



To: Mr. Christopher Ryan
Planning Director
Belmont Office of Planning and Building
19 Moore Street, 2nd Floor
Belmont, MA 02478

Date: March 7, 2025

Project #: 13555.11

From: Vinod K. Kalikiri, PE, PTOE
Chelsea Sadler, TDM-CP

Re: Response to 2/14/25 Transportation Peer Review
McLean Hospital Zone 4 CAC Development
Belmont, Massachusetts

This memorandum summarizes the response to the February 14, 2025 peer review comments prepared by the Town of Belmont’s traffic peer review consultant, Howard Stein Hudson (HSH) based on their review of the Transportation Impact Assessment¹ (TIA) for the proposed Zone 4 development of the Child and Adolescent Campus (CAC) on the McLean Hospital campus.

Comments that are noted as “no further action is required” have been omitted from this response document. The numbering of the paraphrased comments herein match the numbering in the peer review letter.

February 2025 TIA Comments and Responses

Comment 2: *HSH noted that the afternoon school dismissal peak (approximately 2:00 PM – 3:00 PM), when a majority of the afternoon traffic leaves Zone 4, was not counted and requested justification for not collecting traffic data for that specific hour.*

Response: The afternoon peak analysis in the TIA was performed from 4:45 PM – 5:45 PM as the traffic data indicated that the general roadway traffic in the area peaks at that time due to the presence of commuter traffic on the roadways. Performing traffic analysis during the commuting peak hour is also consistent with the requirements outlined in the superseded 1999 Traffic Monitoring and Mitigation Agreement (1999 TMMA) that had included certain traffic thresholds applicable to the commuting peak hours. Nonetheless, based on the peer review comment, record data that was originally collected in November 2024 for the preparation of the TIA was reviewed and the data for the school dismissal peak was processed and extracted. A comparison of the 2:00 PM – 3:00 PM traffic count data and the 4:45 PM – 5:45 PM data used in the TIA indicated the following.

- › At the intersection of Trapelo Road at Pleasant Street, approximately 472 fewer vehicles (20% fewer vehicles) traveled during 2:00 PM – 3:00 PM than during 4:45 PM – 5:45 PM.
- › At the intersection of Pleasant Street at Olmsted Drive, approximately 141 fewer vehicles (16% fewer vehicles) traveled during 2:00 PM – 3:00 PM than during 4:45 PM – 5:45 PM.

The comparison indicates traffic volume during 2:00 PM – 3:00 PM is in fact noticeably lower than during 4:45 PM – 5:45 PM. The new count worksheets for the 2:00 PM – 3:00 PM timeframe are included in the attachment to this memorandum.

Comments 3&6: *HSH requested confirmation that vehicular traffic generated by Zone 4 during the 2:00 PM – 3:00 PM peak hour does not negatively impact the traffic operations in the study area.*

¹ McLean Hospital - Zone 4: Child and Adolescent Campus, Transportation Impact Assessment dated February 4, 2025, prepared by VHB

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Response: Additional traffic operational analysis was performed at the study locations using the newly processed turning movement count data developed in Response #2 and the Zone 4 trip generation estimate for the 2:00 PM – 3:00 PM school dismissal peak that was included in the TIA. Worksheets for the additional analysis are included in the attachment to this memorandum. The analysis results are included in Tables 1 and 2. For comparison purposes, the tables also include the 4:45 – 5:45 PM commuter peak hour results that were summarized in the TIA.

At the intersection of Trapelo Road at Pleasant Street, the results are slightly better for the 2:00 – 3:00 PM analysis with a LOS B and 4 seconds less overall delay when compared to the results that were presented in the TIA.

At the intersection of Pleasant Street at Olmsted Drive, even with the higher exiting trip generation from 2:00 – 3:00 PM, the delay for vehicles on the stop-controlled southbound approach of Olmsted Drive only increased by about 3 seconds, with no change in the LOS, when compared to the 4:45 – 5:45 PM results that were presented in the TIA. Additionally, as discussed in the TIA, Olmsted Drive's operations do not impact the through traffic flow on Pleasant Street under any of the analysis scenarios.

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Memorandum

Table 1 Signalized Intersection Operations Analysis (PM Peak Comparison)

	2024 Existing Conditions					2031 No-Build Conditions					2031 Build Conditions				
	v/c ^a	Del ^b	LOS ^c	50Q ^d	95Q ^e	v/c	Del	LOS	50Q	95Q	v/c	Del	LOS	50Q	95Q
Trapelo Road (Route 60) at Pleasant Street (Route 60)															
<i>Weekday Afternoon (TIA 4:45 – 5:45 PM)</i>															
Trapelo Road EB L	0.66	17	B	53	128	0.74	25	C	82	172	0.74	25	C	84	173
Trapelo Road EB T	0.59	11	B	201	335	0.65	12	B	246	382	0.65	12	B	250	382
Trapelo Road WB T/R	0.63	21	C	209	326	0.71	24	C	254	355	0.71	24	C	257	355
Private Driveway NB L/T/R	0.00	0	A	0	0	0.00	0	A	0	0	0.00	0	A	0	0
Pleasant Street SB L	0.74	51	D	113	183	0.79	54	D	126	#223	0.80	54	D	129	#231
Pleasant Street SB R	0.36	13	B	61	98	0.37	14	B	67	114	0.38	14	B	70	120
Overall	0.74	19	B	-	-	0.79	22	C	-	-	0.80	23	C	-	-
<i>Weekday Afternoon (2:00 – 3:00 PM)</i>															
Trapelo Road EB L	0.40	8	A	31	63	0.46	10	A	36	68	0.59	12	B	51	87
Trapelo Road EB T	0.41	8	A	109	192	0.44	9	A	127	210	0.44	9	A	134	210
Trapelo Road WB T/R	0.46	15	B	138	220	0.50	16	B	157	242	0.55	19	B	174	276
Private Driveway NB L/T/R	0.00	0	A	0	0	0.00	0	A	0	0	0.00	0	A	0	0
Pleasant Street SB L	0.70	49	D	101	164	0.74	51	D	113	183	0.78	53	D	123	#208
Pleasant Street SB R	0.45	15	B	71	122	0.48	17	B	85	141	0.53	18	B	110	161
Overall	0.70	16	B	-	-	0.74	17	B	-	-	0.78	19	B	-	-

a volume to capacity ratio

b delay, measured in seconds

c level of service

d 50th percentile queue in feet

e 95th percentile queue in feet

95th percentile volume exceeds capacity and queues may be longer

Table 2 Unsignalized Intersection Operations Analysis (PM Peak Comparison)

	2024 Existing Conditions			2031 No-Build Conditions			2031 Build Conditions		
	Del ^a	LOS ^b	95Q ^c	Del	LOS	95Q	Del	LOS	95Q
Olmsted Drive at Pleasant Street (Route 60)									
<i>Weekday Afternoon (TIA 4:45 – 5:45 PM)</i>									
Olmsted Drive SB L/R	15	C	3	17	C	8	17	C	15
<i>Weekday Afternoon (2:00 – 3:00 PM)</i>									
Olmsted Drive SB L/R	13	B	3	14	B	8	20	C	45

a delay, measured in seconds

b level of service

c 95th percentile queue in feet



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Comment 7: *HSH requests the Applicant provide minimum required sight distances, calculated in conformance with the latest edition of the American Association of State Highway Transportation Officials' (AASHTO's) A Policy on the Geometric Design of Highway and Streets (the Green Book). HSH encourages the Applicant to utilize these dimensions to ensure that the Project maintains the minimum required sight lines at all proposed driveway intersections.*

Response: Graphical exhibits showing that the available intersection sight distance (ISD) measurements exceed the desired ISD values at the two new driveway intersections are included in the attachments to this memorandum. While not critical to the discussion, the exhibits also tabulate the available and required stopping sight distance (SSD) values for the two new driveway intersections. These exhibits confirm that adequate sight distances, based on AASHTO requirements, will be available at the two new driveway intersections on Olmsted Drive.

