TO: John A. Bodziak, Architect, AIA, PA

FROM: Michael D. Raysor, P.E.
RAYSOR Transportation Consulting

SUBJECT: 408 East Shore Drive; Clearwater, Florida
Traffic Study

DATE: February 25, 2019

SECTION 1.0 INTRODUCTION

This technical memorandum documents a traffic study undertaken in association with the proposed development of a hotel site at 408 East Shore Drive, in Clearwater, Florida. The project site is planned for the development of a 74 unit hotel, with ancillary marina (boat dockage), integrated parking structure, adjacent surface parking, and valet operations. Refer to Figure 1.0 for the project site location map and Figure 2.0 for the project site plan.

SECTION 2.0 PROJECT GENERATED TRIPS

The daily and peak hour trip generation of the project site was estimated using trip characteristic data as identified in the Institute of Transportation Engineers' *Trip Generation Manual* (ITE, 10th edition, 2017); as summarized in Table 1.0. The project site is anticipated to generate 620 trips per day, with 35 trips during the AM peak hour and 44 trips during the PM peak hour. The worst-case period was determined to be the PM peak hour, and was thus used as the analysis period for this study. The distribution of project traffic was estimated manually based on area land use patterns, as shown in Figure 3.0 for PM peak hour conditions.

TABLE 1.0 TRIP GENERATION SUMMARY

ITE LUC	Land Use Description	Size	Weekday		AM Peak Hour				PM Peak Hour			
			Trip Rate	Trips	Trip Rate	Trips	Enter	Exit	Trip Rate	Trips	Enter	Exit
210	Hotel	74 units	8.36	620	0.47	35	21	14	0.60	44	22	22

FIGURE 1.0 PROJECT SITE LOCATION

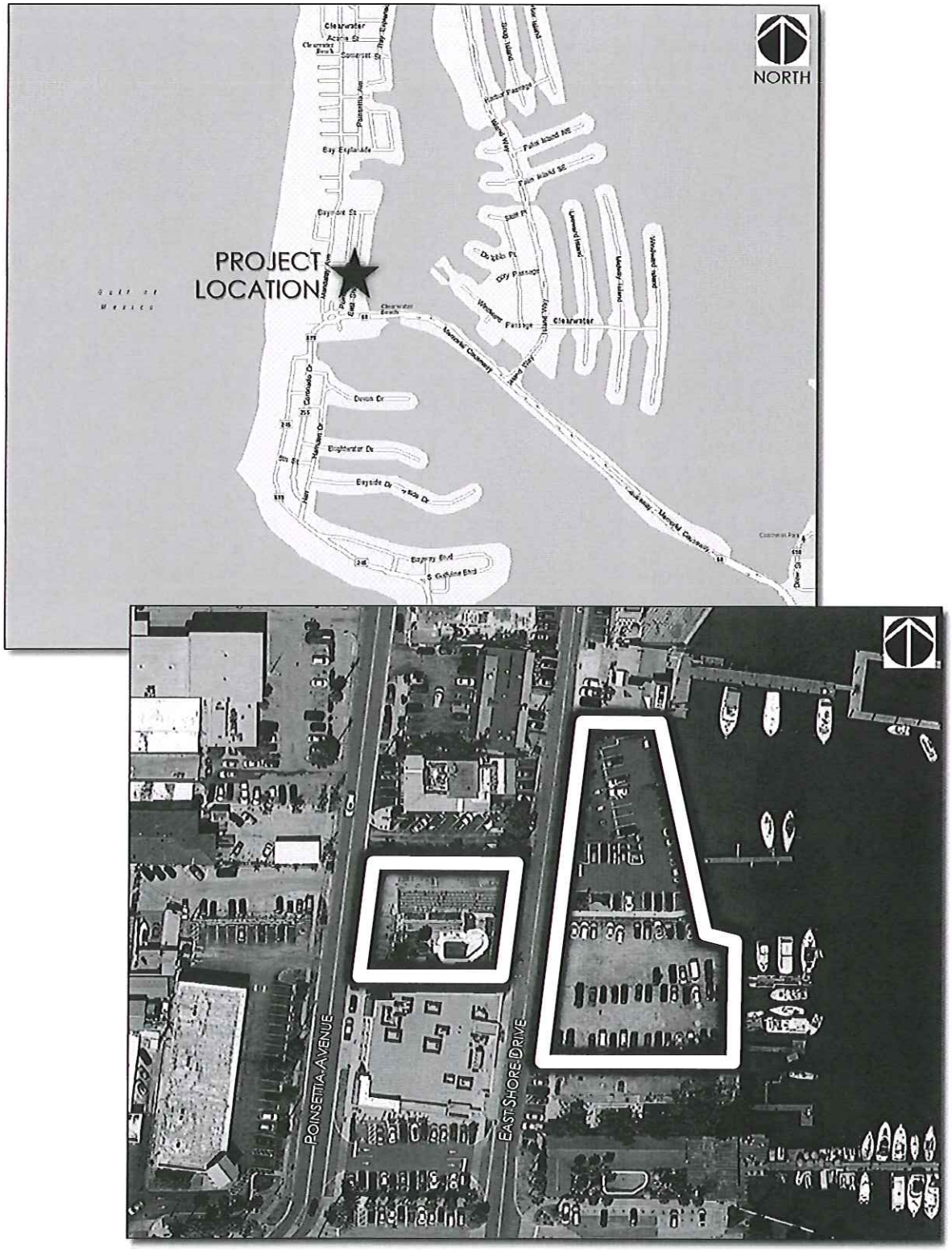


FIGURE 2.0 PROJECT SITE PLAN

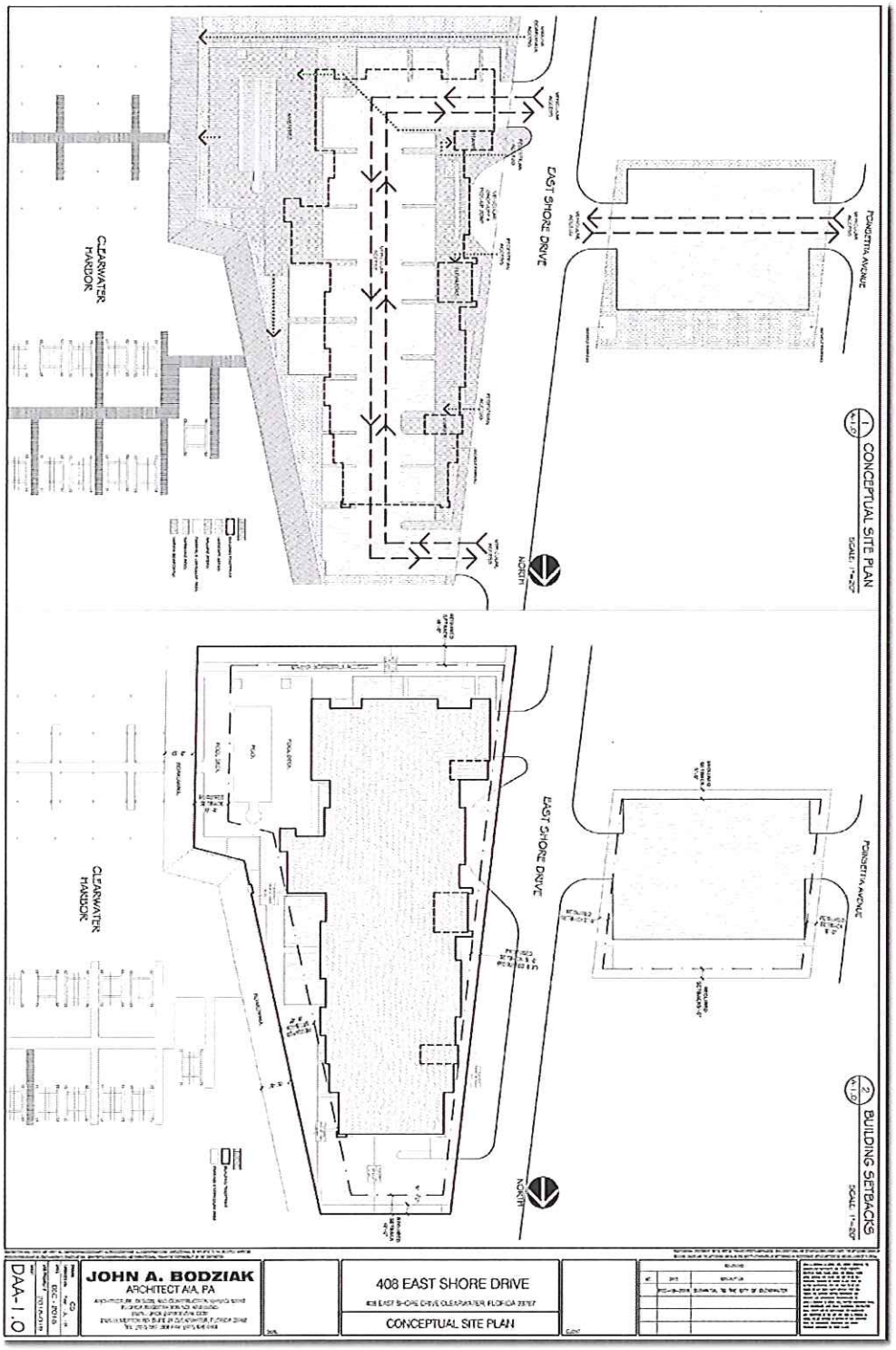
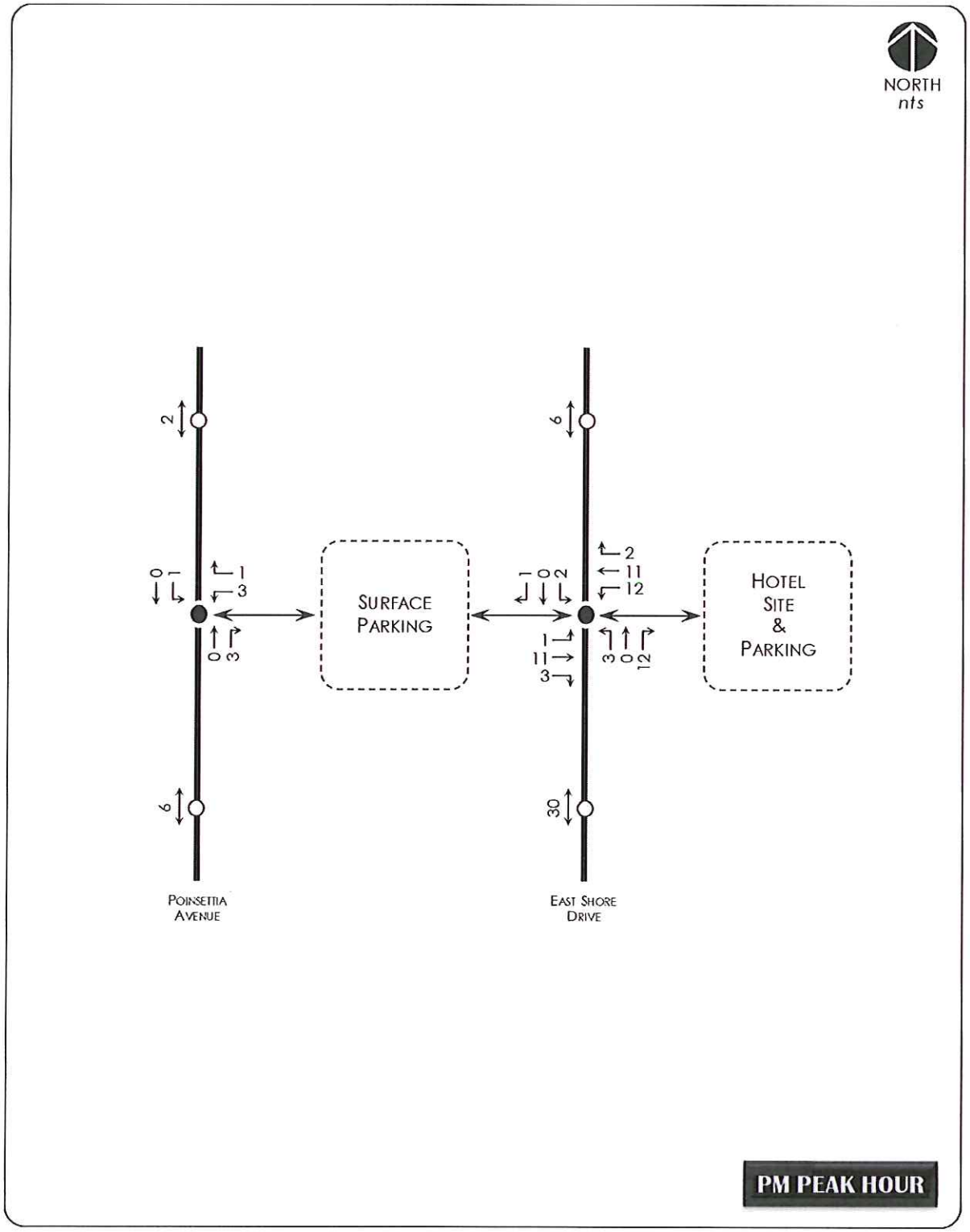


