

March 17, 2022

Mr. Frank Petise
Transportation, Traffic & Parking
City of Stamford
888 Washington Blvd., 7th Floor
Stamford, CT 06901

Re: 225 High Ridge Road, Stamford, Connecticut
Zoning Board Application 221-33 – Referral Comments

Dear Mr. Petise,

This letter is written in response to comments made by the Transportation, Traffic and Parking Department and incorporated in Zoning Board Approval No. 221-33. In reference to your interoffice memorandum dated February 4, 2022 and attached hereto, we offer the following responses for your consideration:

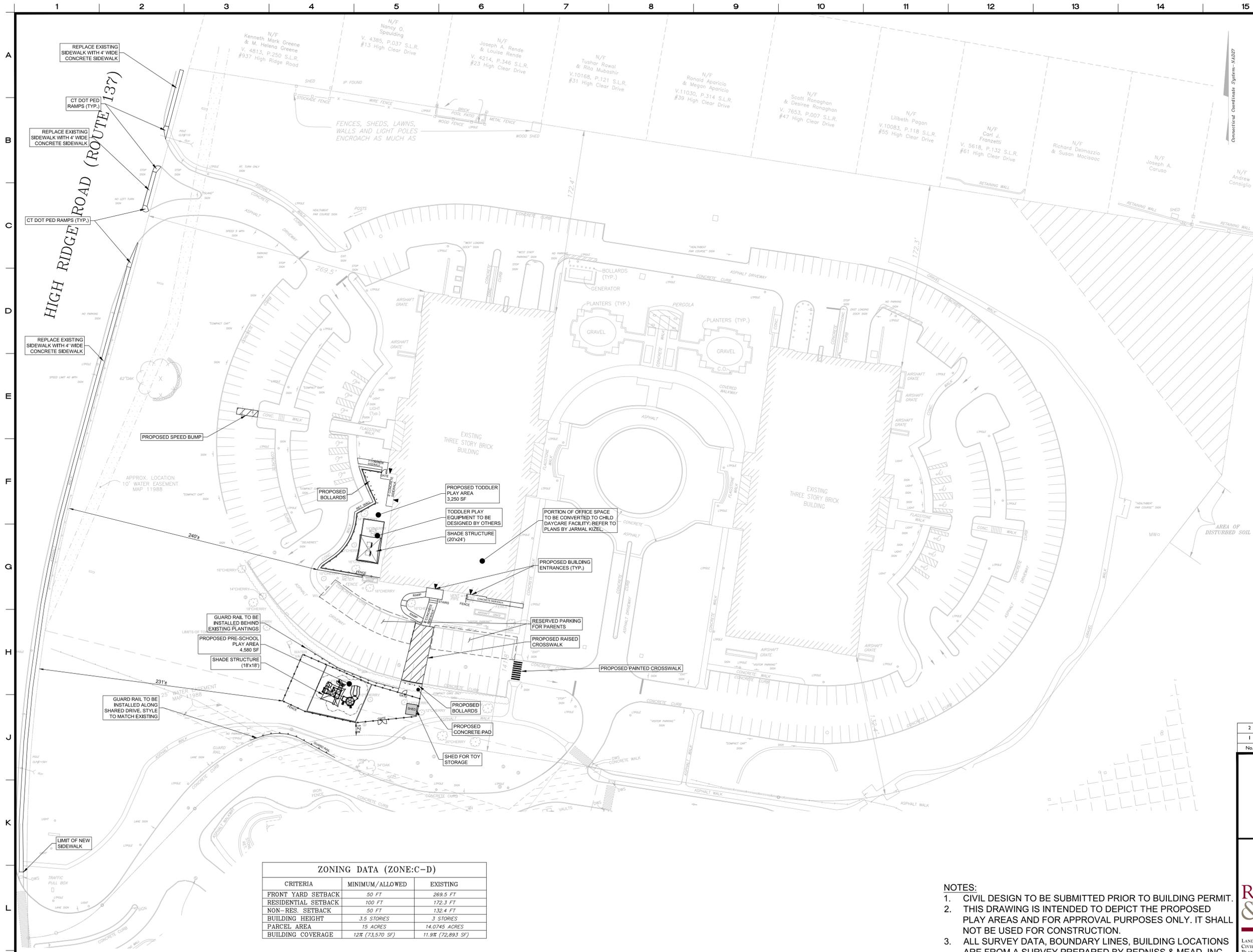
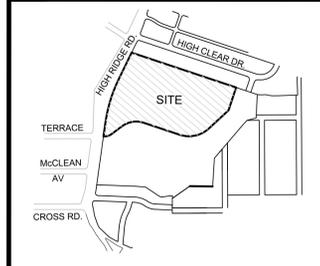
1. The attached traffic statement for the development has been prepared by Tighe & Bond. As stated in the report, the proposed Goddard School is not expected to significantly impact traffic operations along High Ridge Road (State Route 137).
2. The applicant agrees to reconstruct the sidewalk along their frontage of High Ridge Road, as indicated on the attached Zoning Site Plan revised 3/16/2022. Since the sidewalk is within the State ROW, we shall coordinate with DOT to complete that work. Details of the sidewalk replacement shall be prepared concurrent with a building permit application.
3. The attached narrative describes the parent pick up and drop off patterns, including an estimated drop off schedule. All parents will park in designated parking spaces. No car queues are expected within the parking lots or drive isles because the Goddard School model is for parents to park their cars and escort their children to and from the school.
4. Specifications for the proposed raised crosswalk and speed hump shall be provided concurrent with a building permit application.
5. A Pavement Marking & Signage plan shall be provided concurrent with a building permit application.
6. The applicant agrees to install a crosswalk as indicated on the revised ZSP.
7. The required 42 parking spaces are located in the surface parking lot in front of the school's proposed entrance and in the below ground garage for staff. This is a slight reduction in required parking for an office use of the same size (3 spaces per 1,000 SF at 14,630 SF = 44 spaces). Therefore, the Property will continue to provide adequate parking for all tenants. The ZSP identifies those spaces.

Based on the above, we have addressed your initial comments and kindly request your endorsement to continue with the zoning board process. Please note we are scheduled to be heard by the Zoning Board on March 28

Sincerely,



Bret Holzwarth, P.E.



ZONING DATA (ZONE:C-D)		
CRITERIA	MINIMUM/ALLOWED	EXISTING
FRONT YARD SETBACK	50 FT	269.5 FT
RESIDENTIAL SETBACK	100 FT	172.3 FT
NON-RES. SETBACK	50 FT	132.4 FT
BUILDING HEIGHT	3.5 STORIES	3 STORIES
PARCEL AREA	15 ACRES	14.0745 ACRES
BUILDING COVERAGE	12% (73,570 SF)	11.9% (72,893 SF)

No.	Date	Revision
2	03/16/2022	ZONING REVISION
1	12/20/2021	ZONING APPLICATION

ZONING SITE PLAN
 DEPICTING
225 HIGH RIDGE ROAD
GODDARD SCHOOL
 STAMFORD, CT
 PREPARED FOR
BAYWATER PROPERTIES

REDNISS & MEAD
 LAND SURVEYING
 CIVIL ENGINEERING
 PLANNING & ZONING CONSULTING
 PERMITTING

22 First Street | Stamford, CT 06905
 Tel: 203.327.0500 | Fax: 203.357.1118
 www.rednissmead.com

SCALE: 0 40 80
1"=40'

DRAWN BY: JWB CHECKED BY: BDH

Bret D. Holzwarth
 BRETT D. HOLZWARTH CT. P.E. 27812
 March 16, 2022

DATE

This document and copies thereof are valid only if they bear the signature and embossed seal of the designated licensed professional. Unauthorized alterations render any declaration herein null & void.

