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Transportation: Engineering • Planning • Design

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).

<u>TEC Comment 1: Cate Street/Bartlett Street</u> – "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	Α	Α	Α	Α	Α
	SBL	С	F	F	F	F
	SBR	Α	Α	В	Α	В
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

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Intersection				<u>. </u>			· .											
Int Delay, s/veh	10.6	·																
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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	e.# -	0	0		0	<u>-</u>												
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												
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Critical Hdwy Stg 1	77.1	_	_	_	5.41	0.23												
Critical Hdwy Stg 2	_	_	_	_	5.41	_												
Follow-up Hdwy	2.2	_	_	_	3.509	3 381												
Pot Cap-1 Maneuver	1510	_	_	_	807	942												
Stage 1	1010	_	_		930	J72												
Stage 2	_	_	_		937	_												
Platoon blocked, %		_	_		337													
Mov Cap-1 Maneuver	1510	_	_		805	942												
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Stage 1	_		-	_	928	_												
Stage 1 Stage 2	-	-	-	-	937	-												
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Approach	EB	r.3	WB	ger Barri	SB		t 12			,					rys:			
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LICIVI LUO					C													
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Capacity (veh/h)		1510	-	-	-	805	942	*										
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HCM Lane LOS		Α	А	-	-	С	Α											
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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 Control Delay, s	0.3		0		62.7		
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HCM Lane LOS A A F A)			-	-		
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)		-	-	•		
Arrange to the first of the control of the first of the f								
Notes ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon		<u> 1 Mar</u>	<u> </u>		<u> </u>	<u> </u>	- N. 75.	

Intersection							
Int Delay, s/veh	78.3						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		. ની	. 1	7	-4	. 7	/
Traffic Vol, veh/h	31	140					
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		
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	529	263	et en
Stage 1		-	_	_	263		
Stage 2	_	_	_	_	266	_	
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	1313	-	_	-	~ 512	759	
Stage 1	-	-	-	-	783	-	
Stage 2	-	_	_	_	781	-	
Platoon blocked, %		-	-	-			
Mov Cap-1 Maneuver	1313	-	_	-	~ 494	759	
Mov Cap-2 Maneuver	-	-	-	-	~ 494	_	
Stage 1	-	-	-	-	756	-	
Stage 2	-	-	-	-	781	_	
-							
Approach	EB		WB	<u> </u>	SB		
HCM Control Delay, s	1.4		0		195.1		
HCM LOS					F		
Minor Lane/Major Mvm	nt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)		1313	-	_	-	494	759
HCM Lane V/C Ratio		0.031	-	-	-		0.091
HCM Control Delay (s)		7.8	0	-	_	213.7	10.2
HCM Lane LOS		Α	Ā	-	-	F	В
HCM 95th %tile Q(veh)	0.1	-	-	-	32.5	0.3
Notes		in the second			٠		Telegraphy Services (1997)
		φ.Γ.	olav -		000	1.0	A Marian Nat Defined 18 All main and the state of the state of
~: Volume exceeds cap	pacity	⊅: D6	elay exc	eeds 3	UUS	+: Com	putation Not Defined *: All major volume in platoon

Intersection							
Int Delay, s/veh	44.7						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		स्	*	7	*	7	-
Traffic Vol, veh/h	3,	92	130v	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 N	lajor1		Major2		Minor2		
Conflicting Flow All	157	0	-	0	286	157	
Stage 1	_	_	_	_	157	-	
Stage 2	_	_	_	_	129	_	
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	1435		_	_	~ 706	870	
Stage 1	-	_	_	_	874	-	
Stage 2	_	-	_	-	899	_	
Platoon blocked, %		_	_	-			
Mov Cap-1 Maneuver	1435		-		~ 704	870	
Mov Cap-2 Maneuver	-	_	_	-	~ 704		
Stage 1	-	_	-		871	_	
Stage 2	_	_	_	_	899	_	
3.							
Approach	EB		WB		SB	ejej i	u grandar Alexandra (1900-1905), iki gulatige Alexandra (190
HCM Control Delay, s	0.2	<u></u>	0	<u> </u>	104.3	: 	dy transfer transfer a state of the state o
HCM LOS	0.2		J		F		
110141 200					•		
national and a second second second		-	CDT	MOT	WOD	ODL: X	
Minor Lane/Major Mvm	1	EBL	FBI	WBT	WBR	SBLn1	
Capacity (veh/h)		1435	-	-	-	704	870
HCM Lane V/C Ratio		0.003	-	-	-	1.152	
HCM Control Delay (s)		7.5	0	-	-	106.1	9.2
HCM Lane LOS		A	Α	-	-	F	A
HCM 95th %tile Q(veh)		0	-	-	-	25.4	0.1
` '							

Intersection	400.0											" ~	·	
Int Delay, s/veh	108.3													
Movement	EBL	EBT	WBT	WBR	SBL	SBR								
Lane Configurations		ૃલી	p 🛉	_ #	_ ች	7	Co. T.							
Traffic Vol. veh/h	31	1 46 ·	/ 227 ,	∮ 596 √	693	هما 64 معمي	P							
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	e,# -	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	1	Major2		Minor2									
Conflicting Flow All	273	0	-	0	547	273							·	
Stage 1	_	-	_	_	273	_								
Stage 2	_	_	_	_	274	_								
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	1302	-	_	_	~ 500	749								
Stage 1	-	_	_	_	775	-								
Stage 2	_	_	_	_	774	_								
Platoon blocked, %				_	117									
Mov Cap-1 Maneuver	1302	_	_	_	~ 483	749								
Mov Cap-1 Maneuver	1002	_	_	-	~ 483	140								
Stage 1			-	_	~ 748	-								
Stage 2	-	-	-	-	774	-					•			
Olage 2	_	-	_	-	114	-								
Approach	EB		WB		SB	****	٠,.					* * *		
HCM Control Delay, s	1.4	•	0	<u></u>	267.3	' '								
HCM LOS	•••		Ū		- F									
					•									
Minor Lane/Major Mvn	nt	EBL	FBT	WBT	WBR	SBLn1 SI	Bi n2							
Capacity (veh/h)	-	1302				483	749	· · · · · · · · · · · · · · · · · · ·						
HCM Lane V/C Ratio		0.031	_	_	_		0.094							
HCM Control Delay (s)	١	7.9	0	-	-	291	10.3							
HCM Lane LOS	'	7.5 A	A	-	-	291 F	10.3 B							
HCM 95th %tile Q(veh	١	0.1	А	-	-	41.7	0.3							
		0.1	-	. •		₩1. /	0.3							
Notes			<u> </u>		·	<u> </u>			19 1			1 7 3		
~: Volume exceeds ca	pacity	\$: De	elay exc	ceeds 3	00s	+: Compt	utation N	ot Defin	ed	*: All	major volume	in platoon		