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

M E M O R A N D U M

DATE: May 12, 2025

TO: Joe Hassell
Managing Partner
Boston Real Estate Capital
Ten Post Office Square 8th Floor
Boston MA 02109

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

RE: **Proposed Walnut Park Residences**
Walnut Park – Wellesley, Massachusetts

MDM Transportation Consultants, Inc. (MDM) has prepared this traffic and parking memorandum (TM) for a proposed residential building to be located within Walnut Park in Wellesley, Massachusetts. The location of the Site relative to adjacent roadways is shown in **Figure 1**. This memorandum describes existing traffic volumes and travel speeds for Walnut Street, evaluates sight lines to/from Walnut Street, quantifies incremental traffic impacts of the Site redevelopment on the adjacent roadways, evaluates safety-related conditions at key study locations that provide access to the Site, and provides a parking assessment.

Key findings of the traffic assessment are as follows:

- *Baseline Traffic Volumes.* Walnut Street to the north of Walnut Park carries approximately 14,750 vehicles per day (vpd) with approximately 1,278 vehicles per hour (vph) and 1,181 vph during the weekday morning and weekday evening peak hours respectively. The peak hour traffic volumes represent approximately 8 to 9 percent of the daily traffic volumes with traffic skewed northbound during the morning peak hour and split evenly during the evening peak hour.

- *Safety Characteristics*. A review of the crash data indicated that no immediate safety countermeasures are warranted based on the crash history at the study intersection of the Walnut Street and Walnut Park. Likewise, available sight lines at the Walnut Park intersection with Walnut Street exceed the sight line requirements published by AASHTO.

Figure 1

Site Location

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Date: May 2017
Dwg No. 928 MR01.dwg

- *Modest Trip Generation*. The proposed development is estimated to generate approximately 11 trips (3 entering and 8 exiting) during the weekday morning peak hour and 14 trips (9 entering and 5 exiting) during the weekday evening peak hour. On a daily basis the project is estimated to generate approximately 190 trips with half entering and half exiting over a 24 hour period. Compared to the existing use of the property, proposed development will result in a *decrease* of 10 to 15 trips during the peak hours and a nominal *decrease* in trips on a weekday.

- *Adequate Roadway Capacity*. The project traffic will not materially impact operating conditions along Walnut Street compared to No-Build conditions. Specifically, the Walnut Park approach to Walnut Street will continue to operate below capacity at level of service (LOS) D or better during the weekday morning peak hour and weekday evening peak hours. Mainline travel along Walnut Street will continue to operate unimpeded with minimal delay.

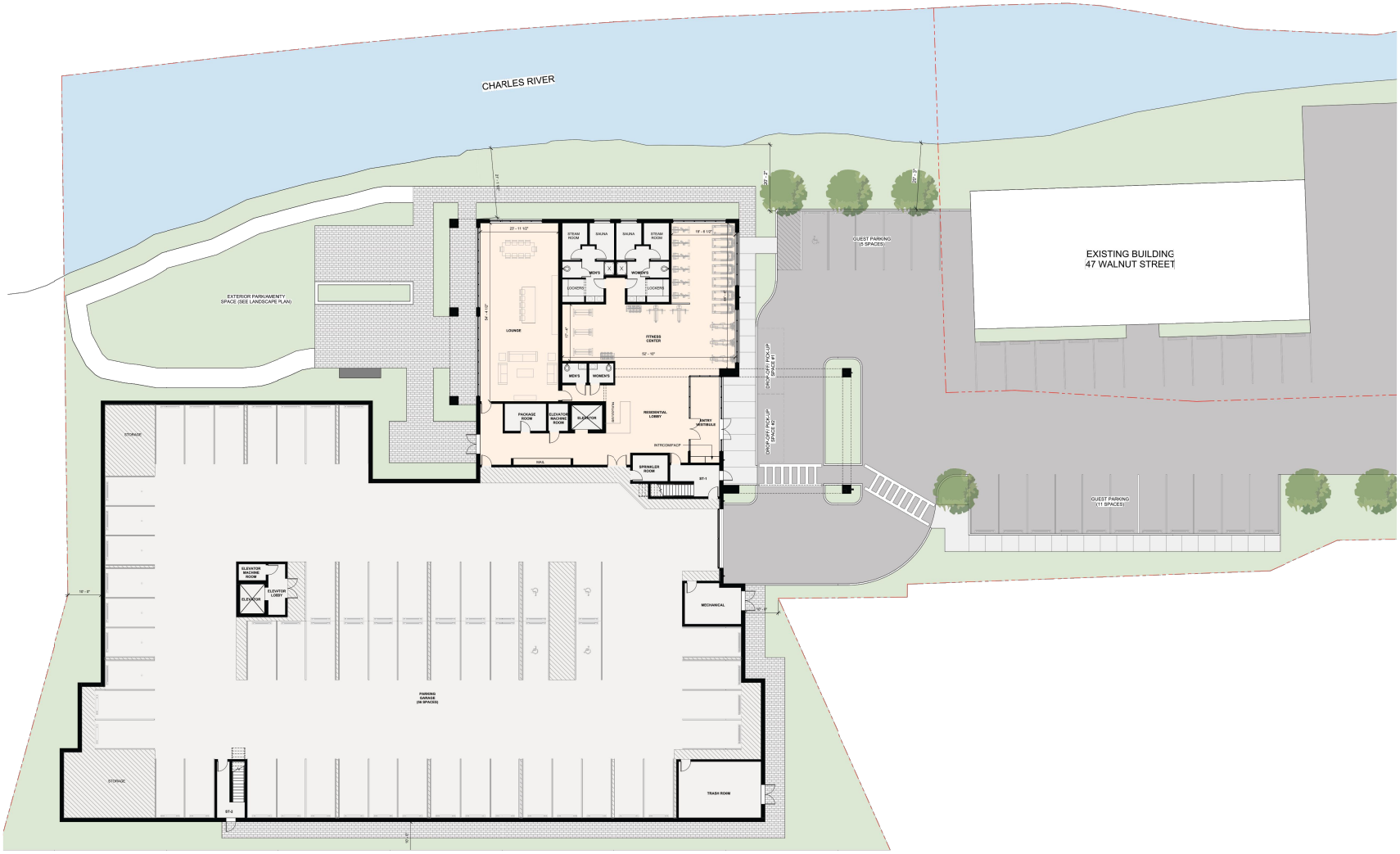
- *Adequate On-site Parking Supply*. The proposed parking supply of 72± marked spaces will accommodate the proposed development with an ample reserve to accommodate day-to-day activity by residents and visitors.

In summary, trip generation for the development is projected to be modest at 15 or fewer trips during commuter peak hours, representing a net trip decrease of 10 to 15 *fewer* trips relative to the existing site use. The project traffic will not materially impact operating conditions along Walnut Street. A review of the most recent data currently available from MassDOT indicated that safety countermeasures are not warranted at the intersection of Walnut Street at Walnut Park. Likewise, the available sight lines at the Walnut Park intersection with Walnut Street exceed the sight line requirements published by AASHTO. The 76 marked spaces on-site and 2 short-term spaces (pick-up/drop-off and TNC uses) will satisfy the peak parking demands of the proposed development with an ample reserve to accommodate day-to-day activity by residents and visitors. Access/egress improvements, pedestrian and bicycle accommodations, and TDM elements to enhancements operations, safety, and traffic flow are outlined under *Recommendation and Conclusions*.

Project Description

The existing Site consists of 17,698 gross square foot (gsf) of commercial office space across four buildings on approximately 1.7± acres of land located at 49 Walnut Street in Wellesley, MA. The existing parking supply includes 75 marked surface parking spaces with access/egress via Walnut Park through its intersection with Walnut Street.

Under the proposed site programming, the four existing buildings will be removed and replaced with a 28-unit residential building. The proposed residential building will be supported by 56 garage parking spaces, 16 surface guest parking spaces, and two short term spaces for pick-up/drop-off and transportation network company (TNC) use. Access/egress to the Site will remain via Walnut Park through its intersection with Walnut Street. A preliminary site plan is presented in **Figure 2**.



North

Scale: Not to Scale

Figure 2

Preliminary Site Plan

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EXISTING TRAFFIC & SAFETY CHARACTERISTICS

An overview of existing roadway conditions, traffic volumes, and safety characteristics is provided below.

Walnut Street

Walnut Street is generally a northeast-southwest roadway under Local (Town) jurisdiction within the study area. Washington Street is classified by the Massachusetts Department of Transportation (MassDOT) as an urban minor arterial roadway within the study area and provides a connection between Washington Street and Quinobequin Road to the northeast and Washington Street to the southwest. Walnut Street provides a single travel lane in each direction with a double yellow centerline and marked shoulders. Additional turn lanes provided at its intersections with Washington Street. There are sidewalks provided along both sides of Walnut Street. The prima facie (regulatory) speed limit on Walnut Street in the study area is 30 miles per hour (mph). Land use along Walnut Street in the study area includes a mix of residential and commercial space including general office and medical office space.

Daily Traffic

Daily traffic volume data for Walnut Street was collected using a video based automatic traffic recorder (ATR) in April 2025 and is summarized in **Table 1**. Detailed count data is provided in the **Attachments**.

TABLE 1
BASELINE TRAFFIC VOLUME SUMMARY
WALNUT STREET NORTH OF WALNUT PARK

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	14,750	9%	1,278	61% NB	775
Weekday Evening Peak Hour	14,750	8%	1,181	52% NB	615

[1]Two-way daily traffic expressed in vehicles per day without seasonal adjustment.
[2]The percent of daily traffic that occurs during the peak hour.
[3]Two-way peak-hour volume expressed in vehicles per hour.
[E]NB = Northbound, SB = Southbound

As summarized in **Table 1**, Walnut Street to the north of Walnut Park carries approximately 14,750 vehicles per day (vpd) with approximately 1,278 vehicles per hour (vph) and 1,181 vph during the weekday morning and weekday evening peak hours respectively. The peak hour traffic volumes represent approximately 8 to 9 percent of the daily traffic volumes with traffic skewed northbound during the morning peak hour and split evenly during the evening peak hour.

Peak Hour Traffic Volumes

Traffic volume data was collected at the intersection of Walnut Part at Walnut Street in April 2025 during the weekday morning (7:00 – 9:00 AM) and weekday evening (4:00 – 6:00 PM) peak periods. Review of MassDOT permanent count station data indicates that April is an above-average traffic month (approximately 1 percent above average month conditions). As a conservative measure, no adjustment (reduction) was made to the traffic counts to represent average conditions. The resulting Baseline weekday morning and weekday evening peak-hour traffic volumes for the study intersection are depicted in **Figure 3**. Turning movement counts and permanent count station data are provided in the **Attachments**.

Existing Trip Generation

Trip existing trip generation for the Site for the office building uses has been determined based on traffic counts conducted at the Site in April 2025. **Table 2** presents the baseline trip generation characteristics of the Site during the study periods. The by-right use of the site as general office use based on Institute of Transportation Engineers (ITE)Trip Generation rates for a General Office Building (LUC 710) has also been provided for reference purposes.

TABLE 2
BASELINE PEAK HOUR TRIP GENERATION

	SITE TRIPS[1]	
Period/Direction	**Existing Site Use[1]**	**By-Right Use[2]**
Weekday Morning Peak Hour:		
Entering	16	24
Exiting	8	3
Total	24	27
Weekday Evening Peak Hour:		
Entering	10	4
Exiting	19	21
Total	29	25

[1]Based on turning movement counts conducted on Wednesday, April 30, 2025.
[2]Based on ITE Trip Generation 11th Edition trip rates for LUC 710 – General Office Building applied to 17,698 square feet.

As summarized in **Table 2**, The existing uses at the site generate approximately 24 vehicle trips (16 entering and 8 exiting) during the weekday morning peak hour and 29 vehicle trips (10 entering and 19 exiting) during the weekday evening peak hour. The observed trip generation is highly consistent with industry standard rates for the existing office uses of the Site.

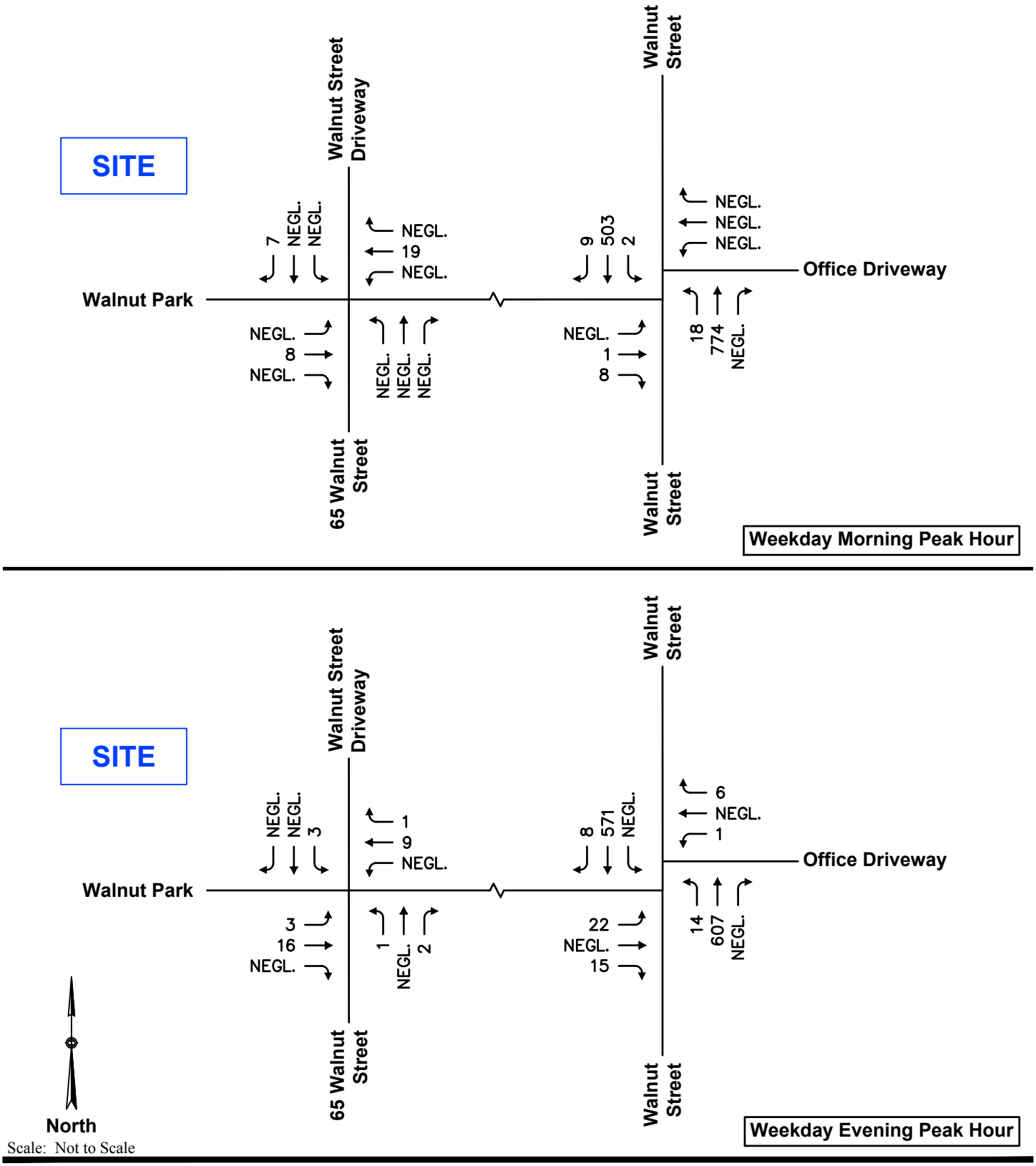

Figure 3

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2025 Baseline Condition
Weekday Peak Hour Volumes

Date: May 2025
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Intersection Crash History

In order to identify crash trends and safety characteristics in the study area, crash data were obtained from MassDOT for the Town of Wellesley for the five-year period 2020 through 2024 (the most recent data currently available from MassDOT). A summary of the crash data is provided in the **Attachments.** Crash rates were calculated for the study intersections. These rates quantify the number of crashes per million entering vehicles. MassDOT has determined the official District 6 (which includes the Town of Wellesley) crash rate to be 0.52 for unsignalized intersections. This rate represents MassDOT's "average" crash experience for District 6 communities and serves as a basis for comparing reported crash rates for the study intersections. Where calculated crash rates notably exceed the district average, some form of safety countermeasures may be warranted.

A review of the crash data indicates that, there were two (2) reported crashes near the intersection of Walnut Street and Walnut Park resulting in a crash rate of 0.07 which is well below the District average crash rate of 0.52. The crashes resulted in one angle type collision and one sideswipe type collision between a vehicle traveling on Walnut Street and a vehicle turning left off out of Walnut Park resulting in property damage type collisions. There were no pedestrian or bicycle crashes reported during the study period. Based on this information, no immediate safety measures are warranted based on the crash history at the Walnut Street intersection with Walnut Park.

Sight Line Evaluation

An evaluation of sight lines was conducted to ensure that minimum recommended sight lines are available at the Walnut Park intersection with Walnut Street. The evaluation documents sight lines under proposed conditions for vehicles as they relate to these roadways with comparison to recommended guidelines.

The American Association of State Highway and Transportation Officials' (AASHTO) standards[1] reference two types of sight distance which are relevant at the Walnut Park intersection: stopping sight distance (SSD) and intersection sight distance (ISD). Sight lines for critical vehicle movements at the Walnut Park intersection along Walnut Street were compared to minimum SSD and ISD recommendations for the regulatory and observed travel speeds in the area.

[1] *A policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (AASHTO), 2018.

Stopping Sight Distance

Sight distance is the length of roadway visible to the motorist to a fixed object. The minimum sight distance available on a roadway should be sufficiently long enough to enable a below-average operator, traveling at or near the design speed limit, to stop safely before reaching a stationary object in its path, in this case, a vehicle exiting onto Walnut Street. The SSD criteria are defined by AASHTO based on design and operating speeds, anticipated driver behavior and vehicle performance, as well as physical roadway conditions. SSD includes the length of roadway traveled during the perception and reaction time of a driver to an object, and the distance traveled during brake application on wet level pavement. Adjustment factors are applied to account for roadway grades when applicable.

SSD was estimated in the field using AASHTO standards for driver's eye (3.5 feet) and object height equivalent to the taillight height of a passenger car (2.0 feet) for the Walnut Street approaches to Walnut Park. **Table 3** presents a summary of the available SSD as they relate to Walnut Street and AASHTO's recommended SSD based on regulatory speeds.

TABLE 3
STOPPING SIGHT DISTANCE SUMMARY
WALNUT STREET APPROACHES TO WALNUT PARK

Approach/ Travel Direction	Available SSD	AASHTO Recommended[1]	
		Regulatory Speed Limit[2]	Criteria Met
Northbound	>500 Feet	200 Feet	Yes
Southbound	310± Feet	200 Feet	Yes

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet to object height of 2.0 feet.
[2] Regulatory speed limit: 30 mph

As summarized in **Table 3,** analysis results indicate that the existing available sight lines exceed AASHTO's recommended SSD criteria along Walnut Street for the regulatory travel speed. Stopping sight-distance calculations are provided in the **Attachments**.

Intersection Sight Distance

Clear sight lines provide sufficient sight distance for a stopped driver on a minor-road approach to depart from the intersection and enter or cross the major road. As stated under AASHTO's Intersection Sight Distance (ISD) considerations, "*…If the available sight distance for an entering …vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to avoid collisions…To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road*." AASHTO's ISD criteria are defined into several "cases". In this case, the site driveway approach is under "STOP" control. The ISD in question relates to the ability to turn either right or left onto Walnut Street.

Available ISD was estimated in the field using AASHTO standards for driver's eye (3.5 feet), object height (3.5 feet) and decision point (8 to 10 feet from the edge of the travel lane) for the northbound and southbound travel directions on Walnut Street. **Table 4** presents a summary of the available ISD for the departures from Walnut Park and AASHTO's recommended ISD assuming continued maintenance within the sight line triangles.

TABLE 4
INTERSECTION SIGHT DISTANCE SUMMARY
WALNUT PARK DEPARTURES TO WALNUT STREET

		AASHTO Minimum[1]	AASHTO Ideal[1]
View Direction	**Available ISD**	**Regulatory Speed Limit[2]**	**Regulatory Speed Limit[2]**
Looking North	300± Feet	200 Feet	290 Feet
Looking South	>500 Feet	200 Feet	335 Feet

[1]Recommended sight distance based on AASHTO, A Policy on Geometric Design of Highways and Streets. Based on driver height of eye of 3.5 feet and an object height of 3.5 feet. Minimum value as noted represents SSD per AASHTO guidance.
[2]Regulatory speed limit: 30 mph

The results of the ISD analysis presented in **Table 4** indicate that the available sight lines looking north and south from the Walnut Park onto Walnut Street exceed the sight line requirements from AASHTO for the regulatory and 85th percentile travel speeds. MDM recommends that any new plantings (shrubs, bushes) or physical landscape features to be located within the sight lines should also be maintained at a height of 2 feet or less above the adjacent roadway grade to ensure unobstructed lines of sight.

DESIGN YEAR TRAFFIC VOLUMES

This section provides an overview of projected trip generation estimates, trip distribution estimates and 2025 Baseline and 2025 Design Year traffic volumes as provided below.

Trip Generation

The trip generation estimates for the proposed development of the Site are provided for the weekday morning and weekday evening periods, which correspond to the critical analysis periods for the proposed use and adjacent street traffic flow. New traffic generated by the project was estimated using trip rates published in ITE's *Trip Generation*[2] for the Land Use Code (LUC) 220 – Multifamily Low-Rise.

Table 5 presents the trip-generation estimates for the proposed development based on ITE methodology for the 28 residential units. A comparison is also provided for the existing use of the property as 17,698 sf of general office space.

TABLE 5
TRIP-GENERATION SUMMARY

Period/Direction	Existing Uses[1]	Proposed Use[2]	Δ
Weekday Morning Peak Hour:			
Entering	24	3	-21
Exiting	3	8	+5
Total	27	11	-16
Weekday Evening Peak Hour:			
Entering	4	9	+5
Exiting	21	5	-16
Total	25	14	-11
Weekday Daily	192	190	-2

[1]Based on **Table 2**, daily trips based on ITE LUC 710 general office applied to 17,698 sf.
[2]Based on ITE LUC 220 trip rates applied to 28 Units.

As summarized in **Table 5**, the proposed development is estimated to generate approximately 11 trips (3 entering and 8 exiting) during the weekday morning peak hour and 14 trips (9 entering and 5 exiting) during the weekday evening peak hour. On a daily basis the project is estimated to generate approximately 190 trips with half entering and half exiting over a 24 hour period. Compared to the existing use of the property, proposed development will result in a *decrease* of 10 to 15 trips during the peak hours and a nominal decrease in trips on a weekday. Trip generation calculations are provided in the **Attachments**.

[2]*Trip Generation,* Ninth Edition; Institute of Transportation Engineers; Washington, DC; 2012.

Trip Distribution

Trip distribution patterns for the proposed renovation project are based on existing travel patterns observed along Walnut Street. The trip distribution percentages and new development-related trips at the Walnut Street intersection with Walnut Park for the weekday morning and weekday evening peak hours are quantified in **Figure 4**. Trip distribution calculations are provided in the **Attachments.**

2025 Design Year Traffic Volumes

Development-related trips for the proposed renovation were assigned to the roadway network using the trip-generation estimates shown in **Table 5**. Design Year conditions for the weekday morning and weekday evening peak hours include existing traffic volumes as presented in **Figure 3** and site generated trips as presented in **Figure 5**. The resulting 2025 Design Year traffic volumes are quantified in **Figure 6.**

OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology, an assessment of operations under 2025 Baseline and 2025 Design Year conditions.

Analysis Methodology

Intersection capacity analyses are presented in this section. 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**.

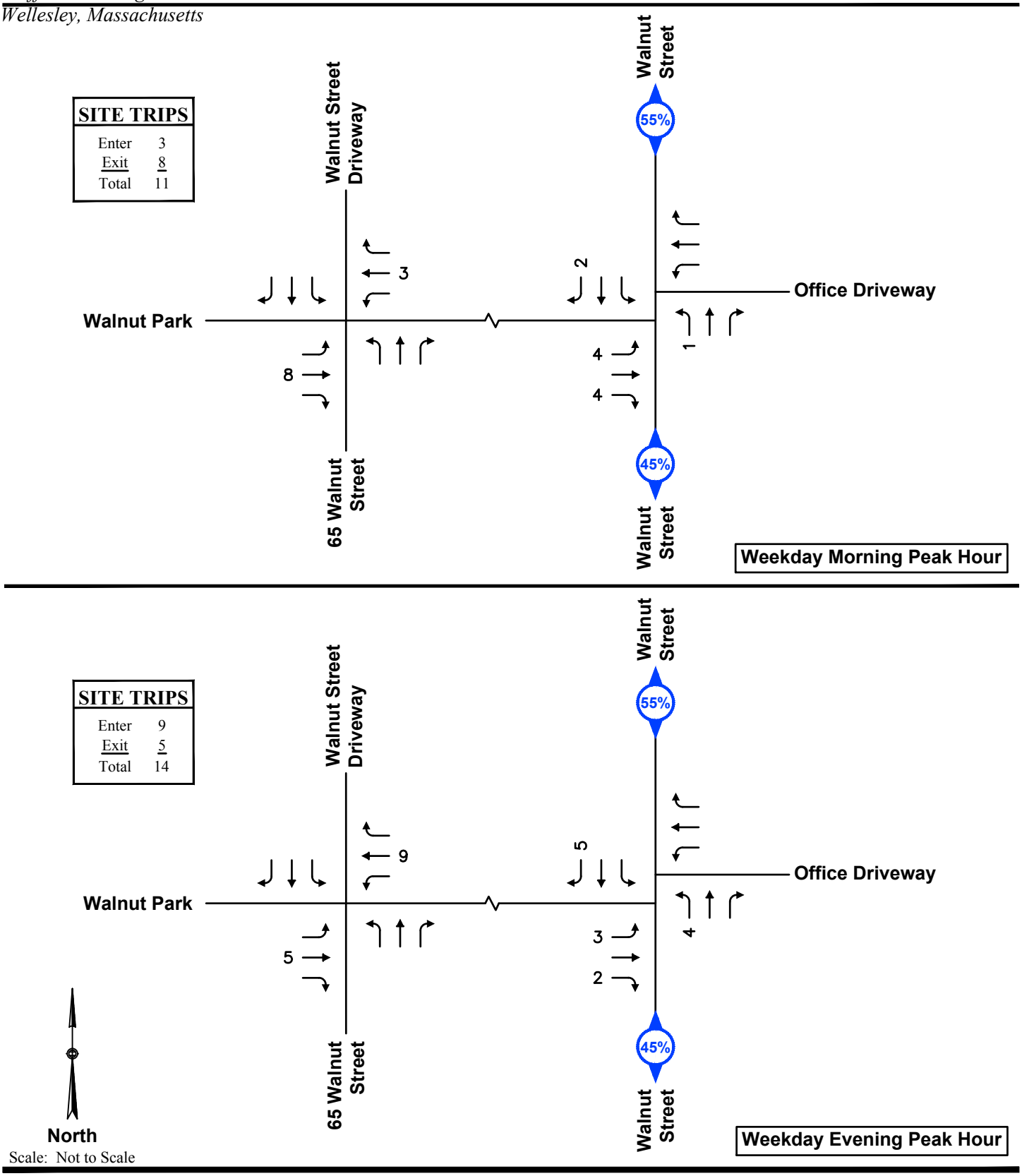

Figure 4

Trip Distribution
Weekday Peak Hour Volumes

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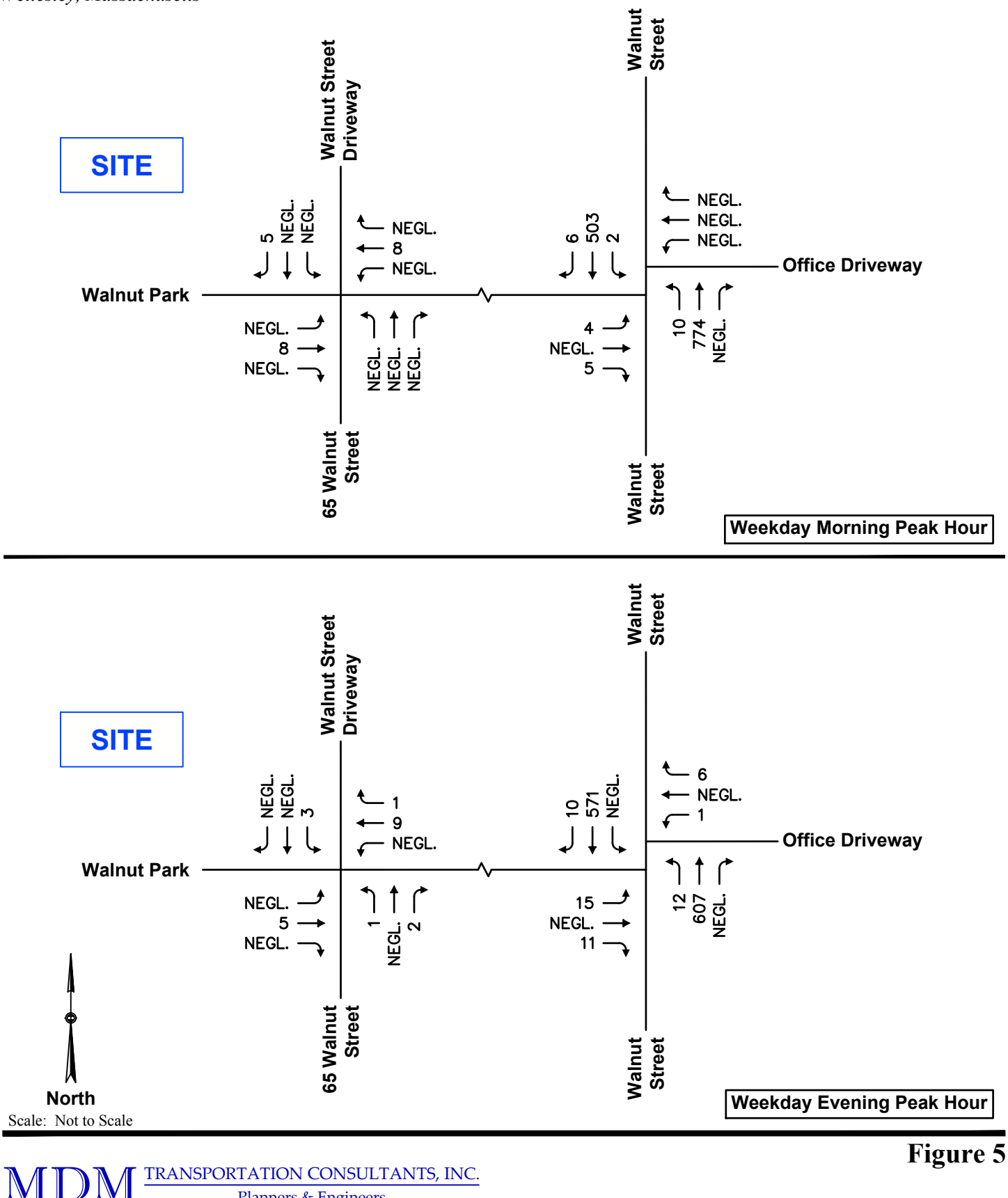

Figure 5

2025 Design Year Condition
Weekday Peak Hour Volumes

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Analysis Results

Level-of-Service (LOS) analyses were conducted for 2025 No-Build and 2025 Design Year conditions for the study intersection. The results of the intersection capacity are summarized below in **Table 6**. Detailed analysis results are presented in the **Attachments**.

TABLE 6
INTERSECTION CAPACITY ANALYSIS RESULTS

		2025 Baseline Conditions			2025 Design Conditions		
Period/Intersection	Approach	v/c	Delay	LOS	v/c	Delay	LOS
Weekday Morning Peak Hour							
Walnut Street at	Eastbound	0.03	14	B	0.05	24	C
Walnut Park	Westbound	0.00	<5	A	0.00	<5	A
	Northbound	0.02	<5	A	0.01	<5	A
	Southbound	0.00	<5	A	0.00	<5	A
Weekday Evening Peak Hour							
Walnut Street at	Eastbound	0.20	28	D	0.14	26	D
Walnut Park	Westbound	0.02	15	C	0.02	15	C
	Northbound	0.02	<5	A	0.01	<5	A
	Southbound	0.00	<5	A	0.00	<5	A

[1]Volume-to-capacity ratio
[2]Average control delay per vehicle (in seconds)
[3]Level of service
[4]n/a = not applicable

As summarized in **Table 6**, under Design Year conditions, capacity analyses indicate that the project traffic will not materially impact operating conditions along Walnut Street compared to No-Build conditions. Specifically, the Walnut Park approach to Walnut Street will continue to operate well below capacity with moderate delay at level of service (LOS) D or better during the weekday morning peak hour and weekday evening peak hours. Mainline travel along Walnut Street will continue to operate unimpeded with minimal delay.

PARKING EVALUATION

The parking evaluation includes parking generation projections with proposed development in place and quantifies the adequacy of the proposed parking supply to meet the peak parking demands of the Site. Under the proposed plan the Site will provide 56 marked garage parking spaces and 16 marked surface guest parking spaces

Parking Summary

The proposed site programming will include 28 units of residential space with a proposed on-site parking supply of 56 marked garage parking spaces and 16 marked surface guest parking spaces. There will also be two short term spaces for pick-up/drop-off and transportation network company (TNC) use. The combined Site total represents an equivalent parking ratio of approximately 2.6 spaces per unit.

The proposed parking ratio of 2.6 spaces per unit is compared to industry standard parking demand rates published by the Institute of Transportation Engineers (ITE) in *Parking Generation*[3] and typical parking supply ratios for residential use. **Table 7** summarizes the industry standard parking demand rates and parking supply ratios for similar uses.

TABLE 7
PARKING RATIO COMPARISON

Methodology	Rate	Projected Demand (28 Units)
ITE Average Rate[1] (Average Demand)	1.27	36
ITE 85th Percentile[2] (Peak Demand)	1.59	45
Proposed Supply	**2.6**	**-**

[1] Unadjusted average parking demand rate based on LUC 220 Multifamily Housing (Low-Rise) (50th percentile peak parking demand).
[2] Unadjusted peak parking demand rate based on LUC 220 Multifamily Housing (Low-Rise) (85th percentile peak parking demand).

As summarized in **Table 7**, the proposed parking supply ratio of 2.6 spaces per unit is higher than the ITE peak parking demand rate of 1.59. The proposed parking supply of 72± marked spaces will accommodate the proposed development with an ample reserve to accommodate day-to-day activity by residents and visitors.

[3] Parking Generation Manual, 6th Edition, Institute of Transportation Engineers, Washington DC (2023).

RECOMMENDATIONS AND CONCLUSIONS

In summary, trip generation for the development is projected to be modest at 15 or fewer trips during commuter peak hours, representing a net trip decrease of 10 to 15 *fewer* trips relative to the existing site use. The project traffic will not materially impact operating conditions along Walnut Street. A review of the most recent data currently available from MassDOT indicated that safety countermeasures are not warranted at the intersection of Walnut Street at Walnut Park. Likewise, the available sight lines at the Walnut Park intersection with Walnut Street exceed the sight line requirements published by AASHTO. The 76 marked spaces on-site and 2 short-term spaces (pick-up/drop-off and TNC uses) will satisfy the peak parking demands of the proposed development with an ample reserve to accommodate day-to-day activity by residents and visitors. MDM recommends the following access/egress improvements, pedestrian and bicycle accommodations, and TDM elements to enhancements operations, safety, and traffic flow:

- *Sight Line Maintenance.* Proponent commits that sight lines for the Walnut Park approach to Walnut Street will be maintained in such a manner that sight distance requirements cited herein are achieved. Any new plantings (shrubs, bushes) or physical landscape features to be located within the sight lines will be maintained at a height of 2 feet or less above the adjacent roadway grade to ensure unobstructed lines of sight.

- *Pedestrian Accommodation.* The design incorporates a sidewalks that connect the proposed building entrances with the proposed visitor parking area.

- *Bicycle Parking*. The Proponent shall incorporate secure and weather-protected bicycle racks to encourage and facilitate this mode of transportation to/from the Site by residents. Additional bike racks should also be provided on-site for visitors near the building entranceway(s).

- *Transportation Demand Management (TDM): A* preliminary list of potential TDM program elements may include the following, subject to refinement of the development program and further evaluation by the Proponent:
  - *Bicycle Parking.*
  - *Preferential Parking and Incentives for Low-Emission Vehicles.*
  - *Electric Vehicle Charging Stations*
  - *On-Site Amenities.*