SHEET No: **SP-1**

Comm. No.: 6885

- NOTES:**
- CIVIL DESIGN TO BE SUBMITTED PRIOR TO BUILDING PERMIT.
 - THIS DRAWING IS INTENDED TO DEPICT THE PROPOSED PLAY AREAS AND FOR APPROVAL PURPOSES ONLY. IT SHALL NOT BE USED FOR CONSTRUCTION.
 - ALL SURVEY DATA, BOUNDARY LINES, BUILDING LOCATIONS ARE FROM A SURVEY PREPARED BY REDNISS & MEAD, INC. TITLED "PROPERTY & LIMITED TOPOGRAPHIC SURVEY" DATED 03/02/2022.

3/16/2022 1:52 PM H:\Redniss\260016600\6885\225 High Ridge-Goddard School Master.dwg

11-0509-015
February 22, 2022

Mr. David Genovese
TNREFIII 225 High Ridge, LLC
c/o Baywater Properties
34 Old Kings Highway South
Darien, CT 06820

Re: **Traffic Statement**
Goddard School, 225 High Ridge Road (State Route 137)
Stamford, Connecticut

Dear Mr. Genovese:

Tighe & Bond has prepared this traffic statement to review the potential traffic impact of the proposed replacement of 14,630 square feet of general office space with a 180-student Goddard School in the southwest corner of the existing building at 225 High Ridge Road (State Route 137) in Stamford. This traffic statement is provided in support of the City of Stamford approval process. The analysis presented in the following letter shows that the proposed replacement is not expected to have a significant impact to traffic operations on High Ridge Road.

Existing Conditions

The existing 225 High Ridge Road building contains 200,000 square feet of general office. It is bordered by High Ridge Road to the west, a recently constructed Waterstone on High Ridge senior living facility at 215 High Ridge Road (formerly 201 High Ridge Road) and The Spire and Pinnacle Schools at 201 High Ridge Road to the south, and residential properties to the east and north. A site location map depicting the property and the surrounding area is provided in Figure 1.

The property is accessible via the existing driveways on High Ridge Road including the right-in/right-out only site driveway (Northern Site Driveway) and the signalized intersection with High Ridge Road opposite Terrace Avenue (Southern Site Driveway). The exit approach of the Northern Site Driveway is 15 feet wide and stop-sign controlled. The Southern Site Driveway consists of one dedicated left-turn lane and a shared through/right-turn lane exiting and one lane entering and is controlled by the traffic signal (traffic signal plan attached for reference). The Southern Site Driveway provides access to both 225 High Ridge Road site and the developments at 201 and 215 High Ridge Road.

High Ridge Road, designated as State Route 137, is classified as an urban principal arterial by the Connecticut Department of Transportation (CTDOT). High Ridge Road runs in north to south, connecting Summer Street and Cold Spring Road in Stamford to the south and the Town of Pound Ridge in New York to the north. Along the site frontage, High Ridge Road is approximately 67 to 72 feet wide with two 11 foot travel lanes in each direction, a 11 foot paved median that accommodates left-turn lanes at key intersections, and 6 to 8 foot shoulder along each side of the road. High Ridge Road is widened at the intersection of Terrace Avenue/Southern Site Driveway to provide a left-turn lane in each direction and a dedicated northbound right-turn lane. Sidewalks are provided along the site frontage and adjacent properties along both sides of High Ridge Road. The posted speed limit on High Ridge Road is 40 miles per hour (mph) in the vicinity of the site. High Ridge Road provides access to residential, office, and commercial uses near the site.



Proposed Conditions

The application proposes to replace approximately 14,630 square feet of general office space with a 180-student Goddard School in the southwest corner of the existing building at 225 High Ridge Road. The development also proposes to install a raised crosswalk and a speed hump along the parking lot driveway to improve pedestrian safety within the site. The site revisions will result in a loss of 6 parking spaces leaving a total of 664 on-site spaces. Driveway access to the property will be via the existing driveways along High Ridge Road and no changes to the driveways are proposed. It is anticipated that the proposed development will be buildout and occupied by summer/fall 2022.

Traffic Volumes

The study area intersections were selected based on the location of the site, existing traffic patterns, and expected volume of generated trips that will impact traffic operations. The following intersections were analyzed for this study:

- High Ridge Road at Northern Site Driveway (Right-In/Right-Out Only)
- High Ridge Road at Terrace Avenue/Southern Site Driveway (Signalized)

The study analyses focus on the weekday morning (7:00 AM - 9:00 AM) and weekday afternoon (4:00 PM - 6:00 PM) peak hours, the periods when site related trips and overall traffic volumes on High Ridge Road are at their highest levels.

As noted, a senior living facility was recently constructed at 215 High Ridge Road (formerly 201 High Ridge Road) to the immediate south of the 225 High Ridge Road site. These two properties share the same driveway opposite to Terrace Avenue that is controlled by a traffic signal. A Traffic Access and Impact Study for the senior living facility was conducted by Fredrick P. Clark Associates in December 2018 and approved by CTDOT and the City of Stamford. The Study collected weekday morning and afternoon peak hour turning movement counts (TMC) at the intersection of High Ridge Road and Terrace Avenue/Southern Site Driveway during the peak periods in 2018 and forecasted the 2021 Build Conditions Traffic Volumes for the intersection based on the proposed development plan. Given the on-going impact of COVID-19 on traffic volumes, the previously approved 2021 Build Conditions Traffic Volumes for the High Ridge Road and Terrace Avenue/Southern Site Driveway intersection were used as the baseline peak hour traffic volumes for this study. The previously approved 2021 Build Conditions Traffic Volumes included in the Study is attached for reference.

Traffic volume data was collected during the weekday morning and afternoon peak periods at the Northern Site Driveway on February 10th, 2022 to review the baseline peak hour traffic at this intersection. Given that the existing general office spaces at 225 High Ridge Road site is approximately 75% leased, the collected traffic data for the northbound right-in and westbound right-out movements at the Northern Site Driveway were adjusted by a factor of 1.33 to account for the unleased office space. It should be noted that the baseline traffic volumes for the Southern Site Driveway included an adjustment for re-occupancy as part of the 225 High Ridge Road (formerly 201 High Ridge Road) Study and were therefore not adjusted. Furthermore, the through volumes on High Ridge Road at the Northern Site Driveway intersection were adjusted to balance with the previously approved traffic volumes on High Ridge Road at the Terrace Avenue/Southern Site Driveway intersection. The raw TMC data for the High Ridge Road and Northern Site Driveway intersection is attached for reference.

Upon consultation with CTDOT, the baseline traffic volumes were projected to a conservative 2023 project completion year using a 0.7% annual growth rate to account for general traffic growth and smaller developments in the area. CTDOT and the City of Stamford records were also reviewed to determine if any additional pending or recently approved developments may add new traffic through the study area in the near future. Upon review of the development records and the traffic studies, 210 Long Ridge Road Assisted Living Development was identified proximate to the study area, however, the development is considered to have negligible impact on the study area due to the expected low volume of site-generated traffic. No additional developments were identified and the annual traffic growth rate was considered sufficient to project the baseline traffic volumes to 2023.

The projected 2023 Background Traffic Volumes for the weekday morning and weekday afternoon peak hours are presented in Figures 2 and 3, respectively. The 2023 Background Condition traffic volumes were reviewed and approved by CTDOT Bureau of Policy and Planning on February 15th, 2022, as shown in the attached documentation.

Collision History

Vehicle collision history from January 2017 to December 2021 was collected from the Connecticut Crash Data Repository at the study area intersections and along the site frontage. The review includes the last three years of data prior to the start of COVID-19 as well as the crash data between January 2020 and December 2021 to review crash patterns before and during COVID-19. Table 1 provides a summary of the collision types and severity.

As shown in Table 1, there were 18 motor vehicle collisions reported within the five-year period analyzed. The most frequent type of collision was rear-end, which accounted for seven (7) crashes (38.9%). Sideswipe same direction was the second most common at six (6) collisions (33.3%). Fixed object was the third most common at three (3) collisions (16.7%). The remaining crash types were one (1) overturn and one (1) sideswipe opposite direction collision.

Throughout the period analyzed, there were no fatalities or collision reporting serious injuries. All of the collisions resulted in minor injuries or property damage only. Additionally, there were no pedestrian or bicyclist related collisions and all collisions were motor vehicle related.

The most common location where collisions occurred was at the signalized intersection of High Ridge Road and Terrance Avenue/Southern Site Driveway, which experienced 13 (72.2%) crashes. The segment of High Ridge Road between Northern Site Driveway and Terrace Avenue/Southern Site Driveways experienced the second most collisions at 4 (22.2%). The intersection of High Ridge Road and Northern Site Driveway accounted for less than 6% of all crashes.

A significant pattern of collisions was not identified from the analysis of the study area. The proposed redevelopment and site-generated traffic are not anticipated to negatively impact existing collision patterns or roadway safety at the study area intersections and along the site frontage.

Trip Generation

The site-generated traffic volumes for the project were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. Based on the published data (Lane Use Code 565, 'Day Care Center'), the 180-Student Goddard School is expected to generate 140 trips (74 entering, 66 exiting) during the weekday morning peak hour and 142 trips (67 entering, 75 exiting) during the weekday afternoon peak hour. Table 2 provides a summary of the trip generation.

As mentioned, the existing 14,630 square feet of office use on the site will be replaced by the proposed Goddard School. Therefore, the existing site-generated trips for the office space were subtracted from the proposed site-generated trips to obtain the net trips associated with the change in land use, above those already on the roadway network. Based on the published data (Land Use Code 710, 'General Office Building'), the 14,630 square feet of general office is expected to generate 22 trips (19 entering, 3 exiting) during the weekday morning peak hour and 21 trips (4 entering, 17 exiting) during the weekday afternoon peak hour. Comparing the existing and proposed site-generated traffic estimates, the proposed development is expected to generate 118 additional trips (55 entering, 63 exiting) during weekday morning peak hour and 121 additional trips (63 Entering, 58 exiting) during weekday afternoon peak hour.

Arrival/Departure Distribution

The distribution of the peak hour site-generated traffic was applied to the roadway network based on existing regional traffic patterns within the study area, the site driveway configurations, the roadway layout, and the distribution approved as part of the 201 High Ridge Road traffic study. Based on this, a 40%, 40%, and 20% of site-generated traffic to and from the north, south, and west, respectively, is expected during the peak hours.

Figure 4 shows the Development Trip Arrival and Departure Distribution percentage into and out of the property at the site driveways within the study area. Figures 5 and 6 show the Site-Generated Traffic Volumes distributed at the study intersections for the weekday morning and weekday afternoon peak hours, respectively. These volumes were then added to the 2023 Background Traffic Volumes to generate the 2023 Combined Traffic Volumes shown in Figures 7 and 8.

Capacity and Queue Analysis

Capacity and queue analyses were performed at the study intersections for the 2023 Background and 2023 Combined Conditions during the weekday morning and weekday afternoon peak hours using Trafficware Synchro Studio 11 – Traffic Analysis Software. The software conducts the analyses based upon the methodology provided in the *Highway Capacity Manual, 6th Edition*. The analysis results are categorized in terms of Level of Service (LOS) and queue. LOS describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. The queue analysis results are summarized based on the length of vehicle queues on an intersection approach. The queues are quantified for 50th (average – signalized intersections only) and 95th (design) percentile queues with 25 feet representing one car length. A detailed summary of the HCM capacity analysis methodology is attached for reference. Tables 3 and 4 summarize the capacity and queue analyses results, respectively. Capacity analyses worksheets with full inputs, settings, and results are attached for reference.

As shown in Tables 3 and 4, the addition of site-generated traffic does not significantly impact traffic operations at the study intersections. Under the 2023 Combined Conditions, the study area intersection approaches are projected to continue operating at similar LOS as in the 2023 Background Conditions during the peak hours with minor increases in average delays with the exception of the Southern Site Driveway westbound left-turn approach. During the weekday morning peak hour, the Southern Site Driveway westbound left-turn approach will experience a drop to LOS E operation as it is on the threshold between LOS D and LOS E operation under 2023 Background Conditions.

A review of the queue results show that the majority of the intersection movements experience minor design queue length increases of less one vehicle length with a maximum increase of just under three vehicle lengths for the High Ridge Road northbound through movement in the afternoon peak hour. Under the 2023 Combined Conditions, the queue of all movements at the study intersections can be accommodated within the available storage length during the peak periods.

Conclusion

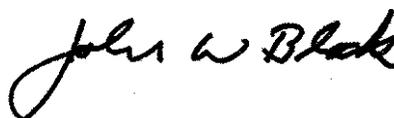
Based on the results of the analyses, it is the professional opinion of Tighe & Bond that the traffic generated by the proposed redevelopment will not have a significant impact on traffic operations on High Ridge Road. The analyses show that the study area intersections can accommodate the addition of site-generated traffic under the 2023 Combined Conditions.

Sincerely,

TIGHE & BOND, INC.



