McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Traffic Impact Study

Proposed Industrial Facility

11 Randolph Road
Randolph, Massachusetts

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Prepared for
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INTRODUCTION

McMahon Associates has completed a review of the existing traffic operations and potential traffic impacts associated with the proposed industrial facility (herein referred to as the "Project") to be located at 11 Randolph Road, in the Town of Randolph, Massachusetts. The purpose of this traffic impact study is to evaluate existing and projected traffic operations and safety conditions associated with the Project within the study area.

The assessment documented in this traffic impact study is based on a review of existing traffic volumes and the anticipated traffic generating characteristics of the Project. The study examines existing and projected traffic operations (both with and without the Project) in the vicinity of the Project site. The study area was selected based on a review of the surrounding roadway network and estimated trip generating characteristics of the proposed Project. This study provides an analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the combination of adjacent roadway volumes and Project trips would be expected to be the greatest.

Project Description

The Project site, depicted in Figure 1, is bounded by Randolph Road and commercial properties to the north, undeveloped land to the east and south, and an existing warehouse to the west. The site is currently undeveloped.

As shown in the proposed Concept Plan prepared by DiPrete Engineering dated August 4, 2022, the Project would include the construction of a 120,000 square foot (sf) industrial building. The proposed site would provide approximately 98 parking spaces and 37 loading spaces. Access to the Project site would be provided via a full-access site driveway on the south side of Randolph Road, approximately 600 feet east of the intersection of North Street at Oak Street/Randolph Road.

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Figure 1
Site Location Map
Proposed Industrial Facility
Randolph, Massachusetts

Study Methodology

This traffic impact study evaluates existing and projected traffic operations within the study area for the weekday morning and weekday afternoon peak hour traffic conditions when the combination of the adjacent roadway volumes and estimated Project trips would be expected to be the greatest.

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the Project study area. As part of this inventory, traffic data was collected during the weekday morning and weekday afternoon peak periods. A field visit was conducted to document intersection and roadway geometries, posted speed limits, and available sight distance at the site driveway. Crash data for the study area intersections was obtained from the Massachusetts Department of Transportation (MassDOT) to determine if the study area has existing traffic safety deficiencies.

The second step of the study built upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with planned future developments that could influence traffic volumes at the study area intersections were assessed. The 2022 Existing traffic volumes were forecasted to the future year 2029 to evaluate the 2029 No Build (without Project) conditions and the 2029 Build (with Project) conditions, consistent with MassDOT traffic study guidelines.

The third step of this study determined if measures were necessary to improve future traffic operations, minimize potential traffic impacts, and provide efficient access to the Project site.

Study Area Intersections

Based on a review of the anticipated traffic generating characteristics of the Project and a review of the adjacent roadways serving the Project site, the following study area intersections were selected for analysis:

- North Street at Oak Street/Randolph Road (unsignalized)
- Randolph Road at Site Driveway (unsignalized)

The traffic impact study presented in this report documents existing and future traffic conditions for the study area intersections noted above.

EXISTING CONDITIONS

An assessment of the potential traffic impacts associated with the Project requires a comprehensive understanding of the existing traffic conditions within the study area. The existing conditions assessment included in this study consists of an inventory of intersection and roadway geometries, an inventory of traffic control devices, the collection of traffic volume data in the study area, and a review of recent crash data. The existing conditions in the vicinity of the Project site are summarized below.

Roadway Network

To assess the existing conditions of the surrounding roadway network, an inventory of the study area intersections and roadway geometries, and existing traffic control was conducted on Tuesday, September 27, 2022. A summary of the existing roadway conditions within the study area is provided below.

North Street

North Street is classified as an urban minor arterial under the Town of Randolph jurisdiction. North Street provides access to residential, industrial, and commercial land extending in the north-south direction from its intersection with South Main Street (Crawford Square) in the south, to the Braintree Town Line in the north, where the road continues as Pond Street. The posted speed limit on North Street in the vicinity of the Project site is 30 miles per hour (mph). North Street includes one 14-foot-wide travel lane in each direction, with shoulders measuring eight-feet in width on both sides of the roadway. A sidewalk measuring six-feet in width is provided along the west side of North Street. There is also a sidewalk provided on the east side of North Street, just north of Randolph Road, to provide access to the Massachusetts Bay Transportation Authority (MBTA) Bus Route 238 (Holbrook/Randolph) stop. A crosswalk marked with a Rapid Rectangular Flashing Beacon (RRFB) is provided across North Street, approximately 100 feet north of the intersection with Oak Street/Randolph Road, connecting the inbound/outbound MBTA bus stops located on either side of the street.

Randolph Road

Randolph Road is a dead-end street that runs in the east-west direction extending approximately 1,000 feet east from its intersection with North Street. Randolph Road is classified as a local roadway under private jurisdiction, providing access to commercial and industrial land uses. Randolph Road is a two-way roadway measuring 30-feet in width with no pavement markings. At the intersection of North Street at Oak Street/Randolph Road, the Randolph Road approach is under stop control. There is no posted speed limit on Randolph Road, therefore it is considered to fall under the Townwide statutory speed limit of 25 mph.

Oak Street

Oak Street is classified as an urban collector under the Town of Randolph jurisdiction and runs in an east-west direction from its intersection with North Main Street (Route 28) in the west to its intersection with North Street in the east. Oak Street provides access to residential properties, providing one 12-foot wide travel lane and a 3-foot wide shoulder in each direction. There is a posted speed limit of 30 mph on Oak Street. Oak Street is under stop control at the unsignalized intersection of North Street at Oak Street/Randolph Road, and there is a crosswalk spanning the Oak Street approach

Public Transportation

The MBTA provides service to the study area via the Bus Route 238 (Holbrook/Randolph). There are two MBTA bus stops located within a five-minute walk of the Project site, with the closet stop being located just north of the study area intersection of North Street at Oak Street/Randolph Road. The Holbrook/Randolph bus line provides connections to the MBTA Red Line and Commuter Rail (Greenbush, Kingston, and Middleborough/Lakeville lines) via Quincy Center.

2022 Existing Traffic Volumes

Turning Movement Count Data

To assess peak hour traffic conditions, manual turning movement counts (TMCs) were conducted at the study area intersection of North Street at Oak Street/Randolph Road during the weekday morning and weekday afternoon peak periods. Counts were conducted on Tuesday, September 13, 2022, during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon (4:00 PM to 6:00 PM) peak periods. Based on a review of the traffic data, the weekday morning peak hour for the study area intersection occurs between 8:00 AM and 9:00 AM, and the weekday afternoon peak hour occurs between 5:00 PM and 6:00 PM. The results of the turning movement counts are tabulated by 15-minute periods and are provided in Appendix A of this report.

Seasonal Variation

To account for seasonal variation in traffic volumes, the MassDOT 2019 Weekday Seasonal Adjustment Factors were reviewed. Based on the data, traffic volumes collected during the month of September on urban minor arterial and local roadways are greater than traffic volumes for an average month. To present a conservative analysis, the September traffic volumes were not seasonally adjusted downward to reflect and average month. The MassDOT seasonal adjustment data is provided in Appendix B of this report**.**

Automatic Traffic Recorder Data

Automatic Traffic Recorder (ATR) data was collected on Randolph Road, just to the east of North Street. The ATR count was conducted for a 48-hour period from Tuesday, September 13, 2022 through Wednesday, September 14, 2022. The ATR data collected on Randolph Road is summarized in Table 1 below and included in Appendix A.

Table 1: ATR Summary

Roadway	Direction	ADT[1]	HV%[2]	Vehicle Speeds[3]
Randolph Road	Eastbound	140	10.2%	18
	Westbound	140	8.6%	18
	Total	280	9.4%	

1 Average daily traffic volume in vehicles per day (vpd) based on Wedensday, September 14, 2022 data.

2 Percentage of heavy vehicles

3 Based on measured 85th percentile speeds

Based on the results of the ATR count, Randolph Road is shown to carry an average daily traffic (ADT) volume of approximately 280 vehicles per day. Approximately 9.4% of the daily traffic included heavy vehicle traffic. Measured 85th percentile operating speeds on Randolph Road were 18 mph.
The resulting peak hour traffic volumes for the 2022 Existing conditions are depicted in Figures 2 and 3 for the weekday morning and weekday afternoon peak hours, respectively.

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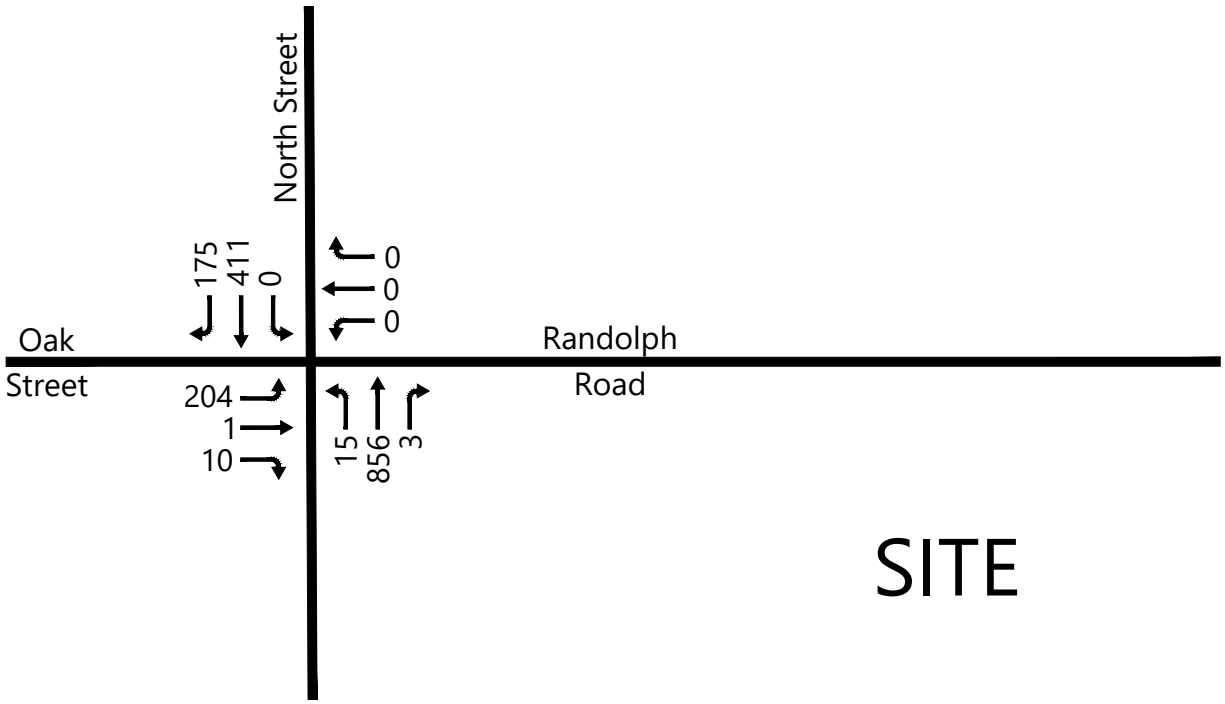

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Figure 2
2022 Existing Weekday Morning
Peak Hour Traffic Volumes
Proposed Industrial Facility
Randolph, Massachusetts

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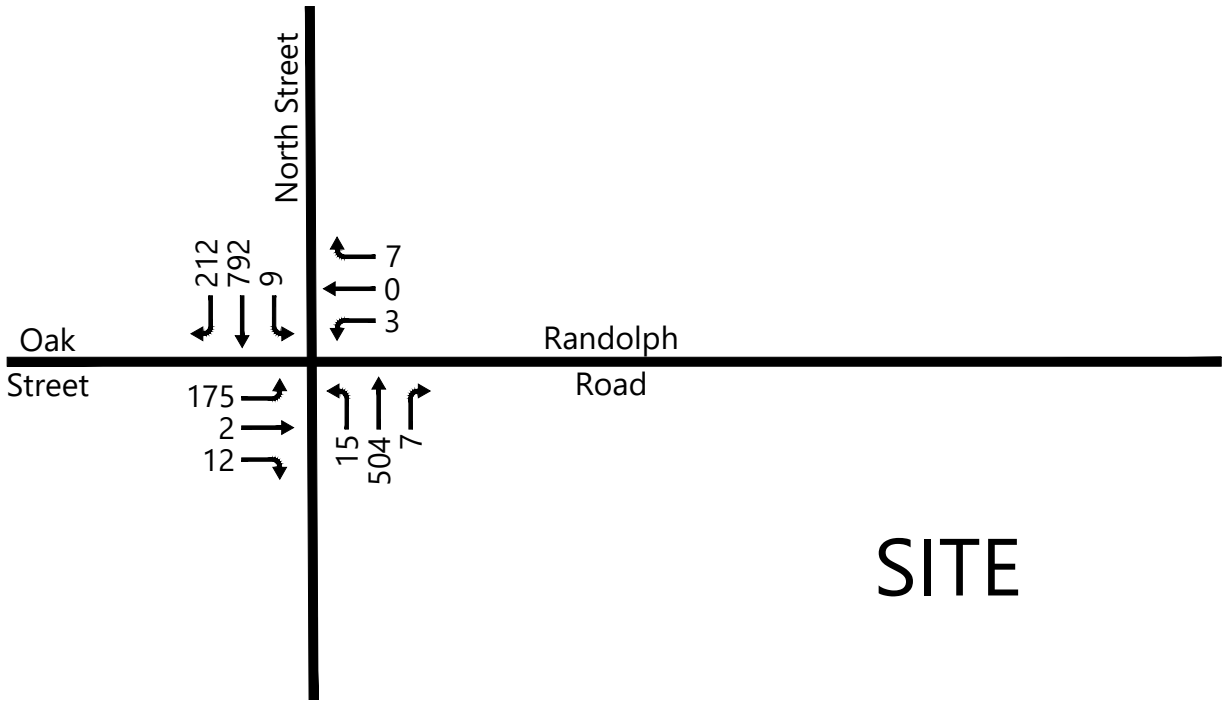

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Figure 3
2022 Existing Weekday Afternoon
Peak Hour Traffic Volumes
Proposed Industrial Facility
Randolph, Massachusetts

Crash Summary

Crash data for the study area intersections was obtained from MassDOT for the most recent five-year period available. This includes complete yearly crash summaries from 2015 through 2019. A summary of the crash data is provided in Appendix C.

The crash rates at the study intersections were calculated to determine whether the crash frequencies at the study area intersections were unusually high given the travel demand. The intersection crash rate is expressed in crashes per million entering vehicles (MEV). The crash rate for each intersection was then compared to the average rate for signalized and unsignalized intersections statewide and within MassDOT District 6. For unsignalized intersections, the statewide and MassDOT District 6 average crash rate is 0.57 and 0.52 crashes per MEV respectively.

North Street at Oak Street/Randolph Road

The unsignalized intersection of North Street at Oak Street/Randolph Road experienced a total of 17 reported crashes over the five-year period analyzed. The resulting crash rate of approximately 0.48 crashes per MEV is below the statewide and District 6 averages. A total of 10 crashes were angle collisions, three were rear-end collisions, three were sideswipe collisions, and one was a head-on collision. Of the 17 reported crashes, eight crashes resulted in personal injury (complaints of pain) and the remaining nine crashes resulted in property damage only.

Randolph Road at Project Site Driveway

During the five-year period analyzed, there were no reported crashes on Randolph Road in the vicinity of the existing site driveway.

FUTURE CONDITIONS

To determine future traffic demands on the study area roadways and intersections, the 2022 Existing traffic volumes were projected to the future-year 2029, by which time the proposed Project would be anticipated to be built and occupied. Traffic volumes on the study area roadways in 2029 are considered to include all existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects, independent of the proposed Project. The potential background traffic growth, unrelated to the proposed Project, was considered in the development of the 2029 No Build (without Project) peak hour traffic volumes. The estimated traffic increases associated with the proposed Project were then added to the 2029 No Build volumes to reflect the 2029 Build (with Project) traffic conditions. A detailed description of the development of the 2029 No Build and 2029 Build traffic volume networks is presented below.

Future Roadway Improvements

Based on coordination with the Town of Randolph, there are no planned roadway improvement projects in the vicinity of the Project site that would be anticipated to impact future traffic volumes or patterns.

Background Traffic Growth

Traffic growth is primarily a function of changes in motor vehicle use and expected land development within the area. To establish the rate at which traffic on the study area roadways can be anticipated to grow during the seven-year forecast period (2022 to 2029), both site-specific traffic growth and planned area developments and were reviewed.

Historic Traffic Growth

Background traffic growth accounts for changes in traffic volumes associated with general changes in population and other developments that are not known at this time. An annual background traffic growth rate of 0.5% per year, compounded annually, was established for the study area in conjunction with the Central Transportation Planning Staff (CTPS) to grow the 2022 traffic volumes to future year 2029.

Site-Specific Growth

Based on coordination with the Town of Randolph Planning Department, no planned developments were identified which would be anticipated to impact traffic volumes within the study area. Developments which may be constructed during the forecast period but that are unknown at this time are considered to be captured in the 0.5% per year historic background growth described above.

2029 No Build Traffic Volumes

The 2022 Existing peak hour traffic volumes were grown by 0.5% per year (compounded annually) over the seven-year study horizon (2022 to 2029) to establish the 2029 base future traffic volumes. The resulting 2029 No Build peak hour traffic volumes are illustrated in Figures 4 and 5 for the weekday morning and weekday afternoon peak hours, respectively. The 2029 No Build traffic volumes are also documented in the traffic projection model presented in Appendix D of this report.

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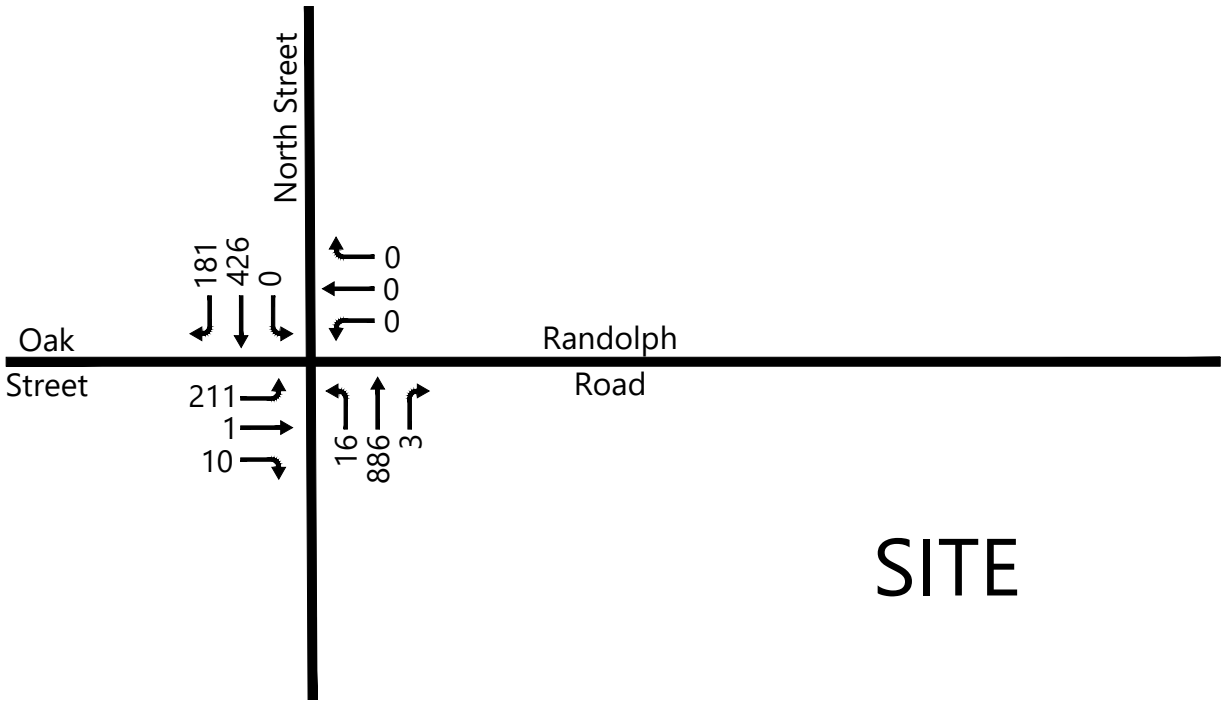

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Figure 4
2029 No Build Weekday Morning
Peak Hour Traffic Volumes
Proposed Industrial Facility
Randolph, Massachusetts

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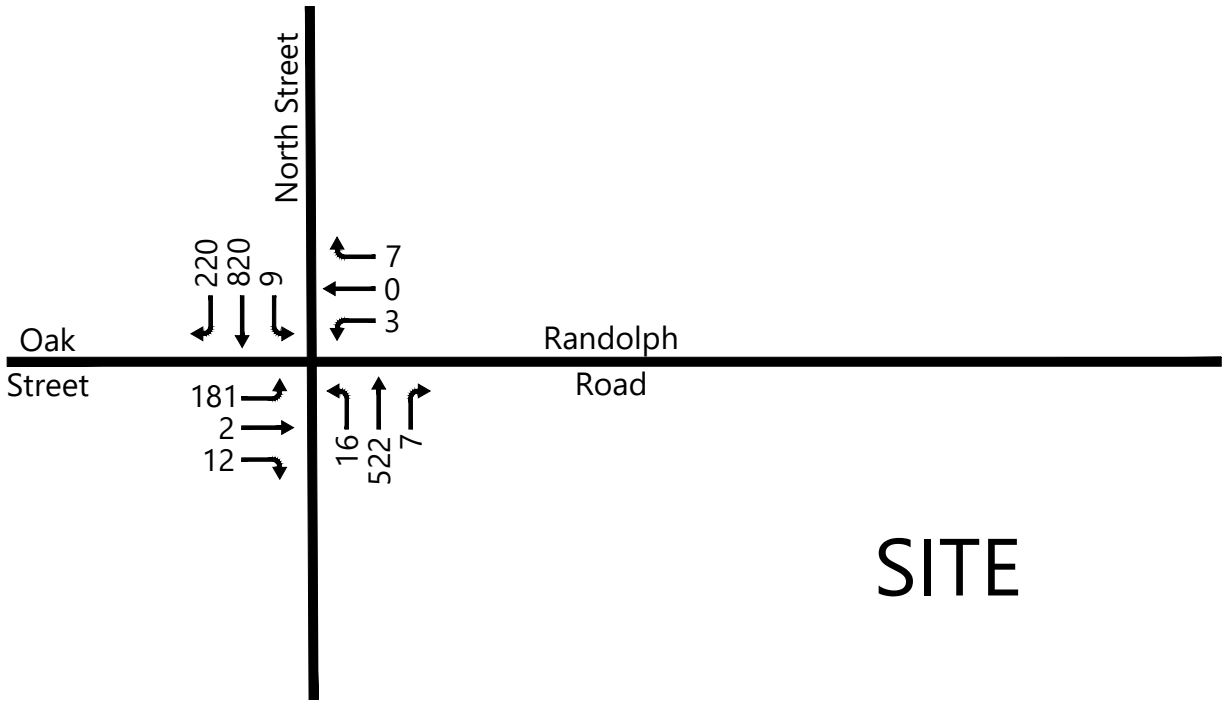

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Figure 5
2029 No Build Weekday Afternoon
Peak Hour Traffic Volumes
Proposed Industrial Facility
Randolph, Massachusetts

Site-Generated Traffic

To estimate the number of vehicle trips associated with the project, the Institute of Transportation Engineers' (ITE) publication, *Trip Generation Manual, 11th Edition,* was referenced. This publication provides traffic generation information for various Land Use Codes (LUCs) compiled from studies conducted by members nationwide. The trip generation estimates for the proposed 120,000 sf industrial facility were developed based on data presented in the Trip Generation Manual for LUC 150 (Warehousing). This reference establishes vehicle trip rates (in this case expressed in trips per square foot) based on actual traffic counts conducted at similar types of existing land uses. The vehicle trips projected to be generated by the development were split into passenger vehicles and trucks based on the heavy vehicle trip generation provided for LUC 150. A summary of the peak hour trip generation estimates for the Project are summarized in Table 2 below.

Table 2: Vehicular Trip Generation

		Weekday AM			Weekday PM			Weekday Daily		
Description	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Proposed Warehouse Trips[1]	120,000 s.f.	29	9	38	11	29	40	114	114	228
Passenger Vehicles		*28*	*8*	*36*	*9*	*27*	*36*	*78*	*78*	*156*
Trucks[2]		*1*	*1*	*2*	*2*	*2*	*4*	*36*	*36*	*72*

1 ITE Land Use Code 150 (Warehousing), based on 120,000 square feet.

2 ITE Land Use Code 150 (Warehousing) truck generation based on 120,000 square feet.

As shown in Table 2, the proposed Project is estimated to result in approximately 38 new vehicle trips (29 entering vehicles and 9 exiting vehicles) during the weekday morning peak hour, approximately five percent of which are anticipated to be heavy vehicles, and approximately 40 new vehicle trips (11 entering vehicles and 29 exiting vehicles) during the weekday afternoon peak hour, approximately ten percent of which are anticipated to be heavy vehicles. During a typical weekday, the proposed Project is estimated to generate approximately 228 new vehicle trips (114 entering vehicles and 114 exiting vehicles), approximately 32 percent of which are anticipated to be heavy vehicles. As shown in Table 2, a majority of the truck trips to the site would be anticipated to occur outside of the peak hours.

Project Trip Distribution and Assignment

The traffic projected to be generated by the Project was distributed onto the study area roadways and intersections based existing travel patterns of the adjacent roadways, available Journey-to-Work data for the Town of Randolph for employees at the site, and logical travel routes for warehouse deliveries which is presented in the Appendix E. The resulting arrival and departure patterns are presented in Figure 6 and are documented in the traffic projection model located in Appendix D.

The Project-related traffic was then assigned to the surrounding roadway network based on the Project trip distribution patterns presented in Figure 6. The resulting distributed new Project trips are shown in Figures 7 and 8 for the weekday morning and weekday afternoon peak hours, respectively.

2029 Build Traffic Volumes

To establish the 2029 Build peak hour traffic volumes, the distributed Project trips were added to the 2029 No Build peak hour traffic volumes. The resulting 2029 Build weekday morning and weekday afternoon peak hour traffic volumes are presented in Figure 9 and 10, respectively, and are documented in the traffic projection model presented in Appendix D of this report.

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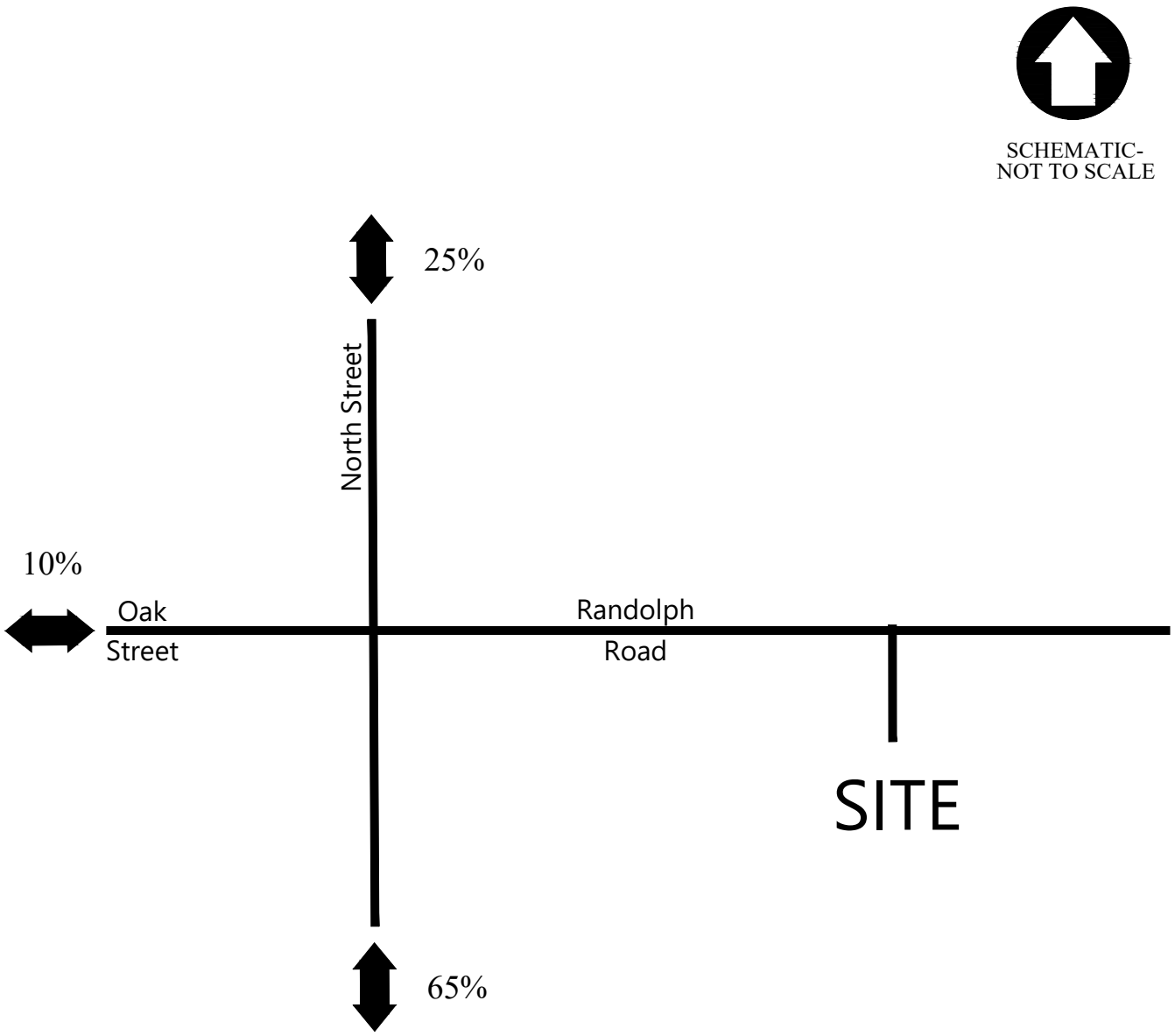

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Figure 6
Direction of Arrivals and Departures
Proposed Industrial Facility
Randolph, Massachusetts

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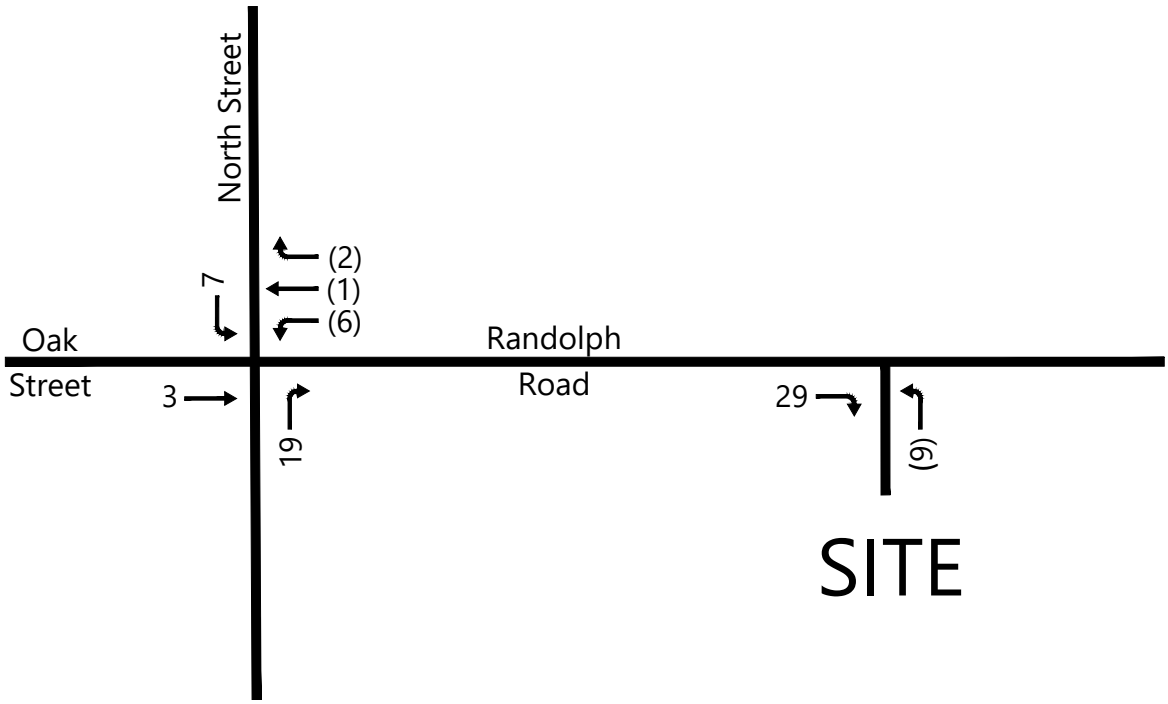