FIGURE 3.0 PM PEAK HOUR PROJECT GENERATED TRAFFIC



SECTION 3.0 STUDY AREA

The study area included in this analysis consisted of the project site access connections and the adjacent roadway segments of East Shore Drive and Poinsettia Avenue.

SECTION 4.0 TRAFFIC VOLUMES

Baseline traffic volumes (2015) were identified from the prior traffic study prepared for the subject site, as shown in Figure 4.0 and documented in Attachment "A". Background traffic volumes were estimated through the application of a 1.8% annual growth rate through the assumed 2020 buildout year as shown in Figure 5.0, where the 1.8% annual growth rate was calculated from historical traffic volumes, as documented in Attachment "B". The traffic estimated to be generated by the subject project was added to the background traffic volumes to estimate the total traffic volumes for use in this study, as shown in Figure 6.0.

SECTION 5.0 ROADWAY SEGMENT ANALYSIS

An analysis of the study area roadway segments was performed for PM peak hour conditions. The analysis was conducted using FDOT's generalized service flow-rate tables (dated December 18, 2012), as shown in Table 2.0, and further documented in Attachment "C". The results of the analysis indicate that acceptable operating conditions can be anticipated for the study area roadway segments, at level of service "C" for total post-development traffic conditions.

SECTION 6.0 SITE ACCESS OPERATIONAL ANALYSIS

An operational analysis of the project site driveway connections was performed for PM peak hour conditions using *Highway Capacity Manual* methodologies calculated by the *Synchro* software program; as documented in Attachment "D". The results of the analysis indicate that acceptable operating conditions can be anticipated for the project site driveway connections, with all movements identified to operate at level of service "B", or better, for total post-development traffic conditions.

SECTION 7.0 SITE ACCESS TURN LANE EVALUATION

A turn lane warrant evaluation was undertaken to identify if new site access related turn lanes would be needed on East Shore Drive or Poinsettia Avenue at the project site driveway connections, as documented in Attachment "E". The need for left turn lanes was evaluated against criteria documented in NCHRP Report

#279. The need for right turn lanes was evaluated against criteria documented in FDOT's Driveway Handbook. The results of the turn lane warrant analysis identified that new site access turn lanes are not warranted.

TABLE 2.0 ROADWAY SEGMENT ANALYSIS SUMMARY

Roadway Segment	LOS Std	Service Volume	Traffic Volume	LOS	V/C Ratio
East Shore Drive [north of project site]	D	1,197	278	C	0.23
East Shore Drive [south of project site]	D	1,197	302	C	0.25
Poinsettia Avenue [north of project site]	D	1,197	248	C	0.21
Poinsettia Avenue [south of project site]	D	1,197	252	C	0.21

SECTION 8.0 CONCLUSION

Based on the data, analyses and findings contained herein, the following is concluded in consideration of the proposed development of 408 East Shore Drive:

- The adjacent roadway segments of East Shore Drive and Poinsettia Avenue are anticipated to operate acceptably for total post-development traffic conditions.

- The project site driveway connections to East Shore Drive and Poinsettia Avenue are anticipated to operate acceptably for total post-development traffic conditions.

- New site access turn lanes were found to not be warranted.

FIGURE 4.0 PM PEAK HOUR BASELINE TRAFFIC VOLUMES

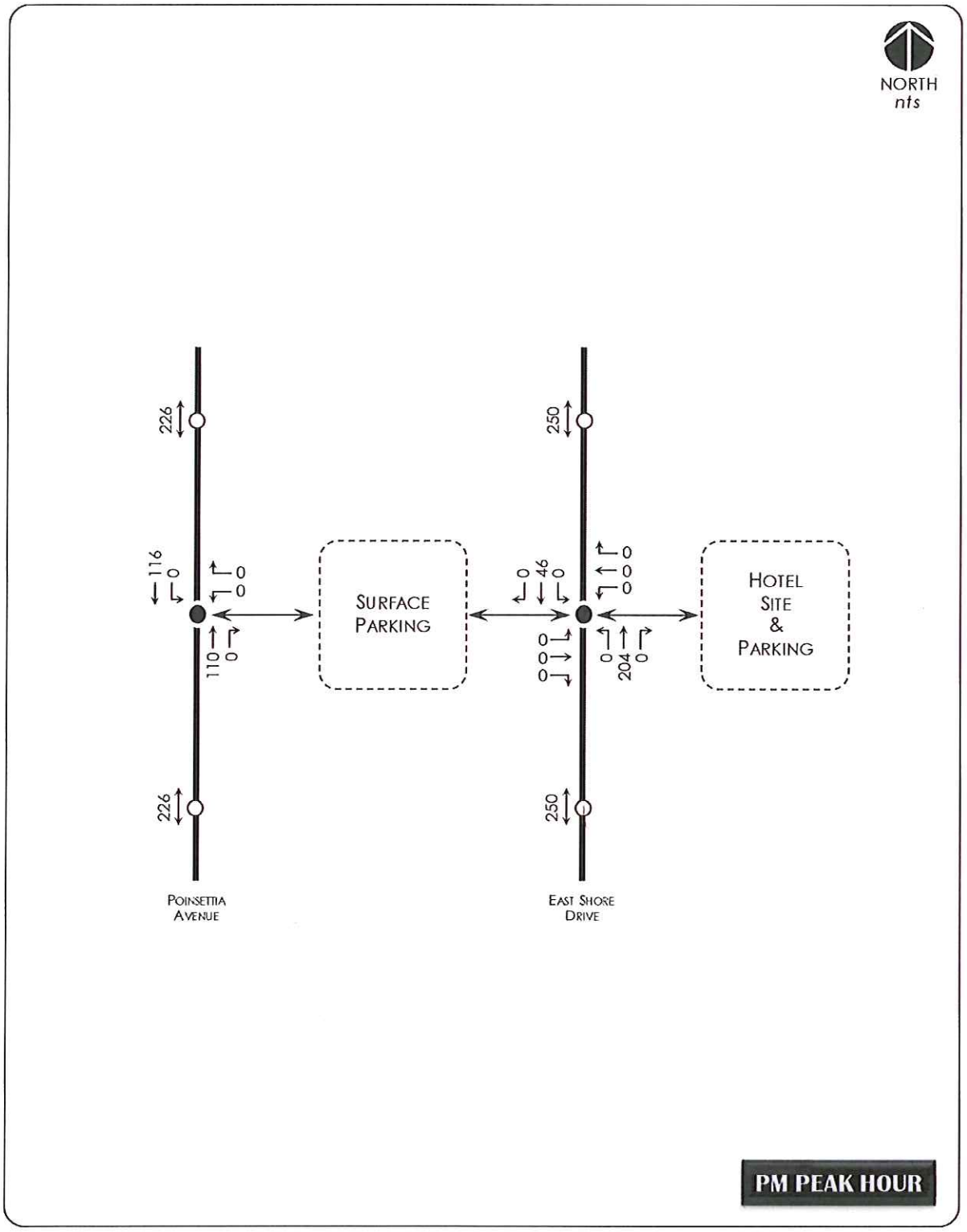


FIGURE 5.0 PM PEAK HOUR BACKGROUND TRAFFIC VOLUMES

