



Memorandum

Date: February 23, 2017

From: Marc R. Acampora, PE

Subject: Unsignalized Intersection Analysis for Study Intersection #2 – Collinsworth Road at Weldon Road
Palmetto Industrial DRI #2649

The Transportation Analysis for Palmetto Industrial DRI #2649 identified the intersection of Collinsworth Road at Weldon Road as operating with a side street level of service (LOS) F in the existing a.m. and p.m. peak hour. In order to mitigate this LOS F, which does not meet the LOS standard, signalization was identified for this intersection. The subsequent analysis of the no-build and build conditions included this signalization. The analysis summarized in this memorandum reveals the intersection operations in the existing, no-build, and build conditions if this intersection should remain unsignalized, with side street stop sign control on the Collinsworth Road (southbound) approach and, in the build condition, on the site access (northbound) approach. The results of the analysis are presented in the following Table and the Synchro printouts are attached to this memorandum.

Levels of Service at Intersection of Collinsworth Road at Weldon Road

Intersection	Existing		No-Build		Build	
	AM	PM	AM	PM	AM	PM
Collinsworth Road at Weldon Road	B	E	C	F	F	F
northbound approach	-	-	-	-	C	C
southbound approach	F	F	F	F	F	F
eastbound left turn	A	A	A	A	A	A
westbound left turn	-	-	-	-	A	A

The analysis reveals that the intersection LOS will drop from B to C to F from the existing to the no-build to the build condition, in the a.m. peak hour, and from E to F to F in the p.m. peak hour. The southbound approach will remain LOS F for all conditions and time periods. The northbound approach exiting the proposed Palmetto Industrial site will operate at LOS C in the build condition, both in the a.m. and p.m. peak hours. The westbound left turn entering the subject site will operate at LOS A in the build a.m. and p.m. peak hours.

Palmetto Industrial DRI #2649
2: Weldon Road & Collinsworth Road

existing a.m.

Intersection						
Int Delay, s/veh	15					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	28	376	107	276	274	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	92	92	86	86
Heavy Vehicles, %	0	1	2	1	1	0
Mvmt Flow	31	422	116	300	319	6
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	416	0	-	0	751	266
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	485	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1154	-	-	-	380	778
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1154	-	-	-	367	778
Mov Cap-2 Maneuver	-	-	-	-	367	-
Stage 1	-	-	-	-	781	-
Stage 2	-	-	-	-	599	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.6		0		54.4	
HCM LOS					F	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1154	-	-	-	371	
HCM Lane V/C Ratio	0.027	-	-	-	0.874	
HCM Control Delay (s)	8.2	0	-	-	54.4	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.1	-	-	-	8.5	

Palmetto Industrial DRI #2649
2: Weldon Road & Collinsworth Road

existing p.m.

Intersection

Int Delay, s/veh 44.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	3	216	390	317	337	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	89	89
Heavy Vehicles, %	0	3	1	1	1	0
Mvmt Flow	3	230	415	337	379	52

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	752	0	820
Stage 1	-	-	584
Stage 2	-	-	236
Critical Hdwy	4.1	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.2	-	3.509
Pot Cap-1 Maneuver	867	-	~ 346
Stage 1	-	-	559
Stage 2	-	-	806
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	867	-	~ 345
Mov Cap-2 Maneuver	-	-	~ 345
Stage 1	-	-	559
Stage 2	-	-	803

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	145.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	867	-	-	-	359
HCM Lane V/C Ratio	0.004	-	-	-	1.199
HCM Control Delay (s)	9.2	0	-	-	145.8
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	17.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Palmetto Industrial DRI #2649
2: Weldon Road & Collinsworth Road

no-build a.m.

Intersection						
Int Delay, s/veh	22.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	30	399	114	293	291	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	92	92	86	86
Heavy Vehicles, %	0	1	2	1	1	0
Mvmt Flow	34	448	124	318	338	6
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	442	0	-	0	799	283
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	516	-
Critical Hdwy	4.1	-	-	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	-	3.509	3.3
Pot Cap-1 Maneuver	1129	-	-	-	356	761
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	601	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1129	-	-	-	342	761
Mov Cap-2 Maneuver	-	-	-	-	342	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	577	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.6		0		83.4	
HCM LOS					F	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1129	-	-	-	345	
HCM Lane V/C Ratio	0.03	-	-	-	0.998	
HCM Control Delay (s)	8.3	0	-	-	83.4	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.1	-	-	-	11.3	

Palmetto Industrial DRI #2649
2: Weldon Road & Collinsworth Road

no-build p.m.

