Kimley»Horn

January 23, 2017
Revised March 15, 2017
Revised April 20, 2017
Revised May 25, 2017
Revised June 21, 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
Proposed Development								
Surf Ranch	10 employees	20	10	10	0	10	0	10
Surf Ranch	50 guests	100	13	13	0	38	19	19
Subtotal		*120*	*23*	*23*	*0*	*48*	*19*	*29*
Driveway Volumes		*120*	*23*	*23*	*0*	*48*	*19*	*29*
Net New External Trips		*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. It should be noted that the intersection of Beeline Highway & Pratt Whitney Road is an isolated signal and does not run on a time of day plan.

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 and the addition of Surf Ranch traffic and Project Beach Ball traffic.

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 approximately 500 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	44.6	D
	SB	48.2	D
	EB	42.3	D
	WB	42.6	D
	Total	43.5	D
PM Peak Hour	NB	47.9	D
	SB	53.4	D
	EB	41.4	D
	WB	45.7	D
	Total	44.3	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	38	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.

SPECIAL EVENT 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 more than three events will occur on site each year.

To manage the traffic generated at these events, the applicant will be utilizing on-site parking for special events, however spectators who cannot be accommodated on site will be arriving via bus/shuttle from off-site, remote parking areas in the vicinity. As regulated in Article 4.B.11.C.6., special events are permitted in all Pods of a PIPD via a DRO approval. The applicant is estimating no more than approximately 5,000 attendees on any given day of a permitted special event. At this time, specific parking arrangements have not been secured by the Applicant.

As permitted in Art 6.A.1.D.3.a., Temporary Parking, the Zoning Director may consider a Special Permit for off-site parking associated with the temporary use of a special event. The parking may be located greater than 600 feet from the event provided the attendees are transported to the site. Per that section, the applicant will be required to enter into a written agreement with the owners of the off-site location acceptable to the zoning division. The ULDC provides for appropriate safeguards and limitations to assure the public is protected in this regard, and the applicant is willing to accept a condition to provide deputies for traffic/crowd control at the code limited number of special events. These deputies would likely be stationed at the entrances to the Park of Commerce and could control the signal Beeline Highway & Pratt Whitney Road.

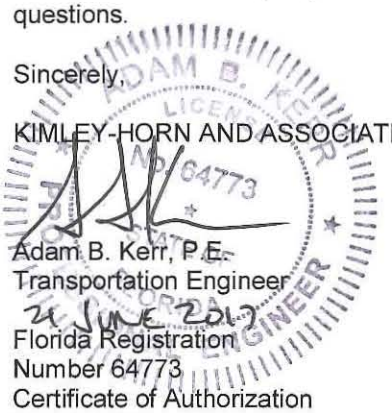
CONCLUSION

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 and special events are expected to be sufficiently accommodated.

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
21 June 2017
Florida Registration
Number 64773
Certificate of Authorization
Number 696

Attachments

K:\WPB_TPTO\1403\140346001 - Surf Ranch\Surf Ranch\2017-06-21 Surf Ranch Concurrency .docx

NORTH

LEGEND

PROJECT SITE

FIGURE 1
SITE LOCATION
SURF RANCH

Kimley»Horn

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

TRAFFIC SURVEY SPECIALISTS, INC.

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

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

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

TRAFFIC SURVEY SPECIALISTS, INC.

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WEST PALM BEACH, FLORIDA
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Site Code : 00170045
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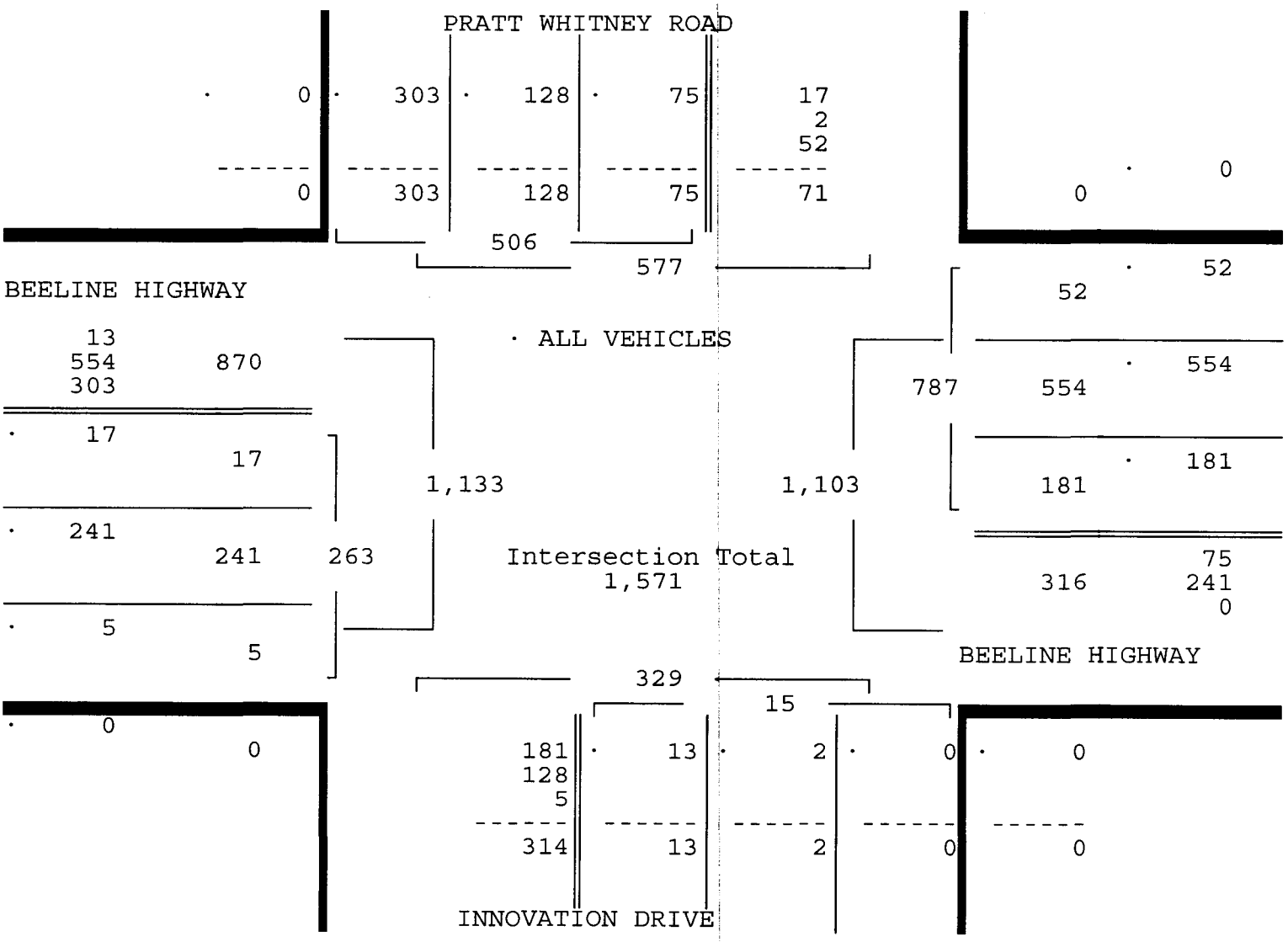
Page : 2

ALL VEHICLES

	PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
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				
Volume	0	75	128	303	1	180	554	52	0	13	2	0	0	17	241	5	
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				



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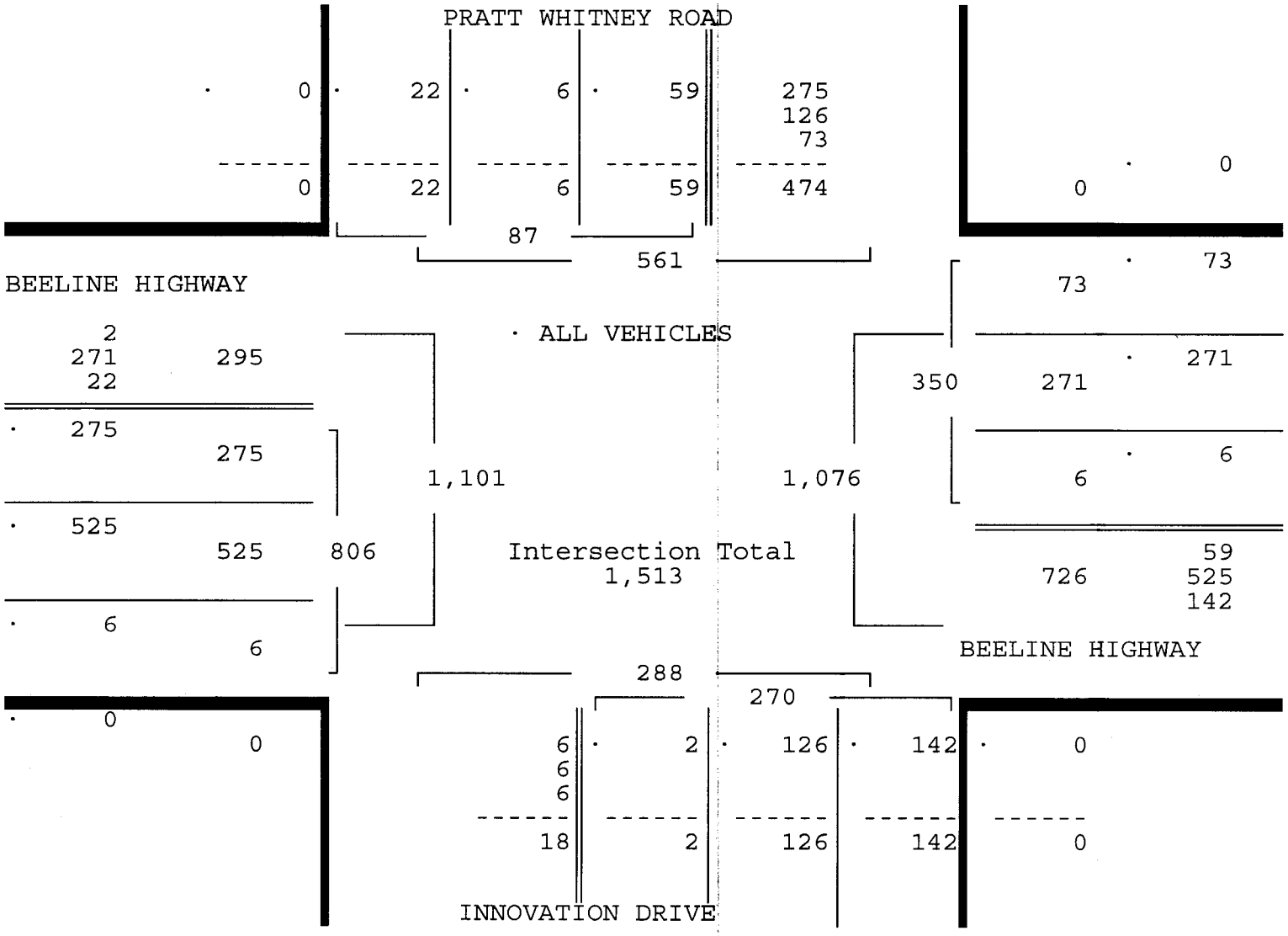
Page : 3

ALL VEHICLES

	PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				
	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Total
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				
Volume	0	59	6	22	0	6	271	73	0	2	126	142	0	275	525	6	
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				



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PEDESTRIANS & BIKES

	PRATT WHITNEY ROAD From North				BEELINE HIGHWAY From East				INNOVATION DRIVE From South				BEELINE HIGHWAY From West				
	Left	BIKES	Right	Peds	Left	BIKES	Right	Peds	Left	BIKES	Right	Peds	Left	BIKES	Right	Peds	Total
Date 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

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

Peak Season =	1	1
Existing Year =	2017	2017

AM Peak Hour

	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
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	13	2	0	102	128	309	42	241	5	181	554	162
TOTAL TRAFFIC	13	2	0	102	128	309	42	241	5	181	554	162

PM Peak Hour

	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
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	126	142	153	6	44	288	525	6	6	271	127
TOTAL TRAFFIC	2	126	142	153	6	44	288	525	6	6	271	127

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

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	*06/19/2017*	Jurisdiction	*PBC*
Time Period	*AM Peak Hour Existing Timing*	Analysis Year	*2017*

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)	*42*	*241*	*5*	*181*	*554*	*162*	*13*	*2*	*0*	*102*	*128*	*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		
Adjusted Flow Rate	*44*	*259*		*191*	*583*	*107*	*14*	*2*	*0*	*107*	*135*	*0*
Lane Group Capacity	*556*	*896*		*923*	*899*	*401*	*286*	*450*	*382*	*340*	*450*	*382*
v/c Ratio	*0.08*	*0.29*		*0.21*	*0.65*	*0.27*	*0.05*	*0.00*	*0.00*	*0.31*	*0.30*	*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	*18.6*	*46.1*		*8.4*	*51.5*	*45.8*	*44.6*	*44.1*	*44.1*	*47.9*	*47.7*	*44.1*
Delay Factor k	*0.11*	*0.11*		*0.11*	*0.23*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*
Incremental Delay d_2	*0.1*	*0.2*		*0.1*	*1.7*	*0.4*	*0.1*	*0.0*	*0.0*	*0.5*	*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	*18.7*	*46.3*		*8.5*	*53.1*	*46.2*	*44.7*	*44.1*	*44.1*	*48.4*	*48.1*	*44.1*
Lane Group LOS	*B*	*D*		*A*	*D*	*D*	*D*	*D*	*D*	*D*	*D*	*D*
Approach Delay	*42.3*			*42.6*			*44.6*			*48.2*		
Approach LOS	*D*			*D*			*D*			*D*		
Intersection Delay	*43.5*			Intersection LOS			*D*					

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *AM Peak Hour Existing Timing*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*TR*		*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
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	*44*	*259*		*191*	*583*	*107*	*14*	*2*	*0*	*107*	*135*	*0*
Satflow/Lane	*1033*	*1770*		*1320*	*1775*	*1509*	*1129*	*1776*	*1509*	*1343*	*1776*	*1509*
Capacity/Lane Group	*556*	*896*		*923*	*899*	*401*	*286*	*450*	*382*	*340*	*450*	*382*
Flow Ratio	*0.0*	*0.1*		*0.1*	*0.2*	*0.1*	*0.0*	*0.0*	*0.0*	*0.1*	0.1	*0.0*
v/c Ratio	*0.08*	*0.29*		*0.21*	*0.65*	*0.27*	*0.05*	*0.00*	*0.00*	*0.31*	*0.30*	*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*
Q_1	*0.9*	*4.7*		*2.7*	*11.9*	*3.7*	*0.5*	*0.1*	*0.0*	*3.8*	*4.8*	*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*
Q_2	*0.1*	*0.2*		*0.2*	*1.1*	*0.2*	*0.0*	*0.0*	*0.0*	*0.2*	*0.3*	*0.0*
Q Average	*1.0*	*5.0*		*3.0*	*13.0*	*3.9*	*0.5*	*0.1*	*0.0*	*4.0*	*5.0*	*0.0*

Percentile Back of Queue (95th percentile)

$f_{B\%}$	*2.1*	*2.0*		*2.0*	*1.8*	*2.0*	*2.1*	*2.1*	*2.1*	*2.0*	*2.0*	*2.1*
Back of Queue	*2.0*	*9.8*		*6.0*	*23.3*	*7.8*	*1.0*	*0.1*	*0.0*	*8.0*	*9.9*	*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*		

 HCS+™ Version 5.4 Generated: 6/19/2017 10:12 AM

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	*06/19/2017*	Jurisdiction	*PBC*
Time Period	*PM Peak Hour Existing Timing*	Analysis Year	*2017*

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)	*288*	*525*	*6*	*6*	*271*	*127*	*2*	*126*	*0*	*153*	*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		
Adjusted Flow Rate	*303*	*559*		*6*	*285*	*71*	*2*	*133*	*0*	*161*	*6*	*0*
Lane Group Capacity	*681*	*897*		*793*	*899*	*401*	*339*	*450*	*382*	*288*	*450*	*382*
v/c Ratio	*0.44*	*0.62*		*0.01*	*0.32*	*0.18*	*0.01*	*0.30*	*0.00*	*0.56*	*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	*20.7*	*51.0*		*8.8*	*46.5*	*44.7*	*44.1*	*47.6*	*44.1*	*51.3*	*44.2*	*44.1*
Delay Factor k	*0.11*	*0.21*		*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.11*	*0.16*	*0.11*	*0.11*
Incremental Delay d_2	*0.5*	*1.4*		*0.0*	*0.2*	*0.2*	*0.0*	*0.4*	*0.0*	*2.4*	*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	*21.2*	*52.4*		*8.8*	*46.7*	*44.9*	*44.1*	*48.0*	*44.1*	*53.8*	*44.2*	*44.1*
Lane Group LOS	*C*	*D*		*A*	*D*	*D*	*D*	*D*	*D*	*D*	*D*	*D*
Approach Delay	*41.4*			*45.7*			*47.9*			*53.4*		
Approach LOS	*D*			*D*			*D*			*D*		
Intersection Delay	*44.3*			Intersection LOS						*D*		

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *PM Peak Hour Existing Timing*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*TR*		*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*	*R*
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	*303*	*559*		*6*	*285*	*71*	*2*	*133*	*0*	*161*	*6*	*0*
Satflow/Lane	*1266*	*1772*		*1135*	*1775*	*1509*	*1339*	*1776*	*1509*	*1136*	*1776*	*1509*
Capacity/Lane Group	*681*	*897*		*793*	*899*	*401*	*339*	*450*	*382*	*288*	*450*	*382*
Flow Ratio	*0.2*	*0.2*		*0.0*	*0.1*	*0.0*	*0.0*	*0.1*	*0.0*	*0.1*	0.0	*0.0*
v/c Ratio	*0.44*	*0.62*		*0.01*	*0.32*	*0.18*	*0.01*	*0.30*	*0.00*	*0.56*	*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*
Q_1	*6.9*	*11.3*		*0.1*	*5.2*	*2.4*	*0.1*	*4.7*	*0.0*	*6.1*	*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*
Q_2	*0.6*	*1.0*		*0.0*	*0.3*	*0.1*	*0.0*	*0.2*	*0.0*	*0.6*	*0.0*	*0.0*
Q Average	*7.6*	*12.3*		*0.1*	*5.5*	*2.5*	*0.1*	*5.0*	*0.0*	*6.7*	*0.2*	*0.0*

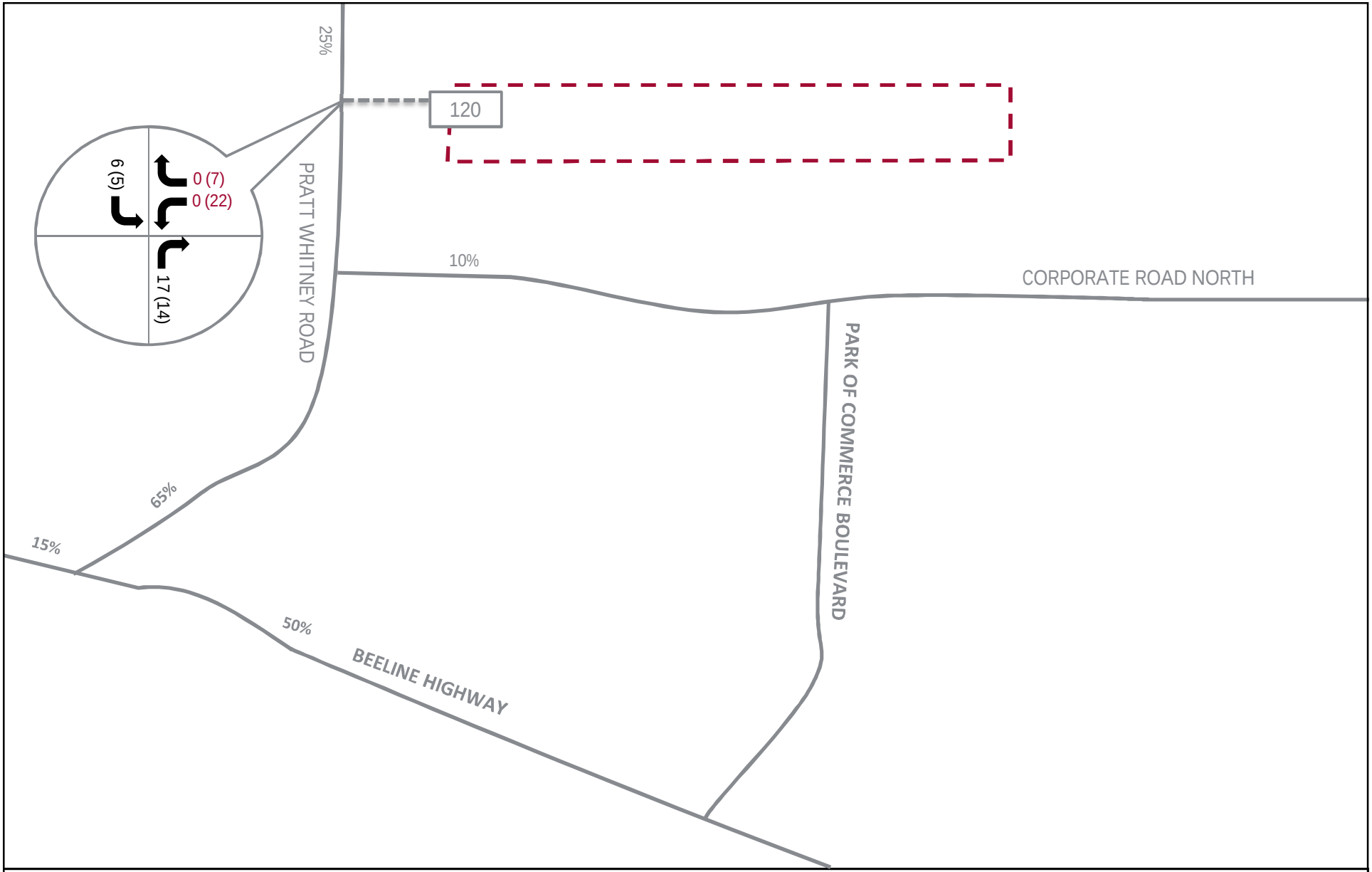
Percentile Back of Queue (95th percentile)

$f_{B\%}$	*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	*14.3*	*22.1*		*0.2*	*10.7*	*5.1*	*0.1*	*9.7*	*0.0*	*12.8*	*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*	*38.0*	*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	*0.5*			*0.0*						*1.5*		

 HCS+™ Version 5.4 Generated: 6/19/2017 10:13 AM



NORTH

LEGEND

PROJECT SITE

XX% PROJECT TRAFFIC DISTRIBUTION

XX 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

Kimley»Horn

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							
	GREEN BEFORE	TRACK CLR	TRACK CLR YEL	MIN DWELL	YEL AFTER	RED AFTER	

SPECIAL FUNCTIONS						
	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.	DATE:	12/16/16