

October 22, 2020

Mr. Phil Bidwell
President, Old Palm Grove HOA
c/o Haag Management & Realty
2295 Corporate Boulevard NW, Suite 138
Boca Raton, Florida 33431

Re: Old Palm Grove / Eastview Avenue Queuing Analysis - #PTC20-088

Dear Mr. Bidwell:

The purpose of this letter is to provide a queuing analysis for the proposed entrance gate at the above referenced residential project. The site is located at the east end of Eastview Avenue at the intersection with Old Palm Lane in the City of Delray Beach, as shown on Attachment 1. The Old Palm Grove residential community is completely built. It is proposed to install a gate at the north entrance on Estuary Way for residents and visitors, and a second gate on Eastview Avenue for residents only. The City has requested that a queuing study be conducted for the Eastview Avenue entrance.

Counts were taken on Eastview Avenue just west of Old Palm Lane from October 15-17, 2020. The count data is attached to this statement. The highest eastbound hourly count occurred on Friday, October 16th beginning at 4:48 PM. Because this count was not taken during peak season, a FDOT peak season factor of 1.16 was applied, resulting in 20 vehicles arriving in one hour, or about one vehicle every three minutes. Studies have been undertaken by the Institute of Transportation Engineers (ITE) relating to queuing. A recent 2017 study conducted by RK Engineering Group observed residential gates at several locations. Visitor and resident traffic splits were determined as well as the service rate for different types of gates. This information was applied to the proposed site to determine the projected queues at the entrance gate. It should be noted that the existing counts may include both residents and visitors, as there is no barrier today. To provide a conservative analysis, all of the critical PM peak hour inbound trips were utilized in the queuing analysis for the resident-only ingress lane.

Attachment 2 provides the queuing analysis for this site. As shown on this attachment, the maximum queue projected for the ingress lane is one vehicle (the vehicle being serviced). With the proposed gate's vehicle detection system, minimal delay will occur when the vehicle approaches the gate. Therefore, the queues are projected to be negligible.

Please contact me at rmulcahy@pindertroutman.com if you have any questions.