Intersection	
Int Delay, s/veh	63.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	3	229	414	336	358	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	89	89
Heavy Vehicles, %	0	3	1	1	1	0
Mvmt Flow	3	244	440	357	402	55

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	798	0	869
Stage 1	-	-	619
Stage 2	-	-	250
Critical Hdwy	4.1	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.2	-	3.509
Pot Cap-1 Maneuver	833	-	~ 324
Stage 1	-	-	539
Stage 2	-	-	794
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	833	-	~ 323
Mov Cap-2 Maneuver	-	-	~ 323
Stage 1	-	-	539
Stage 2	-	-	791

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	209.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	833	-	-	-	337
HCM Lane V/C Ratio	0.004	-	-	-	1.357
HCM Control Delay (s)	9.3	0	-	-	209.9
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	22.6

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection

Int Delay, s/veh 141.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	30	411	7	84	173	293	2	4	25	291	17	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	80	80	80	87	87	87
Heavy Vehicles, %	0	1	0	46	15	1	0	0	52	1	0	0
Mvmt Flow	33	457	8	91	188	318	2	5	31	334	20	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	507	0	0	457	0	0	1066	1212	457	1071	1053	347
Stage 1	-	-	-	-	-	-	523	523	-	530	530	-
Stage 2	-	-	-	-	-	-	543	689	-	541	523	-
Critical Hdwy	4.1	-	-	4.56	-	-	7.1	6.5	6.72	7.11	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.5	-
Follow-up Hdwy	2.2	-	-	2.614	-	-	3.5	4	3.768	3.509	4	3.3
Pot Cap-1 Maneuver	1068	-	-	907	-	-	202	184	512	~ 199	228	701
Stage 1	-	-	-	-	-	-	541	534	-	534	530	-
Stage 2	-	-	-	-	-	-	528	450	-	527	534	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1068	-	-	907	-	-	166	159	512	~ 163	197	701
Mov Cap-2 Maneuver	-	-	-	-	-	-	166	159	-	~ 163	197	-
Stage 1	-	-	-	-	-	-	518	512	-	512	477	-
Stage 2	-	-	-	-	-	-	452	405	-	469	512	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.4	16.2	\$ 583.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	360	1068	-	-	907	-	-	167
HCM Lane V/C Ratio	0.108	0.031	-	-	0.101	-	-	2.154
HCM Control Delay (s)	16.2	8.5	0	-	9.4	-	-	\$ 583.5
HCM Lane LOS	C	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.3	-	-	28.8

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 174.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	271	2	23	433	336	7	14	42	358	5	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	80	80	80	90	90	90
Heavy Vehicles, %	0	8	0	48	3	1	0	0	31	1	0	0
Mvmt Flow	3	285	2	24	456	354	9	18	52	398	6	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	809	0	0	285	0	0	1003	1150	285	1008	973	633
Stage 1	-	-	-	-	-	-	292	292	-	681	681	-
Stage 2	-	-	-	-	-	-	711	858	-	327	292	-
Critical Hdwy	4.1	-	-	4.58	-	-	7.1	6.5	6.51	7.11	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.5	-
Follow-up Hdwy	2.2	-	-	2.632	-	-	3.5	4	3.579	3.509	4	3.3
Pot Cap-1 Maneuver	825	-	-	1054	-	-	223	200	690	~ 220	254	483
Stage 1	-	-	-	-	-	-	720	675	-	442	453	-
Stage 2	-	-	-	-	-	-	427	376	-	688	675	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	825	-	-	1054	-	-	191	195	690	~ 186	247	483
Mov Cap-2 Maneuver	-	-	-	-	-	-	191	195	-	~ 186	247	-
Stage 1	-	-	-	-	-	-	717	672	-	440	443	-
Stage 2	-	-	-	-	-	-	366	367	-	617	672	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	17.3	\$ 628.1
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	372	825	-	-	1054	-	-	201
HCM Lane V/C Ratio	0.212	0.004	-	-	0.023	-	-	2.278
HCM Control Delay (s)	17.3	9.4	0	-	8.5	-	-	\$ 628.1
HCM Lane LOS	C	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	0.8	0	-	-	0.1	-	-	36.8

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon