

To: Ms. Jennifer Hager, Planning Director Town of Sutton 4 Uxbridge Road Sutton, MA 01590

Project #: 15047.01

From: Vinod Kalikiri, PE, PTOE

Re: Response to RMA Traffic Comments dated June 24, 2022
Unified Buildings 2 and 3 (40 & 42 Unified Parkway)
Providence Road/Boston Road, Sutton, Massachusetts

VHB has prepared this memorandum to summarize the response to the June 24, 2022 traffic peer review comments (2nd Traffic Peer Review) prepared by Ron Müller & Associates (RMA) regarding the above referenced Project. RMA has previously reviewed the March 30, 2022 traffic impact evaluation (traffic study) as well as traffic responses dated June 8, 2022 in response to their 1st Traffic Peer Review.

For ease of reference, this response letter discusses responses only to the pending items from the 2nd Peer Review Letter. Items that were noted as being resolved are not repeated in this response. The paraphrased pending comments follow the numbering of the comments in the 2nd Traffic Peer Review. The new responses are presented in bold font below.

Note: Comments in RMA's 1st and 2nd Traffic Peer Reviews can be generally grouped into two categories of comments.

- I. Comments related to the Traffic study and site access/circulation for Buildings 2 and 3 (Comments 1 through 15, Comment 17, Comment 19 through 23, and Comment 29)
- II. Comments related to the public roadway intersections on Unified Parkway (Comment 16, Comment 18 and Comments 24 through 28)

At the Planning Board hearing on June 27, 2022, the Sutton Planning Board (Planning Board) voted in support of a new concept for the intersection of Boston Road/Unified Parkway that supersedes the improvement plan included with the original site plan submittal. The new concept was developed by the design team, at the direction of the Planning Board, to better balance the need to preserve a large growth tree and a historic stone wall on the north side of Boston Road with the need to provide efficient access to Unified Parkway from Boston Road. The design team has initiated a redesign of the intersection plans based on the feedback from the Planning Board. Since the revised intersection and roadway plans will require a new peer review, it is requested that the RMA comments related to the intersection design plans be deferred to a future date. The Applicant proposes to submit the revised intersection design plans as part of a request to amend the previously approved subdivision roadway and a new application for altering a scenic road.

I. Remaining Comments related to the Traffic study and site access/circulation for Buildings 2 and 3

Comment 4: It appears that the existing condition weekday morning peak hour volumes are unbalanced, traveling

westbound, between Galaxy Pass and Dudley Road. It is recommended that these volumes be

balanced.

Response: The minor balancing discrepancy in the existing condition weekday morning peak hour traffic volume between the two intersections has been resolved. The revised weekday morning peak

hour network is included in the attachment to this memorandum.

101 Walnut St. PO Box 9151 Watertown, MA 02472 P 617.924.1770 Ref: 15076.00 March 31, 2021

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<u>Comment 10:</u> It is recommended that separate site generated networks showing trucks and passenger cars be

presented.

Response: Separate site generated traffic networks for trucks and employee vehicles are included in the

attachment to this memorandum.

Comment 12: Existing condition analyses should be re-run for the weekday morning peak hour condition based on

Comment 4.

Response: The existing condition weekday morning peak hour capacity analysis has been updated. The

revised results are shown in the shaded cells and italicized font in the tables included in the attachment to this memorandum. Results that are not in shaded cells remain the same as in the

response to the 1st Traffic Peer Review.

Comment 19: It should be confirmed that the fire department has adequate accessibility to all sides of the building.

Response: The design team is currently coordinating with the Sutton Fire Department regarding the

adequacy of the Buildings 2 & 3 site layout for their needs. The Applicant will submit the Fire

Department's final feedback when it is received.

<u>Comment 21:</u> Sight line profiles should be developed for the two project driveways on Unified Parkway.

Response: As noted in the response to the 1st Traffic Peer Review, for the design speed of Unified

Parkway, Intersection Sight Distances (ISD) calculated per AASHTO requirements is 335 feet. Sight line profile sketches showing available ISD at the two site driveways are included in the attachment to this memorandum. As shown, available ISD exiting both driveways is 335 feet or

longer.

<u>Comment 22:</u> Sight line profiles be developed for the midblock crosswalk on Unified Parkway.

Response: A sight line profile sketch showing the required Stopping Sight Distances (SSD) of 205 feet at

the midblock crosswalk is included in the attachment to this memorandum.

Comment 23: The town should determine if the number of parking spaces proposed is adequate for the site.

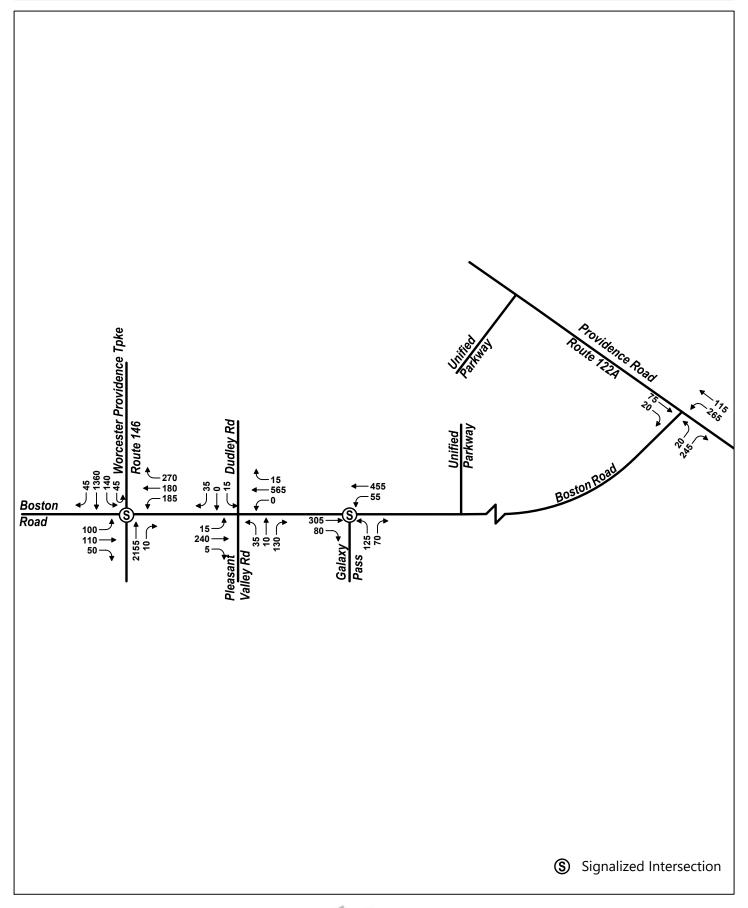
Response: At the Planning Board hearing on June 27, 2022, the Board voted to approve the reduced

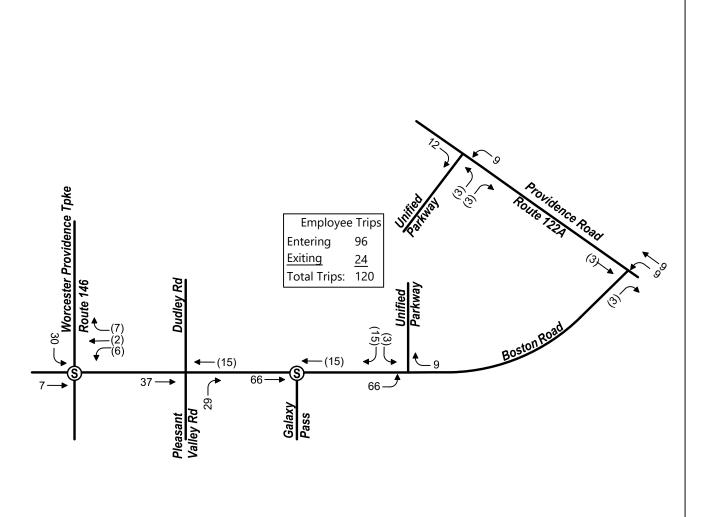
parking proposed for the Project.

In summary, with the exception of the Fire Department feedback regarding Comment 19, which will be provided when available, other pending comments related to the traffic study and site access/ circulation elements for Buildings 2 and 3 have been addressed with this response. If RMA concurs, we respectfully request that they provide written confirmation to this effect.

II. Remaining Comments related to the public roadway intersections on Unified Parkway

As noted earlier in this response memorandum, we request that the RMA comments related to the intersection and roadway plans (Comment 16, Comment 18 and Comments 24 through 28) be deferred to a future date. The Applicant proposes to submit the revised intersection design plans as part of a request to amend the previously approved subdivision roadway and a new application for altering a scenic road. Roadway geometry related comments on public streets would be handled as part of the future review of the revised roadway improvement plans.





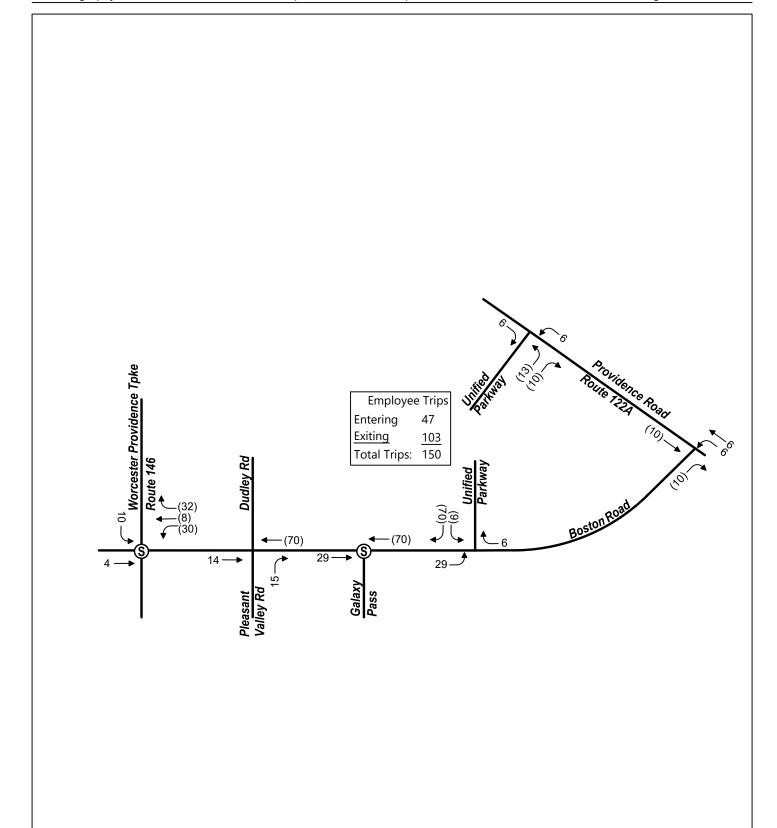
Traffic Volumes Shown on this figure do not include project generated truck trips. (shown on a separate figure)

