

RAYSOR Transportation Consulting

TECHNICAL MEMORANDUM



TO: Creighton Companies, LLC

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

SUBJECT: 7-Eleven Site; NWC Price & Cranberry, North Port, Florida
Traffic Study

DATE: September 20, 2019

Michael
D Raysor
PE

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by Michael D
Raysor, PE
Date:
2019.09.20
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SECTION 1.0 INTRODUCTION

This technical memorandum documents a traffic study performed in association with the proposed 7-Eleven site planned for development at the northwest corner of the intersection of Price Boulevard at Cranberry Boulevard, in North Port, Florida (refer to Figure 1.0 for project site location map). The project site is proposed to be developed with a 3,454 square foot convenience store and fueling station with 16 vehicle fueling positions (and ancillary car wash). Access to the project site is planned to be provided via right-in/right-out connections to Price Boulevard and Cranberry Boulevard (refer to Figure 2.0 for the project site concept plan).

SECTION 2.0 PROJECT GENERATED TRIPS

The daily and peak hour trip generation of the project site was estimated using trip characteristic data in accordance with the Institute of Transportation Engineers' *Trip Generation Manual* (ITE, 10th edition, 2017) and FDOT's pass-by rate of 77% for the subject land use, as shown in Table 1.0. Site generated trips were estimated using the worst case between Convenience Store with Gas (LUC 853) with square footage as the independent variable, and (b) Gas with Convenience Store (LUC 945) with vehicle fueling positions as the independent variable. The distribution of new external project traffic was estimated based on existing land use patterns in the area of the project site. The distribution of pass-by project traffic was estimated in consideration of existing traffic patterns. Figures 3.0 through 5.0 show the estimated distribution of project generated trips.



FIGURE 1.0 PROJECT SITE LOCATION MAP

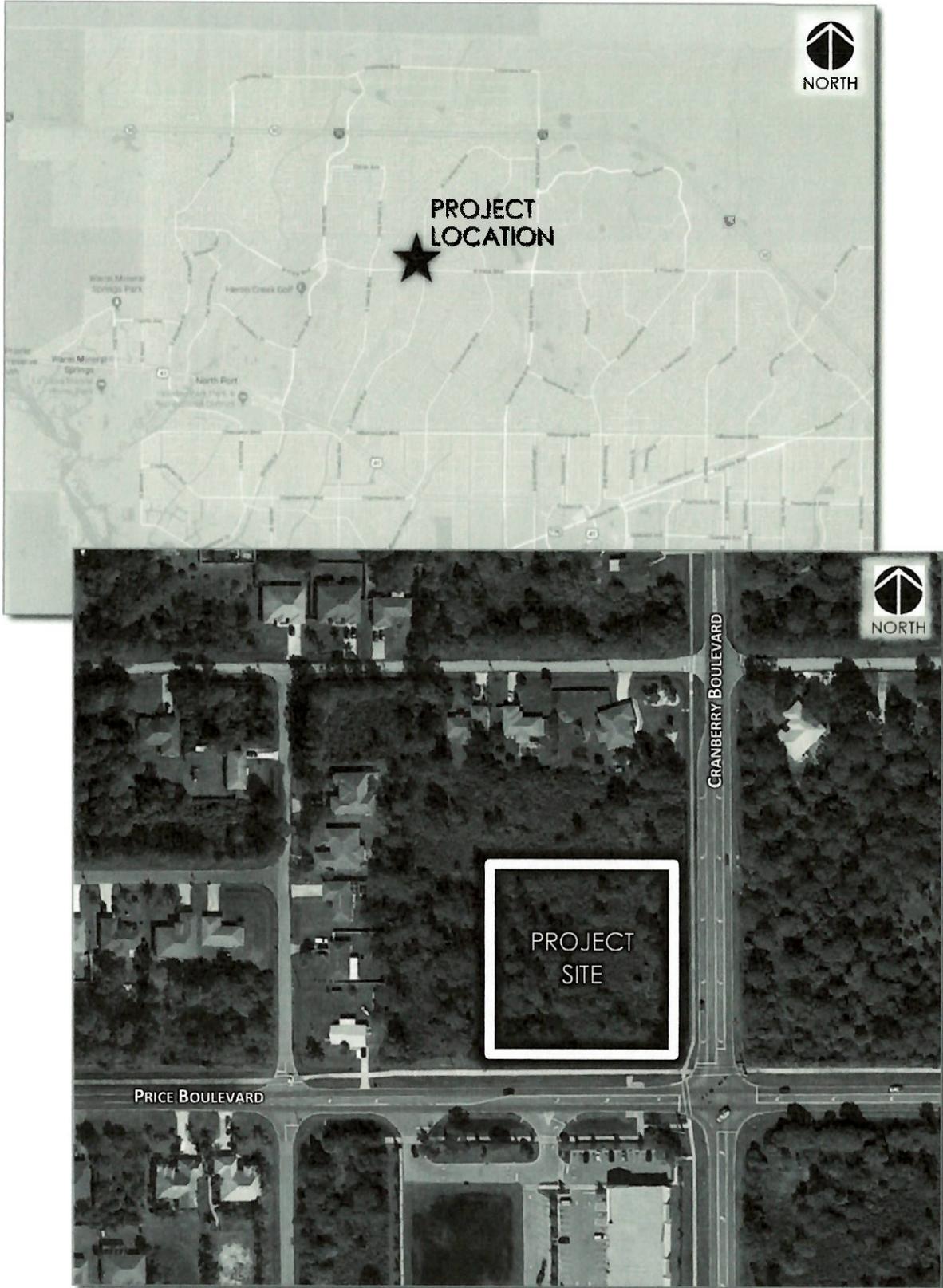




TABLE 1.0 TRIP GENERATION ESTIMATE SUMMARY

Proposed Land Use (Trip Generation Option 1)	ITE LUC	Land Use Description	Size	Daily		AM Peak Hour				PM Peak Hour			
				Rate	Trips	Rate	Trips	Enter	Exit	Rate	Trips	Enter	Exit
				853	Conv. Market w/ Gasoline	3,454 sf	624.20	2,156	40.59	140	70	70	49.29
Driveway Trips			-	2,156	-	140	70	70	-	170	85	85	
<i>Pass-By Trips (per FDOT)</i>			<i>77%</i>	<i>1,660</i>	<i>77%</i>	<i>108</i>	<i>54</i>	<i>54</i>	<i>77%</i>	<i>130</i>	<i>65</i>	<i>65</i>	
New External Trips			-	496	-	32	16	16	-	40	20	20	

Proposed Land Use (Trip Generation Option 2)	ITE LUC	Land Use Description	Size	Daily		AM Peak Hour				PM Peak Hour			
				Rate	Trips	Rate	Trips	Enter	Exit	Rate	Trips	Enter	Exit
				945	Gas Station w/ Conv. Market	16 vfp	205.36	3,286	12.47	200	100	100	13.99
Driveway Trips			-	3,286	-	200	100	100	-	224	112	112	
<i>Pass-By Trips (per FDOT)</i>			<i>77%</i>	<i>2,530</i>	<i>77%</i>	<i>154</i>	<i>77</i>	<i>77</i>	<i>77%</i>	<i>172</i>	<i>86</i>	<i>86</i>	
New External Trips			-	756	-	46	23	23	-	52	26	26	

Worst-Case Trip Generation				Daily		AM Peak Hour				PM Peak Hour			
				Rate	Trips	Rate	Trips	Enter	Exit	Rate	Trips	Enter	Exit
	Driveway Trips			-	3,286	-	200	100	100	-	224	112	112
Pass-By Trips			-	2,530	-	154	77	77	-	172	86	86	
New External Trips			-	756	-	46	23	23	-	52	26	26	



FIGURE 3.0 PROJECT GENERATED PEAK HOUR TRAFFIC VOLUMES (TOTAL TRIPS: NEW EXTERNAL & PASS-BY)

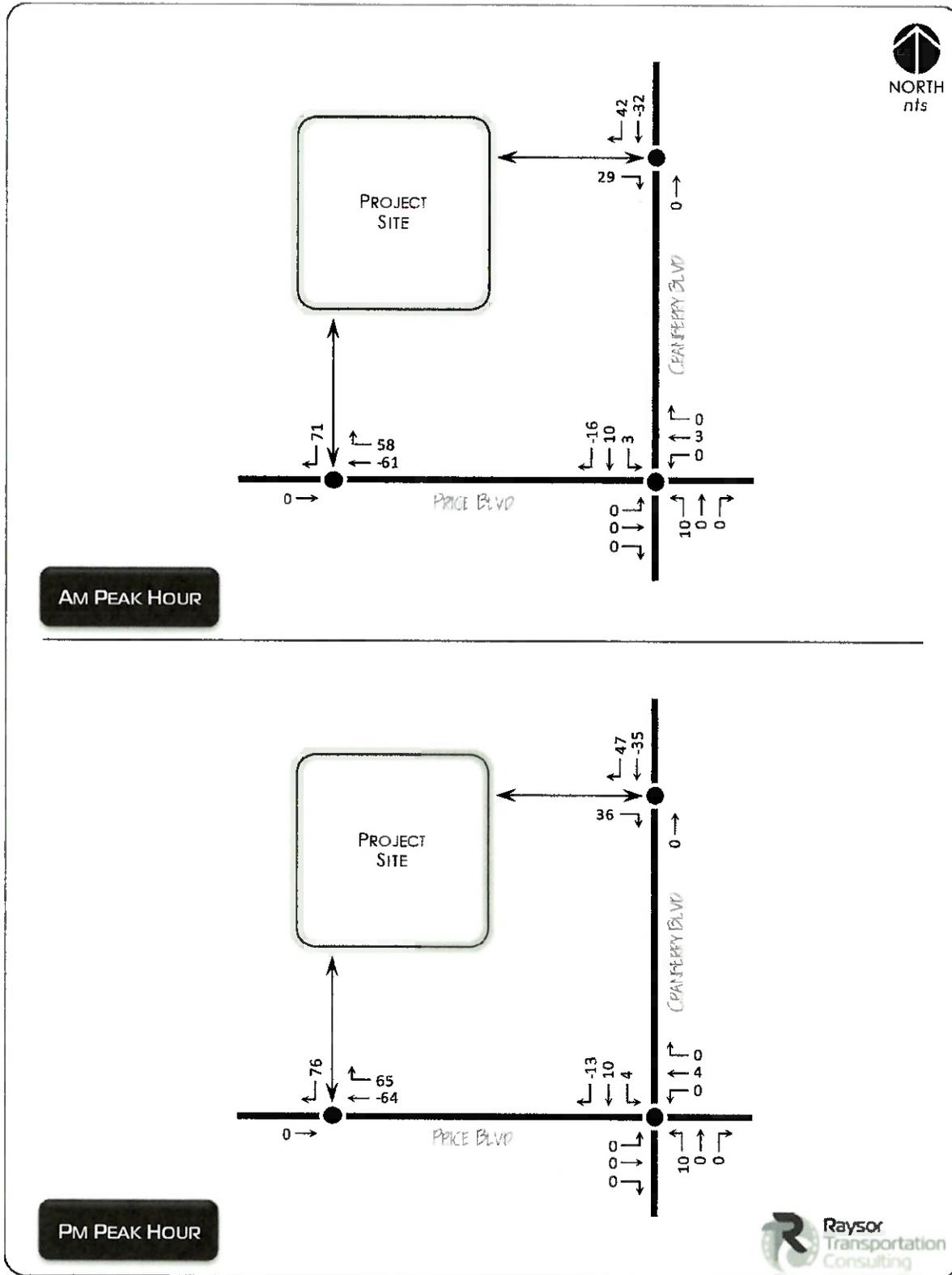
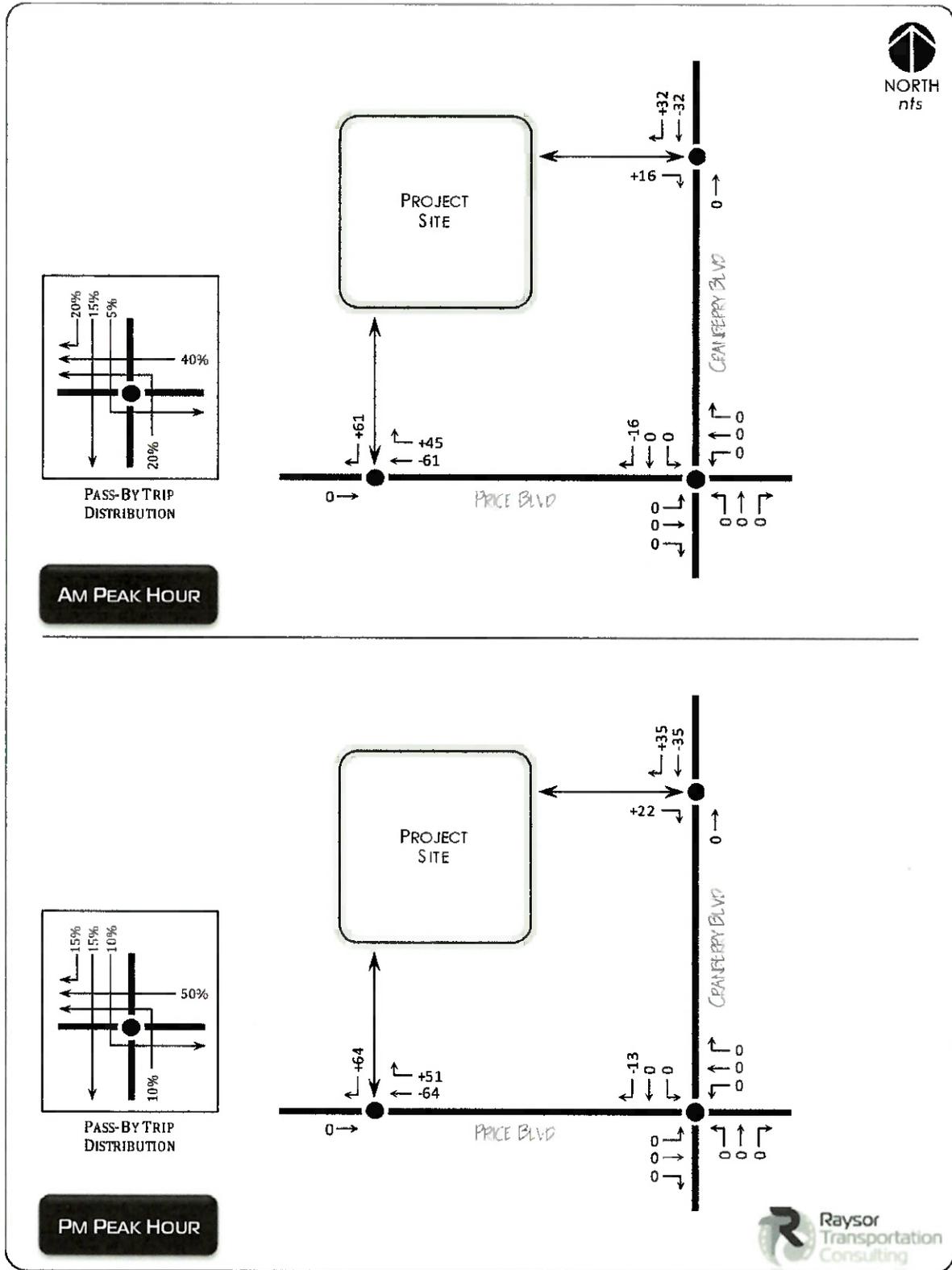




FIGURE 5.0 PROJECT GENERATED PEAK HOUR TRAFFIC VOLUMES (PASS-BY TRIPS)





SECTION 3.0 STUDY AREA

Pursuant to discussions with City staff, the study area was determined to consist of the intersections of the project site driveway connections to Price Boulevard and Cranberry Boulevard, and the intersection of Price Boulevard at Cranberry Boulevard.

SECTION 4.0 TRAFFIC VOLUMES

Traffic volumes were obtained from manual intersection turning movement counts subsequently adjusted using FDOT seasonal factors to reflect peak season conditions. Traffic count data for existing conditions is provided in Attachment "A". Future year background traffic volumes were calculated by adding a 5.1% annual growth rate to the existing traffic volumes through the 2020 buildout year, where this growth rate was provided by City staff. Total post-development traffic volumes were calculated by adding project generated trips to the background traffic volumes. Figures 6.0 through 8.0 show the traffic volumes used in this analysis.

SECTION 5.0 INTERSECTION ANALYSIS

Operational analyses were undertaken for post-development total traffic conditions for AM and PM peak hour periods for the study intersections. The analyses were performed using *Highway Capacity Manual* methods calculated using *Synchro* analysis software; in consideration of traffic signal timings observed during field data collection. The analysis includes consideration of the planned improvements to Price Boulevard, including the intersection of Price Boulevard at Cranberry Boulevard, as documented in Attachment "B". The results of the analysis indicate that the study intersections are anticipated to operate acceptably for post-development total traffic conditions, as summarized in Table 2.0 and further documented in Attachment "C".



FIGURE 6.0 EXISTING PEAK HOUR TRAFFIC VOLUMES

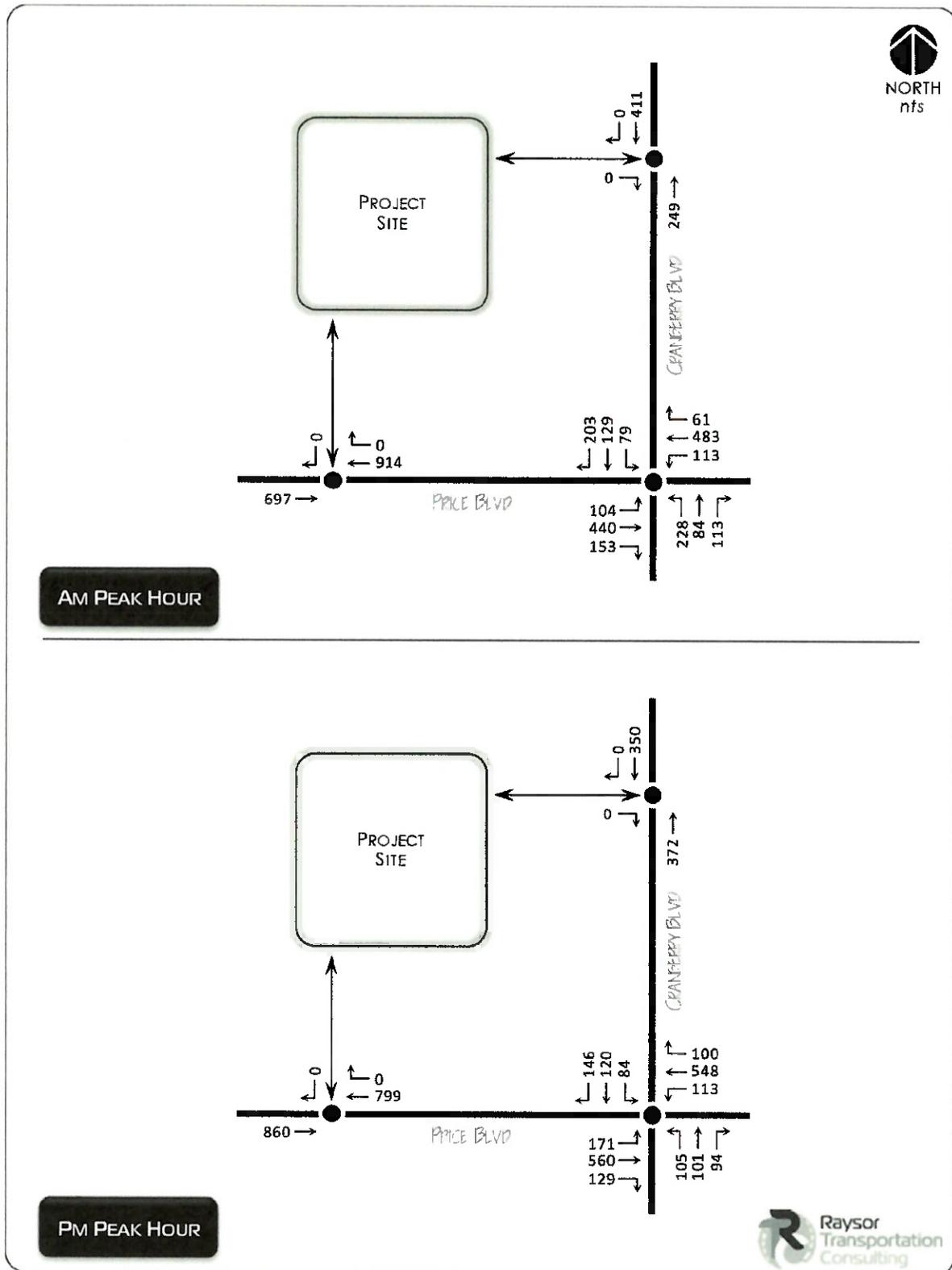




FIGURE 7.0 BACKGROUND PEAK HOUR TRAFFIC VOLUMES

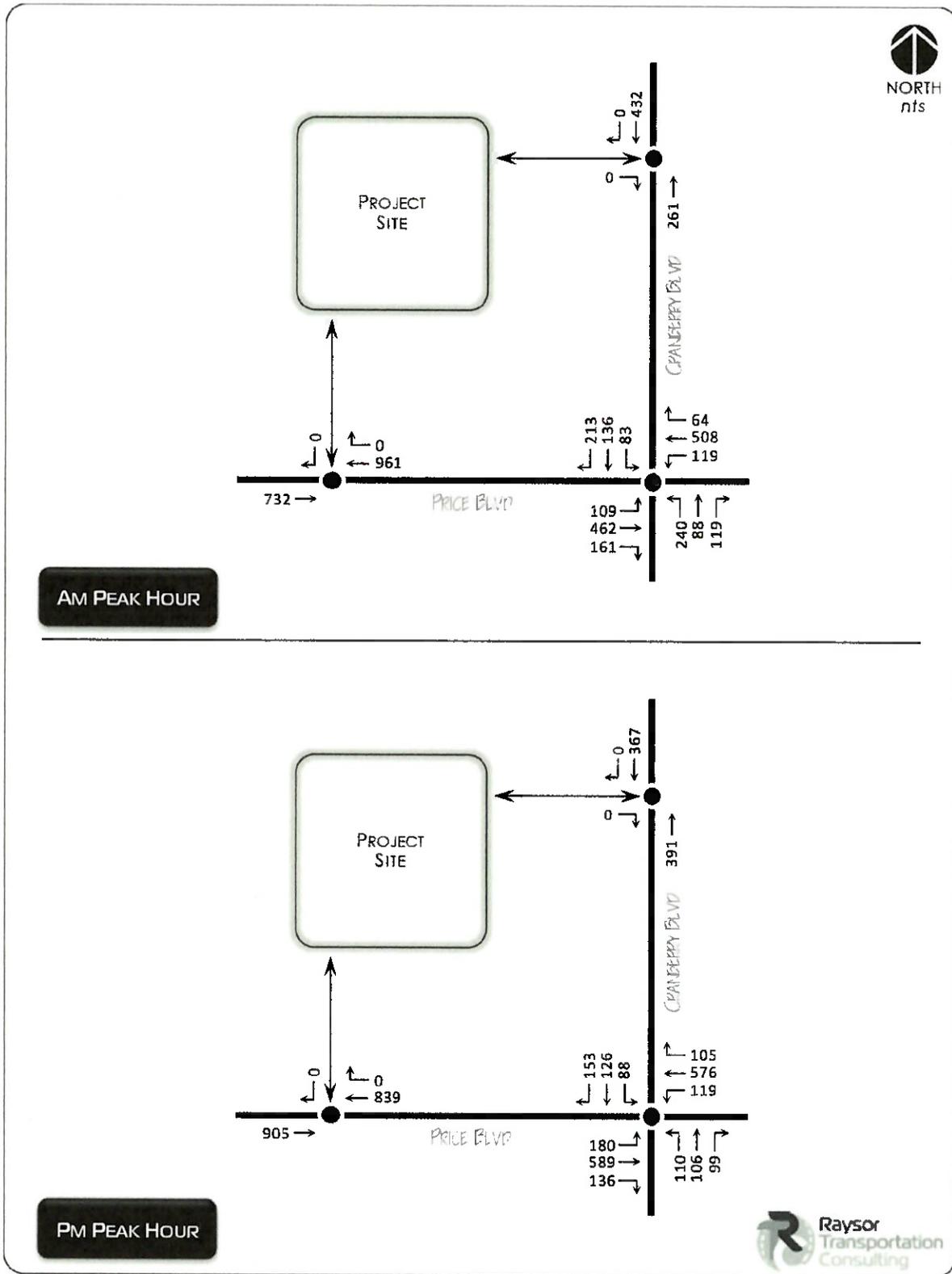




FIGURE 8.0 POST-DEVELOPMENT TOTAL PEAK HOUR TRAFFIC VOLUMES

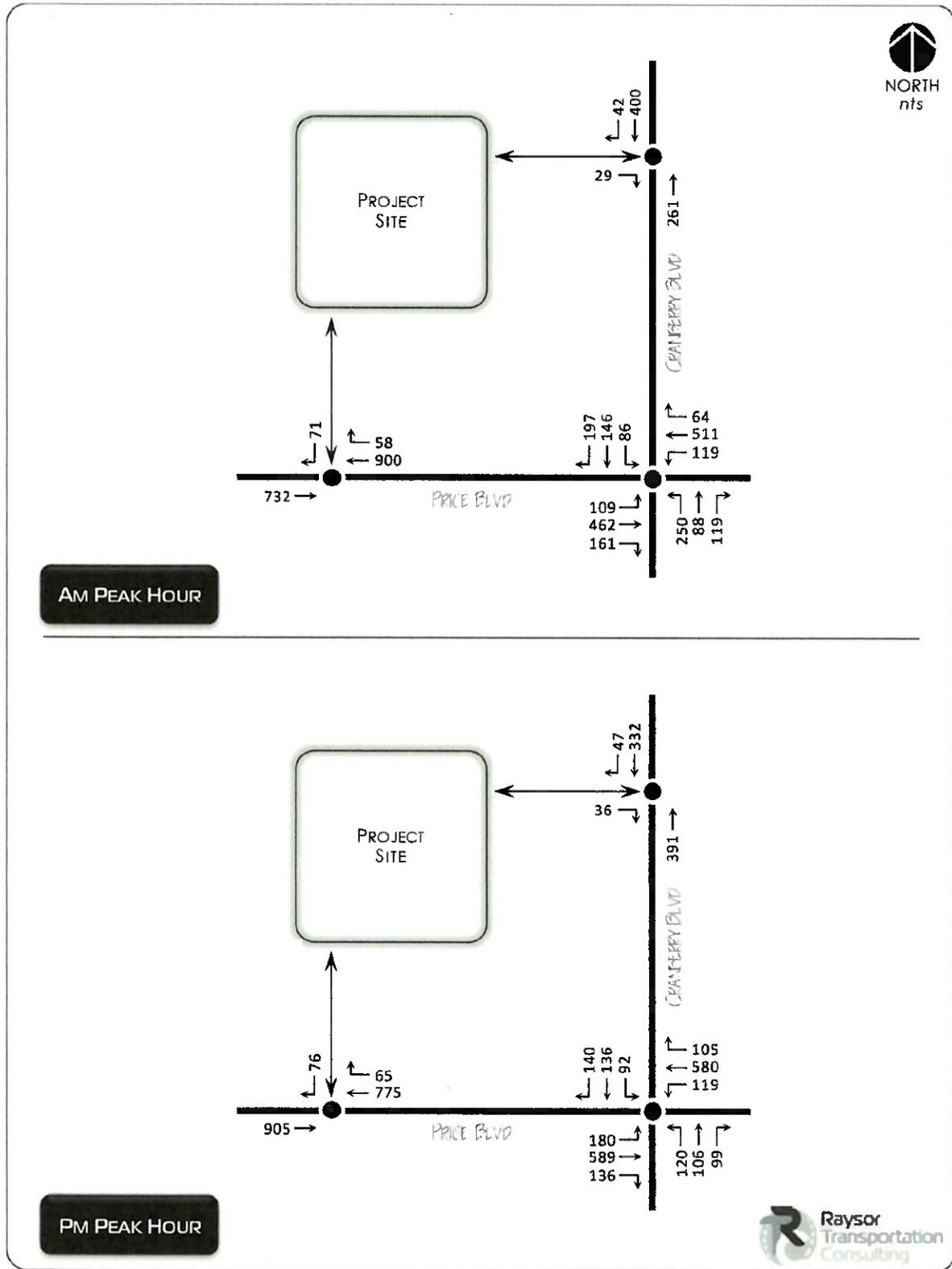




TABLE 2.0 INTERSECTION ANALYSIS SUMMARY

Intersection	Peak Hour	Metric	Eastbound			Westbound			Northbound			Southbound			Over all
			L	T	R	L	T	R	L	T	R	L	T	R	
Price Boulevard at Cranberry Boulevard	AM	LOS	B	C	[2]	B	C	[2]	B	C	C	C	C	C	C
		Delay	17.3	29.5	[2]	18.1	28.5	[2]	18.8	24.0	23.1	23.9	32.3	29.0	20.0
		V/C	0.36	0.71	[2]	0.42	0.67	[2]	0.56	0.21	0.09	0.25	0.51	0.14	0.63
	PM	LOS	B	C	[2]	B	C	[2]	B	C	C	C	C	C	C
		Delay	13.9	23.6	[2]	15.9	26.6	[2]	19.7	27.2	25.4	22.3	29.9	27.2	23.9
		V/C	0.49	0.66	[2]	0.38	0.70	[2]	0.30	0.31	0.06	0.25	0.45	0.09	0.54
Price Boulevard Project Driveway	AM	LOS	[1]	[3]	[1]	[1]	[3]	[2]	[1]	[1]	[1]	A	[1]	[1]	[1]
		Delay	[1]	[3]	[1]	[1]	[3]	[2]	[1]	[1]	[1]	10.0	[1]	[1]	[1]
		V/C	[1]	[3]	[1]	[1]	[3]	[2]	[1]	[1]	[1]	0.10	[1]	[1]	[1]
	PM	LOS	[1]	[3]	[1]	[1]	[3]	[2]	[1]	[1]	[1]	A	[1]	[1]	[1]
		Delay	[1]	[3]	[1]	[1]	[3]	[2]	[1]	[1]	[1]	9.4	[1]	[1]	[1]
		V/C	[1]	[3]	[1]	[1]	[3]	[2]	[1]	[1]	[1]	0.09	[1]	[1]	[1]
Cranberry Boulevard Project Driveway	AM	LOS	[1]	[1]	B	[1]	[1]	[1]	[1]	[3]	[1]	[1]	[3]	[2]	[1]
		Delay	[1]	[1]	11.4	[1]	[1]	[1]	[1]	[3]	[1]	[1]	[3]	[2]	[1]
		V/C	[1]	[1]	0.06	[1]	[1]	[1]	[1]	[3]	[1]	[1]	[3]	[2]	[1]
	PM	LOS	[1]	[1]	B	[1]	[1]	[1]	[1]	[3]	[1]	[1]	[3]	[2]	[1]
		Delay	[1]	[1]	10.7	[1]	[1]	[1]	[1]	[3]	[1]	[1]	[3]	[2]	[1]
		V/C	[1]	[1]	0.06	[1]	[1]	[1]	[1]	[3]	[1]	[1]	[3]	[2]	[1]

[1] Not Applicable; [2] Shared Lane; [3] Unopposed Movement



SECTION 6.0 TURN LANE EVALUATION

The potential need for new site access right turn lanes on Price Boulevard and Cranberry Boulevard at the project site driveway connections was evaluated in consideration of the warranting criteria as documented in NCHRP No. 279. The turn lane warrant evaluation identified that site access turn lanes were found to not be warranted. Refer to Attachment "D" for details regarding the turn lane warrant evaluation.

SECTION 7.0 CONCLUSION

Based on the data, analysis and findings contained herein, the following is concluded in consideration of the proposed 7-Eleven site planned for development at the northwest corner of the intersection of Price Boulevard at Cranberry Boulevard, in North Port, Florida.

- ❖ The intersections of the project site driveway connections to Price Boulevard and Cranberry Boulevard, and the intersection of Price Boulevard at Cranberry Boulevard, are anticipated to operate acceptably for post-development total traffic conditions.

- ❖ Site access turn lanes were found to not be warranted on Price Boulevard or Cranberry Boulevard at the project site driveway connections.

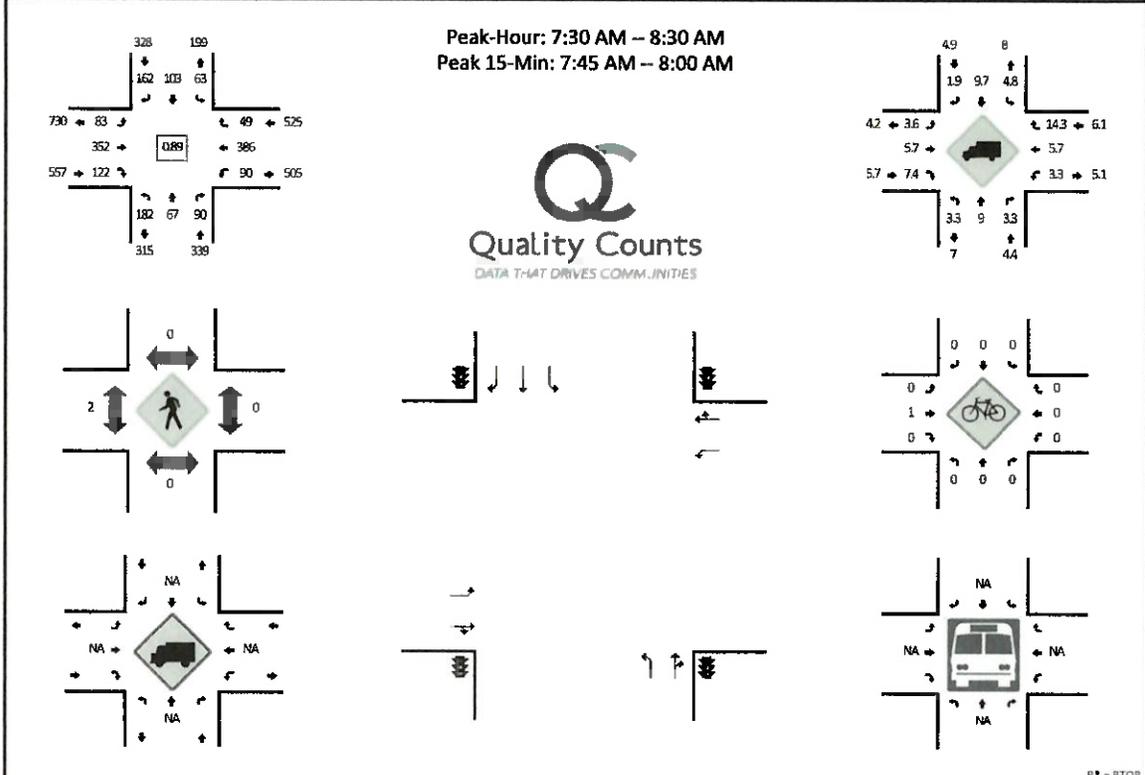
ATTACHMENT "A"

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Cranberry Blvd -- Price Blvd
CITY/STATE: Sarasota, FL

QC JOB #: 15045401
DATE: Wed, Aug 14 2019



R* = RTOR

15-Min Count Period Beginning At	Cranberry Blvd (Northbound)					Cranberry Blvd (Southbound)					Price Blvd (Eastbound)					Price Blvd (Westbound)					Total	Hourly Totals
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
7:00 AM	36	20	13	0	3	21	17	5	0	22	19	60	15	0	3	14	92	5	0	0	345	
7:15 AM	22	15	9	0	3	14	17	9	0	21	19	97	38	0	2	11	66	8	0	0	351	
7:30 AM	30	16	15	0	7	17	30	19	0	23	18	107	47	0	0	20	74	16	0	0	439	
7:45 AM	54	15	16	0	6	24	31	19	0	30	22	83	38	0	4	28	113	9	0	1	493	1628
8:00 AM	46	16	19	0	12	11	17	23	0	21	16	90	24	0	1	11	106	9	0	1	423	1706
8:15 AM	52	20	11	0	4	11	25	10	0	17	27	72	6	0	2	31	93	12	0	1	394	1749
8:30 AM	20	10	0	0	6	19	13	10	0	27	34	93	12	0	1	15	101	8	0	0	369	1679
8:45 AM	31	11	9	0	2	20	9	23	0	9	16	95	17	0	0	12	94	10	0	2	360	1546
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
All Vehicles	216	60	88	0	24	96	124	196	0	120	88	332	168	0	16	112	452	40	0	4	2136	
Heavy Trucks	4	4	0			8	12	4			8	28	16			4	28	4			120	
Pedestrians	0	0	0			0	0	0			0	4	0			0	0	0			4	
Bicycles	0	0	0			0	0	0			0	0	0			0	0	0			0	
Railroad																						
Stopped Buses																						

Comments:

Report generated on 8/19/2019 9:06 AM

SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

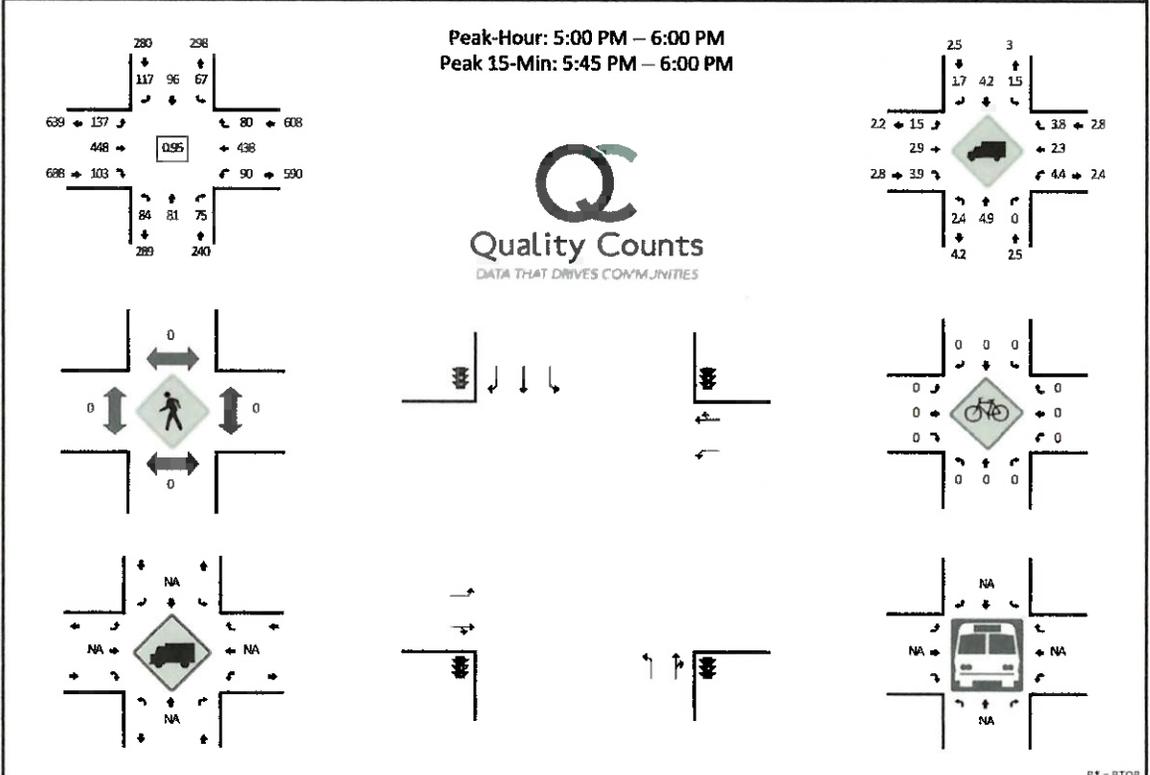
ATTACHMENT "A"

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Cranberry Blvd -- Price Blvd
CITY/STATE: Sarasota, FL

QC JOB #: 15045402
DATE: Wed, Aug 14 2019



R* = RTOR

15-Min Count Period Beginning At	Cranberry Blvd (Northbound)					Cranberry Blvd (Southbound)					Price Blvd (Eastbound)					Price Blvd (Westbound)					Total	Hourly Totals
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
4:00 PM	16	19	13	0	0	12	12	8	0	15	50	114	22	0	1	25	93	14	0	1	415	
4:15 PM	21	27	13	0	6	10	27	12	0	18	42	99	31	0	3	17	94	10	0	2	432	
4:30 PM	13	23	13	0	4	11	22	11	0	20	37	115	21	0	3	21	109	13	0	3	439	
4:45 PM	30	27	13	0	4	14	23	6	0	29	26	110	25	0	2	28	120	17	0	0	474	1760
5:00 PM	23	20	22	0	0	26	29	11	0	25	30	93	24	0	2	27	94	23	0	2	451	1796
5:15 PM	19	21	11	0	5	12	22	9	0	16	40	107	24	0	4	21	115	19	0	0	445	1809
5:30 PM	15	16	17	0	4	14	25	8	0	23	30	116	19	0	0	28	109	13	0	4	441	1811
5:45 PM	27	24	13	0	3	15	20	5	0	20	37	132	30	0	0	14	120	17	0	2	479	1816
Peak 15-Min Flowrates	Northbound					Southbound					Eastbound					Westbound					Total	
	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*	Left	Thru	Right	U	R*		
All Vehicles	108	96	64	0	12	60	80	100	0	80	148	528	120	0	0	56	480	76	0	8	2016	
Heavy Trucks	4	0	0			4	4	0			4	16	4			8	4	0			48	
Pedestrians	0	0	0			0	0	0			0	0	0			0	0	0			0	
Bicycles	0	0	0			0	0	0			0	0	0			0	0	0			0	
Railroad																						
Stopped Buses																						

Comments:

Report generated on 8/19/2019 9:06 AM

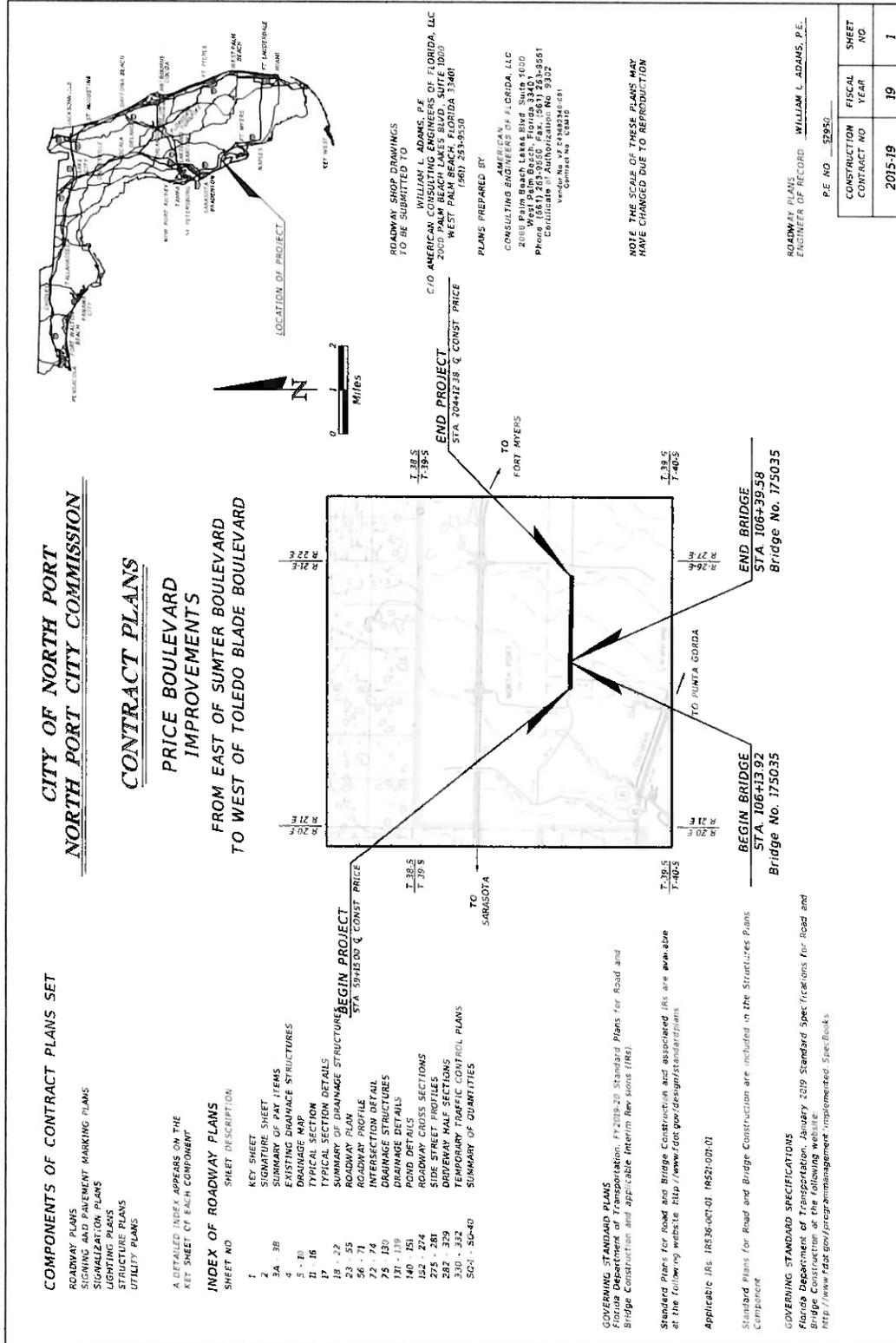
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

ATTACHMENT "A"

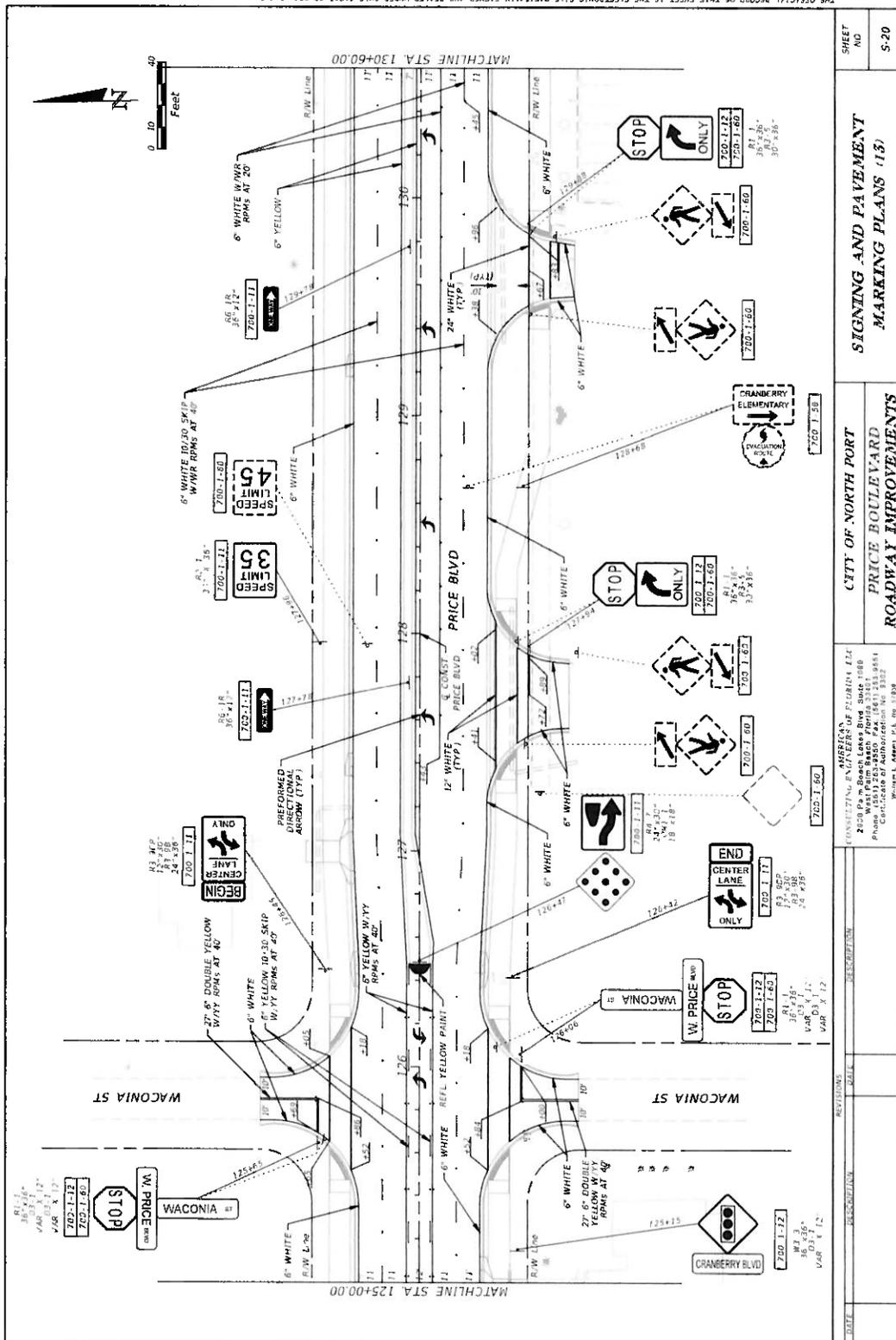
2018 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: DISTRICT
 CATEGORY: 1700 SARASOTA COUNTYWIDE

WEEK	DATES	SF	MOCF: 0.88 PSCF
1	01/01/2018 - 01/06/2018	1.03	1.17
2	01/07/2018 - 01/13/2018	1.00	1.14
3	01/14/2018 - 01/20/2018	0.97	1.10
4	01/21/2018 - 01/27/2018	0.94	1.07
* 5	01/28/2018 - 02/03/2018	0.92	1.05
* 6	02/04/2018 - 02/10/2018	0.89	1.01
* 7	02/11/2018 - 02/17/2018	0.87	0.99
* 8	02/18/2018 - 02/24/2018	0.86	0.98
* 9	02/25/2018 - 03/03/2018	0.86	0.98
*10	03/04/2018 - 03/10/2018	0.86	0.98
*11	03/11/2018 - 03/17/2018	0.85	0.97
*12	03/18/2018 - 03/24/2018	0.86	0.98
*13	03/25/2018 - 03/31/2018	0.87	0.99
*14	04/01/2018 - 04/07/2018	0.89	1.01
*15	04/08/2018 - 04/14/2018	0.90	1.02
*16	04/15/2018 - 04/21/2018	0.91	1.03
*17	04/22/2018 - 04/28/2018	0.94	1.07
18	04/29/2018 - 05/05/2018	0.97	1.10
19	05/06/2018 - 05/12/2018	1.01	1.15
20	05/13/2018 - 05/19/2018	1.04	1.18
21	05/20/2018 - 05/26/2018	1.04	1.18
22	05/27/2018 - 06/02/2018	1.04	1.18
23	06/03/2018 - 06/09/2018	1.05	1.19
24	06/10/2018 - 06/16/2018	1.05	1.19
25	06/17/2018 - 06/23/2018	1.05	1.19
26	06/24/2018 - 06/30/2018	1.06	1.20
27	07/01/2018 - 07/07/2018	1.06	1.20
28	07/08/2018 - 07/14/2018	1.07	1.22
29	07/15/2018 - 07/21/2018	1.07	1.22
30	07/22/2018 - 07/28/2018	1.08	1.23
31	07/29/2018 - 08/04/2018	1.09	1.24
32	08/05/2018 - 08/11/2018	1.09	1.24
33	08/12/2018 - 08/18/2018	1.10	1.25
34	08/19/2018 - 08/25/2018	1.11	1.26
35	08/26/2018 - 09/01/2018	1.13	1.28
36	09/02/2018 - 09/08/2018	1.14	1.30
37	09/09/2018 - 09/15/2018	1.15	1.31
38	09/16/2018 - 09/22/2018	1.14	1.30
39	09/23/2018 - 09/29/2018	1.12	1.27
40	09/30/2018 - 10/06/2018	1.11	1.26
41	10/07/2018 - 10/13/2018	1.09	1.24
42	10/14/2018 - 10/20/2018	1.08	1.23
43	10/21/2018 - 10/27/2018	1.07	1.22
44	10/28/2018 - 11/03/2018	1.06	1.20
45	11/04/2018 - 11/10/2018	1.06	1.20
46	11/11/2018 - 11/17/2018	1.05	1.19
47	11/18/2018 - 11/24/2018	1.05	1.19
48	11/25/2018 - 12/01/2018	1.04	1.18
49	12/02/2018 - 12/08/2018	1.04	1.18
50	12/09/2018 - 12/15/2018	1.03	1.17
51	12/16/2018 - 12/22/2018	1.01	1.15
52	12/23/2018 - 12/29/2018	0.99	1.13
53	12/30/2018 - 12/31/2018	0.97	1.10

* PEAK SEASON



ATTACHMENT "B"



THE OFFICIAL RECORD ON THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15 23.004, F.A.C.

DATE	DESCRIPTION	REVISIONS	TABLE	DESCRIPTION	SHEET NO
					5-20

CITY OF NORTH PORT
PRICE BOULEVARD
ROADWAY IMPROVEMENTS

MARSHALL CONSULTING ENGINEERS OF FLORIDA, LLC
 2828 Pa. Beach Lane Blvd. Suite 108B
 North Port, FL 34108
 Phone: (888) 253-8550 Fax: (888) 253-8554
 Certificate of Authorization No. 1027

PROJECT: PRICE BOULEVARD ROADWAY IMPROVEMENTS
 SHEET: 5-20

ATTACHMENT "C"

HCM Signalized Intersection Capacity Analysis

North Port 7-Eleven

1: Cranberry Blvd & Price Blvd

AM Peak Hour Total Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	462	161	119	511	64	250	88	119	86	146	197
Future Volume (vph)	109	462	161	119	511	64	250	88	119	86	146	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	3266		1752	3321		1752	1743	1568	1719	1727	1583
Flt Permitted	0.25	1.00		0.22	1.00		0.44	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	461	3266		409	3321		804	1743	1568	1254	1727	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	122	519	181	134	574	72	281	99	134	97	164	221
RTOR Reduction (vph)	0	28	0	0	8	0	0	0	98	0	0	180
Lane Group Flow (vph)	122	672	0	134	638	0	281	99	36	97	164	41
Heavy Vehicles (%)	4%	6%	7%	3%	6%	14%	3%	9%	3%	5%	10%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	34.3	24.4		33.9	24.2		35.4	22.9	22.9	23.2	15.7	15.7
Effective Green, g (s)	34.3	24.4		33.9	24.2		35.4	22.9	22.9	23.2	15.7	15.7
Actuated g/C Ratio	0.41	0.29		0.40	0.29		0.42	0.27	0.27	0.27	0.19	0.19
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	336	943		318	951		501	472	424	385	320	294
v/s Ratio Prot	0.04	c0.21		c0.05	0.19		c0.10	0.06		0.02	0.09	
v/s Ratio Perm	0.10			0.12			c0.14		0.02	0.05		0.03
v/c Ratio	0.36	0.71		0.42	0.67		0.56	0.21	0.09	0.25	0.51	0.14
Uniform Delay, d1	16.6	26.9		17.2	26.6		17.4	23.8	23.0	23.6	31.0	28.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	2.6		0.9	1.9		1.4	0.2	0.1	0.3	1.4	0.2
Delay (s)	17.3	29.5		18.1	28.5		18.8	24.0	23.1	23.9	32.3	29.0
Level of Service	B	C		B	C		B	C	C	C	C	C
Approach Delay (s)		27.7			26.7			20.9			29.1	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT "C"

HCM Unsignalized Intersection Capacity Analysis 100: Price Blvd & Project Driveway

North Port 7-Eleven
AM Peak Hour Total Traffic



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Traffic Volume (veh/h)	0	732	900	58	0	71
Future Volume (Veh/h)	0	732	900	58	0	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	822	1011	65	0	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			500			
pX, platoon unblocked	0.85				0.85	0.85
vC, conflicting volume	1076				1454	538
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	725				1172	89
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	90
cM capacity (veh/h)	739				157	805
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	411	411	674	402	80	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	65	80	
cSH	1700	1700	1700	1700	805	
Volume to Capacity	0.24	0.24	0.40	0.24	0.10	
Queue Length 95th (ft)	0	0	0	0	8	
Control Delay (s)	0.0	0.0	0.0	0.0	10.0	
Lane LOS					A	
Approach Delay (s)	0.0		0.0		10.0	
Approach LOS					A	
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			37.8%		ICU Level of Service	A
Analysis Period (min)			15			

ATTACHMENT "C"

HCM Unsignalized Intersection Capacity Analysis 200: Cranberry Blvd & Project Driveway

North Port 7-Eleven
AM Peak Hour Total Traffic

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	29	0	261	400	42
Future Volume (Veh/h)	0	29	0	261	400	42
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	33	0	293	449	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				500		
pX, platoon unblocked	0.94					
vC, conflicting volume	766	472	496			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	719	472	496			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	372	592	1068			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	33	293	496			
Volume Left	0	0	0			
Volume Right	33	0	47			
cSH	592	1700	1700			
Volume to Capacity	0.06	0.17	0.29			
Queue Length 95th (ft)	4	0	0			
Control Delay (s)	11.4	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	11.4	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		33.6%		ICU Level of Service		A
Analysis Period (min)			15			