Craig D. Yannes, PE, PTOE, RSP1
Project Manager

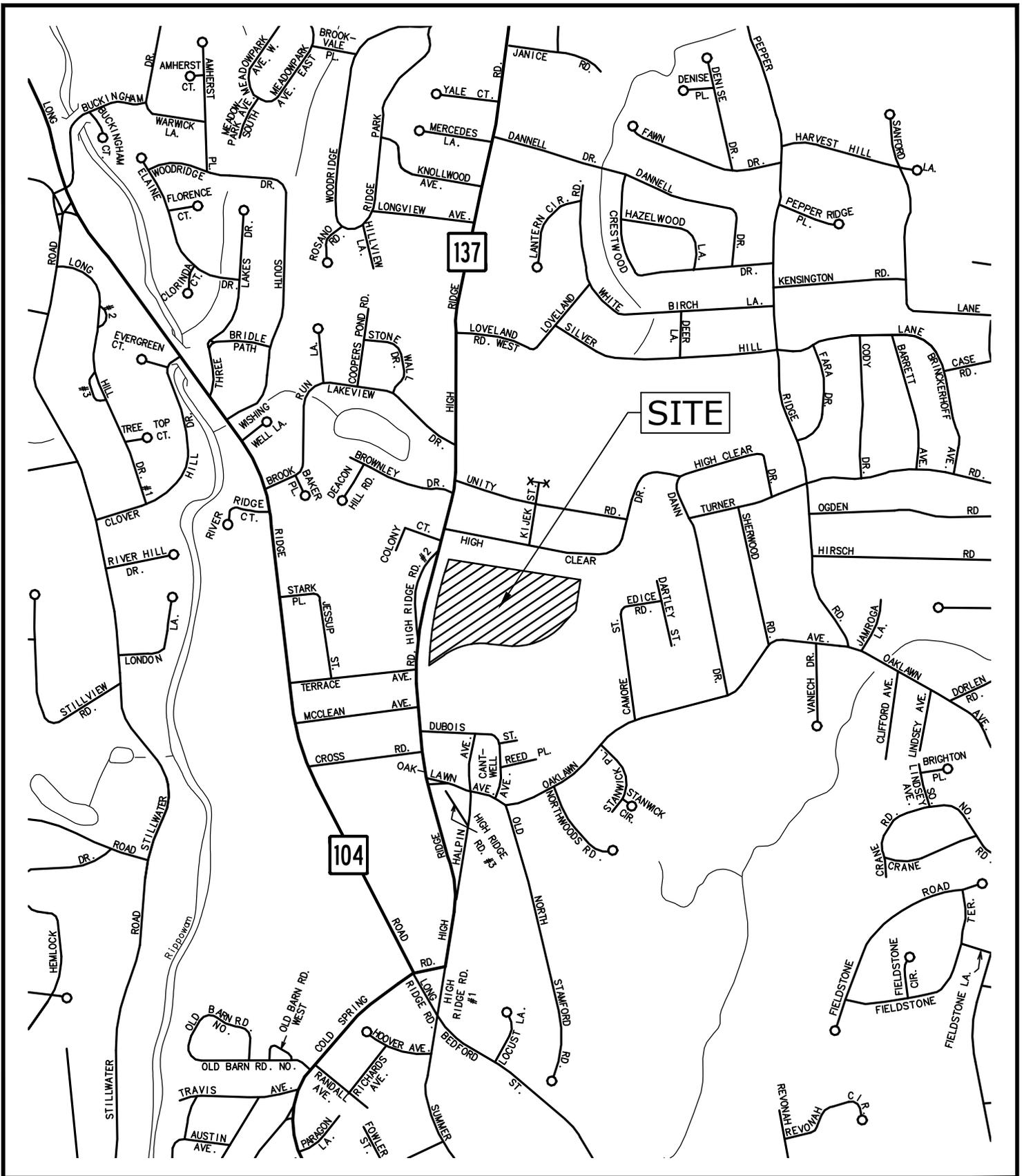


John W. Block, PE, L.S.
Senior Vice President

Enclosures: Site Location Map (Figure 1)
Traffic Volumes (Figures 2 through 8)
Collision History Summary (Table 1)
Trip Generation Summary (Table 2)
Capacity Analyses Summary (Tables 3 and 4)
High Ridge Road at Terrace Avenue/Southern Site Driveway Traffic Signal Plan
201 High Ridge Road Approved Traffic Study Volumes
Traffic Count Data
CTDOT Traffic Volume Approval (Dated February 15, 2022)
Capacity Analyses Methodology Summary
Capacity Analyses Worksheets

\\tighebond.com\data\Data\Projects\B\B0509 Baywater\015 - 225 High Ridge Rd\Report_Evaluation\Traffic Statement\2022_02-16 225 High Ridge Road Traffic Statement.docx

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225 HIGH RIDGE ROAD
STAMFORD, CT

SITE LOCATION MAP



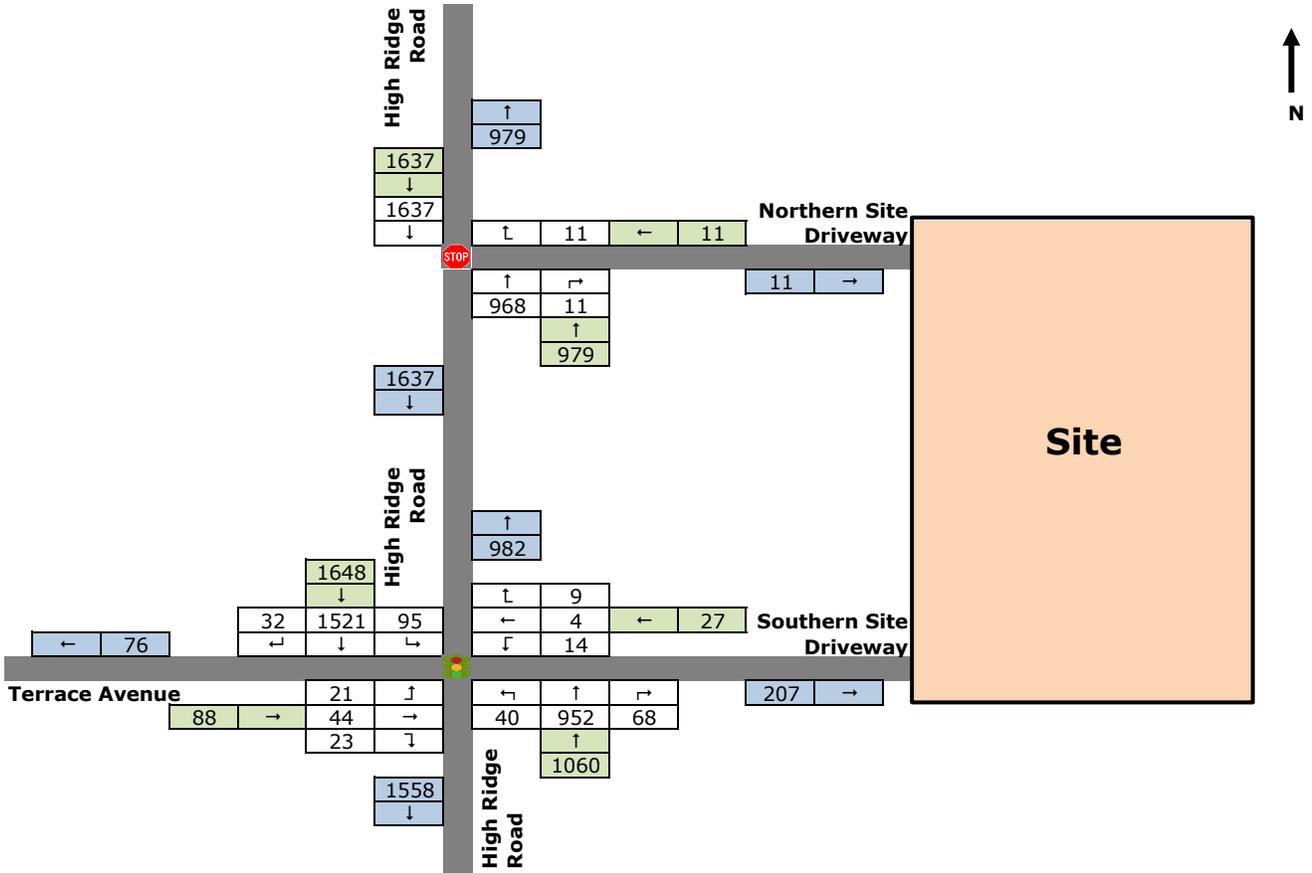
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FIGURE 1



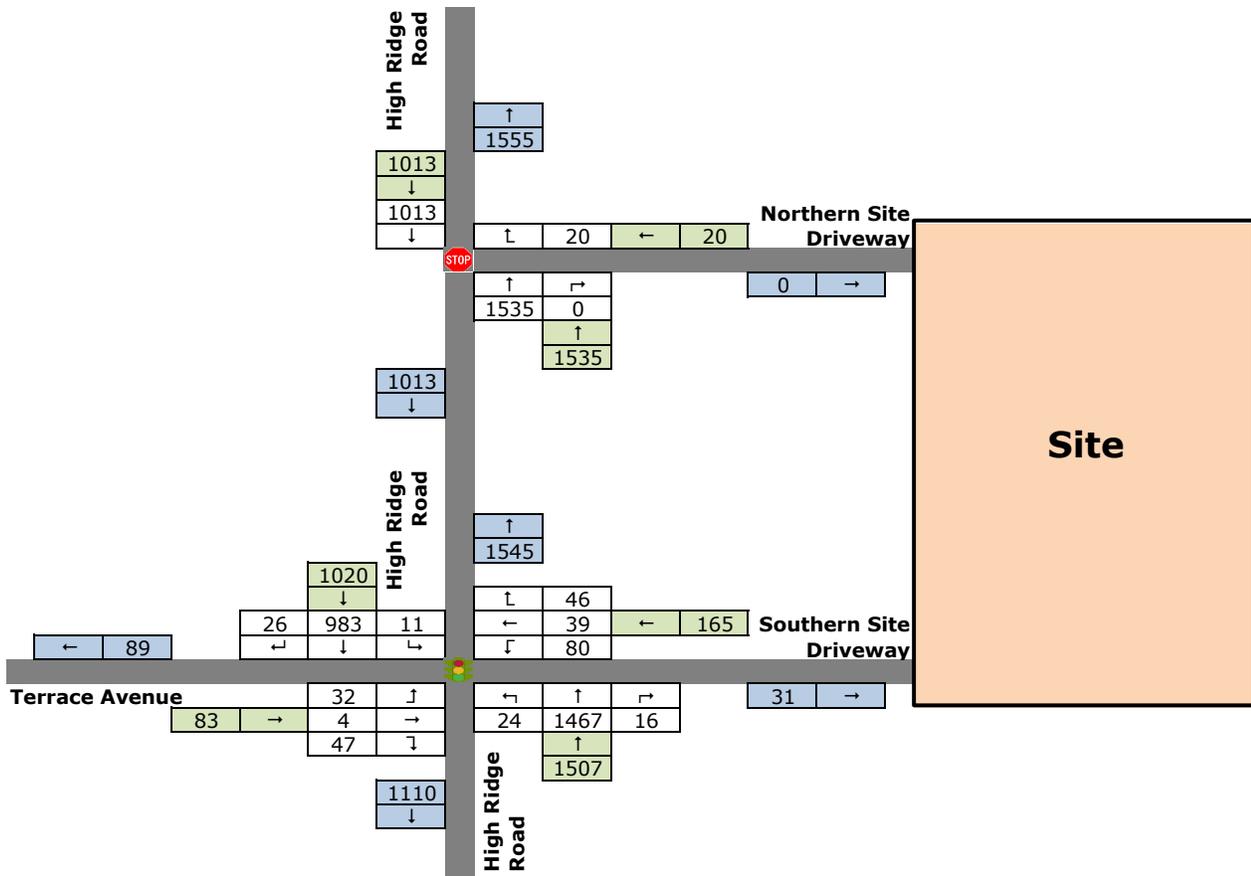
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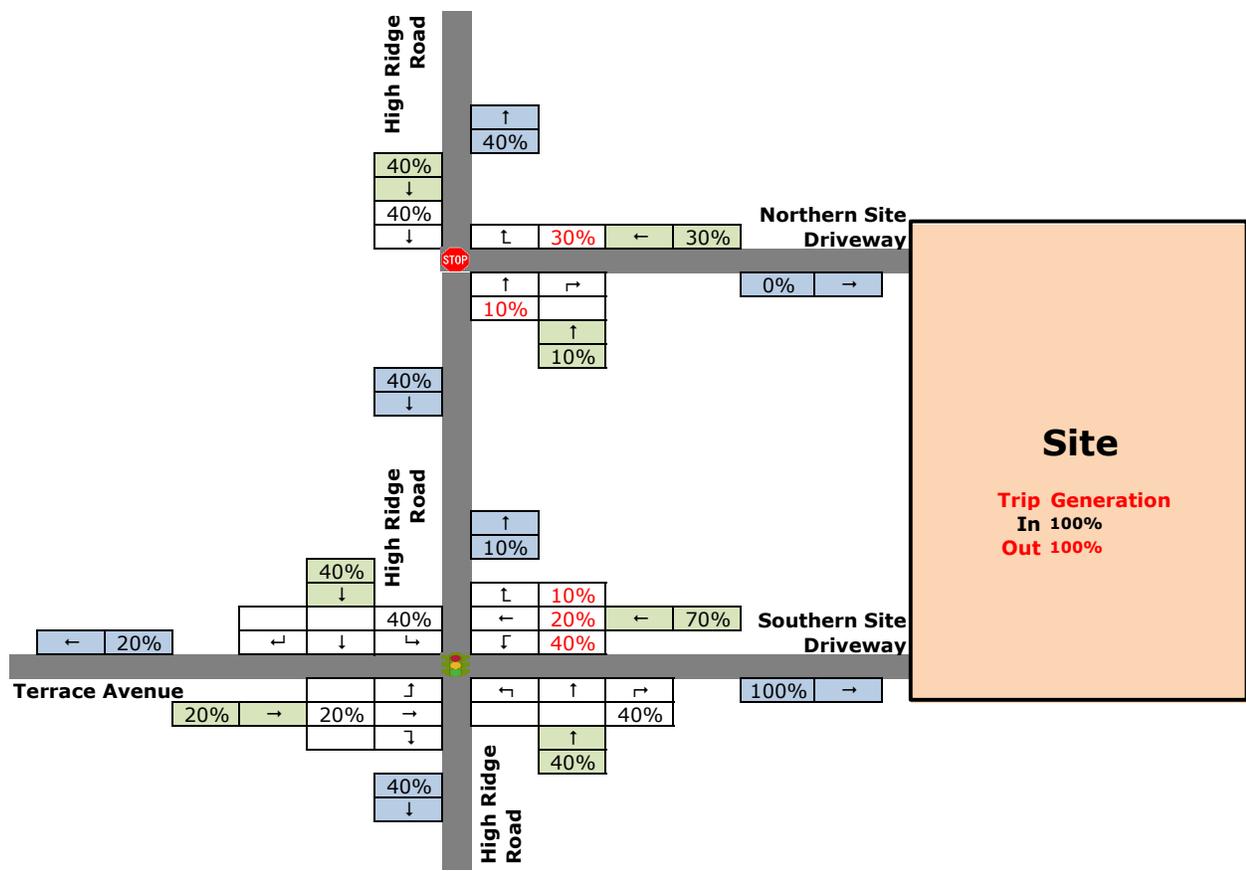
Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
2023 Background Conditions
Weekday Morning Peak Hour

Figure 2



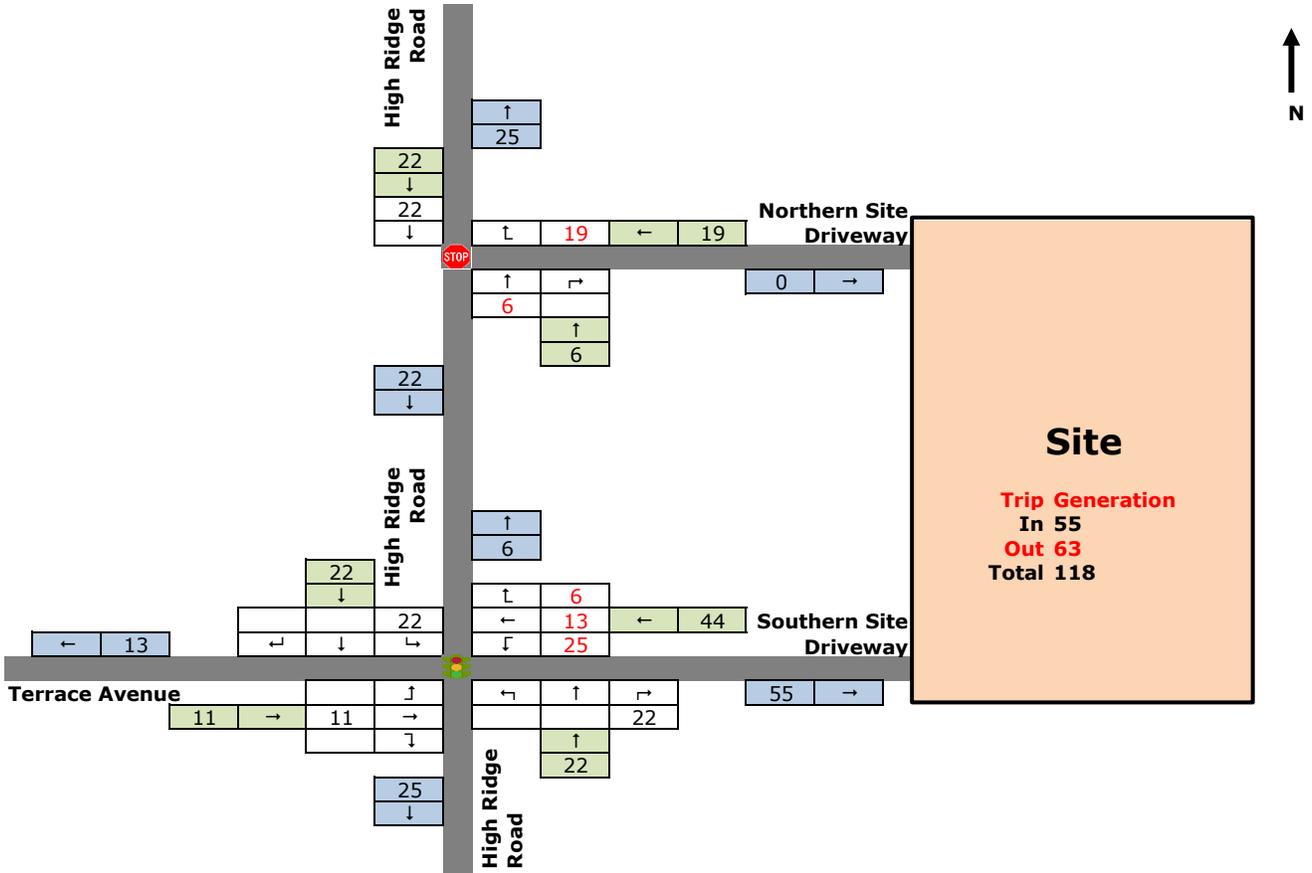
Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
2023 Background Conditions
Weekday Afternoon Peak Hour

