MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Daniel J. Mills, P.E., PTOE

MEMORANDUM

DATE: March 11, 2021

TO: Michael J. Uccellini
UA Senior Manager, LLC
300 Jordan Road
Troy, NY 12180

FROM: Daniel J. Mills, P.E., PTOE – Principal
Jack Lawrence, EIT – Transportation Engineer

RE: **Arbella at Ashland – Age-Restricted Residential Development**
Memorial Drive, Ashland, MA

MDM Transportation Consultants, Inc. (MDM) has prepared this initial traffic memorandum (TM) for the proposed age-restricted multifamily residential development to be located at 0 Memorial Drive in Ashland, MA in response to the Town's request for Level-of-Service analysis at the Site's intersection with Memorial Drive. The project location and surrounding roadway network is shown in **Figure 1**. This memorandum describes baseline traffic volumes for the adjacent roadway, estimates trip generation characteristics of the proposed development, and quantifies incremental traffic impacts of the Site development on the adjacent roadway at the key study location that provides access to the Site.

Key findings of the traffic assessment are as follows:

- *Baseline Traffic Volumes.* The weekday daily traffic volume on Memorial Drive at the proposed Site driveway is approximately 3,020 vehicles per day (vpd) on a weekday with travel patterns highly directional northbound during the weekday morning peak hour and directional southbound during the weekday evening peak hour which is consistent with commuter traffic to/from the Ashland Commuter Rail Station located to the north. Peak hour traffic flow on Memorial Drive is approximately 424 vehicles per hour (vph) during the weekday morning and 462 vph during the weekday evening peak hours representing approximately 15 percent of daily traffic flow.

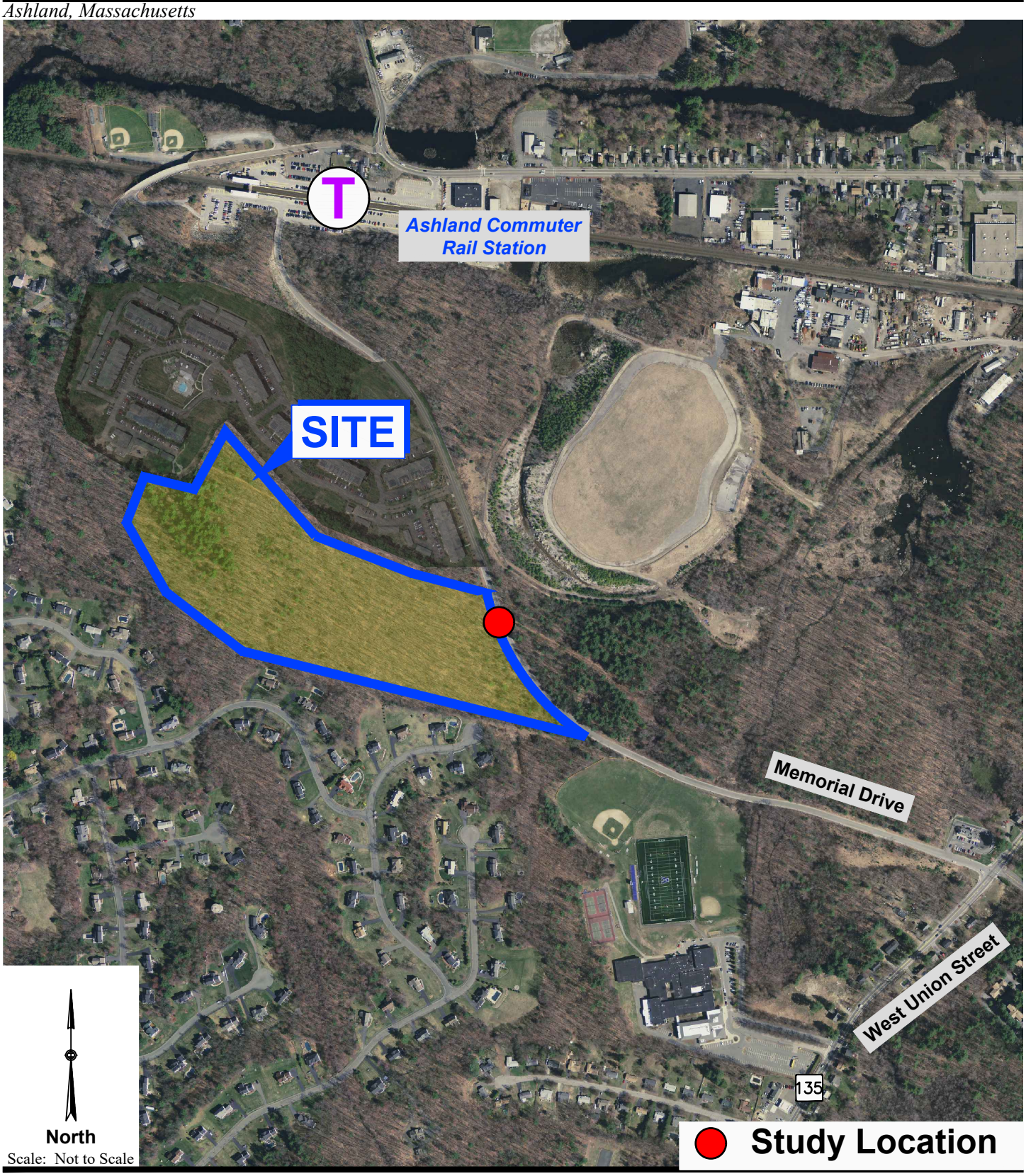

Figure 1

Site Location

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Date: March 2021
Dwg No. 1124 MR01.dwg

- *Adequate Capacity*. The proposed development does not result in any significant change in operations at the proposed intersection location. Therefore, no off-site mitigation is warranted based on the capacity analysis. Specifically, mainline traffic along Memorial Drive will continue to operate at an overall LOS A during the peak hours and the single lane Site Driveway approach to Memorial Drive will operate at LOS B or better during the peak hours. The project will generally result in queue lengths of 1 vehicle or less on all approaches.

In summary, trip generation for the development is projected to be moderate at 45 or fewer trips during commuter peak hours. The proposed development does not result in any significant change in operations to mainline traffic along Memorial Drive.

PROJECT DESCRIPTION

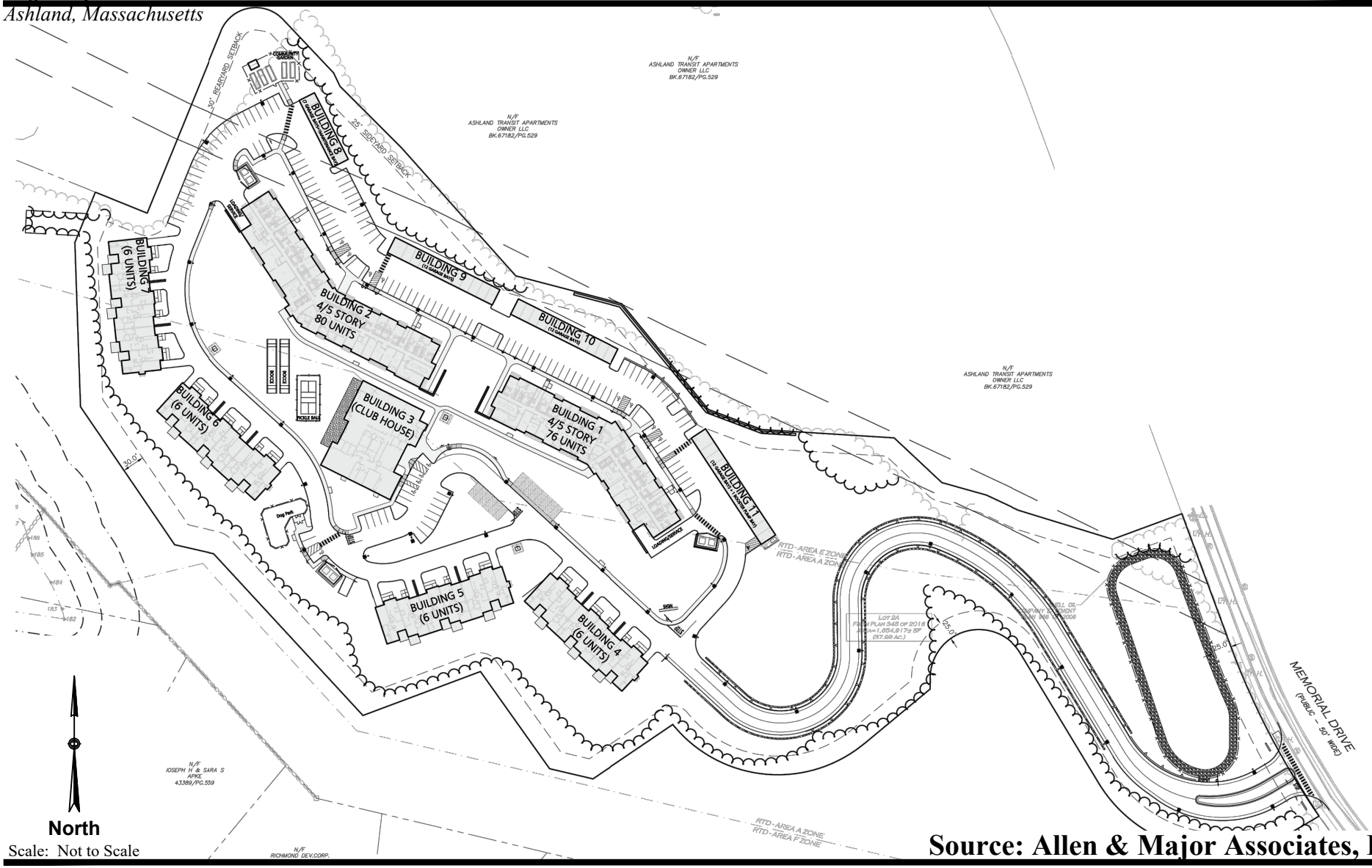
The Site consists of approximately 17.98± acres of undeveloped land located on Memorial Drive in Ashland, MA. Access/egress for the proposed apartment complex is via a two-lane unsignalized driveway along the Memorial Drive. Under the proposed Site programming, 180 residential units will be constructed at the property. The Site will be supported by 243± combined surface and covered parking spaces. A preliminary site layout plan prepared by Allen & Major Associates; Inc. is presented in **Figure 2**.

BASELINE TRAFFIC & SAFETY CHARACTERISTICS

An overview of baseline roadway conditions and traffic volumes is provided below.

Memorial Drive

Memorial Drive is a north-south roadway classified by MassDOT as a local roadway under Local (Town) jurisdiction that connects West Union Street (Route 135) to the south with the Ashland Commuter Rail Station to the north. Memorial Drive provides a single 15-foot-wide travel lane in each direction with additional turn lanes provided at Route 135. A 10± foot wide path with street lighting is provided along the entire western side of Memorial Drive. The regulatory speed limit is 30 mph in both directions. Land uses along Memorial Drive include undeveloped parcels that are part of the Town of Ashland Rail Transit Zoning District (RTD), a solar farm, a Dunkin Donuts near Route 135, the Ashland Commuter Rail Station, and athletic fields associated with the Ashland Middle School.



Scale: Not to Scale

Source: Allen & Major Associates, Inc.

Figure 2

Preliminary Site Layout

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Date: March 2021
Dwg No. 1124 MR01.dwg

Baseline Traffic Data

This traffic memorandum includes the following study area intersection:

- Memorial Drive at Proposed Site Driveway (Unsignalized)

Traffic volume data along Memorial Drive were collected in June 2019, prior to the State of Emergency due to the Covid-19 Pandemic, at the study area intersection during the weekday morning peak period (7:00 AM – 9:00 AM) and the weekday evening peak period (4:00 PM - 6:00 PM) periods to coincide with peak traffic activity of the adjacent streets. The weekday morning, weekday evening, and daily traffic volumes have been adjusted by a 0.5% growth per year over a two-year period to create a 2021 Baseline Traffic Condition. The resulting 2021 Baseline weekday morning and weekday evening peak hour traffic volumes for the study intersections are shown in **Figure 3**. Traffic count data and MassDOT permanent count station data are provided in the **Attachments**.

Daily Traffic Volumes

Daily traffic volumes were obtained along Memorial Drive within close proximity to the proposed Site Driveway and includes traffic generated by the Cirrus Apartments to the north of the Site. This data has been adjusted to reflect 2021 Baseline conditions (non-Pandemic) as summarized in **Table 1** and are discussed below.

Weekday Morning Peak Hour

Scale: Not to Scale

Weekday Evening Peak Hour

Figure 3

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2021 Baseline Condition
Weekday Peak Hour Volumes

Date: March 2021
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TABLE 1
BASELINE TRAFFIC VOLUME SUMMARY
MEMORIAL DRIVE SOUTH OF CIRRUS DRIVE

Time Period	Daily Volume (vpd)[1]	Percent Daily Traffic[2]	Peak Hour Volume (vph)[3]	Peak Flow Direction[4]	Peak Hour Directional Volume (vph)
Weekday Morning Peak Hour	3,020	14%	424	67% NB	285
Weekday Evening Peak Hour	3,020	15%	462	71% SB	323

[1]Two-way daily traffic expressed in vehicles per day adjusted by 1% per year to reflect 2021 conditions grown from 2019 counts.
[2]The percent of daily traffic that occurs during the peak hour.
[3]Two-way peak-hour volume expressed in vehicles per hour.
[4]EB = Eastbound, WB = Westbound

As summarized in **Table 1**, the weekday daily traffic volume on Memorial Drive at the proposed Site Driveway is approximately 3,020 vehicles per day (vpd) on a weekday with travel patterns highly directional northbound during the weekday morning peak hour and directional southbound during the weekday evening peak hour which is consistent with commuter traffic relative to major travel routes in the area. Peak hour traffic flow on Memorial Drive is approximately 424 vehicles per hour (vph) during the weekday morning and 462 vph during the weekday evening peak hours representing approximately 15 percent of daily traffic flow.

FUTURE TRAFFIC VOLUMES

This section provides a summary of trip generation characteristics of the Site, trip distribution patterns, Build traffic volume projections, and an assessment of operations under Build conditions.

Historical Area Growth

Nearby permanent count station data published by MassDOT indicates a flat growth rate per year. For purposes of this evaluation and to remain conservative, a 0.5 percent compounded annual growth rate was used (3.6 percent increase over a 7-year horizon). This growth rate is consistent with historic rates and is also expected to account for any small fluctuation in hourly traffic as may occur from time to time in the study area and traffic associated with other potential small developments or vacancies in the area. MassDOT permanent count station data are provided in the **Attachments**.

Trip Generation

The trip generation estimates for the Site are provided for the weekday morning and weekday evening periods, which correspond to the critical analysis periods for the proposed uses and adjacent street traffic flow.

New traffic generated by the project was estimated using trip rates published in ITE's *Trip Generation*[1] for the Land Use Code (LUC's) 252 – Senior Adult Housing (Attached). **Table 3** presents the estimated site trips to be generated by the development based on ITE trip rate methodology. Trip calculation are provided in the **Attachments**.

TABLE 3
TRIP-GENERATION SUMMARY

Period	Site Trips[1]
Weekday Morning Peak-Hour:	
Enter	13
Exit	23
Total	36
Weekday Evening Peak-Hour:	
Enter	25
Exit	20
Total	45
Daily	698

[1] Based on ITE LUC 252 (Senior Adult Housing (Attached)) trip rates applied to 180 Units.

As summarized in **Table 3,** based on ITE methodology the proposed development is estimated to generate approximately 36 vehicle trips (13 entering and 23 exiting) during the weekday morning peak hour, 45 vehicle trips (25 entering and 20 exiting) during the weekday evening peak hour, and 698 daily trips on a weekday.

[1] ITE *Trip Generation,* Tenth Edition; 2017.

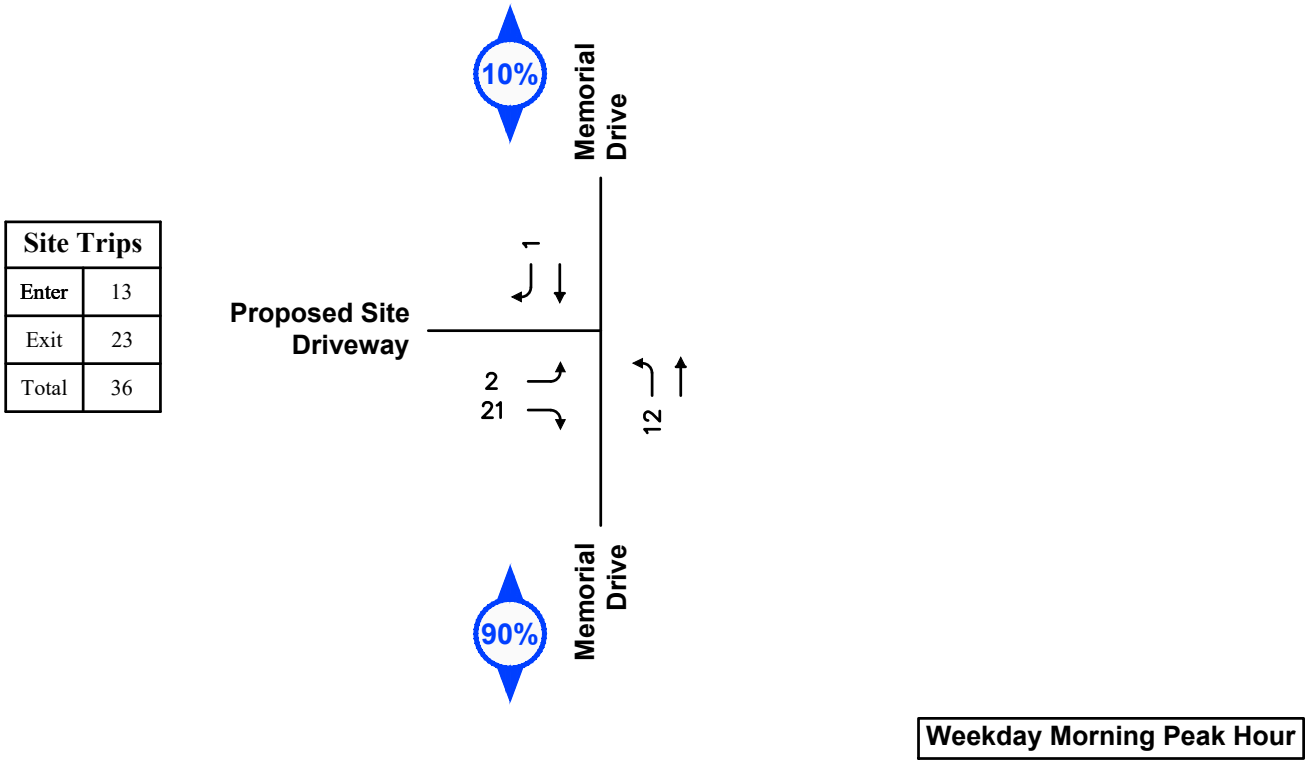
Trip Distribution

The directional distribution of development-generated trips on the roadway network is a function of a number of variables including local area populations and the efficiency of the roadways leading to the Site. Journey to work census data served as the primary basis for determining the trip distribution pattern for the proposed development. Travel patterns from the adjacent apartment complex were also reviewed. Consistent with observations at the existing apartment complex, 10% of the trips likely to be destined to the Ashland MBTA Station. Said trips were assumed to be via automobile and not pedestrian, however, it is likely that a portion would walk given the proximity and daily parking fee charged at the station. Trip distribution calculations are provided in the **Attachments**.

Proposed development-related trips are assigned to the roadway network using the trip-generation estimates shown in **Table 3** and the distribution patterns presented in **Figure 4**. Development-related trips at each intersection approach for the weekday morning and weekday evening peak hours are also quantified in **Figure 4**.

Build Traffic Conditions

2028 Build conditions for the weekday morning and weekday evening peak hours include 2021 Baseline traffic volumes grown by 0.5% per year for 7-years and site-generated trips. The resulting 2028 Build traffic volumes are quantified in **Figure 5**.