Comment 12: *HSH requests the Applicant detail the number of secure bicycle parking spaces that will be provided within the garage.*

Response: Section 5.1 of the McLean Hospital District zoning requires one bicycle parking space for every 20 vehicle parking spaces. Based on the proposed parking space count of 270 spaces, approximately 14 bicycle spaces are required. The current design calls for 14 secured bicycle parking spaces in the parking garage.

Comment 13: *HSH requested the anticipated loading and service activity expected to occur on site and AutoTURN sketches for both emergency and delivery vehicles be provided.*

Response: The following list of loading/delivery/service approximate vehicle count was prepared based on feedback from McLean Hospital operations staff.

- › Trash removal: Operations are coordinated with Zone 5 trash removal operations, and the trips typically occur via the internal gated connection. A pickup truck is used for this internal campus operation.
- › Food deliveries: Supported by outside vendors, via Olmsted Drive. The residential program will have food deliveries three times a day. Snacks and "hospital food" are coordinated with Zone 5 operations, and authorized campus vehicles transporting food between the zones will use the internal dated connection.
- › Linen Delivery: Expected twice per day, seven days a week via cargo van.
- › Soiled Linen Pickup: Expected twice per day, seven days a week via cargo van.
- › Other Deliveries: Expected three times per week via cargo van.

As noted, a majority of the service/delivery trips are coordinated with operations in Zone 5 and will be made via authorized campus vehicles that use the internal gated access between Zones 4 and 5. External vendor trips would make the trips via Olmsted Drive. Majority of daily service/delivery vehicles that will use Olmsted Drive will be the size of a cargo van or smaller. To the extent practical, these trips will be planned to not coincide with the school drop-off/pick-up operations.

AutoTURN turning templates are included in the attachment to this memorandum.

Comment 14: *HSH encourages the Applicant to ensure pedestrian accommodations conform to ADA requirements. HSH also encourages the Applicant to install sharrow pavement markings or other applicable signage that will inform motorists that the roadways are shared with cyclists.*

Response: The pedestrian accommodations depicted on the site plans have been designed to conform to ADA requirements. As noted in the comment letter, the final construction documents will depict sharrow pavement markings or other applicable signage that are designed to inform motorists that the internal roadways are shared with cyclists.

Comment 15: *HSH requests that the Applicant evaluate the short-term construction impacts of the Project and provide details of the overall construction schedule, working hours, number of construction workers, transportation and parking, number of construction vehicles, and routes to and from the Project site. To minimize transportation impacts during the construction period, HSH recommends the Project Proponent encourage construction workers to carpool by limiting the number of construction worker parking spaces on site and providing secure space on site for workers' supplies and tools.*

Response: Graphical construction logistics plans were included in the December 16, 2024 site plan submittal package and a Construction Management Plan (CMP) narrative was submitted to the Planning Board on January 27, 2025. These materials include preliminary information that is available to the Proponent at the current state of design development. The Proponent commits to providing an updated CMP to the Town that will include details such as construction schedule, working hours, number of construction workers and routes to and from the Project site, as the project nears construction. Additionally, certain elements of the CMP, such as the construction schedule, will need to be coordinated with Zone 3 developer as and when their development advances to construction.

Comment 16: *HSH requests the Applicant provide the approximate width of proposed pedestrian pathways. The Applicant should provide AutoTURN sketches to demonstrate that emergency, refuse removal service, and delivery vehicles can navigate the site.*

Response: AutoTURN sketches are included in the attachment to this memorandum. An updated site layout plan, showing the proposed width of proposed pedestrian pathways, is also included in the attachment.

Attachments

- › 2 -3 PM Turning Movement Counts - Trapelo Road at Pleasant Street
- › Capacity analysis worksheets for 2 - 3 PM (Existing, No-Build, and Build)
- › Sight distance exhibits
- › AutoTURN turning templates

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	95	39	0	134	61	0	27	0	88	23	135	0	0	158	0	0	0	0	0	380
2:15 PM	0	109	36	0	145	62	0	45	0	107	32	135	0	0	167	0	0	0	0	0	419
2:30 PM	0	127	51	0	178	71	0	54	0	125	33	163	0	0	196	0	0	0	0	0	499
2:45 PM	0	174	55	0	229	56	0	49	0	105	40	171	0	0	211	0	0	0	0	0	545
Total	0	505	181	0	686	250	0	175	0	425	128	604	0	0	732	0	0	0	0	0	1843
Grand Total	0	505	181	0	686	250	0	175	0	425	128	604	0	0	732	0	0	0	0	0	1843
Approach %	0.0	73.6	26.4	0.0		58.8	0.0	41.2	0.0		17.5	82.5	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	27.4	9.8	0.0	37.2	13.6	0.0	9.5	0.0	23.1	6.9	32.8	0.0	0.0	39.7	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	854					309					680					0					1843
Cars	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804
% Cars	0.0	98.2	98.3	0.0	98.3	98.4	0.0	97.1	0.0	97.9	95.3	98.0	0.0	0.0	97.5	0.0	0.0	0.0	0.0	0.0	97.9
Exiting Leg Total	838					300					666					0					1804
Heavy Vehicles	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
% Heavy Vehicles	0.0	1.8	1.7	0.0	1.7	1.6	0.0	2.9	0.0	2.1	4.7	2.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.1
Exiting Leg Total	16					9					14					0					39

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	95	39	0	134	61	0	27	0	88	23	135	0	0	158	0	0	0	0	0	380
2:15 PM	0	109	36	0	145	62	0	45	0	107	32	135	0	0	167	0	0	0	0	0	419
2:30 PM	0	127	51	0	178	71	0	54	0	125	33	163	0	0	196	0	0	0	0	0	499
2:45 PM	0	174	55	0	229	56	0	49	0	105	40	171	0	0	211	0	0	0	0	0	545
Total Volume	0	505	181	0	686	250	0	175	0	425	128	604	0	0	732	0	0	0	0	0	1843
% Approach Total	0.0	73.6	26.4	0.0		58.8	0.0	41.2	0.0		17.5	82.5	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.726	0.823	0.000	0.749	0.880	0.000	0.810	0.000	0.850	0.800	0.883	0.000	0.000	0.867	0.000	0.000	0.000	0.000	0.000	0.845
Cars	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804
Cars %	0.0	98.2	98.3	0.0	98.3	98.4	0.0	97.1	0.0	97.9	95.3	98.0	0.0	0.0	97.5	0.0	0.0	0.0	0.0	0.0	97.9
Heavy Vehicles	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
Heavy Vehicles %	0.0	1.8	1.7	0.0	1.7	1.6	0.0	2.9	0.0	2.1	4.7	2.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.1
Cars Enter Leg	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804
Heavy Enter Leg	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
Total Entering Leg	0	505	181	0	686	250	0	175	0	425	128	604	0	0	732	0	0	0	0	0	1843
Cars Exiting Leg	838					300					666					0					1804
Heavy Exiting Leg	16					9					14					0					39
Total Exiting Leg	854					309					680					0					1843

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Cars

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total	
	from North					from East					from South					from West						
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total		
2:00 PM	0	94	39	0	133	60	0	26	0	86	21	130	0	0	151	0	0	0	0	0	370	
2:15 PM	0	107	35	0	142	62	0	42	0	104	30	132	0	0	162	0	0	0	0	0	408	
2:30 PM	0	126	50	0	176	71	0	54	0	125	32	160	0	0	192	0	0	0	0	0	493	
2:45 PM	0	169	54	0	223	53	0	48	0	101	39	170	0	0	209	0	0	0	0	0	533	
Total	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804	
Grand Total	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804	
Approach %	0.0	73.6	26.4	0.0		59.1	0.0	40.9	0.0		17.1	82.9	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	27.5	9.9	0.0	37.4	13.6	0.0	9.4	0.0	23.1	6.8	32.8	0.0	0.0	39.6	0.0	0.0	0.0	0.0	0.0		
Exiting Leg Total					838					300					666						0	1804

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total	
	from North					from East					from South					from West						
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total		
2:00 PM	0	94	39	0	133	60	0	26	0	86	21	130	0	0	151	0	0	0	0	0	370	
2:15 PM	0	107	35	0	142	62	0	42	0	104	30	132	0	0	162	0	0	0	0	0	408	
2:30 PM	0	126	50	0	176	71	0	54	0	125	32	160	0	0	192	0	0	0	0	0	493	
2:45 PM	0	169	54	0	223	53	0	48	0	101	39	170	0	0	209	0	0	0	0	0	533	
Total Volume	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804	
% Approach Total	0.0	73.6	26.4	0.0		59.1	0.0	40.9	0.0		17.1	82.9	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.734	0.824	0.000	0.756	0.866	0.000	0.787	0.000	0.832	0.782	0.871	0.000	0.000	0.854	0.000	0.000	0.000	0.000	0.000	0.846	
Entering Leg	0	496	178	0	674	246	0	170	0	416	122	592	0	0	714	0	0	0	0	0	1804	
Exiting Leg					838					300					666						0	1804
Total					1512					716					1380						0	3608

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**



Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	1	0	0	1	1	0	1	0	2	2	5	0	0	7	0	0	0	0	0	10
2:15 PM	0	2	1	0	3	0	0	3	0	3	2	3	0	0	5	0	0	0	0	0	11
2:30 PM	0	1	1	0	2	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	6
2:45 PM	0	5	1	0	6	3	0	1	0	4	1	1	0	0	2	0	0	0	0	0	12
Total	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
Grand Total	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
Approach %	0.0	75.0	25.0	0.0		44.4	0.0	55.6	0.0		33.3	66.7	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	23.1	7.7	0.0	30.8	10.3	0.0	12.8	0.0	23.1	15.4	30.8	0.0	0.0	46.2	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	16					9					14					0					39
Buses	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7
% Buses	0.0	33.3	66.7	0.0	41.7	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	17.9
Exiting Leg Total	2					2					3					0					7
Single-Unit Trucks	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
% Single-Unit	0.0	55.6	33.3	0.0	50.0	75.0	0.0	100.0	0.0	88.9	50.0	83.3	0.0	0.0	72.2	0.0	0.0	0.0	0.0	0.0	69.2
Exiting Leg Total	13					4					10					0					27
Articulated Trucks	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
% Articulated	0.0	11.1	0.0	0.0	8.3	25.0	0.0	0.0	0.0	11.1	50.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	12.8
Exiting Leg Total	1					3					1					0					5

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

2:00 PM	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	1	0	0	1	1	0	1	0	2	2	5	0	0	7	0	0	0	0	0	10
2:15 PM	0	2	1	0	3	0	0	3	0	3	2	3	0	0	5	0	0	0	0	0	11
2:30 PM	0	1	1	0	2	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	6
2:45 PM	0	5	1	0	6	3	0	1	0	4	1	1	0	0	2	0	0	0	0	0	12
Total Volume	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
% Approach Total	0.0	75.0	25.0	0.0		44.4	0.0	55.6	0.0		33.3	66.7	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.450	0.750	0.000	0.500	0.333	0.000	0.417	0.000	0.563	0.750	0.600	0.000	0.000	0.643	0.000	0.000	0.000	0.000	0.000	0.813
Buses	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7
Buses %	0.0	33.3	66.7	0.0	41.7	0.0	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	17.9
Single-Unit Trucks	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
Single-Unit %	0.0	55.6	33.3	0.0	50.0	75.0	0.0	100.0	0.0	88.9	50.0	83.3	0.0	0.0	72.2	0.0	0.0	0.0	0.0	0.0	69.2
Articulated Trucks	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
Articulated %	0.0	11.1	0.0	0.0	8.3	25.0	0.0	0.0	0.0	11.1	50.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	12.8
Buses	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7
Single-Unit Trucks	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
Articulated Trucks	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
Total Entering Leg	0	9	3	0	12	4	0	5	0	9	6	12	0	0	18	0	0	0	0	0	39
Buses	2					2					3					0					7
Single-Unit Trucks	13					4					10					0					27
Articulated Trucks	1					3					1					0					5
Total Exiting Leg	16					9					14					0					39

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Buses

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total	
	from North					from East					from South					from West						
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total		
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	
2:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	
2:30 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7	
Grand Total	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7	
Approach %	0.0	60.0	40.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0			
Total %	0.0	42.9	28.6	0.0	71.4	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0		
Exiting Leg Total						2					2					3					0	7

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total	
	from North					from East					from South					from West						
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total		
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	
2:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	
2:30 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7	
% Approach Total	0.0	60.0	40.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0			
PHF	0.000	0.750	0.500	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.875	
Entering Leg	0	3	2	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	7	
Exiting Leg						2					2					3					0	7
Total						7					2					5					0	14

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Single-Unit Trucks

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	1	0	0	1	1	0	1	0	2	1	4	0	0	5	0	0	0	0	0	8
2:15 PM	0	0	1	0	1	0	0	3	0	3	2	2	0	0	4	0	0	0	0	0	8
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
2:45 PM	0	4	0	0	4	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	8
Total	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
Grand Total	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
Approach %	0.0	83.3	16.7	0.0		37.5	0.0	62.5	0.0		23.1	76.9	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	18.5	3.7	0.0	22.2	11.1	0.0	18.5	0.0	29.6	11.1	37.0	0.0	0.0	48.1	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	13					4					10					0					27

