

MEMORANDUM

Ref: 1831A

To: Juliet T.H. Walker, AICP
City of Portsmouth

From: Stephen G. Pernaw, P.E., PTOE

Subject: Updated Traffic Study – Proposed Mixed-Use Site
Portsmouth, New Hampshire

Date: June 10, 2019

On April 24, 2019 our office published the report entitled “*Traffic Impact and Site Access Study-Updated / Proposed Mixed-Use Site*” for Torrington Properties, Inc. to assess the traffic impacts associated with the proposed residential/commercial development located on the east side of US1 Bypass at the site of the Frank Jones Center in Portsmouth, New Hampshire. We are now in receipt of peer review comments from The Engineering Corporation (TEC) dated June 3, 2019. The purpose of this memorandum is to respond to their request in Comment #9 (Page 4 of 7).

TEC Comment 1: Cate Street/Bartlett Street – “*TEC requests that additional analyses be performed for the 2018 Existing, 2020 No Build, 2020 Build and 2030 No Build conditions for Configuration C of the Cate Street/Bartlett Street intersection to show the progression of the operation of this intersection.*”

SGP & Company, Inc. Response: The table below and Attachments 1-5.

Alternative Mitigation Evaluation - Bartlett Street/Cate Street Realignment
Alternative Configuration C - Weekday PM Peak Hour
June 10, 2019

		2018 Existing	2020 No-Build	2020 Build	2030 No Build	2030 Build
Overall Intersection Delay (sec)		10.6	26.8	78.3	44.7	108.3
Volume to Capacity Ratio	EBL	0.00	0.00	0.03	0.00	0.03
	SBL	0.79	1.02	1.04	1.15	1.58
	SBR	0.01	0.02	0.09	0.02	0.09
Movement Delay (sec)	EBL	7	8	8	8	8
	SBL	24	64	214	106	291
	SBR	9	9	10	9	10
Level of Service	EBL	A	A	A	A	A
	SBL	C	F	F	F	F
	SBR	A	A	B	A	B
95 th Percentile Queue	EBL	<1	<1	<1	<1	<1
	SBL	8	18	33	25	42
	SBR	<1	<1	<1	<1	<1

cc: Jay Bisognano, Torrington Properties, Inc.
Gregg M. Mikolaities, P.E., August Consulting, PLLC

HCM 2010 TWSC

1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection

Int Delay, s/veh 10.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↖	↖	↖	↖
Traffic Vol, veh/h	2	63	80	513	578	12
Future Vol, veh/h	2	63	80	513	578	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	3	83	96	618	635	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	96	0	0	185	96
Stage 1	-	-	-	96	-
Stage 2	-	-	-	89	-
Critical Hdwy	4.1	-	-	6.41	6.29
Critical Hdwy Stg 1	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	5.41	-
Follow-up Hdwy	2.2	-	-	3.509	3.381
Pot Cap-1 Maneuver	1510	-	-	807	942
Stage 1	-	-	-	930	-
Stage 2	-	-	-	937	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1510	-	-	805	942
Mov Cap-2 Maneuver	-	-	-	805	-
Stage 1	-	-	-	928	-
Stage 2	-	-	-	937	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	23.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1510	-	-	-	805	942
HCM Lane V/C Ratio	0.002	-	-	-	0.789	0.014
HCM Control Delay (s)	7.4	0	-	-	24	8.9
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0	-	-	-	8.1	0

HCM 2010 TWSC

1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection

Int Delay, s/veh 26.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations		↗	↗	↗	↗	↗
Traffic Vol, veh/h	3	86	121	622	673	13
Future Vol, veh/h	3	86	121	622	673	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	4	113	146	749	740	14

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	146	0	267
Stage 1	-	-	146
Stage 2	-	-	121
Critical Hdwy	4.1	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.2	-	3.509
Pot Cap-1 Maneuver	1448	-	~ 724
Stage 1	-	-	884
Stage 2	-	-	907
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1448	-	~ 722
Mov Cap-2 Maneuver	-	-	~ 722
Stage 1	-	-	881
Stage 2	-	-	907

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	62.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1448	-	-	-	722	883
HCM Lane V/C Ratio	0.003	-	-	-	1.024	0.016
HCM Control Delay (s)	7.5	0	-	-	63.7	9.1
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0	-	-	-	17.8	0

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC

1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection

Int Delay, s/veh 78.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↑	↕	↑
Traffic Vol, veh/h	31 ✓	140 ✓	218 ✓	538 ✓	628 ✓	63 ✓
Future Vol, veh/h	31	140	218	538	628	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	184	263	648	690	69

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	263	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1313	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1313	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	195.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1313	-	-	-	494	759
HCM Lane V/C Ratio	0.031	-	-	-	1.397	0.091
HCM Control Delay (s)	7.8	0	-	-	213.7	10.2
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	32.5	0.3

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC

1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection

Int Delay, s/veh 44.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↕	↕	↕
Traffic Vol, veh/h	3 ✓	92 ✓	130 ✓	680 ✓	738 ✓	14 ✓
Future Vol, veh/h	3	92	130	680	738	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	4	121	157	819	811	15

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	157	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1435	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1435	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	104.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1435	-	-	-	704	870
HCM Lane V/C Ratio	0.003	-	-	-	1.152	0.018
HCM Control Delay (s)	7.5	0	-	-	106.1	9.2
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0	-	-	-	25.4	0.1

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 TWSC

1: Cate St. Realigned/Cate Street Realigned & Bartlett Street

Intersection

Int Delay, s/veh 108.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↕	↕	↕
Traffic Vol, veh/h	31	✓146	✓227	✓596	✓693	✓64
Future Vol, veh/h	31	146	227	596	693	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Stop
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	83	83	91	91
Heavy Vehicles, %	0	2	0	2	1	9
Mvmt Flow	41	192	273	718	762	70

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	273	0	0
Stage 1	-	-	273
Stage 2	-	-	274
Critical Hdwy	4.1	-	6.41
Critical Hdwy Stg 1	-	-	5.41
Critical Hdwy Stg 2	-	-	5.41
Follow-up Hdwy	2.2	-	3.509
Pot Cap-1 Maneuver	1302	-	~500
Stage 1	-	-	775
Stage 2	-	-	774
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1302	-	~483
Mov Cap-2 Maneuver	-	-	~483
Stage 1	-	-	~748
Stage 2	-	-	774

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	267.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1302	-	-	-	483	749
HCM Lane V/C Ratio	0.031	-	-	-	1.577	0.094
HCM Control Delay (s)	7.9	0	-	-	291	10.3
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.1	-	-	-	41.7	0.3

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon