



January 23, 2017
Revised March 15, 2017
Revised April 20, 2017
Revised May 25, 2017

Joni Brinkman, AICP, Principal
Urban Design Kilday Studios
610 Clematis Street, Suite CU02
West Palm Beach, Florida 33401

**RE: Surf Ranch at Palm Beach Park of Commerce
Palm Beach County, Florida
Kimley-Horn #140346000**

Dear Ms. Brinkman:

Pursuant to your request, Kimley-Horn has performed a traffic statement for the proposed development to be located within Palm Beach Park of Commerce. The site location is provided in *Figure 1* and a site plan is included for reference. The site is proposed to be a surf park with a wave lagoon that produces artificial waves for professional surfers and surf camp attendees.

BACKGROUND

Palm Beach Park of Commerce is located at the northeast corner of State Route 710 (Beeline Highway) and Pratt Whitney Road in Palm Beach County, Florida. A Development of Regional Impact (DRI) application was filed for the project in the early 1980's. Various approvals and vesting were issued. In 1992, a vesting determination and agreement was made by Palm Beach County and the property owner concluding that 6.25 million square feet was approved in addition to the approximately 200,000 square feet of industrial land use that existed in 1992, at the time of the vesting determination. In 2006, concurrency vesting for the Park was further approved for 6,893 new external peak hour trips.

TRIP GENERATION

Trip generation was based on projected employees and guests for a typical day (non-event) provided by the managing director for AW Property. The trip generation rates used to calculate daily, AM peak hour, and PM peak hour trips were developed based on the assumption that employees will enter the development during the AM peak hour and exit the development during the PM peak hour and that the majority of patrons will enter and exit the development during the PM peak hour. Information provided by the managing director is attached to this document. As summarized in *Table 1*, the proposed site is expected to generate 120 net new daily trips, 23 net new external AM peak hour trips (23 in, 0 out), and 48 net new external PM peak hour trips (19 in, 29 out).

TABLE 1 TRIP GENERATION PALM BEACH PARK OF COMMERCE SURF RANCH								
Land Use	Intensity	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
<u>Proposed Development</u>								
Surf Ranch	10 employees	20	10	10	0	10	0	10
Surf Ranch	50 guests	100	13	13	0	38	19	19
	<i>Subtotal</i>	120	23	23	0	48	19	29
	<i>Driveway Volumes</i>	120	23	23	0	48	19	29
	<i>Net New External Trips</i>	120	23	23	0	48	19	29
Trip generation was calculated using the following data: Daily Trip Generation Surf Ranch (per employee) = 2 trips/employee Surf Ranch (per guest) = 2 trips/guest AM Peak Hour Trip Generation Surf Ranch (per employee) = T = 1 trip/employee (100% in, 0% out) Surf Ranch (per guest) = T = 0.25 trips/guest (100% in, 0% out) PM Peak Hour Trip Generation Surf Ranch (per employee) = T = 1 trip/employee (0% in, 100% out) Surf Ranch (per guest) = T = 0.75 trips/guest (50% in, 50% out)								

k:\wpb_tpto\1403\140346000 - palm beach park of commerce\surf ranch\2017-04-17 surf ranch 2.xlsx]tgen 1 to 1
4/19/2017 17:49

2016 MONITORING STUDY

A Traffic Monitoring Study was prepared and submitted to Palm Beach County in 2016 which evaluated the current traffic conditions on roadways adjacent to the Florida Research Park. The study concluded that significant unused capacity exists on Beeline Highway and Pratt Whitney Road. Furthermore, traffic signalization at any of the Park’s existing entrances to Beeline Highway and Pratt Whitney Road is not currently warranted.

ANALYSIS OF BEELINE HIGHWAY & PRATT WHITNEY ROAD

A detailed analysis of this existing intersection was conducted using *HCS+* software. The intersection analysis prepared for the annual monitoring study was updated to include the impacts of this project. Existing turning movement counts were collected on March 8, 2017 during the AM and PM peak hours of 7:00 AM-9:00 AM and 4:00 PM-6:00 PM. The turning movement counts are attached to this document. Existing signal timing information provided by the Palm Beach County Traffic Division was utilized in this analysis and is attached.

Data from the Palm Beach County Traffic Division for this intersection was unavailable; therefore, a nominal 1% growth rate and a buildout year of 2021 was used for the analysis. As shown in the attached *HCS+* worksheets and *Table 2*, the signalized intersection is expected to operate at Level of Service (LOS) D or better during the AM and PM peak hours with existing timing.

Queuing is not expected to occur in the northbound right and southbound right directions due to the existing free flow conditions for those movements. As shown in the attached *Table 3*, average queue spacing was calculated for each movement based on the percentage of project traffic, Project Beach Ball traffic, and non-project traffic expected for that movement. Half of the Project Beach Ball traffic was assumed to require 75 feet of queue space to serve delivery trucks at the intersection due to the truck-related nature of that development. All project traffic and non-project traffic was assumed to require the typical 25 feet of queue space; the Surf Ranch use is not expected to generate significant truck and trailer traffic. As shown in the attached Back-of-Queue worksheets, queues are expected to be contained within the existing storage lanes during the AM peak hour. Queues are expected to exceed the existing storage length during the PM peak hour. The existing storage length is 320 feet; the proposed storage length is 490 feet.

