



Traffic Impact Study

38 Great Hill Road
Derby, Connecticut

Prepared for:
Eddy Alan Block Irrevocable Trust

Prepared by:
KWH Enterprise, LLC
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By Marc J Garofalo MPA, MMC, MCTC at 11:25 am, Oct 16, 2026

Traffic Impact Study 38 Great Hill Road Derby, Connecticut

This study examines the traffic impact of a residential development at 38 Great Hill Road in Derby, Connecticut. Levels of Service (LOS) for traffic flows under 2024 existing and 2027 no-build and build traffic conditions were analyzed to identify any deficiencies in existing and future traffic operations at area intersections. For the purpose of this traffic study, 2027 was assumed to be the year during which the development is completed and occupied.

I. Summary

- The residential development is projected to generate 149, 254, and 240 vehicular trips during the respective weekday morning, weekday afternoon, and Saturday midday peak hours.
- The traffic impact of the project will be negligible. After the residential units are built and occupied, traffic movements at area intersections will operate at favorable LOS A, B, or C during the peak traffic hours.
- Recent-year accident records for intersections and roadway segments near the development were reviewed. No abnormal accident patterns were identified.

II. Project Description

The residential development at 38 Great Hill Road will include one existing house that will remain, 311 new residential units, a 10,000 SF community building, a 4,600 SF repurposed barn, and a 17,000 SF event hall. Three driveways on Great Hill Road and one driveway on Silver Hill Road are proposed.

III. Existing Traffic Conditions

For the evaluation of the quality of traffic operation in the vicinity of the development, the following signalized and unsignalized intersections were analyzed for the study:

- Route 334 (Great Hill Road and Fountain Lake Road) and Southwest Road;
- Route 334 (Great Hill Road and Wakelee Avenue), Lower Derby Avenue, and Route 8 southbound on ramp;
- Great Hill Road and Derby Neck Road;
- Silver Hill Road and Derby Neck Road;
- Site driveways and Great Hill Road; and
- Site driveway and Silver Hill Road.

Traffic counts were collected at the existing intersections in September and October 2024. Traffic volumes for three peak hours—7:00 am-8:00 am and 4:45 pm-5:45 pm for weekday and 12:30 pm-1:30 pm for Saturday—were identified and were used for the traffic analyses. The peak-hour traffic volumes are shown in Figures 1, 2, and 3 of the Appendices.

Capacity Analysis

For the assessment of the quality of traffic flow, intersection capacity analysis was conducted for the existing, future no-build, and future build traffic conditions. Capacity analysis provides an indication of how well roadway facilities serve the traffic demands placed upon them. Synchro 12, a software package that includes the evaluation criteria of the *Highway Capacity Manual, 2000 Edition and 7th Edition*, was used to analyze the intersections.

Level of service (LOS) is the term used to describe the different operating conditions that occur on a given roadway segment or intersection under various traffic conditions. It is a qualitative measure of the effects of a number of factors including roadway geometry, speed, travel delay, freedom to maneuver, and safety. Six levels of service can be defined for each type of facility. Each level of service (LOS) is given a letter designation from A to F, with LOS A representing the best operating conditions and LOS F representing the worst.

Table 1 that follows shows the capacity analysis results for the analyzed intersections under the 2024 existing traffic conditions. All traffic approaches at area intersections and the signalized intersection of Route 334 and Route 8 southbound on ramp as a whole are operating at favorable LOS A, B, or C with short delays during the three peak hours.

Table 1 Capacity Analyses for Existing Conditions

Intersection	2024 Existing Conditions								
	Weekday Morning Peak Hour of Adjacent Streets			Weekday Afternoon Peak Hour of Adjacent Streets			Sunday Midday Peak Hour of Adjacent Streets		
	Delay (sec)	LOS	95th-Percentile Queue (ft)	Delay (sec)	LOS	95th-Percentile Queue (ft)	Delay (sec)	LOS	95th-Percentile Queue (ft)
Route 8 SB On Ramp, Rt. 334 (Wakelee Ave.), Lower Derby Ave., and Rt. 334 (Great Hill Rd.) (Signalized)									
EB Left Turn	18.7	B	73	18.7	B	68	18.3	B	68
EB Through and Right	26.2	C	214	26.2	C	131	23.4	C	187
SB Through	17.5	B	217	17.5	B	139	16.2	B	136
SB Right Turn	16.5	B	172	16.5	B	87	15.4	B	83
NB Left Turn	28.6	C	144	28.6	C	215	24.7	C	158
NB Through	5.8	A	47	5.8	A	85	5.6	A	50
Intersection	19.5	B	-	19.5	B	-	18.1	B	-
Southwest Rd., Rt. 334 (Great Hill Rd.), and Rt. 334 (Fountain Lake Rd.) (Unsignalized)									
NB	13.4	B	-	13.4	B	-	13.6	B	-
WB Left Turn	8.5	A	-	8.5	A	-	8.1	A	-
Derby Neck Rd. and Great Hill Rd. (Unsignalized)									
EB Left Turn	0.0	A	-	0.0	A	-	7.3	A	-
SB	8.7	A	-	8.7	A	-	8.7	A	-
Hawthorne Ave., Silver Hill Rd., and Derby Neck Rd. (Unsignalized)									
EB Left Turn	7.2	A	-	7.2	A	-	7.3	A	-
SB	8.7	A	-	8.7	A	-	8.7	A	-

EB Eastbound
WB Westbound
NB Northbound
SB Southbound
LOS Level of Service

IV. Future Traffic Conditions

For the purpose of this traffic impact study, it was assumed that the development will be built and occupied in 2027.

As a comparison for demonstrating the traffic impact of the project, a 2027 no-build scenario is included in the study. Figures 4, 5, and 6 of the Appendices show the 2027 no-build traffic volumes, which were generated by using an annual traffic growth rate of 0.9 percent between 2024 and 2027 that was recommended by the CTDOT Bureau of Policy and Planning and by including traffic from a potential industrial development Fountain Lake Industrial Park to the north; for this study, a building floor space of 150,000 SF was assumed for this industrial park that will be developed by others.

Table 2 details the capacity analysis results for the 2024 no-build traffic conditions. There will be little change in the LOS and average delays during the three peak hours. All traffic movements will continue to operate at LOS A, B, or C during the peak hours.

Table 2 Capacity Analyses for No-Build Conditions

Intersection	2027 No-Build Conditions								
	Weekday Morning Peak Hour of Adjacent Streets			Weekday Afternoon Peak Hour of Adjacent Streets			Sunday Midday Peak Hour of Adjacent Streets		
	Delay (sec)	LOS	95th- Percentile Queue (ft)	Delay (sec)	LOS	95th- Percentile Queue (ft)	Delay (sec)	LOS	95th- Percentile Queue (ft)
Route 8 SB On Ramp, Rt. 334 (Wakelee Ave.), Lower Derby Ave., and Rt. 334 (Great Hill Rd.) (Signalized)									
EB Left Turn	19.3	B	77	20.3	C	75	18.6	B	76
EB Through and Right	28.7	C	227	23.8	C	160	25.2	C	207
SB Through	18.2	B	222	17.6	B	143	16.8	B	139
SB Right Turn	17.7	B	186	16.7	B	92	16.0	B	89
NB Left Turn	31.1	C	165	30.1	C	242	25.9	C	168
NB Through	5.8	A	48	5.7	A	87	5.8	A	52
Intersection	21.0	C	-	19.1	B	-	19.2	B	-
Southwest Rd., Rt. 334 (Great Hill Rd.), and Rt. 334 (Fountain Lake Rd.) (Unsignalized)									
NB	13.7	B	-	14.5	B	-	13.9	B	-
WB Left Turn	8.6	A	-	8.0	A	-	8.2	A	-
Derby Neck Rd. and Great Hill Rd. (Unsignalized)									
EB Left Turn	0.0	A	-	7.3	A	-	7.3	A	-
SB	8.8	A	-	8.7	A	-	8.8	A	-
Hawthorne Ave., Silver Hill Rd., and Derby Neck Rd. (Unsignalized)									
EB Left Turn	7.3	A	-	7.3	A	-	7.3	A	-
SB	8.7	A	-	8.8	A	-	8.9	A	-

EB Eastbound
WB Westbound
NB Northbound
SB Southbound
LOS Level of Service

Trip Generation

The peak-hour vehicular trips generated by a potential development at the Fountain Lake Industrial Park to the north by others (Table 3A) and by the development at 38 Great Hill Road (Table 3B) were estimated primarily using data from ITE (Institute of Transportation Engineers) *Trip Generation Manual, 11th Edition*. Because the ITE manual does not include land use categories for the event hall and the barn at 38 Great Hill Road that will be available for event rentals, the trips for these two buildings were based on the 84 parking spaces on the site plan with the assumption that half of the spaces will be filled during each of the weekday afternoon and the Saturday midday peak hours.

The development at 38 Great Hill Road is projected to generate 149, 254, and 240 vehicular trips during the respective weekday morning, weekday afternoon, and Saturday midday peak hours.

Table 3A Trip Generation for Background Development by Others (vph)

Industrial Park (ITE LU 130) (150,000 SF)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	41	10	51
Weekday Afternoon Peak Hour of Adjacent Street	11	40	51
Saturday Midday Peak Hour of Adjacent Street	21	45	66

vph Vehicles per hour

Table 3B Trip Generation for 38 Great Hill Road (vph)

Multifamily Housing (Mid-Rise), Not Close to Rail Transit (ITE LU 221) (240 Units)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	20	69	89
Weekday Afternoon Peak Hour of Adjacent Street	57	37	94
Saturday Midday Peak Hour of Adjacent Street	48	46	94
Single-Family Attached Housing (ITE LU 215) (44 Units)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	7	14	21
Weekday Afternoon Peak Hour of Adjacent Street	14	11	25
Saturday Midday Peak Hour of Adjacent Street	12	13	25
Single-Family Detached Housing (ITE LU 210) (27 Units)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	5	14	19
Weekday Afternoon Peak Hour of Adjacent Street	16	9	25
Saturday Midday Peak Hour of Adjacent Street	14	11	25
Single-Family Detached Housing (ITE LU 210) (One Existing House)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	0	1	1
Weekday Afternoon Peak Hour of Adjacent Street	1	0	1
Saturday Midday Peak Hour of Adjacent Street	1	0	1
Recreational Community Center (ITE LU 495) (10,000 SF Community Building)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	13	6	19
Weekday Afternoon Peak Hour of Adjacent Street	12	13	25
Saturday Midday Peak Hour of Adjacent Street	6	5	11
Event Hall (17,000 SF) and Barn (4,600 SF) (84 Parking Spaces, Assuming 50% Hourly Arrivals)			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	0	0	0
Weekday Afternoon Peak Hour of Adjacent Street	42	0	84
Saturday Midday Peak Hour of Adjacent Street	42	0	84
Total			
	Entry	Exit	Entry & Exit
Weekday Morning Peak Hour of Adjacent Street	45	104	149
Weekday Afternoon Peak Hour of Adjacent Street	142	70	254
Saturday Midday Peak Hour of Adjacent Street	123	75	240

vph Vehicles per hour

Table 4 depicts the distribution of the site-generated trips along the area routes. The distribution takes into account the relative traffic volumes of the area roadways and the development patterns in this part of Derby. Traffic volumes for the 2027 build conditions, which combine the no-build volumes and the new site trips, are presented in Figures 8, 9, and 10.

Table 4 Trip Distribution

To / From Route	Entry/Exit
North: Route 8	25%
North: Route 334 (Great Hill Road)	10%
South: Route 8	35%
South and East: Hawthorne Avenue via Silver Hill Road	10%
East: Silver Hill Road	10%
West: Derby Neck Road via Great Hill Road	10%
Total	100%

Capacity Analysis

Table 5 shows the capacity analysis results for the 2027 build traffic conditions. All LOS for the traffic approaches and the signalized intersection will continue to operate at favorable LOS, A, B, or C during the three peak hours. The incremental increases in average delays between the no-build and build conditions will be limited. For example, at the signalized intersection of Route 334 and the Route 8 southbound on ramp, the intersection-level traffic delay will only increase by zero to 1.1 seconds per vehicle during the three peak hours after the residential development is built and occupied. The traffic impact of the development will be negligible.

Table 5 Capacity Analyses for Build Conditions

Intersection	2027 Build Conditions								
	Weekday Morning Peak Hour of Adjacent Streets			Weekday Afternoon Peak Hour of Adjacent Streets			Sunday Midday Peak Hour of Adjacent Streets		
	Delay (sec)	LOS	95th- Percentile Queue (ft)	Delay (sec)	LOS	95th- Percentile Queue (ft)	Delay (sec)	LOS	95th- Percentile Queue (ft)
Route 8 SB On Ramp, Rt. 334 (Wakelee Ave.), Lower Derby Ave., and Rt. 334 (Great Hill Rd.) (Signalized)									
EB Left Turn	19.4	B	84	20.3	C	80	18.5	B	80
EB Through and Right	31.3	C	247	24.6	C	173	25.2	C	214
SB Through	18.5	B	222	17.7	B	143	16.7	B	137
SB Right Turn	18.6	B	195	17.4	B	114	16.4	B	105
NB Left Turn	31.4	C	165	30.7	C	242	25.5	C	163
NB Through	5.9	A	48	5.8	A	87	5.8	A	50
Intersection	22.1	C	-	19.6	B	-	19.2	B	-
Southwest Rd., Rt. 334 (Great Hill Rd.), and Rt. 334 (Fountain Lake Rd.) (Unsignalized)									
NB	14.1	B	-	13.7	B	-	13.4	B	-
WB Left Turn	8.6	A	-	8.1	A	-	8.2	A	-
Great Hill Rd. and Driveway #1 (Unsignalized)									
WB	8.6	A	-	8.6	A	-	8.6	A	-
SB Left Turn	7.3	A	-	7.3	A	-	7.3	A	-
Derby Neck Rd. and Great Hill Rd. (Unsignalized)									
EB Left Turn	0.0	A	-	7.3	A	-	7.3	A	-
SB	8.8	A	-	8.8	A	-	8.9	A	-
Hawthorne Ave., Silver Hill Rd., and Derby Neck Rd. (Unsignalized)									
EB Left Turn	7.3	A	-	7.3	A	-	7.3	A	-
SB	8.9	A	-	8.9	A	-	9.0	A	-
Great Hill Rd. and Driveway #3 (Unsignalized)									
WB	8.8	A	-	8.8	A	-	8.8	A	-
SB Left Turn	0.0	A	-	0.0	A	-	0.0	A	-
Great Hill Rd. and Driveway #2 (Unsignalized)									
WB	8.5	A	-	8.6	A	-	8.5	A	-
SB Left Turn	7.3	A	-	7.3	A	-	7.3	A	-
Silver Hill Rd. and Driveway #4 (Unsignalized)									
NB Left Turn	7.3	A	-	7.4	A	-	7.4	A	-
EB	8.9	A	-	9.2	A	-	9.2	A	-

EB Eastbound
 WB Westbound
 NB Northbound
 SB Southbound
 LOS Level of Service

V. Traffic Accident Record Summary

Traffic accident records for Great Hill Road and Silver Hill Road in Derby, Southwest Road in Seymour, and the segment of Route 334 at the intersection of Southwest Road in Seymour during 2021-2023 were reviewed. The details are summarized in Table 6.

Zero accident was recorded for Great Hill Road and Silver Hill Road during the three years. Three accidents occurred on Southwest Road, including two collisions with roadside objects and one sideswipe accidents between vehicles in opposite directions.

13 accidents occurred on Route 334 at the Southwest Road intersection. Five of the accidents involved collisions with roadside objects including trees and guiderails. There were three sideswipe accidents between vehicles of opposite directions, one overturn accident, two rear-end accidents, and two front-to-front accidents.

Based on the numbers and locations of the accidents over the three-year period and the accident categories in the table, no abnormal accident patterns were identified from these records. Because the development traffic will be adequately accommodated by the existing roadways in the area and will not create congestions at the area intersections, it is not expected to adversely affect the safety conditions of the adjacent roadways.

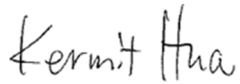
Table 6 Accident Record Summary

	Southwest Road (Seymour)	Route 334 at Southwest Road Intersection, Mile 1.97 to 2.04
Location		
Year		
2021	1	2
2022	2	4
2023	0	7
Total	3	13
Accident Severity		
Fatality		
Injury (No Fatality)	0	6
Property Damage Only	3	7
Total	3	13
Type of Collision		
Sideswipe-Opposite Direction	1	3
Overturn		1
Front to Rear		2
Front to Front		2
Fixed Object	2	5
Total	3	13

Source: Connecticut Crash Data Repository

VI. Conclusions

Area traffic operation was analyzed for a residential development at 38 Great Hill Road under the 2024 existing and the 2027 no-build and build traffic conditions. Traffic generated by the development will be adequately and safely accommodated by the adjacent roadways and intersections. The traffic impact of the development will be negligible.



Kermit Hua, PE, PTOE
Principal
KWH Enterprise, LLC
(203) 606-3525
kermit.hua@kwhenterprise.com

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By Marc J Garofalo MPA, MMC, MCTC at 11:25 am, Oct 16, 2026