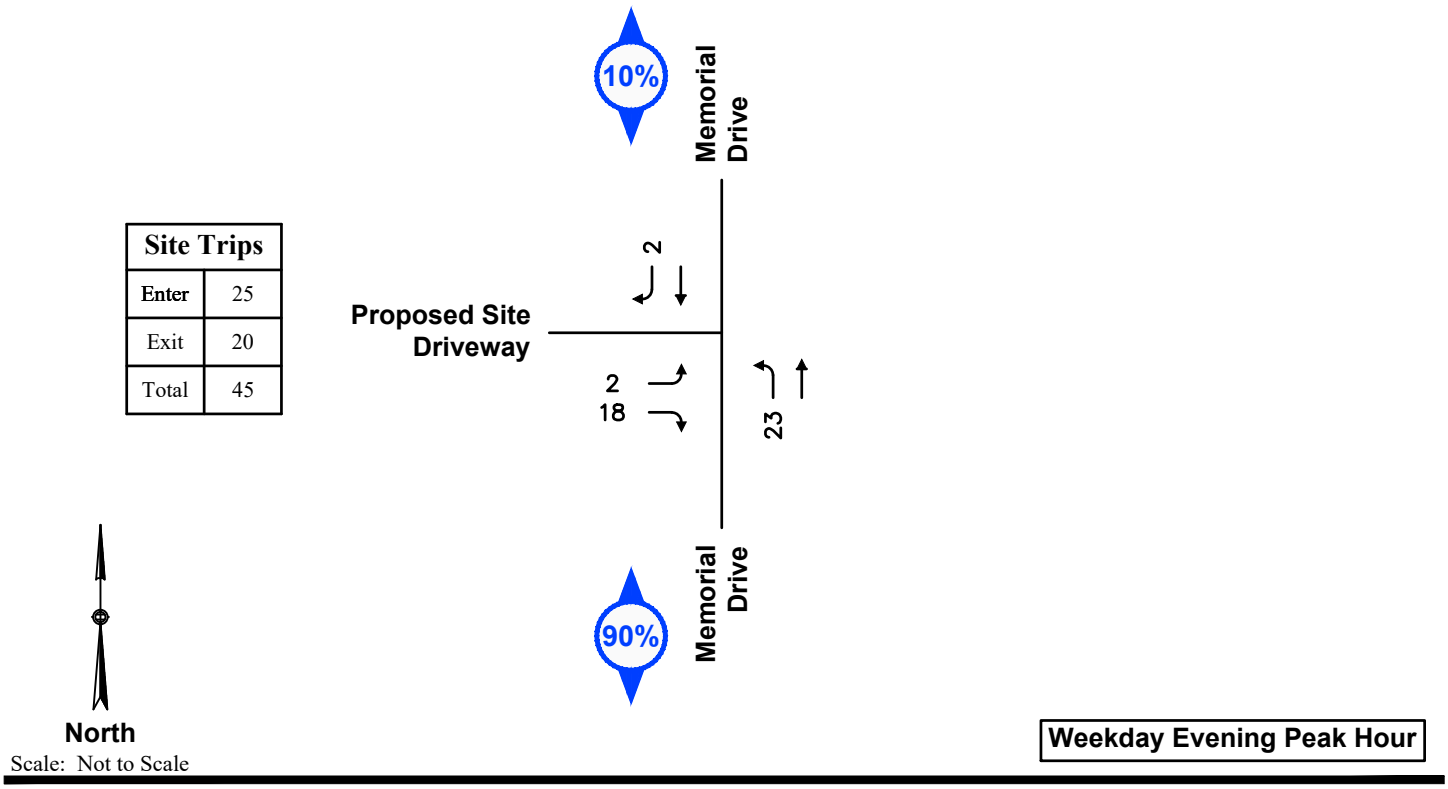


Figure 4

Site Trip Tracing
Weekday Peak Hour Volumes

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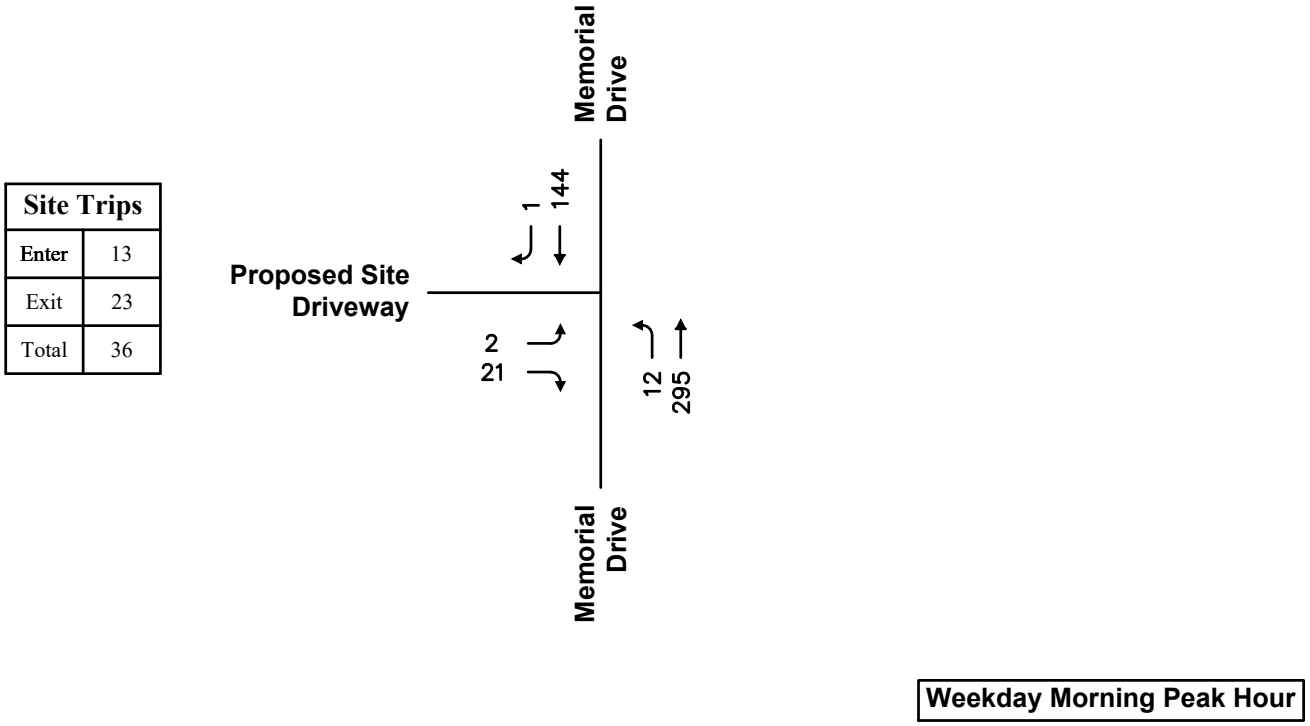

Figure 5

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2028 Build Condition
Weekday Peak Hour Volumes

Date: March 2021
Dwg No. 1124 MR01.dwg

OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology, an assessment of roadway operations under projected Build conditions.

Analysis Methodology

Intersection capacity analyses are presented in this section for the Build traffic-volume conditions. Capacity analyses, conducted in accordance with EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section.

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the Highway Capacity Manual 6th Edition (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements). The specific control delays and associated LOS designations are presented in the **Attachments**.

Analysis Results

Level-of-Service (LOS) analyses were conducted for the 2028 Build condition for the study intersection and are summarized below in **Table 4**. Detailed analysis results are presented in the **Attachments**.

TABLE 4
INTERSECTION CAPACITY ANALYSIS RESULTS
2028 BUILD CONDITION

		Weekday AM Peak Hour				Weekday PM Peak Hour			
Intersection	Approach	v/c[1]	LOS[2]	Delay[3]	95th Q[4]	v/c[1]	LOS[2]	Delay[3]	95th Q[4]
Memorial Drive at	Eastbound	0.03	A	9	<25	0.03	B	11	<25
Proposed Site Driveway	Northbound	0.01	A	<5	<25	0.02	A	<5	<25
	Southbound	0.00	A	<5	<25	0.00	A	<5	<25

[1]Volume-to-capacity ratio
[2]Level of service
[3]Average stopped delay per vehicle (in seconds)
[4]95th percentile queue length in feet

As summarized in **Table 4**, under future Build conditions the proposed unsignalized Site driveway intersection with single-lane approaches will operate at an overall LOS B or better during the peak hours. The proposed development does not result in any significant change in operations to mainline traffic along Memorial Drive which will continue to operate with minimal delay. Based on the capacity analysis no off-site mitigation is warranted.

CONCLUSIONS

In summary, adequate capacity is available along Memorial Drive and at its intersection with the proposed site driveway to accommodate the traffic increases that may occur due to the project. The proposed age-restricted residential development is estimated to generate approximately 36 vehicle trips during the weekday morning peak hour and 45 vehicle trips during the weekday evening peak hour. Mainline traffic along Memorial Drive will continue to operate at an overall LOS A during the peak hours and the single lane Site Driveway approach to Memorial Drive will operate at LOS B or better during the peak hours. The project will generally result in queue lengths of 1 vehicle or less on all approaches.

ATTACHMENTS

- Traffic Volume Data
- Yearly Adjustment Data
- Trip Generation
- Trip Distribution – Cirrus Driveway Turning Movement Data
- Capacity Analysis

□ Traffic Volume Data

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

NW/SE: Memorial Drive
South of Cirrus Apt. Driveway
Ashland, MA

Site Code: 1044
Station ID:

Start Time	11-Jun-19 Tue	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	11			13	10				
12:15		0	9			0	11				
12:30		2	10			4	9				
12:45		2	22	4	52	3	15	20	45	24	97
01:00		0	15			1	8				
01:15		0	4			0	8				
01:30		0	10			1	9				
01:45		0	10	0	39	0	7	2	32	2	71
02:00		0	6			2	17				
02:15		0	11			1	15				
02:30		0	11			1	8				
02:45		0	11	0	39	0	12	4	52	4	91
03:00		0	23			0	24				
03:15		0	7			1	15				
03:30		0	10			0	10				
03:45		1	11	1	51	1	17	2	66	3	117
04:00		0	12			0	17				
04:15		0	10			0	19				
04:30		4	40			0	25				
04:45		2	8	6	70	1	18	1	79	7	149
05:00		3	65			4	26				
05:15		7	78			4	34				
05:30		11	14			40	34				
05:45		15	166	36	323	2	41	50	135	86	458
06:00		21	22			50	23				
06:15		30	15			34	30				
06:30		29	103			56	21				
06:45		27	8	107	148	53	22	193	96	300	244
07:00		18	20			36	20				
07:15		30	27			142	17				
07:30		47	18			37	21				
07:45		43	22	138	87	67	27	282	85	420	172
08:00		27	13			19	23				
08:15		21	9			39	22				
08:30		30	10			9	19				
08:45		18	19	96	51	11	19	78	83	174	134
09:00		20	2			10	14				
09:15		18	9			10	16				
09:30		20	11			5	17				
09:45		12	7	70	29	9	16	34	63	104	92
10:00		14	7			4	5				
10:15		8	4			8	13				
10:30		6	2			10	4				
10:45		14	10	42	23	14	1	36	23	78	46
11:00		14	3			9	7				
11:15		12	3			5	4				
11:30		13	10			6	2				
11:45		12	2	51	18	10	4	30	17	81	35
Total		551	930			732	776			1283	1706
Percent		37.2%	62.8%			48.5%	51.5%			42.9%	57.1%
Total		551	930			732	776			1283	1706
Percent		37.2%	62.8%			48.5%	51.5%			42.9%	57.1%
Combined Total		1481				1508				2989	

□ Yearly Adjustment Data

SECTION I - CONTINUOUS COUNTING STATION MONTHLY AVERAGE DAILY TRAFFIC

STATION 307 - WESTBOROUGH - RTE.9 - EAST OF NORTHBOROUGH T.L.

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
07	47,505	47,283	49,268	49,136	*50,000*	*52,000*	*53,000*	52,322	49,031	50,571	49,662	47,007	49,732
	-4%	-2%	-3%	1%	1%	-4%	-8%	-7%	-1%	-3%	-4%	-1%	-3%
08	45,614	46,112	47,829	49,816	*50,518*	*49,936*	*48,629*	48,759	48,531	49,009	47,490	46,696	48,245
	-3%	1%	-3%	-2%	-2%	0%	-2%	-3%	-2%	-1%	0%	2%	-1%
09	44,103	46,434	46,455	49,049	*49,474*	*49,934*	*47,638*	47,056	47,762	48,663	47,379	47,564	47,626
	-1%	0%	2%	0%	0%	1%	-1%	1%	1%	1%	2%	2%	1%
11	43,244	46,150	48,016	48,943	*49,781*	*50,525*	*46,812*	48,234	48,825	49,198	49,151	49,888	48,231
	7%	2%	1%	-1%	1%	-1%	3%	4%	0%	2%	2%	-5%	1%
12	46,381	46,883	48,608	48,662	*50,126*	*49,961*	*48,380*	49,941	48,882	50,056	50,015	47,600	48,791
	0%	-1%	-2%	1%	1%	-9%	3%	-1%	2%	0%	-1%	2%	0%
13	46,393	46,220	47,421	49,359	*50,657*	*45,623*	*49,797*	49,223	49,935	50,021	49,651	48,441	48,562
	1%	1%	2%	1%	1%	6%	0%	1%	0%	1%	1%	1%	1%
16	47,447	47,570	50,342	50,977	*52,259*	*53,476*	*49,724*	50,789	50,057	51,035	51,749	50,442	50,489

Average Yearly Growth Calculated -0.27%
Yearly Growth Factor Used 0.5%

How Volume Trend is Calculated

1. Take the AADT values for each year.

2. If the Location has no AADT values, use the average of all 24hr volume counts that are not marked as abnormal for that year.

Year	Volume Trend
2,019	**0.0%**
2,018	**3.0%**
2,017	**-1.0%**
2,016	**-2.0%**
2,015	**-1.0%**

Average -0.20%
Yearly Growth Factor Used 0.5%

ITALICS = ESTIMATED DATA
MADT

- Trip Generation

Institute of Transportation Engineers (ITE) 10th Edition
Land Use Code (LUC) 252 - Senior Adult Housing - Attached

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 180

AVERAGE WEEKDAY DAILY

T = 4.02 *(X) - 25.37 (Small Sample Size - Use with Caution)
T = 4.02* 180 - 25.373
T = 698.23 vehicle trips
T= 698
with 50% (349 vpd) entering and 50% (349 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.2*(X) - 0.18
T = 0.20* 180 - 0.18
T = 35.82 vehicle trips
T = 36
with 35% (13 vph) entering and 65%(23 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.24*(X) + 2.26
T = 0.24* 180 + 2.26
T = 45.46
T = 45
with 55% (25 vph) entering and 45%(20 vph) exiting.

SATURDAY DAILY

T = 3.97 * (X) - 60.09 (Small Sample Size - Use with Caution)
T = 3.97 * 180 - 60.09
T = 654.51
T = 654 vehicle trips
with 50% (327 vpd) entering and 50% (327 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 0.35 * (X) - 1.67
T = 0.35 * 180 - 1.67
T = 61.33
T = 61 vehicle trips
with 57% (35 vph) entering and 43%(26 vph) exiting.

- Trip Distribution – Cirrus Driveway Turning Movement Data

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

N/S: Memorial Drive
E/W: Cirrus Drive
Ashland, MA

File Name : 1044 Memorial at Cirrus
Site Code : 1044
Start Date : 6/11/2019

Groups Printed- Lights - Mediums - Articulated Trucks

	Memorial Drive From North				Memorial Drive From South				Cirrus Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
07:00 AM	0	3	0	3	42	2	0	44	14	1	0	15	62
07:15 AM	3	18	0	21	133	2	0	135	20	6	0	26	182
07:30 AM	0	13	0	13	45	3	0	48	28	1	0	29	90
07:45 AM	0	16	0	16	50	4	0	54	30	1	0	31	101
Total	3	50	0	53	270	11	0	281	92	9	0	101	435
08:00 AM	0	2	0	2	18	4	0	22	19	0	0	19	43
08:15 AM	1	3	0	4	33	5	0	38	19	2	0	21	63
08:30 AM	1	4	0	5	2	5	0	7	26	0	0	26	38
08:45 AM	0	2	0	2	6	5	0	11	19	0	0	19	32
Total	2	11	0	13	59	19	0	78	83	2	0	85	176
04:00 PM	1	1	0	2	6	10	0	16	9	1	0	10	28
04:15 PM	1	3	0	4	5	15	0	20	7	0	0	7	31
04:30 PM	0	36	0	36	2	23	0	25	5	1	0	6	67
04:45 PM	0	1	0	1	4	14	0	18	7	0	0	7	26
Total	2	41	0	43	17	62	0	79	28	2	0	30	152
05:00 PM	2	73	0	75	8	19	0	27	11	0	0	11	113
05:15 PM	0	48	0	48	1	31	0	32	10	1	0	11	91
05:30 PM	0	3	0	3	11	28	0	39	12	0	0	12	54
05:45 PM	5	157	0	162	11	27	0	38	11	2	0	13	213
Total	7	281	0	288	31	105	0	136	44	3	0	47	471
Grand Total	14	383	0	397	377	197	0	574	247	16	0	263	1234
Apprch %	3.5	96.5	0		65.7	34.3	0		93.9	6.1	0		
Total %	1.1	31	0	32.2	30.6	16	0	46.5	20	1.3	0	21.3	
Lights	13	377	0	390	373	192	0	565	243	15	0	258	1213
% Lights	92.9	98.4	0	98.2	98.9	97.5	0	98.4	98.4	93.8	0	98.1	98.3
Mediums	1	6	0	7	4	5	0	9	4	1	0	5	21
% Mediums	7.1	1.6	0	1.8	1.1	2.5	0	1.6	1.6	6.2	0	1.9	1.7
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0

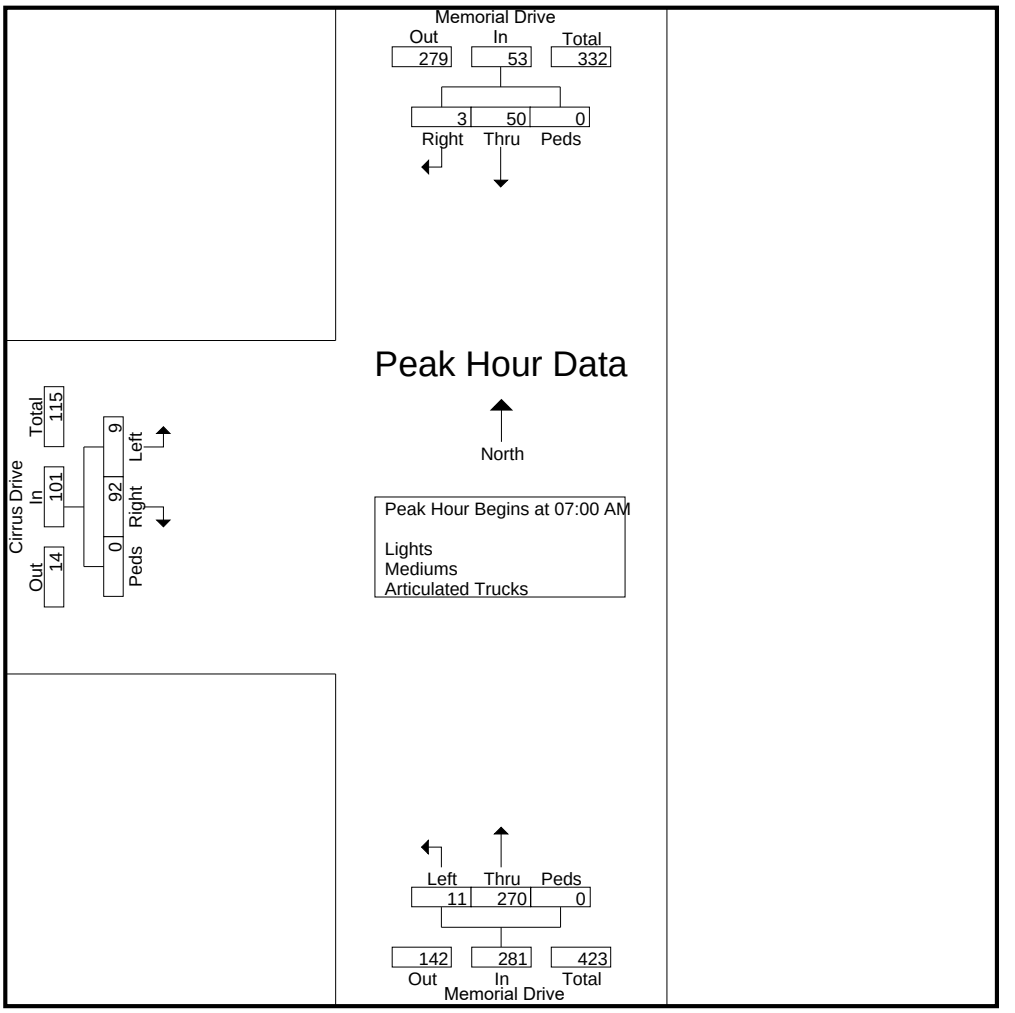
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

N/S: Memorial Drive
E/W: Cirrus Drive
Ashland, MA

File Name : 1044 Memorial at Cirrus
Site Code : 1044
Start Date : 6/11/2019
Page No : 2

