Bowman

January 30, 2024

Chris Dilorio
Director of Community Development & Planning
Town of Hull
253 Atlantic Avenue
Hull, MA 02045

RE: Response to Traffic Peer Review
Paragon Dunes Mixed-Use Development
Hull, Massachusetts

Dear Mr. Dilorio:

Bowman is in receipt of the Traffic Engineering Peer Review comments provided by Tighe & Bond, Inc. in a letter dated January 5, 2024, in response to the Traffic Impact Study submitted by Procopio Enterprises, Inc. dated October 2023 regarding the proposed Paragon Dunes mixed-use development in Hull, MA. The following response to comments provides an updated written response to each of the comments provided by Tighe & Bond to the initial Traffic Impact Study.

Traffic Volumes

Comment 1: We generally agree with using the Rec-East group data rather than the U4 group data from MassDOT for seasonal adjustment. Since counts were collected in late October, we would typically recommend using the November adjustment factor of 1.08 for the Rec-East group to present a conservative analysis; however, the sensitivity analysis presented in the TIA adequately addresses an assumed peak condition.

Response 1: No additional analysis required.

Comment 2: Provide comment on the balancing done between intersections when generating the 2023 Existing condition traffic volumes.

Response 2: Due to limited opportunities for vehicles to enter or exit the network between the study area intersections, vehicle volumes were balanced to a zero-vehicle imbalance between intersections. To present a conservative analysis, balancing was achieved by adding vehicles to the network and distributing them to the highest volume approach to help mitigate the effects of the balancing.

Comment 3: Provide southbound and Saturday ATR data, which is missing from Appendix A.

Response 3: The southbound and Saturday ATR data have been provided as an attachment to this response to comments.

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Comment 4: ATR data presented in Table 1 should be seasonally adjusted by the same factor as the TMC data.

Response 4: The ATR data from Table 1 has been seasonally adjusted and is presented below.

Table 1: Seasonally Adjusted ATR Volumes

Roadway	Direction	ADT[1]		HV%[2]	85th %[3] Speed
		Weekday	Saturday		
George Washington Boulevard	Northbound	6,330	5,900	2%	38
	Southbound	6,820	6,260	2%	41
	Combined	13,150	12,160	2%	39

(1) Average daily traffic in vehicles per day
(2) Weekday heavy vehicle percentage
(3) Weekday 85th percentile speed in miles per hour

Crash Data

Comment 5: MassDOT crash rate calculation worksheets should be provided.

Response 5: The MassDOT crash rate calculation worksheets are attached to this response to comments.

Comment 6: Tighe & Bond recommends reviewing actual crash reports from the Hull Police Department to further assess the crash history of the study area intersections.

Response 6: With the very low crash rates for each the study area intersections, no significant safety deficiencies are specifically identified. Bowman has reached out to the Police Department to understand if any specific safety deficiencies exist at the study area intersections based on local knowledge and information. It was shared that the level of effort to compile the individual crash reports would be extensive. However, Bowman is coordinating to discuss the existing safety operations with the safety officer in the Hull Police Department.

Trip Generation

Comment 7: Clarify why LUC 221 Multifamily Housing (Mid Rise) was utilized over LUC 220 Multifamily Housing (Low Rise). The proposed building has 3 residential stories; "low rise" applies to two and three story structures, while "mid rise" applies to buildings with between four and ten stories.

Response 7: The Mid Rise Multifamily housing was originally used based on the overall number of stories within the proposed development. A comparison of the trips generated for each land use code is presented in Table 2 below.

Table 2: Trip Generation Summary

Land Use	Size	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour			Saturday Midday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Multifamily Housing (Mid-Rise)[1]	132 d.u.	11	36	47	32	20	52	27	26	53
Multifamily Housing (Low-Rise)[2]	132 d.u.	15	48	63	49	29	78	27	27	54
Difference		4	12	16	17	9	26	0	1	1

(1) ITE Land Use Code 221 (Multifamily Housing (Mid-Rise)) based on 132 dwelling units.

(2) ITE Land Use Code 220 (Multifamily Housing (Low-Rise)) based on 132 dwelling units.

Since the Low Rise land use code is shown to generate trips at a higher rate the Mid Rise land use code, revised analysis has been presented as part of this response to comments to ensure a conservative review of the proejct. The sensitivity analysis presented in the original traffic impact study has been updated to include the trip generation values using Land Use Code 220 (Multifamily Housing (Low-Rise)). The results of this updated sensitivity analysis are included in the updated level-of-service (LOS) summary and Synchro sheets, both attached. With the updated trip generation numbers, the overall findings of the original traffic impact study continue to be supported showing that the proposed project is not projected to have a significant impact on the study area.

Comment 8: An independent review of trip generation data in Table 2 via the ITE TripGen Web-based app reveals a variance of one exiting trip for both LUC 221 in the weekday morning peak hour and for LUC 932 in the weekday afternoon peak hour. Since the presented data is higher by one trip in both instances, no adjustment is necessary.

Response 8: No additional analysis required.

Comment 9: Pass-by data maintained by ITE for LUC 932 varies from 23 percent to 63 percent pass-by trip percentage for the weekday afternoon peak hour for site data largely collected in the 1990s. Provide justification why an average of this data is appropriate for a site in Hull. The geography of the Hull peninsula would likely diminish the likelihood of pass-by trips for restaurants outside of the summer months.

Response 9: Following the MassDOT Transportation Impact Assessment guidelines, the average pass-by rate would be applied to determine the pass-by trips for any new development. Pass-by traffic is traffic pulled from roadways and intersections directly adjacent to a project site limiting the potential impact of the surrounding geography (in this case the Hull peninsula). A review of the number of pass-by trips and the adjacent roadway volumes also fall within the TIA guidelines presented by MassDOT. There is a sizeable residential population north of the project site and therefore trips traveling to and from those residential

areas would be expected to serve as a sufficient source of potential pass-by trips.

It should also be noted that no internal capture reductions were applied to the trip generation estimates provided in the traffic impact study. Residents of the project site would be expected visit the proposed commercial areas on-site reducing the overall number of new project trips to and from the project site. According to ITE, unconstrained internal trip capture rates for trips between residential and retail/restaurant land uses can be as high as 20% during a weekday morning peak hour and up to 46% during a weekday afternoon peak hour. No application of internal capture would provide for a more conservative analysis and allow for some space in variation for potential pass-by rates.

Due to the seasonal fluctuations experienced within the study area, the volume of pass-by trips may also be expected to change with the season. The average was applied within the TIS since the analysis completed was intended to reflect an average month. However, it is expected that during the peak summer months the number of pass-by trips would increase due to additional nearby activity, reducing the overall number of new trips to and from the project site. Conversely, during the off-peak months, the number of pass-by trips could be lower thereby increasing the volume of new trips to and from the on-site land uses. That said, the volumes on the adjacent roadways during the off-peak months would also be expected to be lower allowing for additional roadway capacity to absorb the additional potential new trips associated with a possible lower pass-by rate continuing to result in a minimal impact to nearby roadway operations as outlined in the TIS.

Comment 10: Provide justification for using the weekday afternoon pass-by trip rate on the Saturday midday peak hour vehicle trips.

Response 10: With no other specific pass-by data available through ITE and given the general recreational and residential nature of the peninsula, pass-by rates would not be expected to be significantly different between a weekday afternoon and Saturday midday peak hour, especially during the summer months. Residential trips leaving the peninsula and recreational trips entering the peninsula would be expected travel past the site providing enough traffic to support a similar pass-by rate during the Saturday midday peak hour. During an off-peak month, volumes on the adjacent roadways would be expected to be lower, and so any additional new trips would be expected to be accommodated by the available roadway capacity.

Trip Distribution

Comment 11: Provide additional breakdown of US Census Journey-to-Work data presented in Appendix E to inform the assumed 30% of site generated trips to and from George Washington Blvd north of the site. For example, given Hull's unique peninsula geography, it is unclear how trips to and from Boston would arrive from and depart to the north.

Response 11: The original distribution of traffic to and from the north on Geroge Washington Boulevard accounted for a portion of Hull residents that also work in Hull as well as a portion of drivers turn right heading toward Wharf Avenue and eventually travel south on Nantasket Avenue. Based on discussions with the peer review consultant, adjustments to the portion of trips traveling to and from the north on George

Washington Boulevard were reduced. The resulting trip distribution was then included in the revised sensitivity analysis provided as part of this response to comments. Based on the revised sensitivity analysis, the findings of no significant impact continue to be applicable to the proposed development.

Comment 12: The TIS states that retail (restaurant) patrons will utilize the DCR lot and other off-site parking along Nantasket Avenue, but Figure 8 shows both residential and retail (restaurant) trips utilizing the site drive and site parking. Clarify whether site parking will be available to retail (restaurant) patrons.