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	1	0	0	1	1	0	1	0	2	1	4	0	0	5	0	0	0	0	0	8
2:15 PM	0	0	1	0	1	0	0	3	0	3	2	2	0	0	4	0	0	0	0	0	8
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
2:45 PM	0	4	0	0	4	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	8
Total Volume	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
% Approach Total	0.0	83.3	16.7	0.0		37.5	0.0	62.5	0.0		23.1	76.9	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.313	0.250	0.000	0.375	0.375	0.000	0.417	0.000	0.667	0.375	0.625	0.000	0.000	0.650	0.000	0.000	0.000	0.000	0.000	0.844
Entering Leg	0	5	1	0	6	3	0	5	0	8	3	10	0	0	13	0	0	0	0	0	27
Exiting Leg	13					4					10					0					27
Total	19					12					23					0					54

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Articulated Trucks

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
2:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
Total	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
Grand Total	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
Approach %	0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
Total %	0.0	20.0	0.0	0.0	20.0	20.0	0.0	0.0	0.0	20.0	60.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	1					3					1					0					5

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

	Trapelo Road					Pleasant Street (Route 60)					Trapelo Road					#570/574 Shared Driveways					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
2:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
Total Volume	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
% Approach Total	0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.250	0.750	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.625
Entering Leg	0	1	0	0	1	1	0	0	0	1	3	0	0	0	3	0	0	0	0	0	5
Exiting Leg	1					3					1					0					5
Total	2					4					4					0					10

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Trapelo Road								Pleasant Street (Route 60)								Trapelo Road								#570/574 Shared Driveways								Total
	from North								from East								from South								from West								
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total		Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total		Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total		Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2				
Grand Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2					
Approach %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Exiting Leg Total	2								0								0								2								

Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

2:00 PM	Trapelo Road								Pleasant Street (Route 60)								Trapelo Road								#570/574 Shared Driveways								Total
	from North								from East								from South								from West								
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total		Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total		Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total		Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
Total Volume	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2					
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.500					
Entering Leg	0								1								0								2								
Exiting Leg	2								0								0								2								
Total	2								1								1								4								

PDI File #: **240294 B (2-3pm)**
 Location: **N: Trapelo Road S: Trapelo Road**
 Location: **E: Pleasant Street (Route 60) W: #570/574 Shared Driveways**
 City, State: **Belmont, MA**
 Client: **VHB/ V. Kalikiri**
 Site Code: **13555.11**
 Count Date: **Thursday, November 21, 2024**
 Start Time: **2:00 PM**
 End Time: **3:00 PM**
 Class:



Pedestrians

	Trapelo Road								Pleasant Street (Route 60)								Trapelo Road								#570/574 Shared Driveways								Total						
	from North								from East								from South								from West														
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total		Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total		Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total		Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total								
2:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	
2:30 PM	0	0	0	0	0	1	1	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
2:45 PM	0	0	0	0	1	1	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	
Total	0	0	0	0	1	4	5	0	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	17	
Grand Total	0	0	0	0	1	4	5	0	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	17	
Approach %	0	0	0	0	20	80		0	0	0	0	33.3	66.7		0	0	0	0	0	0	0		0	0	0	0	0	0	100										
Total %	0	0	0	0	5.88	23.5	29.4	0	0	0	0	11.8	23.5	35.3	0	0	0	0	0	0	0		0	0	0	0	0	0	35.3	35.3									
Exiting Leg Total	5							6							0							6							17										

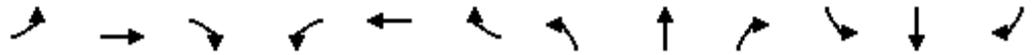
Peak Hour Analysis from 02:00 PM to 03:00 PM begins at:

	Trapelo Road								Pleasant Street (Route 60)								Trapelo Road								#570/574 Shared Driveways								Total						
	from North								from East								from South								from West														
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total		Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total		Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total		Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total								
2:00 PM	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	
2:30 PM	0	0	0	0	0	1	1	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
2:45 PM	0	0	0	0	1	1	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	8	
Total Volume	0	0	0	0	1	4	5	0	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	17	
% Approach Total	0.0	0.0	0.0	0.0	20.0	80.0		0.0	0.0	0.0	0.0	33.3	66.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	100.0										
PHF	0.000	0.000	0.000	0.000	0.250	1.000	0.625	0.000	0.000	0.000	0.000	0.500	0.500	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.375	0.375	0.531									
Entering Leg	0	0	0	0	1	4	5	0	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	17	
Exiting Leg	5							6							0							6							17										
Total	10							12							0							12							34										

McLean TIA
1: Private Driveway/Pleasant Street & Trapelo Road

2024 Existing Condition - PM (2-3 PM)

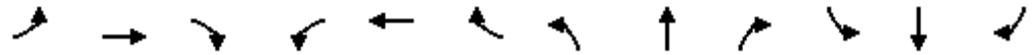
Timing Plan: PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	505	0	0	605	130	0	0	0	175	0	255
Future Volume (vph)	180	505	0	0	605	130	0	0	0	175	0	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	16	16	16	15	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1728	1818	0	0	3371	0	0	2153	0	1928	0	1583
Flt Permitted	0.258									0.757		
Satd. Flow (perm)	469	1818	0	0	3371	0	0	2153	0	1536	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					32							103
Link Speed (mph)		30			30			30				30
Link Distance (ft)		732			503			198				678
Travel Time (s)		16.6			11.4			4.5				15.4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.90	0.90	0.90	0.92	0.92	0.92	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	3%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	510	0	0	816	0	0	0	0	188	0	274
Turn Type	pm+pt	NA			NA					Perm		custom
Protected Phases	5	2			6			8				4
Permitted Phases	2						8			4		5
Detector Phase	5	2			6		8	8		4		4
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0		5.0		5.0
Minimum Split (s)	24.0	24.0			24.0		24.0	24.0		24.0		24.0
Total Split (s)	24.0	64.0			40.0		26.0	26.0		26.0		26.0
Total Split (%)	26.7%	71.1%			44.4%		28.9%	28.9%		28.9%		28.9%
Yellow Time (s)	4.0	4.0			4.0		3.0	3.0		3.0		3.0
All-Red Time (s)	2.0	2.0			2.0		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0			0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0			6.0			6.0		6.0		6.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	Min	C-Min			C-Max		Min	Min		Min		Min
Act Effct Green (s)	62.3	62.3			47.4					15.7		30.6
Actuated g/C Ratio	0.69	0.69			0.53					0.17		0.34
v/c Ratio	0.40	0.41			0.46					0.70		0.45
Control Delay	8.2	7.7			14.8					48.9		15.4
Queue Delay	0.0	0.0			0.0					0.0		0.0
Total Delay	8.2	7.7			14.8					48.9		15.4

McLean TIA
 1: Private Driveway/Pleasant Street & Trapelo Road

2024 Existing Condition - PM (2-3 PM)
 Timing Plan: PM Peak Hour

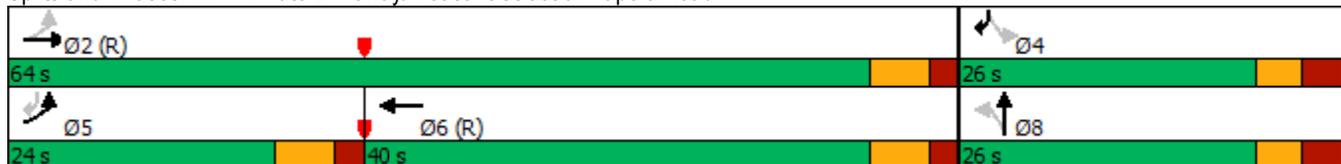


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A			B					D		B
Approach Delay		7.8			14.8						29.0	
Approach LOS		A			B						C	
Queue Length 50th (ft)	31	109			138					101		71
Queue Length 95th (ft)	63	192			220					164		122
Internal Link Dist (ft)		652			423			118			598	
Turn Bay Length (ft)										300		
Base Capacity (vph)	576	1259			1788					341		584
Starvation Cap Reductn	0	0			0					0		0
Spillback Cap Reductn	0	0			0					0		0
Storage Cap Reductn	0	0			0					0		0
Reduced v/c Ratio	0.32	0.41			0.46					0.55		0.47

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 15.7
 Intersection LOS: B
 Intersection Capacity Utilization 53.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Pleasant Street & Trapelo Road



McLean TIA
2: Pleasant Street & Olmstead Drive

2024 Existing Condition - PM (2-3 PM)
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	305	420	10	5	10
Future Vol, veh/h	5	305	420	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	90	90	69	69
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	6	359	467	11	7	14

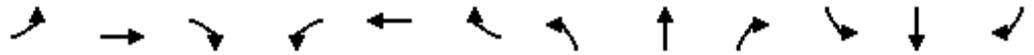
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	478	0	-	0	844 473
Stage 1	-	-	-	-	473 -
Stage 2	-	-	-	-	371 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1095	-	-	-	336 595
Stage 1	-	-	-	-	631 -
Stage 2	-	-	-	-	702 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1095	-	-	-	334 595
Mov Cap-2 Maneuver	-	-	-	-	334 -
Stage 1	-	-	-	-	628 -
Stage 2	-	-	-	-	702 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1095	-	-	-	472
HCM Lane V/C Ratio	0.005	-	-	-	0.046
HCM Control Delay (s)	8.3	-	-	-	13
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

McLean TIA
1: Private Driveway/Pleasant Street & Trapelo Road

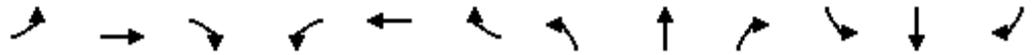
2031 NB Conditions - PM (2-3 PM)
Timing Plan: PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	540	0	0	650	150	0	0	0	195	0	275
Future Volume (vph)	195	540	0	0	650	150	0	0	0	195	0	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	16	16	16	15	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1728	1818	0	0	3365	0	0	2153	0	1928	0	1583
Flt Permitted	0.232									0.757		
Satd. Flow (perm)	422	1818	0	0	3365	0	0	2153	0	1536	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					36							91
Link Speed (mph)		30			30			30				30
Link Distance (ft)		732			503			198				678
Travel Time (s)		16.6			11.4			4.5				15.4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	3%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	545	0	0	870	0	0	0	0	210	0	296
Turn Type	pm+pt	NA			NA					Perm		custom
Protected Phases	5	2			6			8				4
Permitted Phases	2						8			4		5
Detector Phase	5	2			6		8	8		4		4
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0		5.0		5.0
Minimum Split (s)	24.0	24.0			24.0		24.0	24.0		24.0		24.0
Total Split (s)	24.0	64.0			40.0		26.0	26.0		26.0		26.0
Total Split (%)	26.7%	71.1%			44.4%		28.9%	28.9%		28.9%		28.9%
Yellow Time (s)	4.0	4.0			4.0		3.0	3.0		3.0		3.0
All-Red Time (s)	2.0	2.0			2.0		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0			0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0			6.0			6.0		6.0		6.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	Min	C-Min			C-Max		Min	Min		Min		Min
Act Effct Green (s)	61.4	61.4			46.0					16.6		32.0
Actuated g/C Ratio	0.68	0.68			0.51					0.18		0.36
v/c Ratio	0.46	0.44			0.50					0.74		0.48
Control Delay	9.5	8.4			16.1					50.5		16.9
Queue Delay	0.0	0.0			0.0					0.0		0.0
Total Delay	9.5	8.4			16.1					50.5		16.9

McLean TIA
 1: Private Driveway/Pleasant Street & Trapelo Road

2031 NB Conditions - PM (2-3 PM)
 Timing Plan: PM Peak Hour

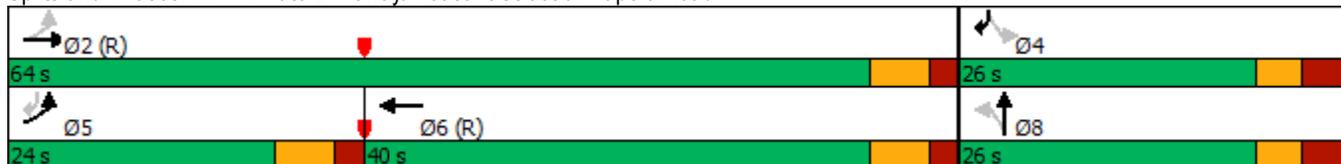


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A			B					D		B
Approach Delay		8.7			16.1						30.8	
Approach LOS		A			B						C	
Queue Length 50th (ft)	36	127			157					113		85
Queue Length 95th (ft)	68	210			242					183		141
Internal Link Dist (ft)		652			423			118			598	
Turn Bay Length (ft)										300		
Base Capacity (vph)	549	1240			1738					341		607
Starvation Cap Reductn	0	0			0					0		0
Spillback Cap Reductn	0	0			0					0		0
Storage Cap Reductn	0	0			0					0		0
Reduced v/c Ratio	0.36	0.44			0.50					0.62		0.49

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	17.0
Intersection LOS:	B
Intersection Capacity Utilization	57.7%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 1: Private Driveway/Pleasant Street & Trapelo Road



McLean TIA
2: Pleasant Street & Olmstead Drive

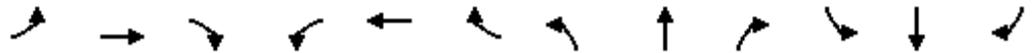
2031 NB Conditions - PM (2-3 PM)
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	325	450	20	15	25
Future Vol, veh/h	20	325	450	20	15	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	22	353	489	22	16	27

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	511	0	-	0	897 500
Stage 1	-	-	-	-	500 -
Stage 2	-	-	-	-	397 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1065	-	-	-	313 575
Stage 1	-	-	-	-	613 -
Stage 2	-	-	-	-	683 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1065	-	-	-	306 575
Mov Cap-2 Maneuver	-	-	-	-	306 -
Stage 1	-	-	-	-	600 -
Stage 2	-	-	-	-	683 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	14.3
HCM LOS			B