Legend
Enter (Exit)

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Figure 7
Weekday Morning Peak Hour
New Project Trips
Proposed Industrial Facility
Randolph, Massachusetts

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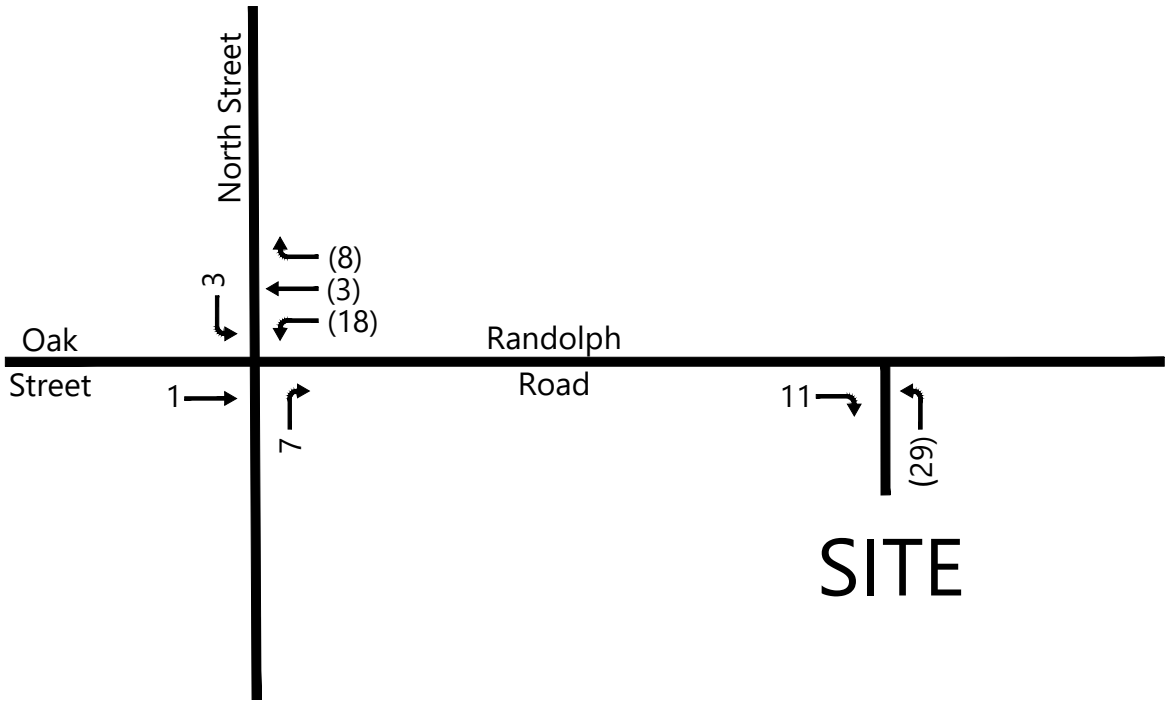

Legend
Enter (Exit)

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Figure 8
Weekday Afternoon Peak Hour
New Project Trips
Proposed Industrial Facility
Randolph, Massachusetts

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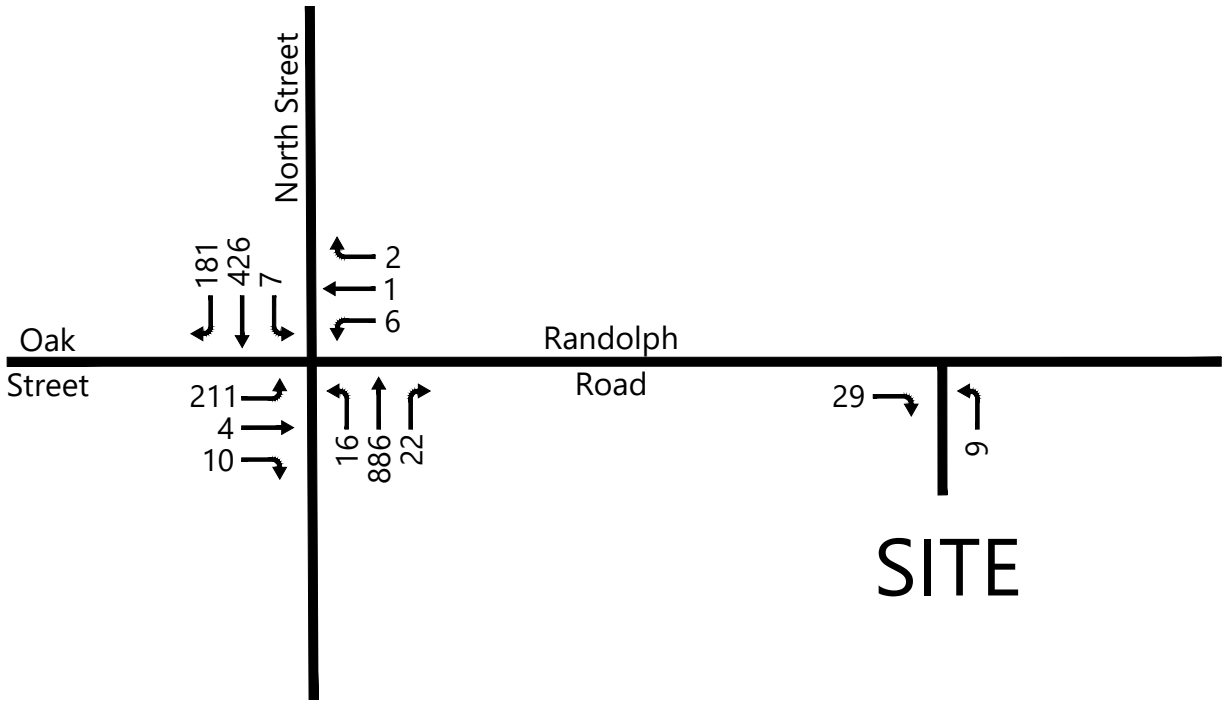

Figure 9
2029 Build Weekday Morning
Peak Hour Traffic Volumes
Proposed Industrial Facility
Randolph, Massachusetts