Response 12: Access to the DCR parking area would be provided via the site driveway on George Washington Boulevard or in close proximity to the site driveway on Rockland Circle. As such, and to provide a more concentrated and thereby more conservative distribution of project trips, all project site trips were distributed to the site driveways Concentrating all of the site trips to the site and DCR parking lot would present a more conservative analysis of concentrated trips instead of reduced number of site driveway trips where trips would access other nearby parking areas. It is recognized that some portion of restaurant trips would be expected to use other parking areas, which would reduce the volume of trips on the study area roadways and thereby reduce the limited impact outlined in the findings of the traffic impact study.

Comment 13: Verify that evening parking would be accessible in the DCR lot for patrons of the retail (restaurant) uses.

Response 13: The DCR parking lot allows parking from dawn to dusk with fees charged from 8AM-4PM daily, May 13 through September 4. Given the peak hour of analysis reviewed in the traffic impact study was from 4:00 PM to 5:00 PM, trips to and from the commercial uses on site could feasibly use the DCR lot, particularly during the peak summer months.

Capacity Analysis

Comment 14: The Applicant should comment on changes in queue length at each study intersection.

Response 14: The results of the updated sensitivity analysis have been summarized and attached to this response to comments included projected queue lengths. The projected queue lengths of the critical movements at each of the site driveway intersections are shown to increase by less than one vehicle during each of the peak hours under the sensitivity analysis condition. A review of the projected 50th percentile queues at the signalized intersection of George Washington Boulevard and Rockland Circle shows an increase of approximately two to four vehicles for specific movements under the sensitivity analysis condition.

Comment 15: It should be noted that the comparison of July 2022 and September 2019 permanent count station data assumes that 2022 and 2019 data can be presumed to be comparable, with no adjustment to account for the COVID-19 pandemic. This is consistent with MassDOT guidance, which accepts data collected after March 2022 as "current" data, with no adjustment required.

Response 15: No additional analysis required.

Comment 16: Summary tables and Synchro worksheets should be provided for the sensitivity analysis referenced in the TIS.

Response 16: The Synchro worksheets and results of the updated sensitivity analysis have been summarized and attached to this response to comments.

Sight Distance

Comment 17: Confirm the posted and/or regulatory speed limits on George Washington Boulevard. A speed limit of 45 miles per hour (mph) was used to calculate required sight distances. Google Streetview shows a speed limit sign of 35 mph on George Washington Boulevard, south of Rockland Circle. It can be noted that SSD is met for the more stringent condition based on a 45 mph limit.

Response 17: The posted speed limit on George Washington Boulevard is 35 miles per hour. The required stopping sight distance at the site driveway on George Washington Boulevard exceeds for the 45 mile per hour speed. No additional analysis is required.

Pedestrian & Bicycle Accommodations

Comment 18: The Applicant may consider bicycle accommodations such as bicycle racks for residents and employees.

Response 18: Eighteen common bicycle parking spaces are included on site under the proposed development.

Comment 19: The Applicant may consider extending the sidewalk on the northeast edge of the parking strip down to Rockland Circle.

Response 19: A shared use path is proposed to be extend for the length of the site along the proposed parking area connecting the existing sidewalk on George Washington Boulevard to Rockland Circle.

Comment 20: Clarify whether public access will be allowed through the site from the DCR lot to Nantasket Avenue between the two commercial areas.

Response 20: Pedestrian access between the DCR lot and Nantasket Avenue would be provided through the site via the existing ArtWalk and the promenade through the proposed buildings.

Site Plan Review

Comment 21: Clarify intended operation for loading and delivery vehicles – e.g. restaurant deliveries, residential package deliveries, moving vans/trucks, etc.

Response 21: Trash pickup, deliveries, and the majority of the move-in and out activity would occur at the northern parking area. Some deliveries would be anticipated to also occur in the south loading space next to the garage entry.

Comment 22: The plans should indicate proposed location(s) for snow storage.

Response 22: Proposed locations for snow storage have been depicted on the updated site plans.

Comment 23: The Applicant should confirm that the 28 parking spaces required for the retail space can be accommodated by the existing parking lots. (see comments 12 and 13)

Response 23: Parking for the on-site commercial spaces would be accommodated by nearby existing parking lots and available on-street parking in the vicinity of the project site. See response 13.

Comment 24: Vehicle tracking paths should be provided to ensure that emergency and delivery vehicles are able to navigate the parking lots and garage.

Response 24: Vehicle tracking paths have been included as exhibits in the revised site plan set.

Comment 25: Recommend coordination with the Hull Fire Department to obtain their concurrence with proposed emergency access.

Response 25: The Hull Fire Department has been in attendance at Town staff meetings regarding the project, but no formal comment as been provided. The project team will coordinate with the Fire Department to ensure concurrence on the proposed emergency access.

If you have any questions or require any additional information regarding the comment responses provided above, please do not hesitate to contact me at 617-556-0020.

Sincerely,

Erin Fredette, P.E.

Volume Report

Job 1057_2_MM_ATR A1
Area Hull, MA
Location George Washington Boulevard NB, south of parking lot driveway

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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Thursday, October 27, 2022

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0200	2		2		0		1400	107		107		0	
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Volume Report

Job 1057_2_MM_ATR A1
Area Hull, MA
Location George Washington Boulevard NB, south of parking lot driveway

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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Saturday, October 29, 2022

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Volume Report

Job 1057_2_MM_ATR A2
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Time	Total		SB				Time	Total		SB			
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0845	109	491	109	491	0	0	2045	29	156	29	156	0	0
0900	112		112		0		2100	32		32		0	
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0015	15		15		0		1215	136		136		0	
0030	8		8		0		1230	122		122		0	
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0115	6		6		0		1315	123		123		0	
0130	2		2		0		1330	131		131		0	
0145	8	29	8	29	0	0	1345	84	472	84	472	0	0
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0215	3		3		0		1415	121		121		0	
0230	6		6		0		1430	107		107		0	
0245	1	15	1	15	0	0	1445	115	457	115	457	0	0
0300	1		1		0		1500	134		134		0	
0315	3		3		0		1515	104		104		0	
0330	5		5		0		1530	95		95		0	
0345	4	13	4	13	0	0	1545	120	453	120	453	0	0
0400	6		6		0		1600	118		118		0	
0415	7		7		0		1615	120		120		0	
0430	3		3		0		1630	106		106		0	
0445	14	30	14	30	0	0	1645	110	454	110	454	0	0
0500	10		10		0		1700	114		114		0	
0515	8		8		0		1715	100		100		0	
0530	17		17		0		1730	91		91		0	
0545	30	65	30	65	0	0	1745	101	406	101	406	0	0
0600	22		22		0		1800	85		85		0	
0615	24		24		0		1815	78		78		0	
0630	45		45		0		1830	70		70		0	
0645	38	129	38	129	0	0	1845	74	307	74	307	0	0
0700	43		43		0		1900	54		54		0	
0715	65		65		0		1915	52		52		0	
0730	63		63		0		1930	47		47		0	
0745	79	250	79	250	0	0	1945	37	190	37	190	0	0
0800	85		85		0		2000	47		47		0	
0815	95		95		0		2015	43		43		0	
0830	100		100		0		2030	40		40		0	
0845	96	376	96	376	0	0	2045	24	154	24	154	0	0
0900	106		106		0		2100	29		29		0	
0915	121		121		0		2115	34		34		0	
0930	131		131		0		2130	36		36		0	
0945	112	470	112	470	0	0	2145	41	140	41	140	0	0
1000	126		126		0		2200	16		16		0	
1015	131		131		0		2215	29		29		0	
1030	145		145		0		2230	17		17		0	
1045	148	550	148	550	0	0	2245	29	91	29	91	0	0
1100	129		129		0		2300	15		15		0	
1115	133		133		0		2315	17		17		0	
1130	121		121		0		2330	16		16		0	
1145	116	499	116	499	0	0	2345	18	66	18	66	0	0
							Total	**6139**		**6139**		**0**	

