Traffic Impact Study

833 Deming Road Residential Development

Berlin, Connecticut

July 2020

Town of Berlin Land Use Applications
CTDOT District 1 Encroachment Permit Application

146 Hartford Road
Manchester, CT 06040

Prepared for:
Metro Realty Group, L.T.D
6 Executive Drive
Farmington, CT 06032

20200382.A10

FUSS & O'NEILL

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Appendices **End of Report**

Summary Sheet

As an aid to reviewers, this Summary Sheet has been included to outline the various study parameters utilized in this report. Although a full explanation of the study methodologies is included in the text of the report, this summary can serve as a useful reference for reviewers.

Applicant:
Metro Realty Group, L.T.D.

Site Acreage:
11.40 acres

Development Size/Type:
88 Residential Units

Parking:
143 parking spaces, including 6 reserved if needed for future parking

Applications:
Town of Berlin Land Use Applications
CTDOT District 1 Encroachment Permit Application

Build Year:
2022

Background Traffic Growth Factor:
0.9% per year

Traffic Counts:
Connecticut Department of Transportation – November 2018 (Automatic Traffic Recorder Counts)

Peak Hours Analyzed:
Morning Peak Hour – 8:00 am to 9:00 am
Afternoon Peak Hour – 5:00 pm to 6:00 pm

Expected New Trip Generation:
Morning Peak Hour – 42 Trips (9 entering, 33 exiting)
Afternoon Peak Hour – 53 Trips (33 entering, 20 exiting)

Capacity Analysis:
Technique –Highway Capacity Manual 6th Edition
Execution – Synchro Professional Software, Version 10.0

1 Introduction

Metro Realty Group, L.T.D. proposes to construct 88 residential units in Berlin, Connecticut. The property is currently made up of three parcels with site access on Route 160 (Deming Road). These parcels are located on the north side of Route 160, east of Bacon Lane, and are bordered by Eversource property to the west, residential property to the east, and Cold Spring Brook Farm to the north. The proposed site location is depicted on the site location map, *Figure No.1* of *Appendix B*. A total of 143 parking spaces will be provided on site for the proposed residential development, six of which will be deferred for future use if needed. The development is expected to be completed in 2022.

Fuss & O'Neill has been retained to study the impact of the proposed development on traffic conditions on the adjacent roadway network. This report has been prepared to document the findings of the study and is being submitted to the Town of Berlin in support of the local approval process as well as CTDOT District 1 in support of an Encroachment Permit application.

2 Existing Condition

2.1 Site of Development

The existing site is currently made up of three parcels that will be combined to create a single 11.40 acre lot. The existing site includes two single family homes that will be removed during construction of the proposed development. The site is located on the north side of Deming Road and bordered by Eversource property to the west, agriculture property to the north, and residential property to the east.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Route 160 (Deming Road/New Britain Avenue)
- Bacon Lane

Route 160 (Deming Road/New Britain Avenue) generally runs east to west through the study area providing access to the Town of Rocky Hill to the east and Route 15 (Berlin Turnpike) to the west. Route 160 provides two lanes of travel, one in each direction, and is classified by CTDOT as an urban minor arterial roadway in the vicinity of the site. Route 160 widens for exclusive turn lanes at key intersections. The posted speed limit is 40 miles per hour and the travel lanes are 12 feet wide. The land use surrounding Deming Road is a mix of commercial, residential, and retail.

Bacon Lane is a short connector roadway, approximately one tenth of a mile in length that runs generally east/west between Route 160 and Wethersfield Road. Bacon Lane carries two lanes of travel, one in each direction, and is classified by CTDOT as an urban collector. The posted speed limit is 25 miles per hour and the travel lanes are 13 feet wide. The land use surrounding Bacon Lane is primarily residential and professional office.

2.3 Study Area Intersection

The following study intersection was reviewed:

- Route 160 (Deming Road/New Britain Avenue) at Site Driveway

The unsignalized intersection of Route 160 at the proposed Site Driveway will provide approaches from the east and west on Route 160 and from the north on the site driveway. The Route 160 approach from the east will provide a free moving combined through/right turn lane and the approach from the west will provide a free moving combined through/left turn lane. The site driveway approach from the north will be stop controlled and provide a combined left/right turn lane.

2.4 Traffic Volumes, Speeds and Counts

The greatest potential for traffic impact on the roadway network by the proposed development will occur during the morning and afternoon peak hours, the periods when commuter/residential related trips are at their highest levels. Peak hour traffic volumes were obtained from recent Automatic Traffic Recorder (ATR) counts performed by the Connecticut Department of Transportation on Wednesday, November 14, 2018 through Thursday, November 14, 2018 on Route 160 at the Berlin Town Line. The traffic count data collected indicates that the 48 hour traffic volume on Route 160 is approximately 9,200 vehicles per day. The morning peak hour of traffic is 8:00 a.m. to 9:00 a.m. and the afternoon peak hour is 5:00 p.m. to 6:00 p.m. These peak hours were subsequently analyzed for impacts.

The existing traffic volumes for these peak hours are shown in *Figure No. 2* of *Appendix B.* Copies of the ATR traffic data have been included in *Appendix E* of this report.

3 Background Traffic Conditions

3.1 Growth Rate

Upon consultation with the Connecticut Department of Transportation (CTDOT), the 2018 existing traffic volumes were projected to the 2022 design year using a 0.9 percent per year peak hour growth factor to account for normal traffic growth in the study area.

3.2 Other Developments

Fuss & O'Neill contacted the Connecticut Department of Transportation (CTDOT) Bureau of Planning and Development, the Town of Berlin Town Planner, and the Town of Rocky Hill Town Planner to identify any other pending or recently approved developments by the Planning and Zoning commission (PZC) having site related traffic in the study area. One such development was identified.

A mixed use development containing 15,022 square feet of retail space and 2,807 square feet of residential space is proposed at 104 Episcopal Road. This development has been included in the analysis

as it will create new site related traffic at the study area intersection. Expected site generated traffic volumes were obtained from the traffic impact study prepared by BL Companies in July 2019.

Traffic volumes from this development are depicted in *Figure 3 of Appendix B*. These volumes were added to the grown 2022 traffic volumes to obtain the 2022 Background traffic volumes which are defined as design year traffic without the proposed 833 Deming Road development. These projected Background traffic volumes are shown in *Figure No. 4 of Appendix B*.

3.3 Planned Roadway Improvement Projects

Fuss & O'Neill contacted the Connecticut Department of Transportation (CTDOT) District 1 office and the Town of Berlin Public Works Department to determine if any roadway improvements are planned in the area of the proposed development. An upgrade of the traffic signal at the intersection of Routes 5/15, Route 160, and Deming Road (Int. No. 007-208) to the west is planned and anticipated to begin construction in spring 2021. In addition, the replacement of signs and sign supports along various curves throughout Cromwell and Berlin is currently under design and is expected to begin construction in December 2022. These planned projects will provide safer and more efficient traffic operations at the intersection and serve to benefit the residents traveling to and from the proposed development.

4 Proposed Conditions

4.1 Development

Metro Realty Group, L.T.D. proposes to construct 88 residential units in Berlin, Connecticut on property currently made up of three parcels north of Route 160 (Deming Road) and east of the Eversource Drive and Bacon Lane intersection. The site location is shown on the site location map, *Figure No.1* of *Appendix B*. A total of 143 new parking spaces will be provided on site for the proposed residential development, six of which will be reserved for future use if needed. The development is expected to be completed in 2022.

4.2 Site Access and Circulation

One full access site driveway will be provided on Route 160 (Deming Road) approximately 430 feet east of the intersection of Deming Road at Bacon Lane and the Eversource Drive. This full access driveway will connect to all parking areas located throughout the development.

4.3 Trip Generation

The expected site generated traffic volumes were calculated using existing empirical data from the Institute of Transportation Engineers (ITE) publication Trip Generation, 10th edition, 2020. This publication is an industry-accepted resource for determining trip generation. Trip generation for the morning and afternoon peak hour was calculated using the ITE land use code 220 "Multifamily Housing

(Low-Rise)". The ITE manual indicates that the 88 unit development is expected to generate a total of 42 vehicle trips (9 entering, 33 exiting) during the morning peak hour, and a total of 53 vehicle trips (33 entering, 20 exiting) during the afternoon peak hour. A summary of the peak hour trip generation information for the proposed 88 unit development is provided in *Table 1* of *Appendix A*.

4.4 Trip Distribution

The distribution of traffic entering and exiting the proposed site was applied to the road network based on the existing regional traffic distributions and the layout of the adjacent roadway network. During the peak hours, the following arrival distributions of traffic are anticipated:

- 60 percent from Deming Road (Route 160) to the west
- 40 percent from Deming Road (Route 160) to the east

A regional arrival/departure distribution for the new site generated traffic traveling to and from the project site is shown in *Figure No. 5* of *Appendix B*.

4.5 Combined Volumes

The site generated traffic was distributed to the roadway system based on the arrival/departure distributions with the results shown in *Figure No. 6* of *Appendix B*. These volumes were then added to the background volumes to yield the year 2022 peak hour Combined traffic volumes shown in *Figure No. 7* of *Appendix B*.

5 Analyses

5.1 Crash Analysis

Crash data was gathered from the University of Connecticut Crash Data Repository for Route 160 (Deming Road) along the site frontage.

The records were gathered for the most recent three years of available data, January 1, 2017 through December 31, 2019. A summary of the crash data per intersection is provided in *Table 2* of *Appendix A*. A detailed tabulation of the crash data has been provided in *Appendix F*.

The site frontage along Deming Road experienced an average of 4.33 crashes per year during the three year study period. The majority of these crashes (6) were uncommon, involving collisions with animals, fallen trees, and other atypical collisions. The second highest frequency of collisions (3) were front to rear collisions mainly attributable to stopped traffic at the traffic signal at the Bacon Lane intersection to the west. Given the traffic volumes experienced on Deming Road and the presence of the traffic signal, the frequency and type of crashes reported is not considered abnormal.

5.2 Intersection Sight Distance Analysis

Intersection sight distances were measured at the proposed site driveway location in accordance with criteria set forth in the 2003 CTDOT *Highway Design Manual*. Intersection sight distance is measured from a point 15 feet back from the edge of traveled way at a height of 3.5 feet, the standard height of a driver's eye.

For a design speed of 45 miles per hour, 500 feet of intersection sight distance is required for a passenger car turning left or right out of the site driveway onto a two-lane roadway.

The intersection sight distance measured looking left (east) out of the driveway was 502' feet, when taken 10' back from the edge of traveled way, limited by roadside vegetation along the site frontage and the horizontal curvature in the roadway on Route 160 to the east. The intersection sight distance to the west was measured to be in excess of 600 feet.

It is recommended that clearing and trimming of vegetation be completed along the Route 160 (Deming Road) site frontage east and west of the proposed site driveway location within both the State right of way and the site property. Adequate intersection sight distances in excess of 500 feet when measured from 15 feet back from the traveled way will be provided for safe egress from the site upon completion of the required clearing of vegetation.

5.3 Intersection Capacity Analysis

Capacity analyses for unsignalized intersections were conducted using Synchro Professional Software, version 10.0.

In discussing unsignalized intersection capacity analyses results, the term level of service (LOS) is used as a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 50 seconds per vehicle for unsignalized intersections. Delay is described as a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

The definition for LOS, as well as the methodology for conducting unsignalized intersection capacity analyses, are taken from the "Highway Capacity Manual 6th Edition" published by the Transportation Research Board.

Using the above referenced methodologies, the morning and afternoon peak hour capacity analyses were conducted at the Route 160 (Deming Road) intersection with the proposed Site Driveway.

Table No. 3 of *Appendix A* presents a summary of the levels of service at the unsignalized intersection for the combined conditions traffic volume. Copies of the analysis worksheets can be found in *Appendices C and D*, for the morning and afternoon peak hours respectively.

At the unsignalized intersection of Route 160 (Deming Road) at the proposed site driveway, the Deming Road eastbound approach left turn movement will operate efficiently at LOS A during both the morning and afternoon peak hours under combined conditions. The southbound site driveway approach will operate acceptably at LOS B and C during the morning and afternoon peak hours respectively under combined conditions. Based on these levels of service, drivers can expect to experience minimal levels of delay when traveling through this intersection.

5.4 Queue Analysis

Combined Condition 95th percentile (design) queue lengths were reviewed at the study intersection. The 95th percentile (design) vehicle queue lengths represent the maximum queue lengths that can be expected at each of the critical approach lanes of the study intersection. The queue lengths are provided in the Synchro capacity analysis worksheets, which are located in *Appendix C and D*. *Tables 4 & 5* of *Appendix A,* provide a summary of the queue lengths for the critical lanes at each intersection.

At the intersection of Route 160 (Deming Road) at the proposed site driveway, minimal queuing (averaging less than one vehicle length) is experienced on all approaches under combined conditions during the morning and afternoon peak hour.

6 Conclusions & Recommendations

The purpose of preparing a Traffic Impact Study is to identify the impact of the proposed residential development's site generated traffic. The study efforts have indicated that the proposed development will conservatively generate up to 42 vehicle trips (9 entering, 33 exiting) during the morning peak hour, and a total of 53 vehicle trips (33 entering, 20 exiting) during the afternoon peak hour.

The proposed residential development in Berlin, Connecticut will be located on 833 Deming Road. The property is currently made up of three parcels on the north side of Route 160 (Deming Road), just east of the intersection with Bacon Lane. Construction is expected to be completed in 2022. The proposed site location is shown on the site location map, *Figure No.1* of *Appendix B*. A total of 143 new parking spaces will be provided on site for the proposed residential development, six of which will be deferred for future use if necessary.

One full access site driveway will be provided on Route 160 (Deming Road) approximately 430 feet east of the intersection of Deming Road at Bacon Lane and the Eversource Drive.

Capacity analysis revealed that the proposed residential development site driveway and intersecting Deming Road approaches operate at an acceptable Level of Service in the combined conditions. In addition, queue lengths for critical approach movements at the study intersection will be insignificant and average less than one vehicle in length.

A review of crash data provided by the University of Connecticut Crash Data Repository indicated that there were no abnormal crash frequencies and crash patterns in the study area given the volume of traffic and roadway classification in the study area.

The location of the site access driveway on Deming Road will provide adequate intersection sight distance for passenger cars exiting the site driveway on Deming Road looking both east and west, following clearing and trimming of vegetation along the site frontage as part of the site construction.

Based on the results of this study, the following recommendation should be implemented to facilitate safe and efficient movement of traffic within the study area:

- Clear, trim, and maintain vegetation within the site property and state right of way along Route 160 (Deming Road) to maintain the required intersection sight distance (a minimum of 500 feet) looking east and west from the site driveway.

It should also be noted that existing conditions revealed the horizontal curve to the east of the site currently maintains proper curve warning signage along and before the curve. There was also reflective striping recently implemented along the curve to increase visibility of the curve. This curve is currently under review by the CTDOT for the removal/addition of curve warning signage under CTDOT project #0171-0440.

Based on the results of the foregoing analysis, it is the professional opinion of Fuss & O'Neill, Inc. that the proposed development, along with the recommendations outlined above, will not have a significant impact to traffic operations within the study area.

Appendix A

Tables

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Table 1

Peak Hour Site Generated Traffic Volumes
833 Deming Road Residential Development
Berlin, Connecticut

Residential Development (88 Units)	Total Trips	Trips Entering	Trips Exiting
Morning Peak Hour	42	9	33
Afternoon Peak Hour	53	33	20

Note: Trip generation based on Rate per Land use Code 220 Multifamily Housing (Low-Rise), as published in *Trip Generation,* 10th Edition, 2020.

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Table 2

Intersection Crash Data Summary
833 Deming Road Residential Development
Berlin, Connecticut

Intersections	Crashes Per Year			
	2017	2018	2019	Average/Year
Site Frontage Along Deming Road	4*	5	4	4.33

*Values indicated are number of crashes along the site frontage during the time period shown.
Data provided by the Connecticut Department of Transportation via the UConn repository.

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Table 3

Unsignalized Intersection Level of Service Summary
833 Deming Road Residential Development
Berlin, Connecticut

Unsignalized Intersection	2022 Morning Peak Hour		2022 Afternoon Peak Hour	
	Background	Combined	Background	Combined
Deming Road at Site Driveway				
EB Approach Left Turns	N/A	LOS A	N/A	LOS A
SB Approach	N/A	LOS B	N/A	LOS C

*Values indicated are approach LOS

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Table 4

Morning Peak Hour Queue Length Summary
833 Deming Road Residential Development
Berlin, Connecticut

Intersection	Approach Lane	2022 Background Queue	2022 Combined Queue
Deming Road at Site Driveway	EB Approach SB Approach	N/A N/A	0 Feet 5 Feet

NOTE: Values indicated represent 95th percentile (design) vehicle queue lengths. Values are rounded to the nearest 5 feet.

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Table 5

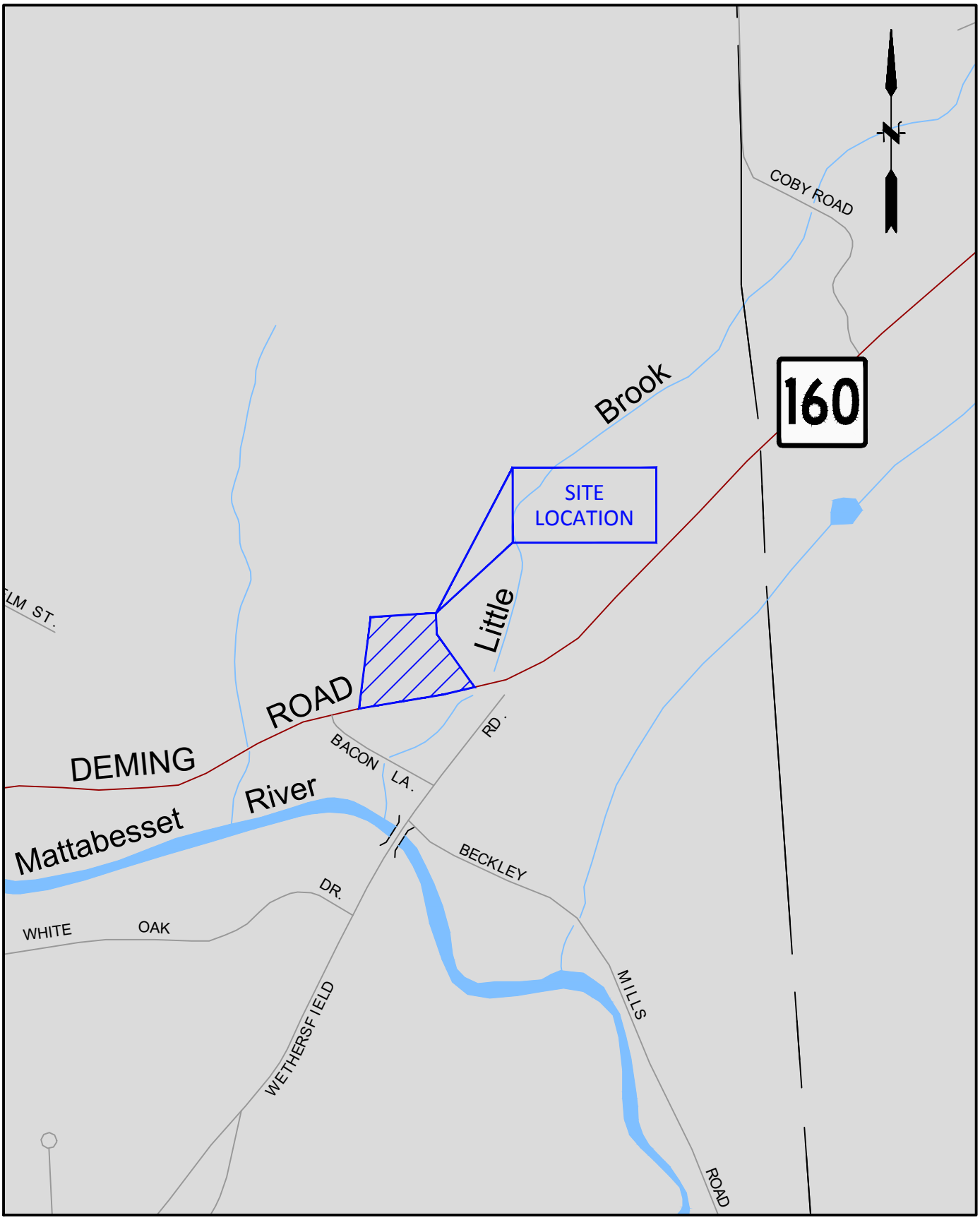
Afternoon Peak Hour Queue Length Summary
833 Deming Road Residential Development
Berlin, Connecticut

Intersection	Approach Lane	2022 Background Queue	2022 Combined Queue
Deming Road at Site Driveway	EB Approach SB Approach	N/A N/A	5 Feet 5 Feet

NOTE: Values indicated represent 95th percentile (design) vehicle queue lengths. Values are rounded to the nearest 5 feet.

Appendix B

Figures



0 300 600

SCALE: 1" = 600'

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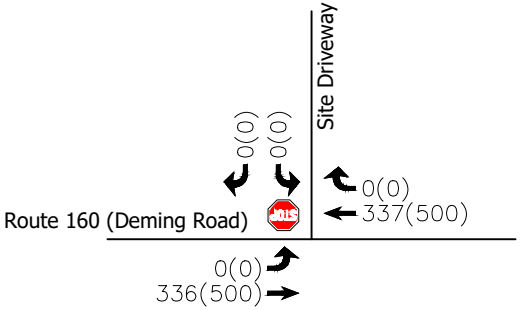
FIGURE 1: SITE LOCATION PLAN

PROJ. NO: 20200382.A10 833 DEMING ROAD RESIDENTIAL DEVELOPMENT - BERLIN, CT JULY 2020



XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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FIGURE 2: 2020 EXISTING TRAFFIC VOLUMES

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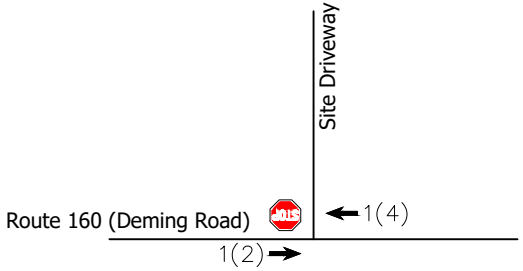

XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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FIGURE 3: BACKGROUND GENERATOR - 104 EPISCOPAL ROAD

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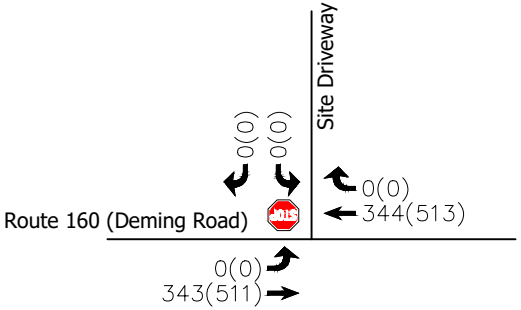

XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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FIGURE 4: 2022 BACKGROUND TRAFFIC VOLUMES