Figure 3



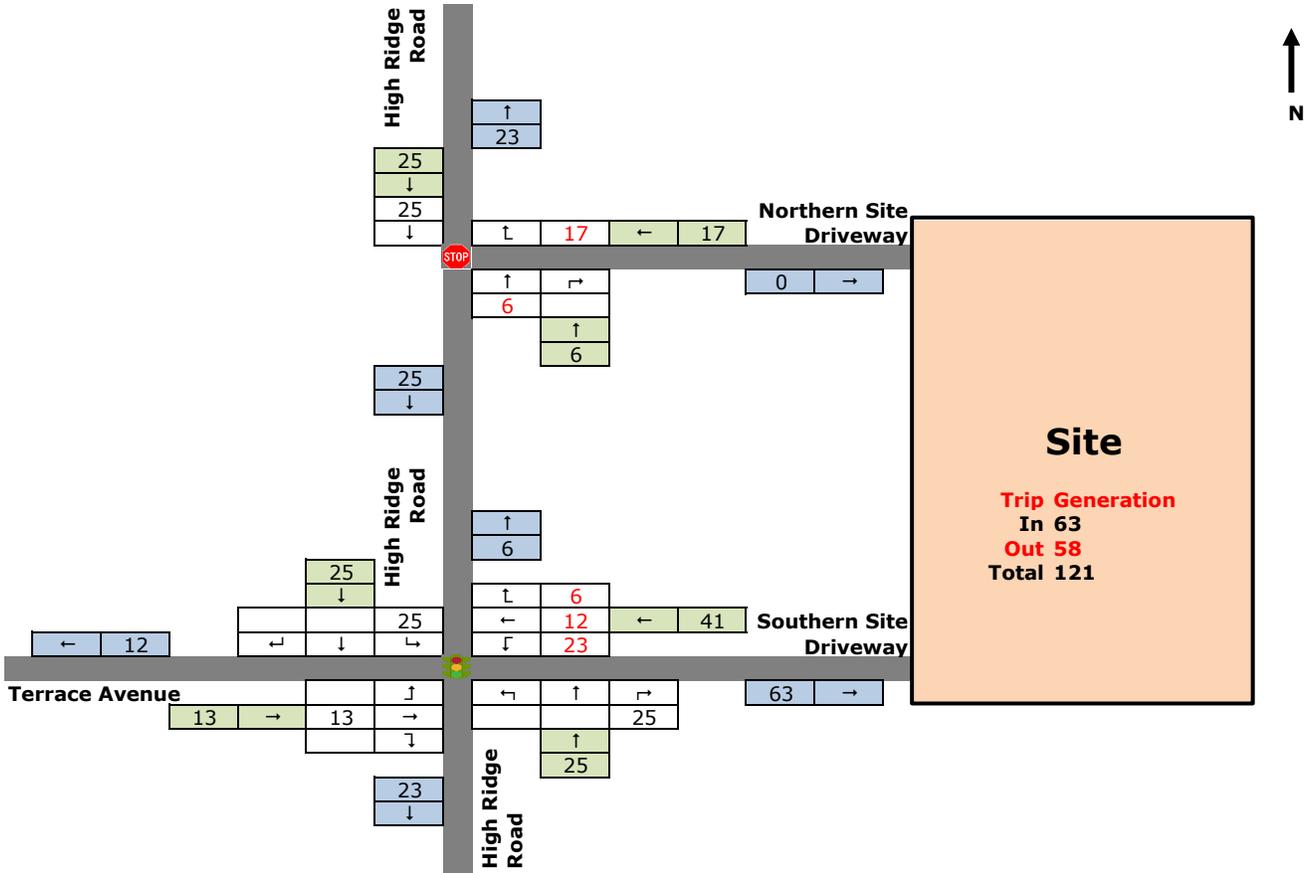
Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
Site Trip Distribution

Figure 4



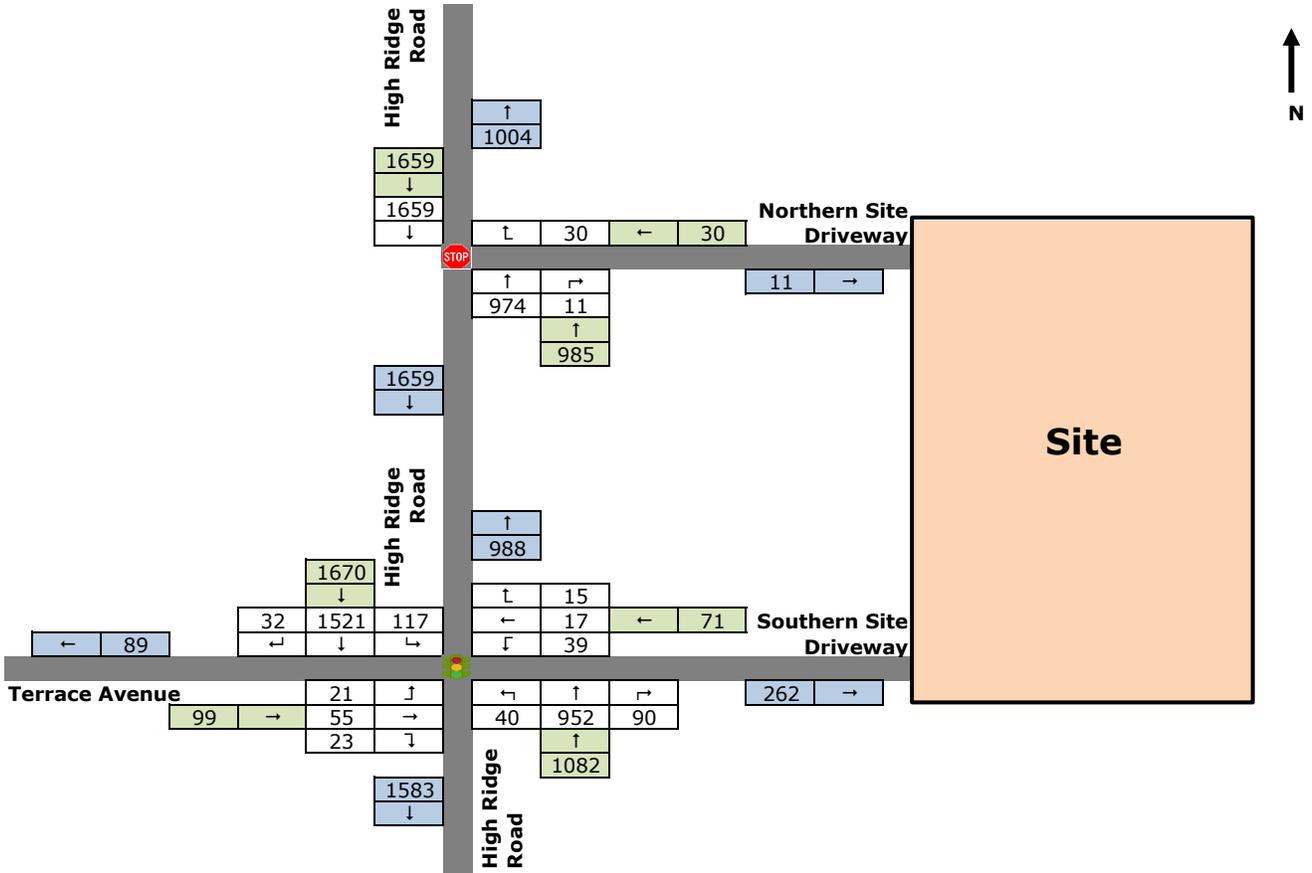
Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
Site Trip Distribution
Weekday Morning Peak Hour