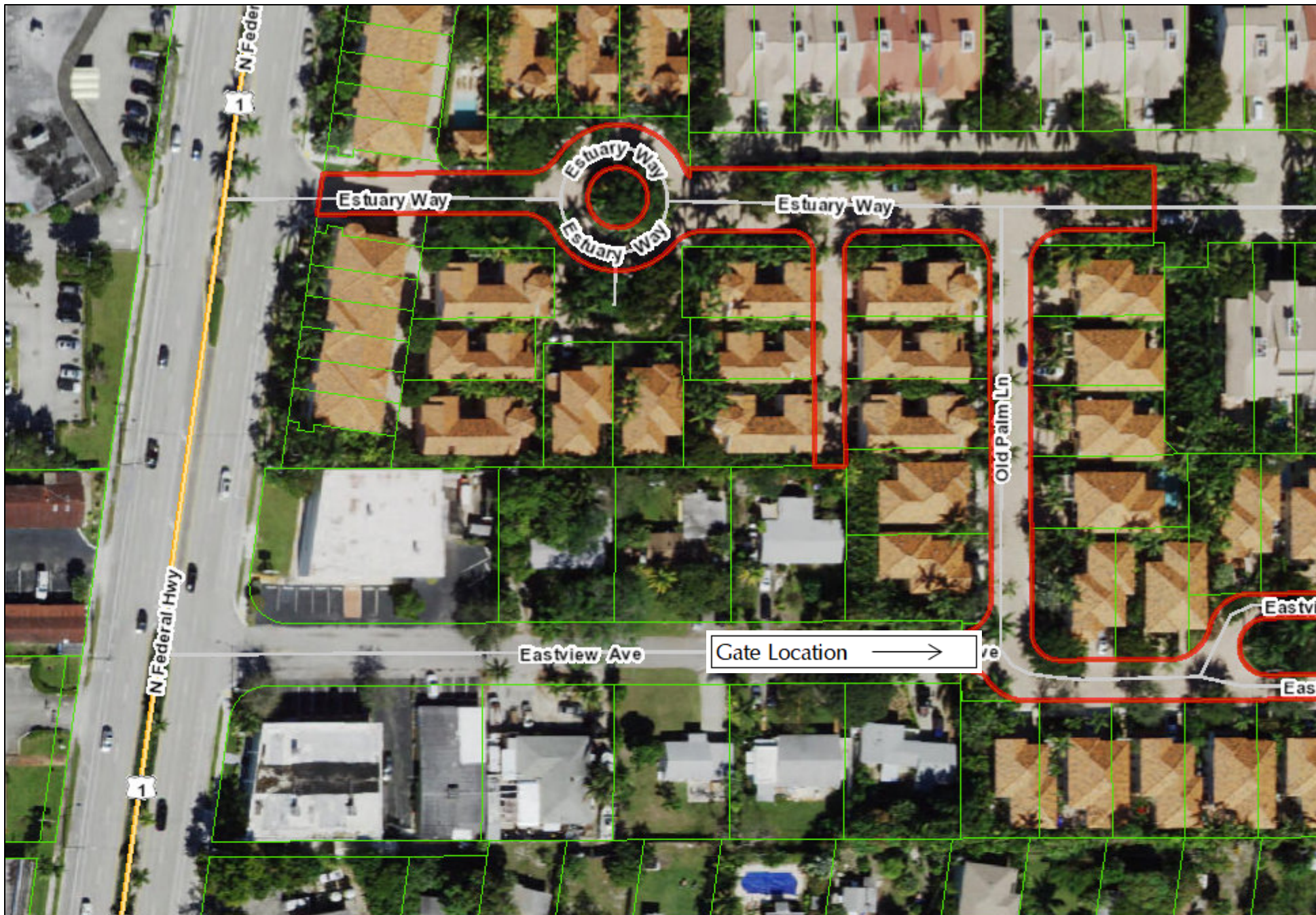
Sincerely,

Rebecca J. Mulcahy, P.E.
Vice President

Attachments

Rebecca J. Mulcahy, State of Florida, Professional Engineer, License No. 42570

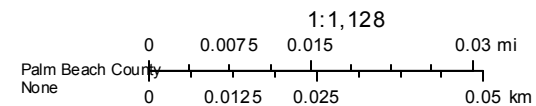
This item has been electronically signed and sealed by Rebecca J. Mulcahy, P.E. on 10/22/20 using a Digital Signature. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.



Created by: Palm Beach County

October 21, 2020

Attachment 1 Project Location



Attachment 2
Old Palm Grove / Eastview Avenue
Entrance Gate Queuing Analysis

QUEUING ANALYSIS	
	Residents
Highest PM Peak Hour Eastbound Count	17 vph
Demand Rate (q) = Count x PSF	20 vph
Service Rate (Q) per lane	210 vph ¹
Number of Storage Lanes (N)	1 Lane
Probability that Maximum Queue will not be Exceeded (P)	0.05 (95%)
Utilization Factor $(q/N*Q) = p$	0.10
Qm Value	0.10
Number of Vehicles Being Served (N)	1 Vehicles
Number of Vehicles in Queue (M) ² (calculated)	-0.70 Vehicles
Number of Vehicles in Queue (M) ² (actual)	0 Vehicles
Total Number of Vehicles in Queue (N+M)	1 Vehicles

¹ Source: RK Engineering Group, Residential Electronic Gate Service Rate Study, June 2017.

² $M = \{[\ln(P)-\ln(Qm)]/\ln(p)\} - 1.0$. Source: ITE Transportation and Land Development.

Daily Vehicle Volume Report

Study Date: Thursday, 10/15/2020

Unit ID:

