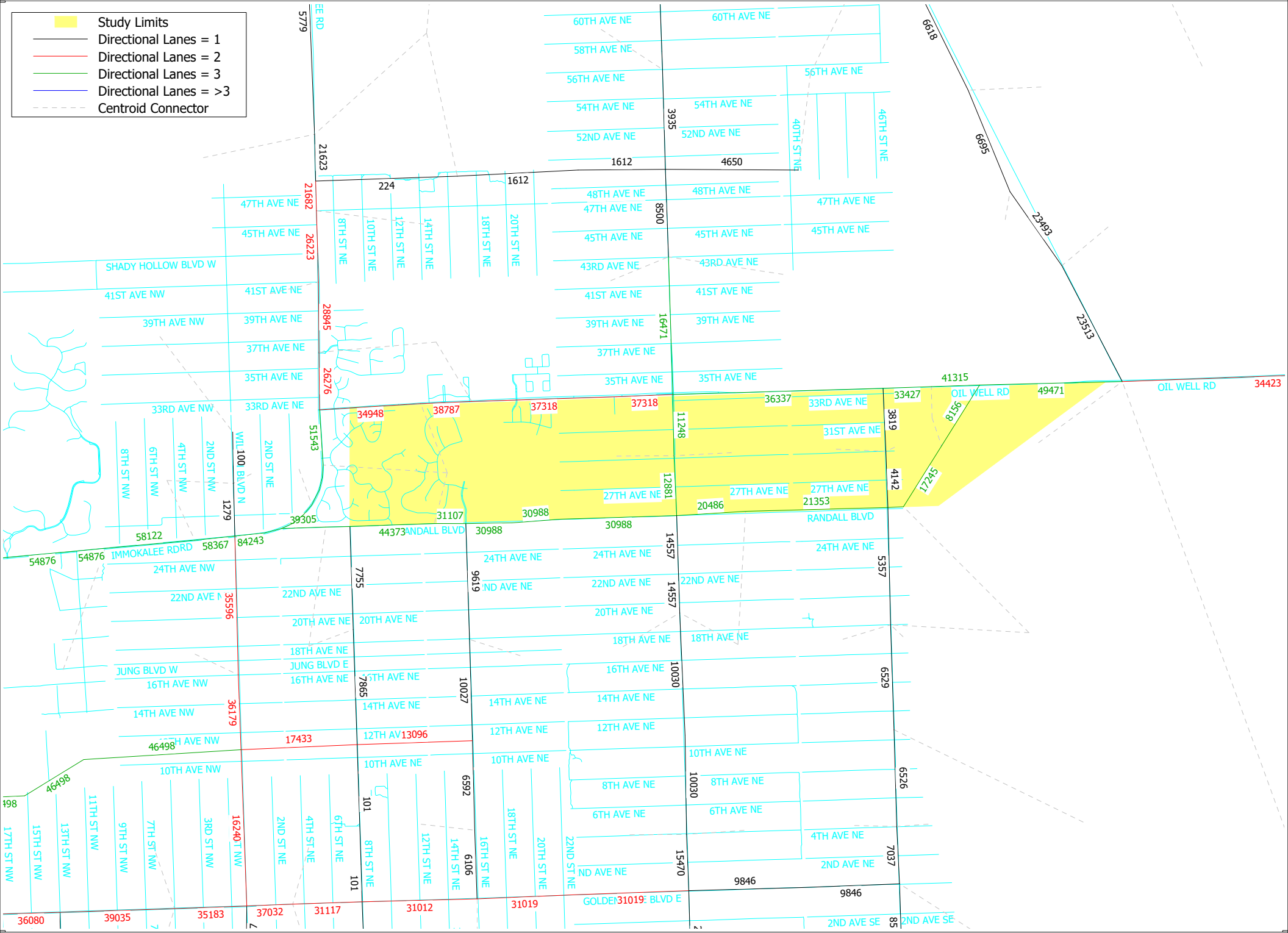
D1RPM Study Area Model - Alternative 3 PSWT Volumes (4-19-19)

- Study Limits
- Directional Lanes = 1
- Directional Lanes = 2
- Directional Lanes = 3
- Directional Lanes = >3
- Centroid Connector



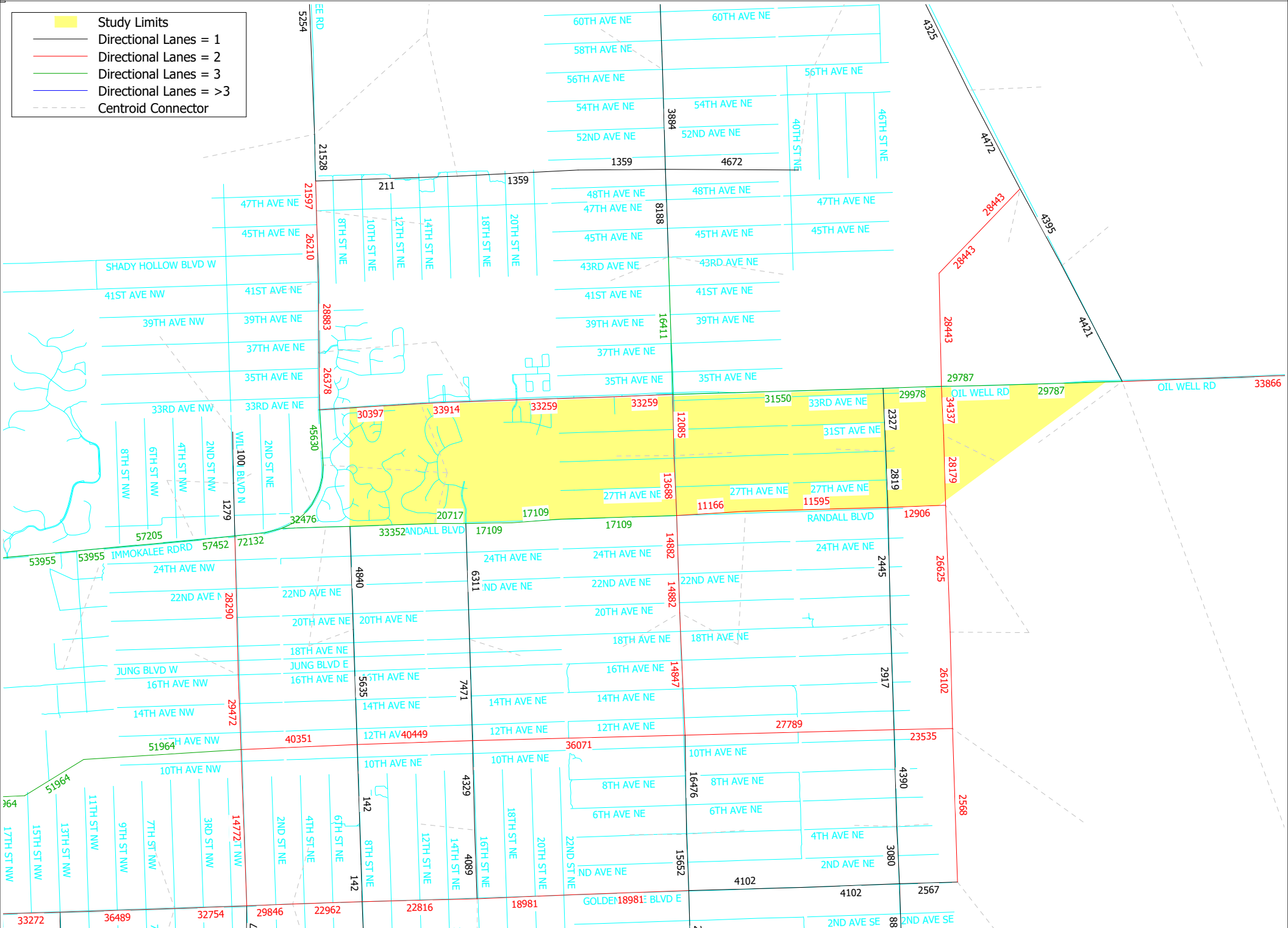
D1RPM Study Area Model - Alternative 4 PSWT Volumes (4-19-19)

- Study Limits
- Directional Lanes = 1
- Directional Lanes = 2
- Directional Lanes = 3
- Directional Lanes = >3
- Centroid Connector



D1RPM Study Area Model - Alternative 5 PSWT Volumes (4-19-19)

- Study Limits
- Directional Lanes = 1
- Directional Lanes = 2
- Directional Lanes = 3
- Directional Lanes = >3
- Centroid Connector



Appendix C
Desktop Cultural Resource Assessment
and Windshield Survey



A DESKTOP CULTURAL RESOURCE ASSESSMENT and WINDSHIELD SURVEY of the RANDALL BOULEVARD and OIL WELL ROAD CORRIDOR, COLLIER COUNTY, FLORIDA

ARCHAEOLOGICAL AND HISTORICAL CONSERVANCY, INC.



AHC PROJECT NO. 2019.212
AHC TECHNICAL REPORT NO. 1222
FEBRUARY 2019

A DESKTOP CULTURAL RESOURCE ASSESSMENT and WINDSHIELD SURVEY of the RANDALL BOULEVARD and OIL WELL ROAD CORRIDOR, COLLIER COUNTY, FLORIDA

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For:

JACOBS ENGINEERING GROUP

AHC PROJECT NO. 2019.21

AHC TECHNICAL REPORT NO. 1222

FEBRUARY 2019



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CONSULTANT SUMMARY

In February, 2019, the Archaeological and Historical Conservancy, Inc. (AHC) conducted a desktop cultural resource assessment and windshield survey for Jacobs Engineering Group of the Randall Blvd and Oil Well Road Corridor located in Collier County. The 3700 acre project area is in Township 48S, Range 28E, Sections 19, 20, 21, 22, and 23 (Figure 1). The study area was surveyed to locate and assess any potential sites of archaeological and/or historical significance. This assessment was not implemented to meet agency guidelines for a Phase I assessment.

Historically, the subject corridor was part of an extensive slash pine/saw palmetto flatwoods and wire grass prairies with four separate discrete linear cypress sloughs. The project area is characterized by circular shallow grass marshes surrounded by wire grass prairies and slash pine/saw palmetto flatwoods. Vegetation today is predominantly pine, cabbage palm, palmetto plus landscaped plants and invasive species but residences occur along much of the corridor.

A search was requested on February 8, 2019 with the Florida Division of Historic Resources (FDHR) and revealed one previously recorded cultural resource within the project corridor. The Enterprise Tram Linear Resource, 8CR965, is a historic trail occurring to the east of the corridor, although the very westernmost extent enters the project area in the northeast corner and curves to the south, terminating within the northeast corner. While most of the trail to the east of the project area appears to retain its integrity, the portion of the trail extending into the project area has been obscured and destroyed by modern clearing, improvements and development (Figure 12). The segment of the trail within the study area will have to be documented and the Florida Master Site File (FMSF) form for 8CR965 updated if a cultural resource assessment survey (CRAS) is conducted.

This project area contains no previously recorded archaeological sites and has an overall low probability for containing archaeological sites. A few potential higher probability targets were identified on historic aerials, however when assessed by windshield survey the majority were determined to be either ponds, pine flatwoods or cypress domes. Only one remnant hammock, with some larger established oak trees was identified (see Figures 10, 13, 14). This hammock is considered to have a low to medium probability for having archaeological sites and shovel testing is recommended to determine if cultural materials occur there.

Four bridges were identified crossing the two north-south canals. These bridges are of a common type, but three were built between 1965 and 1966 and therefore, by being 50 years old or older, are considered historic, and will require documentation for the FMSF if a CRAS is conducted.

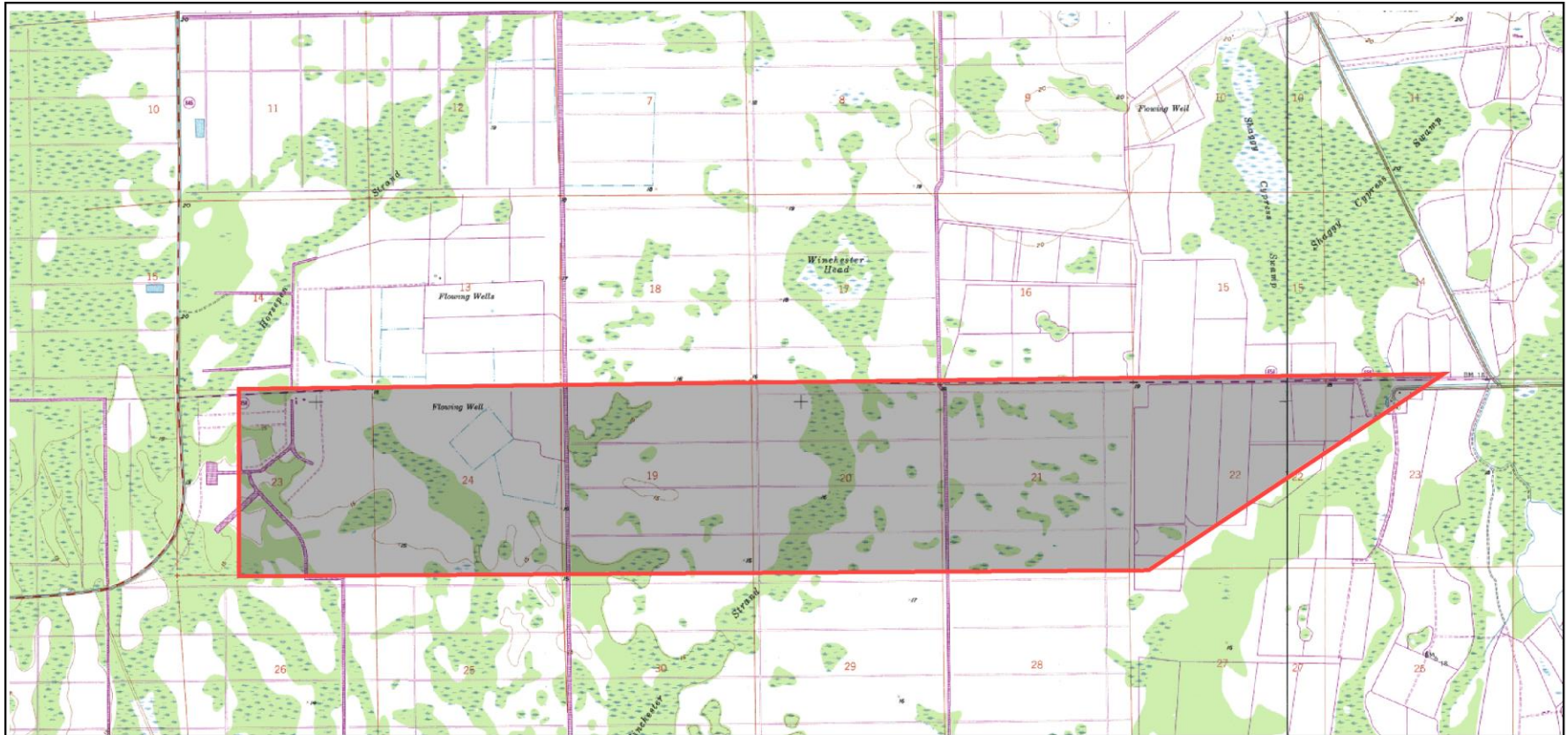


Figure 1. USGS Map of the Randall Boulevard/Oil Well Road road corridor.

TOWNSHIP 48S, RANGE 27E, SECTION 13, 14, 23, 24, 25, 26, 27
 TOWNSHIP 48S, RANGE 28E SECTION 14, 15, 16, 17, 18, 19, 20, 21, 23, 27
 USGS Maps: CORKSCREW SE, REV. 1973
 IMMOKALEE SW, REV. 1984



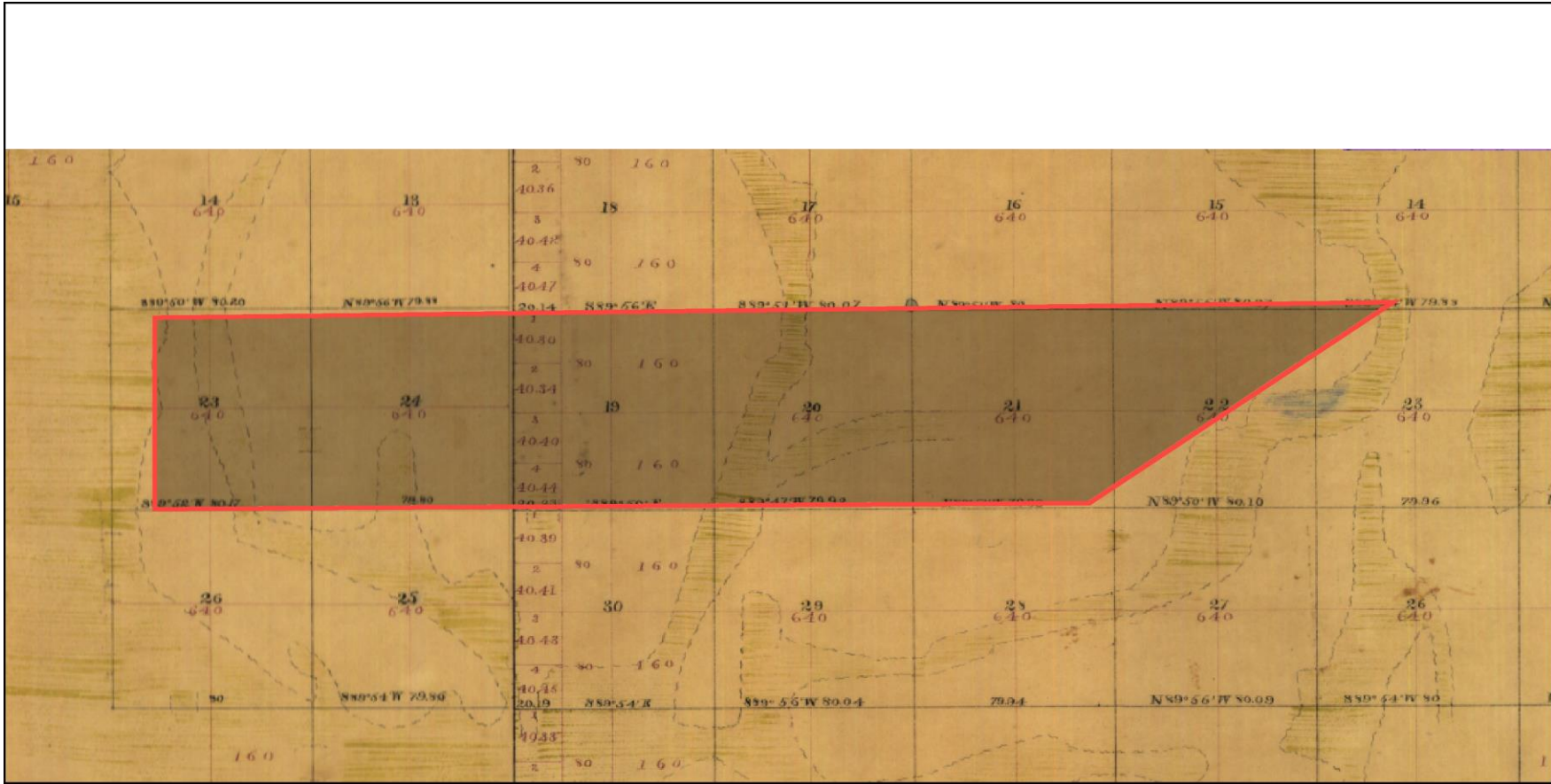
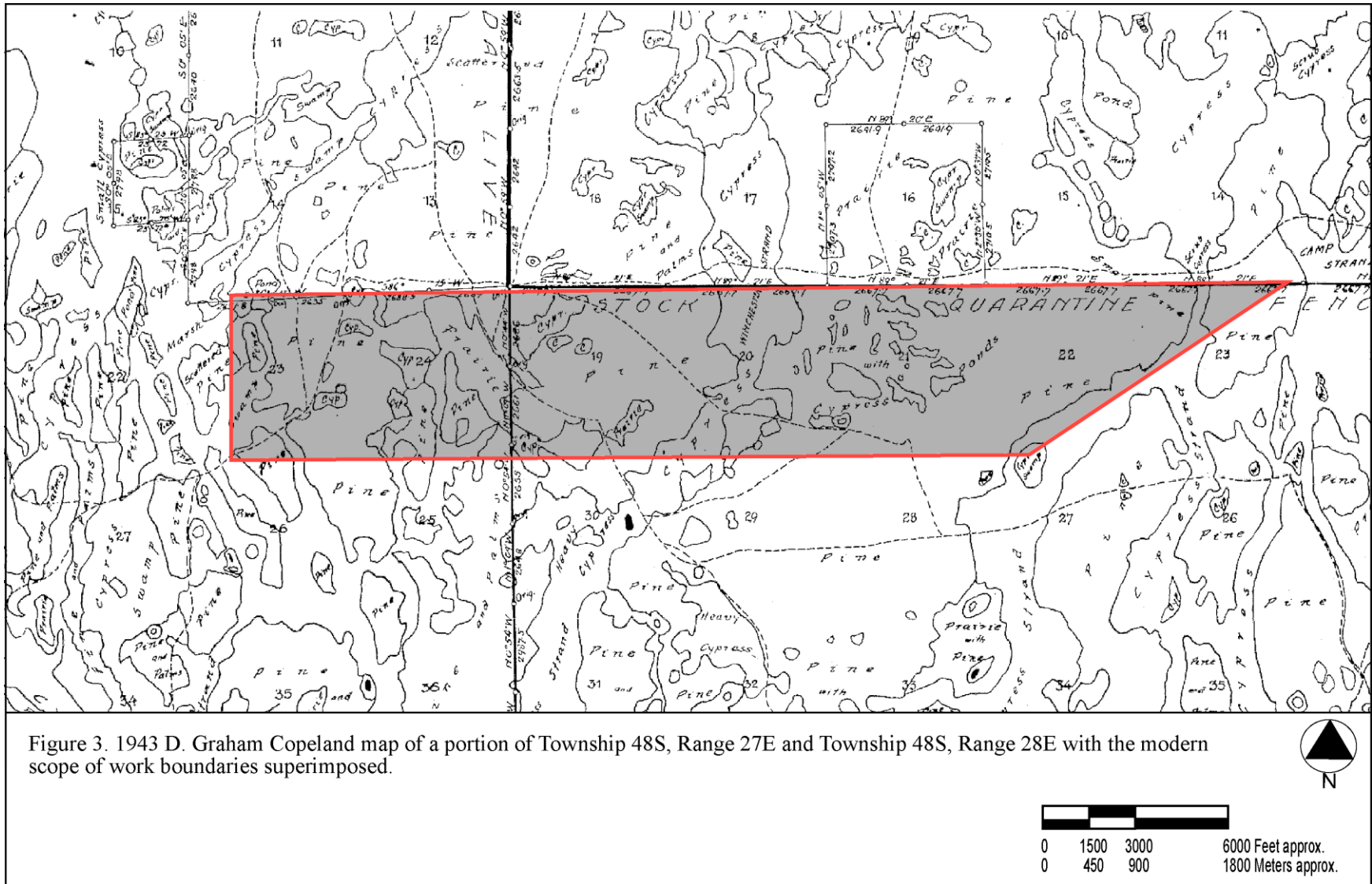


Figure 2. Portions of the 1874 plat maps for Township 48S, Range 27E and Township 48S, Range 28E with the project parcel boundaries superimposed.





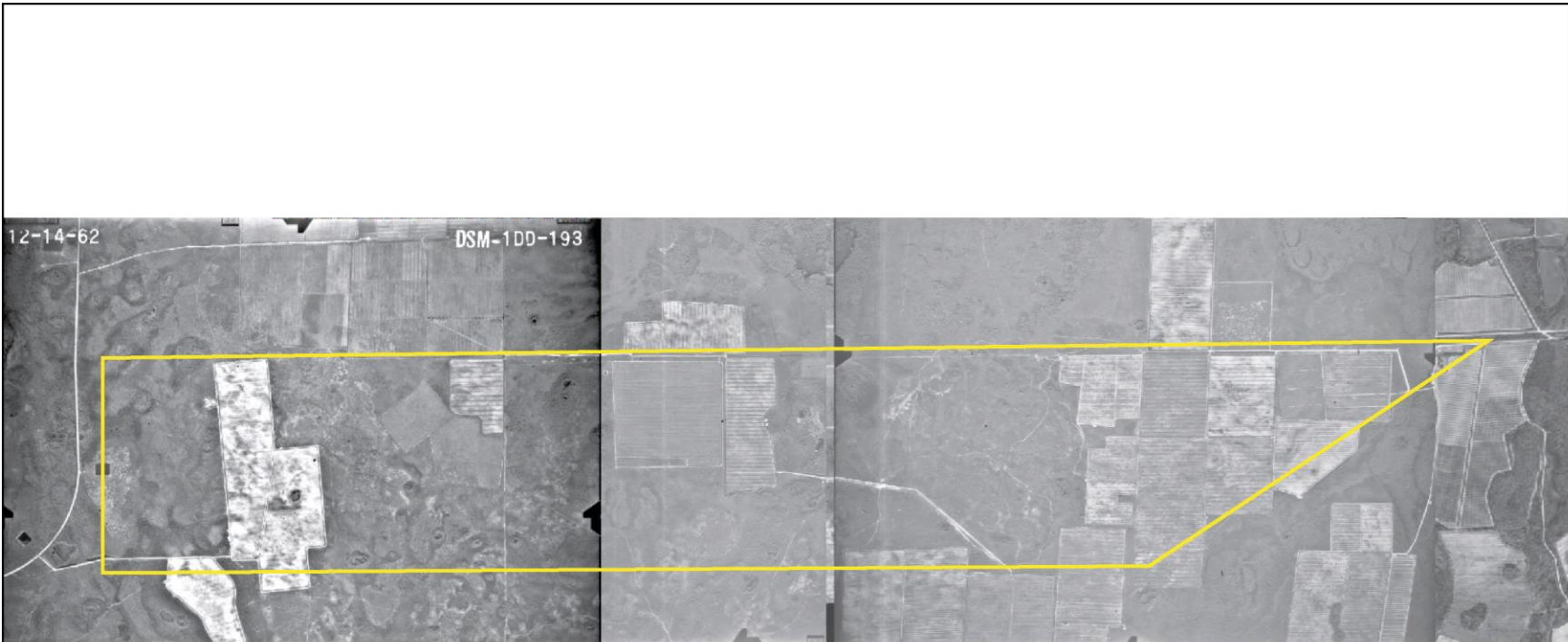
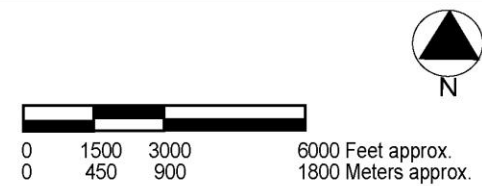


Figure 4. 1962 Black and white aerial mosaic of the Randall Boulevard/Oil Well Road scope of work area.



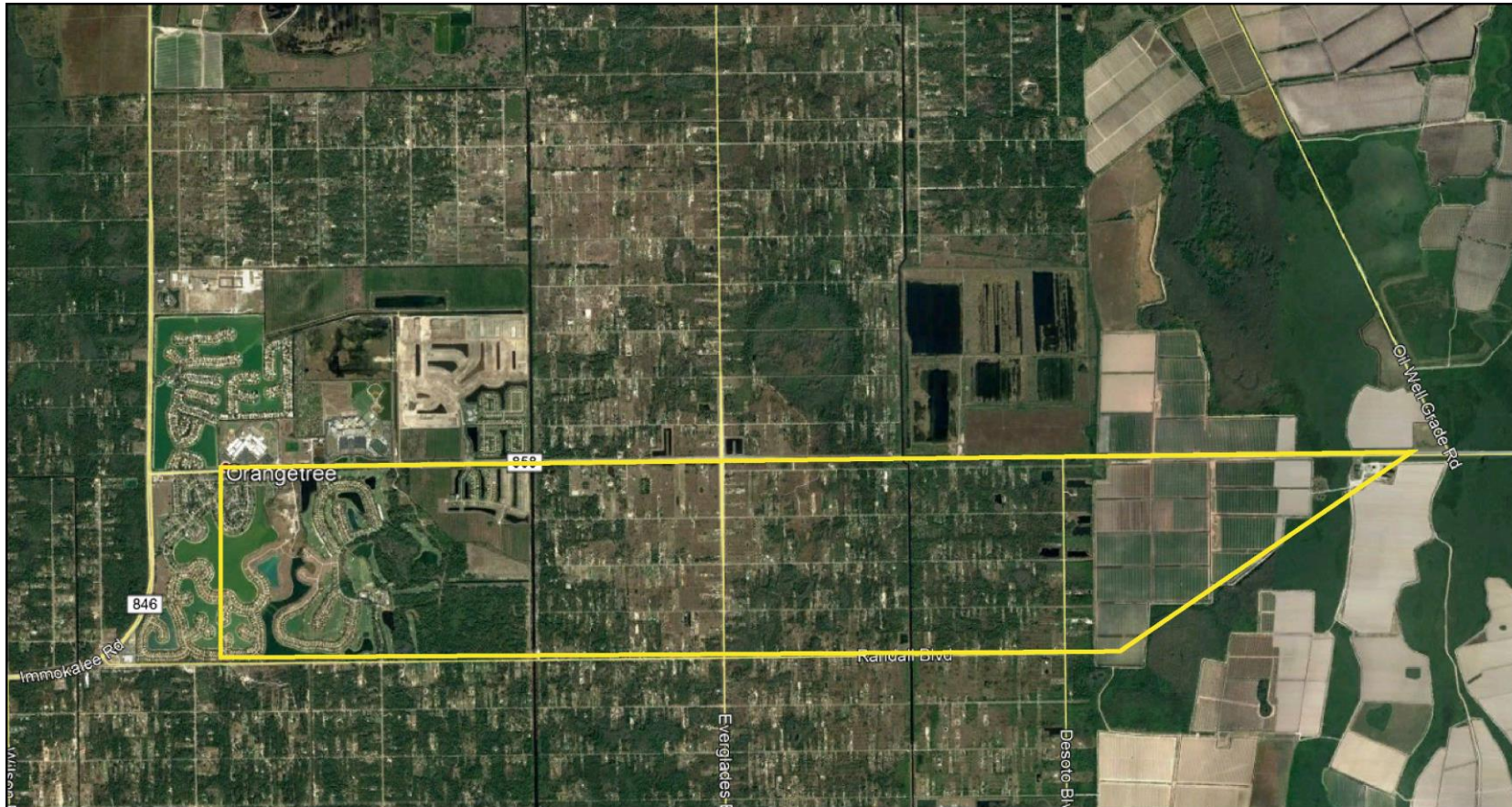


Figure 5. 2017 color aerial orthophotograph of the Randall Boulevard/Oil Well Road scope of work.



PREVIOUS RESEARCH

Southwest Florida has been a focus of archaeological investigations since the 1880s, although much of the early work was directed toward the recovery of museum quality artifacts rather than understanding cultural processes. Griffin (1988:48-50) discussed some of the very early references to archaeological sites in South Florida and noted that these early reports were mostly casual observations, and few appear to refer to southwest Florida, but rather to southeast Florida and the Florida Keys.

The first attempt to systematically survey of the area's archaeological sites was by Ales Hrdlička, who visited a number of sites along the coast and tidal mangrove estuaries in 1918, focusing on the Ten Thousand Island region (Hrdlička 1922). Hrdlička noted that southwest Florida was a distinct region within south Florida and made an attempt to type sites by function.

John M. Goggin was the first to define a south Florida cultural area (Glades Area), and describe south Florida ceramics (Glades ware), establishing a basis for later archaeological work. He published an analysis of the ceramic sequence in south Florida (Goggin 1939, 1940). In later reports (Goggin, 1947, 1949a, 1949b), he formulated a basic framework of cultural areas and chronologies that is still current (although modifications with additional data have been made, see further discussion below). Goggin (1949b) summarized much of this information in an unpublished manuscript, which Griffin (1988) described.

Most of the earlier studies focused on the coastal sites. Recent work in the interior has made significant advances in documenting the extent of inland sites, especially in the Big Cypress and Everglades parks (Ehrenhard et al. 1978, 1979; Ehrenhard and Taylor 1980). Griffin's (1988) synthesis of the Everglades Park data is the defining work on south Florida archaeology to date.

Three miles west of the project study area AHC surveyed the Piper's Grove Parcel (aka Twin Eagles) (Carr et al. 1994). Other studies were done to the northwest between Moulder and Rivers Roads on the 20-acre Hunt Parcel (Beriault 1998) and on the four-square-mile SR 846 Parcel (Beriault 2001). In 2002 AHC archaeologists conducted a Phase I assessment of a 500-acre area to the north and east at the Immokalee Road South Parcel in which ten archaeological sites were assessed (Beriault et al. 2006). All of these projects resulted in the discovery of archaeological sites, indicating that the general area has the potential to contain a high concentration of archaeological features and sites. Other work by AHC at the 150-acre Woodsedge Parcel yielded no sites, suggesting the sites may mostly occur in high-ground areas vegetated in hammock (Beriault 2005).

LITERATURE REVIEW

A search was requested on February 8, 2019 with the Florida Division of Historic Resources for archives and literature associated with the project area. This included site forms and cultural resource reports from the Master Site File in Tallahassee on and within one mile of the project parcel.

Table 1. Literature Review Summary

Previously Recorded Sites:	1 (linear resource 8CR965)
Within Project Parcel	1
Within Mile of Project Parcel	0
Previous Assessments:	9
In Project Parcel	5
Within One Mile of Project Parcel	4

A review of Florida site files determined that one previously recorded site occurs within the project parcel (Table 2). The Collier Enterprise Tram Linear Resource, 8CR965 is an approximately 1 mile in length and 2m wide linear trail with a dilapidated wooden bridge. The majority of the trail occurs to the east of the project area, although the very westernmost extent of the trail enters the project area in the northeast corner and curves to the south (terminating within the northeast corner of the project area). The trail was first reported in 2006 (Archaeological Consultants 2006), and while noted as being important to understanding local historic settlement, was similar to other trails and bridges found throughout the State.

Table 2. Previously Recorded Sites Summary¹

Site No.	Site Name	Site Type	References	In Survey Parcel	Outside of Parcel
8CR965	Collier Enterprises Tram	1950s farm road and trestle/linear resource	<i>Archaeological Consultants, 2007</i>	X	
Note: ¹ Based on sites within or within one mile of the project parcel.					

A review of the state report files indicated nine cultural resource assessments previously conducted within one mile of the project parcel (Table 3).

Table 3. Previous Cultural Resource Assessments

Date	Survey Number	Author	Title	In Parcel	Out of Parcel
1986	1108	Florida Preservation Services	<i>Historical/Architectural Survey of Collier County, Florida</i>		X
2001	6608	Archaeological and Historical Conservancy	<i>An Archaeological Survey of the County Road 846 (Immokalee Road) Expansion, Collier Boulevard (CR951) to Oil Well Road (CR858), Collier County, Florida</i>		X

Date	Survey Number	Author	Title	In Parcel	Out of Parcel
2005	16859	Panamerican Consultants	<i>An Archeological and Historical Survey of the Orange Blossom Ranch Project Area in Collier County, Florida</i>		X
2005	11274	Janus Research, Inc.	<i>Cultural Resource Assessment Survey of the FPL Collier-Orange River #3 230 KV Transmission Line: Segment E, Collier County, Florida</i>		X
2006	20017	Archaeological Consultants, Inc.	<i>Cultural Resource Assessment Survey Oilwell Road (CR 858), Collier County, Florida</i>	X	
2007	14434	Archaeological Consultants, Inc.	<i>An Addendum to the Cultural Resource Predictive Model Collier Enterprises, LTD, Big Cypress Stewardship District, Collier County, Florida</i>	X	
2014	21625	Archaeological Consultants, Inc.	<i>Cultural Resource Assessment Survey Project Development and Environment Study Golden Gate Estates- Three Bridges 8th Street NE, 16th Street NE, and 47th Avenue NE, Collier County, Florida FPID No. 431895-1</i>	X	
2014	20785	Suncoast Archaeological Consultants, Inc.	<i>Phase I Cultural Resource Survey of the Golden Gate LDS Church, Collier County, Florida</i>	X	
2018	25172	Archaeological Consultants, Inc.	<i>Cultural Resource Assessment Survey of the Big Corkscrew Park Property, Collier County, Florida</i>	X	

Note: ¹Based on assessments within one mile of the project parcel.

Cultural Resource Search One Mile Buffer Collier County

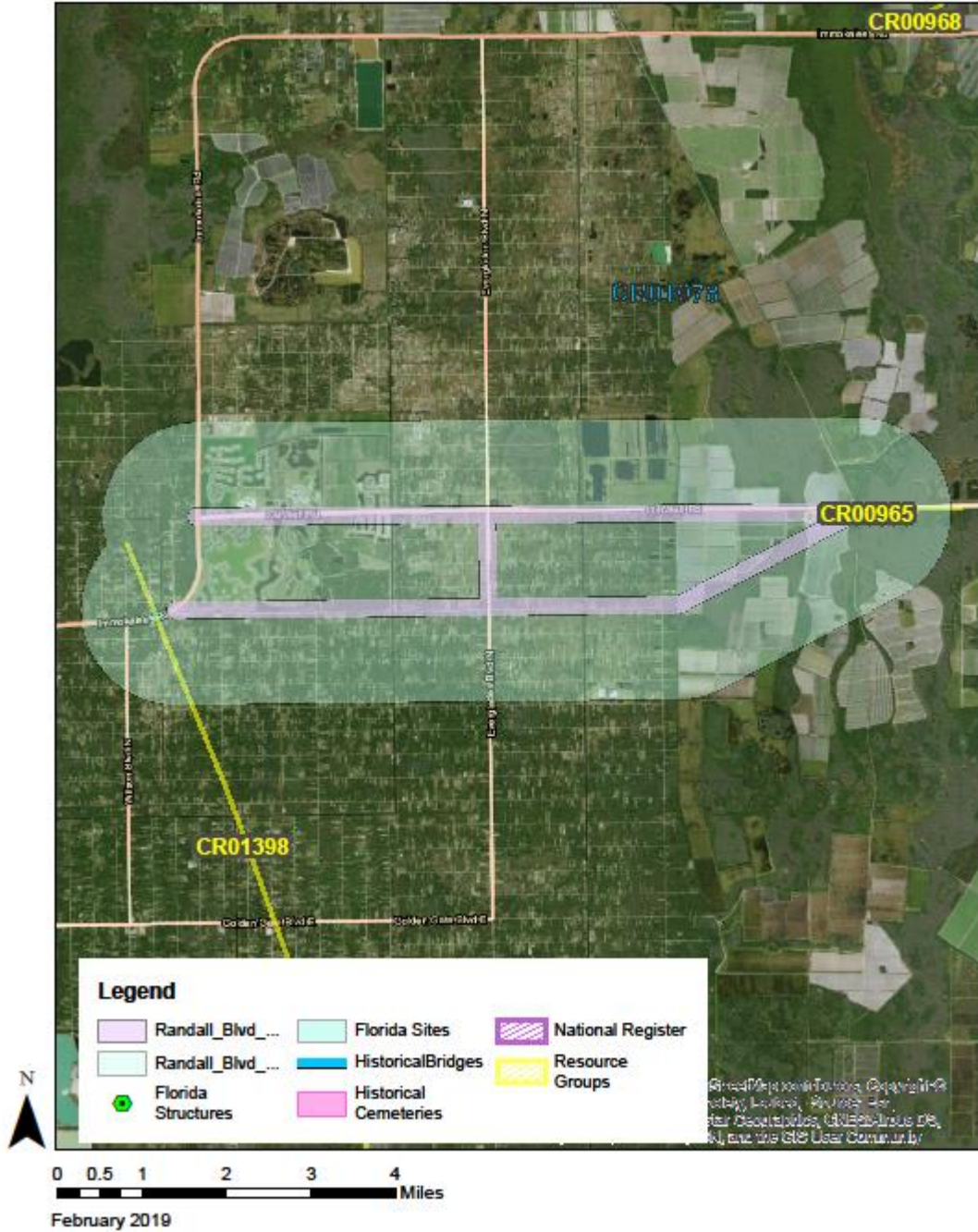


Figure 6. Previously recorded cultural resources within 500m of the project area.

METHODOLOGY

Prior to conducting fieldwork in the project parcel, relevant archives and literature were reviewed. This included, but was not limited to, studying previous archaeological reports for sites in Collier County, reviewing information from the Master Site File, and examining USGS maps of the project area. Also, black and white as well as color aerial photographs of the project area that could aid in revealing anthropogenic changes to the topography and floral communities, were interpreted.

RESEARCH DESIGN

The principal project goal was to identify known and potential cultural resources within the proposed project area. A predictive archaeological site model was used based on topographic and vegetative attributes that are associated with prehistoric and historic sites in interior Collier County. This model postulates that live oak, tropical hardwood, and cabbage palm hammocks in close proximity to drainage sloughs, marshes, and creeks/rivers are medium to high probability areas for archaeological sites. The elevational information on the USGS quadrangle map for the area also was used.

Based on a review of historic aerial photographs the project parcel was determined to have a low to moderate probability for archaeological sites based on the project area being characterized by circular shallow grass marshes surrounded by wire grass prairies and slash pine/saw palmetto flatwoods. Water sources in the project parcel were limited to several shallow grass ponds. Only a few small possible hardwood hammocks were identified and considered to be possible higher probability than the surrounding area.

FIELDWORK

In addition to the archival review, a reconnaissance survey was conducted across the proposed project area to document the project, noting any potentially historic structures or linear features and ground-truthing possible higher probability areas for archaeological sites. Photographs were taken across the project area. No subsurface testing was conducted.

RESULTS AND CONCLUSIONS

The archival review determined that historically the area was flat and relatively featureless with seasonal marsh ponds as indicated in the 1874 plat map (Figure 2). Much of the pine flatwoods are hydric in nature with seasonal flooding in the summer months. Based on the overall lack of observed uplands, the project corridor is considered to have a low probability for archaeological sites.

The few observable higher probability areas were subject to a reconnaissance windshield assessment and determined to be low-lying pine flatwoods, ponds, or cypress domes. One remnant hammock with larger established oak trees was observed (see Figures 10, 13, 14), That hammock directly abuts Randall Blvd, and within a formal CRAS should be considered medium probability and shovel tested at 50m intervals.

One previously recorded historical resource extends into the project area. The site, 8CR965, is a historic trail. While most of the trail is to the east of the project area appears to retain its integrity (Figure 11), the portion of the trail extending into the project corridor has been obscured and destroyed by modern clearing, improvements and development (Figure 12). This segment of the trail will have to be documented and the site form for 8CR965 updated if a CRAS is conducted of the project corridor.

Four bridges were identified crossing the two north-south canals. These bridges are common types, but were built between 1965 and 1966 and therefore, by being 50 years old or older, are considered historic, and will require documentation for the FMSF if a CRAS is conducted.



Figure 7. Randall Blvd, looking east in project corridor.



Figure 8. Project area, showing typical pine flatwoods.



Figure 9. Project area, vegetated in pine and palmetto.



Figure 10. 2017 aerial photograph of the Randall Blvd / Oil Well Road corridor showing previously recorded and potential cultural resources.



Figure 11. Historic trail, 8CR965, looking east outside of project area.



Figure 12. Location of historic trail, 8CR965, looking west into project area, showing trail to be obscured/destroyed by improvements and development.



Figure 13. Randall Blvd, looking west, showing remnant oak hammock.



Figure 14. Remnant oak hammock, looking north.



Figure 15. Easternmost bridge on Oil Well Road, looking northeast.



Figure 16. Easternmost bridge on Oil Well Road, bridge number and date.

REFERENCES CITED

Archaeological Consultants, Inc.

2006 Cultural Resource Assessment Survey Oilwell Road (CR 858), Collier County, Florida. Survey #20017 on file, Division of Historic Resources, Tallahassee, Florida.

Beriault, JG

1998 An Archaeological Survey of the Standerfer Parcel, Lee County, Florida. Archaeological and Historical Conservancy, Miami, FL. *AHC Technical Report #226*.

2001 An Archaeological Survey of the County Road 846 (Immokalee Road) Expansion, Collier Boulevard (CR 951) to Oil Well Road (CR 855), Collier County, Florida. Survey #6608 on file, Division of Historic Resources, Tallahassee, Florida.

Beriault, JB, JF Mankowski, and J Crump

2005 A Phase II Archaeological Assessment of Archaeological Sites 8CR831, 8CR832, 8CR834, and 8CR836, Immokalee Road South Parcel, Collier County, Florida.

Carr, RS, W Steele and J Davis

1994a A Phase I Archaeological and Historical Assessment of the Piper Tract, Collier County, Florida. April, 1994.

1994b A Phase II Archaeological and Historical Assessment of the Piper Tract, Collier County, Florida. June, 1994.

Ehrenhard, JE, RS Carr, and RC Taylor

1978 *The Archaeological Survey of Big Cypress National Preserve: Phase I*. National Park Service, Southeast Archaeological Center, Tallahassee, Florida.

1979 *The Big Cypress National Preserve: Archaeological Survey Season 2*. National Park Service, Southeast Archaeological Center, Tallahassee, Florida.

Goggin, JM

1939 A Ceramic Sequence in South Florida. *New Mexico Anthropologist* 3:36-40.

1940 The distribution of pottery wares in the Glades Archaeological Area of South Florida. *New Mexico Anthropologist* 4:22-33.

1947 A Preliminary Definition of Archaeological areas and Periods in Florida. *American Antiquity* 13:114-127.

1949a Cultural Occupation at Goodland Point, Florida. *The Florida Anthropologist* 2(3-4): 65-91.

1949b The Archaeology of the Glades Area. Unpublished MS on file, SE Archaeological Research Center, NPS, Tallahassee, Fl.

1949c Cultural Traditions in Florida Prehistory. In J.W. Griffin (editor) *The Florida Indian and his Neighbors*. Winter Park, Florida: Rollins College.

Griffin, JW

1974 Archaeology and Environment in South Florida. In P.J. Gleason (ed.), *Environments of South Florida: Present and Past II*. Coral Gables: Miami Geological Society, pp 342-346.

Hrdlička, A

1922 *The Anthropology of Florida*. Deland, Florida: Publications of the Florida State Historical Society 1.

Appendix D
Natural Resources Technical
Memorandum

Natural Resource Evaluation Report

Randall Boulevard and Oil Well Road Corridor Study

Prepared For:



Prepared By:

Johnson Engineering, Inc.
(Sub to CH2M/Jacobs)

April 30, 2019

Executive Summary

Collier County initiated the Randall Boulevard and Oil Well Road Corridor Study (Study) to evaluate potential roadway network improvements near Randall Boulevard and Oil Well Road in Collier County, Florida.

Based on the review of available information from the Florida Fish and Wildlife Conservation Commission (FWC) and U.S. Fish and Wildlife Service (USFWS) in relation to the potential habitat impacts that may be associated with the proposed project, an effect determination was established for each federal and state-listed/protected species (including protected nonlisted wildlife species) that may occur in the project vicinity.

Considering mitigation measures (compensatory mitigation for the potential loss of listed species habitat and standard protection measures) that will be implemented prior to project construction, the following preliminary effect determinations are provided for the Recommended Build Alternative:

Protected Species and Habitats

No effect on the following federally protected species:

- Shorebirds including the roseate tern (*Sterna dougallii*), piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*)
- Florida scrub-jay (*Aphelocoma coelurescens*)
- Everglades snail kite (*Rostrhamus sociabilis plumbeus*)
- Red-cockaded woodpecker (*Picoides borealis*)
- West Indian manatee (*Trichechus manatus*)

May affect but is not likely to adversely affect the following federally-listed species:

- Eastern indigo snake (*Drymarchon corais couperi*)
- Wood stork (*Mycteria americana*)
- Crested caracara (*Caracara cheriway*)
- Florida bonneted bat (*Eumops floridanus*)
- Florida panther (*Puma concolor coryi*)

No adverse effects are anticipated to the following state-listed species:

- Florida burrowing owl (*Athene cunicularia*):
- Shorebirds including the snowy plover (*Charadrius nivosus*), least tern (*Sternula antillarum*), and black skimmer (*Rynchops niger*)
- Wading birds including the tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), and roseate spoonbill (*Platalea ajaja*)
- Southeastern American kestrel (*Falco sparverius paulus*)

May affect but is not likely to adversely affect the following state-listed species:

- Gopher tortoise (*Gopherus polyphemus*)
- Florida sandhill crane (*Antigone canadensis pratensis*)
- Big Cypress fox squirrel (*Sciurus niger avicennia*)

Two species which may occur in the project vicinity are not listed as threatened, endangered, or species of special concern (SSC), but receive other legal protection. The Florida black bear (*Ursus americanus floridanus*) may be affected, but it is not likely to be adversely affected. The project has no effect on the bald eagle (*Haliaeetus leucocephalus*).

Based on USFWS current guidelines, compensatory mitigation will be required to address the loss of panther habitat and potentially the loss of woodstork foraging biomass. Preliminary analysis indicates approximately 313.68 Panther Habitat Units (PHUs) may be required. The project's anticipated wetland mitigation (2.58 credits from Panther Island Mitigation Bank) would provide 89.78 PHUs, with each wetland credit providing 34.80 PHUs. Remaining PHUs (± 223.90) would need to be purchased from an approved conservation bank. Currently, Panther Passage is selling each PHU for approximately \$850, resulting in the purchase of \$190,315 for additional panther mitigation. Each wetland credit at PIMB also has 0.31 Kg long hydroperiod & 1.06 Kg short hydroperiod wood stork credits associated with it, to help offset the potential loss of woodstork foraging associated with wetland impacts and/or permanent loss of surface waters. Preliminary analysis indicates the 2.58 wetland credits would offset lost foraging biomass associated with the project's wetland impacts.

Wetlands and Surface Waters

For the Recommended Build Alternative, approximately 21.62 acres of U.S. Army Corps of Engineers (USACE) and South Florida Water Management District (SFWMD) jurisdictional surface waters and 5.00 acres of jurisdictional wetlands are anticipated to be temporarily or permanently impacted. These impacts occur in manmade, excavated canals/ditches and disturbed wetland communities adjacent to the existing roadway. Collier County will address impacts to wetland and surface waters that require mitigation during the future permitting phase of this project. Preliminary functional assessment (UMAM) conducted for the wetland impacts indicate approximately 2.58 mitigation credits are needed to compensate for project impacts. The current price per wetland mitigation credit at Panther Island Mitigation Bank is currently \$105,000, resulting in an initial cost estimate for wetland mitigation at \$270,900.

Essential Fish Habitat

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (50 CFR Section 600.920), as amended through January 12, 2007 and as administered by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), federal agencies must consult with NMFS regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect Essential Fish Habitat (EFH).

No essential fish habitat is documented within or adjacent to the project limits; therefore, no essential fish habitat will be impacted.

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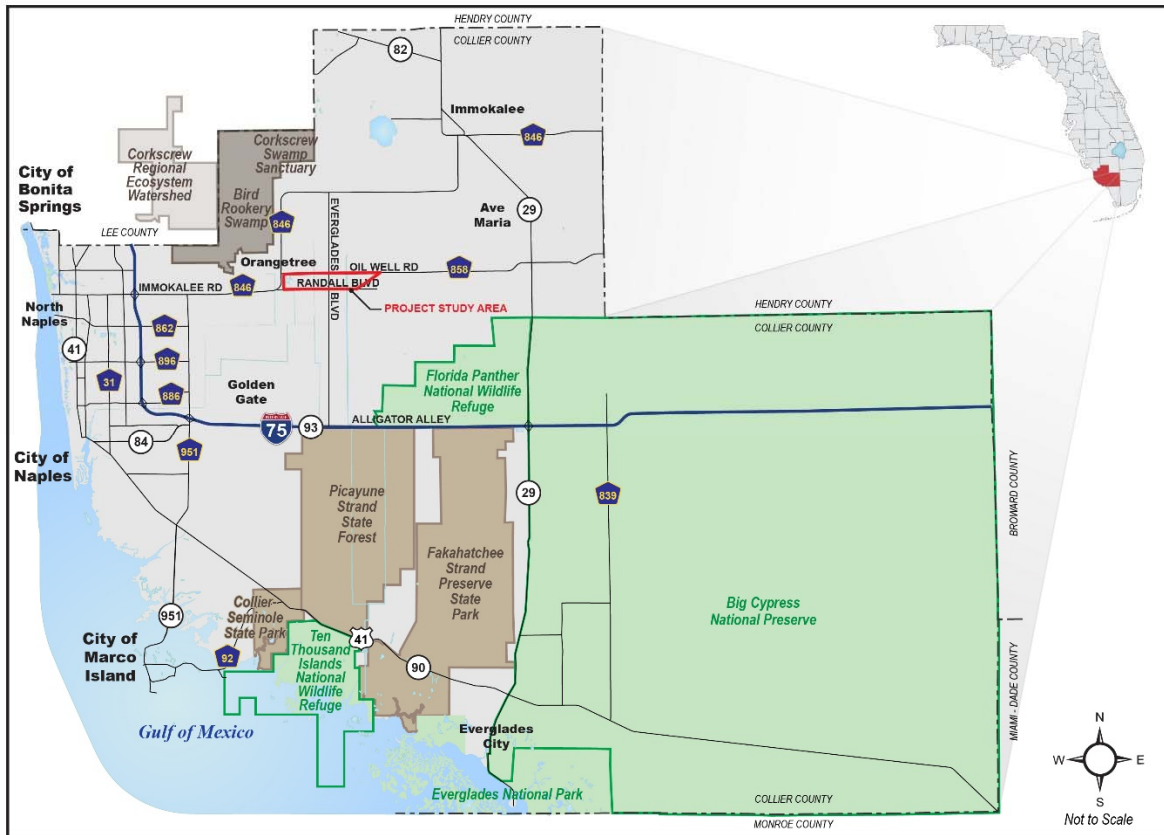
Acronyms and Abbreviations

BGEPA – Bald and Golden Eagle Protection Act
CA – Consultation Area
CFA – Core Foraging Area
CH – Critical Habitat
CREW – Corkscrew Regional Ecosystem Watershed
EFH – Essential Fish Habitat
ESA – Endangered Species Act
FAC – Florida Administrative Code
FDACS – Florida Department of Agricultural and Consumer Services
FDEP – Florida Department of Environmental Protection
FDOT – Florida Department of Transportation
FLUCCS – Florida Land Use, Cover and Forms Classification System
FNAI – Florida Natural Areas Inventory
FS – Florida Statute
FWC – Florida Fish and Wildlife Conservation Commission
GIS – Geographic Information Systems
LOS – Level of Service
LRTP – Long Range Transportation Plan
MBTA – Migratory Bird Treaty Act
MUID – Map Unit Identified
ROW – Right-of-Way
SFH – Suitable Foraging Habitat
SFWMD – South Florida Water Management District
SSC – Species of Special Concern
UMAM – Uniform Mitigation Assessment Methodology
USACE – U.S. Army Corps of Engineers
USFWS – U.S. Fish and Wildlife Service

1.0 Introduction

1.1 Project Overview

Collier County initiated the Randall Boulevard and Oil Well Road Corridor Study (Study) to evaluate potential roadway network improvements near Randall Boulevard and Oil Well Road in Collier County, Florida. The study is located in northern Collier County, east of I-75. **Figure 1-1** presents the Regional Location Map.



Regional Location Map
Randall Boulevard Corridor Study - Collier County, Florida

Figure 1-1. Regional Location Map

The Study involves the evaluation of potential improvements to existing Randall Boulevard, Oil Well Road, Desoto Boulevard and Everglades Boulevard, as well as potential corridors on a new alignment. **Figure 1-2** presents the Project Location Map. The study process involves the development of alternatives, a comparative evaluation of the social and environmental effects and the overall cost of each option.



Figure 1-2. Project Location Map

1.2 Purpose of Corridor Study

The Collier Metropolitan Planning Organization (MPO) 2040 Long Range Transportation Plan (LRTP) approved in December 2015, identified the following facilities with a high degree of future congestion:

- Randall Boulevard east of Immokalee Road
- Oil Well Road between Everglades Boulevard and Oil Well Grade Road

During the development of the Needs Plan for the LRTP, this Study was identified to better define the most appropriate multi-lane improvements and/or new roadway within the study area.

The purpose of the project is to develop an east-west corridor that will reduce congestion and improve traffic flow in the study area and accommodate future travel demand through 2045. Without the proposed improvements, Oil Well Road and Randall Boulevard are projected to be highly congested before the year 2040. This Study considers traffic operation improvements such as roundabouts, grade separated overpasses, frontage roadways, access management, and new traffic signal locations for the Recommended Build Alternative.

1.3 Project Needs

Oil Well Road and Randall Boulevard are parallel east-west routes. They serve as a primary connection to Immokalee Road for the existing and future developments of Orangetree, northern Golden Gate Estates, rural residential areas, and future planned development. Immokalee Road is critical in facilitating movement of local and regional traffic (including truck traffic) in northern Collier County. Additionally, Immokalee Road is one of three east-west connections to I-75 in Collier County and is the only east-west connection from I-75 in northern Collier County that connects to northeastern Collier County.

The needs of the project are to:

- **Reduce congestion** for future traffic needs due to population and employment growth
- **Enhance regional mobility** and access between I-75 and eastern Collier County, as well as improve freight (truck), transit, bicycle and pedestrian access
- **Improve safety** by reducing vehicle, bicycle and pedestrian user conflicts
- **Improve emergency evacuation** by increasing the number of residents from eastern Collier County that can be evacuated and access times for emergency responder

2.0 Alternatives Development

2.1 Initial Alternatives

The corridors were developed to evaluate an east-west corridor that will reduce congestion and improve traffic flow in the study area and accommodate future travel demand through 2045. The development of potential corridors to be studied as part of this project was carried out in stages. Initially, the project was broken into segments defined as follows:

- New Alignment "S-Connector" – connecting Randall Blvd to Oil Well Road
- Randall Blvd - from Immokalee Road to Everglades Blvd (or the S-Connector proposed intersection)
- Randall Blvd - from Everglades Blvd (or the S-Connector proposed intersection) to DeSoto Blvd
- Randall Blvd - from DeSoto Blvd to Oil Well Road (new alignment)
- Oil Well Road – from Everglades Blvd (or the S-Connector proposed intersection) to Oil Well Grade Road
- Everglades Blvd – from Randall Blvd to Oil Well Road

DeSoto Blvd – from Randall Blvd to Oil Well Road Initial alternatives were developed based on the Collier MPO 2040 LRTP as stated in Section 1.2. All alternatives propose a new connection from Randall Boulevard east of Desoto Boulevard N to Oil Well Road just west of Oil Well Grade Road. Four alternatives were developed and presented at the Initial Alternatives Public Meeting on May 24, 2018.

The No Build Alternative is included in the study and serves as a baseline for comparison with the Recommended Build Alternative.

2.2 No Build Alternative

The No Build (No Action) Alternative includes highway facilities that are likely to exist in 2040. This includes the existing highway network, which is part of all alternatives in addition to the highway improvements that are identified in the *Collier County MPO 2040 Long Range Transportation Plan* and the *FDOT's Transportation Improvement Program Projects*. The No Build Alternative includes those projects that provide for an increase in capacity, such as new roadway construction, widening projects, and major interchanges. Distinct benefits and limitations associated with this alternative are described below.

Benefits:

- No impedance to traffic flow during construction,
- No expenditure of funds for right of way acquisition, engineering, design or construction,
- No impact to the adjacent natural, physical, and human environments, and
- No disruption to existing land uses due to construction-related activities.

Limitations:

- Increase in traffic congestion and road user costs, unacceptable level of service, and an increase in accidents associated with an increase in travel times and traffic volumes due to excessive delays,
- Increase in carbon monoxide levels and other air pollutants caused by an increase in traffic congestion,
- Increase in maintenance costs due to roadway and structure deterioration,
- Increase in emergency service response time in addition to an increase in evacuation time during weather emergencies because of heavy congestion,
- Increase in safety-related accidents due to heavy congestion, and

- Potential increase in safety-related accidents due to less than desirable levels of service and access management.

The No Build Alternative shall remain a viable alternative through the public involvement process. The final selection of an alternative will not be made until all impacts are considered and responses to the public hearing comments have been evaluated.

2.3 Viable Alternatives

A qualitative analysis was initiated to reduce and refine a wide range of roadway alignments for each initial alternative segment down to a specific improvement program, thereby eliminating from consideration infeasible or non-viable alternatives. Based on public comment, traffic analysis, a comparative evaluation, and careful consideration, a consensus was reached to eliminate Initial Alternatives 3 and 4 from further consideration, since they provided no additional benefit over Initial Alternatives 1 and 2.

Initial Alternatives 1 and 2 were carried forward in the study for further evaluation as Viable Alternatives 1 and 2. Both viable alternatives were refined based on public and agency comments, future traffic demand, planning consistency and the minimization and/or avoidance of environmental impacts and costs.

2.4 Recommended Build Alternative

Based on the analysis of the viable alternatives, public comment, and purpose and need satisfaction, including the traffic analysis and regional long-range plans, a consensus was reached to eliminate Viable Alternative 1. The proposed S-Connector cannot provide a connection to Vanderbilt Beach Road extension, and moves more traffic to Immokalee Road and, therefore, does not provide the long-term benefit to the region. Given the regional mobility needs, and higher environmental impacts and costs, Viable Alternative 1 was eliminated from further evaluation. Therefore, Viable Alternative 2 is proposed as the Recommended Build Alternative.

Viable Alternative 2 improvements are presented on the following page as Figure 2-1 and include:

- Widening Randall Boulevard from 2 lanes to 6 lanes between 8th Street NE and Everglades Boulevard
- Widening Randall Boulevard from 2 lanes to 4 lanes between Everglades Boulevard and the Future Big Cypress Parkway
- Widening Everglades Boulevard from 2 lanes to 4 lanes between Oil Well Road and Randall Boulevard
- Widening Oil Well Road from 4 lanes to 6 lanes between Everglades Boulevard and Oil Well Grade Road

SECTION 2 – ALTERNATIVES DEVELOPMENT

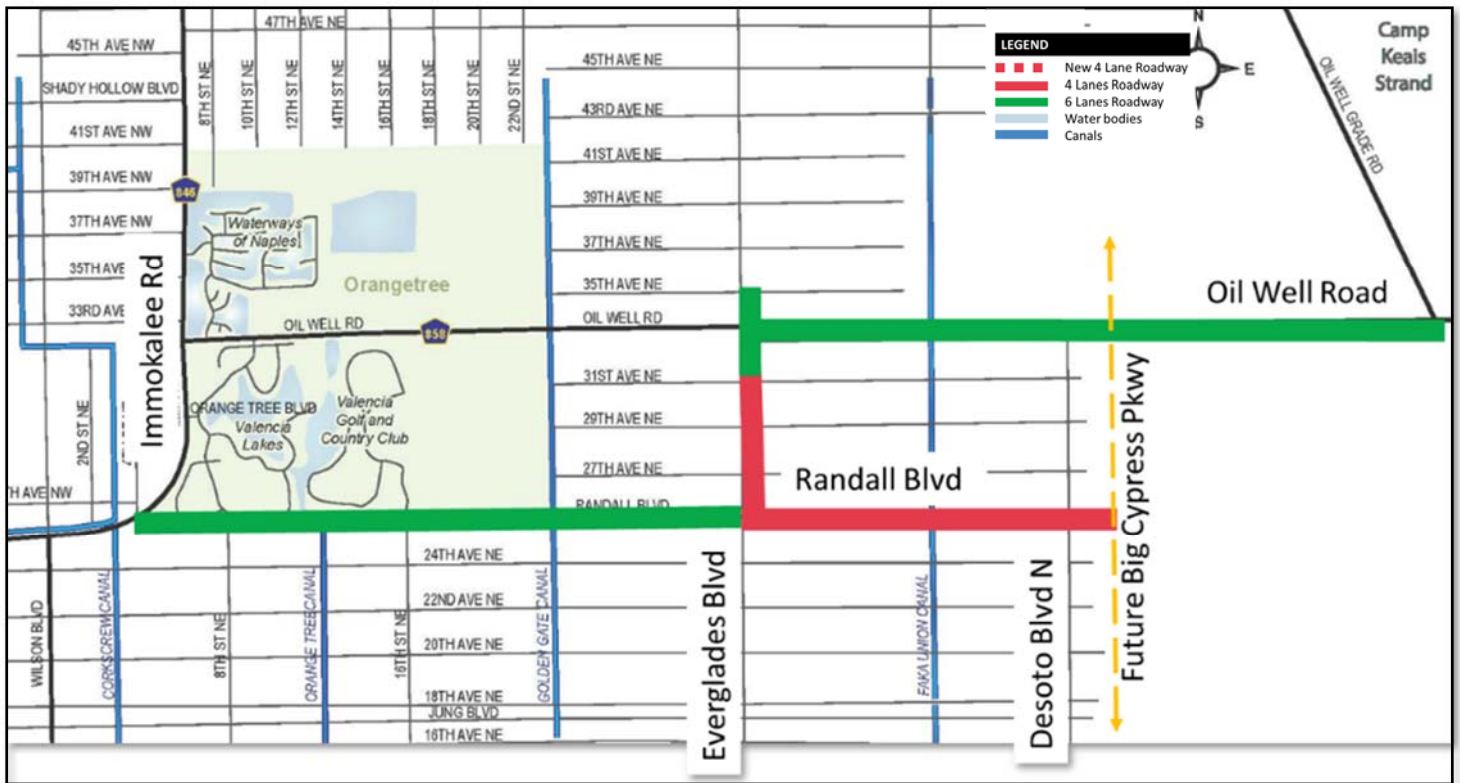


Figure 2-1. Recommended Build Alternative

3.0 Existing Environmental Conditions

3.1 Habitat and Land Use

Habitat and land use mapping were classified in accordance with the methodology set forth in the Florida Land Use, Cover and Forms Classification System (FLUCCS) (FDOT, 1999). Land use was first reviewed within the study area using the 2008 data layers from the South Florida Water Management District (SFWMD). Habitats were subsequently field verified on November 8-10, and a project-specific FLUCCS map was prepared. The FLUCCS map was then updated in April 2019 to reflect obvious changes in land use that had occurred since the initial 2017 mapping exercise. **Figure 3-1** depicts the most current land use and land cover classifications within the study area. **Table 3-1** provides a summary of the land use/land cover types. Descriptions of the project area land uses are provided in **Appendix A**.

The major land use/land cover classifications within the study area include rangeland (~29%) with varying degrees of disturbance, such as Dry Prairie (FLUCCS 3110), Mixed Rangeland (FLUCCS 3300), Shrub and Brushland (FLUCCS 3200), and Palmetto Prairie (FLUCCS 3210); upland forest habitat (~17%) such as Pine Flatwoods (FLUCCS 4110) and Brazilian Pepper (FLUCCS 4220); agricultural land uses (~14%) such as Improved Pasture (FLUCCS 2110) and Row Crops (FLUCCS 2140); urban and built up land uses (~13%) comprised of varying density residential and commercial uses; Roads and Maintained Right-of-Way (FLUCCS 8140~12%); wetland habitats with varying degrees of disturbance (~9%) including Mixed Wetland Hardwoods (FLUCCS 6170 and 6172), forested Cypress habitats (FLUCCS 6210, 6216, 6240, and 6249), Hydric Pine Flatwoods (FLUCCS 6250 and 6259), Wetland Forested Mix (FLUCCS 6309), Wetland Shrub (FLUCCS 6318 and 6319) and Freshwater Marsh (FLUCCS 6410); surface waters (~4%) comprised of major canals (FLUCCS 5120) such as the Golden Gate Canal and Faka Union, Ditches (FLUCCS 5140), and Reservoirs less than 10 acres (FLUCCS 5340). **Appendix B** contains representative photos of the disturbed nature of the natural wetland habitats along the existing roadways.

3.2 Soils

The soils surveys of Collier County, Florida, published by the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) were reviewed for the project study area. According to the Soil Survey of Collier County (2018) approximately 40% of the soils in the study area are classified as state hydric. The most prevalent soils in the Recommended Build Alternative (greater than 5% cover), include Immokalee Fine Sand (MUID 7 – non-hydric), Basinger Fine Sand (MUID 17, hydric), Malabar Fine Sand (MUID 3, hydric), and Oldsmar Fine Sand (MUID 16, non-hydric). Project study area soil types are described in more detail in **Appendix C**. **Figure 3-2** illustrates the location of hydric soils in and around the project corridor.