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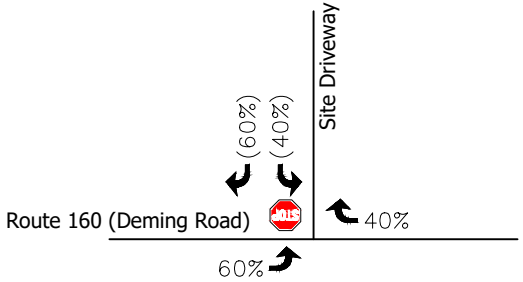

XX(XX) = ENTERING TRAFFIC (EXITING TRAFFIC)

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FIGURE 5: SITE GENERATED TRIP DISTRIBUTION

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SITE GENERATED TRAFFIC VOLUMES

	ENTER	EXIT	TOTAL
MORNING	9	33	42
AFTERNOON	33	20	53

XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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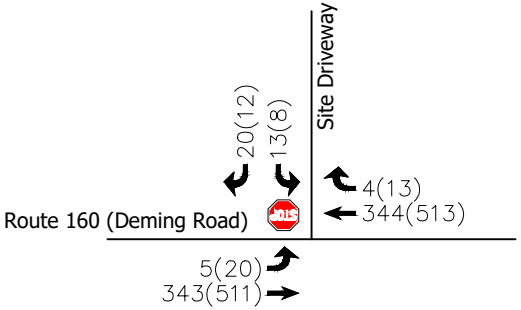
FIGURE 6: SITE GENERATED TRAFFIC VOLUMES

PROJ. NO: 20200382.A10 | 833 DEMING ROAD RESIDENTIAL DEVELOPMENT - BERLIN, CT | JULY 2020



XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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FIGURE 7: 2022 COMBINED TRAFFIC VOLUMES

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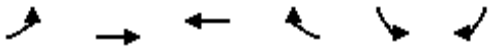
Appendix C

Intersection Capacity Analysis Worksheets
2022 Combined Traffic Volumes
Morning Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	343	344	4	13	20
Future Volume (vph)	5	343	344	4	13	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.917	
Flt Protected		0.999			0.981	
Satd. Flow (prot)	0	2109	1861	0	1676	0
Flt Permitted		0.999			0.981	
Satd. Flow (perm)	0	2109	1861	0	1676	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		381	313		215	
Travel Time (s)		8.7	7.1		4.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	373	374	4	14	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	378	378	0	36	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	343	344	4	13	20
Future Vol, veh/h	5	343	344	4	13	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	5	373	374	4	14	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	378	0	-	0	759	376
Stage 1	-	-	-	-	376	-
Stage 2	-	-	-	-	383	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1180	-	-	-	374	670
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1180	-	-	-	372	670
Mov Cap-2 Maneuver	-	-	-	-	372	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	689	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1180	-	-	-	509
HCM Lane V/C Ratio	0.005	-	-	-	0.07
HCM Control Delay (s)	8.1	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

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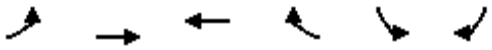
Appendix D

Intersection Capacity Analysis Worksheets
2022 Combined Traffic Volumes
Afternoon Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	511	513	13	8	12
Future Volume (vph)	20	511	513	13	8	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.997		0.920	
Flt Protected		0.998			0.980	
Satd. Flow (prot)	0	2107	1857	0	1679	0
Flt Permitted		0.998			0.980	
Satd. Flow (perm)	0	2107	1857	0	1679	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		381	313		215	
Travel Time (s)		8.7	7.1		4.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	555	558	14	9	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	577	572	0	22	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	511	513	13	8	12
Future Vol, veh/h	20	511	513	13	8	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	22	555	558	14	9	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	572	0	-	0	1164	565
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	599	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1001	-	-	-	215	524
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1001	-	-	-	208	524
Mov Cap-2 Maneuver	-	-	-	-	208	-
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	549	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1001	-	-	-	326
HCM Lane V/C Ratio	0.022	-	-	-	0.067
HCM Control Delay (s)	8.7	0	-	-	16.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Appendix E

Automatic Traffic Recorder (ATR) Data

Status: OK

RKYH-027 - East & West

Route 160 - 1.09 mi At Berlin Town Line

Town.....Rocky Hill
Station.....27
Location..... 41.647362,-72.713947
2015-Minor Arterial 4.....2015-Urban
Start Report.....14-Nov-2018 07:00AM
End Report.....15-Nov-2018 07:00AM
Axle Correction Factor.....None
Annualized ADT.....9200
24-Hour Count.... 9828 * G4(0.94) = 9238.3
UnRounded AADT.....9238.3 / 1 = 9238.3

OK	2018 Wed 14-Nov -this report-...	9200
OK	2015 Thu 15-Oct	10700
OK	2012 Wed 24-Oct	8400
REV	2009 Mon 09-Nov	7300
OK	2006 Mon 30-Oct	8500

	14-Nov Wed	15-Nov Thu
12:00am	x	19
01:00am	x	10
02:00am	x	6
03:00am	x	9
04:00am	x	33
05:00am	x	131
06:00am	x	327
07:00am	660	x
08:00am	661	x
09:00am	540	x
10:00am	552	
11:00am	576	
12:00pm	653	
01:00pm	618	
02:00pm	692	
03:00pm	780	
04:00pm	955	
05:00pm	982	
06:00pm	623	
07:00pm	414	
08:00pm	255	
09:00pm	196	
10:00pm	95	
11:00pm	41	
Totals	9293	535

Appendix F

Crash Data

Uconn Crash Data

833 Deming Road
Berlin, Connecticut
1/1/2017-12/31/2019

Date Of Crash	Time of Crash	Severity	No. of Veh.	Town	Milage	Roadway	Intersecting Roadway	Collision Type	Weather	Light Condition	Road Surface Condition	Contributing Circumstances
1.) Site Frontage Along Deming Road												
2/14/2017	9:59:00	PDO	2	Berlin	0.63	DEMING RD	BACON LA	Angle	Clear	Daylight	Dry	None
3/16/2017	18:03:00	PDO	2	Berlin	0.96	DEMING RD/ROCKY HILL LINE	unknown	Front to front	Clear	Daylight	Dry	None
4/20/2017	17:02:00	PDO	2	Berlin	0.68	DEMING RD	unknown	Front to rear	Clear	Daylight	Dry	None
8/11/2017	14:25:00	PDO	1	Berlin	0.79	DEMING RD	unknown	Not Applicable	Clear	Daylight	Dry	None
4/5/2018	12:13:00	PDO	1	Berlin	0.63	160-E	BACON LA	Not Applicable	Clear	Daylight	Dry	None
4/14/2018	14:19:00	Injury - Suspected Serious	2	Berlin	0.74	160-E	unknown	Other	Clear	Daylight	Dry	None
7/25/2018	17:52:00	PDO	2	Berlin	0.63	160-E	BACON LA	Other	Cloudy	Daylight	Wet	None
11/20/2018	23:23:00	Injury - Possible	1	Berlin	0.63	160-E	BACON LA	Not Applicable	Clear	Dark-Lighted	Dry	None
12/26/2018	17:41:00	PDO	2	Berlin	0.63	160-E	unknown	Sideswipe, opposite direction	Clear	Dark-Not Lighted	Dry	None
4/3/2019	7:06:00	PDO	1	Berlin	0.73	160-E	unknown	Not Applicable	Clear	Daylight	Dry	Animal(s) in Roadway
10/17/2019	3:04:00	PDO	1	Berlin	0.67	160-E	unknown	Not Applicable	Rain	Dark-Not Lighted	Wet	Weather Conditions
11/5/2019	14:52:00	PDO	2	Berlin	0.97	160-E	unknown	Not Applicable	Clear	Daylight	Dry	None
11/22/2019	7:53:00	PDO	2	Berlin	0.63	160-E	BACON LA	Front to rear	Cloudy	Daylight	Dry	None

PDO - Property Damage Only