TABLE 2 LEVEL OF SERVICE ANALYSIS PALM BEACH PARK OF COMMERCE SURF RANCH			
Peak Hour	Approach	Beeline Highway & Pratt Whitney Road	
		Delay	LOS
AM Peak Hour	NB	44.7	D
	SB	48.4	D
	EB	42.5	D
	WB	43.2	D
	Total	43.9	D
PM Peak Hour	NB	48.1	D
	SB	54.1	D
	EB	42.0	D
	WB	45.9	D
	Total	44.8	D

TABLE 3 QUEUE SPACING ADJUSTMENT PALM BEACH PARK OF COMMERCE SURF RANCH												
AM Peak Hour												
	Northbound			Southbound			Eastbound			Westbound		
	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT
Total Traffic w/o RTOR	14	2	0	105	133	321	43	251	5	188	576	164
Project Beach Ball Traffic				27		6	22					98
50% at 75' Queue				13		3	11					49
50% at 25' Queue				14		3	11					49
Surf Ranch and Non-Project Traffic	14	2	0	78	133	315	21	251	5	188	576	66
100% at 25' Queue	14	2	0	78	133	315	21	251	5	188	576	66
Total Traffic at 75' of queue spacing	0	0	0	13	0	3	11	0	0	0	0	49
Total Traffic at 25' of queue spacing	14	2	0	92	133	318	32	251	5	188	576	115
Average Queue Spacing (ft)	25	25	0	31	25	25	38	25	25	25	25	40
PM Peak Hour												
	Northbound			Southbound			Eastbound			Westbound		
	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT
Total Traffic w/o RTOR	2	131	148	155	6	45	299	546	6	6	282	130
Project Beach Ball Traffic				79		18	10					44
50% at 75' Queue				39		9	5					22
50% at 25' Queue				40		9	5					22
Surf Ranch and Non-Project Traffic	2	131	148	76	6	27	289	546	6	6	282	86
100% at 25' Queue	2	131	148	76	6	27	289	546	6	6	282	86
Total Traffic at 75' of queue spacing	0	0	0	39	0	9	5	0	0	0	0	22
Total Traffic at 25' of queue spacing	2	131	148	116	6	36	294	546	6	6	282	108
Average Queue Spacing (ft)	25	25	25	37	25	35	26	25	-	25	25	33

SITE CIRCULATION AND TURN LANE REQUIREMENTS

Figure 2 illustrates the project traffic distribution and the future total driveway volumes generated by the project during the AM and PM peak hours.

According to the Palm Beach County “Guide to Parking Lot and Street Access Design Criteria and Standards,” it is necessary to classify project entrances that provide access to the local roadway network as minor, intermediate, or major according to the following criteria:

- Minor – Provides services for a maximum average daily traffic of 500 vehicles.
- Intermediate – Provides services for a maximum average daily traffic from 501 to 2,000 vehicles.
- Major – Provides service for a maximum average daily traffic greater than 2,000 vehicles.

Based on these criteria, the driveway is classified as minor.

The project driveway volumes were compared to the thresholds identified by the Palm Beach County Land Development Division to determine the turn lane requirements of the site's driveway. Section 300 of the Design Standards Manual identifies the threshold for installation of a right-turn lane as 75 or more inbound peak hour right-turning vehicles where street average daily traffic volumes exceed 10,000 vehicles per day and the threshold for a left-turn as 30 or more inbound peak hour left-turning vehicles.

Based on the data collected from the Palm Beach County Traffic Division, Pratt Whitney Road does not exceed 10,000 vehicles per day; therefore, the right-turn lane threshold does not apply to the project driveway. Furthermore, the DRI specifies development thresholds for implementing a right-turn lane, and the threshold has not yet been met. Turn lanes at the project driveway are required to be added when the net external two-way trips for the entire Park reach 2,570 trips. As of the 2016 Monitoring Study, the Park does not yet generate the requisite number of trips to warrant turn lanes at this location; however, to mitigate possible queuing during special events at Surf Ranch, a northbound right-turn lane and a westbound left-turn lane are proposed at the project driveway.

A northbound right-turn lane is proposed to prevent possible queuing during special events at Surf Ranch.

A westbound left-turn lane is not required for the outbound movement at the site's driveway based on the anticipated driveway volumes; however, a left-turn lane is proposed to enhance on-site operations.

The code requirements in Palm Beach County's *Unified Land Development Code* Article 4 Chapter B Section 1.124 limit special event use to three times per year, and as such, no additional special accommodations for Surf Ranch events are needed.

CONCLUSION

Based on the increase in trip generation (23 net new AM peak hour trips and 48 net new PM peak hour trips) associated with the proposed development, adequate capacity exists (as identified in the 2016 traffic monitoring study for the Florida Research Park. Significant land use vesting is available to include the proposed surf ranch.

Please contact me at (561) 840-0874 or adam.kerr@kimley-horn.com should you have any questions.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.


Adam B. Kerr, P.E.
Transportation Engineer

25 May 2017
Florida Registration
Number 64773
Certificate of Authorization
Number 696

Attachments

K:\WPB_TPTO\1403\140346000 - Palm Beach Park of Commerce\Surf Ranch\2017-05-25 Surf Ranch Concurrency .docx



PRATT WHITNEY ROAD

CORPORATE ROAD NORTH

PARK OF COMMERCE BOULEVARD

BEE LINE HIGHWAY

LEGEND



PROJECT SITE



FIGURE 1
SITE LOCATION
SURF RANCH

Kraemer, Addie

From: Kerr, Adam
Sent: Tuesday, January 17, 2017 9:22 AM
To: Kraemer, Addie
Subject: FW: Surf ranch

-----Original Message-----

From: Brian K. Waxman [mailto:BWaxman@awproperty.com]
Sent: Wednesday, January 11, 2017 4:15 PM
To: Kerr, Adam <Adam.Kerr@kimley-horn.com>
Cc: jbrinkman@udkstudios.com
Subject: RE: Surf ranch

A typical day's use may be 10 employees and 20 - 50 guests. 20 when the members are using and 50 when the surf schools are using.

We spoke to UDKS today about possibly adding industrial buildings on the west side of the site. I'll let Joni advise if she thinks that should be included in your traffic analysis now or later.

Thanks.

Brian K. Waxman, Managing Director
11780 US Highway One, Suite 305 ☐ North Palm Beach, Florida 33408
Office: (561) 687-5800 ☐ Facsimile: (561) 689-1255 bwaxman@awproperty.com ☐ awproperty.com

-----Original Message-----

From: Adam.Kerr@kimley-horn.com [mailto:Adam.Kerr@kimley-horn.com]
Sent: Wednesday, January 11, 2017 8:09 AM
To: Brian K. Waxman
Cc: jbrinkman@udkstudios.com
Subject: RE: Surf ranch

Brian-

As we alluded to at the meeting the other day, we'll develop traffic projections based on projected visitors/employees, etc. for a typical day (non-event). Do you have any information that you could provide? Thanks!

Adam B. Kerr, P.E. (FL, AL)
Kimley-Horn | 1920 Wekiva Way, Suite 200, West Palm Beach, FL 33411
Direct: 561 840 0874 | Main: 561 845 0665 Connect with us: Twitter | LinkedIn | Facebook | YouTube

Proud to be one of FORTUNE magazine's 100 Best Companies to Work For

BEELINE HIGHWAY & PRATT WHITNEY ROAD
 WEST PALM BEACH, FLORIDA
 COUNTED BY: RICH MENDEZ
 NOT SIGNALIZED

TRAFFIC SURVEY SPECIALISTS, INC.
 85 SE 4TH AVENUE, UNIT 109
 DELRAY BEACH, FLORIDA
 PHONE (561)272-3255

Site Code : 00170045
 Start Date: 03/08/17
 File I.D. : BEE_PRAT
 Page : 1

ALL VEHICLES

Date	PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				Total
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	
03/08/17																	
07:00	0	13	16	74	1	22	122	13	0	0	0	0	0	9	77	1	348
07:15	0	18	30	64	0	34	137	9	0	2	1	0	0	5	81	0	381
07:30	0	20	29	68	0	49	158	15	0	2	1	0	0	3	65	2	412
07:45	0	16	30	91	0	55	128	13	0	6	0	0	0	5	44	1	389
Hr Total	0	67	105	297	1	160	545	50	0	10	2	0	0	22	267	4	1530
08:00	0	21	39	80	1	42	131	15	0	3	0	0	0	4	51	2	389
08:15	0	24	24	61	0	39	95	15	0	1	3	1	0	6	70	3	342
08:30	0	14	18	41	0	36	104	14	0	2	1	1	0	1	71	2	305
08:45	0	14	15	38	0	23	104	11	0	2	1	4	1	1	50	2	266
Hr Total	0	73	96	220	1	140	434	55	0	8	5	6	1	12	242	9	1302
* BREAK *																	
16:00	0	14	1	4	0	4	72	21	0	1	17	28	0	72	115	1	350
16:15	0	9	1	1	0	0	74	17	0	0	25	33	0	67	143	2	372
16:30	0	22	1	10	0	0	74	19	0	0	26	29	0	73	132	1	387
16:45	0	12	2	9	0	4	58	16	0	2	30	40	0	63	120	2	358
Hr Total	0	57	5	24	0	8	278	73	0	3	98	130	0	275	510	6	1467
17:00	0	16	2	2	0	2	65	21	0	0	45	40	0	72	130	1	396
17:15	0	20	1	1	0	0	61	15	0	7	32	28	0	65	127	1	358
17:30	0	10	1	4	0	1	76	20	0	0	24	36	0	55	117	1	345
17:45	0	16	2	2	0	0	63	17	0	1	20	30	0	36	110	0	297
Hr Total	0	62	6	9	0	3	265	73	0	8	121	134	0	228	484	3	1396
TOTAL	0	259	212	550	2	311	1522	251	0	29	226	270	1	537	1503	22	5695

BEELINE HIGHWAY & PRATT WHITNEY ROAD
 WEST PALM BEACH, FLORIDA
 COUNTED BY: RICH MENDEZ
 NOT SIGNALIZED

TRAFFIC SURVEY SPECIALISTS, INC.
 85 SE 4TH AVENUE, UNIT 109
 DELRAY BEACH, FLORIDA
 PHONE (561)272-3255

Site Code : 00170045
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 File I.D. : BEE_PRAT
 Page : 2

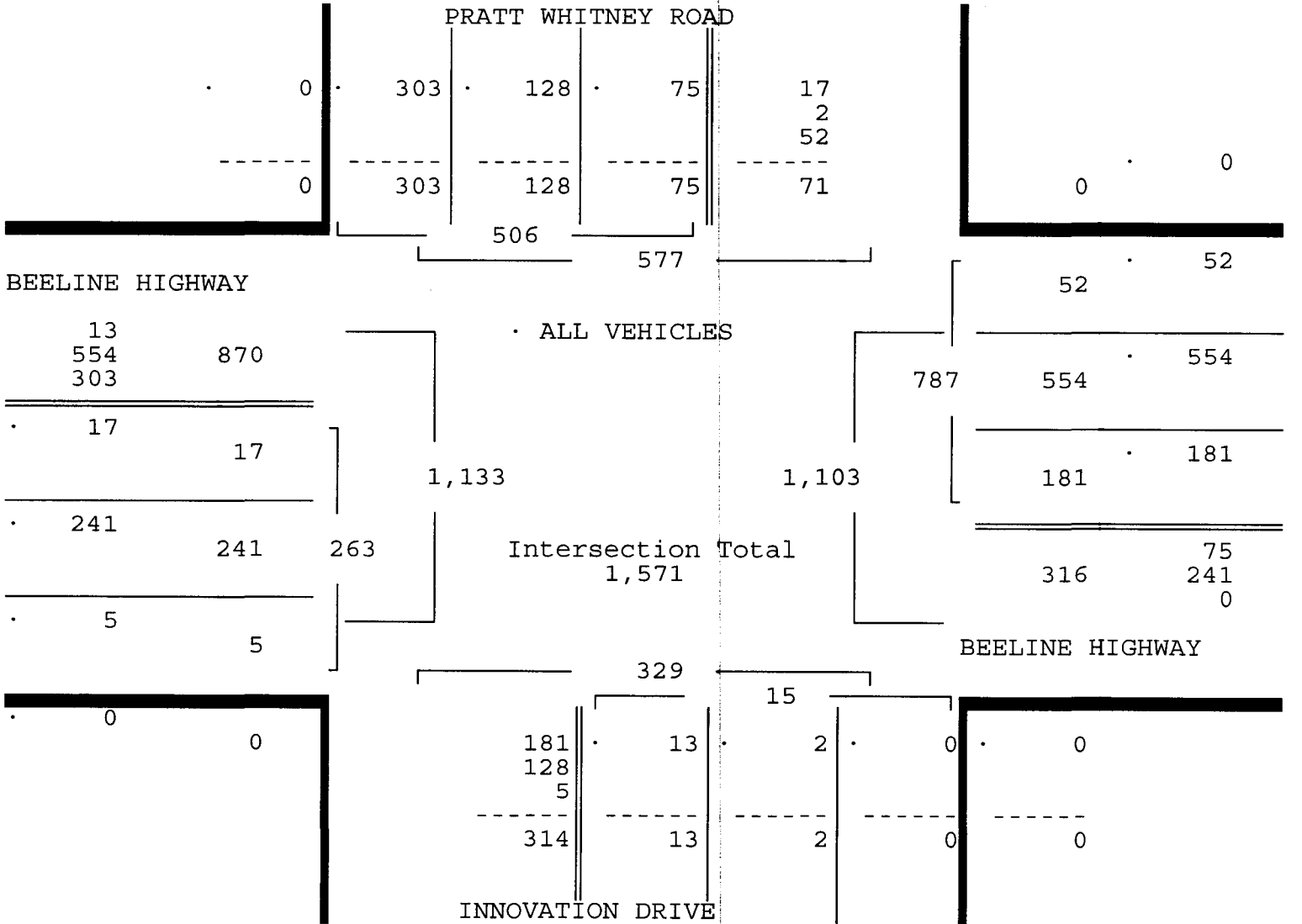
ALL VEHICLES

PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				Total
UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	

Date 03/08/17

Peak Hour Analysis By Entire Intersection for the Period: 07:00 to 09:00 on 03/08/17

Peak start 07:15				07:15				07:15				07:15				Total
Volume	0	75	128	303	1	180	554	52	0	13	2	0	0	17	241	
Percent	0%	15%	25%	60%	0%	23%	70%	7%	0%	87%	13%	0%	0%	6%	92%	2%
Pk total	506			787				15				263				
Highest	08:00			07:30				07:45				07:15				
Volume	0	21	39	80	0	49	158	15	0	6	0	0	0	5	81	0
Hi total	140			222				6				86				
PHF	.90			.89				.62				.76				



BEELINE HIGHWAY & PRATT WHITNEY ROAD
 WEST PALM BEACH, FLORIDA
 COUNTED BY: RICH MENDEZ
 NOT SIGNALIZED

TRAFFIC SURVEY SPECIALISTS, INC.
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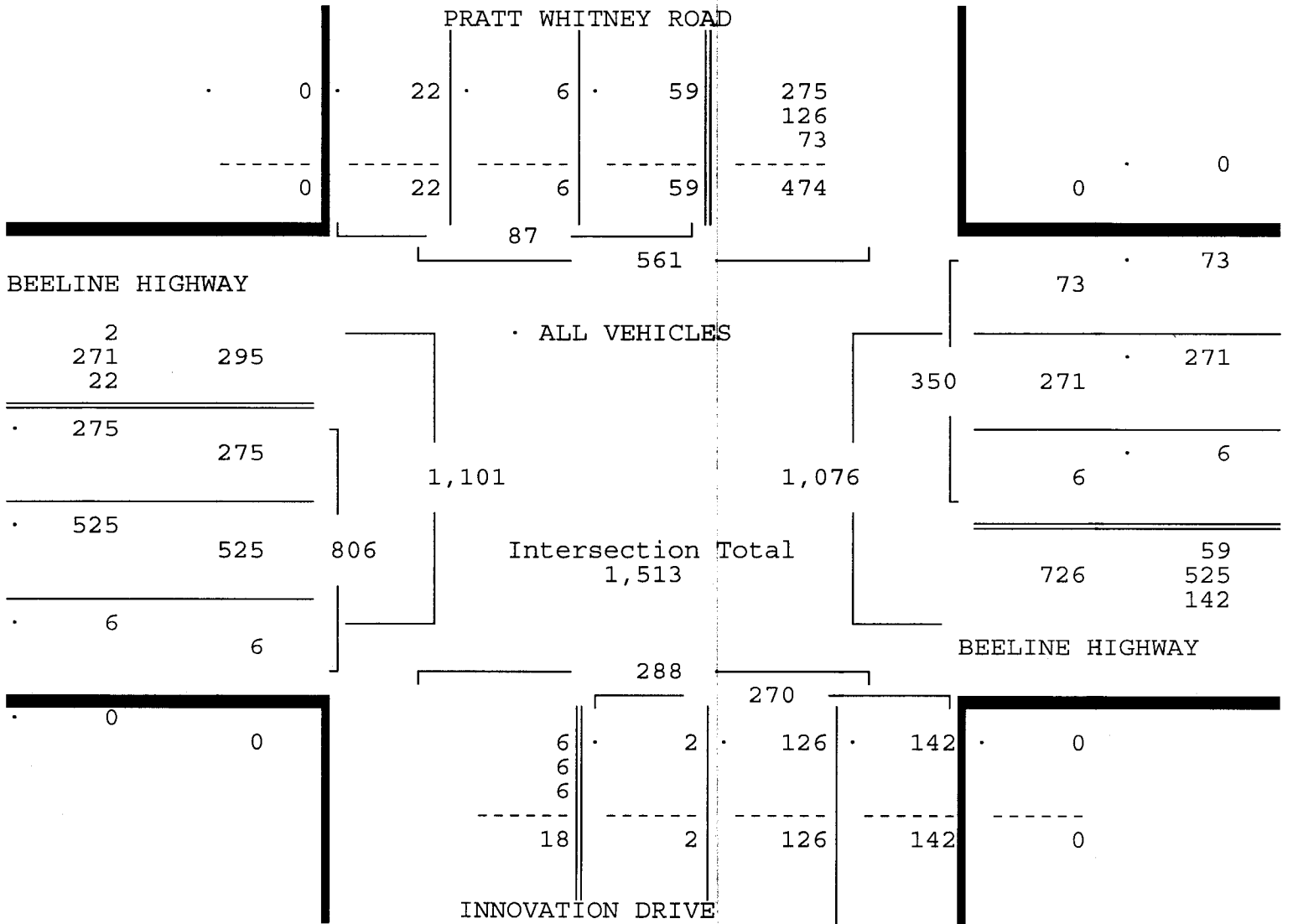
ALL VEHICLES

PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				Total
UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	

Date 03/08/17

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 03/08/17

Peak start 16:15				16:15				16:15				16:15				Total
Volume	0	59	6	22	0	6	271	73	0	2	126	142	0	275	525	
Percent	0%	68%	7%	25%	0%	2%	77%	21%	0%	1%	47%	53%	0%	34%	65%	1%
Pk total	87			350			270			806						
Highest	16:30			16:30			17:00			16:15						
Volume	0	22	1	10	0	0	74	19	0	0	45	40	0	67	143	2
Hi total	33			93			85			212						
PHF	.66			.94			.79			.95						



BEELINE HIGHWAY & PRATT WHITNEY ROAD
 WEST PALM BEACH, FLORIDA
 COUNTED BY: RICH MENDEZ
 NOT SIGNALIZED

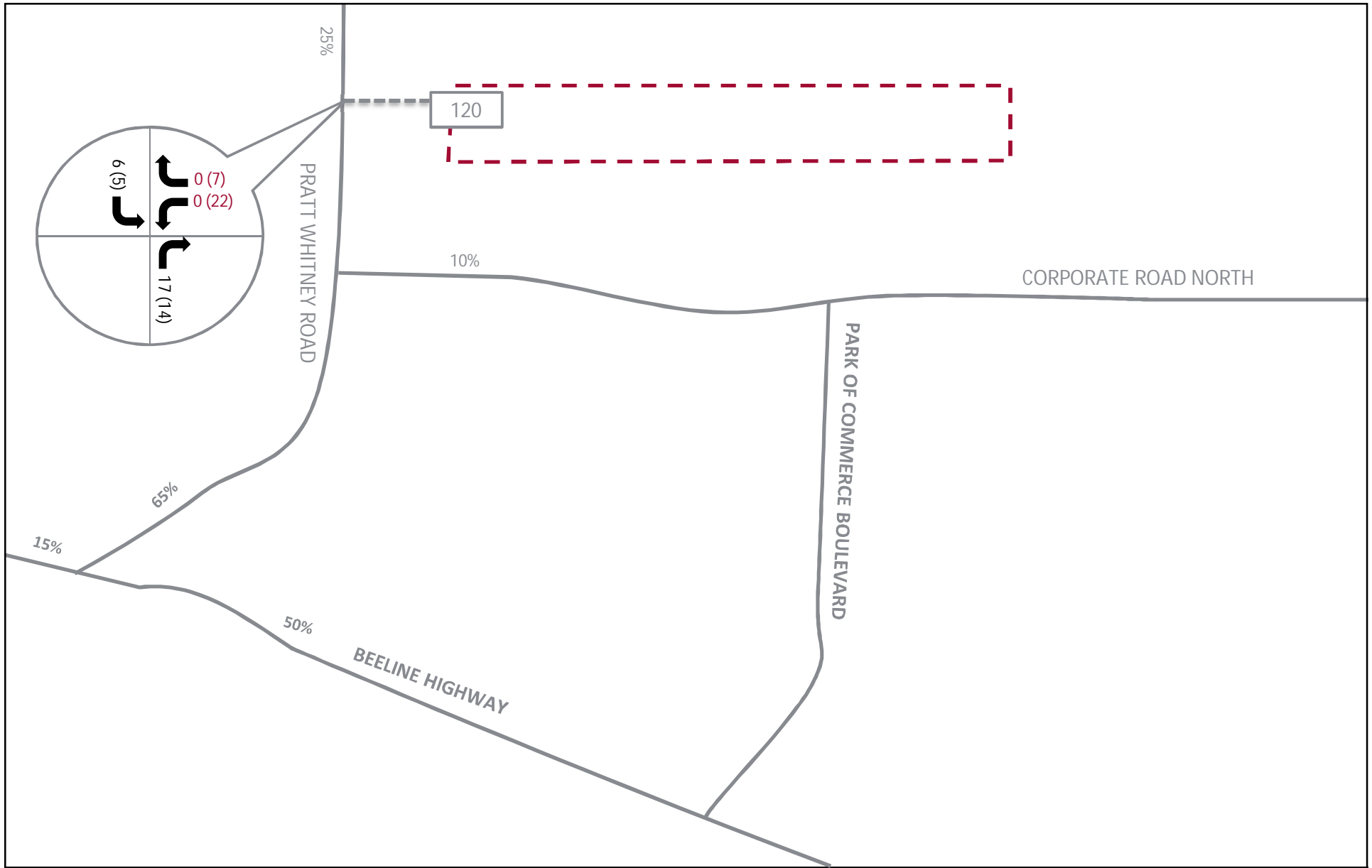
TRAFFIC SURVEY SPECIALISTS, INC.

85 SE 4TH AVENUE, UNIT 109
 DELRAY BEACH, FLORIDA
 PHONE (561)272-3255

Site Code : 00170045
 Start Date: 03/08/17
 File I.D. : BEE_PRAT
 Page : 1

PEDESTRIANS & BIKES

Date	PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				Total
	Left	BIKES	Right	Peds	Left	BIKES	Right	Peds	Left	BIKES	Right	Peds	Left	BIKES	Right	Peds	
03/08/17																	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Hr Total	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
* BREAK *																	
TOTAL	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2



LEGEND



PROJECT SITE

XX%

PROJECT TRAFFIC DISTRIBUTION



DAILY TRIPS

- XX INBOUND AM PEAK HOUR TRIPS
- (XX) INBOUND PM PEAK HOUR TRIPS
- XX OUTBOUND AM PEAK HOUR TRIPS
- (XX) OUTBOUND PM PEAK HOUR TRIPS

FIGURE 2
DRIVEWAY VOLUMES
SURF RANCH



CRITICAL SUM INTERSECTION ANALYSIS SHEET
SURF RANCH
PRATT WHITNEY ROAD & BEELINE HIGHWAY
Existing Geometry

Growth Rate = 1.00%
Peak Season = 1 1
Buildout Year = 2021 2021
Years = 4 4

<u>AM Peak Hour</u>												
	Northbound			Southbound			Eastbound			Westbound		
	LT	Thru	RT*	LT	Thru	RT*	LT	Thru	RT	LT	Thru	RT
Existing Volume on 03/08/2017	13	2	0	75	128	303	17	241	5	181	554	52
Peak Season Volume	13	2	0	75	128	303	17	241	5	181	554	52
Traffic Volume Growth	1	0	0	3	5	12	1	10	0	7	22	2
Committed Development	0	0	0	0	0	0	0	0	0	0	0	0
1% Traffic Volume Growth	1	0	0	3	5	12	1	10	0	7	22	2
Committed + 1% Growth	1	0	0	3	5	12	1	10	0	7	22	2
Max (Committed + 1% or Historic Growth)	1	0	0	3	5	12	1	10	0	7	22	2
Background Traffic Volumes	14	2	0	78	133	315	18	251	5	188	576	54
Project Beach Ball Traffic				27		6	22					98
Project Traffic												
Inbound Traffic Assignment							15.0%					50.0%
Inbound Traffic Volumes							3					12
Outbound Traffic Assignment				50.0%		15.0%						
Outbound Traffic Volumes				0		0						
Project Traffic							3					12
Total Traffic w/o RTOR	14	2	0	105	133	321	43	251	5	188	576	164
TOTAL TRAFFIC	14	2	0	105	133	321	43	251	5	188	576	164
<u>PM Peak Hour</u>												
	Northbound			Southbound			Eastbound			Westbound		
	LT	Thru	RT*	LT	Thru	RT*	LT	Thru	RT	LT	Thru	RT
Existing Volume on 03/08/2017	2	126	142	59	6	22	275	525	6	6	271	73
Peak Season Volume	2	126	142	59	6	22	275	525	6	6	271	73
Traffic Volume Growth	0	5	6	2	0	1	11	21	0	0	11	3
Committed Development	0	0	0	0	0	0	0	0	0	0	0	0
1% Traffic Volume Growth	0	5	6	2	0	1	11	21	0	0	11	3
Committed + 1% Growth	0	5	6	2	0	1	11	21	0	0	11	3
Max (Committed + 1% or Historic Growth)	0	5	6	2	0	1	11	21	0	0	11	3
Background Traffic Volumes	2	131	148	61	6	23	286	546	6	6	282	76
Project Beach Ball Traffic				79		18	10					44
Project Traffic												
Inbound Traffic Assignment							15.0%					50.0%
Inbound Traffic Volumes							3					10
Outbound Traffic Assignment				50.0%		15.0%						
Outbound Traffic Volumes				15		4						
Project Traffic				15		4	3					10
Total Traffic w/o RTOR	2	131	148	155	6	45	299	546	6	6	282	130
RTOR Reduction												
TOTAL TRAFFIC	2	131	148	155	6	45	299	546	6	6	282	130

*Channelized right-turn movement; therefore, volumes in HCS+ have been reduced to 0 due to the free-flow movement.

CONTROLLER TIME SHEET

DATE TIMING INSTALLED: _____

INTERSECTION:	BEELINE HWY & PRATT WHITNEY RD (SOUTH ENTRANCE)	CONTROLLER TYPE	NAZTEC
SIGNAL #	7020	SYSTEM #	258

PHASE NUMBER	APPROACH	MIN GREEN	GAP EXT	MAX 1	MAX 2	YEL CLR	RED CLR	WALK	PED CLR	MIN RCL	MAX RCL	PED RCL	LOCK CALLS	NA1 RIW	DETECTOR SETTINGS
	INTERVAL														
1	WALT	5.0	3.0	45.0		5.5	2.0			0			0		L1:NORMAL
2	EA	20.0	4.0	40.0		5.5	2.5			1			1		L2:NORMAL
3															
4	SA	6.0	4.0	40.0		5.5	2.0			0			0		L4:NORMAL
5	EALT	5.0	3.0	55.0		5.5	2.0			0			0		L5:NORMAL
6	WA	20.0	4.0	40.0		5.5	2.5			1			1		L6:NORMAL
7															
8	NA	6.0	4.0	40.0		5.5	2.0			0			0		L8:NORMAL

PRE-EMPTION TIMING							SPECIAL FUNCTIONS					
	GREEN BEFORE	TRACK CLR	TRACK CLR YEL	MIN DWELL	YEL AFTER	RED AFTER		START Φ	DUAL ENTRY	DET SWITCH	OUT OF FLASH	INTO FLASH
								2-6	2,4,6,8	1,5	2-6	4-8
COMMENTS	*UPDATED CLEARANCES							TIMING DESIGNED BY: K. LANE-PALMER			DATE:	12/16/2016
								APPROVED BY: G. JEEDIGUNTA, P.E. P.T.O.E. <i>GJ</i>			DATE:	12/16/16

SHORT REPORT												
General Information						Site Information						
Analyst <i>KHA</i> Agency or Co. <i>KHA</i> Date Performed <i>04/19/2017</i> Time Period <i>AM Peak Hour</i>						Intersection <i>Beeline Hwy & Pratt Whitney Rd</i> Area Type <i>All other areas</i> Jurisdiction <i>PBC</i> Analysis Year <i>2021</i>						
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Lane Group	L	TR		L	T	R	L	T	R	L	T	R
Volume (vph)	43	251	5	188	576	164	14	2	0	105	133	0
% Heavy Vehicles	7	7	7	7	7	7	7	7	7	7	7	7
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
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	4.0	4.0		2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3		3	3	3	3	3	3	3	3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	60	0	0	3	0	0	60
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	Excl. Left	WB Only	EW Perm	04	NS Perm	06	07	08				
Timing	G = 45.0	G = 10.0	G = 40.0	G =	G = 40.0	G =	G =	G =				
	Y = 7.5	Y =	Y = 8	Y =	Y = 7.5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 158.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	45	269		198	606	109	15	2	0	111	140	0
Lane Group Capacity	548	896		918	899	401	282	450	382	340	450	382
v/c Ratio	0.08	0.30		0.22	0.67	0.27	0.05	0.00	0.00	0.33	0.31	0.00
Green Ratio	0.54	0.27		0.70	0.27	0.27	0.25	0.25	0.25	0.25	0.25	0.25
Uniform Delay d ₁	18.8	46.3		8.5	51.9	45.9	44.7	44.1	44.1	48.0	47.8	44.1
Delay Factor k	0.11	0.11		0.11	0.25	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Incremental Delay d ₂	0.1	0.2		0.1	2.0	0.4	0.1	0.0	0.0	0.6	0.4	0.0
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control Delay	18.9	46.5		8.6	53.9	46.3	44.7	44.1	44.1	48.6	48.2	44.1
Lane Group LOS	B	D		A	D	D	D	D	D	D	D	D
Approach Delay	42.5			43.2			44.7			48.4		
Approach LOS	D			D			D			D		
Intersection Delay	43.9			Intersection LOS						D		