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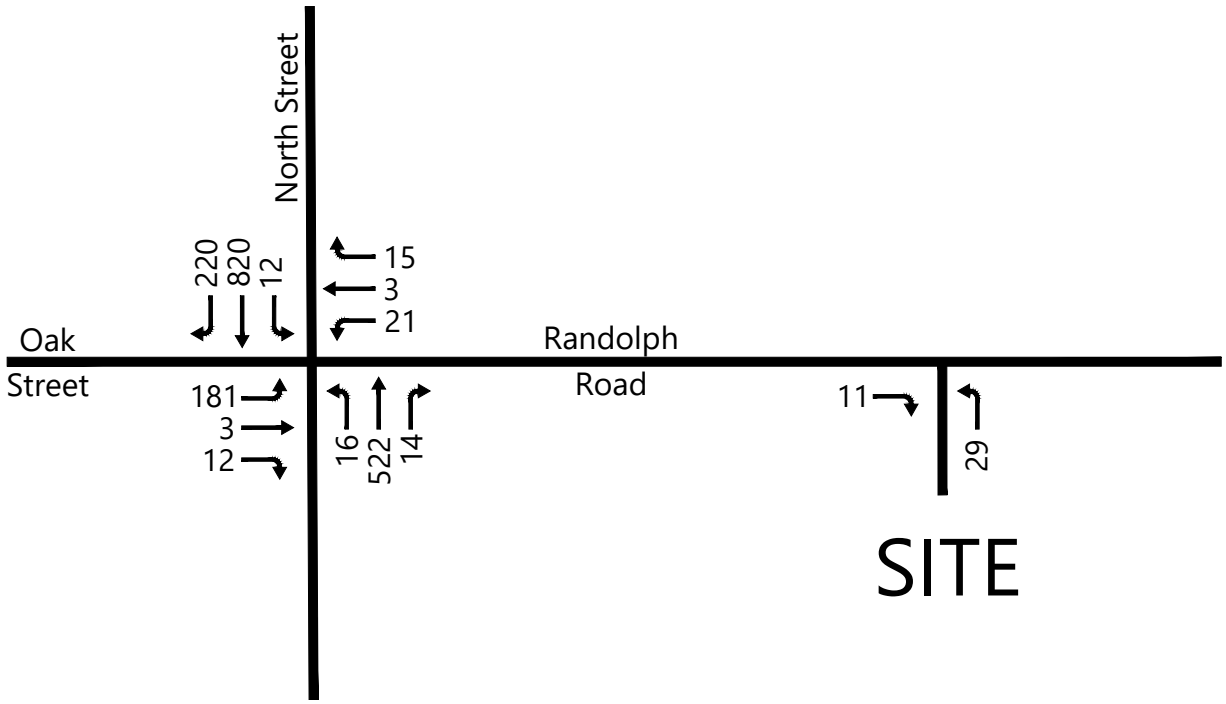

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Figure 10
2029 Build Weekday Afternoon
Peak Hour Traffic Volumes
Proposed Industrial Facility
Randolph, Massachusetts

TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic at the study area intersections has been discussed. This section describes the overall quality of the traffic flow at the study area intersections during the weekday morning and weekday afternoon peak hours. As a basis for this assessment, intersection capacity analysis was conducted using the Synchro capacity analysis software at the study area intersections under the 2022 Existing, 2029 No Build, and 2029 Build peak hour traffic conditions. The analysis is based on capacity analysis methodologies and procedures contained in the *Highway Capacity Manual, 6th Edition* (HCM), which is summarized in Appendix F. A discussion of the evaluation criteria and a summary of the results of the capacity analyses are presented below.

Level-of-Service Criteria

Average total vehicle delay is reported as level-of-service (LOS) on a scale of A to F. LOS A represents delays of 10 seconds or less and LOS F represents delays in excess of 50 seconds and 80 seconds for unsignalized and signalized movements, respectively. A more detailed description of the LOS criteria is provided in Appendix F.

Field Calibration

To confirm that the existing field conditions are consistent with the Synchro capacity analysis software, a field delay study and gap acceptance study was conducted at the intersection of North Street at Oak Street/Randolph Road on Tuesday, September 27, 2022 during the weekday afternoon peak hour (5:00 PM to 6:00 PM).

Delay Study

The delay study included measuring the number of vehicles at the stop controlled eastbound approach on Oak Street at the intersection of North Street at Oak Street/Randolph Road every 15 seconds.

During the weekday afternoon peak hour, the average delay per vehicle on Oak Street was calculated to be approximately 72.5 seconds. The delay study data is provided in Appendix G.

Gap Acceptance Study

The gap acceptance study was conducted to measure the shortest gaps that drivers turning onto North Street from both Oak Street and Randolph Road are willing to accept. These gaps were compared to the default values used in the HCM. During the study period, vehicles turning onto North Street from Oak Street were shown to accept gaps as small as 4.7 seconds, and vehicles turning onto North Street from Randolph Road were shown to accept gaps as small as 6.3 seconds.

To better estimate vehicle operations at the intersection of North Street at Oak Street/Randolph Road, the Synchro capacity analysis at this intersection was calibrated with a critical gap of 4.7 seconds for eastbound vehicles on Oak Street and 6.3 seconds for westbound vehicles on Randolph Road. The gap acceptance field study results are provided in Appendix H.

The calibrated capacity analysis results using the critical gaps are consistent with the measured field delay at the unsignalized intersection of North Street at Oak Street/Randolph Road.

Capacity Analysis Results

Intersection capacity analyses was conducted using Synchro capacity analysis software for the study area intersections to evaluate the 2022 Existing, 2029 No Build, and 2029 Build traffic conditions during the weekday morning and weekday afternoon peak hours. As mentioned previously, the peak hour traffic volumes utilized as part of this analysis are provided in the traffic projection model, attached in Appendix D of this report.

The detailed Synchro capacity analysis worksheets for the 2022 Existing, 2029 No Build, and 2029 Build traffic conditions are presented in Appendix I, Appendix J, and Appendix K, respectively. The capacity analysis results for the unsignalized study area intersections are presented in Table 3 for the weekday morning and weekday afternoon peak hour. The results of the specific capacity analysis at the study area intersections are discussed below. A detailed summary of the capacity analysis results is provided in Appendix L.

Table 3: Unsignalized Capacity Analysis Results

			2022 Existing				2029 No Build				2029 Build			
Intersection	Movement	Peak Period	LOS[1]	Delay[2]	V/C[3]	95th% Queue[4]	LOS	Delay	V/C	95th% Queue	LOS	Delay	V/C	95th% Queue
Oak Street/Randolph Road	EB LTR	AM	F	96.7	0.99	240	F	126.2	1.08	280	F	156.8	1.17	315
at North Street		PM	F	77.6	0.90	188	F	100.5	0.98	220	F	129.1	1.07	250
	WB LTR	AM	A	0.0	0.00	0	A	0.0	0.00	0	E	37.4	0.08	8
		PM	C	20.7	0.05	5	C	21.8	0.05	5	E	43.6	0.34	35
	NB LTR	AM	A	0.2	0.02	3	A	0.2	0.02	3	A	0.2	0.02	3
		PM	A	0.3	0.03	3	A	0.3	0.03	3	A	0.3	0.03	3
	SB LTR	AM	A	0.0	0.00	0	A	0.0	0.00	0	A	0.1	0.01	0
		PM	A	0.1	0.01	0	A	0.1	0.01	0	A	0.1	0.01	0
Site Driveway	NB LR	AM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	A	8.6	0.01	0
at Randolph Road		PM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	A	8.7	0.03	3

1 Level-of-Service
2 Average vehicle delay in seconds
3 Volume-to-capacity ratio
4 95th percentile queue in feet
n/a Not applicable

The Oak Street eastbound approach operating at LOS F is an existing condition, and the Project is not anticipated to add any traffic to the critical eastbound left-turn movement. The projected increase of the Oak Street eastbound approach volume from 222 vehicles in the 2029 No Build condition to 225 vehicles in the 2029 Build condition during weekday morning peak hour represents a 1.3% percent increase as a result of the Project. Similarly, the projected increase of the Oak Street eastbound approach volume from 195 vehicles in the 2029 No Build condition to 196 vehicles in the 2029 Build condition during weekday afternoon peak hour represents a 0.5% percent as a result of the Project.

The Randolph Road westbound approach, which serves vehicles exiting the proposed site, is shown to operate with a volume-to-capacity ratio of 0.34 or better under 2029 Build conditions, which indicates the critical movement is anticipated to operate under capacity.

The Site Driveway on Randolph Road is anticipated to operate at LOS A during both peak hours analyzed under the 2029 Build conditions.

Site Access and Circulation

Access to the Project site would be provided via a full-access site driveway on Randolph Road approximately 600 feet east of the intersection of North Street at Oak Street/Randolph Road. A total of 98 passenger vehicle parking spaces are proposed to be located on the southwest site of the site, and 37 truck loading docks would be provided on the northeast side of the site. Two-way circulation would be provided throughout the site

Sight Distance

A field review of the available sight distance was conducted at the proposed site driveway location on Randolph Road and at the westbound Randolph Road approach to the intersection of North Street at Oak Street/Randolph Road. The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2018 Edition*, defines minimum and recommended sight distances at intersections.

The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main road. The recommended sight distance allows vehicles to enter the main street traffic flow without requiring the mainline traffic to slow to less than 70% of their speed and is referred to as intersection sight distance (ISD). According to AASHTO, "If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient time to anticipate and avoid collisions."

A speed study was conducted on North Street on Tuesday, September 27, 2022 from 3:15 PM to 3:45 PM to assess vehicle speeds along North Street adjacent to the Project site. Vehicle speeds collected indicate that the 85th percentile speeds on North Street are 41 mph in the northbound direction and 37 mph in the southbound direction. The posted speed limit on this portion of North Street is 30 mph. Speed data collected by the ATR on Randolph Road indicates that the 85th percentile speeds are 18 mph in both the eastbound and westbound directions, which is lower than the 25 mph speed limit. The speed data is provided in Appendix M.

Table 4 summarizes the sight distance at the proposed site driveway and the westbound Randolph Road approach to the intersection of North Street at Oak Street/Randolph Road. To present a conservative approach, the 25-mph speed limit on Randolph Road was applied as the measured 85th percentile speeds were lower, and the operating speeds were used along North Street since the speeds were higher than the posted speed limit.

Table 4: Sight Distance Requirements

Intersection	Looking	Speed Limit (mph)	85th % Speed (mph)	SSD[1] Required (ft)	ISD[2] Recommended (ft)	Sight Distance Measured (ft)
Randolph Road at North Street	Left (South)	30	41	315	395	>600
	Right (North)	30	37	270	410	490
Site Driveway at Randolph Road[(3)]	Left (West)	25	18	155	240	600

1 Stopping sight distance (see AASHTO equations 3-2 and 3-3) for the 85th percentile speed.
2 Intersection sight distance (see AASHTO equations 9-1 and 9-2) for the 85th percentile speed.
3 Sight distance is based on the 25 mph speed limit (since speed limit is higher than 85th percentile speed) and extends to adjacent intersection.

As shown in Table 4, the available sight distances for vehicles on Randolph Road at the North Street at Oak Street/Randolph Road intersection exceed the minimum SSD requirements and ISD recommendations for the 85th percentile speeds on North Street. Similarly, looking left from the proposed site driveway on Randolph Road, there is a clear line of sight to the intersection with North Street, which exceeds the required SSD and recommended ISD. Overall, based on this review, the location of the Project site driveways would allow for safe and efficient access to and from the site.

CONCLUSION

The proposed Project, located at 11 Randolph Road in Randolph, Massachusetts, includes the construction of a 120,000 sf industrial facility with approximately 98 parking spaces and 37 loading spaces. Site access and egress would be provided via a full access site driveway on Randolph Road, approximately 600 feet east of North Street.

Based on data published by ITE, the proposed Project is estimated to result in approximately 38 new vehicle trips (29 entering vehicles and 9 exiting vehicles) during the weekday morning peak hour and approximately 40 new vehicle trips (11 entering vehicles and 29 exiting vehicles) during the weekday afternoon peak hour. The proposed Project would result in a total of approximately 228 vehicle trips (114 entering and 114 exiting) during the weekday with a majority of the truck trips to the site anticipated to occur outside of the peak hours.

The AASHTO minimum stopping sight distance and recommended intersection sight distance are exceeded at the Randolph Road approach to the intersection of North Street at Oak Street/Randolph and the proposed site driveway approach at Randolph Road. Based on the review of available sight distances, the proposed Project allows for safe and efficient access to and from the Project site.

The Oak Street eastbound approach operates at LOS F under existing conditions, and the Project is not anticipated to add any traffic to the critical left-turn movement. The projected increase of the Oak Street eastbound volume from 222 vehicles in the 2029 No Build condition to 225 vehicles in the 2029 Build condition during weekday morning peak hour represents only an 1.3% percent increase in approach volumes. Similarly, the projected increase of Oak Street eastbound volume from 195 vehicles in the 2029 No Build condition to 196 vehicles in the 2029 Build condition during weekday afternoon peak hour represents only an 0.5% percent increase in approach volumes.

The Randolph Road westbound approach, which serves vehicles exiting the proposed site, is shown to operate with a volume-to-capacity ratio of 0.34 or better under 2029 Build conditions, which indicates the critical movement is anticipated to operate under capacity. Overall, the Project would have limited impacts to the unsignalized intersection of North Street at Oak Street/Randolph Road within the study area during the weekday morning and weekday afternoon peak hours.

Based on the evaluation documented within this traffic impact study, the proposed industrial facility is not shown to have a significant impact on the overall traffic operations or safety of the study area roadways and intersections.