Location: Eastview Avenue West of Old Palm Lane

Comments: Delray Beach, Florida

	Eastbound Volume	Westbound Volume	Total Volume
00:00 - 00:14	0	0	0
00:15 - 00:29	0	0	0
00:30 - 00:44	0	0	0
00:45 - 00:59	0	0	0
01:00 - 01:14	0	0	0
01:15 - 01:29	0	1	1
01:30 - 01:44	2	0	2
01:45 - 01:59	0	0	0
02:00 - 02:14	0	0	0
02:15 - 02:29	0	0	0
02:30 - 02:44	0	0	0
02:45 - 02:59	0	0	0
03:00 - 03:14	0	0	0
03:15 - 03:29	0	0	0
03:30 - 03:44	0	0	0
03:45 - 03:59	0	0	0
04:00 - 04:14	0	0	0
04:15 - 04:29	0	0	0
04:30 - 04:44	0	0	0
04:45 - 04:59	0	0	0
05:00 - 05:14	0	0	0
05:15 - 05:29	0	0	0
05:30 - 05:44	0	0	0
05:45 - 05:59	0	0	0
06:00 - 06:14	0	0	0
06:15 - 06:29	0	0	0
06:30 - 06:44	0	0	0
06:45 - 06:59	1	2	3
07:00 - 07:14	0	0	0
07:15 - 07:29	1	0	1
07:30 - 07:44	1	3	4
07:45 - 07:59	0	0	0
08:00 - 08:14	2	4	6
08:15 - 08:29	2	3	5
08:30 - 08:44	0	2	2
08:45 - 08:59	4	2	6
09:00 - 09:14	2	0	2
09:15 - 09:29	2	0	2
09:30 - 09:44	2	1	3
09:45 - 09:59	2	3	5
10:00 - 10:14	1	3	4
10:15 - 10:29	0	1	1
10:30 - 10:44	1	3	4
10:45 - 10:59	3	1	4
11:00 - 11:14	3	2	5
11:15 - 11:29	0	2	2
11:30 - 11:44	1	1	2
11:45 - 11:59	1	1	2
12:00 - 12:14	3	1	4
12:15 - 12:29	4	1	5
12:30 - 12:44	2	1	3
12:45 - 12:59	2	0	2

Daily Vehicle Volume Report

Study Date: Thursday, 10/15/2020

Unit ID:

Location: Eastview Avenue West of Old Palm Lane

Comments: Delray Beach, Florida

	Eastbound Volume	Westbound Volume	Total Volume
13:00 - 13:14	0	0	0
13:15 - 13:29	0	0	0
13:30 - 13:44	3	2	5
13:45 - 13:59	2	1	3
14:00 - 14:14	1	2	3
14:15 - 14:29	3	1	4
14:30 - 14:44	4	0	4
14:45 - 14:59	4	1	5
15:00 - 15:14	3	2	5
15:15 - 15:29	3	1	4
15:30 - 15:44	2	1	3
15:45 - 15:59	1	0	1
16:00 - 16:14	0	1	1
16:15 - 16:29	3	0	3
16:30 - 16:44	5	1	6
16:45 - 16:59	3	1	4
17:00 - 17:14	3	1	4
17:15 - 17:29	1	0	1
17:30 - 17:44	3	0	3
17:45 - 17:59	2	1	3
18:00 - 18:14	1	0	1
18:15 - 18:29	3	3	6
18:30 - 18:44	1	1	2
18:45 - 18:59	2	1	3
19:00 - 19:14	1	0	1
19:15 - 19:29	0	2	2
19:30 - 19:44	1	0	1
19:45 - 19:59	1	0	1
20:00 - 20:14	4	0	4
20:15 - 20:29	0	1	1
20:30 - 20:44	1	0	1
20:45 - 20:59	0	0	0
21:00 - 21:14	0	0	0
21:15 - 21:29	1	1	2
21:30 - 21:44	1	0	1
21:45 - 21:59	0	0	0
22:00 - 22:14	1	0	1
22:15 - 22:29	0	0	0
22:30 - 22:44	0	0	0
22:45 - 22:59	0	0	0
23:00 - 23:14	0	0	0
23:15 - 23:29	1	1	2
23:30 - 23:44	0	0	0
23:45 - 23:59	0	0	0
Totals	107	64	171
AM Peak Time	08:21 - 09:20	07:32 - 08:31	08:00 - 08:59
AM Peak Volume	10	11	19
PM Peak Time	14:10 - 15:09	13:18 - 14:17	14:10 - 15:09
PM Peak Volume	15	6	20

Daily Vehicle Volume Report

Study Date: Friday, 10/16/2020

Unit ID:

Location: Eastview Avenue West of Old Palm Lane

Comments: Delray Beach, Florida

	Eastbound Volume	Westbound Volume	Total Volume
00:00 - 00:14	0	0	0
00:15 - 00:29	0	0	0
00:30 - 00:44	0	0	0
00:45 - 00:59	0	0	0
01:00 - 01:14	0	0	0
01:15 - 01:29	0	0	0
01:30 - 01:44	0	0	0
01:45 - 01:59	0	0	0
02:00 - 02:14	0	0	0
02:15 - 02:29	0	0	0
02:30 - 02:44	0	0	0
02:45 - 02:59	0	1	1
03:00 - 03:14	0	0	0
03:15 - 03:29	0	0	0
03:30 - 03:44	0	0	0
03:45 - 03:59	0	0	0
04:00 - 04:14	0	0	0
04:15 - 04:29	0	0	0
04:30 - 04:44	0	0	0
04:45 - 04:59	0	0	0
05:00 - 05:14	0	0	0
05:15 - 05:29	0	0	0
05:30 - 05:44	0	0	0
05:45 - 05:59	0	0	0
06:00 - 06:14	0	0	0
06:15 - 06:29	0	1	1
06:30 - 06:44	0	1	1
06:45 - 06:59	0	0	0
07:00 - 07:14	0	1	1
07:15 - 07:29	3	0	3
07:30 - 07:44	1	1	2
07:45 - 07:59	0	2	2
08:00 - 08:14	2	2	4
08:15 - 08:29	5	2	7
08:30 - 08:44	3	2	5
08:45 - 08:59	2	1	3
09:00 - 09:14	2	1	3
09:15 - 09:29	3	1	4
09:30 - 09:44	2	1	3
09:45 - 09:59	3	4	7
10:00 - 10:14	0	0	0
10:15 - 10:29	4	4	8
10:30 - 10:44	1	1	2
10:45 - 10:59	2	2	4
11:00 - 11:14	2	0	2
11:15 - 11:29	4	1	5
11:30 - 11:44	3	0	3
11:45 - 11:59	1	0	1
12:00 - 12:14	7	0	7
12:15 - 12:29	1	2	3
12:30 - 12:44	1	1	2
12:45 - 12:59	0	0	0

Daily Vehicle Volume Report

Study Date: Friday, 10/16/2020

Unit ID:

Location: Eastview Avenue West of Old Palm Lane

Comments: Delray Beach, Florida

	Eastbound Volume	Westbound Volume	Total Volume
13:00 - 13:14	2	3	5
13:15 - 13:29	1	0	1
13:30 - 13:44	5	0	5
13:45 - 13:59	2	2	4
14:00 - 14:14	2	4	6
14:15 - 14:29	2	3	5
14:30 - 14:44	4	0	4
14:45 - 14:59	4	3	7
15:00 - 15:14	1	5	6
15:15 - 15:29	2	1	3
15:30 - 15:44	1	3	4
15:45 - 15:59	3	4	7
16:00 - 16:14	5	2	7
16:15 - 16:29	0	1	1
16:30 - 16:44	1	0	1
16:45 - 16:59	5	2	7
17:00 - 17:14	4	0	4
17:15 - 17:29	2	2	4
17:30 - 17:44	3	2	5
17:45 - 17:59	5	2	7
18:00 - 18:14	3	2	5
18:15 - 18:29	2	0	2
18:30 - 18:44	1	2	3
18:45 - 18:59	1	1	2
19:00 - 19:14	1	1	2
19:15 - 19:29	1	0	1
19:30 - 19:44	0	0	0
19:45 - 19:59	1	0	1
20:00 - 20:14	2	2	4
20:15 - 20:29	2	0	2
20:30 - 20:44	0	0	0
20:45 - 20:59	0	0	0
21:00 - 21:14	0	0	0
21:15 - 21:29	1	0	1
21:30 - 21:44	2	2	4
21:45 - 21:59	0	0	0
22:00 - 22:14	0	0	0
22:15 - 22:29	1	0	1
22:30 - 22:44	0	0	0
22:45 - 22:59	0	0	0
23:00 - 23:14	0	0	0
23:15 - 23:29	0	0	0
23:30 - 23:44	0	0	0
23:45 - 23:59	0	0	0
Totals	124	81	205
AM Peak Time	08:05 - 09:04	09:22 - 10:21	08:05 - 09:04
AM Peak Volume	13	10	20
PM Peak Time	16:48 - 17:47	15:03 - 16:02	15:05 - 16:04
PM Peak Volume	17	14	25

Daily Vehicle Volume Report

Study Date: Saturday, 10/17/2020

Unit ID:

Location: Eastview Avenue West of Old Palm Lane

Comments: Delray Beach, Florida

	Eastbound Volume	Westbound Volume	Total Volume
00:00 - 00:14	0	0	0
00:15 - 00:29	0	0	0
00:30 - 00:44	0	0	0
00:45 - 00:59	0	0	0
01:00 - 01:14	0	0	0
01:15 - 01:29	0	0	0
01:30 - 01:44	0	1	1
01:45 - 01:59	0	0	0
02:00 - 02:14	0	0	0
02:15 - 02:29	1	0	1
02:30 - 02:44	0	0	0
02:45 - 02:59	0	0	0
03:00 - 03:14	0	0	0
03:15 - 03:29	0	0	0
03:30 - 03:44	0	0	0
03:45 - 03:59	0	0	0
04:00 - 04:14	0	0	0
04:15 - 04:29	0	0	0
04:30 - 04:44	0	0	0
04:45 - 04:59	0	0	0
05:00 - 05:14	0	0	0
05:15 - 05:29	0	0	0
05:30 - 05:44	0	0	0
05:45 - 05:59	1	1	2
06:00 - 06:14	0	0	0
06:15 - 06:29	0	0	0
06:30 - 06:44	0	0	0
06:45 - 06:59	0	0	0
07:00 - 07:14	1	1	2
07:15 - 07:29	0	1	1
07:30 - 07:44	3	0	3
07:45 - 07:59	0	1	1
08:00 - 08:14	1	0	1
08:15 - 08:29	1	1	2
08:30 - 08:44	0	1	1
08:45 - 08:59	3	1	4
09:00 - 09:14	1	3	4
09:15 - 09:29	2	2	4
09:30 - 09:44	2	0	2
09:45 - 09:59	2	2	4
10:00 - 10:14	2	1	3
10:15 - 10:29	5	4	9
10:30 - 10:44	2	2	4
10:45 - 10:59	2	0	2
11:00 - 11:14	3	2	5
11:15 - 11:29	3	0	3
11:30 - 11:44	0	3	3
11:45 - 11:59	5	3	8
12:00 - 12:14	3	4	7
12:15 - 12:29	4	2	6
12:30 - 12:44	3	1	4
12:45 - 12:59	1	0	1

Daily Vehicle Volume Report

Study Date: Saturday, 10/17/2020

Unit ID:

Location: Eastview Avenue West of Old Palm Lane

Comments: Delray Beach, Florida

	Eastbound Volume	Westbound Volume	Total Volume
13:00 - 13:14	1	0	1
13:15 - 13:29	0	0	0
13:30 - 13:44	0	0	0
13:45 - 13:59	1	1	2
14:00 - 14:14	4	4	8
14:15 - 14:29	1	0	1
14:30 - 14:44	5	2	7
14:45 - 14:59	1	0	1
15:00 - 15:14	1	0	1
15:15 - 15:29	3	1	4
15:30 - 15:44	1	0	1
15:45 - 15:59	3	1	4
16:00 - 16:14	2	0	2
16:15 - 16:29	1	0	1
16:30 - 16:44	0	0	0
16:45 - 16:59	1	0	1
17:00 - 17:14	2	0	2
17:15 - 17:29	1	0	1
17:30 - 17:44	0	1	1
17:45 - 17:59	0	1	1
18:00 - 18:14	1	0	1
18:15 - 18:29	2	1	3
18:30 - 18:44	1	1	2
18:45 - 18:59	2	0	2
19:00 - 19:14	2	0	2
19:15 - 19:29	0	0	0
19:30 - 19:44	1	0	1
19:45 - 19:59	0	0	0
20:00 - 20:14	1	0	1
20:15 - 20:29	1	0	1
20:30 - 20:44	1	1	2
20:45 - 20:59	2	3	5
21:00 - 21:14	0	0	0
21:15 - 21:29	0	0	0
21:30 - 21:44	1	1	2
21:45 - 21:59	1	0	1
22:00 - 22:14	0	0	0
22:15 - 22:29	0	0	0
22:30 - 22:44	1	0	1
22:45 - 22:59	1	0	1
23:00 - 23:14	1	0	1
23:15 - 23:29	1	0	1
23:30 - 23:44	0	0	0
23:45 - 23:59	0	0	0
Totals	99	55	154
AM Peak Time	09:55 - 10:54	09:44 - 10:43	09:55 - 10:54
AM Peak Volume	13	9	21
PM Peak Time	12:02 - 13:01	12:00 - 12:59	12:00 - 12:59
PM Peak Volume	12	7	18