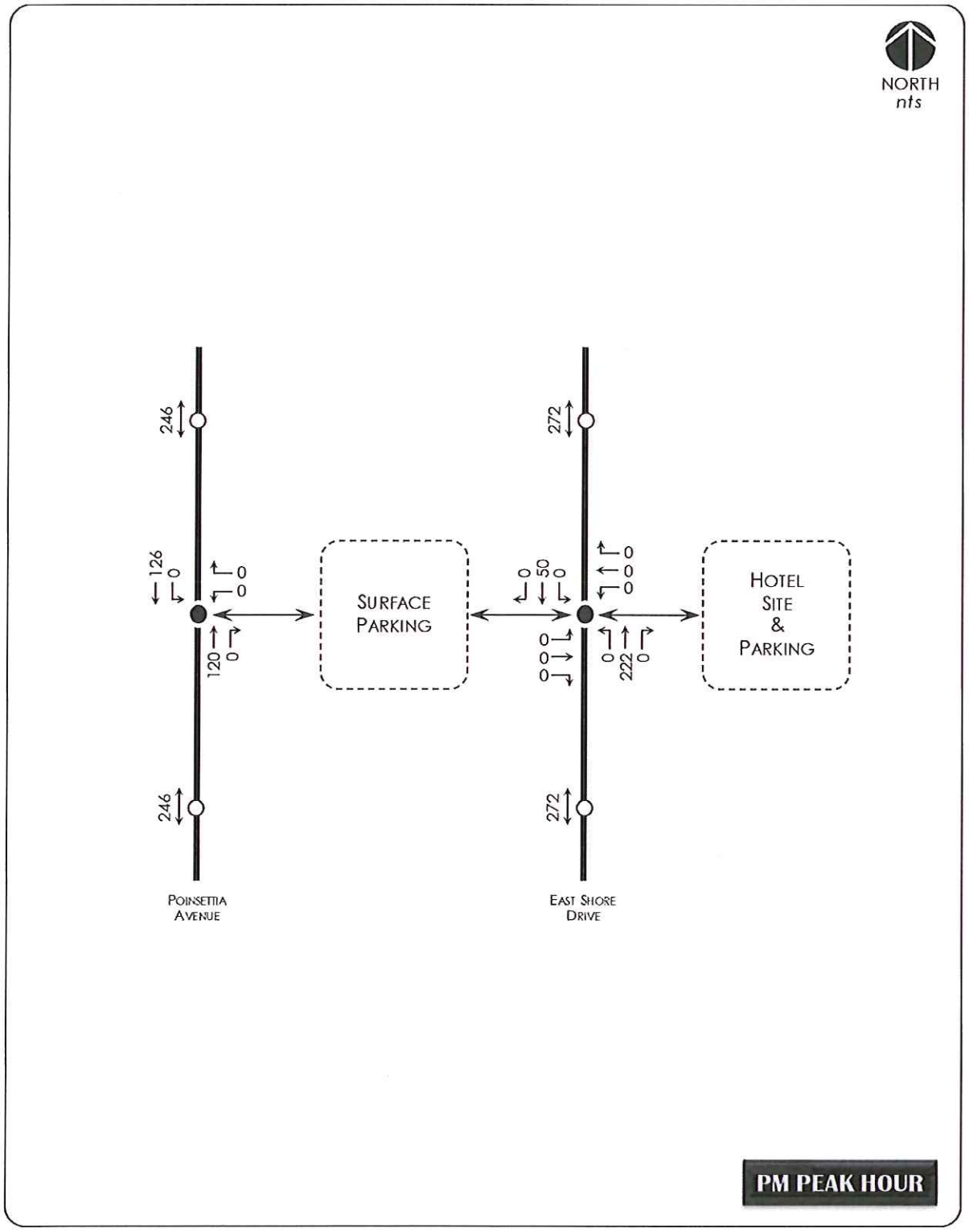
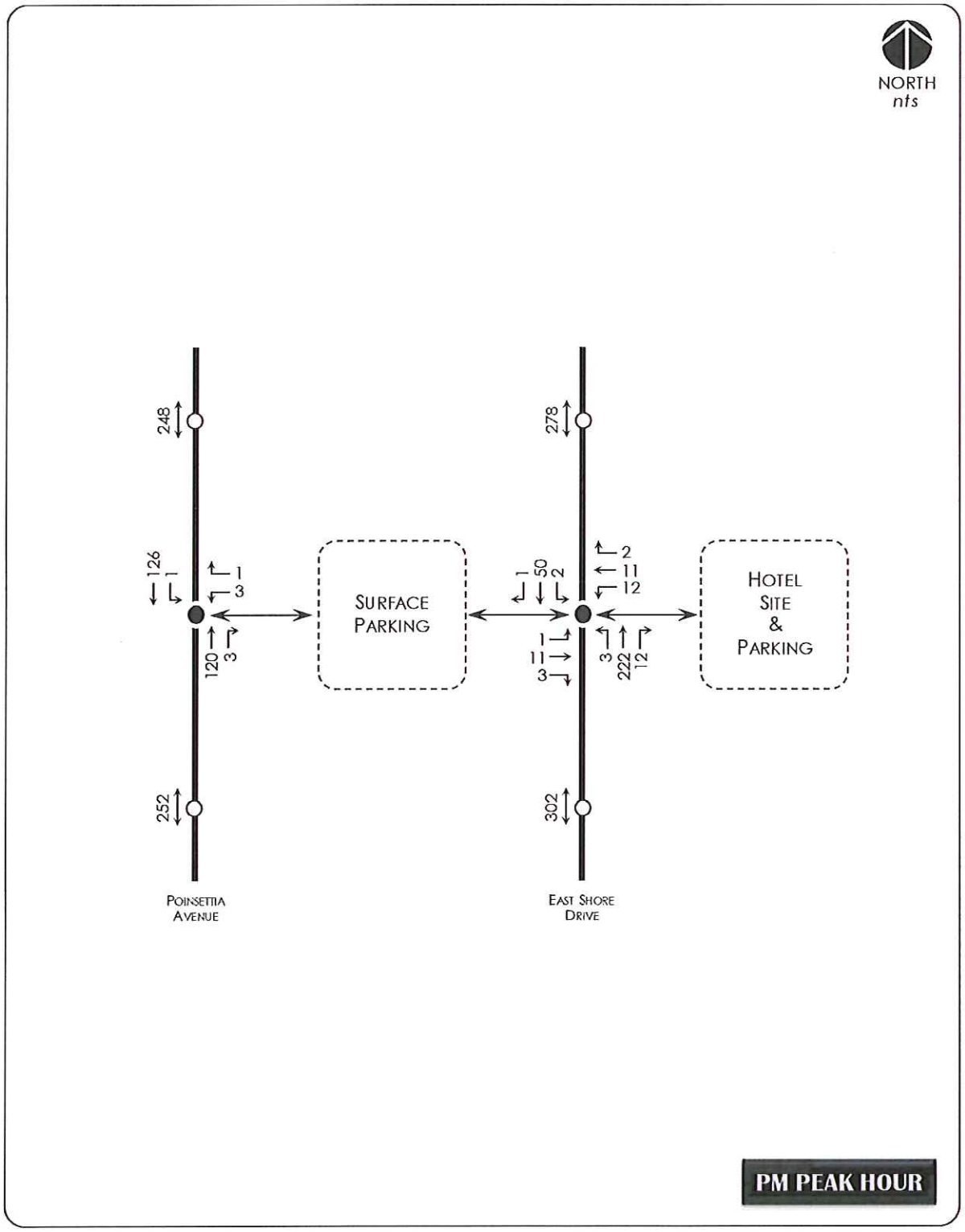
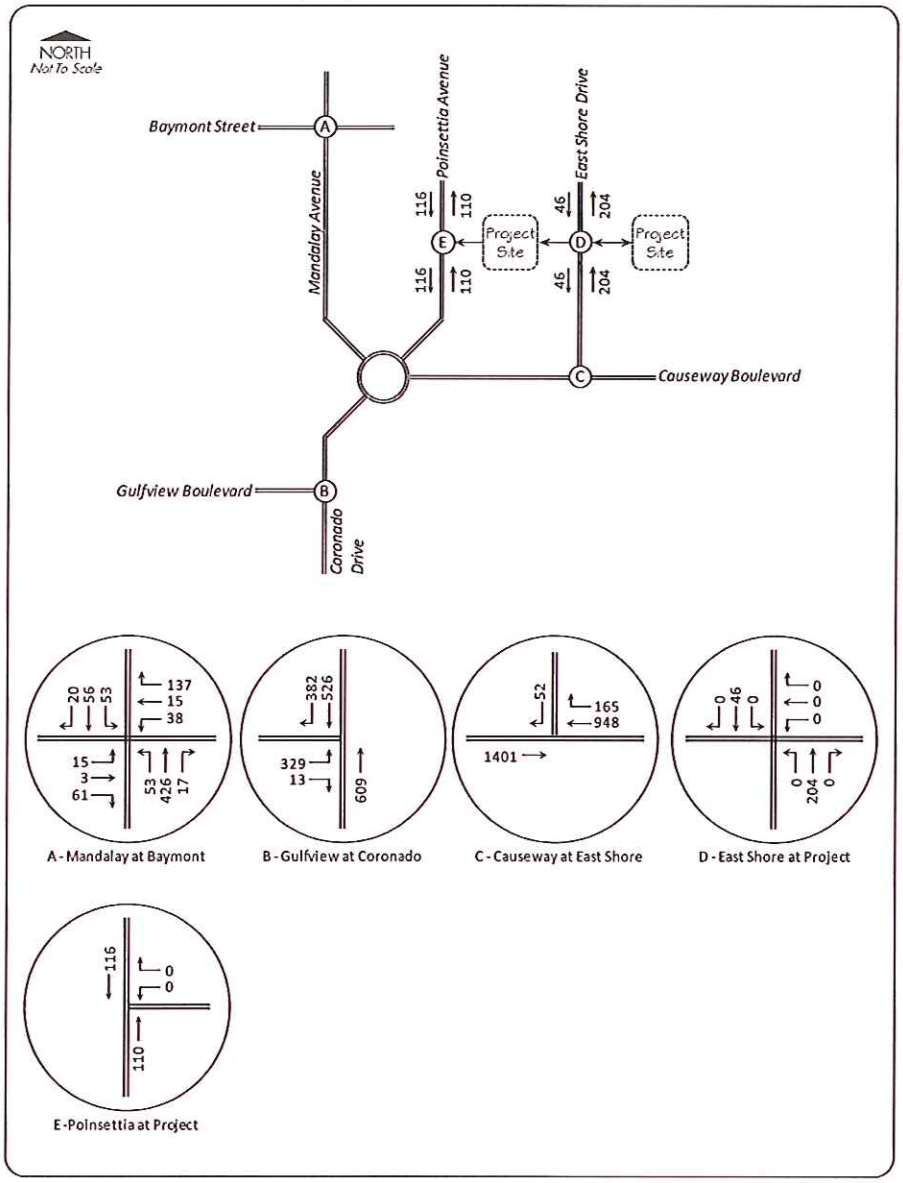