Classification Report

Job # 1057_2_MM_ATR A1
Area Hull, MA
Location George Washington Boulevard NB, south of parking lot driveway
Direction Northbound
Thursday, October 27, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	35	0	32	3	0	0	0	0	0	0	0	0	0	0
0100	15	1	13	1	0	0	0	0	0	0	0	0	0	0
0200	8	0	6	1	0	1	0	0	0	0	0	0	0	0
0300	19	0	17	1	0	1	0	0	0	0	0	0	0	0
0400	14	0	13	0	0	0	1	0	0	0	0	0	0	0
0500	42	0	35	6	0	1	0	0	0	0	0	0	0	0
0600	150	0	115	27	1	2	4	1	0	0	0	0	0	0
0700	273	0	225	41	1	2	3	1	0	0	0	0	0	0
0800	305	1	249	45	5	4	0	0	1	0	0	0	0	0
0900	278	1	225	43	1	4	3	1	0	0	0	0	0	0
1000	302	2	248	39	3	5	3	2	0	0	0	0	0	0
1100	407	1	348	48	1	3	3	2	1	0	0	0	0	0
1200	397	0	350	39	2	0	4	2	0	0	0	0	0	0
1300	382	0	327	50	1	0	3	0	1	0	0	0	0	0
1400	448	1	382	56	2	2	1	2	2	0	0	0	0	0
1500	557	1	482	61	2	1	1	4	5	0	0	0	0	0
1600	521	4	448	60	0	1	1	6	1	0	0	0	0	0
1700	532	2	480	45	1	1	0	2	1	0	0	0	0	0
1800	449	1	404	39	1	1	0	3	0	0	0	0	0	0
1900	365	0	330	32	0	1	0	2	0	0	0	0	0	0
2000	294	0	269	23	0	0	1	1	0	0	0	0	0	0
2100	198	1	178	18	0	1	0	0	0	0	0	0	0	0
2200	130	0	115	15	0	0	0	0	0	0	0	0	0	0
2300	88	0	82	6	0	0	0	0	0	0	0	0	0	0
Total	**6209**	**16**	**5373**	**699**	**21**	**31**	**28**	**29**	**12**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.26%**	**86.54%**	**11.26%**	**0.34%**	**0.50%**	**0.45%**	**0.47%**	**0.19%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 1057_2_MM_ATR A1
Area Hull, MA
Location George Washington Boulevard NB, south of parking lot driveway
Direction Northbound
Saturday, October 29, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	69	0	63	6	0	0	0	0	0	0	0	0	0	0
0100	44	0	41	3	0	0	0	0	0	0	0	0	0	0
0200	18	0	17	0	0	1	0	0	0	0	0	0	0	0
0300	14	0	12	0	0	2	0	0	0	0	0	0	0	0
0400	9	0	8	1	0	0	0	0	0	0	0	0	0	0
0500	18	0	15	3	0	0	0	0	0	0	0	0	0	0
0600	59	1	47	9	0	0	2	0	0	0	0	0	0	0
0700	142	0	111	26	1	3	1	0	0	0	0	0	0	0
0800	205	1	168	32	1	1	0	0	2	0	0	0	0	0
0900	307	0	267	31	1	5	0	2	0	1	0	0	0	0
1000	318	0	280	33	0	0	3	2	0	0	0	0	0	0
1100	454	1	410	36	1	1	1	4	0	0	0	0	0	0
1200	420	0	379	29	4	3	0	3	2	0	0	0	0	0
1300	477	3	431	34	0	2	2	4	1	0	0	0	0	0
1400	508	3	441	53	2	0	0	8	0	0	0	0	0	1
1500	471	1	421	41	0	2	2	3	0	0	0	0	0	1
1600	466	4	417	37	2	2	1	3	0	0	0	0	0	0
1700	412	2	373	34	0	0	0	2	1	0	0	0	0	0
1800	351	2	325	19	0	0	0	3	2	0	0	0	0	0
1900	277	0	242	32	0	1	0	2	0	0	0	0	0	0
2000	228	0	208	18	0	0	0	1	1	0	0	0	0	0
2100	201	0	181	17	1	1	0	1	0	0	0	0	0	0
2200	178	1	163	12	0	0	0	2	0	0	0	0	0	0
2300	129	0	123	5	0	0	0	1	0	0	0	0	0	0
Total	**5775**	**19**	**5143**	**511**	**13**	**24**	**12**	**41**	**9**	**1**	**0**	**0**	**0**	**2**
	100.00%	**0.33%**	**89.06%**	**8.85%**	**0.23%**	**0.42%**	**0.21%**	**0.71%**	**0.16%**	**0.02%**	**0.00%**	**0.00%**	**0.00%**	**0.03%**

Classification Report

Job # 1057_2_MM_ATR A2
Area Hull, MA
Location George Washington Boulevard SB, south of parking lot driveway
Direction Southbound
Thursday, October 27, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	15	0	14	0	0	1	0	0	0	0	0	0	0	0
0100	10	0	10	0	0	0	0	0	0	0	0	0	0	0
0200	10	0	8	0	0	2	0	0	0	0	0	0	0	0
0300	28	0	21	6	0	1	0	0	0	0	0	0	0	0
0400	82	0	64	18	0	0	0	0	0	0	0	0	0	0
0500	201	1	157	41	0	2	0	0	0	0	0	0	0	0
0600	371	0	315	49	0	2	1	3	1	0	0	0	0	0
0700	511	1	440	59	2	1	1	5	2	0	0	0	0	0
0800	491	1	413	62	2	3	4	4	2	0	0	0	0	0
0900	454	0	398	45	6	1	2	2	0	0	0	0	0	0
1000	485	0	422	46	5	5	4	1	2	0	0	0	0	0
1100	443	3	377	54	1	6	1	1	0	0	0	0	0	0
1200	457	1	396	47	4	4	3	2	0	0	0	0	0	0
1300	460	4	391	53	1	4	1	4	2	0	0	0	0	0
1400	485	2	415	58	5	1	2	2	0	0	0	0	0	0
1500	498	2	419	68	2	2	1	3	1	0	0	0	0	0
1600	452	5	373	66	1	2	1	1	2	0	0	0	0	1
1700	381	2	337	37	0	2	0	2	1	0	0	0	0	0
1800	327	1	281	43	1	0	1	0	0	0	0	0	0	0
1900	183	0	172	11	0	0	0	0	0	0	0	0	0	0
2000	156	1	133	21	0	1	0	0	0	0	0	0	0	0
2100	103	0	94	7	1	0	0	1	0	0	0	0	0	0
2200	53	0	49	3	0	1	0	0	0	0	0	0	0	0
2300	31	0	28	3	0	0	0	0	0	0	0	0	0	0
Total	**6687**	**24**	**5727**	**797**	**31**	**41**	**22**	**31**	**13**	**0**	**0**	**0**	**0**	**1**
	100.00%	**0.36%**	**85.64%**	**11.92%**	**0.46%**	**0.61%**	**0.33%**	**0.46%**	**0.19%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.01%**

Classification Report

Job # 1057_2_MM_ATR A2
Area Hull, MA
Location George Washington Boulevard SB, south of parking lot driveway
Direction Southbound
Saturday, October 29, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	55	0	51	4	0	0	0	0	0	0	0	0	0	0
0100	29	0	27	2	0	0	0	0	0	0	0	0	0	0
0200	15	0	12	2	0	1	0	0	0	0	0	0	0	0
0300	13	0	11	2	0	0	0	0	0	0	0	0	0	0
0400	30	0	25	3	0	2	0	0	0	0	0	0	0	0
0500	65	0	50	14	0	0	0	1	0	0	0	0	0	0
0600	129	0	104	22	0	3	0	0	0	0	0	0	0	0
0700	250	0	207	38	1	2	2	0	0	0	0	0	0	0
0800	376	2	325	43	0	1	2	3	0	0	0	0	0	0
0900	470	0	400	59	3	0	0	5	3	0	0	0	0	0
1000	550	0	496	44	0	1	2	5	1	1	0	0	0	0
1100	499	0	461	27	0	0	0	9	1	1	0	0	0	0
1200	468	1	421	40	2	2	1	1	0	0	0	0	0	0
1300	472	0	422	43	2	2	1	1	1	0	0	0	0	0
1400	457	2	398	47	1	4	0	5	0	0	0	0	0	0
1500	453	3	404	42	0	1	0	2	1	0	0	0	0	0
1600	454	5	385	51	1	1	2	8	1	0	0	0	0	0
1700	406	2	365	34	0	0	1	3	1	0	0	0	0	0
1800	307	0	272	34	0	0	0	1	0	0	0	0	0	0
1900	190	0	179	9	0	1	0	0	1	0	0	0	0	0
2000	154	0	142	11	0	1	0	0	0	0	0	0	0	0
2100	140	0	127	9	1	3	0	0	0	0	0	0	0	0
2200	91	0	83	6	2	0	0	0	0	0	0	0	0	0
2300	66	0	63	3	0	0	0	0	0	0	0	0	0	0
Total	**6139**	**15**	**5430**	**589**	**13**	**25**	**11**	**44**	**10**	**2**	**0**	**0**	**0**	**0**
	100.00%	**0.24%**	**88.45%**	**9.59%**	**0.21%**	**0.41%**	**0.18%**	**0.72%**	**0.16%**	**0.03%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Speed Report

Job 1057_2_MM_ATR A1
Area Hull, MA
Location George Washington Boulevard NB, south of parking lot driveway
Dir Northbound
Thursday, October 27, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	35	0	0	0	0	0	5	14	14	2	0	0	0	0	0	0	0
0100	15	0	0	0	0	0	1	7	5	2	0	0	0	0	0	0	0
0200	8	0	0	0	0	0	2	2	3	1	0	0	0	0	0	0	0
0300	19	0	0	0	0	0	5	8	4	2	0	0	0	0	0	0	0
0400	14	0	0	0	0	0	1	8	4	1	0	0	0	0	0	0	0
0500	42	0	0	0	0	0	6	24	7	5	0	0	0	0	0	0	0
0600	150	0	0	0	0	1	36	72	36	5	0	0	0	0	0	0	0
0700	273	0	0	0	0	1	42	121	90	18	1	0	0	0	0	0	0
0800	305	0	0	0	2	3	43	143	86	28	0	0	0	0	0	0	0
0900	278	0	0	0	0	5	54	123	77	18	1	0	0	0	0	0	0
1000	302	0	0	0	0	3	49	144	83	22	1	0	0	0	0	0	0
1100	407	0	0	0	0	2	52	206	121	23	3	0	0	0	0	0	0
1200	397	0	0	0	0	2	79	167	125	23	1	0	0	0	0	0	0
1300	382	0	0	0	0	4	75	181	112	9	1	0	0	0	0	0	0
1400	448	0	0	0	0	5	48	207	158	26	4	0	0	0	0	0	0
1500	557	0	0	0	0	2	56	252	205	39	3	0	0	0	0	0	0
1600	521	0	0	0	0	1	54	230	197	35	4	0	0	0	0	0	0
1700	532	0	0	0	0	2	53	258	187	29	2	1	0	0	0	0	0
1800	449	0	0	0	1	1	67	238	127	15	0	0	0	0	0	0	0
1900	365	0	0	0	0	4	32	187	124	17	1	0	0	0	0	0	0
2000	294	0	0	0	0	3	38	132	104	17	0	0	0	0	0	0	0
2100	198	0	0	0	0	3	21	92	69	13	0	0	0	0	0	0	0
2200	130	0	0	0	0	2	11	56	54	7	0	0	0	0	0	0	0
2300	88	0	0	0	0	0	9	40	35	4	0	0	0	0	0	0	0
Total	**6209**	**0**	**0**	**0**	**3**	**44**	**839**	**2912**	**2027**	**361**	**22**	**1**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.00%**	**0.05%**	**0.71%**	**13.51%**	**46.90%**	**32.65%**	**5.81%**	**0.35%**	**0.02%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 50.8 mph, Minimum = 16.2 mph, Mean = 34.0 mph
85% Speed = 37.86 mph, 95% Speed = 40.38 mph, Median = 33.95 mph
10 mph Pace = 29 - 39, Number in Pace = 5082 (81.85%)
Variance = 14.46, Standard Deviation = 3.80 mph

Speed Report

Job 1057_2_MM_ATR A1
Area Hull, MA
Location George Washington Boulevard NB, south of parking lot driveway
Dir Northbound
Saturday, October 29, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	69	0	0	0	0	1	16	32	17	3	0	0	0	0	0	0	0
0100	44	0	0	0	0	0	7	22	11	3	1	0	0	0	0	0	0
0200	18	0	0	0	0	0	3	7	7	1	0	0	0	0	0	0	0
0300	14	0	0	0	0	0	1	7	4	2	0	0	0	0	0	0	0
0400	9	0	0	0	0	0	0	2	4	3	0	0	0	0	0	0	0
0500	18	0	0	0	0	0	2	12	3	1	0	0	0	0	0	0	0
0600	59	0	0	0	0	2	11	22	20	3	1	0	0	0	0	0	0
0700	142	0	0	0	0	1	26	48	54	13	0	0	0	0	0	0	0
0800	205	0	0	0	1	2	29	91	64	17	1	0	0	0	0	0	0
0900	307	0	0	0	1	0	25	139	123	19	0	0	0	0	0	0	0
1000	318	0	0	1	0	9	50	152	83	20	3	0	0	0	0	0	0
1100	454	0	0	0	0	6	73	181	170	21	3	0	0	0	0	0	0
1200	420	0	0	0	0	12	43	197	138	30	0	0	0	0	0	0	0
1300	477	0	0	1	0	1	50	206	194	24	1	0	0	0	0	0	0
1400	508	0	0	0	0	4	85	229	155	34	1	0	0	0	0	0	0
1500	471	0	0	0	0	2	69	198	164	37	1	0	0	0	0	0	0
1600	466	0	0	0	1	1	52	199	171	40	2	0	0	0	0	0	0
1700	412	0	0	0	0	11	50	174	152	23	2	0	0	0	0	0	0
1800	351	0	0	0	0	3	69	186	80	13	0	0	0	0	0	0	0
1900	277	0	0	0	1	2	27	136	99	11	1	0	0	0	0	0	0
2000	228	0	0	0	0	0	27	112	80	9	0	0	0	0	0	0	0
2100	201	0	0	0	0	1	18	104	62	15	1	0	0	0	0	0	0
2200	178	0	0	0	0	0	23	86	58	11	0	0	0	0	0	0	0
2300	129	0	0	0	0	1	5	63	53	7	0	0	0	0	0	0	0
Total	**5775**	**0**	**0**	**2**	**4**	**59**	**761**	**2605**	**1966**	**360**	**18**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.03%**	**0.07%**	**1.02%**	**13.18%**	**45.11%**	**34.04%**	**6.23%**	**0.31%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 49.9 mph, Minimum = 13.7 mph, Mean = 34.1 mph
85% Speed = 38.08 mph, 95% Speed = 40.54 mph, Median = 34.06 mph
10 mph Pace = 29 - 39, Number in Pace = 4647 (80.47%)
Variance = 15.51, Standard Deviation = 3.94 mph

Speed Report

Job 1057_2_MM_ATR A2
Area Hull, MA
Location George Washington Boulevard SB, south of parking lot driveway
Dir Southbound
Thursday, October 27, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	15	0	0	0	0	1	2	5	6	1	0	0	0	0	0	0	0
0100	10	0	0	0	0	0	2	3	4	1	0	0	0	0	0	0	0
0200	10	0	0	0	0	0	0	3	6	1	0	0	0	0	0	0	0
0300	28	0	0	0	0	0	0	6	15	7	0	0	0	0	0	0	0
0400	82	0	0	0	0	0	4	15	33	26	4	0	0	0	0	0	0
0500	201	0	0	1	0	0	3	43	95	56	3	0	0	0	0	0	0
0600	371	0	0	0	0	2	18	98	195	49	9	0	0	0	0	0	0
0700	511	0	0	0	0	0	20	96	252	124	19	0	0	0	0	0	0
0800	491	0	0	0	0	2	21	103	246	97	19	3	0	0	0	0	0
0900	454	0	0	1	0	0	27	136	212	72	4	2	0	0	0	0	0
1000	485	0	0	0	0	1	28	170	217	58	11	0	0	0	0	0	0
1100	443	0	0	0	0	2	29	172	179	54	5	1	1	0	0	0	0
1200	457	0	0	0	1	3	37	159	191	59	6	1	0	0	0	0	0
1300	460	0	0	0	2	4	46	204	158	41	5	0	0	0	0	0	0
1400	485	0	0	0	2	2	33	163	189	87	9	0	0	0	0	0	0
1500	498	0	0	1	1	1	23	142	242	81	7	0	0	0	0	0	0
1600	452	0	0	0	0	2	19	138	213	69	10	1	0	0	0	0	0
1700	381	0	0	0	0	1	15	90	188	76	10	0	1	0	0	0	0
1800	327	0	0	0	0	3	43	115	114	48	4	0	0	0	0	0	0
1900	183	0	0	0	0	1	14	60	77	29	2	0	0	0	0	0	0
2000	156	0	0	0	1	3	12	52	52	31	5	0	0	0	0	0	0
2100	103	0	0	0	0	2	5	31	44	17	4	0	0	0	0	0	0
2200	53	0	0	0	1	1	2	10	21	16	2	0	0	0	0	0	0
2300	31	0	0	0	0	0	4	5	15	7	0	0	0	0	0	0	0
Total	**6687**	**0**	**0**	**3**	**8**	**31**	**407**	**2019**	**2964**	**1107**	**138**	**8**	**2**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.04%**	**0.12%**	**0.46%**	**6.09%**	**30.19%**	**44.32%**	**16.55%**	**2.06%**	**0.12%**	**0.03%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 57.7 mph, Minimum = 13.5 mph, Mean = 36.3 mph
85% Speed = 40.60 mph, 95% Speed = 43.17 mph, Median = 36.35 mph
10 mph Pace = 31 - 41, Number in Pace = 5165 (77.24%)
Variance = 18.37, Standard Deviation = 4.29 mph

Speed Report

Job 1057_2_MM_ATR A2
Area Hull, MA
Location George Washington Boulevard SB, south of parking lot driveway
Dir Southbound
Saturday, October 29, 2022

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	55	0	0	0	0	0	7	18	26	4	0	0	0	0	0	0	0
0100	29	0	0	0	0	0	1	14	11	1	2	0	0	0	0	0	0
0200	15	0	0	0	0	0	0	6	7	1	0	0	1	0	0	0	0
0300	13	0	0	0	0	0	0	5	4	2	2	0	0	0	0	0	0
0400	30	0	0	0	0	0	0	4	9	11	5	1	0	0	0	0	0
0500	65	0	0	0	0	0	1	12	28	18	5	1	0	0	0	0	0
0600	129	0	0	0	0	0	11	35	49	28	4	2	0	0	0	0	0
0700	250	0	0	0	0	0	7	46	120	67	9	1	0	0	0	0	0
0800	376	0	0	0	0	2	10	58	193	99	12	2	0	0	0	0	0
0900	470	0	0	0	0	1	6	113	242	93	15	0	0	0	0	0	0
1000	550	0	0	0	0	2	37	203	243	51	13	1	0	0	0	0	0
1100	499	0	0	0	0	1	33	146	237	75	6	1	0	0	0	0	0
1200	468	0	0	0	0	4	23	151	211	68	10	1	0	0	0	0	0
1300	472	0	0	0	0	2	23	182	198	63	4	0	0	0	0	0	0
1400	457	0	0	0	0	1	30	163	201	55	7	0	0	0	0	0	0
1500	453	0	0	0	0	0	33	139	226	48	7	0	0	0	0	0	0
1600	454	0	0	0	0	1	34	153	199	62	5	0	0	0	0	0	0
1700	406	0	0	0	1	2	34	146	170	47	6	0	0	0	0	0	0
1800	307	0	0	0	1	7	28	129	116	25	1	0	0	0	0	0	0
1900	190	0	0	0	0	3	20	70	75	17	5	0	0	0	0	0	0
2000	154	0	0	0	0	0	8	56	61	26	3	0	0	0	0	0	0
2100	140	0	0	0	0	3	12	53	55	17	0	0	0	0	0	0	0
2200	91	0	0	0	0	1	7	32	41	8	2	0	0	0	0	0	0
2300	66	0	0	0	0	0	5	21	33	6	1	0	0	0	0	0	0
Total	**6139**	**0**	**0**	**0**	**2**	**30**	**370**	**1955**	**2755**	**892**	**124**	**10**	**1**	**0**	**0**	**0**	**0**
	100.00%	**0.00%**	**0.00%**	**0.00%**	**0.03%**	**0.49%**	**6.03%**	**31.85%**	**44.88%**	**14.53%**	**2.02%**	**0.16%**	**0.02%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Maximum = 55.2 mph, Minimum = 17.8 mph, Mean = 36.2 mph
85% Speed = 40.32 mph, 95% Speed = 43.01 mph, Median = 36.24 mph
10 mph Pace = 31 - 41, Number in Pace = 4839 (78.82%)
Variance = 17.51, Standard Deviation = 4.18 mph

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hull COUNT DATE : 10/27/2023

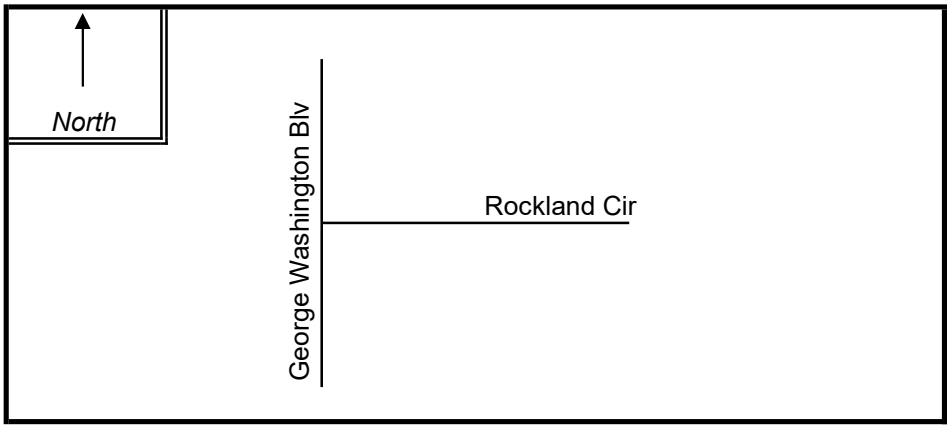
DISTRICT : 5 UNSIGNALIZED : SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : George Washington Boulevard

MINOR STREET(S) : Rockland Circle

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	600	464	67			1,131

" K " FACTOR : **0.075** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **15,080**

TOTAL # OF CRASHES : 8 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.60**

CRASH RATE CALCULATION : **0.29** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: Paragon Dunes Mixed-Use Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hull COUNT DATE : 10/27/2023

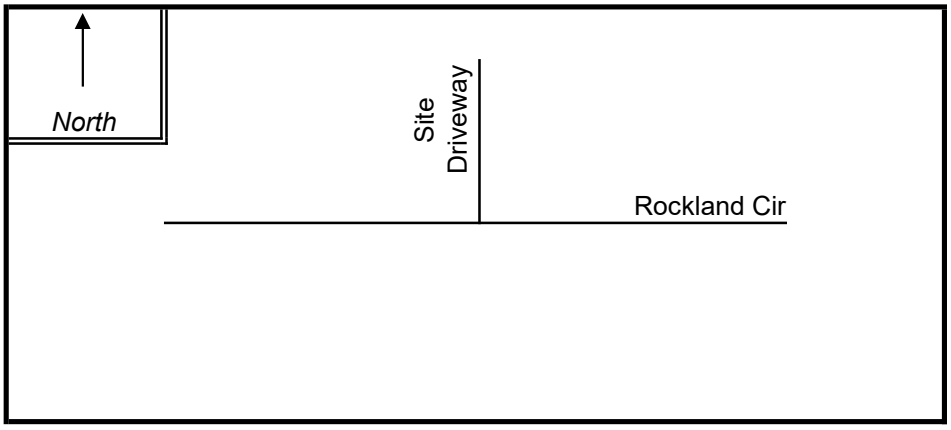
DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Rockland Circle

MINOR STREET(S) : Site Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	1	107	66			174

" K " FACTOR : **0.075**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **2,320**

TOTAL # OF CRASHES : 0

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.00**

CRASH RATE CALCULATION : **0.00**

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: Paragon Dunes Mixed-Use Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hull COUNT DATE : 10/27/2023

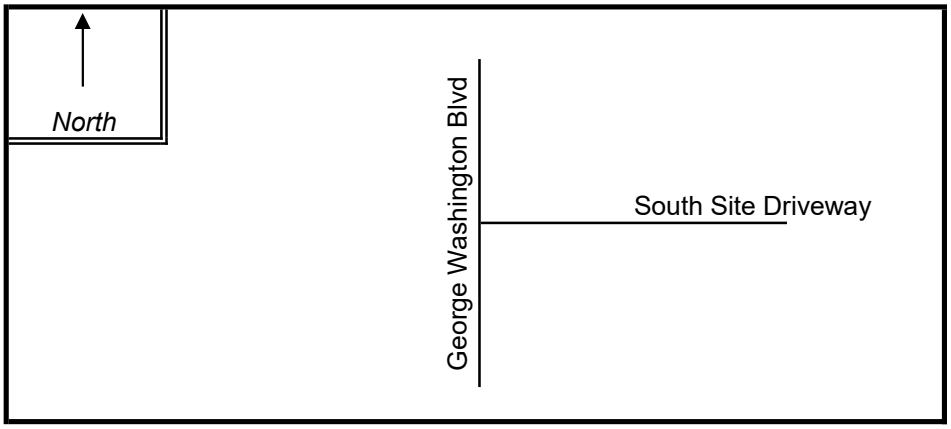
DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : George Washington Boulevard

MINOR STREET(S) : South Site Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	552	470	3			**1,025**

" K " FACTOR : **0.075** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **13,667**

TOTAL # OF CRASHES : 1 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.20**

CRASH RATE CALCULATION : **0.04** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: Paragon Dunes Mixed-Use Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hull COUNT DATE : 10/27/2023

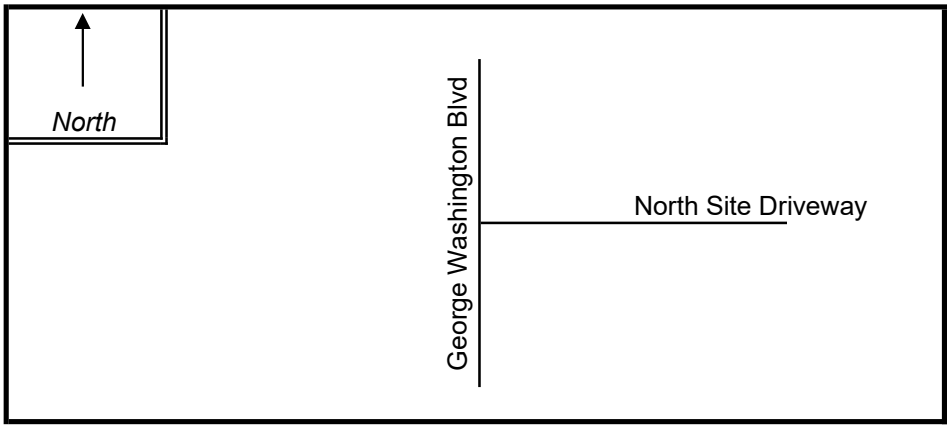
DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : George Washington Boulevard

MINOR STREET(S) : North Site Driveway

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	555	470	0			**1,025**

" K " FACTOR : **0.075** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **13,667**

TOTAL # OF CRASHES : 0 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.00**

CRASH RATE CALCULATION : **0.00** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date: Paragon Dunes Mixed-Use Development

JOURNEY-TO-WORK DATA

Paragon Dunes Mixed-Use Development

Hull, Massachusetts

#	Location of Work of Hull Residents	Number of Workers	Percent	Assigned Route(s)	
1	Boston city	1,180	27.8%	George Washington Blvd S	
2	Hull town	998	23.5%	George Washington Blvd N	George Washington Blvd S
3	Hingham town	694	16.4%	George Washington Blvd S	
4	Quincy city	299	7.1%	George Washington Blvd S	
5	Weymouth Town city	276	6.5%	George Washington Blvd S	
6	Norwell town	216	5.1%	George Washington Blvd S	George Washington Blvd N
7	Cohasset town	203	4.8%	George Washington Blvd N	Rockland Cir E
8	Braintree Town city	144	3.4%	George Washington Blvd S	
9	Plymouth town	120	2.8%	George Washington Blvd S	George Washington Blvd N
10	Cambridge city	110	2.6%	George Washington Blvd S	
	Total	**4,240**	**100.0%**		

Trip Distribution	% Of Total Workers	Trips Assigned
George Washington Blvd N	24.0%	25%
George Washington Blvd S	73.6%	70%
Rockland Cir E	2.4%	5%
Total	**100.0%**	**100%**

TRAFFIC PROJECTION MODEL

Weekday Morning Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

102

Intersection	Dir.	Turn	2022 Counted Volumes	Seasonal Adjustment 1.02	Background Growth 2022-2023 0.5%	Volume Balancing	2023 Existing Volumes	Background Growth 2023-2030 0.5%	2030 No Build Volumes	New Residential PERCENT ENTER	New Residential ENTER	New Retail PERCENT ENTER	New Retail ENTER	New Residential PERCENT EXIT	New Residential EXIT	New Retail PERCENT EXIT	New Retail EXIT	Project Trips TOTAL	Pass-by Trips	Peak Seasonal Adjustment 1.50	DCR Lot Exiting Vehicles	2030 Sensitivity Analysis Volumes
George Washington Boulevard at	WB	L	0	0	0		0	0	0									0				0
South Site Driveway		R	0	0	0		0	0	0					25%	12	25%	7	19			26	45
	NB	T	333	7	2		342	12	354									0		181		535
		R	0	0	0		0	0	0	40%	6							6				6
	SB	L	0	0	0		0	0	0	20%	3							3				3
		T	540	11	3		554	19	573	5%	1	25%	9					10		292		875
George Washington Boulevard at	WB	L	45	1	0		46	2	48					70%	34	70%	21	55		52	71	226
Rockland Circle		R	22	0	0		22	1	23									0		12		35
	NB	T	311	6	2	1	320	11	331	40%	6							6		169		506
		R	31	1	0		32	1	33	30%	4	70%	26					30		32		95
	SB	L	13	0	0		13	0	13	5%	1	25%	9					10		12		35
		T	522	10	3	6	541	19	560									0		280		840
Rockland Circle at	EB	L	1	0	0		1	0	1	35%	5	95%	35					40				41
Site Driveway		T	43	1	0		44	1	45									0		44		89
	WB	T	62	1	0	4	67	3	70									0		64		134
		R	1	0	0		1	0	1	5%	1	5%	2					3				4
	SB	L	0	0	0		0	0	0					5%	2	5%	2	4			5	9
		R	1	0	0		1	0	1					70%	34	70%	21	55			71	127

Peak Hour: 7:30 AM - 8:30 AM

TRAFFIC PROJECTION MODEL

Weekday Afternoon Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

102

Intersection	Dir.	Turn	2022 Counted Volumes	Seasonal Adjustment 1.02	Background Growth 2022-2023 0.5%	Volume Balancing	2023 Existing Volumes	Background Growth 2023-2030 0.5%	2030 No Build Volumes	New Residential PERCENT ENTER	New Residential ENTER	New Retail PERCENT ENTER	New Retail ENTER	New Residential PERCENT EXIT	New Residential EXIT	New Retail PERCENT EXIT	New Retail EXIT	Project Trips TOTAL	Pass-by Trips	Peak Seasonal Adjustment 1.50	DCR Lot Exiting Vehicles	2030 Sensitivity Analysis Volumes
George Washington Boulevard at	WB	L	0	0	0		0	0	0									0				0
South Site Driveway		R	3	0	0		3	0	3					25%	7	25%	3	10	6		26	45
	NB	T	552	11	3		566	20	586									0	-6	300		880
		R	0	0	0		0	0	0	40%	20							20				20
	SB	L	0	0	0		0	0	0	20%	10							10				10
		T	470	9	2		481	17	498	5%	2	25%	6					8		254		760
George Washington Boulevard at	WB	L	39	1	0		40	1	41					70%	20	70%	7	27	6	37	71	182
Rockland Circle		R	28	1	0		29	1	30									0		15		45
	NB	T	518	10	3	6	537	19	556	40%	20							20	-6	285		855
		R	82	2	0		84	3	87	30%	15	70%	18					33	6	63		189
	SB	L	27	1	0		28	1	29	5%	2	25%	6					8	6	22		65
		T	437	9	2	5	453	16	469									0	-6	232		695
Rockland Circle at	EB	L	2	0	0		2	0	2	35%	17	95%	24					41	13			56
Site Driveway		T	105	2	0	3	110	4	114									0	-1	85		198
	WB	T	63	1	0	4	68	2	70									0	-1	52		121
		R	3	0	0		3	0	3	5%	2	5%	1					3	1			7
	SB	L	0	0	0		0	0	0					5%	2	5%	1	3	1		5	9
		R	1	0	0		1	0	1					70%	20	70%	7	27	7		71	106

Peak Hour: 4:00 PM - 5:00 PM

TRAFFIC PROJECTION MODEL

Saturday Midday Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

102

Intersection	Dir.	Turn	2022 Counted Volumes	Seasonal Adjustment 1.02	Background Growth 2022-2023 0.5%	Volume Balancing	2023 Existing Volumes	Background Growth 2023-2030 0.5%	2030 No Build Volumes	New Residential PERCENT ENTER	New Residential ENTER	New Retail PERCENT ENTER	New Retail ENTER	New Residential PERCENT EXIT	New Residential EXIT	New Retail PERCENT EXIT	New Retail EXIT	Project Trips TOTAL	Pass-by Trips	Peak Seasonal Adjustment 1.50	DCR Lot Exiting Vehicles	2030 Sensitivity Analysis Volumes
George Washington Boulevard at	WB	L	2	0	0		2	0	2									0				0
South Site Driveway		R	0	0	0		0	0	0					25%	7	25%	5	12	7		26	45
	NB	T	495	10	2	3	510	18	528									0	-7	267		788
		R	0	0	0		0	0	0	40%	11							11				11
	SB	L	0	0	0		0	0	0	20%	6							6				6
		T	509	10	2		521	18	539	5%	1	25%	6					7		274		820
George Washington Boulevard at	WB	L	55	1	0		56	2	58					70%	19	70%	15	34	7	51	71	223
Rockland Circle		R	22	0	0		22	1	23									0		12		35
	NB	T	476	10	2		488	17	505	40%	11							11	-7	255		764
		R	75	2	0		77	3	80	30%	8	70%	16					24	7	56		167
	SB	L	35	1	0		36	1	37	5%	1	25%	6					7	7	26		77
		T	474	9	2	2	487	17	504									0	-7	248		743
Rockland Circle at	EB	L	9	0	0		9	0	9	35%	9	95%	22					31	16			56
Site Driveway		T	94	2	0	8	104	4	108									0	-2	82		188
	WB	T	72	1	0	5	78	3	81									0	-1	63		143
		R	1	0	0		1	0	1	5%	1	5%	1					2	1			4
	SB	L	0	0	0		0	0	0					5%	1	5%	1	2	2		5	9
		R	0	0	0		0	0	0					70%	19	70%	15	34	8		71	115

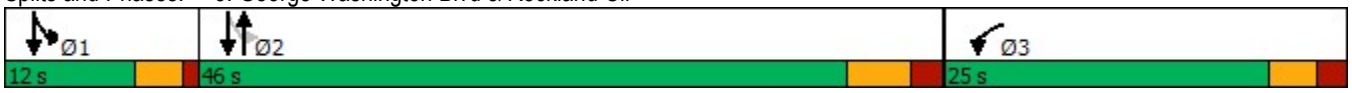
Peak Hour: 12:30 PM - 1:30 PM

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	226	35	506	95	35	840
Future Volume (vph)	226	35	506	95	35	840
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	205	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				75	
Satd. Flow (prot)	1776	0	3351	0	1671	3539
Flt Permitted	0.958				0.370	
Satd. Flow (perm)	1776	0	3351	0	651	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	9		36			
Link Speed (mph)	30		30			30
Link Distance (ft)	176		639			1106
Travel Time (s)	4.0		14.5			25.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	5%	5%	6%	8%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	284	0	653	0	38	913
Turn Type	Prot		NA		D.P+P	NA
Protected Phases	3		2		1	1 2
Permitted Phases					2	
Detector Phase	3		2		1	1 2
Switch Phase						
Minimum Initial (s)	8.0		40.0		8.0	
Minimum Split (s)	13.0		46.0		12.0	
Total Split (s)	25.0		46.0		12.0	
Total Split (%)	30.1%		55.4%		14.5%	
Yellow Time (s)	3.0		4.0		3.0	
All-Red Time (s)	2.0		2.0		1.0	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	5.0		6.0		4.0	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None		None		None	
Act Effct Green (s)	16.5		40.1		50.1	54.1
Actuated g/C Ratio	0.21		0.50		0.63	0.68
v/c Ratio	0.76		0.38		0.07	0.38
Control Delay	42.4		12.7		5.4	6.4
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	42.4		12.7		5.4	6.4

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D		B		A	A
Approach Delay	42.4		12.7			6.4
Approach LOS	D		B			A
Queue Length 50th (ft)	129		95		6	92
Queue Length 95th (ft)	213		143		16	137
Internal Link Dist (ft)	96		559			1026
Turn Bay Length (ft)					205	
Base Capacity (vph)	453		1705		512	2406
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.63		0.38		0.07	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 83			
Actuated Cycle Length: 79.6			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 57.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: George Washington Blvd & Rockland Cir



Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	535	6	3	875
Future Vol, veh/h	0	45	535	6	3	875
Conflicting Peds, #/hr	0	2	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	2
Mvmt Flow	0	49	582	7	3	951

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1068	297	0	0	589	0
Stage 1	586	-	-	-	-	-
Stage 2	482	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	217	699	-	-	982	-
Stage 1	519	-	-	-	-	-
Stage 2	587	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	216	698	-	-	982	-
Mov Cap-2 Maneuver	216	-	-	-	-	-
Stage 1	519	-	-	-	-	-
Stage 2	583	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	698	982	-
HCM Lane V/C Ratio	-	-	0.07	0.003	-
HCM Control Delay (s)	-	-	10.5	8.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	89	134	4	9	127
Future Vol, veh/h	41	89	134	4	9	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	0	2	2	2
Mvmt Flow	45	97	146	4	10	138

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	150	0	-	0	335	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	187	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1431	-	-	-	660	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	845	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1431	-	-	-	638	899
Mov Cap-2 Maneuver	-	-	-	-	638	-
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	845	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	9.9
HCM LOS			A

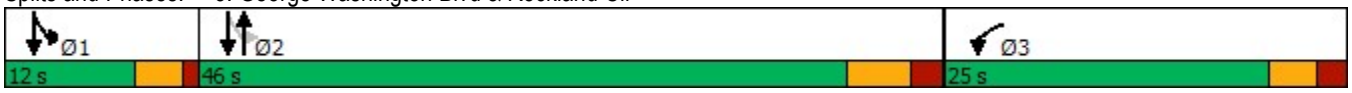
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1431	-	-	-	875
HCM Lane V/C Ratio	0.031	-	-	-	0.169
HCM Control Delay (s)	7.6	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	182	45	855	189	65	695
Future Volume (vph)	182	45	855	189	65	695
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	205	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				75	
Satd. Flow (prot)	1735	0	3484	0	1805	3539
Flt Permitted	0.961				0.170	
Satd. Flow (perm)	1735	0	3484	0	323	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	14		44			
Link Speed (mph)	30		30			30
Link Distance (ft)	176		639			1106
Travel Time (s)	4.0		14.5			25.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	1%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	247	0	1134	0	71	755
Turn Type	Prot		NA		D.P+P	NA
Protected Phases	3		2		1	1 2
Permitted Phases					2	
Detector Phase	3		2		1	1 2
Switch Phase						
Minimum Initial (s)	8.0		40.0		8.0	
Minimum Split (s)	13.0		46.0		12.0	
Total Split (s)	25.0		46.0		12.0	
Total Split (%)	30.1%		55.4%		14.5%	
Yellow Time (s)	3.0		4.0		3.0	
All-Red Time (s)	2.0		2.0		1.0	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	5.0		6.0		4.0	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None		None		None	
Act Effct Green (s)	15.2		40.1		50.1	54.1
Actuated g/C Ratio	0.19		0.51		0.64	0.69
v/c Ratio	0.71		0.63		0.20	0.31
Control Delay	39.4		15.7		6.2	5.6
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	39.4		15.7		6.2	5.6

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D		B		A	A
Approach Delay	39.4		15.7			5.7
Approach LOS	D		B			A
Queue Length 50th (ft)	107		191		10	65
Queue Length 95th (ft)	182		286		25	108
Internal Link Dist (ft)	96		559			1026
Turn Bay Length (ft)					205	
Base Capacity (vph)	454		1803		358	2443
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.54		0.63		0.20	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 83			
Actuated Cycle Length: 78.4			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 65.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: George Washington Blvd & Rockland Cir



Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	880	20	10	760
Future Vol, veh/h	0	45	880	20	10	760
Conflicting Peds, #/hr	0	1	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	1	2	2	2
Mvmt Flow	0	49	957	22	11	826

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1410	498	0	0	986	0
Stage 1	975	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	129	518	-	-	696	-
Stage 1	326	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	124	514	-	-	691	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	324	-	-	-	-	-
Stage 2	602	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	514	691	-
HCM Lane V/C Ratio	-	-	0.095	0.016	-
HCM Control Delay (s)	-	-	12.7	10.3	0.1
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	198	121	7	9	106
Future Vol, veh/h	56	198	121	7	9	106
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	2	2	2	2
Mvmt Flow	61	215	132	8	10	115

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	142	0	-	0	475	138
Stage 1	-	-	-	-	138	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1441	-	-	-	548	910
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1438	-	-	-	520	908
Mov Cap-2 Maneuver	-	-	-	-	520	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.9
HCM LOS			A

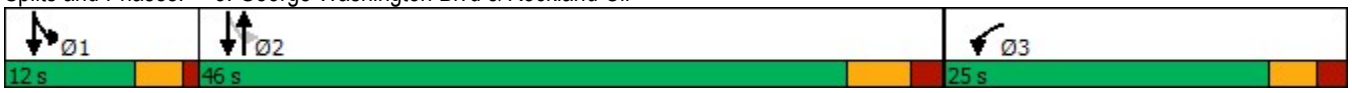
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1438	-	-	-	858
HCM Lane V/C Ratio	0.042	-	-	-	0.146
HCM Control Delay (s)	7.6	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	223	35	764	167	77	743
Future Volume (vph)	223	35	764	167	77	743
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	205	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				75	
Satd. Flow (prot)	1789	0	3465	0	1805	3539
Flt Permitted	0.959				0.209	
Satd. Flow (perm)	1789	0	3465	0	397	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	9		43			
Link Speed (mph)	30		30			30
Link Distance (ft)	176		639			1106
Travel Time (s)	4.0		14.5			25.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	1%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	280	0	1012	0	84	808
Turn Type	Prot		NA		D.P+P	NA
Protected Phases	3		2		1	1 2
Permitted Phases					2	
Detector Phase	3		2		1	1 2
Switch Phase						
Minimum Initial (s)	8.0		40.0		8.0	
Minimum Split (s)	13.0		46.0		12.0	
Total Split (s)	25.0		46.0		12.0	
Total Split (%)	30.1%		55.4%		14.5%	
Yellow Time (s)	3.0		4.0		3.0	
All-Red Time (s)	2.0		2.0		1.0	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	5.0		6.0		4.0	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?						
Recall Mode	None		None		None	
Act Effct Green (s)	16.3		40.1		50.1	54.1
Actuated g/C Ratio	0.21		0.51		0.63	0.68
v/c Ratio	0.75		0.57		0.21	0.34
Control Delay	41.7		15.2		6.4	6.1
Queue Delay	0.0		0.0		0.0	0.0
Total Delay	41.7		15.2		6.4	6.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D		B		A	A
Approach Delay	41.7		15.2			6.1
Approach LOS	D		B			A
Queue Length 50th (ft)	127		170		12	77
Queue Length 95th (ft)	209		244		29	117
Internal Link Dist (ft)	96		559			1026
Turn Bay Length (ft)					205	
Base Capacity (vph)	457		1769		392	2410
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.61		0.57		0.21	0.34