3.3 Conservation Lands and Special Designations

Conservation Lands

Based upon review of the Florida Natural Areas Inventory (FNAI) data layers, there are no Florida managed conservation lands within the study area. However, there are a number of State managed lands in the project vicinity, including the Corkscrew Swamp Regional Ecosystem Watershed, Red Maple Swamp Preserve, and Winchester Head, as illustrated on the Conservation Lands Map (**Figure 3-3**). Although none overlap with the recommended alignment, there are also a number of private preserves adjacent to the project corridor that are under a conservation easement granted to the SFWMD as part of an approved Environmental Resource Permit (ERP) for the associated development.

Special Designations

There are no designated Outstanding Florida Waters (OFW) as defined in Chapter 62-302 of the Florida Administrative Code (FAC) in the study area. According to the State of Florida, F.A.C, Chapter 62-302.400

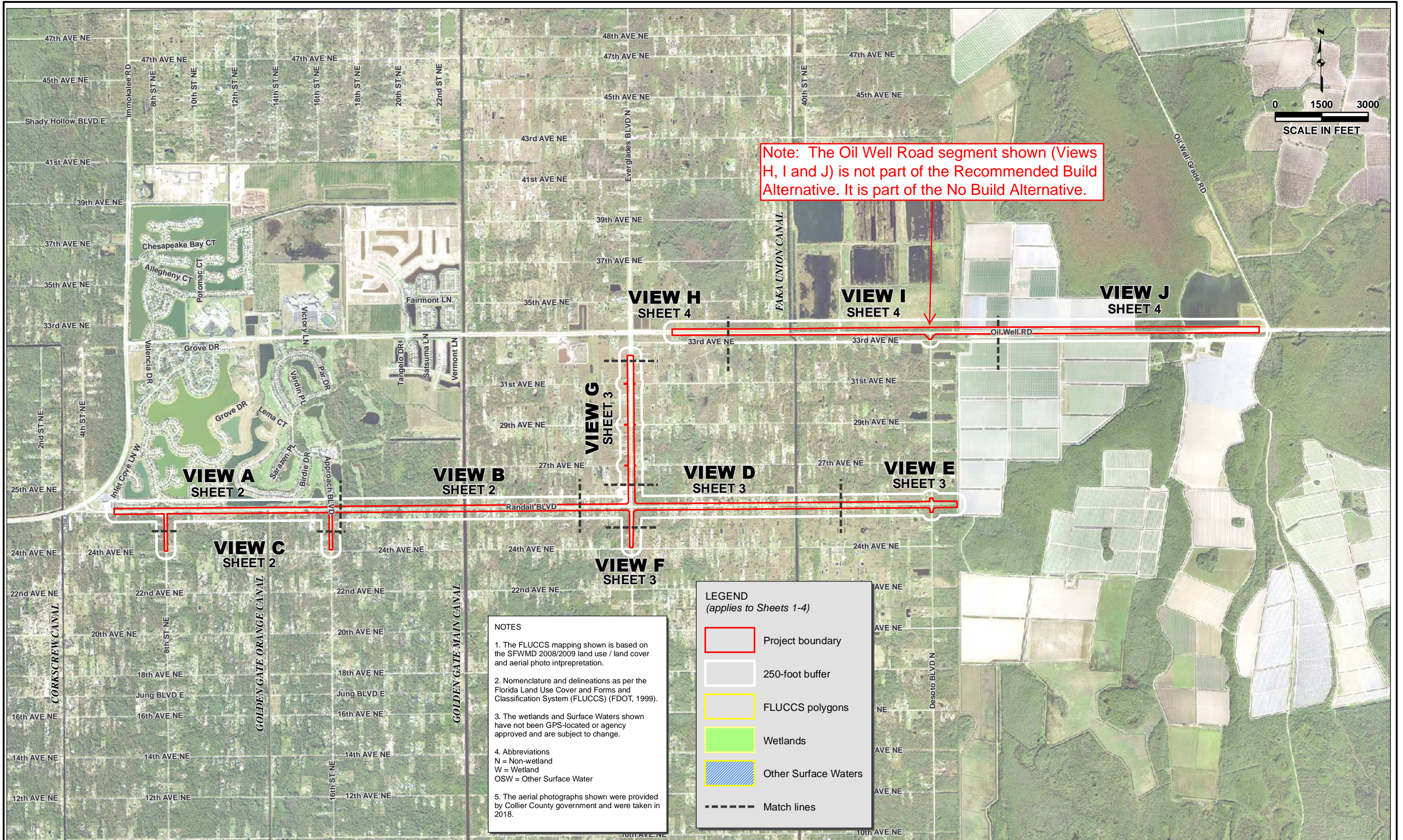
(August 5, 2010), all other waters within the study area have been designated as Class III waters. Because these canals do not provide breeding or nursery area for marine fish species, no essential fish habitat occurs in the study area.

Table 3-1. Existing Land Use/Land Cover (FLUCCS) within the Study Area

FLUCCS Code	FLUCCS Description	Approx. Area in Acres	Percent of Total Project Area	
1000: URBAN AND BUILT UP	1100	Low density residential	44.03	4.94%
	1110	Low density fixed single family units	5.23	0.59%
	1180	Residential rural - 1 unit on 2 or more acres	172.14	19.33%
	1210	Medium density fixed single family units	21.60	2.43%
	1260	Medium density residential golf	8.77	0.98%
	1410	Commercial shopping center	1.35	0.15%
	1722	Church	4.58	0.51%
	1754	Florida Forest Service	1.19	0.13%
1820	Golf course	7.26	0.82%	
Total		266.15	29.89%	
2000: AGRICULTURE	2110	Improved pasture	22.48	2.52%
	2140	Row crops	91.32	10.26%
Total		113.80	12.78%	
3000: RANGELAND	3100	Herbaceous (dry prairie)	10.03	1.13%
	3109	Herbaceous (dry prairie), disturbed	0.42	0.05%
	3200	Shrub and brushland	12.57	1.41%
	3209	Shrub and brushland, disturbed	32.82	3.69%
	3210	Palmetto prairie	18.02	2.02%
	3300	Mixed rangeland	23.28	2.61%
	3309	Mixed rangeland, disturbed	67.94	7.63%
Total		165.08	18.54%	
4000: UPLAND FOREST	4110	Pine flatwoods	62.63	7.03%
	4220	Brazilian pepper	24.52	2.75%
Total		87.15	9.79%	
5000: WATER	5120	Major canals	4.73	0.53%
	5140	Ditches	21.59	2.42%
	5300	Streams and waterways	9.21	1.03%
	5340	Reservoirs less than 10 acres	8.62	0.97%
Total		44.15	4.96%	
6000: WETLANDS	6170	Mixed wetland hardwoods	2.89	0.32%
	6172	Mixed wetland hardwoods - mixed shrubs	22.96	2.58%
	6200	Wetland coniferous forest	4.54	0.51%
	6210	Cypress	16.04	1.80%
	6216	Cypress - mixed hardwoods	4.54	0.51%
	6240	Cypress-pine-cabbage palm	0.23	0.03%
	6249	Cypress-pine-cabbage palm, disturbed	0.68	0.08%
	6250	Hydric pine flatwoods	20.84	2.34%
	6259	Hydric pine flatwoods, disturbed	1.46	0.16%
	6309	Wetland forested mixed, disturbed	1.26	0.14%
	6318	Wetland shrub, predominantly willow	1.48	0.17%
	6319	Wetland shrub, disturbed	1.23	0.14%
6410	Freshwater marsh	2.21	0.25%	
Total		80.36	9.02%	
700: BARREN LAND	7400	Disturbed land	8.34	0.94%
	7401	Disturbed land, hydric	1.96	0.22%
Total		10.30	1.16%	
8000: TRANSPORTATION, COMMUNICATION & UTILITIES	8140	Road and maintained right-of-way	123.49	13.87%
Total		123.49	13.87%	
Totals for Alignment +250-foot buffer area		890.48	100.00%	

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NOTES

1. The FLUCCS mapping shown is based on the SFWMD 2008/2009 land use / land cover and aerial photo interpretation.
2. Nomenclature and delineations as per the Florida Land Use Cover and Forms and Classification System (FLUCCS) (FDOT, 1999).
3. The wetlands and Surface Waters shown have not been GPS-located or agency approved and are subject to change.
4. Abbreviations
N = Non-wetland
W = Wetland
OSW = Other Surface Water
5. The aerial photographs shown were provided by Collier County government and were taken in 2018.

LEGEND
(applies to Sheets 1-4)

- Project boundary
- 250-foot buffer
- FLUCCS polygons
- Wetlands
- Other Surface Waters
- Match lines

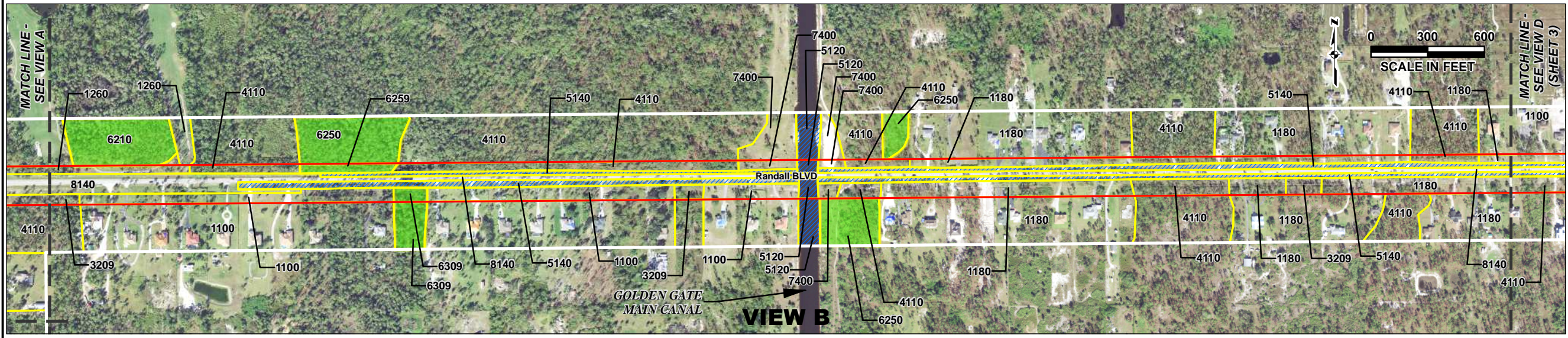
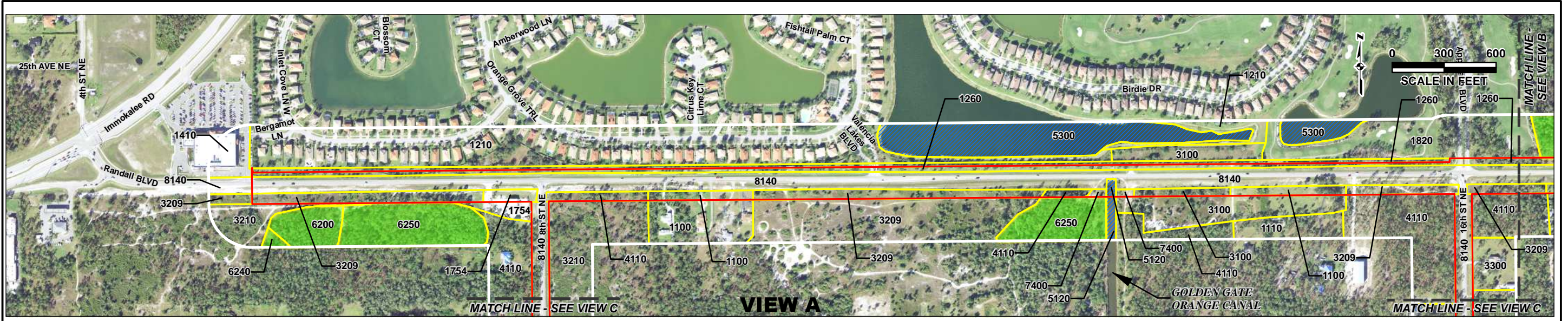


Randall Boulevard & Oil Well Road
Corridor Study
Collier County, Florida

Index Map
Preliminary FLUCCS Maps

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See Sheet 1 for Notes applicable to this sheet, legend and FLUCFCS table.

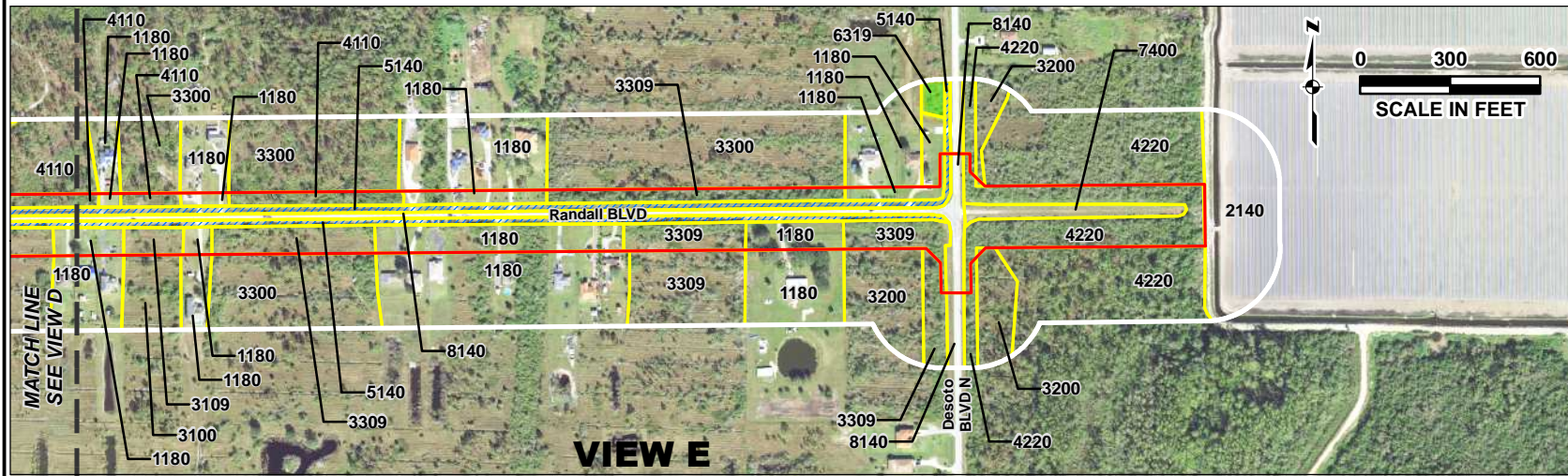
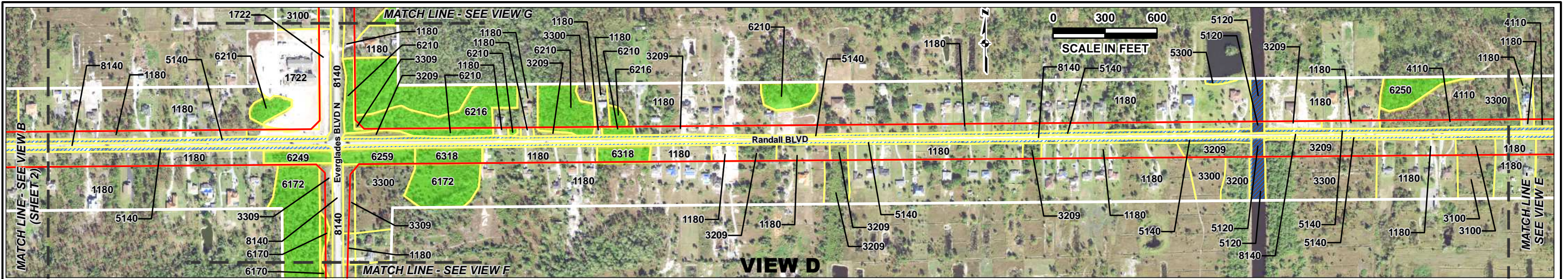


Randall Boulevard & Oil Well Road
Corridor Study
Collier County, Florida

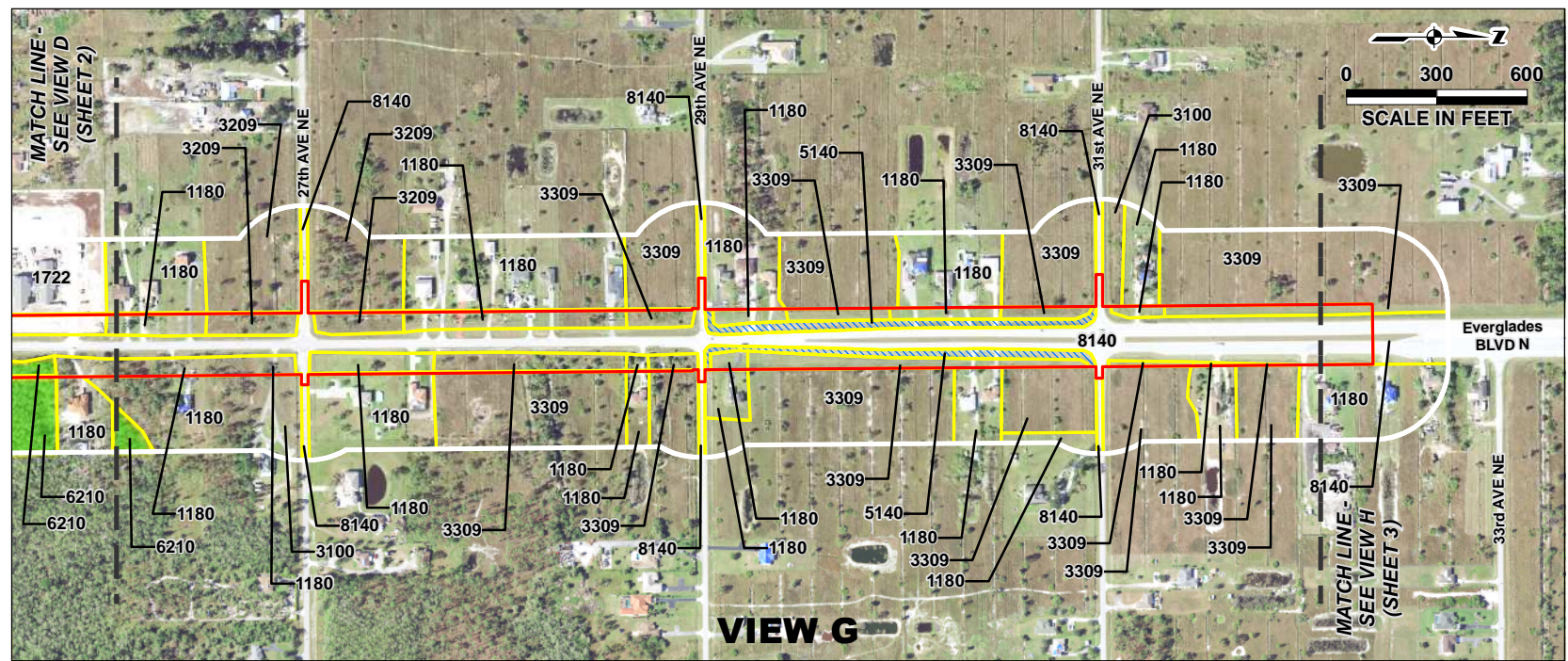
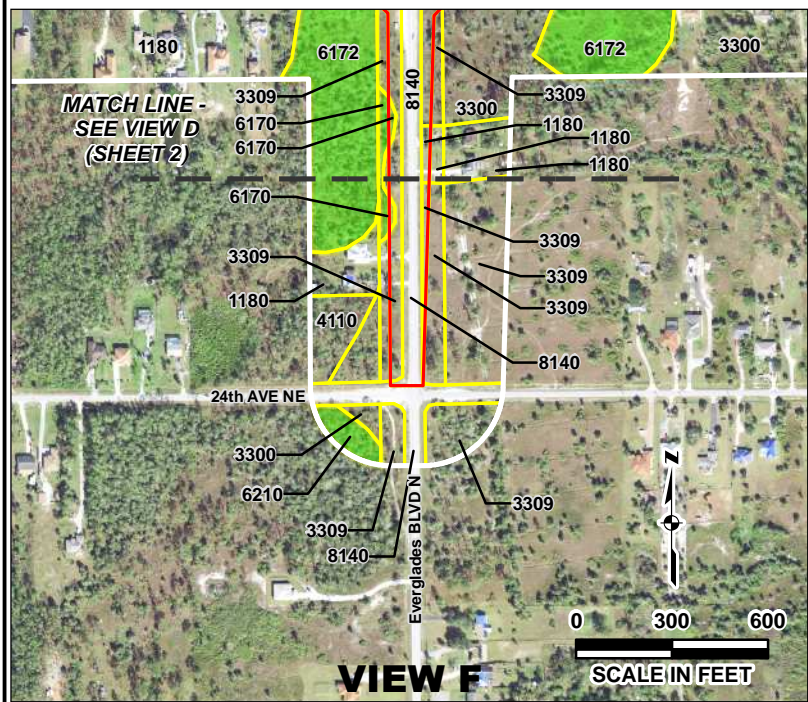
Preliminary FLUCCS Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
April 2019	20170252-000	--	As Shown	Fig. 3-1 (2)

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See Sheet 1 for Notes applicable to this sheet, legend and FLUCCS table.

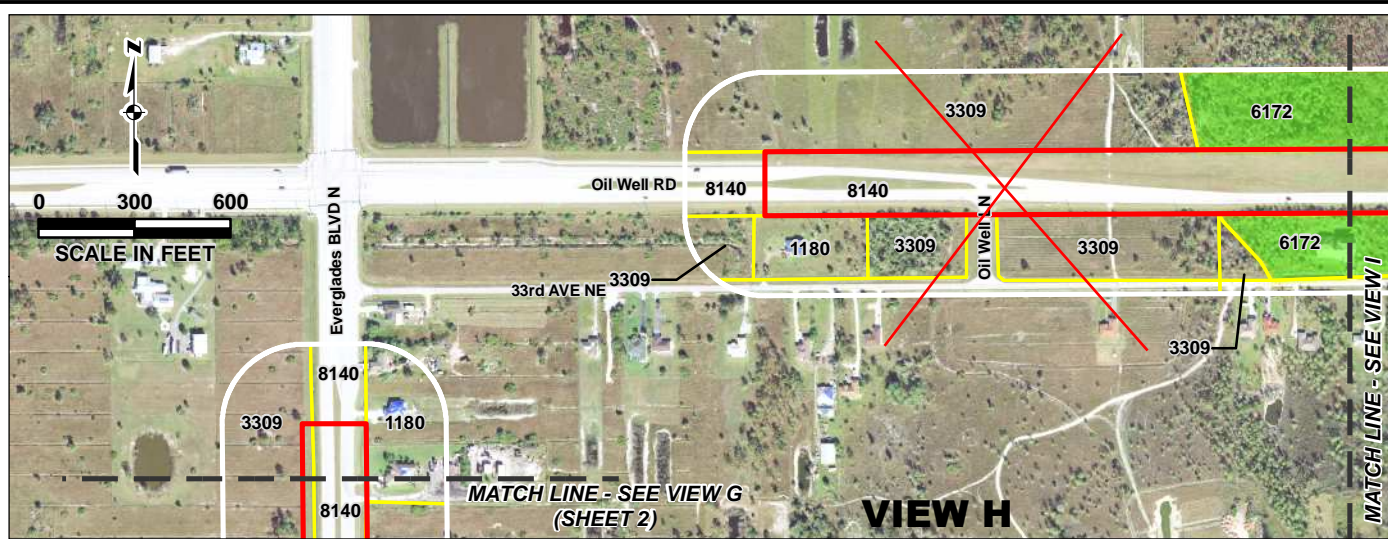


Randall Boulevard & Oil Well Road
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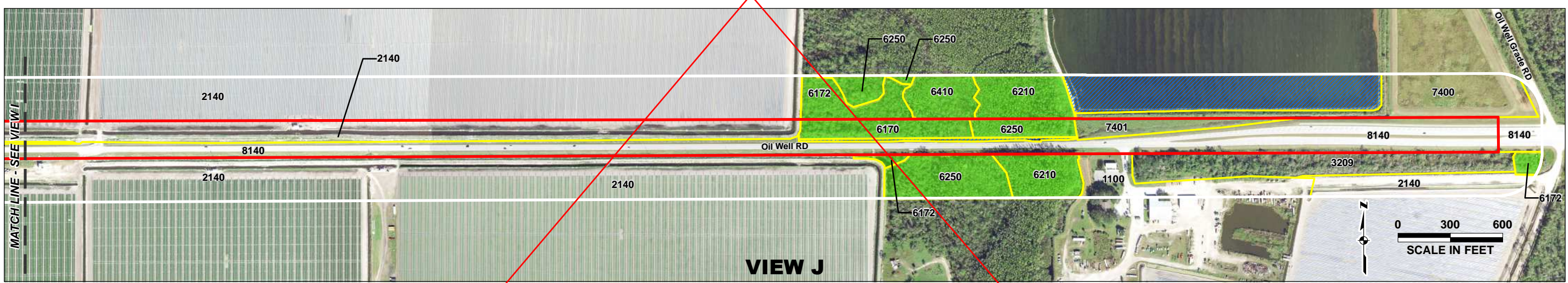
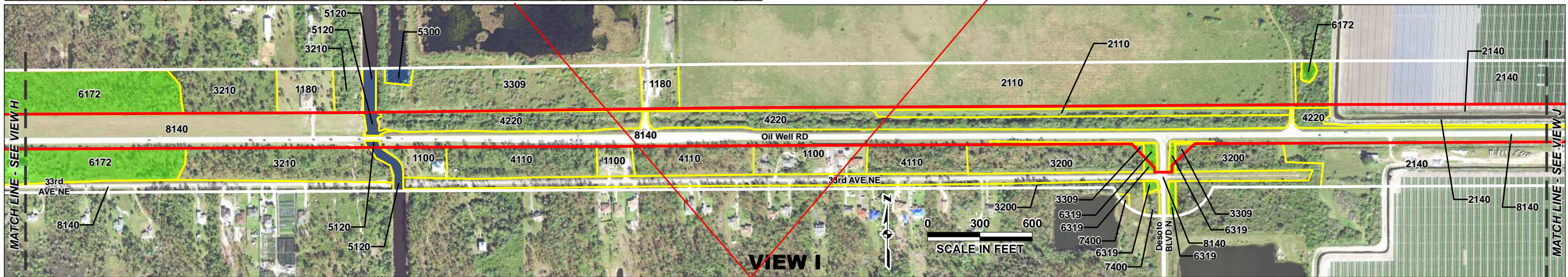
Preliminary FLUCCS Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
April 2019	20170252-000	-	As Shown	Fig. 3-1 (3)

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Note: The Oil Well Road segment illustrated in Views H, I, and J is not part of the Recommended Build Alternative. It is part of the No Build Alternative.



See Sheet 1 for Notes applicable to this sheet, legend and FLUCCS table.



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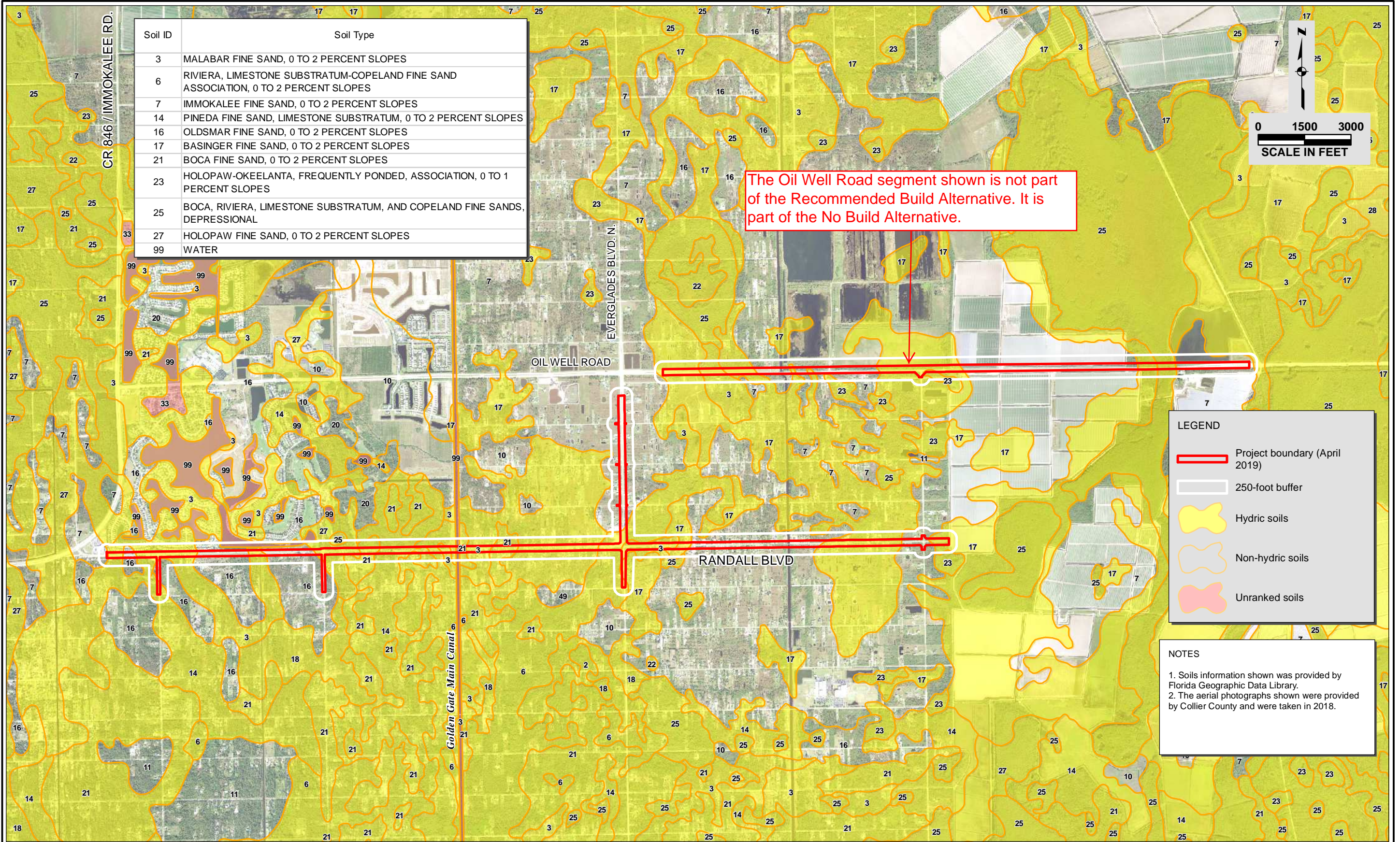
Preliminary FLUCCS Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
April 2019	20170252-000	--	As Shown	Fig. 3-1 (4)

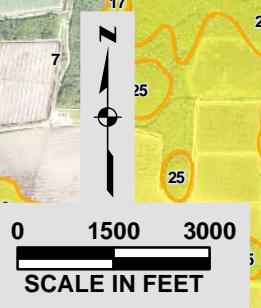
Table 3-2. Existing NRCS Soil Types within the Recommended Alignment

MUID	Soil Type	Hydric Status	Percent within Alignment
3	Malabar Fine Sand, 0 to 2 Percent Slopes	Hydric	17.34%
6	Riviera, Limestone Substratum-Copeland Fine Sand Association, 0 to 2 Percent Slopes	Hydric	2.65%
7	Immokalee Fine Sand, 0 to 2 Percent Slopes	Non-hydric	41.09%
14	Pineda Fine Sand, Limestone Substratum, 0 to 2 Percent Slopes	Hydric	3.25%
16	Oldsmar Fine Sand, 0 to 2 Percent Slopes	Non-hydric	7.89%
17	Basinger Fine Sand, 0 to 2 Percent Slopes	Hydric	18.90%
21	Boca Fine Sand, 0 to 2 Percent Slopes	Hydric	4.40%
23	Holopaw-Okeelanta, Frequently Poned, Association, 0 to 1 Percent Slopes	Hydric	0.22%
25	Boca, Riviera, Limestone Substratum, and Copeland Fine Sands, Depressional	Hydric	1.14%
27	Holopaw Fine Sand, 0 to 2 Percent Slopes	Hydric	2.90%
99	Water	N/A	0.22%
Totals			100.00%

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Soil ID	Soil Type
3	MALABAR FINE SAND, 0 TO 2 PERCENT SLOPES
6	RIVIERA, LIMESTONE SUBSTRATUM-COPELAND FINE SAND ASSOCIATION, 0 TO 2 PERCENT SLOPES
7	IMMOKALEE FINE SAND, 0 TO 2 PERCENT SLOPES
14	PINEDA FINE SAND, LIMESTONE SUBSTRATUM, 0 TO 2 PERCENT SLOPES
16	OLDSMAR FINE SAND, 0 TO 2 PERCENT SLOPES
17	BASINGER FINE SAND, 0 TO 2 PERCENT SLOPES
21	BOCA FINE SAND, 0 TO 2 PERCENT SLOPES
23	HOLOPAW-OKEELANTA, FREQUENTLY PONDED, ASSOCIATION, 0 TO 1 PERCENT SLOPES
25	BOCA, RIVIERA, LIMESTONE SUBSTRATUM, AND COPELAND FINE SANDS, DEPRESSIONAL
27	HOLOPAW FINE SAND, 0 TO 2 PERCENT SLOPES
99	WATER



The Oil Well Road segment shown is not part of the Recommended Build Alternative. It is part of the No Build Alternative.

LEGEND

- Project boundary (April 2019)
- 250-foot buffer
- Hydric soils
- Non-hydric soils
- Unranked soils

NOTES

1. Soils information shown was provided by Florida Geographic Data Library.
2. The aerial photographs shown were provided by Collier County and were taken in 2018.

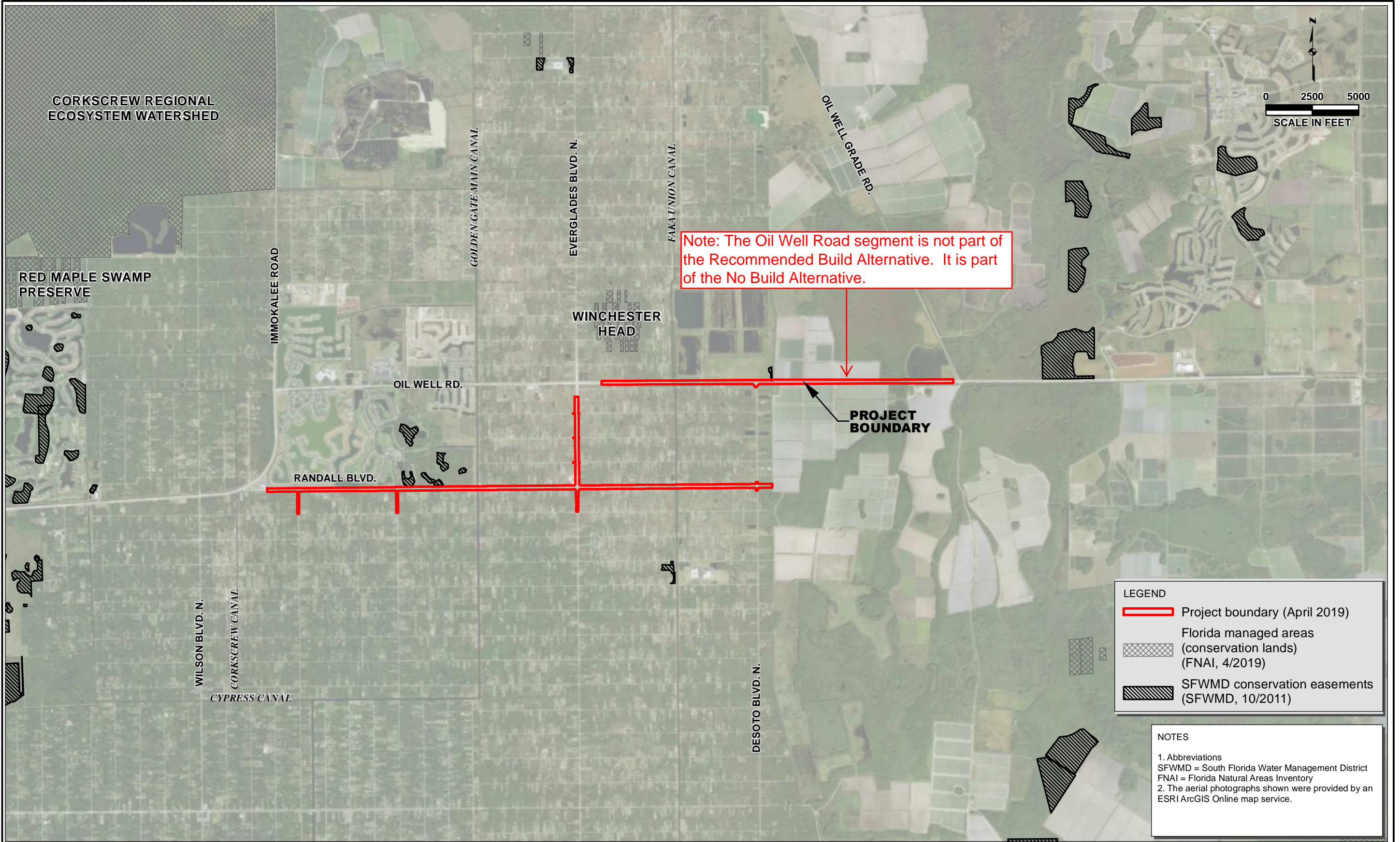


Randall Boulevard & Oil Well Road
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Soils Map

DATE April 2019	PROJECT NO. 20170252-000	FILE NO. --	SCALE As Shown	SHEET Fig. 3-2
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Randall Boulevard & Oil Well Road
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Conservation Lands

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
April 2019	20170252-000	--	As Shown	Fig. 3-3

4.0 Protected Species and Habitat

This project was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with 50 CFR Part 402 of the Endangered Species Act (ESA) of 1973, as amended, the Florida Endangered and Threatened Species Act, Section 379.2291, Florida Statutes (FS), and Part 2, Chapter 16 of the FDOT PD&E Manual titled Protected Species and Habitat. The project area does not fall within U.S. Fish and Wildlife (USFWS)-designated Critical Habitat (CH) for any species. The project falls entirely within the USFWS Consultation Areas (CA) and Focal Area of the Florida bonneted bat (*Eumops floridanus*). The project falls within the Core Foraging Areas (CFAs) of wood stork colonies 619041, 619310, Corkscrew, and North Catherine Island II. The western portion of the project area falls within the consultation area for the red-cockaded woodpecker (*Picoides borealis*). The project is within the Florida panther primary and secondary zones.

4.1 Agency Coordination

As outlined above, the project is within the CAs of multiple federally protected species and the primary and secondary zone of the panther focus area. Additionally, the Florida Fish and Wildlife Conservation Commission (FWC) receives many black bear nuisance calls within the vicinity of this project. As discussed below, panther habitat unit (PHU) credits are expected to be sufficient mitigation for the Florida panther. The U.S. Fish and Wildlife Service (USFWS) will evaluate the PHU compensation calculations associated with the project during the USACE permitting process. Collier County will follow best management practices during construction to minimize human-bear interactions associated with construction sites during project construction. Therefore, no additional involvement with the panther or black bear is anticipated. Species-specific surveys will be conducted for the Florida bonneted bat as part of the USACE permitting process for project construction and the need for further surveys during the design phase will be coordinated with the appropriate regulatory agencies (FWC and USFWS) during the SFWMD and USACE construction permitting processes, accordingly.

4.2 Methodology

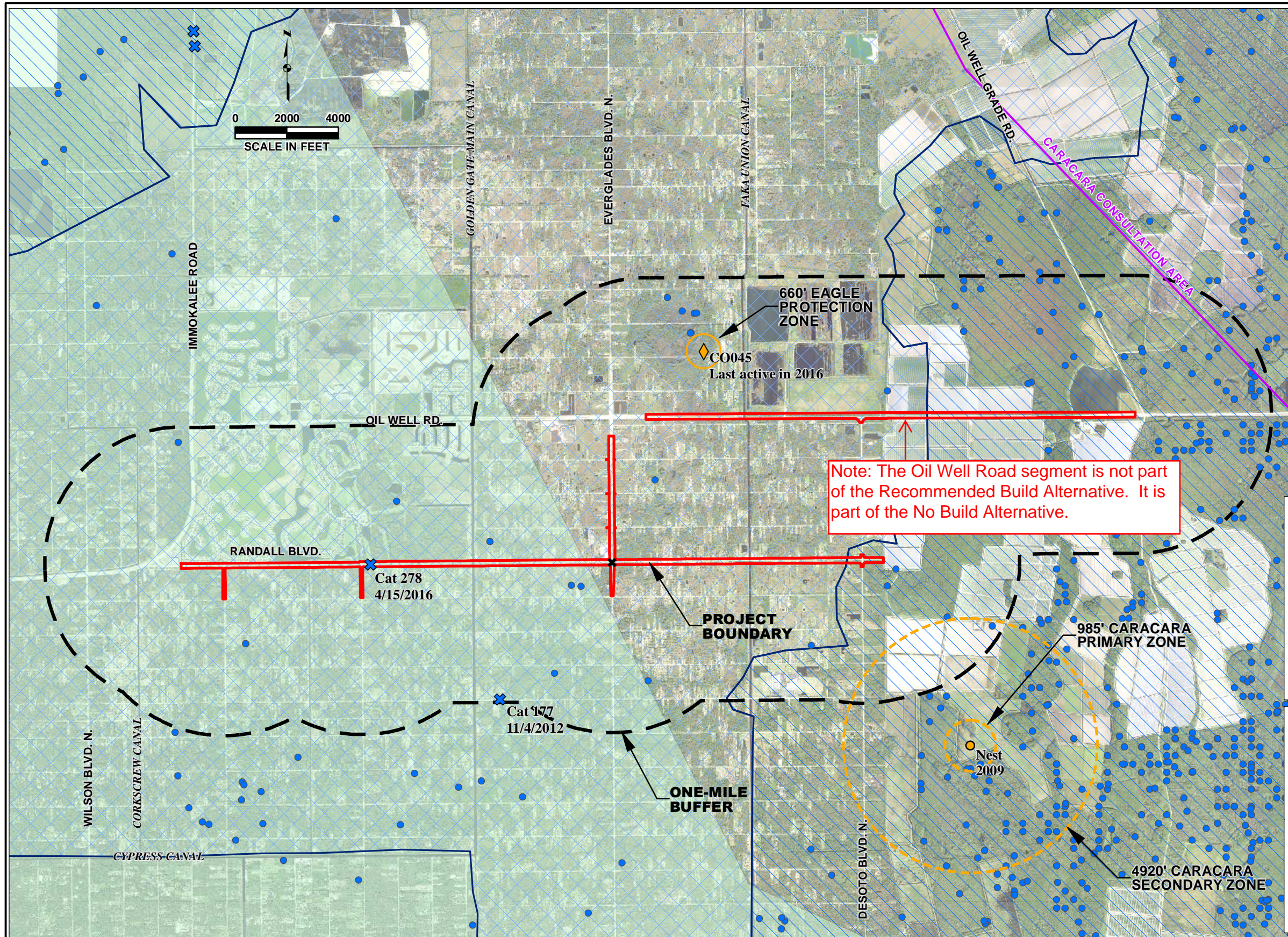
Literature reviews, agency database searches, and field reviews of potential habitat were conducted to identify state and federally protected species occurring or potentially occurring within the project area. The Collier County Soil Survey, recent aerial imagery (2016 at time of initial survey) and SFWMD land use/land cover mapping was reviewed to help determine habitat types occurring within and adjacent to the project corridor. Land use/land cover mapping was updated to reflect the current field conditions.

Information sources and databases reviewed for the project include the following:

- USFWS Information for Planning and Consultation (IPaC) Review (November 2017);
- USFWS ECOS – Environmental Conservation Online System, accessed November 10, 2017
- FNAI – Florida Natural Areas Inventory Tracking List, accessed November 10, 2017
- FWC Bald Eagle Nest Locator (2016-2017 nesting season data);
- FWC Scrub Jay (1993) and Red-Cockaded Woodpecker (RCW) (2005) Locations;
- USFWS Scrub Jay Locations (2011)
- USFWS Waterbird colony observations (2007);
- USFWS database for CA and CH for threatened and endangered species (2017);
- USFWS South Florida wood stork CFA (18.6-mile radius); and
- Documented caracara roosts and nest database (Morrison 2010 and 2014)

Figure 4-1 depicts field observations as well as historic species occurrences from database searches. Based on the results of database searches, preliminary field reviews, and review of aerial photographs and soil surveys, field survey methods for specific habitat types and tables of potentially occurring protected fauna and flora were developed.

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LEGEND

- Combined Woodstork core foraging areas (see Note 1) (USFWS, 2010)
- Bonneted bat consultation area (see Note 2) (USFWS, 2017)
- Bonneted bat focal area (See Note 3) (USFWS, 2017)
- RCW consultation area (USFWS, 2003)
- Caracara nests & observations (USFWS, 2014)
- Eagle nests (FFWCC, 2016)
- Panther telemetry (USFWS, 2017)
- Panther road kills (FGDL/FFWCC, 2017)
- Panther primary zone (USFWS, 2007)
- Panther secondary zone (USFWS, 2007)
- Caracara consultation area (USFWS, 9/2011)
- Indigo snake (FFWCC, 11/2018)

LAYERS / SPECIES CHECKED INCLUDE THOSE SHOWN AND:

- Scrub jay locations (FFWCC, 1993)
- Woodstork nests (USFWS, 2006)
- Caracara roosts (Morrison, 2010)
- Caracara nests (Morrison, 2014)
- RCW general locations (FFWCC, 2005)
- Wading bird colony observations (USFWS, 2007)
- Scrub Jay locations (USFWS, 2011)

NOTES

1. The project boundary and one-mile buffer are at least partly within Woodstork core foraging areas of colonies 619041, 619310, Corkscrew and North Catherine Island II.
2. The entire project boundary and one-mile buffer are within the Bonneted bat consultation area.
3. The entire project boundary and one-mile buffer are within the Bonneted bat focal area.
4. Abbreviations
USFWS = United States Fish and Wildlife Service
FFWCC = Florida Fish and Wildlife Conservation Commission
RCW = Red Cockaded Woodpecker
5. The aerial photographs shown were provided by Collier County government and were taken in 2018.



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Documented Occurrences of Listed Species

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Field reviews consisted of vehicular surveys and pedestrian surveys through natural areas and altered habitats within the study area with the potential to support protected species. In the absence of physical evidence of a protected species, evaluation of the appropriate habitat was conducted to determine the likelihood of a species being present. All natural areas were considered potential habitat for listed wildlife and plant species. Occurrences of listed species were recorded on project aerals. Project scientists conducted the general listed species surveys on November 13-14, 2017. At each field event, the field team consisted of an ecologist with a bachelor's degrees in a biological science, and several years of field experience in Florida ecosystems, and a certified wildlife biologist that holds a Ph.D., with research focused on the Florida panther.

To further summarize the results of desktop and field data collection efforts, each potential occurring species was assigned a likelihood for occurrence of "none", "low", "moderate", or "high" within habitats found in the project corridor and an indicator of suitable habitat proximity to the project area was assigned as "distant", "near", or "contiguous".

Likelihood of Species Presence

None – Species has been documented in Collier County, but due to complete absence of suitable habitat, could not be naturally present within the project corridor.

Low – Species with a low likelihood of occurrence within the project area are defined as those species that are known to occur in Collier County or the bio-region, but preferred habitat is limited in the project area, or the species is rare.

Moderate - Species with a moderate likelihood for occurrence are those species known to occur in Collier or nearby counties, and for which suitable habitat is well represented in the project area, but no observations or positive indications exist to verify presence.

High - Species with a high likelihood for occurrence are suspected within the project area based on known ranges and existence of sufficient preferred habitat in the area; are known to occur adjacent to the project; or have been previously observed or documented in the vicinity.

Habitat Proximity

Distant - Appropriate habitat is distant from the project footprint when accounting for the species' home range size and level of mobility.

Near - Appropriate habitat is near the project footprint when accounting for the species' home range size and level of mobility.

Contiguous - Appropriate habitat occurs within or immediately adjacent to the project footprint.

4.3 Results

Table 4-1 on the following page presents the potentially occurring and observed listed wildlife species in the study area. Listed species surveys will be required to be updated for the SFWMD and USACE permitting processes and may include species specific surveys not conducted for the subject corridor study.

Table 4-1. Potentially Occurring and Observed Listed Wildlife Species in the Study Area

Species	Common Name	FWC	USFWS	Habitat	Habitat Occurrence Relative to Project Footprint	Probability of Species Occurrence
REPTILES						
<i>Drymarchon corais couperi</i>	Eastern indigo snake	FT	T	Gopher tortoise burrows, canal banks, hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp	Contiguous	High
<i>Gopherus polyphemus</i>	Gopher tortoise	T	C	Old field, sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood	Contiguous	Moderate
BIRDS						
<i>Antigone canadensis pratensis</i>	Florida sandhill crane	T	-	Basin marsh, depression marsh, dry prairies, marl prairie, pastures, human-altered suburban landscapes	Contiguous	High
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	FT	T	Relict dune ecosystems or scrub on well drained to excessively well drained sandy soils	Near	Low
<i>Athene cunicularia floridana</i>	Florida burrowing owl	T	-	Native prairies and cleared areas with short groundcover	Near	Low
<i>Calidris canutus rufa</i>	Red knot	FT	T	Coastal marine and estuarine areas with large areas of exposed intertidal sediment	Distant	Low
<i>Caracara cheriway</i>	Crested caracara	FT	T	Wet and dry prairies, rangeland, citrus groves; nests primarily in cabbage palms and live oaks in Florida	Contiguous	Moderate
<i>Charadrius melodus</i>	Piping plover	FT	T	Sandy upper beaches, sparsely vegetated shores of shallow lakes, ponds, rivers, and impoundments	Distant	Low
<i>Charadrius nivosus</i>	Snowy plover	T	-	Beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds	Distant	Low
<i>Egretta caerulea</i>	Little blue heron	T	-	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	High
<i>Egretta rufescens</i>	Reddish egret	T	-	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Low
<i>Egretta tricolor</i>	Tricolored heron	T	-	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	High
<i>Falco sparverius paulus</i>	Southeastern American kestrel	T	-	Sandhill, mesic flatwoods, ruderal, dry prairie	Contiguous	Moderate
<i>Haliaeetus leucocephalus</i>	Bald eagle	-	*	Forests, estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
<i>Mycteria americana</i>	Wood stork	FT	T	Estuarine tidal swamps/marshes, lacustrine, seepage stream, ditches, ruderal	Contiguous	High/Observed
<i>Picoides borealis</i>	Red-cockaded woodpecker	FE	E	Mature pine forests containing living longleaf pine trees	Distant	Low

SECTION 4 --PROTECTED SPECIES AND HABITAT

Species	Common Name	FWC	USFWS	Habitat	Habitat Occurrence Relative to Project Footprint	Probability of Species Occurrence
<i>Platalea ajaja</i>	Roseate spoonbill	T	-	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	High
<i>Rostrhamus sociabilis plumbeus</i>	Everglade snail kite	FE	E	Lowland freshwater marshes and littoral shelves of lakes	Near	Moderate
<i>Rynchops niger</i>	Black skimmer	T	-	Open sand on beaches, sandbars, and dredge material islands	Distant	None
<i>Sterna dougallii</i>	Roseate tern	FT	T	Shell-sand beaches, exposed limestone, rock and marl fill, dredge material, rooftops, forage over open water, coasts, tidal channels	Distant	None
<i>Sternula antillarum</i>	Least tern	T	-	Coastal beaches, estuaries, and bays, occasional use of rooftops	Distant	Low
MAMMALS						
<i>Eumops floridanus</i>	Florida bonneted bat	FE	E	Roosts in palms, snags, cavity trees, buildings, bridges. Forages above natural and human-altered landscapes	Contiguous	High Occurrence of Foraging
<i>Puma concolor coryi</i>	Florida Panther	FE	E	Extensive blocks of forests, large wetlands, can use human-altered landscapes	Contiguous	High
<i>Trichechus manatus</i>	West Indian Manatee	FT	T	Coastal waters, bays, rivers, estuaries, sometimes lakes and canals	Distant	None
<i>Sciurus niger avicennia</i>	Big Cypress fox squirrel	T	-	Upland and wetland forests, golf courses	Contiguous	High
<i>Ursus americanus floridanus</i>	Florida black bear	**	-	Forests and forested wetlands, bayheads	Contiguous	High

Sources:

USFWS – USFWS status, Official lists of Threatened and Endangered species, 50 CFR 17.11
FWC – FWC, Florida’s Imperiled Species Management Plan 2016-2026, Updated November 16, 2016
FWC - Florida’s Endangered and Threatened Species, Updated December 2018.
USFWS ECOS – Environmental Conservation Online System, accessed November 10, 2017
FNAI – Florida Natural Areas Inventory Tracking List, accessed November 10, 2017

Notes:

*The Bald Eagle is afforded federal protection through the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA).

**The Florida black bear is no longer listed as threatened, however is protected under the FAC 68A-4.009 Florida Black Bear Conservation Key:

E – endangered, T – threatened, C – candidate for listing, FE – federally endangered, FT – federally threatened

4.3.1 Wildlife

4.3.1.1 Recommended Build Alternative, Federally Listed Species, No-Effect

Shorebirds

The roseate tern (*Sterna dougallii*), piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*) are all coastal nesting and foraging birds with federal Endangered species status. Piping plover do not nest in Florida but instead are winter migratory visitors, preferring to roost and forage on beaches, mudflats, sandflats, and barrier islands. The roseate tern is a colonial-nesting marine bird known to breed between Marathon and the Dry Tortugas in the Florida Keys. It is strictly a coastal species, foraging along shorelines, and in winter is primarily pelagic. The red knot also does not breed in Florida but used to winter on Florida's Gulf Coast in large numbers. They are primarily marine shorebirds where they feed on coastal invertebrates. The project site contains neither nesting or foraging habitat for these three coastal species and therefore, the project is expected to have no effect on these shorebird species.

Florida Scrub-Jay (*Aphelocoma coerulescens*)

The project site is located within the USFWS Consultation Area for this federally Threatened species. However, no appropriate scrub habitat for this species occurs within the project limits or on immediately adjacent properties. No Florida scrub-jay nests or individuals were observed during the initial listed species surveys. According to the FWC database, the closest documented Florida scrub-jay occurrence was in 1993, approximately 10.1 miles to the northeast of the project site. Given the distance and age of the nearest observation and that optimal habitat for the Florida scrub-jay is not available within the project limits, the project is anticipated to have no effect on the Florida scrub jay.

Everglades snail kite (*Rostrhamus sociabilis plumbeus*)

The project site is located within the USFWS Consultation Area for this federally Endangered species. However, the project site is not located in or near designated critical habitat or a priority management zone for this species. Snail kite foraging habitat consists of relatively shallow wetland vegetation, either within extensive marsh systems, or in lake littoral zones. Emergent vegetation, including spike rushes, maidencane, and bulrushes are important components of habitat because they allow apple snails to occupy the area. Dense, thick vegetation is not optimal for snail kite foraging because kites cannot readily see apple snails to capture them. The snail kite typically nests over open water in areas with good foraging habitat nearby, and most foraging occurs in marshes immediately surrounding the nest. No large, marsh systems or lake littoral zones occur on the project site, which reduces the adequacy of the habitat for snail kites. The surface waters that occur adjacent to the project site (man-made canals) do not provide preferred water depth or clarity for foraging opportunities for the snail kite. No snail kite nests or individuals were observed within the site boundary during initial protected species surveys. The nearest documented observation is approximately 18 miles to the southeast of the project limits and occurred in 1992. The nearest documented nesting site is approximately 25 miles to the northwest of the project area and occurred in 2010. Given that no evidence of the species was observed, documented occurrences are far from the project area, and mitigation will be provided for permanent impacts to surface waters, it is expected that the project will have no effect on the Everglade snail kite.

Red-Cockaded Woodpecker (*Picoides borealis*)

The western portion of the project is located within the USFWS Consultation Area for this federally Endangered species. Nesting habitat for this species consists of open old-growth pine forests (>60-80 years old), comprised largely of longleaf pine (*Pinus palustris*) and/or loblolly pine (*Pinus taeda*). RCW excavate cavities in the live wood of these trees for nesting. Stands of mature pine (>50 years of age) comprise preferred foraging habitat, and RCWs usually forage within 0.5 mile of cavity trees. There are no suitable nesting habitat/live cavity trees identified in the project corridor. The project site could potentially be

adjacent to mature pine trees, but no RCW cavity trees or individuals were observed during initial protected species surveys. The closest documented occurrence was located approximately 8.95 miles west of the site in 2006. The potential for RCW to nest or forage on-site is considered low because the site does not support suitable habitat for this species, but Collier County will implement best management practices during construction to ensure no live cavity trees are disturbed or removed. Therefore, the Recommended Build Alternative is anticipated to have no effect on the red-cockaded woodpecker.

West Indian Manatee (*Trichechus manatus*)

The West Indian manatee is listed as a federally threatened species that can be found in Florida year-round. They prefer marine and freshwater systems near the shore with abundant underwater vegetation like seagrass or eelgrass for foraging. Manatees can occasionally be found a far distance from the coast when they follow rivers or man-made canals inland. The project site overlaps or is adjacent to man-made canals that have some connectivity with coastal waters, though at least one control structure is located along that path. It is unlikely that a manatee could navigate the canals to within distance of the project area but Collier County will ensure that all construction over or adjacent to the canals will be temporary in nature and consist of best management practices such as barrier floats, therefore, the project is anticipated to have no effect on the West Indian manatee.

Bald Eagle (*Haliaeetus leucocephalus*)

Although the Bald eagle is no longer listed under the Endangered Species Act, it receives federal protection under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). There are currently no active nests within 660' of the project (federal protection standards) that would be impacted by project construction; therefore, the project is anticipated to have no effect on the bald eagle. As there is suitable nesting habitat within 660' of the project, an updated review of current nest locations should be conducted prior to project commencement.

4.3.1.2 Recommended Build Alternative, No Adverse Effect, State Listed Species

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is the state's smallest and only diurnal owl and is listed as State Threatened by the FWC. Their primary preferred habitat consists of open prairies with very little understory vegetation and can include human-influenced areas like golf courses, pastures, and vacant lots. Small tracts of suitable dry prairie habitat are present within the project limits, and suboptimal habitat is available in the surrounding area. However, no burrows were observed during field reviews and habitat is fragmented. Therefore, the project is anticipated to have no adverse impacts on the Florida burrowing owl.

Shorebirds

The snowy plover (*Charadrius nivosus*), least tern (*Sternula antillarum*), and black skimmer (*Rynchops niger*) are shorebirds with a state designation of Threatened. The snowy plover is a resident of Florida and breeds along the Gulf Coast, though in greater numbers in the Panhandle. They require open, sandy beaches for nesting and the closest confirmed nest is 20.45 miles to the east was recorded in 2002. The least tern nests along the coast and forages in nearby waters for fish. The black skimmer is a colony and beach-nesting bird and sometimes does so in association with least terns, though there have been a few rare confirmed inland nests of skimmers on rooftops or ag fields. Black skimmers need open surface water in order to forage for fish.

Wading Birds

The tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), and roseate spoonbill (*Platalea ajaja*) are wading birds with the state designation of Threatened. The

reddish egret is almost entirely restricted to the coast where it forages in shallow waters for fish and most nesting in Florida occurs in the Keys. The tricolored heron is most numerous in saltwater or brackish water but can be observed foraging inland. They are colony nesters with other herons and ibis using trees or bushes over standing water. Roseate spoonbills nest in Tampa Bay, Merritt Island, and Florida Bay and are uncommon and local visitors to coastal and slightly inland areas of Peninsular Florida for foraging. The little blue heron is the only bird listed here with a preference for freshwater habitats and it can be observed foraging in canals. There is not adequate nesting habitat within or adjacent to the project corridor for either of the three shorebirds or four wading birds listed here. The man-made canals that are within or adjacent to the project area could provide foraging habitat for the little blue heron but since these birds travel long distances to forage, the temporary impacts to these canals from construction is not expected to impact these species. Therefore, the project is anticipated to have no adverse effects on snowy plover, least tern, black skimmer, tricolored heron, little blue heron, reddish egret, or roseate spoonbill.

Southeastern American Kestrel (*Falco sparverius paulus*)

A non-migratory subspecies of kestrel, this species is listed as Threatened by the state. Their preferred habitats include open woodlands, prairie, and pastures. High-quality kestrel habitat must provide both suitable nesting and adequate foraging. Kestrels nest in cavities of large, dead trees previously hollowed by woodpeckers but will also use human-provided nest boxes. Kestrels readily perch along roadsides to hunt for small vertebrates and invertebrates. The project site may contain some foraging habitat for kestrels, but nesting habitat was not identified during survey. For these reasons, there is no adverse effect anticipated on the southeastern American kestrel.

4.3.1.3 Recommended Build Alternative, May Affect but Not Likely to Adversely Affect, Federally Listed Species

Eastern Indigo Snake (*Drymarchon corais couperi*)

This species is listed as Threatened by the USFWS, primarily due to habitat loss. Indigo snakes are found in a variety of habitats, including pine flatwoods, dry prairie, edges of freshwater marshes, agricultural fields, dunes, and human-altered habitats, including along man-made ditches and canals. They have been known to utilize gopher tortoise burrows. Based on available data from the FWC, there was a sighting of an Eastern indigo snake in 1980 near the current intersection of Everglades Parkway and Randall Boulevard, but no individuals were observed during the initial protected species survey. Collier County will adhere to the most recent version of the USFWS Standard Protection Measures for the Eastern Indigo Snake during land clearing activities and construction to minimize potential impacts to indigo snakes. Given this commitment, it is anticipated that the project may affect but is not likely to adversely affect the Eastern indigo snake.

Wood Stork (*Mycteria americana*)

The wood stork is listed as federally Threatened. The species is known to use freshwater marshes, swamps, lagoons, ponds, flooded fields, depressional areas, open pine-cypress wetlands, and manmade wetlands (i.e., ditches, canals, and stormwater retention ponds) for foraging. Wood storks are typically colonial nesters and construct their nests in medium to tall trees located within wetlands or on islands. The USFWS has defined the Core Foraging Area (CFA) for a wood stork colony as the area within an 18.6-mile radius from the colony location. The project site is located within the CFA of wood stork colonies 619041 (Corkscrew) and 619310 (North Catherine Island II), with the North Catherine Island colony being located approximately 5.08 miles southeast of the project area. Although no wood stork nests or individuals were observed within the site boundary during initial protected species surveys, the surface waters and wetlands within the project corridor would be considered suitable foraging habitat. Coordination with the USFWS will be initiated during the design phase for the wood stork, and mitigation for surface water impacts will likely exceed what is required to offset impacts to wood stork suitable foraging habitat. Therefore, the project may affect but is not likely to adversely affect the wood stork.

Crested Caracara (*Caracara cheriway*)

The project site is not located within the USFWS Consultation Area for this federally Threatened species, although there was a confirmed nest located 1.69 miles to the southeast of the project site in 2009. Dry prairies with scattered cabbage palms are areas which constitute the typical habitat, although it also occurs in improved pasture lands and even in relatively wooded areas with more limited stretches of open grasslands. Caracara tend to nest in cabbage palm and live oak, but have also been found nesting in pine, cypress, cedar, and even man-made structures such as a billboard. The majority of the project corridor does not contain suitable nesting habitat for this species, but the eastern end of the Recommended Build Alternative does cross into agricultural lands that may provide some habitat value. No caracara nests or individuals were observed during initial protected species surveys, but due to the presence of some potential for caracara nesting habitat within the 1,500-m (4,920 ft) buffer required by USFWS, additional caracara-specific surveys may be advised around suitable habitat prior to construction. As such, a determination that the project may affect but is not likely to adversely affect the crested caracara is being suggested instead of a no effect determination that may normally be associated with a project outside the consultation area.

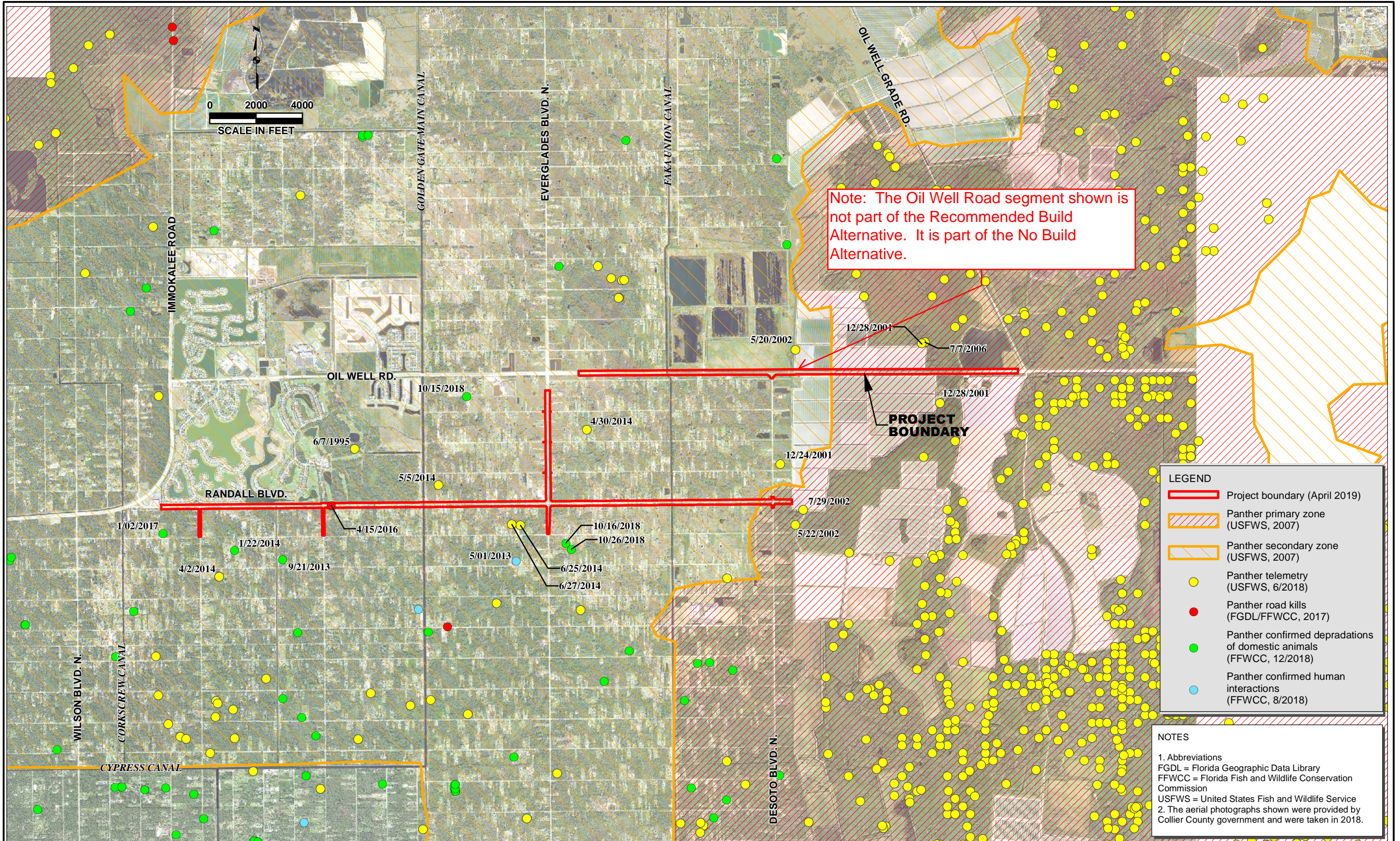
Florida Bonneted Bat (*Eumops floridanus*)

The project is located within the USFWS Consultation Area for the Florida bonneted bat and occurs within one of the USFWS designated Focal Areas for this federally Endangered species. The nearest documented Florida bonneted bat observation is 5.8 miles to the northwest. This was an acoustic observation that occurred in March 2016. Relatively little is known regarding the habitat requirements and range of the Florida bonneted bat. Most documented roosts occur in manmade structures such as bat houses and residential homes. To minimize adverse impacts to the Florida bonneted bat, Section 7 consultation with the USFWS will be initiated during the design and permitting phase of the project. Due to the project size and location, both acoustic and roost surveys for the FBB will likely be required during the consultation process. Thus, the project may affect but is not likely to adversely affect the Florida bonneted bat.