2019 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
 CATEGORY: 9300 EAST- A1A TO US1

				MOCF: 0.90
WEEK	DATES		SF	PSCF
=====				
1	01/01/2019	- 01/05/2019	0.92	1.02
2	01/06/2019	- 01/12/2019	0.93	1.03
* 3	01/13/2019	- 01/19/2019	0.93	1.03
* 4	01/20/2019	- 01/26/2019	0.92	1.02
* 5	01/27/2019	- 02/02/2019	0.91	1.01
* 6	02/03/2019	- 02/09/2019	0.89	0.99
* 7	02/10/2019	- 02/16/2019	0.88	0.98
* 8	02/17/2019	- 02/23/2019	0.88	0.98
* 9	02/24/2019	- 03/02/2019	0.88	0.98
*10	03/03/2019	- 03/09/2019	0.89	0.99
*11	03/10/2019	- 03/16/2019	0.89	0.99
*12	03/17/2019	- 03/23/2019	0.90	1.00
*13	03/24/2019	- 03/30/2019	0.91	1.01
*14	03/31/2019	- 04/06/2019	0.92	1.02
*15	04/07/2019	- 04/13/2019	0.93	1.03
16	04/14/2019	- 04/20/2019	0.94	1.04
17	04/21/2019	- 04/27/2019	0.96	1.07
18	04/28/2019	- 05/04/2019	0.98	1.09
19	05/05/2019	- 05/11/2019	1.01	1.12
20	05/12/2019	- 05/18/2019	1.03	1.14
21	05/19/2019	- 05/25/2019	1.05	1.17
22	05/26/2019	- 06/01/2019	1.07	1.19
23	06/02/2019	- 06/08/2019	1.09	1.21
24	06/09/2019	- 06/15/2019	1.10	1.22
25	06/16/2019	- 06/22/2019	1.11	1.23
26	06/23/2019	- 06/29/2019	1.12	1.24
27	06/30/2019	- 07/06/2019	1.13	1.26
28	07/07/2019	- 07/13/2019	1.14	1.27
29	07/14/2019	- 07/20/2019	1.14	1.27
30	07/21/2019	- 07/27/2019	1.15	1.28
31	07/28/2019	- 08/03/2019	1.15	1.28
32	08/04/2019	- 08/10/2019	1.15	1.28
33	08/11/2019	- 08/17/2019	1.15	1.28
34	08/18/2019	- 08/24/2019	1.15	1.28
35	08/25/2019	- 08/31/2019	1.16	1.29
36	09/01/2019	- 09/07/2019	1.16	1.29
37	09/08/2019	- 09/14/2019	1.17	1.30
38	09/15/2019	- 09/21/2019	1.17	1.30
39	09/22/2019	- 09/28/2019	1.14	1.27
40	09/29/2019	- 10/05/2019	1.11	1.23
41	10/06/2019	- 10/12/2019	1.07	1.19
42	10/13/2019	- 10/19/2019	1.04	1.16
43	10/20/2019	- 10/26/2019	1.02	1.13
44	10/27/2019	- 11/02/2019	1.01	1.12
45	11/03/2019	- 11/09/2019	0.99	1.10
46	11/10/2019	- 11/16/2019	0.98	1.09
47	11/17/2019	- 11/23/2019	0.97	1.08
48	11/24/2019	- 11/30/2019	0.95	1.06
49	12/01/2019	- 12/07/2019	0.94	1.04
50	12/08/2019	- 12/14/2019	0.93	1.03
51	12/15/2019	- 12/21/2019	0.92	1.02
52	12/22/2019	- 12/28/2019	0.93	1.03
53	12/29/2019	- 12/31/2019	0.93	1.03

* PEAK SEASON

14-FEB-2020 15:39:27

830UPD

4_9300_PKSEASON.TXT