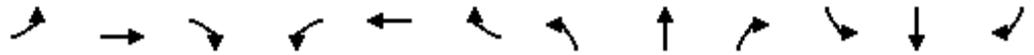
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1065	-	-	-	432
HCM Lane V/C Ratio	0.02	-	-	-	0.101
HCM Control Delay (s)	8.5	-	-	-	14.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	540	0	0	650	170	0	0	0	215	0	330
Future Volume (vph)	250	540	0	0	650	170	0	0	0	215	0	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	16	16	16	15	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	0		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1728	1818	0	0	3355	0	0	2153	0	1928	0	1583
Flt Permitted	0.212									0.757		
Satd. Flow (perm)	386	1818	0	0	3355	0	0	2153	0	1536	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					42							91
Link Speed (mph)		30			30			30				30
Link Distance (ft)		732			503			198				678
Travel Time (s)		16.6			11.4			4.5				15.4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	0%	0%	0%	3%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	253	545	0	0	892	0	0	0	0	231	0	355
Turn Type	pm+pt	NA			NA					Perm		custom
Protected Phases	5	2			6			8				4
Permitted Phases	2						8			4		5
Detector Phase	5	2			6		8	8		4		4
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0		5.0		5.0
Minimum Split (s)	24.0	24.0			24.0		24.0	24.0		24.0		24.0
Total Split (s)	24.0	64.0			40.0		26.0	26.0		26.0		26.0
Total Split (%)	26.7%	71.1%			44.4%		28.9%	28.9%		28.9%		28.9%
Yellow Time (s)	4.0	4.0			4.0		3.0	3.0		3.0		3.0
All-Red Time (s)	2.0	2.0			2.0		3.0	3.0		3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0			0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0			6.0			6.0		6.0		6.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	Min	C-Min			C-Max		Min	Min		Min		Min
Act Effct Green (s)	60.7	60.7			43.2					17.3		34.8
Actuated g/C Ratio	0.67	0.67			0.48					0.19		0.39
v/c Ratio	0.59	0.44			0.55					0.78		0.53
Control Delay	12.0	8.7			18.5					53.0		17.5
Queue Delay	0.0	0.0			0.0					0.0		0.0
Total Delay	12.0	8.7			18.5					53.0		17.5

McLean TIA
 1: Private Driveway/Pleasant Street & Trapelo Road

2031 Build Conditions - PM (2-3 PM)
 Timing Plan: PM Peak Hour

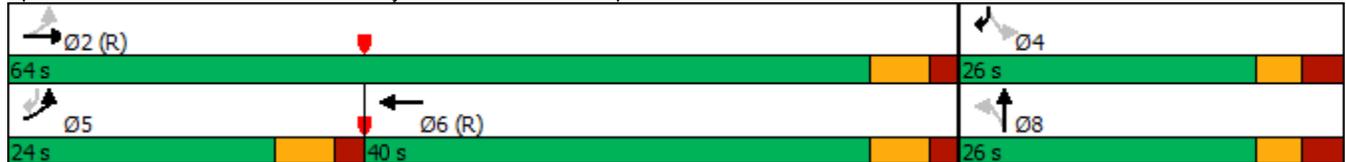


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A			B					D		B
Approach Delay		9.8			18.5						31.5	
Approach LOS		A			B						C	
Queue Length 50th (ft)	51	134			174					123		110
Queue Length 95th (ft)	87	210			276					#208		161
Internal Link Dist (ft)		652			423			118			598	
Turn Bay Length (ft)										300		
Base Capacity (vph)	528	1225			1632					341		645
Starvation Cap Reductn	0	0			0					0		0
Spillback Cap Reductn	0	0			0					0		0
Storage Cap Reductn	0	0			0					0		0
Reduced v/c Ratio	0.48	0.44			0.55					0.68		0.55

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 18.8
 Intersection LOS: B
 Intersection Capacity Utilization 62.5%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Private Driveway/Pleasant Street & Trapelo Road

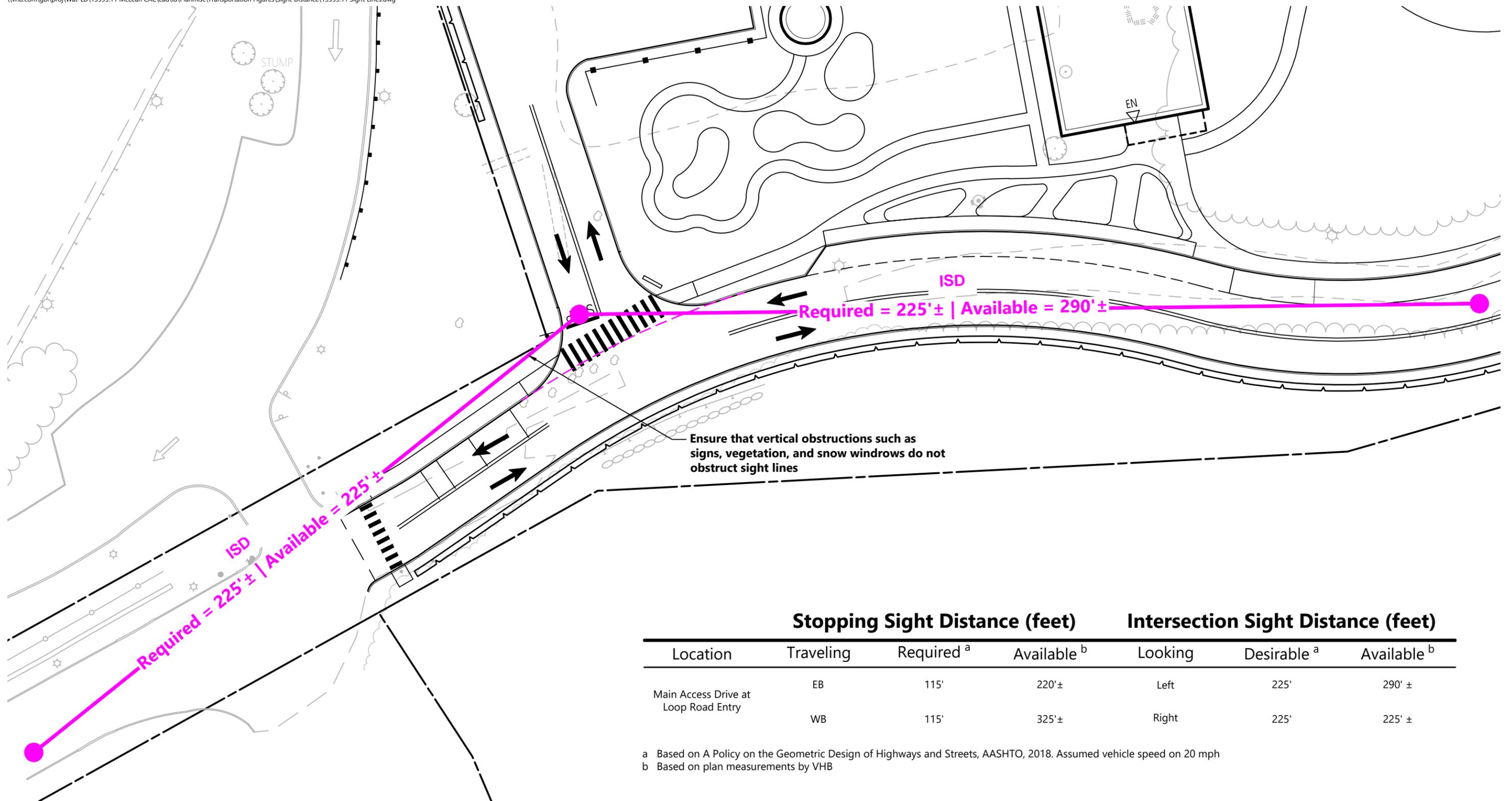


Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	325	450	45	40	100
Future Vol, veh/h	95	325	450	45	40	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	103	353	489	49	43	109