BACK-OF-QUEUE WORKSHEET												
General Information												
Project Description <i>AM Peak Hour Existing Timing</i>												
Average Back of Queue												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	<i>L</i>	<i>TR</i>		<i>L</i>	<i>T</i>	<i>R</i>	<i>L</i>	<i>T</i>	<i>R</i>	<i>L</i>	<i>T</i>	<i>R</i>
Initial Queue/Lane	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flow Rate/Lane Group	45	269		198	606	109	15	2	0	111	140	0
Satflow/Lane	1018	1771		1313	1775	1509	1113	1776	1509	1343	1776	1509
Capacity/Lane Group	548	896		918	899	401	282	450	382	340	450	382
Flow Ratio	0.0	0.1		0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.0
v/c Ratio	0.08	0.30		0.22	0.67	0.27	0.05	0.00	0.00	0.33	0.31	0.00
I Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Arrival Type	3	3		3	3	3	3	3	3	3	3	3
Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1	0.9	4.9		2.9	12.5	3.8	0.5	0.1	0.0	4.0	5.0	0.0
k _B	0.7	0.6		0.9	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5
Q2	0.1	0.3		0.2	1.2	0.2	0.0	0.0	0.0	0.2	0.3	0.0
Q Average	1.0	5.2		3.1	13.7	4.0	0.5	0.1	0.0	4.2	5.2	0.0
Percentile Back of Queue (95th percentile)												
f _B %	2.1	1.9		2.0	1.8	2.0	2.1	2.1	2.1	2.0	1.9	2.1
Back of Queue	2.1	10.1		6.2	24.4	7.9	1.1	0.1	0.0	8.3	10.2	0.0
Queue Storage Ratio												
Queue Spacing	38.0	25.0		25.0	25.0	40.0	25.0	25.0	0.0	31.0	25.0	25.0
Queue Storage	700	0		1375	0	0	0	0	0	320	0	0
Average Queue Storage Ratio	0.1			0.1						0.4		
95% Queue Storage Ratio	0.1			0.1						0.8		

SHORT REPORT												
General Information						Site Information						
Analyst	KHA					Intersection	Beeline Hwy & Pratt Whitney Rd					
Agency or Co.	KHA					Area Type	All other areas					
Date Performed	04/19/2017					Jurisdiction	PBC					
Time Period	PM Peak Hour Existing Timing					Analysis Year	2021					
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Lane Group	L	TR		L	T	R	L	T	R	L	T	R
Volume (vph)	299	546	6	6	282	130	2	131	0	155	6	0
% Heavy Vehicles	7	7	7	7	7	7	7	7	7	7	7	7
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
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green	4.0	4.0		2.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival Type	3	3		3	3	3	3	3	3	3	3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	60	0	0	60	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0	0	0	0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	
Phasing	Excl. Left	WB Only	EW Perm	04	NS Perm	06	07	08				
Timing	G = 45.0	G = 10.0	G = 40.0	G =	G = 40.0	G =	G =	G =				
	Y = 7.5	Y = 0	Y = 8	Y =	Y = 7.5	Y =	Y =	Y =				
Duration of Analysis (hrs) = 0.25						Cycle Length C = 158.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate	315	581		6	297	74	2	138	0	163	6	0
Lane Group Capacity	675	897		785	899	401	339	450	382	283	450	382
v/c Ratio	0.47	0.65		0.01	0.33	0.18	0.01	0.31	0.00	0.58	0.01	0.00
Green Ratio	0.54	0.27		0.70	0.27	0.27	0.25	0.25	0.25	0.25	0.25	0.25
Uniform Delay d ₁	21.0	51.4		9.0	46.7	44.8	44.1	47.8	44.1	51.6	44.2	44.1
Delay Factor k	0.11	0.23		0.11	0.11	0.11	0.11	0.11	0.11	0.17	0.11	0.11
Incremental Delay d ₂	0.5	1.6		0.0	0.2	0.2	0.0	0.4	0.0	2.9	0.0	0.0
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Control Delay	21.5	53.1		9.0	46.9	45.0	44.1	48.2	44.1	54.5	44.2	44.1
Lane Group LOS	C	D		A	D	D	D	D	D	D	D	D
Approach Delay	42.0			45.9			48.1			54.1		
Approach LOS	D			D			D			D		
Intersection Delay	44.8			Intersection LOS						D		

BACK-OF-QUEUE WORKSHEET												
General Information												
Project Description <i>PM Peak Hour Existing Timing</i>												
Average Back of Queue												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	<i>L</i>	<i>TR</i>		<i>L</i>	<i>T</i>	<i>R</i>	<i>L</i>	<i>T</i>	<i>R</i>	<i>L</i>	<i>T</i>	<i>R</i>
Initial Queue/Lane	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Flow Rate/Lane Group	315	581		6	297	74	2	138	0	163	6	0
Satflow/Lane	1255	1773		1124	1775	1509	1339	1776	1509	1119	1776	1509
Capacity/Lane Group	675	897		785	899	401	339	450	382	283	450	382
Flow Ratio	0.3	0.2		0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0
v/c Ratio	0.47	0.65		0.01	0.33	0.18	0.01	0.31	0.00	0.58	0.01	0.00
I Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Arrival Type	3	3		3	3	3	3	3	3	3	3	3
Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q1	7.3	11.9		0.1	5.5	2.5	0.1	4.9	0.0	6.3	0.2	0.0
k _B	0.8	0.6		0.8	0.6	0.6	0.5	0.6	0.5	0.5	0.6	0.5
Q2	0.7	1.1		0.0	0.3	0.1	0.0	0.3	0.0	0.6	0.0	0.0
Q Average	7.9	12.9		0.1	5.8	2.6	0.1	5.2	0.0	6.8	0.2	0.0
Percentile Back of Queue (95th percentile)												
f _B %	1.9	1.8		2.1	1.9	2.0	2.1	2.0	2.1	1.9	2.1	2.1
Back of Queue	15.0	23.2		0.2	11.2	5.3	0.1	10.1	0.0	13.1	0.4	0.0
Queue Storage Ratio												
Queue Spacing	26.0	25.0		25.0	25.0	33.0	25.0	25.0	25.0	37.0	25.0	35.0
Queue Storage	700	0		1375	0	0	0	0	0	320	0	0
Average Queue Storage Ratio	0.3			0.0						0.8		
95% Queue Storage Ratio	0.6			0.0						1.5		