xx = Entering Trips

(xx) = Exiting Trips

S Signalized Intersection



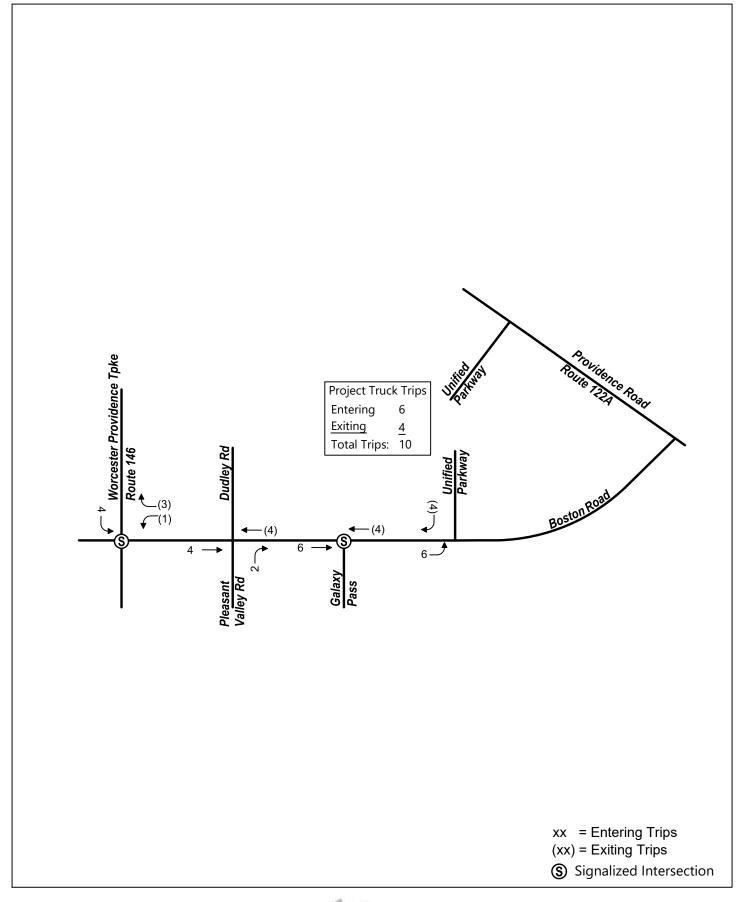


Traffic Volumes Shown on this figure do not include project generated truck trips. (shown on a separate figure)