Intersection Summary			
Area Type:	Other		
Cycle Length: 83			
Actuated Cycle Length: 79.4			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: George Washington Blvd & Rockland Cir



Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	45	788	11	6	820
Future Vol, veh/h	0	45	788	11	6	820
Conflicting Peds, #/hr	0	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	1	2	2	2
Mvmt Flow	0	49	857	12	7	891

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1326	438	0	0	872	0
Stage 1	866	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	147	567	-	-	769	-
Stage 1	372	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	565	-	-	767	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	591	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	565	767	-
HCM Lane V/C Ratio	-	-	0.087	0.009	-
HCM Control Delay (s)	-	-	12	9.7	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	188	143	4	9	115
Future Vol, veh/h	56	188	143	4	9	115
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	1	0	2	2	2
Mvmt Flow	61	204	155	4	10	125

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	484	158
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	326	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1419	-	-	-	542	887
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1418	-	-	-	514	886
Mov Cap-2 Maneuver	-	-	-	-	514	-
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	730	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1418	-	-	-	842
HCM Lane V/C Ratio	0.043	-	-	-	0.16
HCM Control Delay (s)	7.7	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

CAPACITY ANALYSIS SUMMARY

Weekday Morning Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

			2023 Existing			2030 No Build			2030 Build			2030 Build Sensitivity Analysis		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
George Washington Boulevard	WB	LR/R	n/a	n/a	n/a	n/a	n/a	n/a	A	9.6	0.03	B	10.5	0.07
at Site Driveway	NB	TR	n/a	n/a	n/a	n/a	n/a	n/a	A	0.0	0.00	A	0.0	0.00
	SB	LT	n/a	n/a	n/a	n/a	n/a	n/a	A	0.0	0.00	A	0.0	0.00
George Washington Boulevard	WB	LR	C	25.0	0.32	C	25.0	0.32	C	31.5	0.46	D	42.4	0.76
at Rockland Circle	NB	TR	A	7.6	0.20	A	7.6	0.20	A	8.2	0.22	B	12.7	0.38
	SB	L	A	2.6	0.02	A	2.6	0.02	A	3.3	0.04	A	5.4	0.07
		T	A	2.6	0.21	A	2.7	0.21	A	3.3	0.22	A	6.4	0.38
	Overall		*A*	*6.1*	*0.49*	*A*	*6.0*	*0.49*	*A*	*8.0*	*0.49*	*B*	*14.0*	*0.57*
Rockland Circle at	EB	LT	A	0.2	0.00	A	0.2	0.00	A	3.5	0.03	A	2.4	0.03
Site Driveway	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	A	8.7	0.00	A	8.6	0.00	A	8.9	0.05	A	9.9	0.17

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio; intersection capacity utilization reported for overall
n/a Not applicable

QUEUE SUMMARY

Weekday Morning Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

			2023 Existing		2030 No Build		2030 Build		2030 Build Sensitivity Analysis	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
George Washington Boulevard	WB	LR/R	n/a	n/a	n/a	n/a	n/a	3	n/a	5
at Site Driveway	NB	TR	n/a	n/a	n/a	n/a	n/a	0	n/a	0
	SB	LT	n/a	n/a	n/a	n/a	n/a	0	n/a	0
George Washington Boulevard	WB	LR	21	57	21	58	47	95	129	213
at Rockland Circle	NB	TR	37	64	38	65	44	76	95	143
	SB	L	1	5	1	5	2	10	6	16
		T	28	50	29	52	34	64	92	137
Rockland Circle at	EB	LT	n/a	0	n/a	0	n/a	3	n/a	3
Site Driveway	WB	TR	n/a	0	n/a	0	n/a	0	n/a	0
	SB	LR	n/a	0	n/a	0	n/a	5	n/a	15

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
n/a Not applicable

CAPACITY ANALYSIS SUMMARY

Weekday Afternoon Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

			2023 Existing			2030 No Build			2030 Build			2030 Build Sensitivity Analysis		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
George Washington Boulevard	WB	LR/R	B	10.3	0.01	B	10.3	0.01	B	10.6	0.03	B	12.7	0.10
at Site Driveway	NB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LT	A	0.0	0.00	A	0.0	0.00	A	0.2	0.01	A	0.2	0.02
George Washington Boulevard	WB	LR	C	23.2	0.36	C	22.7	0.32	C	28.0	0.41	D	39.4	0.71
at Rockland Circle	NB	TR	A	8.7	0.35	A	8.4	0.34	A	9.0	0.36	B	15.7	0.63
	SB	L	A	2.8	0.05	A	2.7	0.05	A	3.2	0.08	A	6.2	0.20
		T	A	2.6	0.18	A	2.5	0.18	A	2.8	0.18	A	5.6	0.31
	Overall		*A*	*7.2*	*0.49*	*A*	*6.9*	*0.49*	*A*	*8.0*	*0.51*	*B*	*14.6*	*0.65*
Rockland Circle at	EB	LT	A	0.1	0.00	A	0.1	0.00	A	2.3	0.04	A	1.7	0.04
Site Driveway	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	A	8.7	0.00	A	8.7	0.00	A	9.0	0.04	A	9.9	0.15

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio; intersection capacity utilization reported for overall

QUEUE SUMMARY

Weekday Afternoon Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

			2023 Existing		2030 No Build		2030 Build		2030 Build Sensitivity Analysis	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
George Washington Boulevard	WB	LR/R	n/a	0	n/a	0	n/a	3	n/a	8
at Site Driveway	NB	TR	n/a	0	n/a	0	n/a	0	n/a	0
	SB	LT	n/a	0	n/a	0	n/a	0	n/a	0
George Washington Boulevard	WB	LR	22	48	18	55	33	77	107	182
at Rockland Circle	NB	TR	78	116	75	117	82	132	191	286
	SB	L	3	9	3	9	4	13	10	25
		T	24	43	24	42	25	48	65	108
Rockland Circle at	EB	LT	n/a	0	n/a	0	n/a	3	n/a	3
Site Driveway	WB	TR	n/a	0	n/a	0	n/a	0	n/a	0
	SB	LR	n/a	0	n/a	0	n/a	3	n/a	13

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
n/a Not applicable

CAPACITY ANALYSIS SUMMARY

Saturday Midday Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

			2023 Existing			2030 No Build			2030 Build			2030 Build Sensitivity Analysis		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
George Washington Boulevard	WB	LR/R	C	16.9	0.01	C	17.3	0.01	B	10.3	0.03	B	12.0	0.09
at Site Driveway	NB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LT	A	0.0	0.00	A	0.0	0.00	A	0.2	0.01	A	0.2	0.01
George Washington Boulevard	WB	LR	C	27.3	0.36	C	26.9	0.36	C	32.0	0.48	D	41.7	0.75
at Rockland Circle	NB	TR	A	8.2	0.29	A	8.4	0.31	A	9.2	0.34	B	15.2	0.57
	SB	L	A	2.9	0.06	A	2.8	0.06	A	3.6	0.09	A	6.4	0.21
		T	A	2.7	0.20	A	2.7	0.19	A	3.3	0.19	A	6.1	0.34
	Overall		*A*	*6.9*	*0.49*	*A*	*7.1*	*0.49*	*A*	*8.9*	*0.58*	*B*	*14.9*	*0.67*
Rockland Circle at	EB	LT	A	0.6	0.01	A	0.6	0.01	A	2.6	0.04	A	1.8	0.04
Site Driveway	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	LR	n/a	n/a	n/a	n/a	n/a	n/a	A	9.1	0.05	A	10.1	0.16

1 Level-of-Service
2 Average vehicle delay, in seconds
3 Volume to capacity ratio; intersection capacity utilization reported for overall
n/a Not applicable

QUEUE SUMMARY

Saturday Midday Peak Hour
Paragon Dunes Mixed-Use Development
Hull, MA

			2023 Existing		2030 No Build		2030 Build		2030 Build Sensitivity Analysis	
Intersection	Movement		50th Queue[1]	95th Queue[2]	50th Queue	95th Queue	50th Queue	95th Queue	50th Queue	95th Queue
George Washington Boulevard	WB	LR/R	n/a	0	n/a	0	n/a	3	n/a	8
at Site Driveway	NB	TR	n/a	0	n/a	0	n/a	0	n/a	0
	SB	LT	n/a	0	n/a	0	n/a	0	n/a	0
George Washington Boulevard	WB	LR	28	65	27	66	50	101	127	209
at Rockland Circle	NB	TR	60	98	67	108	76	125	170	244
	SB	L	3	11	3	11	5	17	12	29
		T	27	48	26	48	31	57	77	117
Rockland Circle at	EB	LT	n/a	n/a	n/a	n/a	n/a	3	n/a	3
Site Driveway	WB	TR	n/a	n/a	n/a	n/a	n/a	0	n/a	0
	SB	LR	n/a	n/a	n/a	n/a	n/a	5	n/a	15

1 50th percentile queue length, in feet
2 95th percentile queue length, in feet
n/a Not applicable