FIGURE 6.0 PM PEAK HOUR TOTAL POST-DEVELOPMENT TRAFFIC VOLUMES



ATTACHMENT "A"

FIGURE 4.0 EXISTING TRAFFIC VOLUMES (2015)

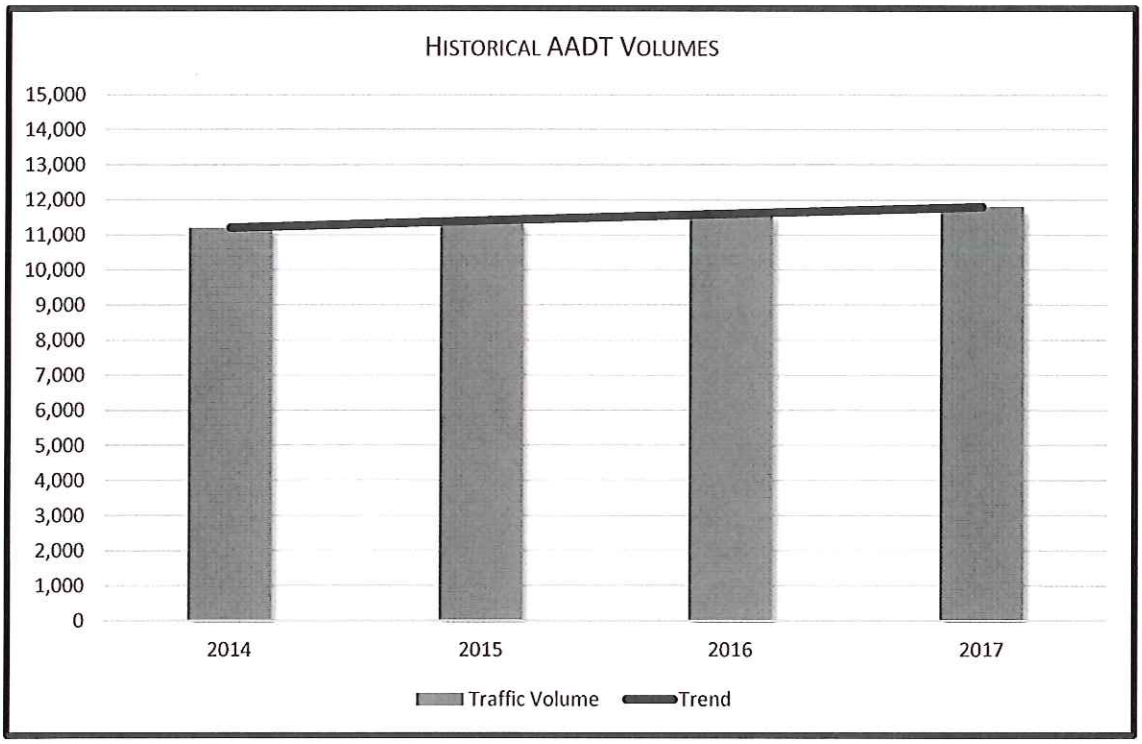


ATTACHMENT "B"

408 East Shore Drive
Growth Rate Calculations

Historical AADT Volumes

Year	Mandalay Avenue *north of State Road 60*	Total Traffic Linear Trend
2017	11,800	11,800
2016	11,600	11,600
2015	11,400	11,400
2014	11,200	11,200
	Annual Growth Rate >>>	**1.8%**



SOURCE

Source: FDOT Count Stations 15-9043

RAYSOR Transportation Consulting

ATTACHMENT "B"

FLORIDA DEPARTMENT OF TRANSPORTATION
TRANSPORTATION STATISTICS OFFICE
2017 HISTORICAL AADT REPORT

COUNTY: 15 - PINELLAS

SITE: 9043 - MANDALAY AVE, N OF SR 60

YEAR	AADT	DIRECTION 1		DIRECTION 2		*K FACTOR	D FACTOR	T FACTOR
2017	11800 T	N	5700	S	6100	9.00	54.50	2.90
2016	11600 S	N	5600	S	6000	9.00	55.90	2.90
2015	11400 F	N	5500	S	5900	9.00	55.00	2.90
2014	11200 C	N	5400	S	5800	9.00	55.40	3.20
2013	13000 S		0		0	9.00	55.20	3.00
2012	13000 F		0		0	9.00	55.00	2.80
2011	13000 C	N	0	S	0	9.00	56.50	3.10

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE
S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE
V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN
*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

ATTACHMENT "C"

TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's **Urbanized Areas**[1]

12/18/12

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,510	1,600	**
4	Divided	*	3,420	3,580	**
6	Divided	*	5,250	5,390	**
8	Divided	*	7,090	7,210	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	660	1,330	1,410
4	Divided	*	1,310	2,920	3,040
6	Divided	*	2,090	4,500	4,590
8	Divided	*	2,880	6,060	6,130

Non-State Signalized Roadway Adjustments
(Alter corresponding state volumes by the indicated percent.)
Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment
Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	260	680	1,770
50-84%	190	600	1,770	>1,770
85-100%	830	1,770	>1,770	**