Florida Panther (*Puma concolor coryi*)

The Florida panther is a federally Endangered species found primarily in south Florida. The project area is located within the USFWS Florida panther primary and secondary zones. Approximately 6.60 acres of panther primary zone and 130.9 acres of panther secondary zone are anticipated within the footprint of the Recommended Build Alternative. According to FWC mortality data collected through 2018, the nearest Florida panther vehicle-caused mortality to this project occurred in 2016 and was documented in the project study area along Randall Boulevard at 16th Street NE. The value of impacted habitats to the Florida panther is preliminarily calculated using the USFWS Panther Tool. This tool assigns a habitat suitability value for each type of panther habitat impacted, and a landscape multiplier based on the habitat's location in either the USFWS primary zone/dispersal zone, secondary zone, or other zone. The tool also includes a base ratio multiplier of 1.98 that accounts for estimated panther habitat lost per year, loss of habitat due to single-family residential developments, and increased potential traffic due to proposed development projects in panther habitat. Using this tool, **(Appendix E)** approximately 313.68 panther habitat unit (PHU) credits are expected to be needed to mitigate the habitat loss associated with the Recommended Build Alternative. Based on the purchase of this mitigation, it is anticipated that the project may affect but is not likely to adversely affect the Florida panther. This finding will be reviewed and evaluated by the USFWS through the USACE permitting process for project construction.

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Randall Boulevard & Oil Well Road
Corridor Study
Collier County, Florida

Panther Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
April 2019	20170252-000	--	As Shown	Fig. 4-2

4.3.1.4 Recommended Build Alternative, May Affect but Not Likely to Adversely Affect, State Listed Species

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is listed as state Threatened and is protected under Florida law, Chapter 68A-27, Florida Administrative Code (FAC). Tortoise utilize upland habitats containing well-drained sandy soils found in pine flatwoods, scrub, dry prairies, and coastal dunes. A gopher tortoise relocation permit is required before disturbing burrows and conducting construction activities, including any type of work within 25 feet of a burrow. No tortoises or burrows were observed during initial protected species surveys, but potential gopher tortoise habitat does occur within the project area and adjacent to the site. If at any point prior to or during construction gopher tortoises or burrows are located, Collier County will ensure all proper permitting and relocations are implemented by an FWC Authorized Gopher Tortoise Agent. Therefore, this project may affect but is not likely to adversely affect the gopher tortoise.

Florida Sandhill Crane (*Antigone canadensis pratensis*)

The Florida sandhill crane is a year-round resident and protected as Threatened by the State. They primarily inhabit freshwater marshes, prairies, and pastures but are commonly seen foraging in and near human landscapes like golf courses, neighborhoods, and roadsides. There is no sandhill crane nesting habitat within the project area, but foraging habitat does occur within the project boundary and in adjacent areas. Impacts to roadside right-of-way where cranes might forage is temporary, as after construction the new right-of-way will consist of similar vegetation. Therefore, this project may affect but is not likely to adversely affect the Florida sandhill crane.

Big Cypress Fox Squirrel (*Sciurus niger avicennia*)

The Big Cypress fox squirrel has been listed as state Threatened since 1990. They prefer habitats of pine flatwoods, cypress swamp, and mixed hardwood-pine forest, but will forage in a much wider range of habitats including golf courses, pastures with scattered trees, and rural residential areas. Slash pine is a primary food source which is found within and adjacent to the project site. No Big Cypress fox squirrels or nests were observed during initial surveys, but pre-construction surveys for nests may be recommended based on available habitat adjacent to the project corridor. Collier County will employ best management practices during construction to ensure no individuals or nests are disturbed. Thus, the project may affect but is not likely to adversely affect the Big Cypress fox squirrel.

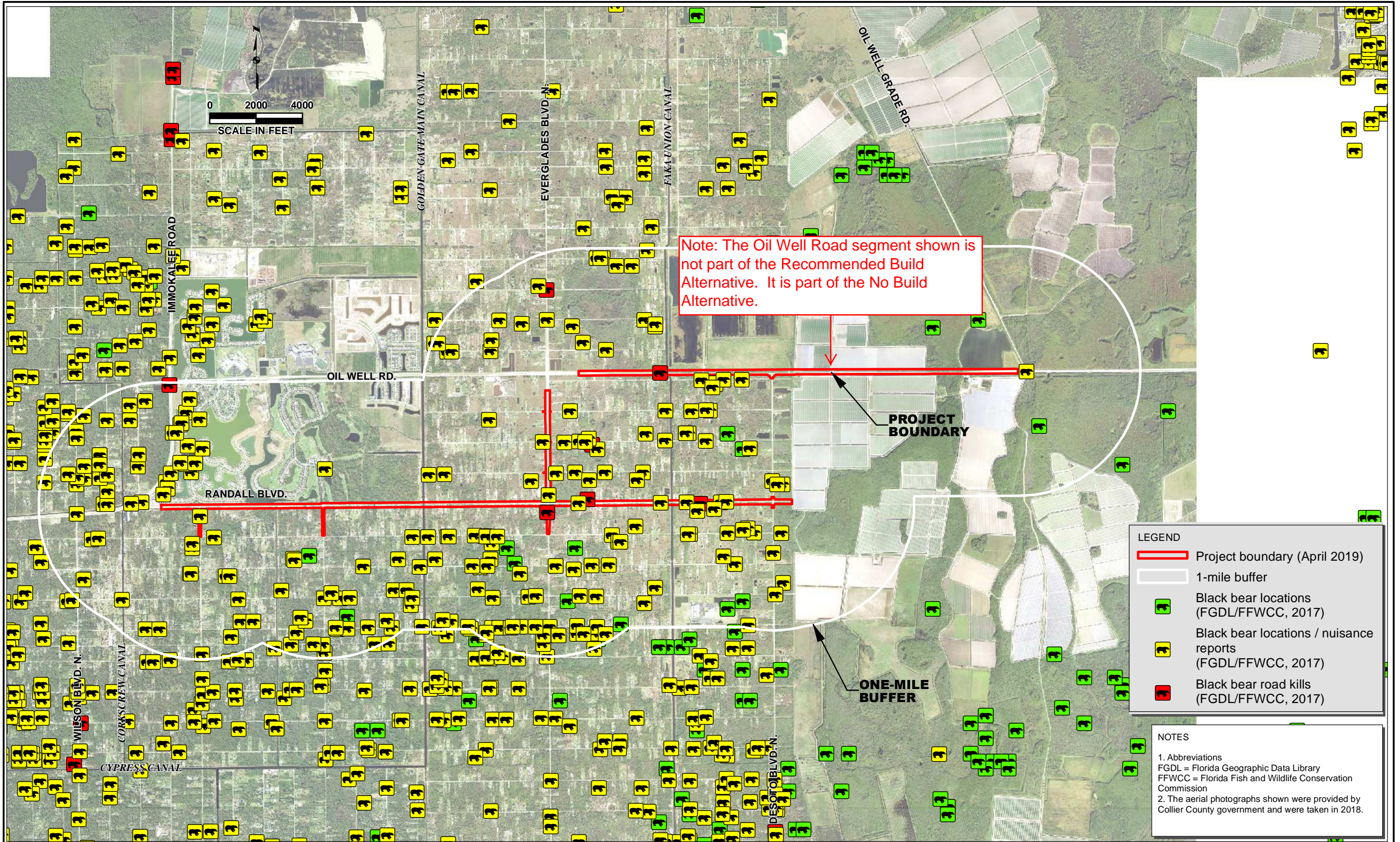
Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is no longer listed as a threatened species by the FWC. While it was removed from the state list of protected species in August 2012, it is still protected through the F.A.C. 68A-4.009 Florida Black Bear Conservation. The project area occurs within the primary range of the Big Cypress population, and the FWC bear mapping unit indicates this area has abundant black bears. Because the Recommended Build Alternative includes improvements to existing paved roadways to which bears have acclimated, the Recommended Build Alternative may affect but is not likely to adversely affect the Florida black bear.

4.3.2 Protected Plant Species

Table 4-2 lists the sixty-five (65) protected plant species known to occur in Collier County. Of these, two species, Garber's spurge (*Euphorbia garberi*) and aboriginal prickly apple (*Harrisia aboriginum*) are federally listed as threatened and endangered, respectively. The remainder are listed by the Florida Department of Agriculture and Consumer Services (FDACS) and/or FNAI. The preferred habitats of these plant species are described in the referenced table below.

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LEGEND

- Project boundary (April 2019)
- 1-mile buffer
- Black bear locations (FGDL/FFWCC, 2017)
- Black bear locations / nuisance reports (FGDL/FFWCC, 2017)
- Black bear road kills (FGDL/FFWCC, 2017)

NOTES

- Abbreviations
 FGDL = Florida Geographic Data Library
 FFWCC = Florida Fish and Wildlife Conservation Commission
- The aerial photographs shown were provided by Collier County government and were taken in 2018.



Randall Boulevard & Oil Well Road
 Corridor Study
 Collier County, Florida

Black Bear Locations

DATE April 2019	PROJECT NO. 20170252-000	FILE NO. --	SCALE As Shown	SHEET Fig. 4-3
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Table 4.2. Potentially Occurring Listed Plant Species

Species	Common Name	USFWS	FDACS - DPI*	Habitat	Probability of Presence
<i>Acrostichum aureum</i>	Golden leather fern	--	T	Brackish and freshwater marshes	None
<i>Andropogon arctatus</i>	Pine-woods bluestem	--	T	Wet pine flatwoods that are subjected to recurring fires	None
<i>Asplenium erosum</i>	Auricled spleenwort	--	E	Epiphytic on tree trunks and logs in swamps and hammocks	Low
<i>Asplenium serratum</i>	American bird's nest fern	--	E	Epiphytic or epipetric on moist rocks, fallen logs, and tree bases in swamps and wet hammocks	Low
<i>Bulbophyllum pachyrachis</i>	Rattail orchid	--	E	strand swamps	None
<i>Burmannia flava</i>	Fakahatchee burmannia	--	E	Moist pinelands	Low
<i>Calopogon multiflorus</i>	Many-flowered grass-pink	--	T	Open, damp to drier pine savannas-flatwoods and meadows	None
<i>Campylocentrum pachyrrhizum</i>	Ribbon orchid	--	E	On hardwood trees in cypress swamps	Low
<i>Campyloneurum angustifolium</i>	Narrow-leaved strap fern	--	E	Hammocks, epiphytic	None
<i>Campyloneurum costatum</i>	Tailed strap fern	--	E	Epiphytic, strand swamps, hammocks	None
<i>Catopsis berteroniana</i>	Powdery catopsis	--	E	Grow on trees in tropical hammocks and cypress swamps	Low
<i>Catopsis floribunda</i>	Many-flowered catopsis	--	E	Grow on trees in tropical hammocks and cypress swamps	Low
<i>Catopsis nutans</i>	Nodding catopsis	--	E	Grow on trees in tropical hammocks and cypress swamps	Low
<i>Celtis iguanaea</i>	Iguana hackberry	--	E	Shell mounds and middens in tropical coastal hammocks	None
<i>Chamaesyce cumulicola</i>	Sand-dune spurge	--	E	Coastal scrub and stabilized dunes	None
<i>Ctenitis sloanei</i>	Florida tree fern	--	E	Inland hammock forests with deep shade and adequate soil moisture	Low
<i>Cyrtopodium punctatum</i>	Cowhorn orchid	--	E	Trunks and stumps of cypress trees in swamps, branches of buttonwood trees in coastal hammocks	Low
<i>Dendrophylax lindenii</i>	Ghost orchid	--	E	Central trunk or large main branches of pond-apple trees, or occasionally pop ash trees	None
<i>Eltroplectris calcarata</i>	Spurred neottia	--	E	Mesic hammock, rockland hammock	None
<i>Epidendrum blanchaenum</i>	Acuna's star orchid	--	E	Dense wooded swamps and sloughs of tropical regions	None
<i>Epidendrum nocturnum</i>	Night-scented orchid	--	E	Hammocks, low woodlands, dry or wet forests	Low
<i>Epidendrum strobiliferum</i>	Pendant epidendrum	--	E	Growing on branches of pop ash and pond apple in swamps	None
<i>Euphorbia garberi</i> **	Garber's spurge	T	E	Dry, sandy soil in ecotones between hammocks and pinelands or coastal hammocks and sea-oats dunes	None
<i>Glandularia maritima</i>	Coastal vervain	--	E	Sandy clearings in coastal dune swales, scrub, pinelands, and open live oak-cabbage palm woods	None
<i>Glandularia tampensis</i>	Tampa vervain	--	E	Sandy coastal hammocks and dunes, clearings, well-drained live oak-slash or longleaf pine-saw palmetto flats, and disturbed areas	None
<i>Guzmania monostachia</i>	Fakahatchee guzmania	--	E	Branches and tree trunks in swamps and wet hammocks	Low
<i>Habenaria distans</i>	Hammock rein orchid	--	E	Coastal berm, floodplain marsh, strand swamp	None
<i>Harrisia aboriginum</i>	Aboriginal prickly apple	E	E	Open coastal hammocks and shell middens at low elevations	None
<i>Ionopsis utricularioides</i>	Delicate Ionopsis	--	E	Hammocks	Low
<i>Jacquemontia curtissii</i>	Pineland jacquemontia	--	T	Pine rocklands, limestone outcrops, and pinelands on Miami or Tamiami limestone	None
<i>Lantana depressa</i> var. <i>sanibelensis</i>	pineland lantana	--	E	pine rockland, coastal strand, marl prairies	None
<i>Lechea cernua</i>	Nodding pinweed	--	T	Sandy openings, evergreen scrub oaks	None
<i>Lechea divaricata</i>	Spreading pinweed	--	E	Scrub and scrubby flatwoods	Low
<i>Lechea lakelae</i>	Lakela's pinweed	--	E	Open, white sands in coastal scrub	None
<i>Lepanthopsis melanantha</i>	Tiny orchid	--	E	Tropical mixed hardwood-cypress swamps and wet hammocks, epiphytic on pond apple	None
<i>Linum carteri</i> var. <i>smallii</i>	Small's flax	--	E	Pine rocklands, pineflatwoods, adjacent disturbed areas	None
<i>Lythrum flagellare</i>	Lowland loosestrife	--	E	swamps, thickets	Low

Table 4.2 continued. Potentially Occurring Listed Plant Species

Species	Common Name	USFWS	FDACS - DPI*	Habitat	Probability of Presence
<i>Maxillaria crassifolia</i>	Hidden orchid	--	E	Epiphytic on hammocks, rocks, tree trunks in cypress swamps and strands	Low
<i>Microgramma heterophylla</i>	Climbing vine fern	--	E	Epiphytic on relatively smooth-barked trees, or growing on logs and rock, in tropical hammocks	Low
<i>Myriopteris microphylla</i>	Southern lip fern	--	E	Epipetric in crevices of limestone outcrops and terrestrial on shell mounds in partial to full sun	None
<i>Ophioglossum palmatum</i>	Hand fern	--	E	Epiphytic on persistent leaf bases of sabal palmetto in moist hammocks	Low
<i>Passiflora pallens</i>	Pineland passionflower	--	E	Coastal and interior hammocks	Low
<i>Peperomia glabella</i>	cypress peperomia	--	E	hammocks, sloughs	None
<i>Peperomia humilis</i>	low peperomia	--	E	maritime hammocks, upland hardwood forests, swamps	None
<i>Peperomia obtusifolia</i>	Blunt-leaved peperomia	--	E	Epiphyte; in Florida usually on oaks, tropical hammocks, cypress swamps	Low
<i>Phlegmariurus dichotomus</i>	Hanging club-moss	--	E	Growing on pond apple in mature swamp forests	None
<i>Pleurothallis gelida</i>	Frost-flower orchid	--	E	Generally on pop ash at central ponds of cypress sloughs	None
<i>Prosthechea boothiana</i> var. <i>erythronioides</i>	Dollar orchid	--	E	Trunks and low limbs of hardwood trees in rockland hammocks	None
<i>Prosthechea cochleata</i>	Clamshell orchid	--	E	Growing on branches of pop ash and pond apple in swamps	None
<i>Prosthechea pygmaea</i>	Dwarf butterfly orchid	--	E	Growing on branches of pop ash and pond apple in swamps	None
<i>Pteris bahamensis</i>	Bahama ladder brake fern	--	T	pine rocklands, hammocks	None
<i>Pteroglossaspis ecristata</i>	Giant orchid	--	T	Sandhill, scrub, pine flatwoods	Low
<i>Roystonea regia</i>	Florida royal palm	--	E	Tropical hammocks	Low
<i>Schizaea pennula</i>	Ray fern	--	E	Wet, rich soil under saw palmetto & gallberry; rotten stumps & trunks of red bay	Low
<i>Stylisma abdita</i>	Scrub stylisma	--	E	Dry sandy soil in oak or sand pine scrub	None
<i>Tephrasia angustissima</i> var. <i>corallicola</i>	Narrowleaf hoarypea	--	E	pine rocklands	None
<i>Thelypteris reptans</i>	Creeping star-hair fern	--	E	Limestone grottoes and sinkholes	None
<i>Thrinax radiata</i>	Florida thatch palm	--	E	Coastal scrub and pineland areas	None
<i>Tillandsia flexuosa</i>	Banded wild-pine	--	T	Grows on shrubs and trees in wetlands	Moderate
<i>Tillandsia pruinosa</i>	Fuzzy-wuzzy air plant	--	E	Branches of trees in cypress swamps	Moderate
<i>Trichocentrum undulatum</i>	Cape Sable dancing lady orchid	--	E	Buttonwood strands in extreme southern Florida, infrequently found in remote cypress sloughs in Big Cypress National Park	None
<i>Trichomanes holopterum</i>	Entire-winged bristle fern	--	E	Grows on mossy rotten logs or stumps in moist forested areas	Moderate
<i>Tripsacum floridanum</i>	Florida gama grass	--	T	Low, rocky pine rocklands in the shallow soils of rock crevices which have some proportion of the redland soil characteristic	None
<i>Vachellia tortuosa</i>	PoPONAX	--	E	Shell middens	None
<i>Vanilla phaeantha</i>	Leafy vanilla	--	E	Margins and open cypress sloughs	Low
<i>Zephyranthes simpsonii</i>	Simpson's zephyr-lily	--	T	wet pinelands and pastures, wet roadsides	Low

*T = Threatened, E = Endangered, N = Not currently listed, nor currently being considered for listing but on FNAI's tracking list** formerly included in the genus *Chamaesyce*

Sources:

1. FNAI - Florida Natural Areas Inventory; Collier Florida, accessed January, 2019
2. FDACS. Notes on Florida's Endangered and Threatened Plants. 2010. Patti J Anderson and Richard E Weaver.
3. Atlas of Florida Plants - Institute for Systematic Botany, University of South Florida <http://florida.plantatlas.usf.edu/Results.aspx>
4. FDACS. Florida's Federally Listed Plant Species Search <https://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Our-Forests/Forest->
5. Habitats described by: Hansen, B.F. and Wunderlin, R.P. 2003. Guide to the vascular plants of Florida. University Press of Florida. Gainesville.

Due to the disturbed nature of the habitat along the existing roadway, much of which is routinely mowed in the right-of-way, no adverse effects are anticipated for these listed plant species. Some natural habitats remain adjacent to the roadway (e.g. pine flatwoods, forested wetlands, dry prairie) that solely based on mapping may indicate the potential for certain listed plants to occur. However, these habitat within the project corridor have been largely fragmented/disturbed by residential development. As such, the habitats are often defined by a variety of nuisance and exotic species, lessening the opportunity for the identified listed plant species.

Although none were documented during the initial surveys, the pine flatwoods may have limited potential to support the giant orchid (*Pteroglossaspis ecristata*), ray fern (*Schizaea pennula*), and entire-winged bristle fern (*Trichomanes holopterum*), which are known to occur in this habitat type. For this reason, the project may affect, but is not likely to adversely affect, these three (3) species.

4.4 Evaluation of Alternatives

4.4.1 Direct Impacts

Table 4-3 shows the expected direct impacts for each alternative by FLUCCS code. Impacts to natural habitats represent impacts to potential wildlife habitat. The impacts for the Recommended Build Alternative were calculated by summing the FLUCCS categories that could potentially be used by a state or federally listed or otherwise protected species.

4.4.1.1 Recommended Build Alternative

The impacts for Recommended Build Alternative were calculated by summing the FLUCCS categories for that alternative. The total impact area proposed for this alternative is 137.50 acres. Of this amount, approximately 62% of the impact will be to areas already disturbed by the existing road and maintained right-of-way (FLUCCS 8140: 39.45 acres, 28.69%), the urban and built environment (FLUCCS series 1000: 43.66 acres, 31.75%), agricultural land use (FLUCCS series 2000: 0.02 acres, 0.01%) and barren land (FLUCCS 7400: 1.68 acres, 1.22%). The remaining 38% of the Recommended Build Alternative is comprised of natural upland and wetland habitats with varying degrees of disturbance.

Rangeland (FLUCCS series 3000), which is primarily characterized by dry herbaceous/shrubby habitats, constitutes the largest area of natural impact within the Recommended Build Alternative at 16.63 acres (12.09%). Upland forests (FLUCCS series 4000), primarily characterized by Pine Flatwoods and Brazilian pepper in the Recommended Build Alternative, represent 9.44 acres (6.87%) of the natural habitat impact. Wetlands (FLUCCS series 6000) account for 5.00 acres (3.64 %) of natural habitat impacts, which are comprised predominantly of forested habitat and shrubby wetlands to a lesser degree. Surface water impacts (FLUCCS series 5000) are comprised largely of roadside ditches (20.79 acres, 15.12%) and two lesser canal crossings (0.83 acres, 0.60%) that will be needed for project construction. Most of these surface water impacts will likely be temporary in nature, as additional roadside ditches will be created during construction.

Given these anticipated habitat impacts, the USFWS Panther Tool was used to evaluate impacts to habitat potentially used by the Florida panther (**Appendix E**). For impacts associated with the Recommended Build Alternative, approximately 314 PHU credits are anticipated to be sufficient mitigation.

4.4.1.2 No Build Alternative

There are no direct impacts to wildlife and/or habitats associated with the No Build Alternative.

Table 4-3. Land Use/Land Cover (FLUCCS) Impacts by Alternative

		Build Alternative		No Build Alternative	
FLUCCS Code	FLUCCS Description	Impacts (Acres)	Percent of Total Project Area	Impacts (Acres)	
1000: URBAN AND BUILT UP	1100	Low density residential	7.10	5.16%	0.00
	1180	Residential rural - 1 unit on 2 or more acres	28.98	21.08%	0.00
	1260	Medium density residential golf	6.36	4.63%	0.00
	1722	Church	1.21	0.88%	0.00
	1754	Florida Forest Service	0.01	0.01%	0.00
Total		43.66	31.75%	0.00	
2000: AGRICULTURE	2110	Improved pasture	0.01	0.01%	0.00
	2140	Row crops	0.01	0.01%	0.00
Total		0.02	0.01%	0.00	
3000: RANGELAND	3100	Herbaceous (dry prairie)	1.07	0.78%	0.00
	3109	Herbaceous (dry prairie), disturbed	0.36	0.26%	0.00
	3209	Shrub and brushland, disturbed	8.46	6.15%	0.00
	3309	Mixed rangeland, disturbed	6.74	4.90%	0.00
Total		16.63	12.09%	0.00	
4000: UPLAND FOREST	4110	Pine flatwoods	6.91	5.03%	0.00
	4220	Brazilian pepper	2.53	1.84%	0.00
Total		9.44	6.87%	0.00	
5000: WATER	5120	Major canals	0.83	0.60%	0.00
	5140	Ditches	20.79	15.12%	0.00
Total		21.62	15.72%	0.00	
6000: WETLANDS	6170	Mixed wetland hardwoods	0.02	0.01%	0.00
	6210	Cypress	1.23	0.89%	0.00
	6249	Cypress-pine-cabbage palm, disturbed	0.68	0.49%	0.00
	6250	Hydric pine flatwoods	0.02	0.01%	0.00
	6259	Hydric pine flatwoods, disturbed	1.34	0.97%	0.00
	6309	Wetland forested mixed, disturbed	0.31	0.23%	0.00
	6318	Wetland shrub, predominantly willow	1.29	0.94%	0.00
	6319	Wetland shrub, disturbed	0.11	0.08%	0.00
Total		5.00	3.64%	0.00	
700: BARREN LAND	7400	Disturbed land	1.68	1.22%	0.00
	7401	Disturbed land, hydric	0.00	0.00%	0.00
Total		1.68	1.22%	0.00	
8000: TRANSPORTATION, COMMUNICATION & UTILITIES	8140	Road and maintained right-of-way	39.45	28.69%	0.00
Total		39.45	28.69%	0.00	
Total for project boundary		137.50	100.00%	0.00	

4.4.2 Indirect, Secondary, and Cumulative Impacts

Indirect and secondary effects are those impacts that are reasonably certain to occur later in time as a result of the proposed project. They may occur outside of the area directly affected by the proposed project. Potential secondary effects include increased noise, traffic, and development, which could impact wildlife or result in a change in wildlife migration patterns. Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the project area. Future federal actions that are unrelated to the proposed project are not considered in the determination of cumulative effects because they require a separate consultation in accordance with Section 7 of the ESA.

4.4.2.1 Recommended Build Alternative

Indirect impacts are anticipated to be minor as a result of the Recommended Build Alternative. Because the habitat impacts are restricted to those adjacent to the existing roadway and have been minimized to only the amount required to achieve the project purpose, secondary impacts are anticipated to be minimal. The proposed roadway corridor is largely surrounded by residential development, with new lots being cleared and built upon regularly. The modifications that had to be made to the current FLUCCS map versus what was established at the start of the corridor study in 2017 are indicative of the rapid land use conversions happening within the study area. There is an edge effect (secondary impact) related to the increase of nuisance/exotic species in adjacent habitat often associated with roadway widening, but much of the adjacent habitat is already disturbed by residential development, agriculture, and significant ATV use. Although nuisance/exotic vegetation has negative impacts to native wildlife, the secondary impacts are anticipated to be minimal based on the disturbed nature of the existing conditions. Based upon the compensatory mitigation and standard protection measures that will be required for listed species habitat during construction level permitting, no cumulative impacts are anticipated for the Recommended Build Alternative.

4.4.2.2 No Build Alternative

There are no indirect, secondary, or cumulative impacts to wildlife associated with the No Build Alternative.

5.0 Wetland Evaluation

5.1 Agency Coordination

No direct agency coordination regarding wetlands has occurred for this project. However, the USACE and SFWMD regulate wetlands within the study area, and permits will need to be obtained from these agencies for unavoidable wetland impacts prior to project authorization/construction. Other agencies, including the USFWS, Florida Department of Environmental Protection (FDEP), and the FWC review and comment on wetland permitting and potential affects to protected wildlife species.

Based on the projected wetland and surface water impacts associated with the Recommended Build Alternative, it is anticipated that the project will require an Individual ERP from the SFWMD, in accordance with F.A.C. Chapter 62-330.054, as well as an Individual Federal Dredge and Fill Permit (Section 404 Permitting) from the USACE. With the project alignment having potential impacts to the Golden Gate and Faka Union Canals, additional review/permitting may be required for work within the regulated systems.

5.2 Methodology

Wetlands and surface waters were identified through the review of available literature, GIS data, and field verification. Following the review of all available materials, field assessments were conducted on November 8-10, 2017 to identify the presence of wetland vegetation, evidence of hydrology, and hydric soil indicators. The jurisdictional limits of the wetlands were estimated using the criteria stated in the US Army Corps of Engineers (USACE) Final Regional Supplement to the Corps of Engineers Wetland Delineations Manual: Atlantic and Gulf Coastal Plain Region (October 2010) and Florida statewide unified wetland delineation methodology as adopted by the FDEP and the Water Management Districts per Chapter 62-340 of the Florida Administrative Code (F.A.C.) and described in The Florida Wetlands Delineation Manual. Per Chapter 62.600(D) F.A.C., boundaries of surface waters with slopes of 4 to 1 (horizontal to vertical) or steeper were estimated using the top of bank. Roadside ditches that contained standing water during the field visit were approximated based upon biological indicators of average wet season water levels. Agricultural rim ditches that were contained wholly within the associated containment berm were not delineated out from the adjacent agricultural land use.

The following sources were reviewed prior to conducting the field review:

- USFWS NWI Maps;
- Land use and land cover maps (SFWMD 2008);
- NRCS Soil Survey of Collier County, Florida; and
- Google Earth Aerial Imagery of the Study Area (1995-2018).

Ecologists evaluated the functional value of the wetland and surface water systems within the Recommended Alignment using the Uniform Mitigation Assessment Method (UMAM). The results presented in this report are a compilation of information collected from field assessment performed by project ecologists and from the data sources described above.

5.3 Results

Considering the project footprint associated with the Recommended Build Alternative (137.5 acres), impacts to wetlands and surface waters are minimal. Wetlands account for approximately 5.0 acres (3.64%) of the Recommended Build Alternative. As this is a linear transportation project, all wetlands within the project footprint will be considered directly impacted during the permitting process. Impacts to wetlands include Mixed Wetland Hardwoods (FLUCCS 6170, 0.02 acres), Cypress (FLUCCS 6210, 1.23

acres), Cypress-Pine-Cabbage Palm, disturbed (FLUCCS 6249, 0.68 acres), Hydric Pine Flatwoods (FLUCCS 6250 and 6259, 1.36 acres), Wetland Forested Mixed, disturbed (FLUCCS 6309, 0.31 acres), and Wetland Shrub (FLUCCS 6318 and 6319, 1.40). The wetlands are illustrated through the use of green shading on the FLUCCS maps included as Figure 3-1. Impacts to surface waters include Major Canals (Golden Gate Main Canal and the Faka Union Canal (FLUCCS 5120, 0.83 acres) and Ditches (FLUCCS 5140, 20.79 acres). The ditches are largely comprised of roadside ditches along Randall Boulevard and Everglades Boulevard that contained water and/or obvious biological indicators of above ground water levels at the time of field review; however, these ditches are typically dry during the dry season. Mitigation is generally not required (and has not been proposed) for these man-made, seasonal conveyances that were created as part of the permitted roadway's stormwater management system.

The potentially affected wetlands within the Recommended Alignment were evaluated using the Uniform Mitigation Assessment Method (UMAM) to assess their ecological functions and determine the amount of mitigation necessary to offset their loss. The UMAM assessment of the USACE and SFWMD-jurisdictional wetlands results in an estimated need of 2.58 federal mitigation UMAM credits (1.84 forested and 0.74 herbaceous freshwater credits). The UMAM Analysis and supporting UMAM forms are provided in **Appendix F**. Note that this assessment does not include potential ponds. Additionally, mitigation has not been proposed for the roadside ditches or the temporary impacts to the major canals.

Indirect impacts are anticipated to be minor as a result of the Recommended Build Alternative. The direct jurisdictional wetland and surface water impacts are restricted to those adjacent to the existing roadway, which have already been disturbed by the existing roadway and adjacent development along the project corridor. No cumulative impacts (net loss of wetland function within the project's drainage basin) are anticipated to occur based on the mitigation that will be required for project impacts.

It is anticipated that mitigation of wetland impacts would be required by both the SFWMD and USACE. Mitigation credits would be purchased from one of the federally approved mitigation banks whose service area covers the project study area, such as: Panther Island Mitigation Bank, Panther Island Expansion Mitigation Bank, Big Cypress Mitigation Bank, and Corkscrew Regional Mitigation Bank. All UMAM scores, UMAM calculations, preliminary surface water boundaries, and determinations discussed are subject to revisions and approval by regulatory agencies during the permitting process. The exact type of mitigation to offset impacts will be coordinated with the USACE and the SFWMD during the permitting phase(s) of this project. To demonstrate no net loss of wetland function within the project's drainage basin (West Collier Drainage Basin), mitigation that may be required for the wetland/surface water impacts will either need to be provided in the same drainage basin, or it will be demonstrated through a cumulative impact analysis at time of permitting that out of basin mitigation will not result in a cumulative impact. Currently the only private, federally approved mitigation within the West Collier Drainage Basin is Panther Island Mitigation Bank (PIMB) and its associated Expansion (PIMBE). Currently, the price per UMAM credit is approximately \$105,000 per credit at PIMB, with each wetland credit also providing 34.80 PHUs and 0.31 Kg long hydroperiod & 1.06 Kg short hydroperiod wood stork credits, to help offset listed species habitat impacts that may be associated with the project.

Based on the estimated need of 2.58 UMAM credits, the project's wetland mitigation cost would be approximately \$270,900. Since this is a County project, cost savings may be available if the County's approved regional mitigation site, Pepper Ranch, has available credits to help offset the impacts associated with the Recommended Build Alternative for the Randall Boulevard and Oil Well Road Corridor Study.

6.0 Conclusions and Next Steps

6.1 Protected Species and Habitats

The project may affect but is not likely to adversely affect federally and state-protected wildlife species.

Federally listed species which may be affected, but are not likely to be adversely affected by the project include:

- Eastern indigo snake (*Drymarchon corais couperi*)
- Wood stork (*Mycteria americana*)
- Crested caracara (*Caracara cheriway*)
- Florida bonneted bat (*Eumops floridanus*)
- Florida panther (*Puma concolor coryi*)

The project is anticipated to have no effect on the following federally listed species:

- Shorebirds including the roseate tern (*Sterna dougallii*), piping plover (*Charadrius melodus*), and red knot (*Calidris canutus rufa*)
- Florida scrub-jay (*Aphelocoma coelurescens*)
- Everglades snail kite (*Rostrhamus sociabilis plumbeus*)
- Red-cockaded woodpecker (*Picoides borealis*)
- West Indian manatee (*Trichechus manatus*)

There is no adverse effect anticipated on the following state-protected species:

- Florida burrowing owl (*Athene cunicularia*):
- Shorebirds including the snowy plover (*Charadrius nivosus*), least tern (*Sternula antillarum*), and black skimmer (*Rynchops niger*)
- Wading birds including the tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), and roseate spoonbill (*Platalea ajaja*)
- Southeastern American kestrel (*Falco sparverius paulus*)

The project may affect but is not likely to adversely affect the following state-listed species:

- Gopher tortoise (*Gopherus polyphemus*)
- Florida sandhill crane (*Antigone canadensis pratensis*)
- Big Cypress fox squirrel (*Sciurus niger avicennia*)

Two species which may occur in the project vicinity are not listed as threatened, endangered, or species of special concern (SSC), but receive other legal protection. The Florida black bear (*Ursus americanus floridanus*), protected under FAC 68A-4.009, may be affected, but it is not likely to be adversely affected. The project has no effect on the bald eagle (*Haliaeetus leucocephalus*).