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	538	0	-	0	1073
Stage 1	-	-	-	-	514
Stage 2	-	-	-	-	559
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1040	-	-	-	246
Stage 1	-	-	-	-	605
Stage 2	-	-	-	-	576
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1040	-	-	-	222
Mov Cap-2 Maneuver	-	-	-	-	222
Stage 1	-	-	-	-	545
Stage 2	-	-	-	-	576

Approach	EB	WB	SB
HCM Control Delay, s	2	0	19.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1040	-	-	-	392
HCM Lane V/C Ratio	0.099	-	-	-	0.388
HCM Control Delay (s)	8.8	-	-	-	19.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	1.8



Location	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)			
	Traveling	Required ^a	Available ^b	Looking	Desirable ^a	Available ^b
Main Access Drive at Loop Road Entry	EB	115'	220'±	Left	225'	290'±
	WB	115'	325'±	Right	225'	225'±

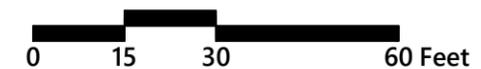
^a Based on A Policy on the Geometric Design of Highways and Streets, AASHTO, 2018. Assumed vehicle speed on 20 mph
^b Based on plan measurements by VHB

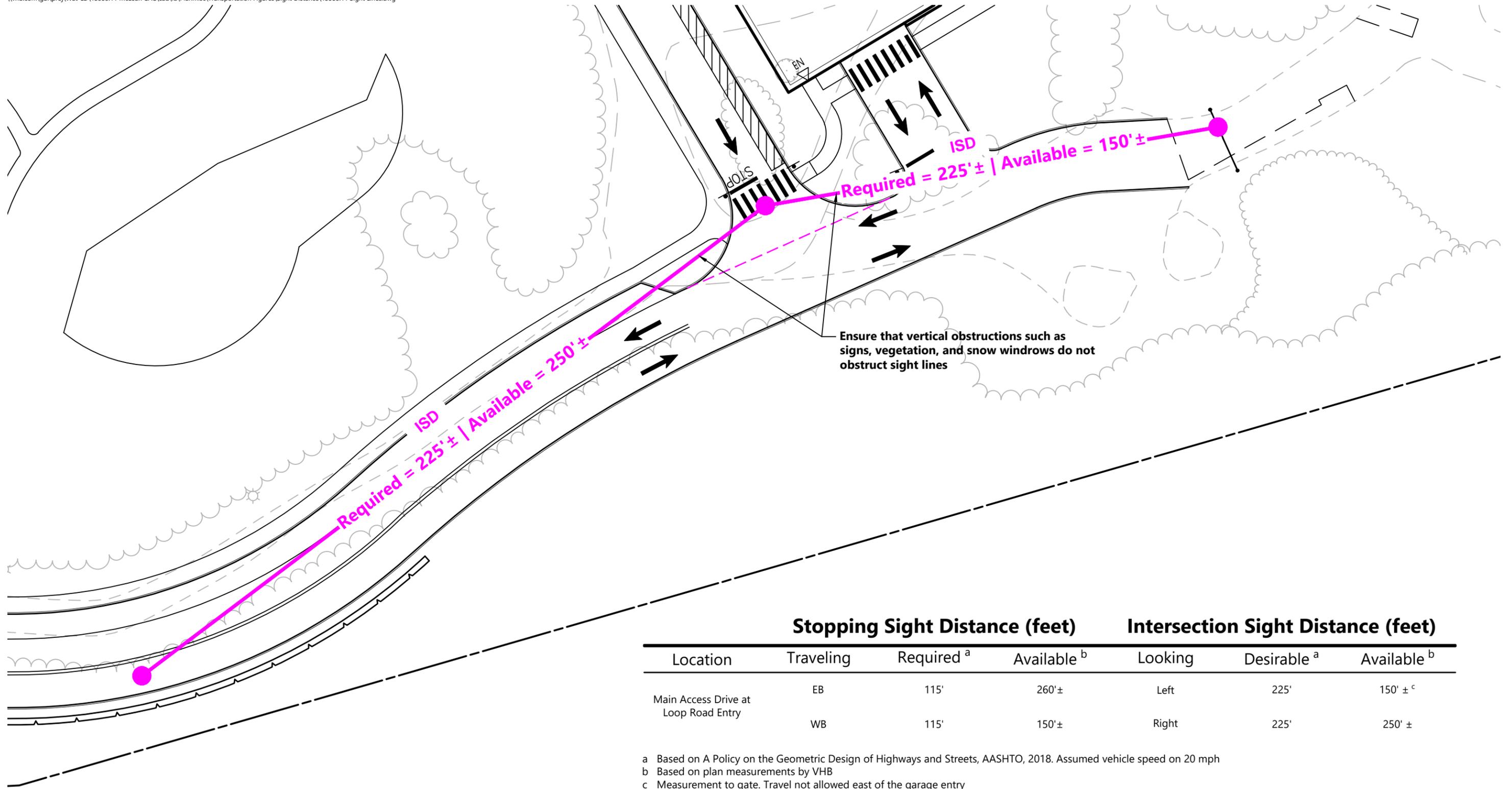
Intersection Sight Distance - Southwest Driveway

McLean Child and Adolescent Campus

Belmont, MA

Source:
 Prepared for: **Local Permitting**
 Date: **February 19, 2025**





Location	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)			
	Traveling	Required ^a	Available ^b	Looking	Desirable ^a	Available ^b
Main Access Drive at Loop Road Entry	EB	115'	260'±	Left	225'	150' ± ^c
	WB	115'	150'±	Right	225'	250' ±

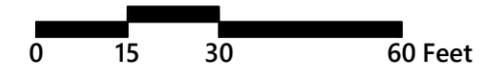
^a Based on A Policy on the Geometric Design of Highways and Streets, AASHTO, 2018. Assumed vehicle speed on 20 mph
^b Based on plan measurements by VHB
^c Measurement to gate. Travel not allowed east of the garage entry