PEDESTRIAN MODE[2]

(Multiply motorized vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,420
85-100%	340	960	1,560	>1,770

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	4,120	5,540	6,700	7,190
6	6,130	8,370	10,060	11,100
8	8,230	11,100	13,390	15,010
10	10,330	14,040	16,840	18,930
12	14,450	18,880	22,030	22,860

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	770	1,530	2,170	2,990
4	Divided	3,300	4,660	5,900	6,530
6	Divided	4,950	6,990	8,840	9,790

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour two-way volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Planning Office
www.dot.state.fl.us/planning/systems/sm/los/default.shtm

2012 FDOT QUALITY/LEVEL OF SERVICE HANDBOOK TABLES

ATTACHMENT "D"

HCM 2010 TWSC
100: East Shore Drive & Site Driveway

408 East Shore Drive
PM Peak Hour Total Traffic

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	11	3	12	11	2	3	222	12	2	50	1
Future Vol, veh/h	1	11	3	12	11	2	3	222	12	2	50	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	12	3	13	12	2	3	241	13	2	54	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	320	319	55	320	313	248	55	0	0	254	0	0
Stage 1	59	59	-	254	254	-	-	-	-	-	-	-
Stage 2	261	260	-	66	59	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	633	598	1012	633	602	791	1550	-	-	1311	-	-
Stage 1	953	846	-	750	697	-	-	-	-	-	-	-
Stage 2	744	693	-	945	846	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	620	596	1012	620	600	791	1550	-	-	1311	-	-
Mov Cap-2 Maneuver	620	596	-	620	600	-	-	-	-	-	-	-
Stage 1	951	844	-	749	696	-	-	-	-	-	-	-
Stage 2	728	692	-	927	844	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.7	11.1	0.1	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1550	-	-	651	622	1311	-	-
HCM Lane V/C Ratio	0.002	-	-	0.025	0.044	0.002	-	-
HCM Control Delay (s)	7.3	0	-	10.7	11.1	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

ATTACHMENT "D"

HCM 2010 TWSC
200: Poinsettia Avenue & Site Driveway

408 East Shore Drive
PM Peak Hour Total Traffic

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	1	120	3	1	126
Future Vol, veh/h	3	1	120	3	1	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	130	3	1	137

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	271	132	0	0	133	0
Stage 1	132	-	-	-	-	-
Stage 2	139	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	718	917	-	-	1452	-
Stage 1	894	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	717	917	-	-	1452	-
Mov Cap-2 Maneuver	717	-	-	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	887	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	758	1452	-
HCM Lane V/C Ratio	-	-	0.006	0.001	-
HCM Control Delay (s)	-	-	9.8	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

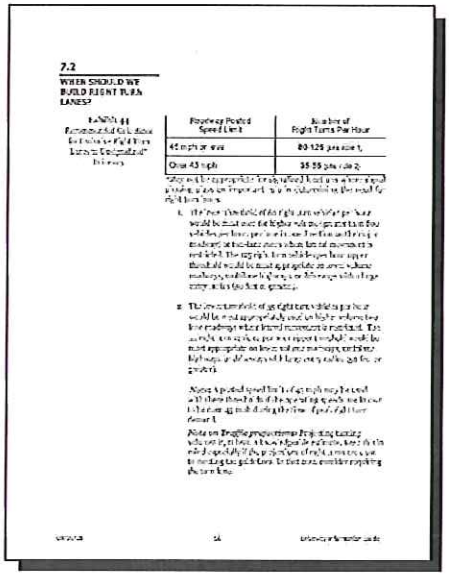
ATTACHMENT "E"

Location: Project Site Driveway at Poinsettia Avenue

PM Right-Turn (NBR)
Right-Turn Volume: 3

PM Left-Turn (SBL)
Left-Turn Volume: 1
Advancing Volume: 127
Opposing Volume: 123

Poinsettia Avenue Posted Speed: *25 mph*

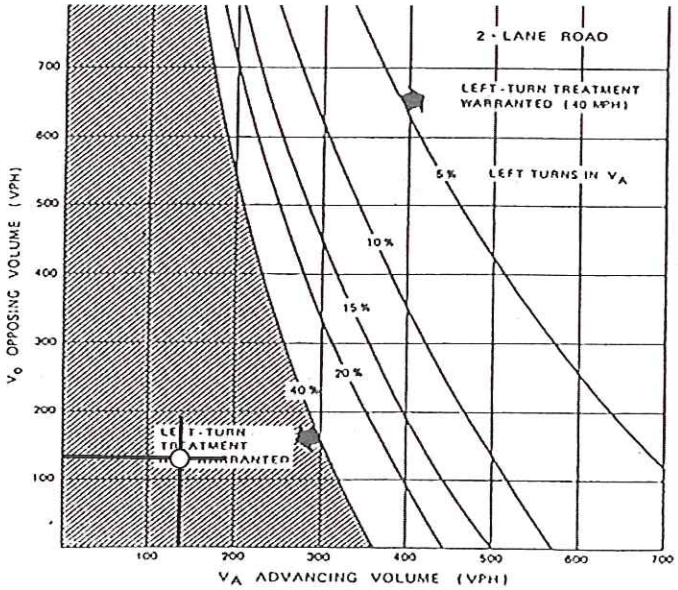


Result
Not Warranted

Warrant Threshold

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80-125 (see note 1)
Over 45 mph	35-55 (see note 2)

RIGHT TURN LANE



Result
Not Warranted

LEFT TURN LANE

408 East Shore Drive

Turn Lane Warrant Evaluation

RAYSOR Transportation Consulting

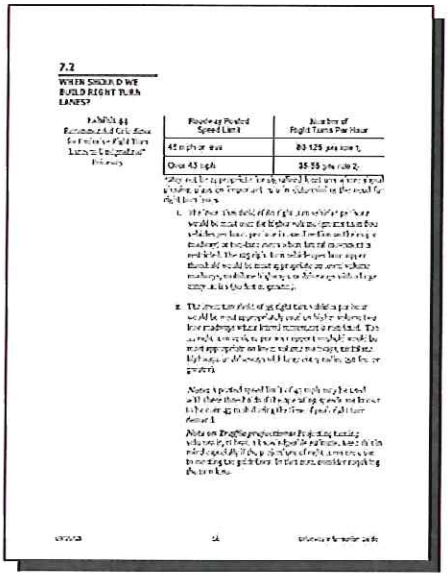
ATTACHMENT "E"