Multiple avenues of protection will be employed to negate and minimize any potential affects to these species. Some of the measures employed may include detailed surveys and agency coordination during the project design phase, including providing appropriate mitigation to offset impacts. During construction, best management practices, adherence to FDOT's "Standard Specification for Road and Bridge Construction and use of preconstruction surveys are strategies that will be considered, as needed, for protection of listed species.

Based upon findings of the preliminary data collection, general corridor surveys, and standard conditions required by the USFWS and FWC that are incorporated into SFWMD and USACE permits, the following protection measures and compensatory mitigation are anticipated:

1. Implementation of the most recent version of USFWS' Standard Protection Measures for the Eastern Indigo Snake (**Appendix D**).
2. Purchase any necessary PHU credits following formal consultation and prior to construction.
3. Contractor education to advise of how to minimize human-bear interactions associated with construction sites during project construction.
4. Pre-construction surveys for gopher tortoise, Big Cypress fox squirrel, and peeping of any snags/cavity trees within the project vicinity to check for the potential of roosting by the Florida bonneted bat.

6.2 Wetlands

The No Build Alternative does not propose impacts to wetlands or surface waters, but it does not fulfill the basic intent of the project. The Recommended Build Alternative proposes direct wetland impacts to 5.7 acres, generally comprised of low to mid-quality. The ditches, canals, and development in the study area have altered the hydrology of the wetland systems, as evidence by diminished above ground water level indicators and significant coverage by nuisance/exotic vegetation. The functional analysis (UMAM) performed for the project wetlands indicates a preliminary estimate of 2.58 freshwater mitigation credits (1.84 forested credit and 0.74 herbaceous credits) may be needed to offset the project's direct wetland impacts. The proposed limits of wetlands and surface waters will need to be field flagged and survey located prior to application for project construction with the SFWMD and USACE, so agency personnel can verify project impacts. Until such time that is done and the UMAM has been agency reviewed and approved, the mitigation estimate should be considered preliminary for planning purposes only.

The direct impacts to the surface waters (0.83 acres of canal and 20.79 acres of ditches) will need to be accounted for during SFWMD and USACE permitting, but mitigation has not been proposed for the impacts. The Golden Gate and Faka Union Canals will likely be impacted by the extension of a box culvert/bridge during roadway construction, but the construction is not anticipated to represent a permanent loss of surface water function. The canals are an important feature to regional drainage and the project design will be required to demonstrate there is no loss of capacity/flow as a result of the project. Likewise, the roadside ditches may be impacted by roadway widening, but it is likely new roadside swales/ditches will be constructed as part of the surface water management system to replace those that are "lost".

6.3 Implementation Measures

Implementation measures are actions that will be required to address special conditions or other agency requirements, either during the design/permitting phase of the project or through post-permit compliance. Project implementation measures that address protected species and wetlands-related items include:

- Practicable measures to avoid or minimize impacts during final design of the project;
- Best Management Practices (BMPs) during construction to minimize impacts to any adverse secondary impacts to wetlands and surface waters that are affected by the proposed project;
- Purchase mitigation credits for unavoidable wetland/surface water impacts as may be required by state/federal permits/regulations.; and
- Comprehensive, pre-construction listed species surveys (100 percent gopher tortoise burrow survey in appropriate habitat, conduct a roost survey for the Florida bonneted bat, check for nesting by Big Cypress fox squirrels).

7.0 References

- Cowardin, Lewis M., Carter, Virginia, Golet, Francis C., and Edward T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service Publication, Washington D.C.
- Florida Association of Environmental Soil Scientists. 2007. Hydric Soils of Florida Handbook, 4th Edition, Gainesville, Florida.
- Florida Department of Transportation. 1999. Florida Land Use, Cover and Forms Classification System. Surveying and Mapping Thematic Mapping Section. Tallahassee, Florida.
- Florida Fish and Wildlife Conservation Commission. 2008. Bald Eagle Management Plan. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida.
- Florida Fish and Wildlife Conservation Commission <Accessed November 3, 2018>. <https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx#search>
- Florida Fish and Wildlife Conservation Commission. 2018. Florida's Official Endangered and Threatened Species List (Updated December 2018).
- National Park Service. 2015. <Accessed April 30, 2019> <https://www.nps.gov/bicy/learn/nature/big-cypress-fox-squirrel.htm>
- National Park Service. 2017. <Accessed April 30, 2019> <https://www.nps.gov/ever/learn/nature/snailkite.htm>
- South Florida Water Management District. 2014. Environmental Resource Permit Information Manual. Regulation Division South Florida Water Management District; West Palm Beach, Florida.
- U.S. Army Corps of Engineers Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.
- U.S. Department of Agriculture. 2018. NRCS. Soil Survey of Collier County, Florida. <Accessed November 13, 2018> <https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?statelid=FL>
- U.S. Fish and Wildlife Service. 2013. <Accessed April 30, 2019> https://www.fws.gov/refuge/Florida_Panther/wah/birds/crca.html

Appendix A

Project Area Land Use Descriptions

Appendix A: Project Area Land Use Descriptions

Low Density Residential (FLUCCS 1100)

Low density residential describes residential developments with less than two permanent structure dwelling units per acre. These areas are generally maintained (mowed) with ground cover consisting primarily of St. Augustine grass (*Stenotaphrum secundatum*), bahiagrass (*Paspalum notatum*) and shrubby false buttonweed (*Spermacoce verticillata*).

Low Density Fixed Single Family Units (FLUCCS 1110)

Low density fixed single family units describes fixed single-family units with less than two permanent structure dwelling units per acre. Ground cover is generally consistent with FLUCCS code 1100. Excluding the non-native planted tree species within the lots, the canopy is sparse with primarily slash pine (*Pinus elliotii*), cabbage palm (*Sabal palmetto*) and oak (*Quercus* spp.)

Residential Rural – 1 unit on 2 or more acres (FLUCCS 1180)

This land use classification describes a rural residential development with one unit per two or more acres. Vegetation communities are generally consistent with FLUCCS code 1110 with the exception being an increased canopy coverage.

Medium Density Residential (FLUCCS 1210)

This land use classification describes a residential development with two to five permanent structure dwelling units per acre. Established subdivisions make up this classification. These areas are generally maintained (mowed) with ground cover dominated by St. Augustine grass.

Medium Density Residential Golf (FLUCCS 1260)

This land use classification describes a residential development with golf courses and small bodies of water. The ground cover is generally consistent with FLUCC code 1100. The vegetation communities in the small bodies of water were mostly absent with the borders being sparse with patches of arrowhead (*Sagittaria lancifolia*), pickerel weed (*Pontederia cordata*), spike rush (*Eleocharis* spp.) and cattail (*Typha* spp.).

Commercial Shopping Center (FLUCCS 1410)

This land use classification describes areas associated with retail sales/services and includes all buildings, amenities, driveways, parking areas and landscape areas associated with it. Canopy species observed in the project area include slash pine, live oak (*Quercus virginiana*), cabbage palm and other common landscape trees. Furthermore, the midstory and ground cover is composed of flora characteristic of landscape areas.

Florida Forest Service (FLUCCS 1754)

This land use classification is used to describe all buildings and facilities which are identifiable as non-military governmental. In this instance, it is a Florida Forest Service facility. The coverage type includes all buildings, amenities, driveways, parking areas and landscape areas associated with it.

Improved Pasture (FLUCCS 2110)

This category is composed of land which has been cleared, tilled, reseeded with specific grass types and periodically improved with brush control and fertilizer application. Water ponds, troughs, feed bunkers and cow trails are evident. Canopy coverage is largely absent. Ground cover is dominated by bahiagrass, smut grass (*Sporobolus indicus*), shrubby false buttonweed and Spanish needles (*Bidens alba*).

Row Crops (FLUCCS 2140)

This land use classification is used to describe agricultural land, specifically, row crops. Corn, tomatoes, potatoes and beans are typical row crops found in Florida. Additionally, rows can remain well defined even after crops have been harvested. The vegetation community is similar to FLUCCS code 2110 in the unplanted fields.

Herbaceous (Dry Prairie) (FLUCCS 3100)

Herbaceous Dry Prairie areas are characterized by upland prairie grasses which occur on non-hydric soils but may be occasionally inundated by water. These areas are generally treeless with a variety of vegetation types dominated by grasses, sedges, rushes, and other herbs including wiregrasses with some saw palmetto (*Serenoa repens*) present. The dry prairie habitat located within the study area is comprised of saw palmetto, rose natal grass (*Melinis repens*), grapevine (*Vitis* spp.), wiregrass (*Aristida stricta*) and occasional cabbage palm and slash pine.

Shrub and Brushland (FLUCCS 3200)

Shrub and Brushland areas are characterized by saw palmetto, gallberry (*Ilex glabra*), wax myrtle (*Morella cerifera*), coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses. The shrub and brushland located in the study area are interspersed between the developed lots and dominated by saw palmetto, gallberry, fetterbush (*Lyonia lucida*) wiregrass, and wax myrtle.

Shrub and Brushland, Disturbed (FLUCCS 3209)

This land use classification is similar to FLUCCS code 3200, with the exception being evidence of land alteration primarily due to human activity and an increased coverage of exotic vegetation.

Palmetto Prairie (FLUCCS 3210)

This land use classification is used to describe more open areas, in this instance, most likely previously pine flatwoods but were cleared when housing development started. The palmetto prairies located in the survey area are comprised primarily with saw palmetto with gallberry interspersed.

Mixed rangeland (FLUCCS 3300)

This land use classification is used to describe a rangeland with a mixed vegetation community. Vegetation community is similar to FLUCCS code 2110.

Mixed rangeland, disturbed (FLUCCS 3309)

This land use classification is similar to FLUCCS code 3300, with the exception being evidence of land alteration primarily due to human activity and an increased coverage of exotic vegetation.

Pine Flatwoods (FLUCCS 4110)

Pine Flatwoods are characterized by a loose canopy of slash pine with a fairly dense saw palmetto understory. Other less common shrub species include wax myrtle, rusty staggerbush (*Lyonia ferruginea*), saltbush (*Baccharis halimifolia*), and gallberry. Vines such as greenbrier (*Smilax* spp.) and grapevine are also present. The majority of the pine flatwoods located within the study area are overgrown and contain a high density of slash pine with a lower density of saw palmetto. Other species observed include wax myrtle, live oak and Brazilian pepper (*Schinus terebinthifolius*). The overgrown nature of the habitats and presence of Brazilian pepper are indicative of fire suppression, as would be expected for natural areas immediately adjacent to development.

Brazilian pepper (FLUCCS 4220)

This habitat is composed primarily of Brazilian pepper. Brazilian pepper is an exotic, pestilent tree species found on peninsular Florida from the Tampa Bay area southward. Commonly found on disturbed sites, this species is an aggressive invader of Florida's plant communities. Areas located within the study area that showcased an approximate coverage of greater than 75% percent Brazilian pepper were classified as FLUCCS code 4220.

Major Canals (FLUCCS 5120)

This category includes rivers, creeks, canals and other linear water bodies where the water course is interrupted by a control structure. Vegetation is generally absent in the major canals located in the study area. The Golden Gate Canal and Faka Union Canal traverse the study area. Both have steep side slopes which contain grasses and forbs. The berms are maintained as evidenced by recent mowing activity.

Ditches (FLUCCS 5140)

This category includes man-made waterways used for drainage. The ditches located in the study area were generally within the maintained road right-of-way and were comprised of hydrophytic plants, such as spadeleaf (*Centella asiatica*), and pennywort (*Hydrocotyle* spp.).

Reservoirs Less Than 10 Acres (FLUCCS 5340)

Reservoirs are artificial impoundments of water. They are used for irrigation, flood control, municipal and rural water supplies, recreation and hydroelectric power generation. Dams, levees, other water control structures or the excavation itself usually will be evident. The reservoirs within the study area consist of existing stormwater management ponds with control structures. They contained very little standing water at the time of field reviews.

Mixed Wetland Hardwoods (FLUCCS 6170)

This wetland habitat classification is reserved for those wetland hardwood communities which are composed of a large variety of hardwood species tolerant of hydric conditions. The mixed wetland hardwoods located in the survey area are composed of live oak, laurel oak (*Quercus laurifolia*), wax myrtle and Carolina willow (*Salix caroliniana*) with a red maple (*Acer rubrum*) overstory. The ground cover is dominated by elderberry (*Sambucus nigra*) and buttonbush (*Cephalanthus occidentalis*).

Mixed Wetland Hardwoods – Mixed Shrubs (FLUCCS 6172)

This wetland habitat is similar to FLUCCS 6170, with the exception being the mid-story has large variety of wetland indicative vegetation as well as the canopy.

Wetland Coniferous Forest (FLUCCS 6200)

This habitat classification is used to describe a wetland which meets the crown closure requirements for coniferous forests (see FLUCCS 4110). These communities are commonly found in the interior wetlands such as river floods plains, bogs, bayheads and sloughs.

Cypress (FLUCCS 6210)

This habitat classification is used to describe a wetland that is composed primarily of pond cypress (*Taxodium ascendens*) or bald cypress (*Taxodium distichum*). The midstory is generally comprised of pond apple (*Annona glabra*), Carolina willow and buttonbush. In most cases the border of the cypress dome is comprised of swamp fern (*Telmatoblechnum serrulatum*).

Cypress-Mixed Hardwoods (FLUCCS 6216)

This wetland habitat is similar to FLUCCS 6210, with the exception being that the canopy is not only limited to pond or bald cypress, but also includes mixed hardwoods (see FLUCCS 6170).

Cypress-Pine-Cabbage Palm (FLUCCS 6240)

This community includes cypress (*Taxodium* spp.), pine (*Pinus* spp.) and/or cabbage palm in combinations in which no species achieves dominance. Although not strictly a wetlands community, it forms a transition between moist upland and hydric sites. Located within the study area, these systems tend to be more hydric and dominated by cypress but have a high concentration of slash pine and cabbage palm interspersed. This is typical of these communities in south Florida.

Cypress-Pine-Cabbage palm, disturbed (FLUCCS 6249)

This habitat is similar to FLUCCS code 6240, with the exception being the evidence of land alteration primarily due to human activity and an increased coverage of exotic vegetation.

Hydric Pine Flatwoods (FLUCCS 6250)

Hydric Pine Flatwoods has a sparse to moderate canopy of slash pines and cabbage palms. The understory is composed of grasses, wiregrass and forbs indicative of a wetland. Additionally, the understory can have sparse saw palmetto. The hydric pine flatwoods located in the survey area generally have a ground cover comprised of Alabama swamp sedge (*Cyperus ligularis*), torpedo grass (*Panicum repens*), bushy bluestem (*Andropogon glomeratus*) and beaksedge (*Rhynchospora* spp.)

Hydric Pine Flatwoods, Disturbed (FLUCCS 6259)

This habitat is similar to FLUCCS 6250, with the exception being the evidence of land alteration primarily due to human activity and an increased coverage of exotic vegetation.

Wetland Forested Mixed, Disturbed (FLUCCS 6309)

This land use classification is used to describe a wetland habitat in which neither hardwoods nor conifers achieve a 66% dominance of the canopy. Vegetation community is consistent with both FLUCCS code 6200 and FLUCCS code 6170. Disturbance in the form of human alternation and coverage by nuisance/exotic species was noted during the survey.

Wetland Shrub, Predominantly Willow (FLUCCS 6318)

This community is associated with topographic depression and poorly drained soil. Associated species include pond cypress, Carolina willow and other hydrophytic low scrub. In this instance, Carolina willow is the dominate species in these wetlands that transition into a roadside ditch.

Wetland Shrub, Disturbed (FLUCCS 6319)

This habitat is similar to FLUCCS code 6318, with the exception being the evidence of land alteration primarily due to human activity and a predominately exotic vegetation community.

Freshwater Marsh (FLUCCS 6410)

This classification is used to describe a wetland generally composed of grassy vegetation on hydric soils. Within the freshwater marshes located in the study area, the ground cover is dominated by maidencane (*Panicum hemitomon*) with sedges (*Cyperus* spp.) interspersed. Standing water was observed in the center of the system.

Disturbed Land (FLUCCS 7400)

This classification is used to describe areas which have been changed primarily due to human activities other than mining. In most cases, these land types showcase an increase of exotic vegetation coverage and an unnatural gradient.

Disturbed Land, Hydric (FLUCCS 7401)

This habitat is similar to FLUCCS code 7400 with the exception being ground cover species are dominated by hydrophytic species, such as torpedo grass, west Indian marshgrass and Peruvian primrose willow (*Ludwigia peruviana*).

Road and Maintained Right-of-Way (FLUCCS 8140)

Transportation facilities are used for the movement of people and goods; therefore, they are major influences on land and many land use boundaries are outlined by them. Coverage type includes all roadways within the survey area, Randall Boulevard being the most prevalent.

Appendix B

Representative Photographs



Representative hydric pine flatwoods, disturbed (FLUCFCS 6259)



Representative hydric pine flatwoods, disturbed (FLUCFCS 6259)



Representative wetland forested mixed, disturbed (FLUCFCS 6309)



Representative wetland forested mixed, disturbed (FLUCFCS 6309)



Representative wetland shrub, disturbed (FLUCFCS 6319) that is slowly transitioning to wetland forested mixed, disturbed (FLUCFCS 6309)

Appendix C

Project Area NRCS Soil Type Descriptions

MALABAR FINE SAND, 0 TO 2 PERCENT SLOPES (Hydric)

This soil type comprises approximately 17.34% of the soils located in the study area. This soil type is described by very deep, very poorly drained, slowly permeable soils in sloughs, shallow depressions and along flood plains. The water table is within depths of 10 inches for 2 to 6 months during most years and can recede to a depth of more than 40 inches in extended dry periods. Native vegetation consists of scattered slash pine, cypress, wax myrtle, cabbage palm and maidencane. In depressions, the vegetation is predominantly St. John's wort or maidencane.

RIVIERA, LIMESTONE SUBSTRATUM-COPELAND FINE SAND ASSOCIATION, 0 TO 2 PERCENT SLOPES (Hydric)

This soil type comprises approximately 2.65% of the soils located in the study area. This soil type is described by very deep, poorly drained, very slowly permeable soils on broad, low flats, flatwoods and in depressions. The water table is within 10 inches of the surface for 2 to 4 months in most years and 10 to 30 inches deep most of the rest of the year. Native vegetation consists of slash pine, cabbage palm, saw palmetto, scattered cypress and maidencane.

IMMOKALEE FINE SAND, 0 TO 2 PERCENT SLOPES (Non-hydric)

This soil type comprises approximately 41.09% of the soils located in the study area. This soil type is described by very deep, very poorly and poorly drained soils that formed in sandy marine sediments. The water table is within 6 to 18 inches of the surface for 1 to 4 months during most years, 18 to 36 inches for 2 to 10 months during most years, and it is below 60 inches during extended dry periods. Native vegetation consists of longleaf and slash pine with an undergrowth of saw palmetto, gallberry and wax myrtle. In depressions, water tolerant plants such as cypress, loblolly bay, red maple and maidencane are common.

PINEDA FINE SAND, LIMESTONE SUBSTRATUM, 0 TO 2 PERCENT SLOPES (Hydric)

This soil type comprises approximately 3.25% of the soils located in the study area. This soil type is described by very deep, nearly level, poorly drained soil on broad low flats, hammocks, sloughs, depressions, poorly defined drainageways and flood plains. The water table is within depths of 10 inches for 1 to 6 months. During the remainder of the year, it is typically at a depth of 10 to 40 inches below the surface. It may, however, recede below 40 inches during extended dry periods. Natural vegetation consists of south Florida slash pine, cypress, wax myrtle, cabbage palm, blue maidencane and chalky bluestem.

OLDSMAR FINE SAND, 0 TO 2 PERCENT SLOPES (Non-hydric)

This soil type comprises approximately 7.89% of the soils located in the study area. This soil type is described by very deep, poorly drained and very poorly drained soils that formed in sandy marine sediments overlying loamy materials. The water table is within 0 to 12 inches of the surface from 1 to 6 months during most years, 12 to 42 inches for the remainder of the year, and it is below 60 inches during extended dry periods. Native vegetation consists of cabbage palm, saw palmetto, live oak, slash pine, with an undergrowth of laurel oak and wax myrtle. In depressions the trees are cypress, pond pine, loblolly bay, red maple, and sweetbay.

BASINGER FINE SAND, 0 TO 2 PERCENT SLOPES (Hydric)

This soil type comprises approximately 18.90% of the soils located in the study area. This soil type is described by very deep, very poorly and poorly drained, rapidly permeable soil in low flats, sloughs, depressions and poorly defined drainageways. The water table is at depths of less than 12 inches for 2 to 6 months annually and at depths of 12 to 30 inches for periods of more than 6 months in most years.

Appendix C. NRCS Soil Type Descriptions

Depressions are covered with standing water for periods of 6 to 9 months or more in most years. Native vegetation consists of scattered slash pine, long leaf pine, cypress with an understory dominated by gallberry, cabbage palm, scattered saw palmetto, St. John's wort, cutthroat grass and blue maidencane.

BOCA FINE SAND, 0 TO 2 PERCENT SLOPES (Hydric)

This soil type comprises approximately 4.40% of the soils located in the study area. This soil type is described by moderately deep, poorly drained and very poorly drained soils that formed in sandy and loamy marine sediments deposited over limestone bedrock. Boca soils are on low broad flats, poorly defined drainageways, depressions, and adjacent tidal flats in areas of the flatwoods. The water table is within depths of 12 inches of the surface for 4 to 9 months during most years and is in the limestone during drier seasons. Depressions are covered by standing water 3 to 6 months or more each year. Native vegetation consists of gallberry, saw palmetto, cabbage palms and slash pine.

HOLOPAW-OKEELANTA, FREQUENTLY PONDED, ASSOCIATION, 0 TO 1 PERCENT SLOPES (Hydric)

This soil type comprises approximately 0.22% of the soils located in the study area. Holopaw soils are described by very deep and very poorly drained soil that formed in sandy and loamy marine sediments. Okeelanta soil is very deep, very poorly drained, rapidly permeable soils in large fresh water marshes and small depressional areas. Holopaw and Okeelanta soils are on nearly level low-lying flats, poorly defined drainageways and depressional areas. The water table for Holopaw is at depths of 6 to 12 inches for 2 to 6 months, during the remainder of the year, it is typically at a depth of 12 to 40 inches. In undrained areas of Okeelanta soil, the water table is at depths of less than 10 inches below the surface or the soil is covered by water 6 to 12 months during most years. Native vegetation is scattered slash and pond pine, cabbage palm and saw palmettos, scattered cypress, wax myrtle, sand cordgrass, gulf muhly and chalky bluestem.

BOCA, RIVIERA, LIMESTONE SUBSTRATUM, AND COPELAND FINE SANDS, DEPRESSIONAL (Hydric)

This soil type comprises approximately 1.14% of the soils located in the study area. Copeland soils are moderately deep, very poorly drained, moderately permeable soils in depressions and flats in peninsular Florida. Boca soils are moderately deep, poorly drained and very poorly drained soils that formed in sandy and loamy marine sediments deposited over limestone bedrock. Riviera soils are very deep, poorly drained, very slowly permeable soils on broad, low flats, flatwoods and in depressions. The water table for Copeland soils is at or near the surface for more than 6 months during most years. This soil is subject to very frequent flooding for periods of one to about 6 months. The water table for Boca soils is within depths of 12 inches of the surface for 4 to 9 months during most years and is in the limestone during drier seasons. The water table is within 10 inches of the surface for 2 to 4 months in most years and 10 to 30 inches deep most of the rest of the year. Native vegetation consists of cabbage palms, maples, cypress, gums with an undergrowth of vines, pineland threeawn and ferns. Blue flags, rushes, sedges, and lilies are common in depressions.

HOLOPAW FINE SAND, 0 TO 2 PERCENT SLOPES (Hydric)

This soil type comprises approximately 2.90% of the soils located in the study area. This soil type is described by very deep, very poorly drained soil that formed in sandy and loamy marine sediments. The water table is at depths of 6 to 12 inches for 2 to 6 months, during the remainder of the year, it is typically at a depth of 12 to 40 inches. Native vegetation is scattered slash and pond pine, cabbage palm, saw palmetto, cypress, wax myrtle, sand cordgrass, gulf muhly, chalky bluestem, plume grass, paspalum, blue maidencane, and pineland threeawn.

Appendix D

Standard Protection Measures for the
Eastern Indigo Snake

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or “approval” from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or “approval” from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11” x 17” or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. “Taking” of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. “Take” is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of \$25,000 for civil violations and up to \$50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant’s designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant’s designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.
2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.
3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).
2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.
3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

Appendix E

Panther Habitat Unit (PHU) Calculations

Table F-1. Conversion from FLUCFCS Codes to USFWS Land Cover Types

FLUCFCS Code	Description	Jurisdictional Status	Acreage	FWS Land Cover Type	FWS Habitat Value
1100, 1180, 1260, 1722, 1754	Residential and Commercial Classifications	N	43.66	Urban	0.0
2110	Improved Pasture	N	0.01	Improved Pasture	5.2
2140	Row Crops	N	0.01	Cropland	4.8
3100, 3109	Herbaceous (Dry Prairie) 9, Disturbed	N	1.43	Dry Prairie	6.3
3200, 3209	Shrub and Brushland (9)Disturbed	N	8.46	Dry Prairie	6.3
3309	Mixed Rangeland (9) Disturbed	N	6.74	Dry Prairie	6.3
4110	Pine Flatwoods	N	6.91	Pine Forest	9.5
422	Brazilian Pepper	N	2.53	Exotic/Nuisance Plants	3.0
5120, 5140	Water Classifications	SW	21.62	Water	0.0
6170	Mixed Wetland Hardwoods	Y	0.02	Hardwood Swamp	9.2
6210	Cypress	Y	1.23	Cypress Swamp	9.2
6249	Cypress-Pine-Cabbage Palm, Disturbed	Y	0.68	Hardwood-Pine	9.3
6250, 6259	Hydric Pine Flatwoods (9) Disturbed	Y	1.36	Pine Forest	9.5
6309	Wetland Forested Mixed, Disturbed	Y	0.31	Hardwood Swamp	9.2
6318, 6319	Wetland Shrub (8) Willow, (9) Disturbed	Y	1.40	Shrub Swamp/Brush	5.5
7400	Disturbed Land	N	1.68	Barren/Disturbed Lands	3.0
8140	Road and maintained right-of-way	N	39.45	Urban	0.0
			137.50		

Table F-2. PHU Impact Calculations

FLUCFCS Codes	FWS Land Cover Types	Panther Zone	Pre-Development Acreage (A)	FWS Assigned PHU Value (B)	Pre-Development PHUs (A)(B)	Post-Development Acreage (C)	Post-Development PHUs (C)(B)
1180	Residential	Primary	0.85	0.0	0.0	0.00	0.0
2140	Row Crops	Primary	0.01	4.8	0.0	0.00	0.0
3209	Shrub and Brushland, Disturbed	Primary	0.03	6.3	0.2	0.00	0.0
3309	Mixed Rangeland, Disturbed	Primary	1.08	6.3	6.8	0.00	0.0
4220	Brazilian Pepper	Primary	0.53	3.0	1.6	0.00	0.0
5140	Ditches	Primary	0.09	0.0	0.0	0.00	0.0
7400	Disturbed Land	Primary	0.95	3.0	2.9	0.00	0.0
8140	Road and maintained right-of-way	Primary	3.06	0.0	0.0	0.00	0.0
Sub-Total Primary Zone Impacts:			6.60		11.48	0.00	0.0
1100, 1180, 1260, 1722, 1754	Residential and Commercial Classifications	Secondary	42.81	0.0	0.0	0.00	0.0
2110	Improved Pasture	Secondary	0.01	5.2	0.1	0.00	0.0
3100, 3109	Dry Prairie	Secondary	1.43	6.3	9.0	0.00	0.0
3209, 3309	Shrub and Brushland; Mixed Rangeland, Disturbed	Secondary	14.09	6.3	88.8	0.00	0.0
4110	Pine Flatwoods	Secondary	6.91	9.5	65.6	0.00	0.0
4220	Brazilian Pepper	Secondary	2.00	3.0	6.0	0.00	0.0
5120, 5140	Canals, Ditches	Secondary	21.53	0.0	0.0	0.00	0.0
6170	Mixed Wetland Hardwoods	Secondary	0.02	9.2	0.2	0.00	0.0
6210	Cypress	Secondary	1.23	9.2	11.3	0.00	0.0
6249	Cypress-Pine-Cabbage Palm, Disturbed	Secondary	0.68	9.3	6.3	0.00	0.0
6250, 6259	Hydric Pine Flatwoods, Disturbed	Secondary	1.36	9.5	12.9	0.00	0.0
6309	Wetland Forested Mixed, Disturbed	Secondary	0.31	9.2	2.9	0.00	0.0
6318, 6319	Wetland Shrub (8) Willow, (9) Disturbed	Secondary	1.40	5.5	7.7	0.00	0.0
7400	Disturbed Land	Secondary	0.73	3.0	2.2	0.00	0.0
8140	Road and maintained right-of-way	Secondary	36.39	0.0	0.0	0.00	0.0
Sub-Total Secondary Zone Impacts:			130.90		212.96	0.00	0.0

Primary Panther Habitat Impacts = [Pre-Development PHUs (11.48) - Post-Development PHUs (0.0)] X 1.98 Landscape Multiplier X 1.0 (Impacts to Primary Zone/Mitigation in Primary Zone) = 22.73 PHUs required

Secondary Panther Habitat Impacts = [Pre-Development PHUs (212.96 - Post-Development PHUs (0.0))] X 1.98 Landscape Multiplier X 0.69 (Impacts to Primary Zone/Mitigation in Primary Zone) = 290.95 PHUs required

Total Estimated Panther Mitigation (PHUs) required = 313.68 PHUs

Appendix F

UMAM Datasheet

Forested/Herbaceous	Habitat Type	Location & Landscape Support		Water Environment		Community Structure		Overall Score			Acres	Units
		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Delta		
Forested	6170	6	0	5	0	5	0	0.53	0.00	0.53	0.02	0.01
Forested	6210	6	0	5	0	5	0	0.53	0.00	0.53	1.23	0.66
Forested	6249	6	0	5	0	5	0	0.53	0.00	0.53	0.68	0.36
Forested	6250	6	0	5	0	5	0	0.53	0.00	0.53	0.02	0.01
Forested	6259	6	0	4	0	4	0	0.47	0.00	0.47	1.34	0.63
Forested	6309	6	0	5	0	6	0	0.57	0.00	0.57	0.31	0.18
Herbaceous	6318	6	0	5	0	5	0	0.53	0.00	0.53	1.29	0.69
Herbaceous	6319	6	0	5	0	4	0	0.50	0.00	0.50	0.11	0.06
TOTAL											5.00	2.58

Functional Units Lost = Mitigation Required: 1.84 Forested Credits + 0.74 Herbaceous Credits = 2.58 Total of Wetland Credits Needed to Offset Direct Wetland Impacts

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6170	Further classification (optional) Mixed wetland hardwoods		Impact or Mitigation Site? Impact	Assessment Area Size 0.02
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas are wetland shrub habitats which have been previously degraded by roadway ditch excavation and nearby residential properties.				
Significant nearby features Randall Blvd, Everglades Blvd N, Oil Well Rd		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6170
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current	with	Current - Connected to roadway with drainage ditches/swales. With - Impacted
	6	
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current	with	Current - Hydrology reduced due to adjacent ditching of roadway. With - Impacted
	5	
1. Vegetation and/or 2. Benthic Community w/o pres or current	with	Current - Assessment areas are wetland shrub habitats which have been previously degraded by roadway ditch excavation and nearby residential properties. With - Impacted
	5	

Score = sum of above scores/30 (if uplands, divide by 20)	
w/o pres or	with
0.53	0.00

Impact Acres
0.02

Delta = [with-current]
-0.53

For impact assessment areas Functional Loss (FL) = delta x acres
-0.01

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6210	Further classification (optional) Cypress		Impact or Mitigation Site? Impact	Assessment Area Size 1.23
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas are cypress-dominated habitats which have been previously degraded by roadway ditch excavation and nearby residential properties.				
Significant nearby features Randall Blvd, Everglades Blvd N		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6210
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current - Connected to roadway with drainage ditches/swales.		
w/o pres or current	with	With - Impacted	
6	0		
.500(6)(b) Water Environment (n/a for uplands)	Current - Hydrology reduced due to adjacent ditching of roadway.		
w/o pres or current	with	With - Impacted	
5	0		
.500(6)(c) Community structure	Current - Assessment areas are cypress-dominated habitats which have been previously degraded by roadway ditch excavation and nearby residential properties.		
1. Vegetation and/or 2. Benthic Community	With - Impacted		
w/o pres or current	with		
5	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
w/o pres or	with
0.53	0.00

Impact Acres
1.23

Delta = [with-current]
-0.53

For impact assessment areas Functional Loss (FL) = delta x acres
-0.66

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6249	Further classification (optional) Cypress-pine-cabbage palm, disturbed		Impact or Mitigation Site? Impact	Assessment Area Size 0.68
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas characterized by cypress, pine and cabbage palm habitats which have been previously degraded by roadway ditch excavation and nearby residential properties.				
Significant nearby features Randall Blvd		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6249
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support w/o pres or current 6	with 0	Current - Connected to roadway with drainage ditches/swales. With - Impacted
.500(6)(b) Water Environment (n/a for uplands) w/o pres or current 5	with 0	Current - Hydrology reduced due to adjacent ditching of roadway. With - Impacted
.500(6)(c) Community structure 1. Vegetation and/or 2. Benthic Community w/o pres or current 5	with 0	Current - Assessment areas characterized by cypress, pine and cabbage palm habitats which have been previously degraded by roadway ditch excavation and nearby residential properties. With - Impacted

Score = sum of above scores/30 (if uplands, divide by 20) w/o pres or 0.53	with 0.00
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Impact Acres 0.68

Delta = [with-current] -0.53
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For impact assessment areas Functional Loss (FL) = delta x acres -0.36