xx = Entering Trips (xx) = Exiting Trips

S Signalized Intersection







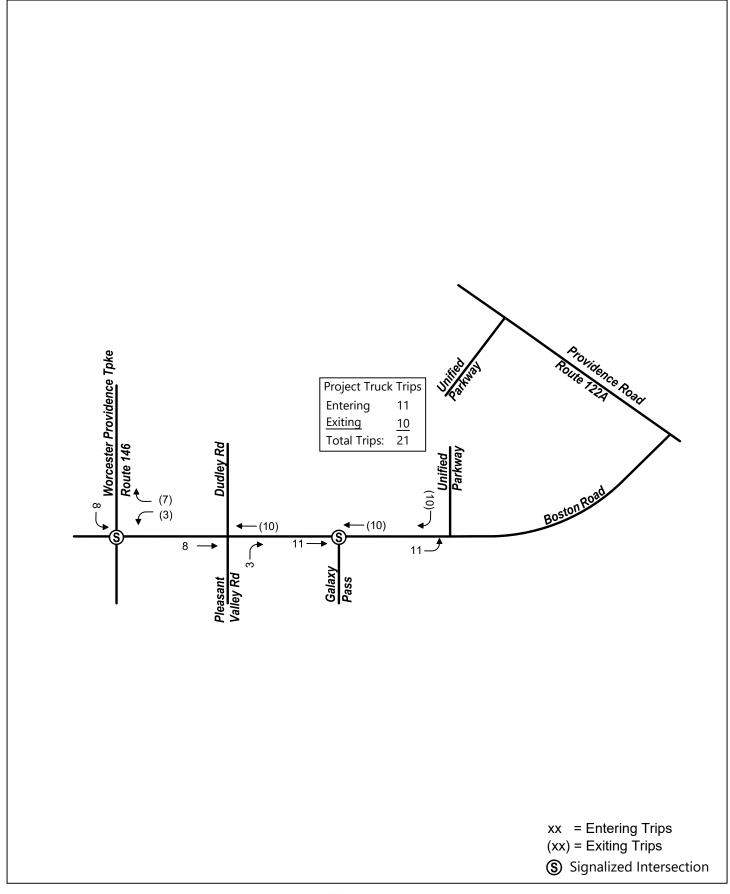




Table T1

Operations Analysis Summary

		20	22 Exist	ing			20	29 No-B	uild			2	029 Bui	ld	
				50 th %	95 th %				50 th %	95 th %				50 th %	95 th %
Intersection/Peak Hour/Lane Group	v/c	Delay	LOS	Queue	Queue	v/c	Delay	LOS	Queue	Queue	v/c	Delay	LOS	Queue	Queue
Route 146 at Boston Road															
Weekday Morning:															
Boston Road EB L	0.78	91	F	164	184	0.68	82	F	124	201	0.69	85	F	125	201
Boston Road EB T	0.55	66	E	166	189	0.47	65	E	130	213	0.49	66	Е	139	221
Boston Road EB R	0.05	59	E	0	0	0.04	60	E	0	4	0.04	61	E	0	4
Boston Road WB L	0.68	78	E	122	163	0.69	77	E	124	177	0.71	80	E	132	185
Boston Road WB T	0.79	83	F	225	317	0.79	81	F	224	338	0.76	79	E	227	338
Boston Road WB R	0.87	97	F	206	346	0.88	97	F	207	404	0.90	101	F	225	434
Route 146 NB T/R	1.04	73	Е	1102	1235	1.11	97	F	1210	1384	1.13	107	F	1237	1384
Route 146 SB L/U	0.65	77	Е	119	163	0.67	77	Е	123	176	0.74	80	F	145	203
Route 146 SB T	0.55	19	В	375	404	0.60	19	В	418	493	0.60	19	В	419	493
Route 146 SB R	0.03	5	Α	0	11	0.03	5	Α	0	11	0.03	5	Α	0	11
Overall Intersection	0.94	59	E			0.98	69	E			0.99	74	E		
Weekday Evening:															
Boston Road EB L	0.61	78	Е	98	161	0.62	81	F	99	167	0.63	82	F	101	167
Boston Road EB T	0.53	69	Е	125	192	0.57	72	Е	137	212	0.58	73	Е	144	221
Boston Road EB R	0.03	62	Е	0	0	0.03	64	Е	0	0	0.03	65	Е	0	0
Boston Road WB L	0.73	76	Е	146	210	0.79	82	F	164	230	0.85	89	F	190	279
Boston Road WB T	0.77	80	F	210	316	0.81	86	F	229	341	0.79	83	F	243	369
Boston Road WB R	0.61	70	Е	118	237	0.76	83	F	166	312	0.88	99	F	218	417
Route 146 NB T/R	0.86	40	D	697	867	0.97	54	D	905	1129	0.98	58	Е	937	1129
Route 146 SB L/U	0.83	82	F	188	289	0.92	98	F	222	352	1.02	>120	F	253	387
Route 146 SB T	0.70	19	В	531	700	0.79	23	С	706	877	0.80	24	С	744	877
Route 146 SB R	0.04	5	Α	0	13	0.05	5	Α	1	15	0.05	5	Α	1	15
Overall Intersection	0.84	40	D			0.94	48	D			0.99	54	D		

v/c = volume-to-capacity ratio Delay in seconds Queue lengths in feet



Table T1 (continued) Operations Analysis Summary

Memorandum

				•								Memorandum				
		20	22 Exist				202	29 No-B			2029 Build					
Intersection/Peak Hour/Lane Group	v/c	Delay	LOS	50 th % Queue	95 th % Queue	v/c	Delay	LOS	50 th % Queue	95 th % Queue	v/c	Delay	LOS	50 th % Queue	95 th %	
Boston Road at Galaxy Pass											-					
Weekday Morning:																
Boston Road EB T/R	0.27	5	Α	17	34	0.27	5	Α	17	37	0.31	5	Α	22	45	
Boston Road WB L/T	0.43	6	Α	30	54	0.43	6	Α	30	59	0.44	6	Α	31	62	
Galaxy Pass NB L/R	0.25	11	В	9	25	0.23	11	В	8	28	0.23	11	В	9	29	
Overall Intersection	0.48	7	Α			0.47	7	Α			0.48	7	Α			
Weekday Evening:																
Boston Road EB T/R	0.33	6	Α	21	43	0.35	6	Α	23	51	0.37	6	Α	27	58	
Boston Road WB L/T	0.47	7	Α	30	59	0.49	7	Α	31	66	0.52	7	Α	38	80	
Galaxy Pass NB L/R	0.31	10	Α	13	41	0.32	10	Α	14	44	0.33	11	В	17	50	
Overall Intersection	0.54	7	Α			0.55	7	Α			0.58	7	Α			
Boston Road at Dudley Road/Pleasant V	alley Road															
Weekday Morning:																
Boston Road EB L	0.02	9	A		3	0.02	9	Α		3	0.02	9	Α		3	
Boston Road WB L	0.00	0	A		0	0.00	0	Α		0	0.00	0	Α		0	
Pleasant Valley Road NB L/T/R	0.34	14	В		38	0.37	15	С		43	0.44	17	С		55	
Dudley Road SB L/T/R	0.17	17	С		15	0.17	17	С		15	0.18	18	С		18	
Weekday Evening:																
Boston Road EB L	0.03	9	Α		3	0.03	9	Α		3	0.03	10	Α		3	
Boston Road WB L	0.01	8	Α		0	0.01	8	Α		0	0.01	8	Α		0	
Pleasant Valley Road NB L/T/R	0.47	23	C		60	0.52	26	D		70	0.61	32	D		95	
Dudley Road SB L/T/R	0.27	20	C		28	0.28	22	С		28	0.34	27	D		35	
Providence Road at Boston Road																
Weekday Morning:																
Providence Road WB L	0.20	8	Α		18	0.23	8	Α		23	0.24	8	Α		23	
Boston Road NB Approach	0.39	12	В		45	0.45	14	В		60	0.47	14	В		63	
Weekday Evening:																
Providence Road WB L	0.27	9	Α		28	0.24	8	Α		25	0.32	9	Α		35	
Boston Road NB Approach	0.49	16	С		68	0.44	14	В		58	0.66	23	С		123	

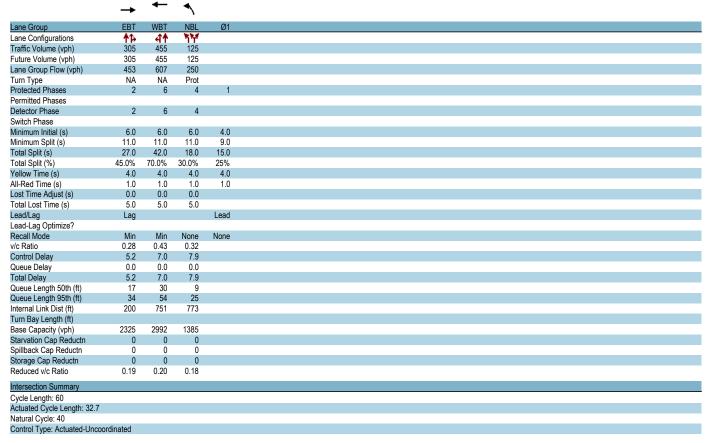
v/c = volume-to-capacity ratio. Delay in seconds. Queue lengths in feet.

Table T1 (continued) Operations Analysis Summary

	2029 Build								
Intersection/Peak Hour/Lane Group	v/c	Delay	LOS	95 th % Queue					
Boston Road at Unified Parkway									
Weekday Morning:									
Boston Road EB L	0.08	9	Α	8					
Unified Parkway SB Approach	0.08	16	С	8					
Weekday Evening:									
Boston Road EB L	0.05	9	Α	5					
Unified Parkway SB Approach	0.24	17	С	23					
Providence Road at Unified Parkway									
Weekday Morning:									
Providence Road WB L	0.01	8	Α	0					
Unified Parkway NB Approach	0.02	11	В	3					
Weekday Evening:									
Providence Road WB L	0.00	8	Α	0					
Unified Parkway NB Approach	0.05	12	В	5					

v/c = volume-to-capacity ratio.

Delay in seconds. Queue lengths in feet.

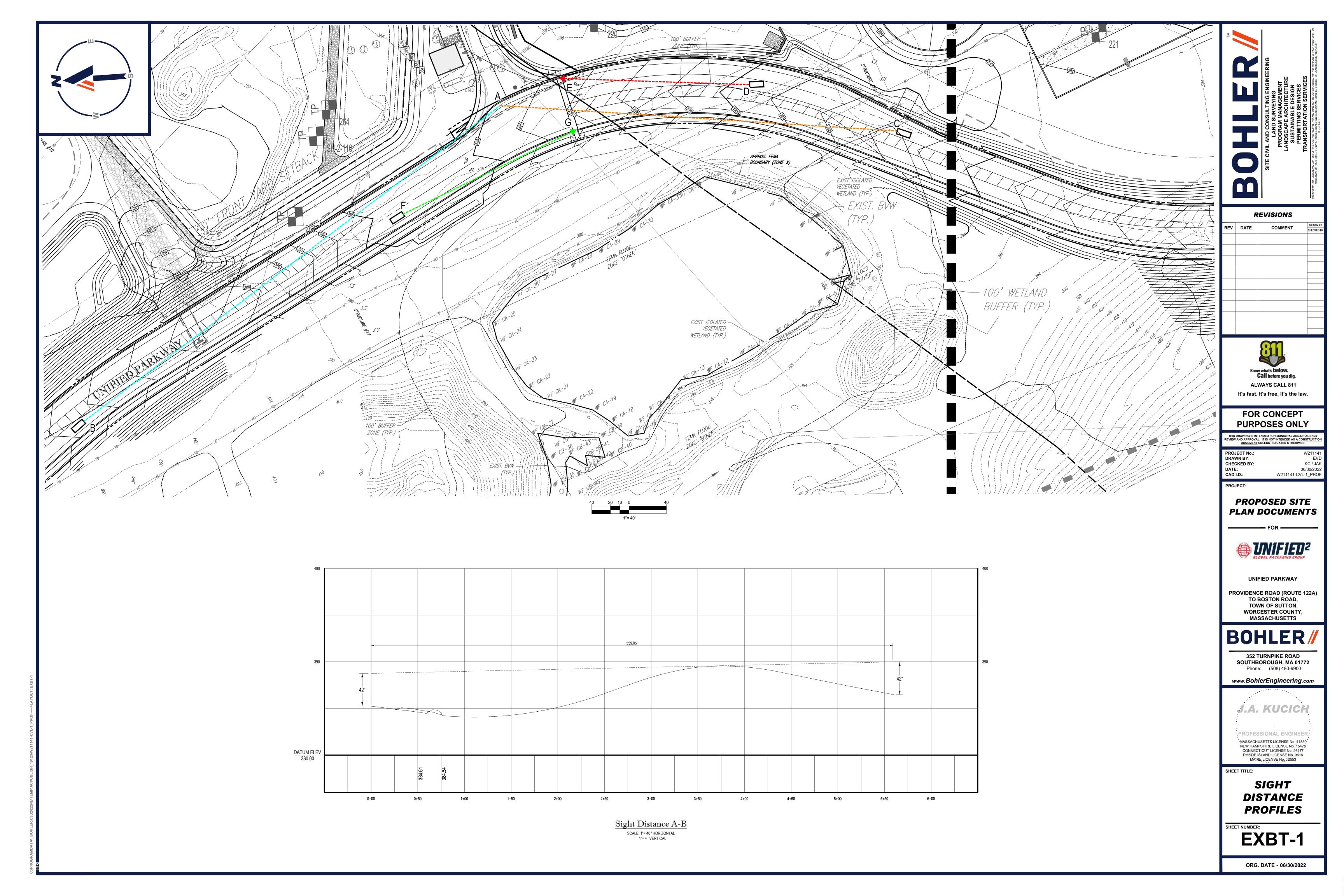


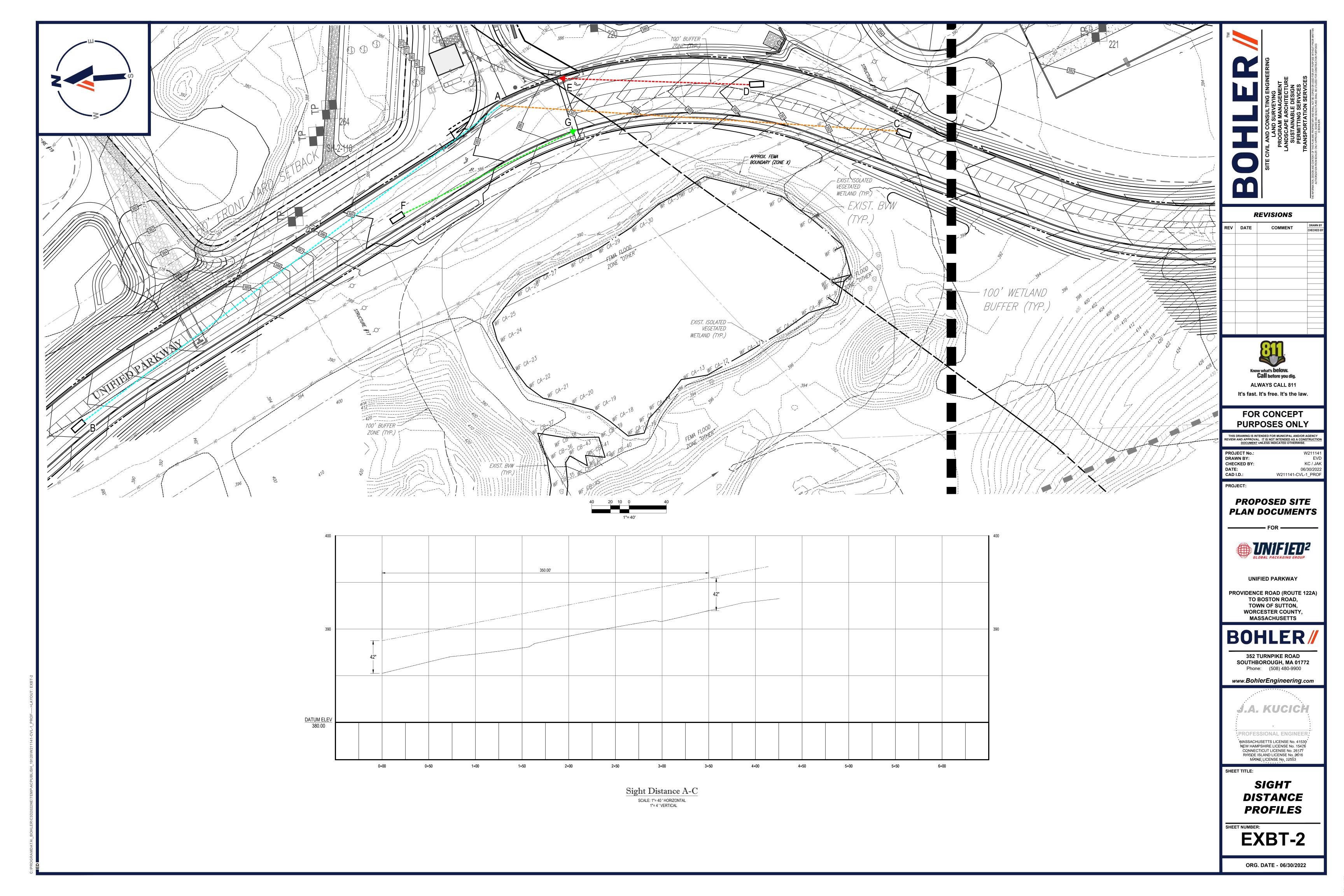
Splits and Phases: 9: Galaxy Pass & Boston Road



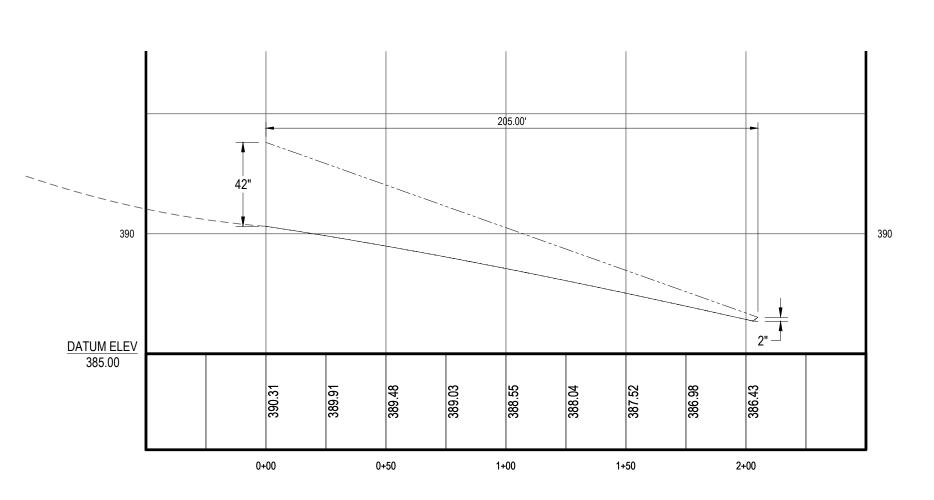
	-	\rightarrow	•	•	•	/			
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	†	LDI	TTDL	414	ሻሻ	וטוי			
Traffic Volume (vph)	305	80	55	455	125	70			
Future Volume (vph)	305	80	55	455	125	70			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Total Lost time (s)	5.0	1900	1300	5.0	5.0	1900			
Lane Util. Factor	0.95			0.95	0.97				
Frt	0.95			1.00	0.97				
	1.00			0.99	0.95				
Flt Protected									
Satd. Flow (prot)	3344			3467	3292				
Flt Permitted	1.00			0.87	0.97				
Satd. Flow (perm)	3344			3022	3292				_
Peak-hour factor, PHF	0.85	0.85	0.84	0.84	0.78	0.78			
Adj. Flow (vph)	359	94	65	542	160	90			
RTOR Reduction (vph)	33	0	0	0	70	0			
Lane Group Flow (vph)	420	0	0	607	180	0			
Heavy Vehicles (%)	5%	3%	0%	4%	3%	2%			
Turn Type	NA		custom	NA	Prot				
Protected Phases	2		1	6	4				
Permitted Phases			1						
Actuated Green, G (s)	15.3			15.3	7.1				
Effective Green, g (s)	15.3			15.3	7.1				
Actuated g/C Ratio	0.47			0.47	0.22				
Clearance Time (s)	5.0			5.0	5.0				
Vehicle Extension (s)	3.0			3.0	3.0				
Lane Grp Cap (vph)	1579			1427	721				
v/s Ratio Prot	0.13			1447	c0.05				
v/s Ratio Perm	0.13			c0.20	60.00				
v/c Ratio	0.27			0.43	0.25				
Uniform Delay, d1	5.2			0.43 5.6	10.4				
	1.00			1.00	1.00				
Progression Factor					0.2				
Incremental Delay, d2	0.1			0.2					
Delay (s)	5.3			5.9	10.6				
Level of Service	A			A	В				
Approach Delay (s)	5.3			5.9	10.6				
Approach LOS	Α			Α	В				
Intersection Summary									
HCM 2000 Control Delay			6.6	H	CM 2000 L	evel of Servic	А		_
HCM 2000 Volume to Capaci	itv ratio		0.48						
Actuated Cycle Length (s)	,		32.4	Sı	um of lost	time (s)	15.0		
Intersection Capacity Utilizati	ion		43.4%		U Level of		A		
Analysis Period (min)			15	- 10	2 20.07 01	2311100			
c Critical Lane Group									
o officer Larie Group									

-												
Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EDL	472	LDN	WDL	4TÞ	WDR	INDL		NDIX	JDL		אפט
Traffic Vol, veh/h	15	↔ 1→ 240	-	0	€I I→ 565	15	35	↔ 10	130	15	↔ 0	35
			5									
Future Vol, veh/h	15	240	5	0	565	15	35	10	130	15	0	35
Conflicting Peds, #/hr	0	0	0	0	_ 0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	90	90	90	79	79	79
Heavy Vehicles, %	0	3	0	0	5	0	10	11	5	18	0	7
Mvmt Flow	17	273	6	0	642	17	39	11	144	19	0	44
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	659	0	0	279	0	0	631	969	140	827	964	330
Stage 1	009	-	-	2/9	-	-	310	310	140	651	651	330
Stage 2	_	-	-	-	-	-	310	659	-	176	313	-
	4.1	-	-	4.1	-	-	7.7	6.72	7	7.86	6.5	7.04
Critical Hdwy	***	-		4.1	-		6.7	5.72		6.86	5.5	-
Critical Hdwy Stg 1	-	-	-			-			-			-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.7	5.72	- 2.25	6.86	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.6	4.11	3.35	3.68	4	3.37
Pot Cap-1 Maneuver	939	-	-	1295	-	-	350	237	873	238	257	651
Stage 1	-	-	-	-	-	-	653	636	-	387	468	-
Stage 2	-	-	-	-	-	-	643	437	-	764	661	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	939	-	-	1295	-	-	321	232	873	188	252	651
Mov Cap-2 Maneuver	-	-	-	-	-	-	321	232	-	188	252	-
Stage 1	-	-	-	-	-	-	639	623	-	379	468	-
Stage 2	-	-	-	-	-	-	599	437	-	613	647	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0			14.3			16.6		
HCM LOS	0.0			U			14.3 B			10.0 C		
I IOWI LUO							Б			U		
Minor Lane/Major Mvmt		NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)		581	939	-	-	1295	-	-	374			
HCM Lane V/C Ratio		0.335	0.018	-	-	-	-	-	0.169			
HCM Control Delay (s)		14.3	8.9	0.1	-	0	-	-	16.6			
HCM Lane LOS		В	Α	Α	-	Α	-	-	С			
HCM 95th %tile Q(veh)		1.5	0.1	-	-	0	-	-	0.6			

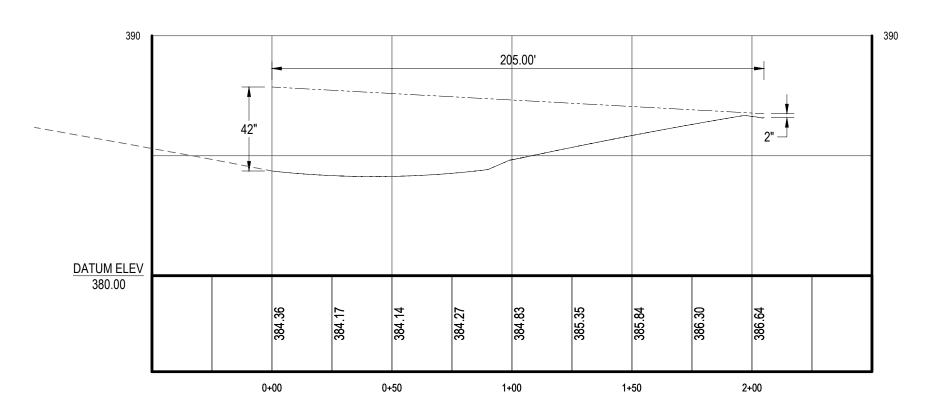








Stopping Sight Distance D-E SCALE: 1"= 40 ' HORIZONTAL 1"= 4 ' VERTICAL



Stopping Sight Distance F-G SCALE: 1"= 40 ' HORIZONTAL 1"= 4 ' VERTICAL



REVISIONS

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PROJECT:

PROPOSED SITE **PLAN DOCUMENTS**



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PROVIDENCE ROAD (ROUTE 122A)
TO BOSTON ROAD,
TOWN OF SUTTON,
WORCESTER COUNTY,
MASSACHUSETTS

352 TURNPIKE ROAD SOUTHBOROUGH, MA 01772 Phone: (508) 480-9900

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SHEET TITLE:

SIGHT **DISTANCE PROFILES**

EXBT-3

ORG. DATE - 06/30/2022