Location: Project Site Driveway (West) at East Shore Drive

PM Right-Turn (SBR)
Right-Turn Volume: 1

PM Left-Turn (NBL)
Left-Turn Volume: 3
Advancing Volume: 237
Opposing Volume: 53

East Shore Drive Posted Speed: *25 mph*

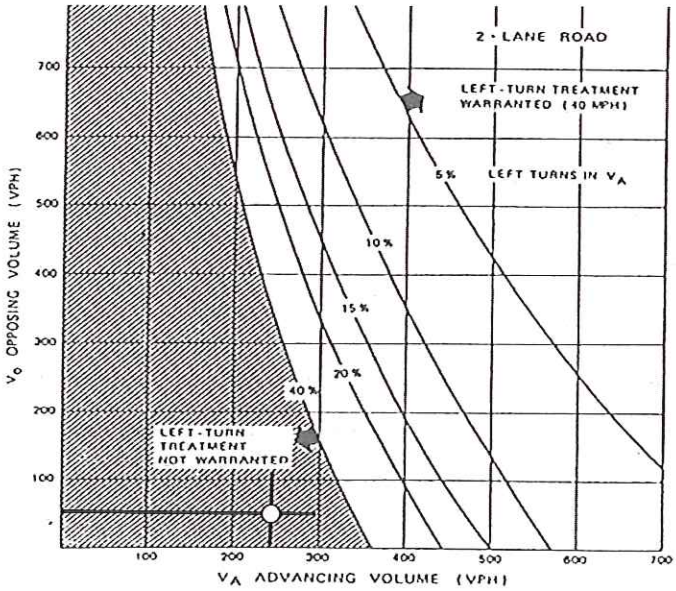


Result
Not Warranted

Warrant Threshold

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80 125 (see note 1)
Over 45 mph	35-55 (see note 2)

RIGHT TURN LANE



Result
Not Warranted

LEFT TURN LANE

408 East Shore Drive

Turn Lane Warrant Evaluation

RAYSOR Transportation Consulting

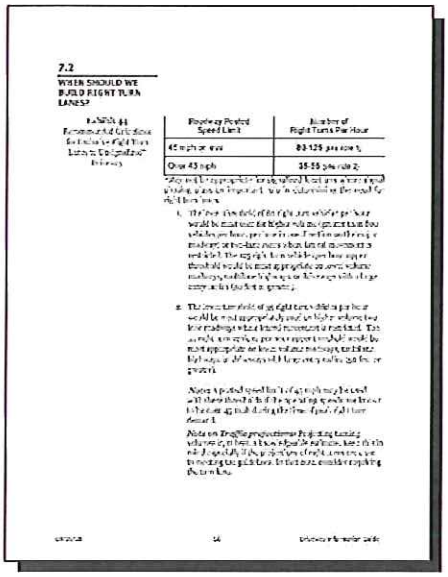
ATTACHMENT "E"

Location: Project Site Driveway (East) at East Shore Drive

PM Right-Turn (NBR)
Right-Turn Volume: 12

PM Left-Turn (SBL)
Left-Turn Volume: 2
Advancing Volume: 53
Opposing Volume: 237

East Shore Drive Posted Speed: *25 mph*

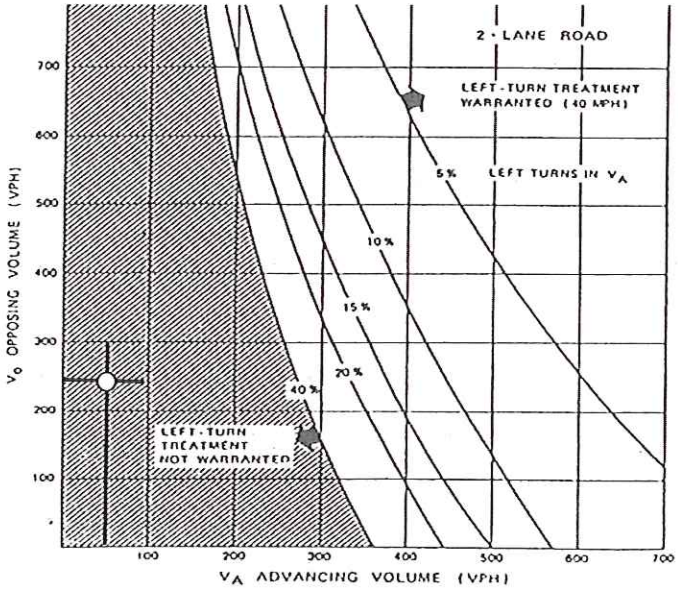


Result
Not Warranted

Warrant Threshold

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80-125 (see note 1)
Over 45 mph	35-55 (see note 2)

RIGHT TURN LANE



Result
Not Warranted

LEFT TURN LANE

408 East Shore Drive

Turn Lane Warrant Evaluation

RAYSOR Transportation Consulting

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CLEARWATER, FLORIDA 33756
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IN REPLY REFER TO:

Clearwater

March 8, 2019

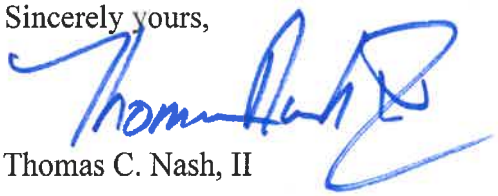
City of Clearwater
Clearwater Central Permitting
100 S Myrtle Ave
Clearwater, FL 33756

Re: Pending Application with the City of Clearwater for 411ES, LLC and East Shore International Enterprises LLC

To whom it may concern:

Please allow this letter to confirm that Frank Dagostino is an authorized signatory for 411ES, LLC and East Shore International Enterprises LLC relating to the applications that have been filed with the City of Clearwater.

Sincerely yours,



Thomas C. Nash, II

TCN:cmb