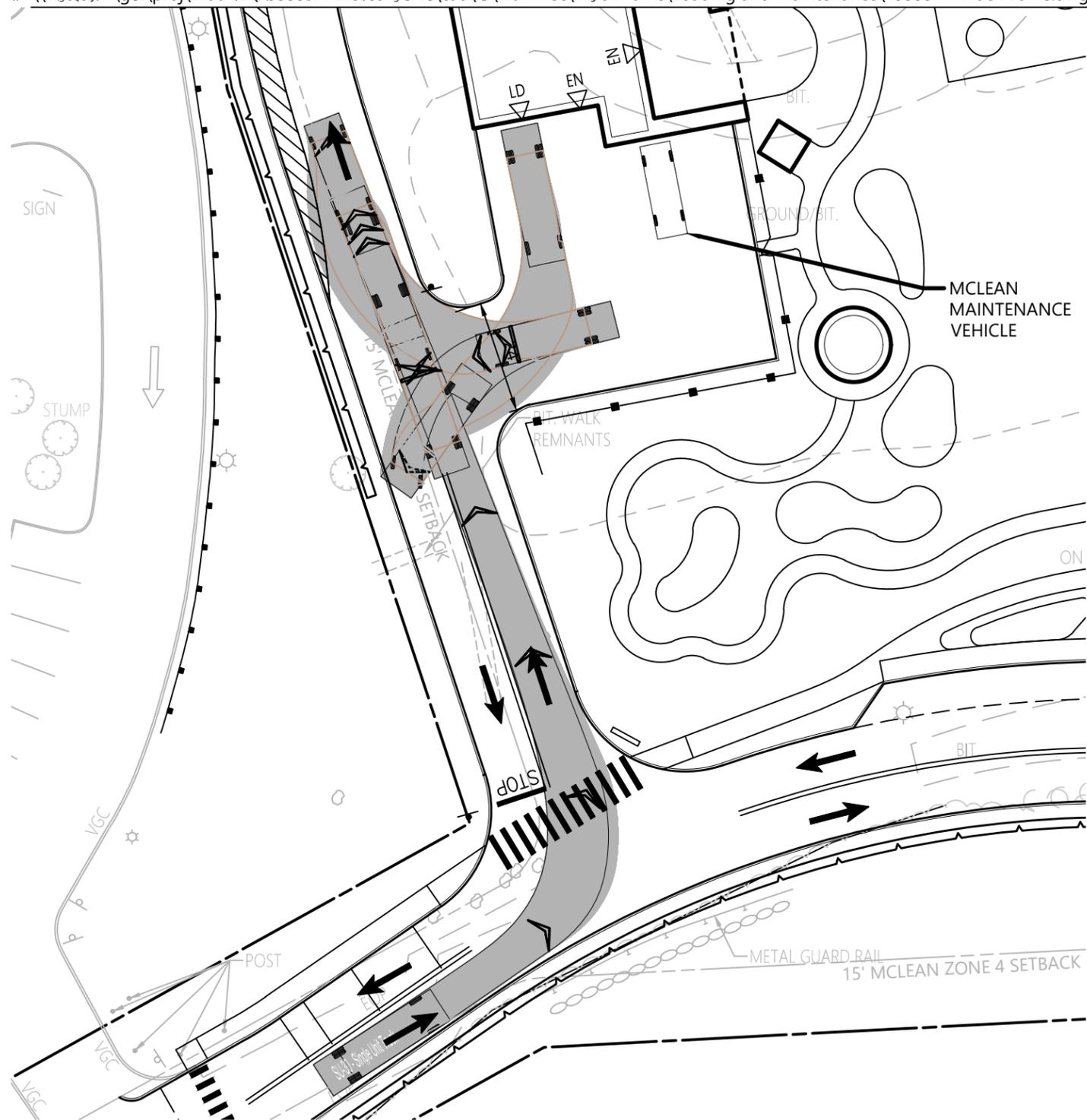
Intersection Sight Distance - Southeast Driveway

McLean Child and Adolescent Campus

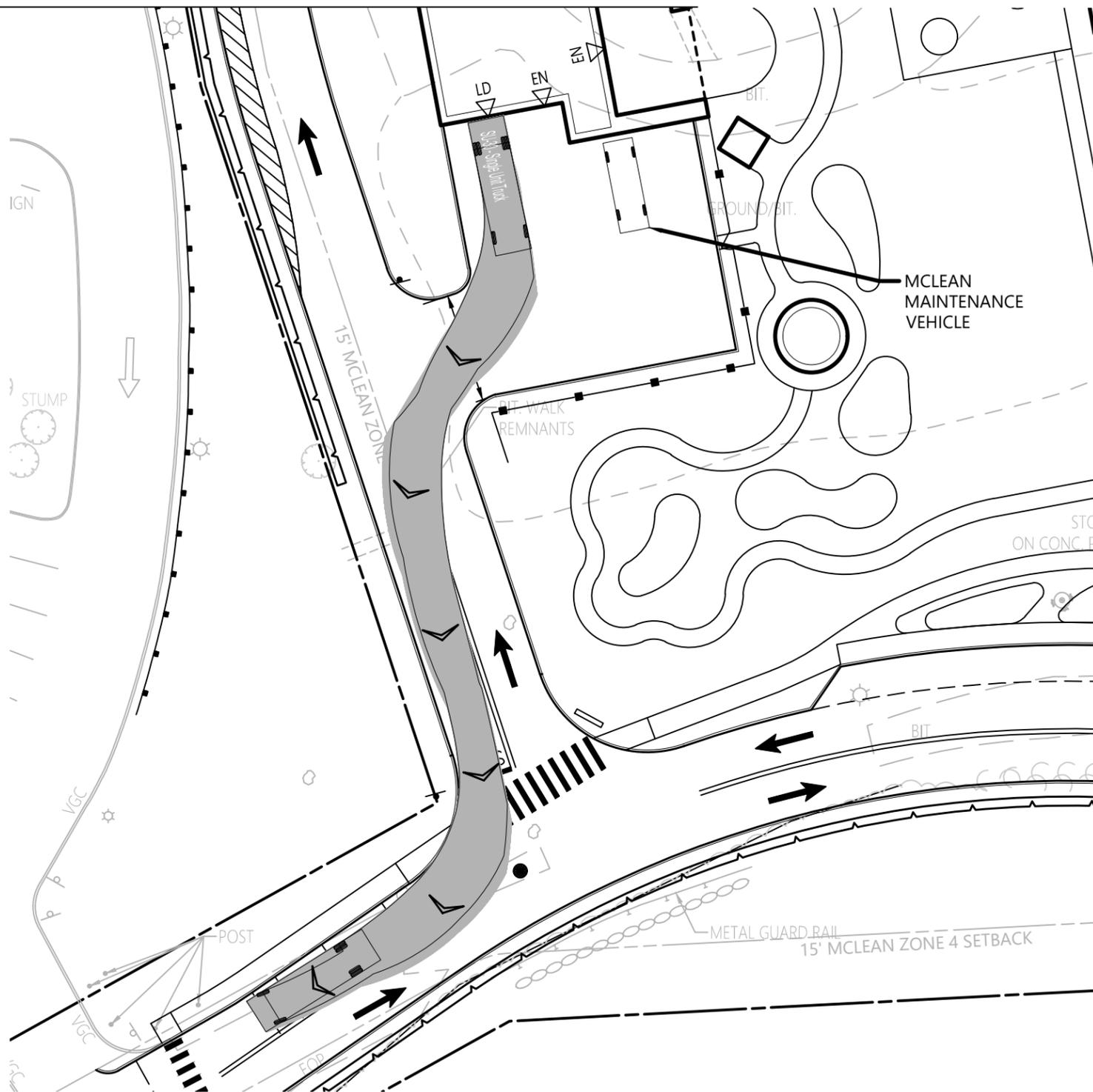
Belmont, MA

Source:
 Prepared for: **Local Permitting**
 Date: **February 19, 2025**





Loading Dock Access



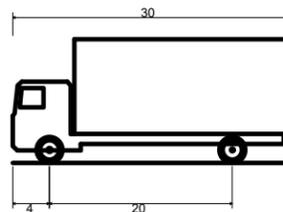
Loading Dock Egress

Loading Dock Turning Movements

McLean Child and Adolescent Campus

Belmont, MA

Source:
Prepared for: **Local Permitting**
Date: **February 18, 2025**



SU-30 - Single Unit Truck
Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock-to-lock time
Max Steering Angle (Virtual)

30.000ft
8.000ft
13.500ft
1.367ft
8.000ft
5.00s
31.80°