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6250	Further classification (optional) Hydric pine flatwoods		Impact or Mitigation Site? Impact	Assessment Area Size 0.02
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas hydric pine flatwoods habitats which have been previously degraded by roadway ditch excavation and nearby agriculture.				
Significant nearby features Oil Well Rd		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6250
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current - Connected to roadway with drainage ditches/swales.		
w/o pres or current	with	With - Impacted	
6	0		
.500(6)(b) Water Environment (n/a for uplands)	Current - Hydrology reduced due to adjacent ditching of roadway.		
w/o pres or current	with	With - Impacted	
5	0		
.500(6)(c) Community structure	Current - Assessment areas hydric pine flatwoods habitats which have been previously degraded by roadway ditch excavation and nearby agriculture.		
1. Vegetation and/or 2. Benthic Community	With - Impacted		
w/o pres or current	with		
5	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
w/o pres or	with
0.53	0.00

Impact Acres
0.02

Delta = [with-current]
-0.53

For impact assessment areas Functional Loss (FL) = delta x acres
-0.01

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6259	Further classification (optional) Hydric pine flatwoods, disturbed		Impact or Mitigation Site? Impact	Assessment Area Size 1.34
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas hydric pine flatwoods habitats exhibiting exotic infestations and which have been significantly degraded by canals, roadway ditch excavation, nearby residential properties and retention ponds.				
Significant nearby features Randall Blvd, Desoto Blvd N		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story, Caesar weed (<i>Urena lobata</i>) and torpedo grass (<i>Panicum repens</i>) in groundcover.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6259
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current - Connected to roadway with drainage ditches/swales.		
w/o pres or current	with	With - Impacted	
6	0		
.500(6)(b) Water Environment (n/a for uplands)	Current - Hydrology reduced due to adjacent canal and ditching of roadway.		
w/o pres or current	with	With - Impacted	
4	0		
.500(6)(c) Community structure	Current - Assessment areas hydric pine flatwoods habitats exhibiting exotic infestations and which have been significantly degraded by canals, roadway ditch excavation, nearby residential properties and retention ponds.		
1. Vegetation and/or 2. Benthic Community	With - Impacted		
w/o pres or current	with		
4	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
w/o pres or	with
0.47	0.00

Impact Acres
1.34

Delta = [with-current]
-0.47

For impact assessment areas Functional Loss (FL) = delta x acres
-0.63

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6309	Further classification (optional) Wetland forested mixed, disturbed		Impact or Mitigation Site? Impact	Assessment Area Size 0.31
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas wetland forested mixed, disturbed habitats which have been degraded by roadway ditch excavation and nearby residential properties.				
Significant nearby features Randall Blvd		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6309
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current - Connected to roadway with drainage ditches/swales.			
w/o pres or current	with	With - Impacted		
6	0			
.500(6)(b) Water Environment (n/a for uplands)	Current - Hydrology reduced due to ditching of roadway.			
w/o pres or current	with	With - Impacted		
5	0			
.500(6)(c) Community structure	Current - Assessment areas wetland forested mixed, disturbed habitats which have been degraded by roadway ditch excavation and nearby residential properties.			
1. Vegetation and/or 2. Benthic Community	With - Impacted			
w/o pres or current	with			
6	0			

Score = sum of above scores/30 (if uplands, divide by 20)		
w/o pres or	with	
0.57	0.00	

Impact Acres
0.31

Delta = [with-current]
-0.57

For impact assessment areas Functional Loss (FL) = delta x acres
-0.18

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6318	Further classification (optional) Wetland shrub, predominantly willow		Impact or Mitigation Site? Impact	Assessment Area Size 1.29
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas wetland shrub, predominantly willow habitats which have been degraded by roadway ditch excavation and nearby residential properties.				
Significant nearby features Randall Blvd		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6318
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current - Connected to roadway with drainage ditches/swales.		
w/o pres or current	with	With - Impacted	
6	0		
.500(6)(b) Water Environment (n/a for uplands)	Current - Hydrology reduced due to ditching of roadway.		
w/o pres or current	with	With - Impacted	
5	0		
.500(6)(c) Community structure	Current - Assessment areas wetland shrub, predominantly willow habitats which have been degraded by roadway ditch excavation and nearby residential properties.		
1. Vegetation and/or 2. Benthic Community	With - Impacted		
w/o pres or current	with		
5	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
w/o pres or	with
0.53	0.00

Impact Acres
1.29

Delta = [with-current]
-0.53

For impact assessment areas Functional Loss (FL) = delta x acres
-0.68

**PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)**

Site/Project Name Randall Blvd		Application Number	Assessment Area I.D. / Polygon I.D.	
FLUCFCS code 6319	Further classification (optional) Wetland shrub, disturbed		Impact or Mitigation Site? Impact	Assessment Area Size 0.11
Basin/Watershed Name/Number West Collier	Affected Waterbody (Class) III	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) None		
Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands Connected to roadway with drainage ditches/swales.				
Assessment area description Assessment areas wetland shrub, disturbed habitats which have been degraded by roadway ditch excavation and nearby residential properties.				
Significant nearby features Randall Blvd		Uniqueness (considering the relative rarity in relation to the regional) Not unique		
Functions Roadway corridor; flood attenuation		Mitigation for previous permit/other historic use		
Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Small mammals, birds, reptiles, amphibians.		Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the) Listed wading birds		
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.): None.				
Additional relevant factors: Brazilian pepper (<i>Schinus terebinthifolius</i>) and melaleuca (<i>Melaleuca quinquenervia</i>) present in mid-story.				
Assessment conducted by: GFT		Assessment date(s): 4/25/2019		

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name Randall Blvd	Application Number	Assessment Area Name or Number 6319
Impact or Mitigation Impact	Assessment conducted by: GFT	Assessment date: 4/25/2019

Scoring Guidance The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

.500(6)(a) Location and Landscape Support	Current - Connected to roadway with drainage ditches/swales.		
w/o pres or current	with	With - Impacted	
6	0		
.500(6)(b) Water Environment (n/a for uplands)	Current - Hydrology reduced due to ditching of roadway.		
w/o pres or current	with	With - Impacted	
5	0		
.500(6)(c) Community structure	Current - Assessment areas wetland shrub, disturbed habitats which have been degraded by roadway ditch excavation and nearby residential properties.		
1. Vegetation and/or 2. Benthic Community	With - Impacted		
w/o pres or current	with		
4	0		

Score = sum of above scores/30 (if uplands, divide by 20)	
w/o pres or	with
0.50	0.00

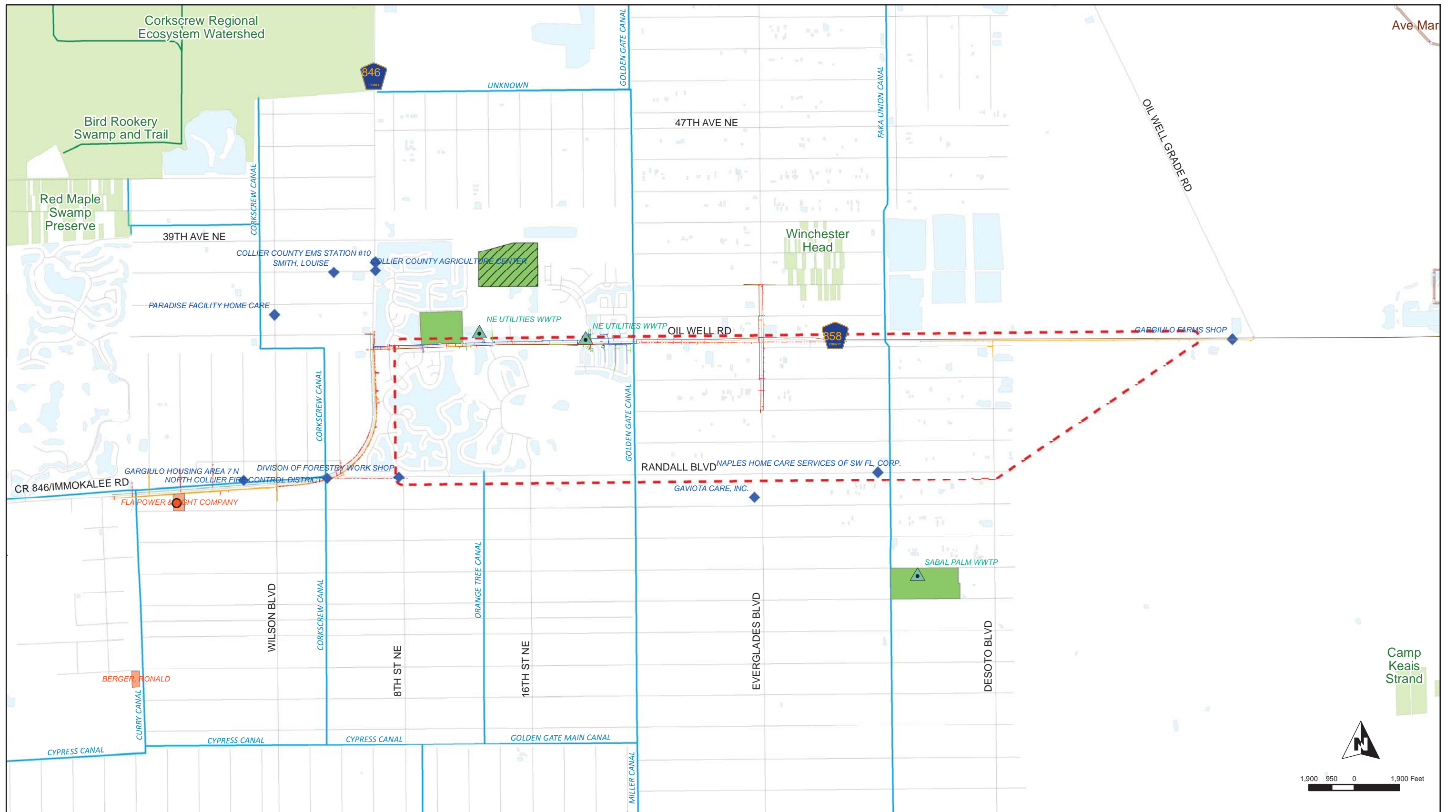
Impact Acres
0.11

Delta = [with-current]
-0.50

For impact assessment areas Functional Loss (FL) = delta x acres
-0.06

Appendix E

Potential Utilities



Legend:

- | | | | |
|-------------------------|-----------------------------|---|------------------------------------|
| Ava Maria Town Boundary | Collier County Parks | Waster Water Treatment Facilities | Overhead Electric (OE) |
| Project Study Area | Collier County Future Parks | Florida Power and Light/Electric Substation | CATV Fiber (CATV) |
| Surface Waters | Florida Managed Lands | Drinking Water Locations | Water (WM) |
| Canals | | Utility Parcels | Sanitary Force Main or Storm Water |
| | | Power Transmission Lines | Telephone Fiber (BT) |
| | | | Conduit Underground |

Appendix E
Utilities Map
Randall Boulevard and Oil Well Road Corridor Study
 Contract # 16-6617/Collier County Project # 60065
 Collier County, Florida

Last Updated: 20190408
 Randall_Utilities
 Source Data: FDOT APLUS 2017, FDOT GIS Roads, Florida Geographic Library, Google Earth, ESRI, Collier County, Growth Management Department of Collier County, Collier County Florida Geographic Information Interactive Mapping, FDEP

Appendix F
Noise Study Technical Memorandum

Draft

RANDALL BOULEVARD & OIL WELL ROAD CORRIDOR STUDY

Noise Study Technical Memorandum

Prepared for
Collier County Transportation Planning

March 20, 2019



Draft

RANDALL BOULEVARD & OIL WELL ROAD CORRIDOR STUDY

Noise Study Technical Memorandum

Prepared for
Collier County Transportation Planning

March 20, 2019

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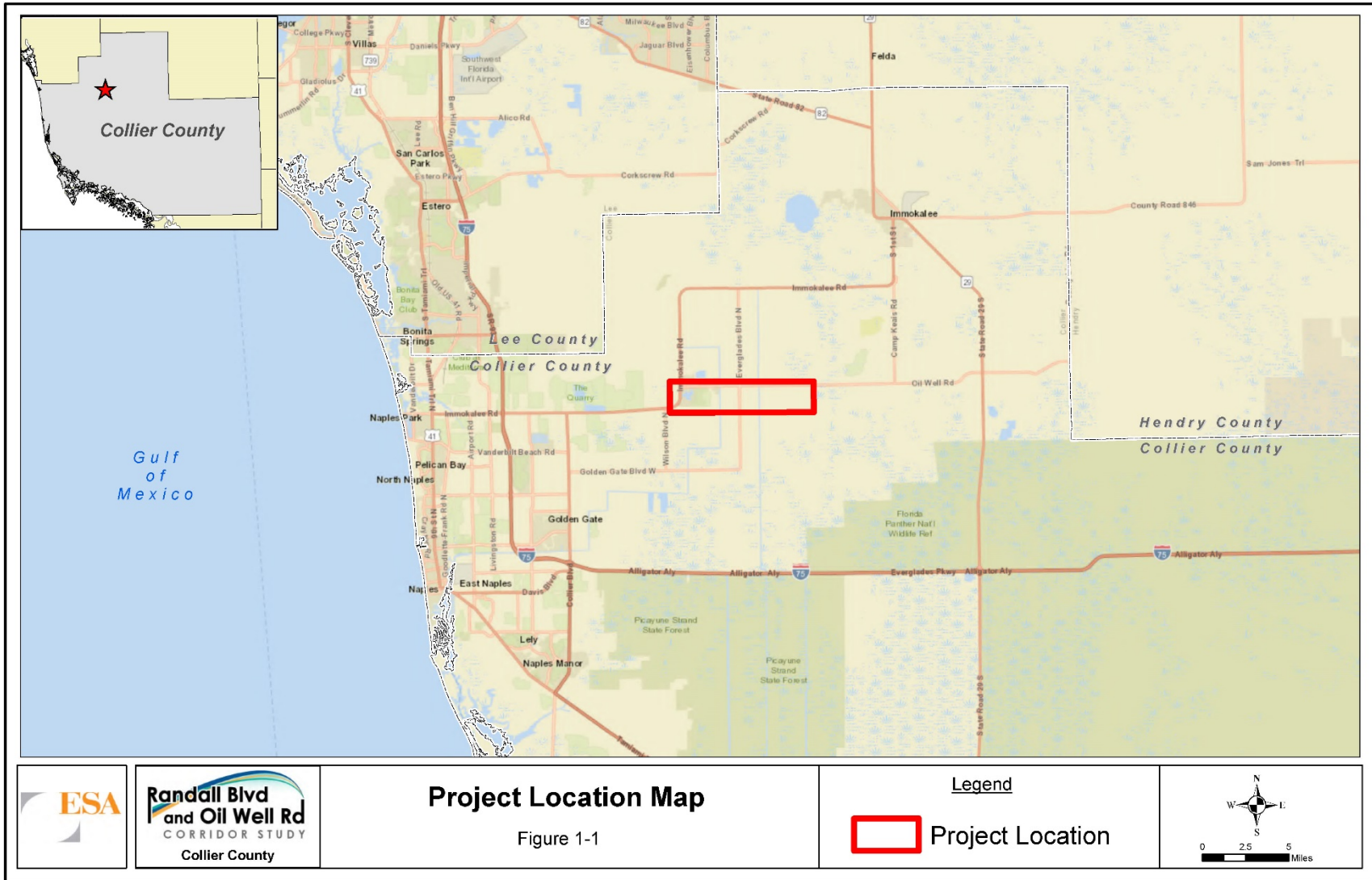
CHAPTER 1

Introduction

Collier County is currently conducting a corridor study to evaluate potential alternatives to improve the roadway network in the vicinity of Randall Boulevard and Oil Well Road. Several alternatives are being considered to enhance traffic operations and safety conditions, as well as to meet anticipated travel demand in the surrounding area. The project study area is provided on **Figure 1-1**.

This study will evaluate potential improvements to the existing facilities for Randall Boulevard, Oil Well Road, Desoto Boulevard and Everglades Boulevard, and will also consider new alignment alternatives within the study area.

The purpose of this Noise Study Technical Memorandum (NSTM) is to document the preliminary traffic noise screening analysis conducted for each of the alternatives under consideration and anticipate the potential number of traffic noise impacts that may result from each alternative.



CHAPTER 2

Methodology

Traffic noise studies are prepared in accordance with Title 23 Code of Federal Regulations (CFR) Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*¹. The evaluation uses methodology and policy established by the Florida Department of Transportation (FDOT) and documented in Part 2, Chapter 18 *Highway Traffic Noise* of the Project Development and Environment (PD&E) Manual (January 14, 2019)². Additional guidance was obtained from the *Traffic Noise Modeling and Analysis Practitioners Handbook*³.

As also required by 23 CFR Part 772, the prediction of existing and future traffic noise levels with and without the proposed improvements was performed using the Federal Highway Administration's (FHWA's) computer model for highway traffic noise prediction and abatement analysis – the Traffic Noise Model (TNM-Version 2.5). The TNM predicts sound energy, in one-third octave bands, between highways and nearby receivers taking the intervening ground's acoustical characteristics/topography and rows of buildings into account.

Since this project is a corridor study, detailed future build traffic noise levels were not predicted for each noise sensitive land use within the project limits. Rather, noise contours were prepared for the four and six-lane typical sections that estimate the distance from the edge of the outside travel lane to where noise impacts are anticipated to occur in the design year (2045) with each alternative. Additionally, no abatement analysis was performed for any of the noise sensitive land uses that are identified as potentially impacted in this report. It is anticipated that a detailed traffic noise study will be conducted once a preferred alternative has been selected for the project.

2.1 Noise Metrics

Noise levels discussed in this report are expressed in decibels (dB) on the A-weighted scale, or dB(A). This scale most closely approximates the response characteristics of the human ear to traffic noise. All noise levels are reported as equivalent level (Leq(h)) values, which is the equivalent steady-state sound level for a one-hour period that contains the same acoustic energy as the time-varying sound level during the same time period. Use of the Leq(h) metric and dB(A) as the unit of measurement is specified by 23 CFR 772.

2.2 Traffic Data

Level of Service (LOS) C traffic volumes were modeled for the four and six-lane typical sections. Vehicle speeds used in the model were based on the proposed posted speed limit of 45 miles per

hour (mph) for both the four and six-lane roadways. The traffic data used in the analysis is provided in **Appendix A**.

2.3 Noise Abatement Criteria

To evaluate traffic noise, the FHWA established Noise Abatement Criteria (NAC). As shown in **Table 2-1**, the criteria vary according to a property’s activity category.

**TABLE 2-1
FHWA NOISE ABATEMENT CRITERIA (NAC)**

Activity Category	Activity Leq(h) ¹		Evaluation Location	Description of Activity Category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ²	67	66	Exterior	Residential
C ²	67	66	Exterior	Active sports areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E ²	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	-	-	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-	-	-	Undeveloped lands that are not permitted.

(Based on Table 1 of 23 CFR Part 772)
¹ The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
² Includes undeveloped lands permitted for this activity category.
Note: FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.

Consistent with the FDOT’s traffic noise policy contained in Part 2, Chapter 18 of the PD&E Manual, a traffic noise impact occurs when either of the following conditions are met:

- When predicted design year, future build traffic noise levels “approach” or exceed the NAC for a given Activity Category listed in Table 2-1. The FDOT defines the term ‘approach’ to mean within one dB(A) of the NAC (i.e., one dB(A) less than the NAC).
- When predicted design year, future build noise levels increase substantially from existing levels. A substantial increase is defined as an increase of 15 dB(A) or more above existing noise levels as a direct result of a transportation improvement project.

As previously discussed, detailed traffic noise level predictions for the future build condition were not made for individual noise sensitive land uses adjacent to the proposed alternatives. The purpose of this study is to prepare noise contours for the four and six-lane typical sections that estimate the distance from the roadway where traffic noise impacts may potentially occur in the design year (2045) with the four alternatives currently under consideration.

2.4 Land Use and Study Process

A review of the study areas was conducted in February 2019. The current dominant land use in the area is residential, and it is anticipated that this use will continue in the future. Additional noise sensitive land uses include a recreational use (golf course at Valencia Golf and Country Club) located on the north side of Randall Boulevard, and a place of worship (Church of Jesus Christ of Latter-Day Saints) in the northwest corner of Randall and Everglades Boulevards.

Based on the noise sensitive land uses identified in the project area, noise contours were prepared to estimate the distance to an approach (within one dB(A) of the NAC, or 65 dB(A)) for Activity Category B (residential) and Activity Category C (recreation) land uses. Since the place of worship does not have a frequent exterior use area (playground, etc.), it was evaluated as Activity Category D of the NAC, which considers interior traffic noise levels. As the building is of masonry construction, a reduction of 25 dB(A) can be expected, consistent with guidance found in the Federal Highway Administration (FHWA) document *Highway Traffic Noise: Analysis and Abatement Guidance*⁴. As such, a 76 dB(A) noise contour was prepared to evaluate the potential for traffic noise impacts at this location (i.e., 51 dB(A) is an approach of the NAC for Activity Category D, plus the anticipated building reduction factor of 25 dB(A)).

Once the distances to an approach for each Activity Category was determined using the TNM for both the four and six-lane typical sections, they were plotted on aerial mapping with each of the four proposed alternatives, and the number of residences “inside” the contour are counted (i.e., considered impacted) if the noise contour line, at a minimum, reaches the edge of the residential structure for category B land uses, any portion of the usable area of a recreational facility, or the edge of the building structure for the place of worship nearest the roadway. The counts estimate the number of potential traffic noise impacts that may result from each of the proposed alternatives under consideration.

As discussed above, a traffic noise impact can also occur if predicted future build, design year traffic noise levels increase 15 dB(A) or more when compared to existing levels as a direct result of a transportation improvement project.

Since increases of this magnitude typically only occur adjacent to new roadway alignments where no roadway previously existed, existing traffic noise levels were predicted using the TNM at four locations between Randall Boulevard and Oil Well Road, west of Everglades Boulevard. The four locations are adjacent to the proposed alignment for the connector roadway linking Randall Boulevard and Oil Well Road that is proposed as part of Alternative 1 (descriptions of each alternative are provided in the following section). The existing noise levels are based on the LOS C traffic data that was provided and consider the sound level contributions from Randall

Boulevard, Oil Well Road, and Everglades Boulevard. The noise levels predicted at the four locations were averaged, resulting in a level of 46.025 dB(A). As such, 46.0 dB(A) was used to represent the existing condition in the area, and an additional noise contour was prepared to estimate the distance to 61 dB(A) which would be considered a substantial increase of at least 15 dB(A). That contour distance was calculated to be 214 feet from the edge of the outside travel lane, and was rounded up to 215 feet to be conservative.

The following assumptions apply to the noise contour analysis presented in this report:

- Noise contour distances are estimates to be used for planning purposes only.
- Noise contour distances do not account for any reduction in noise levels that may occur as a result of shielding, either from existing privacy walls/earth berms, or from other structures.
- Noise contour distances do not consider topography. A default ground type of “lawn” was used in the TNM.
- Noise contour distances are not an indication of the reasonableness and feasibility of providing noise abatement at potentially impacted locations.
- The estimated number of potential traffic noise impacts presented in this report assumes that none of the noise sensitive land uses will be acquired to accommodate the right-of-way (ROW) necessary to construct any of the proposed alternatives.
- A detailed traffic noise study for the preferred alternative may result in more, or less traffic noise impacts than what is documented in this report.

2.5 Alternatives Considered

Four alternatives are being considered as part of this corridor study. A description of each is provided below. The four and six-lane typical sections are provided in **Appendix B**.

- **Alternative 1 – New Alignment:** Alternative 1 includes a new alignment roadway connecting Randall Blvd to Oil Well Road. Traffic would be able to bypass the existing north-south connections of Everglades Boulevard and DeSoto Boulevard, thus allowing potential roundabouts at those connections with Randall Boulevard.
- **Alternative 2 – Six-Lane Randall Boulevard Plus Four-Lane Everglades Boulevard:** Since Oil Well Road is constrained to four lanes near Immokalee Road, traffic would have the option to use Randall Boulevard and Everglades Boulevard as a bypass. This increase in traffic demand could be met with widening Randall Boulevard to six lanes and Everglades Boulevard to four lanes in the study area. Roundabouts are not likely to be included with this alternative.
- **Alternative 3 – Six-Lane Randall Boulevard Plus Four-Lane Everglades Boulevard and Four-Lane Desoto Boulevard:** Since Oil Well Road is constrained to four lanes

near Immokalee Road, traffic would have the option to use Randall Boulevard and Everglades Boulevard and Desoto Boulevard as a bypass. This increase in traffic demand could be met with widening Randall Boulevard to six lanes, Everglades Boulevard to four lanes, and Desoto Boulevard to four lanes in the study area. Roundabouts are not likely to be included with this alternative.

- **Alternative 4 – Six-Lane Randall Boulevard Plus Six-Lane Everglades Boulevard:** Since Oil Well Road is constrained to 4 lanes near Immokalee Road, traffic would have the option to use Randall Boulevard and Everglades Boulevard as a bypass. This increase in traffic demand could be met with widening Randall Boulevard to six lanes and Everglades Boulevard to six lanes in the study area. Roundabouts are not likely to be included with this alternative.

CHAPTER 3

Noise Contour Results

Table 3-1 provides the predicted distances to an approach of the NAC for Activity Category B and C land uses for each of the roadways included in this alternatives analysis. That distance is 100 feet from the edge of the outside travel lane for the four-lane roadways and 140 feet (rounded up from the modeled distance of 137 feet in order to be conservative) for six-lane roadways. Based on the results of the analysis, the noise contour for Activity Category D land uses will not extend outside the ROW for either the four or six-lane typical sections. As such, no impacts to the single Activity Category D land use (Church of Jesus Christ of Latter-Day Saints) are anticipated with any of the alternatives under consideration.

**TABLE 3-1
NOISE CONTOUR DISTANCES¹**

Impact Category	Four-Lane Typical Section	Six-Lane Typical Section
Approach of 67 dB(A) for Category B and C ²	100 feet	140 feet ³
Substantial Increase ⁴	215 feet	NA

NOTES:

- 1 Distances are measured from the outside edge of the nearest travel lane, do not account for any reduction in noise levels due to shielding, and are to be used for planning purposes only.
- 2 As discussed in the paragraph above, the noise contour for Activity Category D is not predicted to extend outside the ROW for either the four or six-lane typical sections.
- 3 Actual contour distance predicted to be 137 feet, and was rounded up to 140 feet to be conservative.
- 4 Calculated only for the 4-lane new alignment typical section as part of Alternative 1. Please see Section 2.4 for additional information.

SOURCE: ESA, 2019.

Table 3-2 contains the anticipated number of traffic noise impacts for Activity Category B and C land uses, for each of the four alternatives under consideration. The exhibits in **Appendix C** depict the noise contours and the anticipated impacts from each alternative.

**TABLE 3-2
POTENTIAL TRAFFIC NOISE IMPACTS BY ALTERNATIVE**

Alternative	Activity Category B (Residential)	Activity Category C (Recreation)	Activity Category D (Place of Worship – Interior)	Total Potential Impacts by Alternative
Alternative 1	83	1 ¹	0	84
Alternative 2	141	1 ¹	0	142
Alternative 3	145	1 ¹	0	146
Alternative 4	157	1 ¹	0	158

NOTES:

¹ Includes portions of three golf course holes at Valencia Golf and Country Club on the north side of Randall Boulevard (the entire golf course is considered one noise sensitive land use).

SOURCE: ESA, 2019.

As shown in Table 3-2, the number of potential traffic noise impacts to recreational facilities is the same for all alternatives, in that portions of three golf course holes at the Valencia Golf and Country Club may be impacted (the entire golf course is considered a single noise sensitive land use). As also shown, the number of potentially impacted residences varies with each alternative, ranging from 83 under Alternative 1 to up to 157 with Alternative 3. The difference in the number of potentially impacted residences is directly attributable to the different typical sections (four-lane vs. six-lane) for each of the roadways with each alternative. As previously mentioned, no impacts to the single Activity Category D land use are anticipated with any of the four alternatives evaluated.

CHAPTER 4

References

1. 23 Code of Federal Regulations, Part 772: “*Procedures for Abatement of Highway Traffic Noise and Construction Noise.*” Federal Highway Administration; July 13, 2010.
2. Florida Department of Transportation Project Development and Environment Manual, Part 2, Chapter 18 “*Highway Traffic Noise*”. January 14, 2019.
3. Florida Department of Transportation “*Traffic Noise Modeling and Analysis Practitioners Handbook.*” January 1, 2016.
4. Federal Highway Administration; “*Highway Traffic Noise: Analysis and Abatement Guidance.*” December 2011.

APPENDIX A

Traffic Data for Noise Contours

FDOT TRAFFIC DATA FOR NOISE STUDIES - DETAILED OUTPUT

Prepared By: Colleen Ross - Jacobs Date: 1/0/1900 Approved for Use By: _____ Date: _____
 Federal Aid Number(s): 0 Section Number: 0
 FPID Number(s): 0 Mile Post To/From: 0
 State/Federal Route No.: 0
 Road Name: 4-Lane Facility
 Project Description: Randall Boulevard and Oil Well Road Corridor Study
 Segment Description: 0

Note: Data sheets are to be completed for each segment having a change in traffic parameters (i.e., volume posted speed, typical section)

Demand Peak Hour/LOS C	Peak or Off-Peak Direction	Vehicle Type	Existing		No Build (Design Year)		Build (Design Year)	
			Year: 2019	Year: 2045	Year: 2045	Year: 2045		
			Posted Speed: 45	Posted Speed: 45	Posted Speed: 45	Posted Speed: 45	Posted Speed: 45	Posted Speed: 45
			Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 4	Number of Travel Lanes: 4
See Columns to Right > for Which Volumes To Use (Demand or LOS C)			Number of Vehicles	Number of Vehicles	Number of Vehicles	Number of Vehicles	Number of Vehicles	Number of Vehicles
			Use Demand Volumes	Use Demand Volumes	Use Demand Volumes	Use Demand Volumes	Use Demand Volumes	Use Demand Volumes
Demand Peak Hour	Peak Direction	Autos	-3	-3	-3	-3	-3	-3
		Med Trucks	1	1	1	1	1	
		Heavy Trucks	1	1	1	1	1	
		Buses	1	1	1	1	1	
		Motorcycles	1	1	1	1	1	
	Total	1	1	1	1	1		
	Off-Peak Direction	Autos	-3	-3	-3	-3	-3	
		Med Trucks	1	1	1	1	1	
		Heavy Trucks	1	1	1	1	1	
		Buses	1	1	1	1	1	
Motorcycles		1	1	1	1	1		
Total	1	1	1	1	1			
LOS C	Peak Direction	Autos	613	613	613	613	1503	
		Med Trucks	3	3	3	3	8	
		Heavy Trucks	19	19	19	19	47	
		Buses	3	3	3	3	6	
		Motorcycles	1	1	1	1	2	
	Total	639	639	639	639	1566		
	Off-Peak Direction	Autos	613	613	613	613	1503	
		Med Trucks	3	3	3	3	8	
		Heavy Trucks	19	19	19	19	47	
		Buses	3	3	3	3	6	
Motorcycles		1	1	1	1	2		
Total	639	639	639	639	1566			

FDOT TRAFFIC DATA FOR NOISE STUDIES - DETAILED OUTPUT

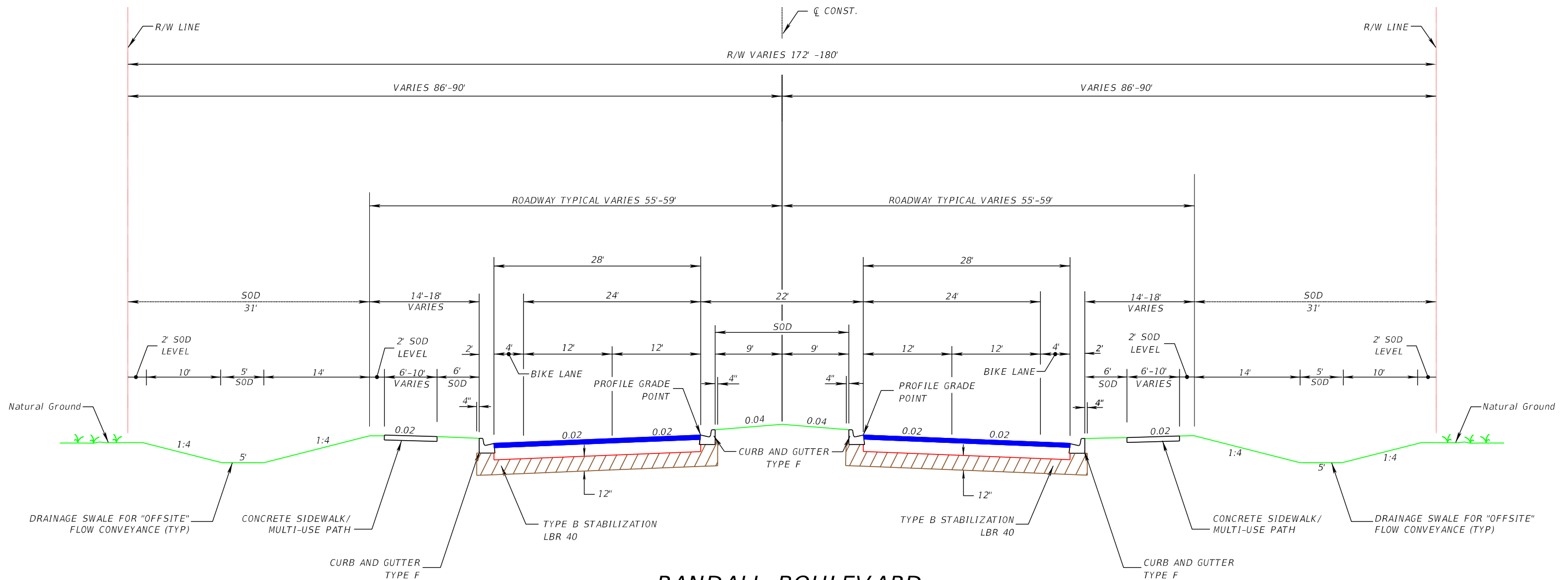
Prepared By: Colleen Ross - Jacobs Date: 2/28/2019 Approved for Use By: _____ Date: _____
 Federal Aid Number(s): 0 Section Number: 0
 FPID Number(s): 0 Mile Post To/From: 0
 State/Federal Route No.: 0
 Road Name: 6-Lane Facility
 Project Description: Randall Boulevard and Oil Well Road Corridor Study
 Segment Description: 0

Note: Data sheets are to be completed for each segment having a change in traffic parameters (i.e., volume posted speed, typical section)

Demand Peak Hour/LOS C	Peak or Off-Peak Direction	Vehicle Type	Existing		No Build (Design Year)		Build (Design Year)	
			Year: 2019	Year: 2045	Year: 2045	Year: 2045		
			Posted Speed: 45	Posted Speed: 45	Posted Speed: 45	Posted Speed: 45	Posted Speed: 45	Posted Speed: 45
			Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 2	Number of Travel Lanes: 6	Number of Travel Lanes: 6
See Columns to Right > for Which Volumes To Use (Demand or LOS C)			Number of Vehicles	Number of Vehicles	Number of Vehicles	Number of Vehicles	Number of Vehicles	Number of Vehicles
			Use Demand Volumes	Use Demand Volumes	Use Demand Volumes	Use Demand Volumes	Use Demand Volumes	Use Demand Volumes
Demand Peak Hour	Peak Direction	Autos	-3	-3	-3	-3	-3	-3
		Med Trucks	1	1	1	1	1	
		Heavy Trucks	1	1	1	1	1	
		Buses	1	1	1	1	1	
		Motorcycles	1	1	1	1	1	
	Total	1	1	1	1	1		
	Off-Peak Direction	Autos	-3	-3	-3	-3	-3	
		Med Trucks	1	1	1	1	1	
		Heavy Trucks	1	1	1	1	1	
		Buses	1	1	1	1	1	
Motorcycles		1	1	1	1	1		
Total	1	1	1	1	1			
LOS C	Peak Direction	Autos	613	613	613	613	2307	
		Med Trucks	3	3	3	3	12	
		Heavy Trucks	19	19	19	19	72	
		Buses	3	3	3	3	10	
		Motorcycles	1	1	1	1	2	
	Total	639	639	639	639	2403		
	Off-Peak Direction	Autos	613	613	613	613	2307	
		Med Trucks	3	3	3	3	12	
		Heavy Trucks	19	19	19	19	72	
		Buses	3	3	3	3	10	
Motorcycles		1	1	1	1	2		
Total	639	639	639	639	2403			

APPENDIX B

Typical Sections



RANDALL BOULEVARD
TYPICAL SECTION
 4 LANE DIVIDED URBAN SECTION
 (NOTE: SECTION LOOKING EAST)

NOTE: STORMWATER TREATMENT AND CONVEYANCE ATTENTION WILL BE PERFORMED IN ROADSIDE SWALES

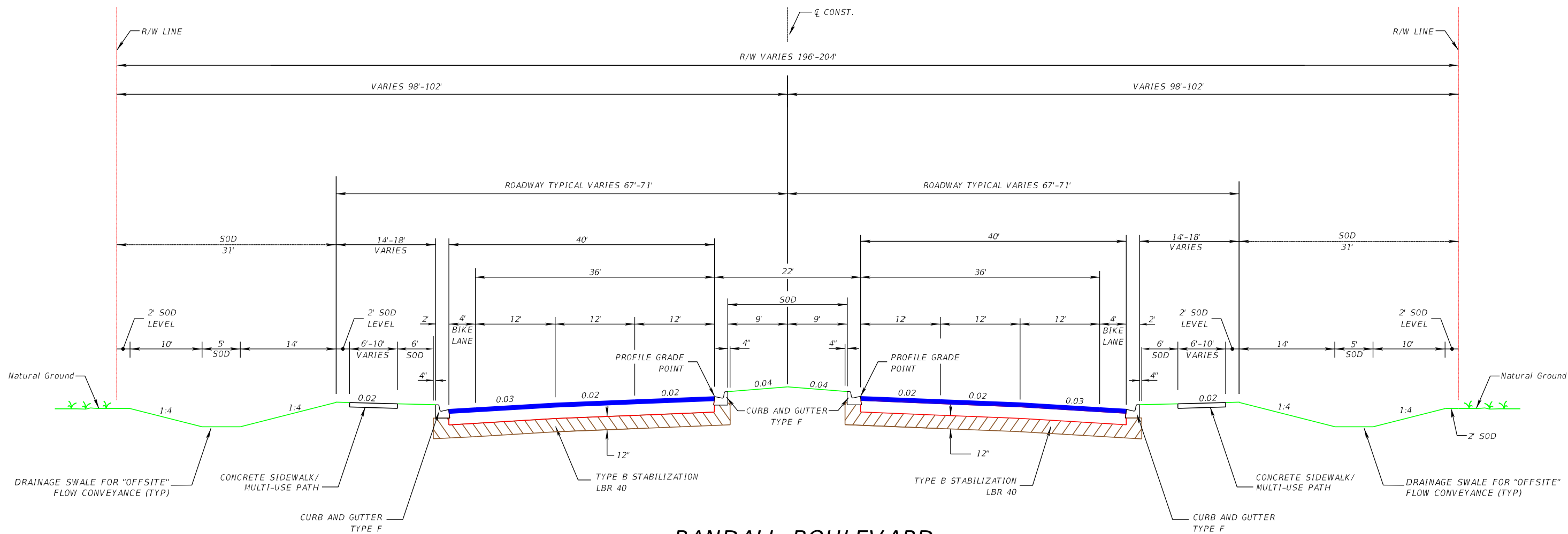
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION



COLLIER COUNTY GROWTH MANAGEMENT DEPARTMENT		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 862	COLLIER	

RANDALL BOULEVARD
TYPICAL SECTIONS
4-LANE URBAN SECTION

SHEET NO.
1



RANDALL BOULEVARD
TYPICAL SECTION
 6 LANE DIVIDED URBAN SECTION
 (NOTE: SECTION LOOKING EAST)

NOTE: STORMWATER TREATMENT AND CONVEYANCE ATTENTION WILL BE PERFORMED IN ROADSIDE SWALES

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ch2m
 5801 Pelican Bay Blvd., Suite 505
 Naples, FL 34108
 (239) 596-1715

COLLIER COUNTY GROWTH MANAGEMENT DEPARTMENT		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 862	COLLIER	

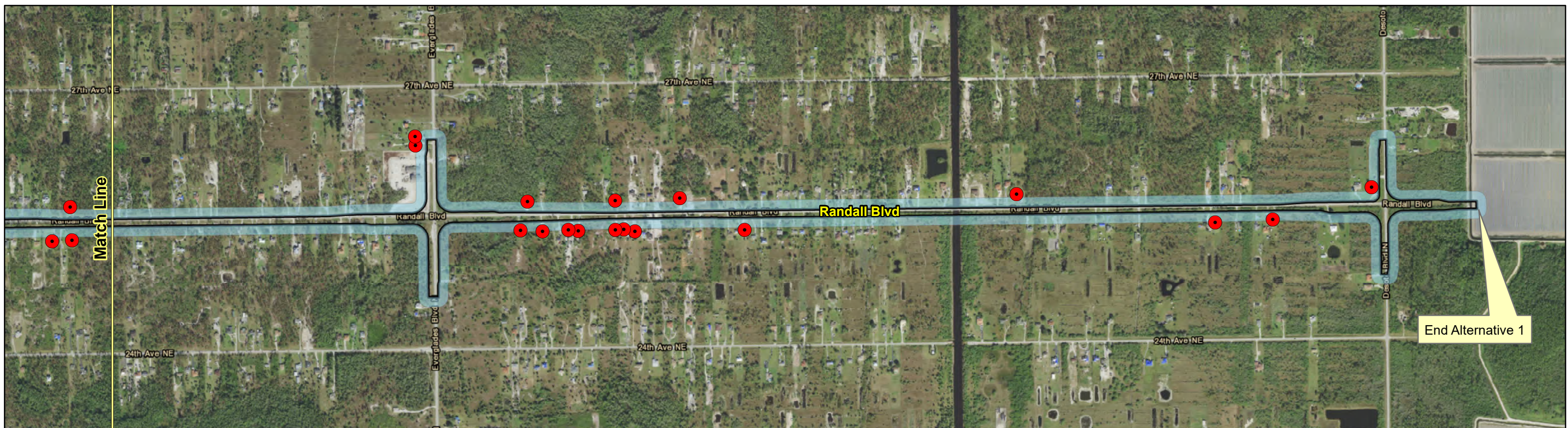
RANDALL BOULEVARD
TYPICAL SECTIONS
 6-LANE URBAN SECTION

SHEET NO.
2

APPENDIX C

Alternatives with Noise Contours and
Potentially Impacted Noise Sensitive Land Uses

ALTERNATIVE 1



			<h2>Alternative 1 Noise Contours</h2> <p>Sheet 1 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour New Alignment Noise Contour 	
--	--	--	---	--	--

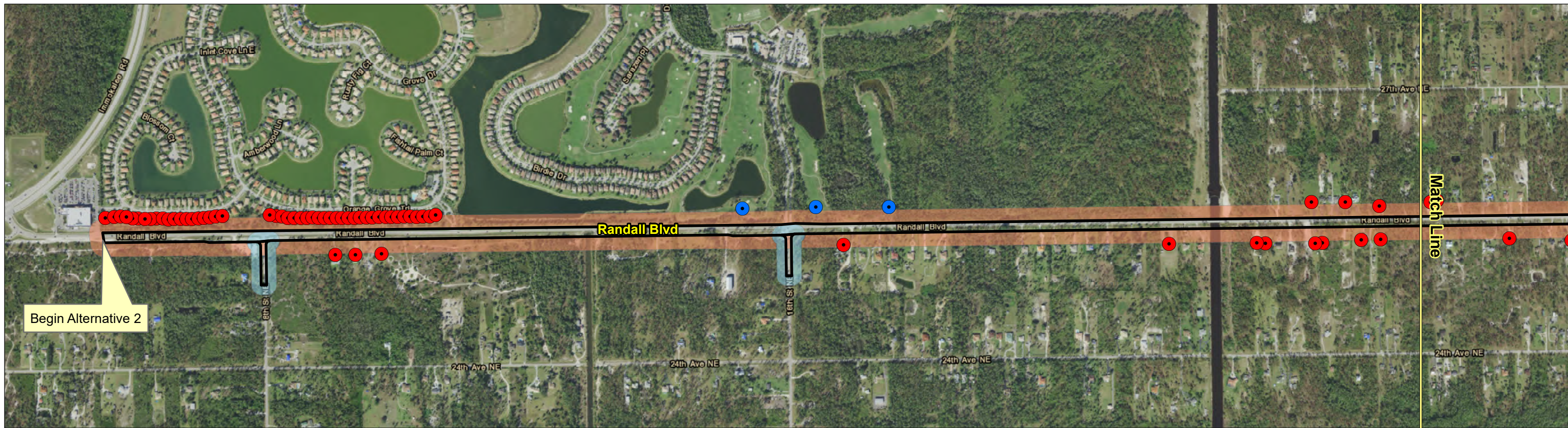


			<h2>Alternative 1 Noise Contours</h2> <p>Sheet 2 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour New Alignment Noise Contour 	
--	--	--	---	--	--

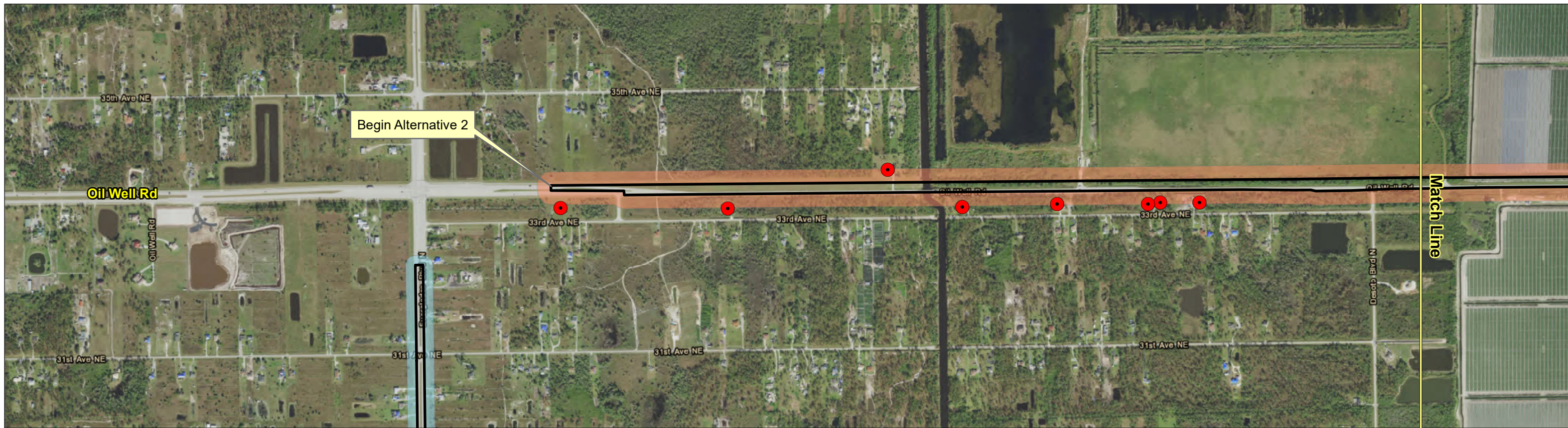


			<h2 style="text-align: center;">Alternative 1 Noise Contours</h2> <p style="text-align: center;">Sheet 3 of 3</p>	<p style="text-align: center;"><u>Legend</u></p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour New Alignment Noise Contour 	
--	--	--	---	--	--

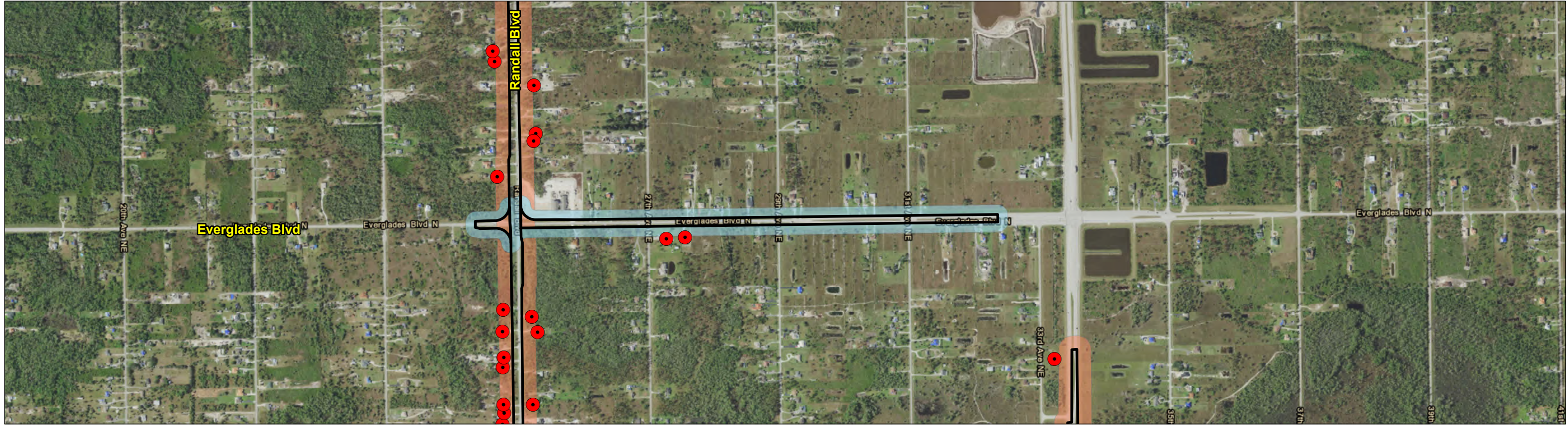
ALTERNATIVE 2



			<h2>Alternative 2 Noise Contours</h2> <p>Sheet 1 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour 	
--	--	--	---	---	--

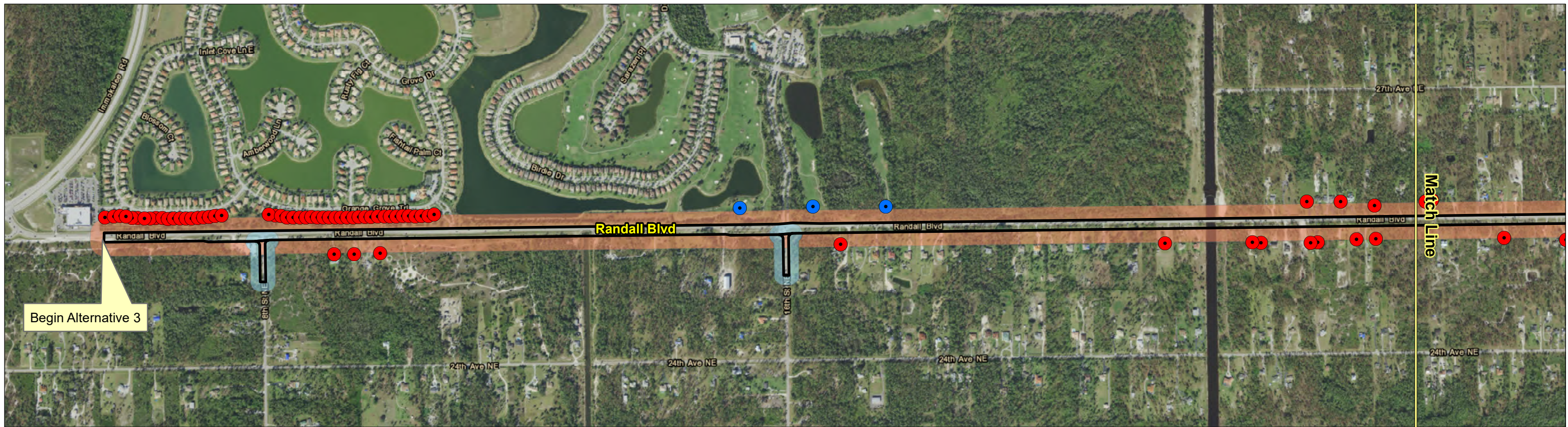


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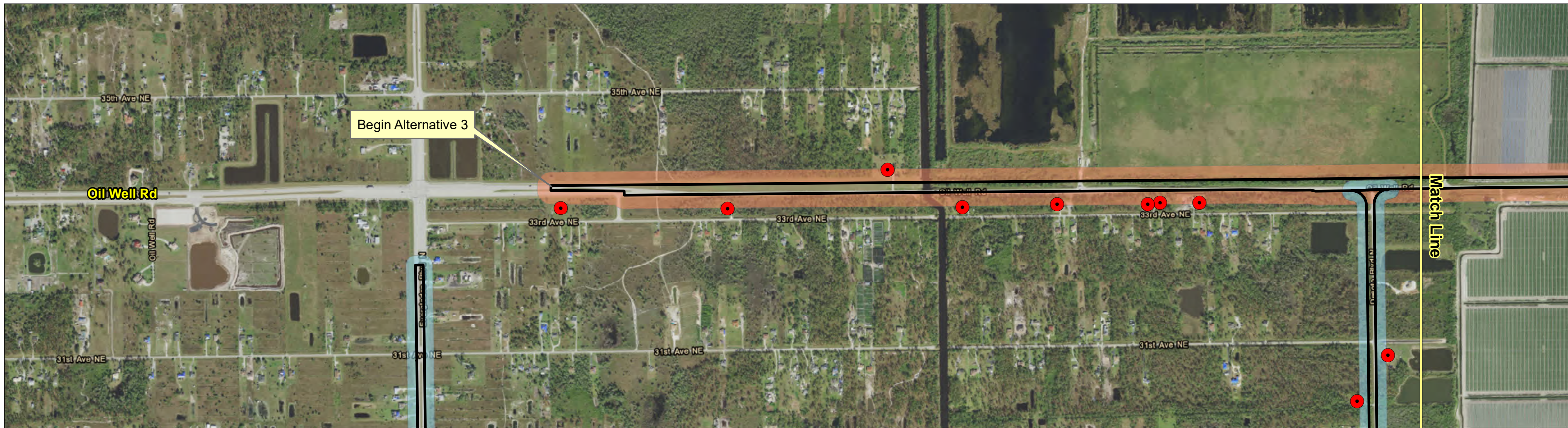


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● Potential Residential Impacts	 4-Lane Noise Contour								
● Potential Recreational Impacts	 6-Lane Noise Contour								

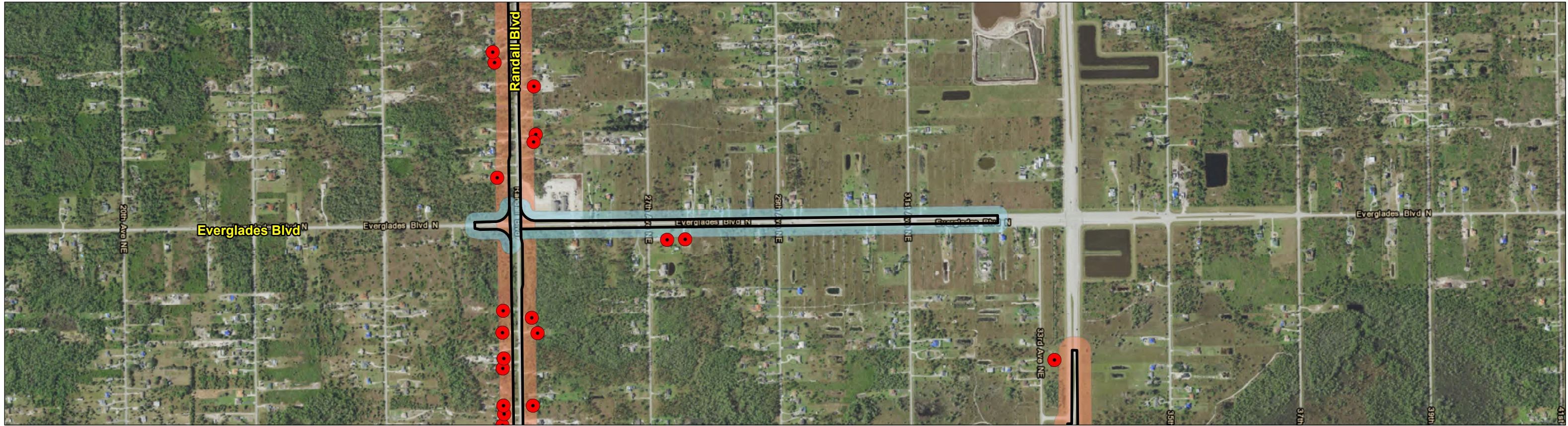
ALTERNATIVE 3



			<h2>Alternative 3 Noise Contours</h2> <p>Sheet 1 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour 	
--	--	--	---	--	--

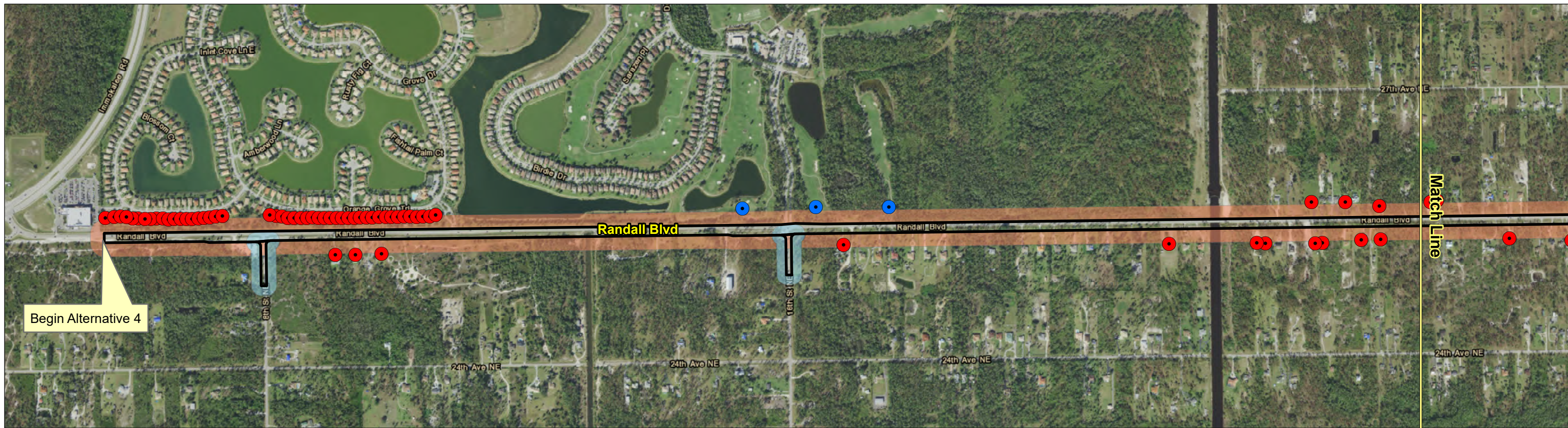


			<h2>Alternative 3 Noise Contours</h2> <p>Sheet 2 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour 	
--	--	--	---	--	--

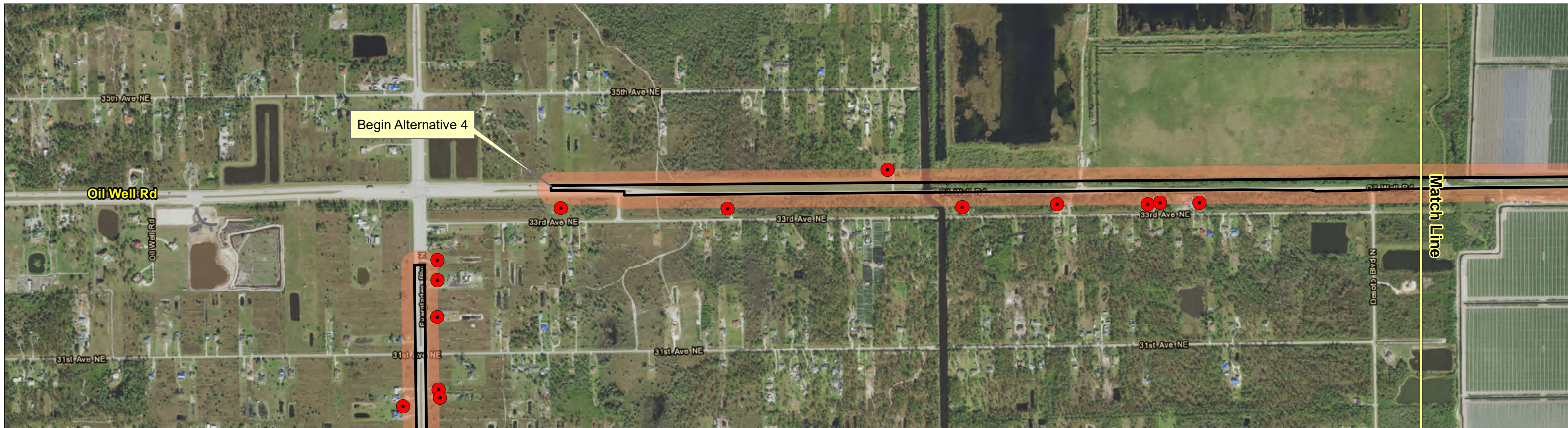


			<h2 style="text-align: center;">Alternative 3 Noise Contours</h2> <p style="text-align: center;">Sheet 3 of 3</p>	<p style="text-align: center;"><u>Legend</u></p> <table border="0"> <tr> <td>● Potential Residential Impacts</td> <td> 4-Lane Noise Contour</td> </tr> <tr> <td>● Potential Recreational Impacts</td> <td> 6-Lane Noise Contour</td> </tr> </table>	● Potential Residential Impacts	 4-Lane Noise Contour	● Potential Recreational Impacts	 6-Lane Noise Contour	
● Potential Residential Impacts	 4-Lane Noise Contour								
● Potential Recreational Impacts	 6-Lane Noise Contour								

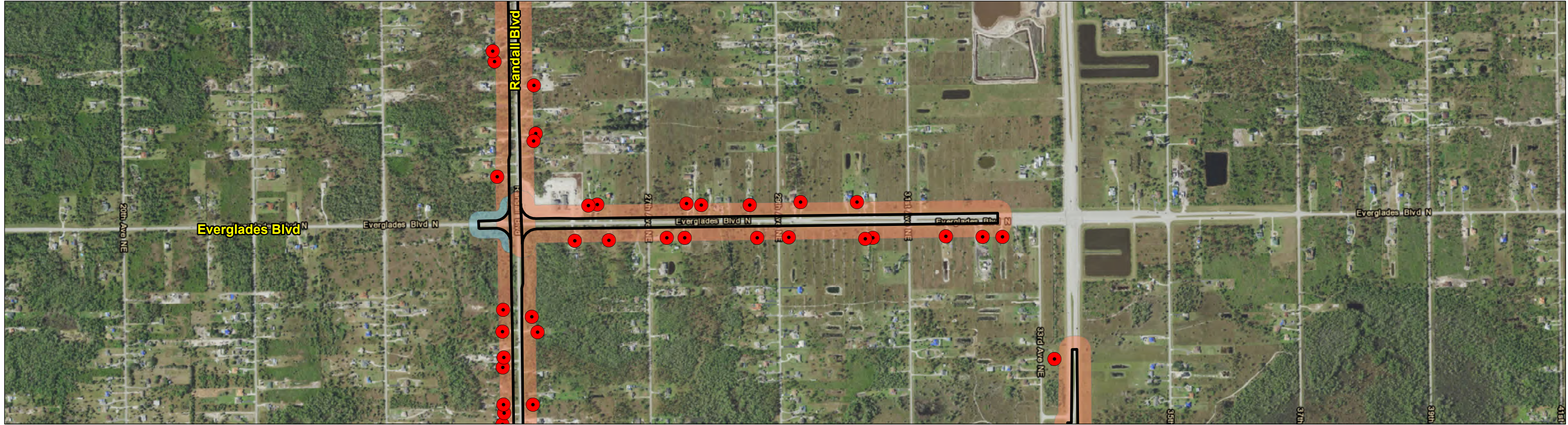
ALTERNATIVE 4



			<h2>Alternative 4 Noise Contours</h2> <p>Sheet 1 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour 	
--	--	--	---	--	--



			<h2>Alternative 4 Noise Contours</h2> <p>Sheet 2 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour 	
--	--	--	---	---	--



			<h2>Alternative 4 Noise Contours</h2> <p>Sheet 3 of 3</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Potential Residential Impacts ● Potential Recreational Impacts 4-Lane Noise Contour 6-Lane Noise Contour 	
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Appendix G
Viable Alternative Costs

Randall Blvd and Oil Well Rd Corridor Study
Cost Estimate - DRAFT

Viability Alternative	Description	Segments	Construction Cost	Project Unknowns	Survey-Design-CEI	Environmental Mitigation	Right of Way	Project Cost
1	Widen 5 miles of Randall Blvd (6/4-lane) with new 1 mile "S" Connector (4-lane)	A+B1+C+D1+F1+G	\$ 56,600,000	\$ 14,200,000	\$ 14,200,000	\$ 5,700,000	\$ 6,958,000	\$ 97,700,000
2	Widen 5 miles of Randall Blvd (6/4-lane) and widen 1 mile of Everglades Blvd (4-lane)	A+B2+C+E2+F+G	\$ 47,800,000	\$ 12,000,000	\$ 12,000,000	\$ 4,800,000	\$ 4,179,000	\$ 80,800,000

Notes:

- Project Unknowns = 25%
- Survey-Design-CEI = 25%
- Environmental Mitigation = 10%
- Segments in red are **BY OTHERS** and not included in the costs
- ROW cost assumes \$70,000 per Acre Impact
- Total project costs include engineering, ROW, and construction, but do not include utility relocations, landscaping, Florida Panther mitigation habitat credit, environmental permit fees, dump fees, or disposal of contaminated soils.
- Noise barriers are not anticipated.

Randall Blvd and Oil Well Rd Corridor Study
Cost Estimate - DRAFT

Randall Blvd and Oil Well Rd Corridor Study
Collier County, FL
April 1, 2019

Long Range Estimate of Segments

Segment Costs are mutually exclusive - See Alternative Cost for results												
Segment	Alignment	from	to	Length (mi)	Improvement	Cost per mile	Roadway Cost	Bridges	Cost per bridge	Bridge Cost	Construction Cost	Remarks
A	Randall Blvd	8th St	Golden Glades Canal	1.8	2 to 6 Widening	\$ 8,215,378	\$ 14,800,000	1	\$ 1,900,000	\$ 1,900,000	\$ 16,700,000	U08
B1	Randall Blvd	Golden Glades Canal	Everglades Blvd	1	2 to 4 Widening	\$ 7,448,544	\$ 7,500,000	1	\$ 1,500,000	\$ 1,500,000	\$ 9,000,000	U05
B2	Randall Blvd	Golden Glades Canal	Everglades Blvd	1	2 to 6 Widening	\$ 8,215,378	\$ 8,300,000	1	\$ 1,900,000	\$ 1,900,000	\$ 10,200,000	U08
C	Randall Blvd	Everglades Blvd	Desoto Rd	2	2 to 4 Widening	\$ 7,448,544	\$ 14,900,000	1	\$ 1,500,000	\$ 1,500,000	\$ 16,400,000	U05
D1	S-connector	Randall Blvd	Oil Well Rd	1.1	New 4-Lane	\$ 7,448,544	\$ 8,200,000	2	\$ 1,500,000	\$ 3,000,000	\$ 11,200,000	U05
E2	Everglades Blvd	Randall Blvd	Oil Well Rd	0.6	2 to 4 Widening	\$ 7,448,544	\$ 4,500,000		\$ 1,500,000	\$ -	\$ 4,500,000	U05
F1	Oil Well Rd	Golden Glades Canal	Everglades Blvd	0.7	4 to 6 Widening	\$ 4,683,454	\$ 3,300,000		\$ 1,900,000	\$ -	\$ 3,300,000	U22
G-by others	Oil Well Rd	Everglades Blvd	Oil Well Grade Rd	3.9	2 to 6 Widening	\$ 8,215,378	\$ 32,100,000	2	\$ 1,900,000	\$ 3,800,000	\$ 35,900,000	U08

Notes:

Cost per mile from FDOT LRE models

<http://www.fdot.gov/programmanagement/Estimates/LRE/CostPerMileModels/CPMSummary.shtm>

Cost per bridge = bridge width * 125' bridge length * \$125/sf