ATTACHMENT "C"

HCM Signalized Intersection Capacity Analysis

North Port 7-Eleven

1: Cranberry Blvd & Price Blvd

PM Peak Hour Total Traffic

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	589	136	119	580	105	120	106	99	92	136	140
Future Volume (vph)	180	589	136	119	580	105	120	106	99	92	136	140
Ideal Flow (vphpf)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3400		1736	3447		1770	1810	1615	1770	1827	1583
Flt Permitted	0.19	1.00		0.25	1.00		0.56	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	357	3400		465	3447		1036	1810	1615	1276	1827	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	620	143	125	611	111	126	112	104	97	143	147
RTOR Reduction (vph)	0	15	0	0	12	0	0	0	83	0	0	121
Lane Group Flow (vph)	189	748	0	125	710	0	126	112	21	97	143	26
Heavy Vehicles (%)	2%	3%	4%	4%	2%	4%	2%	5%	0%	2%	4%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	38.0	26.1		31.8	23.0		25.2	15.6	15.6	21.2	13.6	13.6
Effective Green, g (s)	38.0	26.1		31.8	23.0		25.2	15.6	15.6	21.2	13.6	13.6
Actuated g/C Ratio	0.49	0.33		0.41	0.29		0.32	0.20	0.20	0.27	0.17	0.17
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	1136		332	1015		424	361	322	394	318	275
v/s Ratio Prot	c0.07	c0.22		0.04	0.21		c0.04	0.06		0.02	c0.08	
v/s Ratio Perm	0.16			0.11			0.06		0.01	0.04		0.02
v/c Ratio	0.49	0.66		0.38	0.70		0.30	0.31	0.06	0.25	0.45	0.09
Uniform Delay, d1	13.0	22.2		15.2	24.5		19.3	26.7	25.3	21.9	28.9	27.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	1.4		0.7	2.1		0.4	0.5	0.1	0.3	1.0	0.1
Delay (s)	13.9	23.6		15.9	26.6		19.7	27.2	25.4	22.3	29.9	27.2
Level of Service	B	C		B	C		B	C	C	C	C	C
Approach Delay (s)		21.7			25.0			23.9			27.0	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	78.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT "C"

HCM Unsignalized Intersection Capacity Analysis 100: Price Blvd & Project Driveway

North Port 7-Eleven
PM Peak Hour Total Traffic



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Traffic Volume (veh/h)	0	905	775	65	0	76
Future Volume (Veh/h)	0	905	775	65	0	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	953	816	68	0	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			500			
pX, platoon unblocked	0.83				0.83	0.83
vC, conflicting volume	884				1326	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	461				992	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	91
cM capacity (veh/h)	914				202	904
Direction, Lane #						
	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	476	476	544	340	80	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	68	80	
cSH	1700	1700	1700	1700	904	
Volume to Capacity	0.28	0.28	0.32	0.20	0.09	
Queue Length 95th (ft)	0	0	0	0	7	
Control Delay (s)	0.0	0.0	0.0	0.0	9.4	
Lane LOS					A	
Approach Delay (s)	0.0		0.0		9.4	
Approach LOS					A	
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			34.9%		ICU Level of Service	A
Analysis Period (min)			15			

ATTACHMENT "C"

HCM Unsignalized Intersection Capacity Analysis 200: Cranberry Blvd & Project Driveway

North Port 7-Eleven
PM Peak Hour Total Traffic

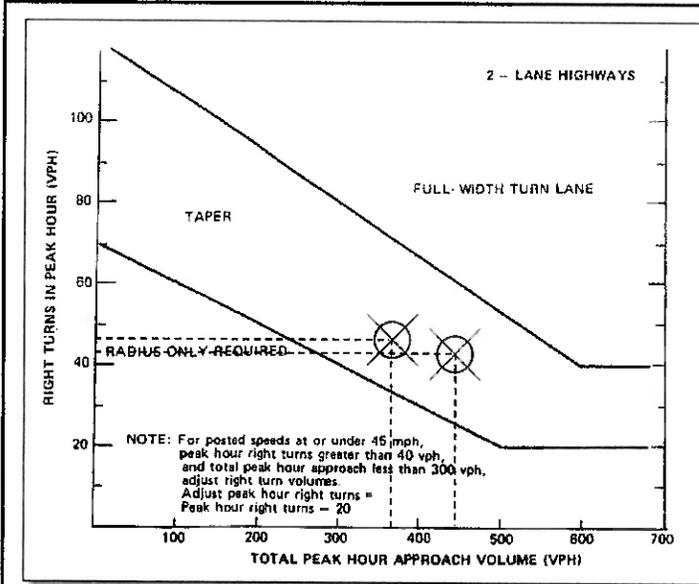


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Volume (veh/h)	0	36	0	391	332	47
Future Volume (Veh/h)	0	36	0	391	332	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	38	0	412	349	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				500		
pX, platoon unblocked	0.90					
vC, conflicting volume	786	374	398			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	374	398			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	362	673	1161			
Direction, Lane #						
	EB 1	NB 1	SB 1			
Volume Total	38	412	398			
Volume Left	0	0	0			
Volume Right	38	0	49			
cSH	673	1700	1700			
Volume to Capacity	0.06	0.24	0.23			
Queue Length 95th (ft)	4	0	0			
Control Delay (s)	10.7	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	10.7	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			30.3%		ICU Level of Service	A
Analysis Period (min)			15			

ATTACHMENT "D"

Location: Project Driveway Connection to Cranberry Boulevard

Cranberry Boulevard Posted Speed: 40 mph



Result
Not Warranted

AM Right-Turn Lane (SBR)

Right-Turn Volume: 42
Approach Volume: 442

PM Right-Turn Lane (SBR)

Right-Turn Volume: 47
Approach Volume: 379

Source: NCHRP No. 279

RIGHT TURN LANE

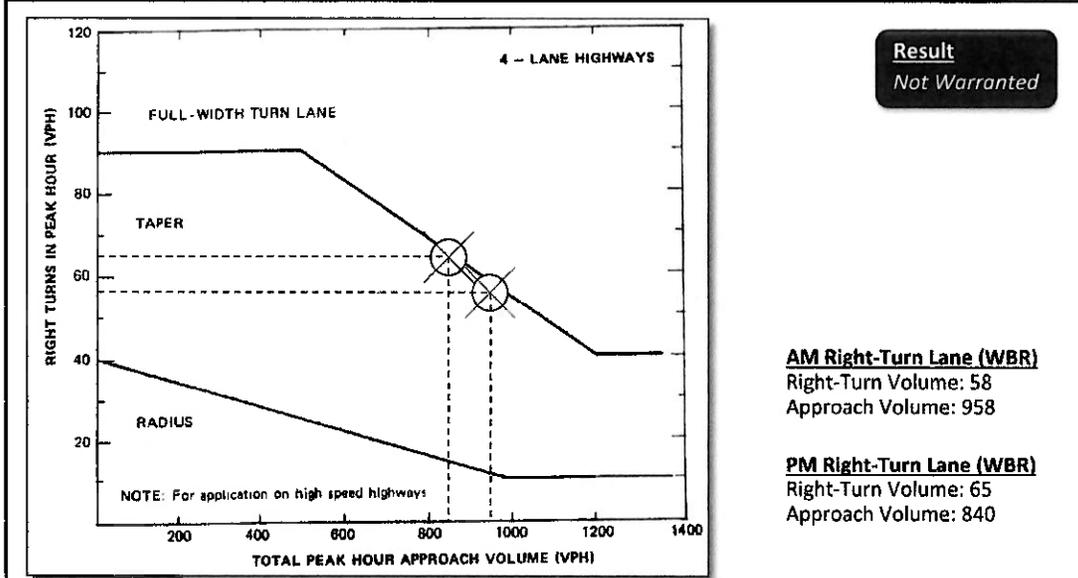
NORTH PORT 7-ELEVEN
Turn Lane Warrant Evaluation



ATTACHMENT "D"

Location: Project Driveway Connection to Price Boulevard

Price Boulevard Posted Speed: 45 mph



Source: NCHRP No. 279

RIGHT TURN LANE

NORTH PORT 7-ELEVEN
Turn Lane Warrant Evaluation

