MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
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M E M O R A N D U M

DATE: December 12, 2023

TO: Mr. Richard A. Salvo, P.E.
Engineering Alliance
194 Central Street
Saugus, MA 01906

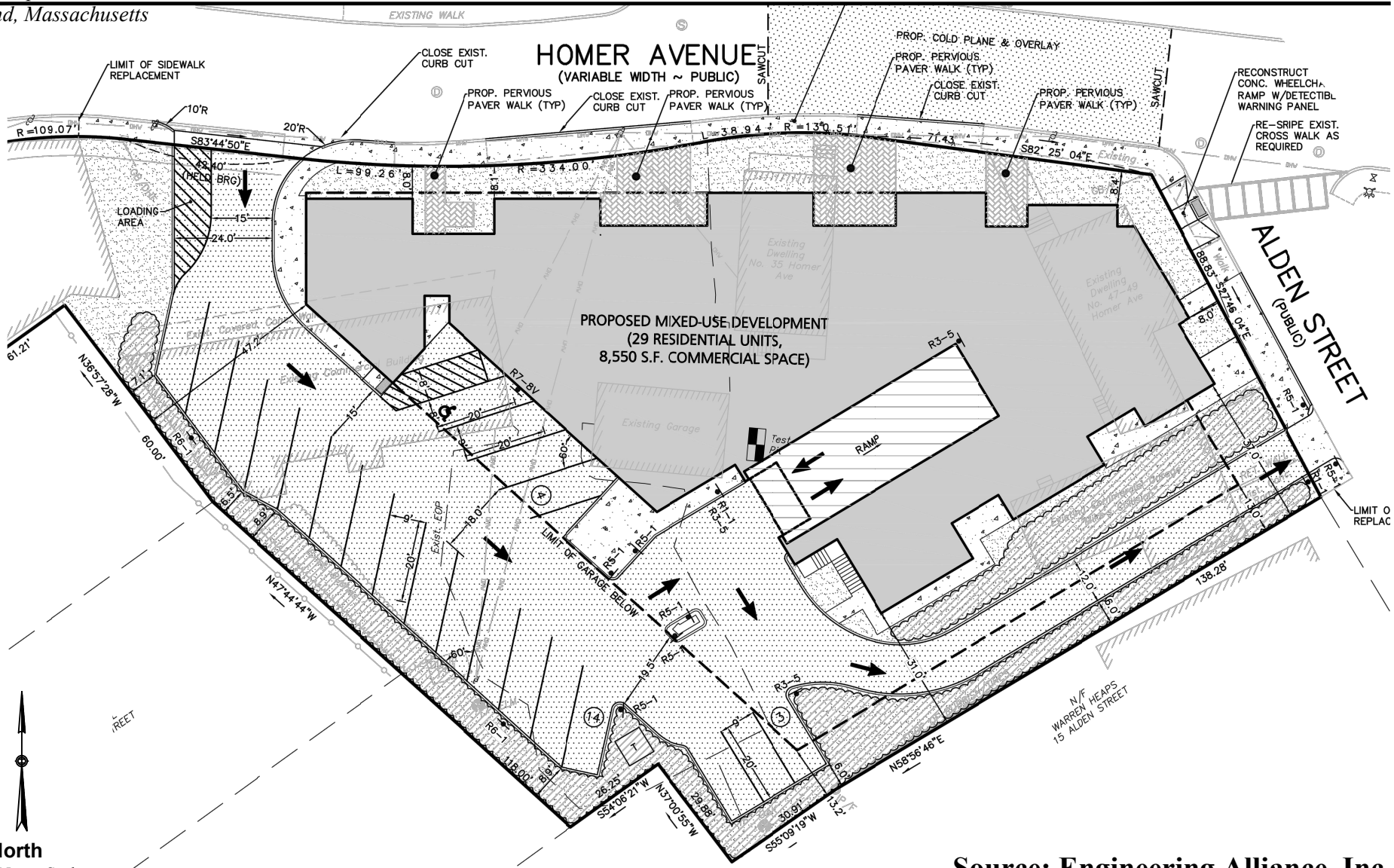
FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Proposed Mixed-Use Development**
Homer Avenue, Ashland, MA

MDM Transportation Consultants, Inc. (MDM) has conducted a trip generation assessment for proposed redevelopment of property at 9-49 Homer Avenue in Ashland, Massachusetts. This memorandum summarizes the traffic generation characteristics of existing and proposed site uses based on application of industry standard trip rates and methodology to estimate relative peak hour and daily trip increases associated with the mixed-use redevelopment.

Project Description

The project Site is an approximate 1-acre tract of land located along Homer Avenue in Ashland, Massachusetts. The Site is currently occupied by two residential homes, a commercial autobody repair garage, approximately 2,800± square feet of retail space, and a 4,000± square foot barber/hair salon. The proposed redevelopment of the site will retain the barber/hair salon use but will replace the other existing uses with a mixed-use development comprising 29 residential units and 8,550± square feet of retail/commercial space. Access is proposed to include a curb cut on Homer Avenue designated as a one-way enter-only driveway and a curb cut along Alden Street designated as a one-way exit-only driveway. Parking to support the proposed building is anticipated to include a mix of surface and garage parking. A preliminary site plan sketch for the project prepared by Engineering Alliance, Inc. is shown in **Figure 1**.



Scale: Not to Scale

Source: Engineering Alliance, Inc.

Figure 1

Preliminary Site Plan

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: December 2023
Dwg No. 1332 MR01.dwg

Existing Site Generated Traffic

The trip generation estimates for the existing uses on 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. The traffic generated by the existing developments were estimated based on trip rates published in the Institute of Transportation Engineers (ITE) *Trip Generation*[1] for Land Use Codes (LUC) 210 – Single Family Detached Housing; LUC 822 (Strip Retail Plaza); LUC 918 (Hair Salon); and LUC 942 (Automobile Care Center) as summarized in **Table 1**. Trip generation calculations are provided in the **Attachments**.

TABLE 1
TRIP-GENERATION SUMMARY – ITE BASIS - EXISTING

Peak Hour/Direction	Residential Homes (2 Units)[1]	Commercial Strip Mall (2.8ksf)[2]	Barber/Hair Salon (3.975ksf)[3]	Auto Repair Garage (1.255ksf)[4]	TOTAL
Weekday Morning Peak Hour:					
Entering	0	4	3	2	9
Exiting	1	3	2	1	7
Total	1	7	5	3	16
Weekday Evening Peak Hour:					
Entering	1	9	1	2	13
Exiting	1	9	5	2	17
Total	2	18	6	4	30
Weekday Daily (24-Hour):	18	152	n/a	28	198+Barber

Source: ITE *Trip Generation*, 11th Edition; 2021 with no reduction for alternative transportation modes.
[1]Based on ITE Trip Generation 11th Edition trip rates for LUC 210 – Single-Family Detached Housing applied to 2 units.
[2]Based on ITE Trip Generation 11th Edition trip rates for LUC 822 – Strip Retail Plaza (<40ksf) applied to 2,800 square feet.
[3]Based on ITE Trip Generation 11th Edition trip rates for LUC 918 – Hair Salon applied to 3,975 square feet. Daily trip generation for Hair Salons are not provided by ITE, however this use does not represent a new proposed use for the site.
[4]Based on ITE Trip Generation 11th Edition trip rates for LUC 942 – Automobile Care Center applied to 1,255 square feet.

As summarized in **Table 1**, the existing site trip activity is estimated to generate approximately 16 vehicle trips (9 entering and 7 exiting) during the weekday morning peak hour, 30 vehicle trips (13 entering and 17 exiting) during the weekday evening peak hour, and approximately 200 vehicle trips on a weekday (exclusive of barber shop to remain), with 50 percent entering and 50 percent exiting.

[1] *Trip Generation*, *11th Edition*, Institute of Transportation Engineers, Washington, DC (2021).

Projected Traffic Volumes

The trip generation estimates for the proposed redevelopment of 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. For planning purposes, the total traffic generated by the project including the existing barber shop to remain plus trips estimated for new uses using trip rates published in ITE *Trip Generation*[2] for LUC 221 (Multifamily Housing, Mid-Rise) and LUC 822 (Strip Retail Plaza <40 ksf). **Table 2** presents a summary of the site trip generation for the proposed uses on the Site. To remain conservative no trip credits (reduction) were taken for alternative transportation modes or telecommuting. Trip generation calculations are provided in the **Attachments.**

TABLE 2
TRIP-GENERATION SUMMARY – ITE BASIS (PROPOSED REDEVELOPMENT)

Peak Hour/Direction	Residential Apartments (29 Units)[1]	Commercial Strip Mall (8.55ksf)[2]	Barber/Hair Salon (3.975ksf)[3]	TOTAL
Weekday Morning Peak Hour:				
Entering	3	12	3	18
Exiting	8	8	2	18
Total	11	20	5	36
Weekday Evening Peak Hour:				
Entering	7	28	1	36
Exiting	4	28	5	37
Total	11	56	6	73
Weekday Daily (24-Hour):	132	466	n/a	598+Barber

Source: ITE *Trip Generation*, 11th Edition; 2021 with no reduction for alternative transportation modes.
[1]Based on ITE Trip Generation 11th Edition trip rates for LUC 221 – Multifamily Housing (Mid-Rise) applied to 29 units.
[2]Based on ITE Trip Generation 11th Edition trip rates for LUC 822 – Strip Retail Plaza (<40ksf) applied to 8,550 square feet.
[3]As found in Table 1.

As summarized in **Table 2**, the proposed development is estimated to generate approximately 36 vehicle trips (18 entering and 18 exiting) during the weekday morning peak hour, 73 vehicle trips (36 entering and 37 exiting) during the weekday evening peak hour, and approximately 600 vehicle trips on a weekday (exclusive of barber shop to remain) with 50 percent entering and exiting.

[2]*Ibid 1*

A comparison of the existing and proposed estimated trip activity for the Site during the weekday morning peak hour, weekday evening peak hour, and over the course of a typical weekday 24-hour period are summarized in **Table 3**.

TABLE 3
TRIP-GENERATION COMPARISON – ITE BASIS – EXISTING VS. PROPOSED

Peak Hour/Direction	Existing Total[1]	Proposed Total[2]	Difference (Δ)
Weekday Morning Peak Hour:			
Entering	9	18	+9
Exiting	7	18	+11
Total	16	36	+20
Weekday Evening Peak Hour:			
Entering	13	36	+23
Exiting	17	37	+20
Total	30	73	+43
Weekday Daily (24-Hour):	198+Barber	598+Barber	+400

[1]From Table 1.
[2]From Table 2.

As shown in **Table 3**, the project at full buildout will result in between 20 and 43 additional vehicles during weekday peak hours and a net increase of 400 vehicle-trips on a weekday.

ATTACHMENTS

- Trip Generation Calculations

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 210 - Single-Family Detached Housing

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 2

AVERAGE WEEKDAY DAILY

T = 9.43* (X)
T = 9.43* 2
T = 18.86
T = 18 vehicle trips
with 50% (9 vpd) entering and 50% (9 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.70* (X)
T = 0.70 * 2
T = 1.40
T = 1 vehicle trips
with 26% (0 vph) entering and 74% (1 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.94* (X)
T = 0.94* 2
T = 1.88
T = 2 vehicle trips
with 63% (1 vph) entering and 37% (1 vph) exiting.

SATURDAY DAILY

T = 9.48* (X)
T = 9.48* 2
T = 18.96
T = 18 vehicle trips
with 50% (9 vph) entering and 50% (9 vph) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 0.92* (X)
T = 0.92* 2
T = 1.84
T = 2 vehicle trips
with 54% (1 vph) entering and 46% (1 vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza <40ksf

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 2.800

AVERAGE WEEKDAY DAILY

T = 54.45*(X)
T = 54.45* 2.80
T = 152.46
T = 152 vehicle trips
with 50% (76 vpd) entering and 50% (76 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 2.36 * (X)
T = 2.36 * 2.80
T = 6.61
T = 7 vehicle trips
with 60% (4 vph) entering and 40% (3 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.59 *(X)
T = 6.59* 2.80
T = 18.45
T = 18 vehicle trips
with 50% (9 vph) entering and 50% (9 vph) exiting.

SATURDAY DAILY

Proportional Estimate Method:

LUC 820 Weekday Daily 37.01 x LUC 822 Saturday Midday 6.57 =
LUC 820 Saturday Midday 4.40

T = 55.26*(X)
T = 55.26* 2.80
T = 154.73
T = 154 vehicle trips
with 50% (77 vpd) entering and 50% (77 vpd) exiting.

SATURDAY PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.57 *(X)
T = 6.57* 2.80
T = 18.45
T = 18 vehicle trips
with 51% (9 vph) entering and 49% (9 vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 918 - Hair Salon (Square Footage)

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area
Independent Variable (X): 4.0

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T= 1.21 * (X)
T= 1.21* 4.0
T= 4.80975
T= 5
with 50% (3 vph) entering and 50% (2 vph) exiting

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 1.45 * (X)
T = 1.45* 4.0
T = 5.76
T = 6 vehicle trips
with 17% (1 vph) entering and 83% (5 vph) exiting

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T= 5.08 * (X)
T= 5.08* 4.0
T= 20.193
T= 20 nicle trips
with 36% (7 vph) entering and 64% (13 vph) exiting

Institute of Transportation Engineers (ITE)
Land Use Code (LUC) 942 - Automobile Care Center

Average Vehicle Trips Ends vs: 1000 Sq. Feet Occ. Gr. Leasable Area
Independent Variable (X): 1.255

AVERAGE WEEKDAY DAILY

ITE LUC 841 Weekday Daily Trip Rate / ITE LUC 841 Evening Peak HourTrip Rate = ITE LUC 942 Weekday Daily Trip Rate / ITE LUC 942 Evening Peak HourTrip Rate

$$\frac{27.06}{3.75} = \frac{(Y)}{3.11} \qquad Y = 22.44$$

T = Y * 1.26
T = 28
T = 28 vehicle trips
with 50% (14 vph) entering and 50% (14 vph) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 2.25* (X)
T = 2.25 * 1.3
T = 2.82
T = 3 vehicle trips
with 66% (2 vph) entering and 34% (1 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 3.11 * (X)
T = 3.11 * 1.3
T = 3.90
T = 4 vehicle trips
with 48% (2 vph) entering and 52% (2 vph) exiting.

SATURDAY DAILY

T = 23.72 * (X)
T = 23.72 * 1.3
T = 29.77
T = 30 vehicle trips
with 50% (15 vph) entering and 50% (15 vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 221 - Multifamily Housing (Mid-Rise)

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 29

Average Weekday Daily

T = 4.54 * X
T = 4.54 * 29
T = 131.66
T = 132 vehicle trips
with 50% (**66** vpd) entering and 50% (**66** vpd) exiting.

Weekday Morning Peak Hour Of Adjacent Street Traffic

T = 0.37 * X
T = 0.37 * 29
T = 10.73
T = 11 vehicle trips
with 23% (**3** vph) entering and 77% (**8** vph) exiting.

Weekday Evening Peak Hour Of Adjacent Street Traffic

T = 0.39 * X
T = 0.39 * 29
T = 11.31
T = 11 vehicle trips
with 61% (**7** vph) entering and 39% (**4** vph) exiting.

Saturday Daily

T = 4.57 * X
T = 4.57 * 29
T = 132.53
T = 132 vehicle trips
with 50% (**66** vpd) entering and 50% (**66** vpd) exiting.

Saturday Midday Peak Hour Of Generator

T = 0.39 * X
T = 0.39 * 29
T = 11.31
T = 11 vehicle trips
with 49% (**5** vph) entering and 51% (**6** vph) exiting.

Institute of Transportation Engineers (ITE) 11th Edition
Land Use Code (LUC) 822 - Strip Retail Plaza <40ksf

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area
Independent Variable (X): 8.550

AVERAGE WEEKDAY DAILY

T = 54.45*(X)
T = 54.45* 8.55
T = 465.55
T = 466 vehicle trips
with 50% (233 vpd) entering and 50% (233 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 2.36 * (X)
T = 2.36 * 8.55
T = 20.18
T = 20 vehicle trips
with 60% (12 vph) entering and 40% (8 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.59 *(X)
T = 6.59* 8.55
T = 56.34
T = 56 vehicle trips
with 50% (28 vph) entering and 50% (28 vph) exiting.

SATURDAY DAILY

Proportional Estimate Method:

LUC 820 Weekday Daily 37.01 x LUC 822 Saturday Midday 6.57 =
LUC 820 Saturday Midday 4.40

T = 55.26*(X)
T = 55.26* 8.55
T = 472.47
T = 472 vehicle trips
with 50% (236 vpd) entering and 50% (236 vpd) exiting.

SATURDAY PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 6.57 *(X)
T = 6.57* 8.55
T = 56.34
T = 56 vehicle trips
with 51% (29 vph) entering and 49% (27 vph) exiting.