	Memorial Drive From North				Memorial Drive From South				Cirrus Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	3	0	3	42	2	0	44	14	1	0	15	62
07:15 AM	**3**	**18**	0	**21**	**133**	2	0	**135**	20	**6**	0	26	**182**
07:30 AM	0	13	0	13	45	3	0	48	28	1	0	29	90
07:45 AM	0	16	0	16	50	**4**	0	54	**30**	1	0	**31**	101
Total Volume	3	50	0	53	270	11	0	281	92	9	0	101	435
% App. Total	5.7	94.3	0		96.1	3.9	0		91.1	8.9	0		
PHF	.250	.694	.000	.631	.508	.688	.000	.520	.767	.375	.000	.815	.598



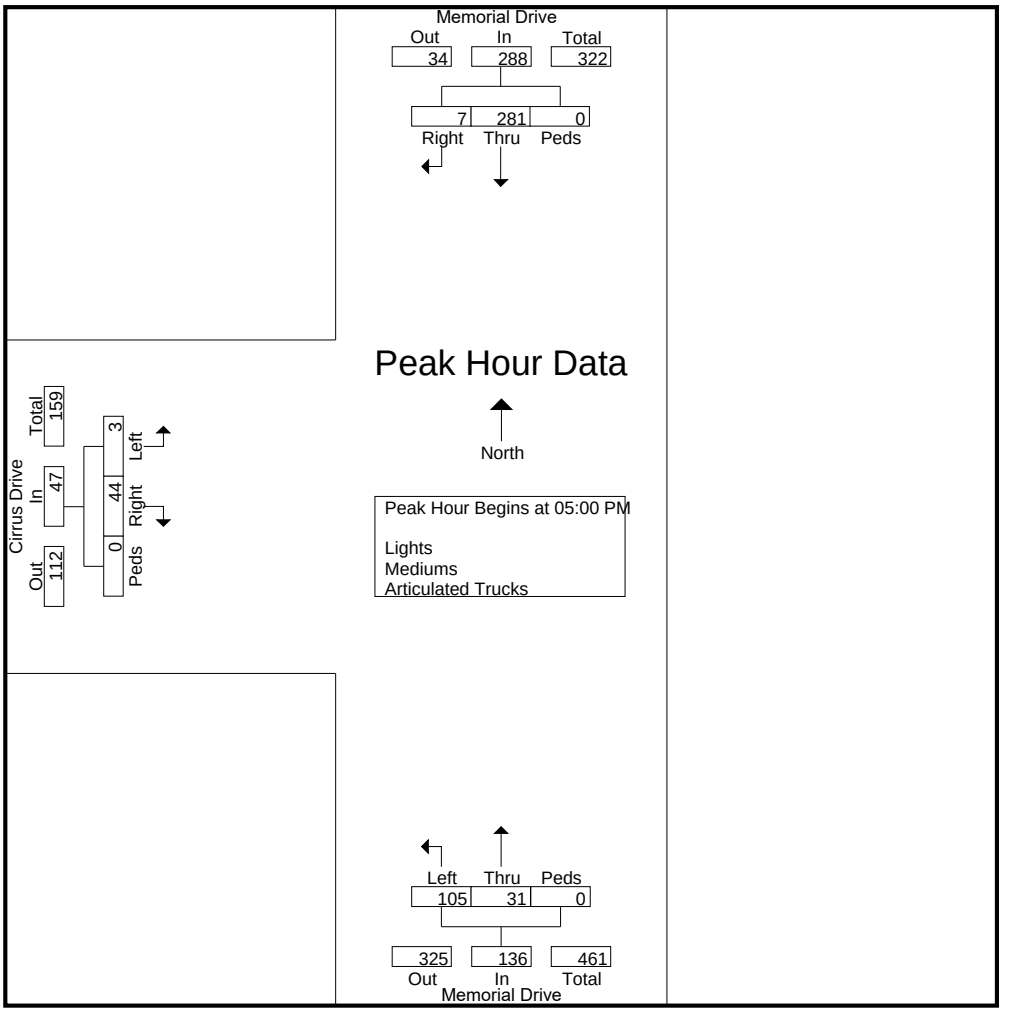
MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA, 01752

N/S: Memorial Drive
E/W: Cirrus Drive
Ashland, MA

File Name : 1044 Memorial at Cirrus
Site Code : 1044
Start Date : 6/11/2019
Page No : 3

	Memorial Drive From North				Memorial Drive From South				Cirrus Drive From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	2	73	0	75	8	19	0	27	11	0	0	11	113
05:15 PM	0	48	0	48	1	**31**	0	32	10	1	0	11	91
05:30 PM	0	3	0	3	**11**	28	0	**39**	**12**	0	0	12	54
05:45 PM	**5**	**157**	0	**162**	11	27	0	38	11	**2**	0	**13**	**213**
Total Volume	7	281	0	288	31	105	0	136	44	3	0	47	471
% App. Total	2.4	97.6	0		22.8	77.2	0		93.6	6.4	0		
PHF	.350	.447	.000	.444	.705	.847	.000	.872	.917	.375	.000	.904	.553



□ Capacity Analysis

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	21	12	295	144	1
Future Vol, veh/h	2	21	12	295	144	1
Conflicting Peds, #/hr	0	0	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	2	2	2	2
Mvmt Flow	2	23	13	321	157	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	505	158	158	0	-	0
Stage 1	158	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	527	887	1422	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	521	887	1422	-	-	-
Mov Cap-2 Maneuver	521	-	-	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	716	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1422	-	836	-	-
HCM Lane V/C Ratio	0.009	-	0.03	-	-
HCM Control Delay (s)	7.6	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	18	23	141	338	2
Future Vol, veh/h	2	18	23	141	338	2
Conflicting Peds, #/hr	0	0	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	2	2	2	2
Mvmt Flow	2	20	25	153	367	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	571	368	369	0	-	0
Stage 1	368	-	-	-	-	-
Stage 2	203	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	482	677	1190	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	471	677	1190	-	-	-
Mov Cap-2 Maneuver	471	-	-	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	831	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1190	-	649	-	-
HCM Lane V/C Ratio	0.021	-	0.033	-	-
HCM Control Delay (s)	8.1	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-