Figure 5



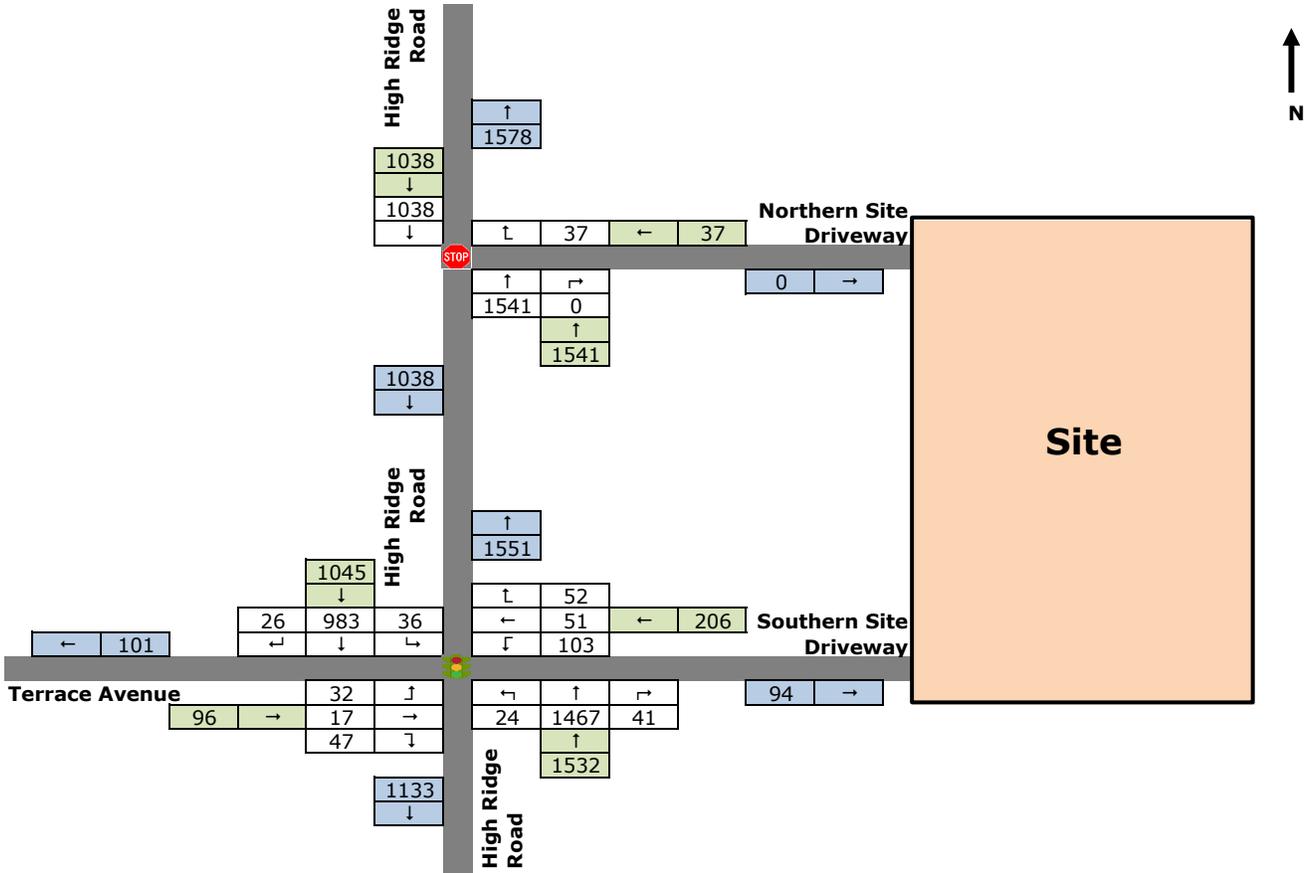
Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
Site Trip Distribution
Weekday Afternoon Peak Hour

Figure 6



Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
2023 Combined Conditions
Weekday Morning Peak Hour

Figure 7



Traffic Volumes
Goddard School, 225 High Ridge Road, Stamford
2023 Combined Conditions
Weekday Morning Peak Hour

Figure 8

TABLE 1
Study Area Collision History Summary

COLLISION TYPE

	2017	2018	2019	2020	2021	Total	Percent
Rear-End	2	1	2	1	1	7	38.9%
Sideswipe, Same Direction	1	0	2	1	2	6	33.3%
Fixed Object	0	0	0	1	2	3	16.7%
Overturn/Rollover	0	0	0	1	0	1	5.6%
Sideswipe, Opposite Direction	1	0	0	0	0	1	5.6%
TOTAL	4	1	4	4	5	18	100%

CONTRIBUTING FACTOR

	2017	2018	2019	2020	2021	Total	Percent
None	4	1	3	4	5	17	94.4%
Backup Due to Prior Crash	0	0	1	0	0	1	5.6%
TOTAL	4	1	4	4	5	18	100%

COLLISION EVENT

	2017	2018	2019	2020	2021	Total	Percent
Motor Vehicle	4	1	4	4	5	18	100.0%
TOTAL	4	1	4	4	5	18	100%

SEVERITY

	2017	2018	2019	2020	2021	Total	Percent
Minor Injury / Property Damage Only (PDO)	4	1	4	4	5	18	100.0%
TOTAL	4	1	4	4	5	18	100%

DAY & TIME

	2017	2018	2019	2020	2021	Total	Percent
Weekday Off-Peak	3	1	2	1	3	10	55.6%
Weekday 6-9 A.M.	1	0	0	0	1	2	11.1%
Weekday 3-6 P.M.	0	0	1	1	0	2	11.1%
Saturday 11 A.M. - 2 P.M.	0	0	1	1	0	2	11.1%
Weekend Off-Peak	0	0	0	1	1	2	11.1%
TOTAL	4	1	4	4	5	18	100%

WEATHER

	2017	2018	2019	2020	2021	Total	Percent
Clear	4	0	4	3	4	15	83.3%
Rain	0	1	0	1	0	2	11.1%
Snow	0	0	0	0	1	1	5.6%
TOTAL	4	1	4	4	5	18	100%

ROAD SURFACE CONDITION

	2017	2018	2019	2020	2021	Total	Percent
Dry	3	0	4	3	4	14	77.8%
Wet	1	1	0	1	0	3	16.7%
Snow	0	0	0	0	1	1	5.6%
TOTAL	4	1	4	4	5	18	100%

LIGHT CONDITIONS

	2017	2018	2019	2020	2021	Total	Percent
Light	3	1	3	3	3	13	72.2%
Dark	1	0	1	1	2	5	27.8%
TOTAL	4	1	4	4	5	18	100%

BY STUDY AREA LOCATION

	2017	2018	2019	2020	2021	Total	Percent
High Ridge Road at Terrace Avenue/Southern Site Driveway	4	1	2	3	3	13	72.2%
High Ridge Road between Northern Site Driveway and Terrace Avenue/Southern Site Driveways	0	0	2	1	1	4	22.2%
High Ridge Road at Northern Site Driveway	0	0	0	0	1	1	5.6%
TOTAL	4	1	4	4	5	18	100%

TABLE 4
Site Generated Traffic Summary

Proposed - 180 Student Daycare			
Peak Hour Period	Enter	Exit	Total
Weekday Morning	74	66	140
Weekday Afternoon	67	75	142
Existing - 14,630 SF General Office			
Peak Hour Period	Enter	Exit	Total
Weekday Morning	19	3	22
Weekday Afternoon	4	17	21
Net Vehicle Trips			
Peak Hour Period	Enter	Exit	Total
Weekday Morning	55	63	118
Weekday Afternoon	63	58	121

Development Plan: Based upon information provided by developer (Dated 1/27/2021)

Source: Institute of Transportation Engineering, Trip Generation, 11th Edition, 2021.
Land Use - 565 Day Care Center
Land Use - 710 General Office Building

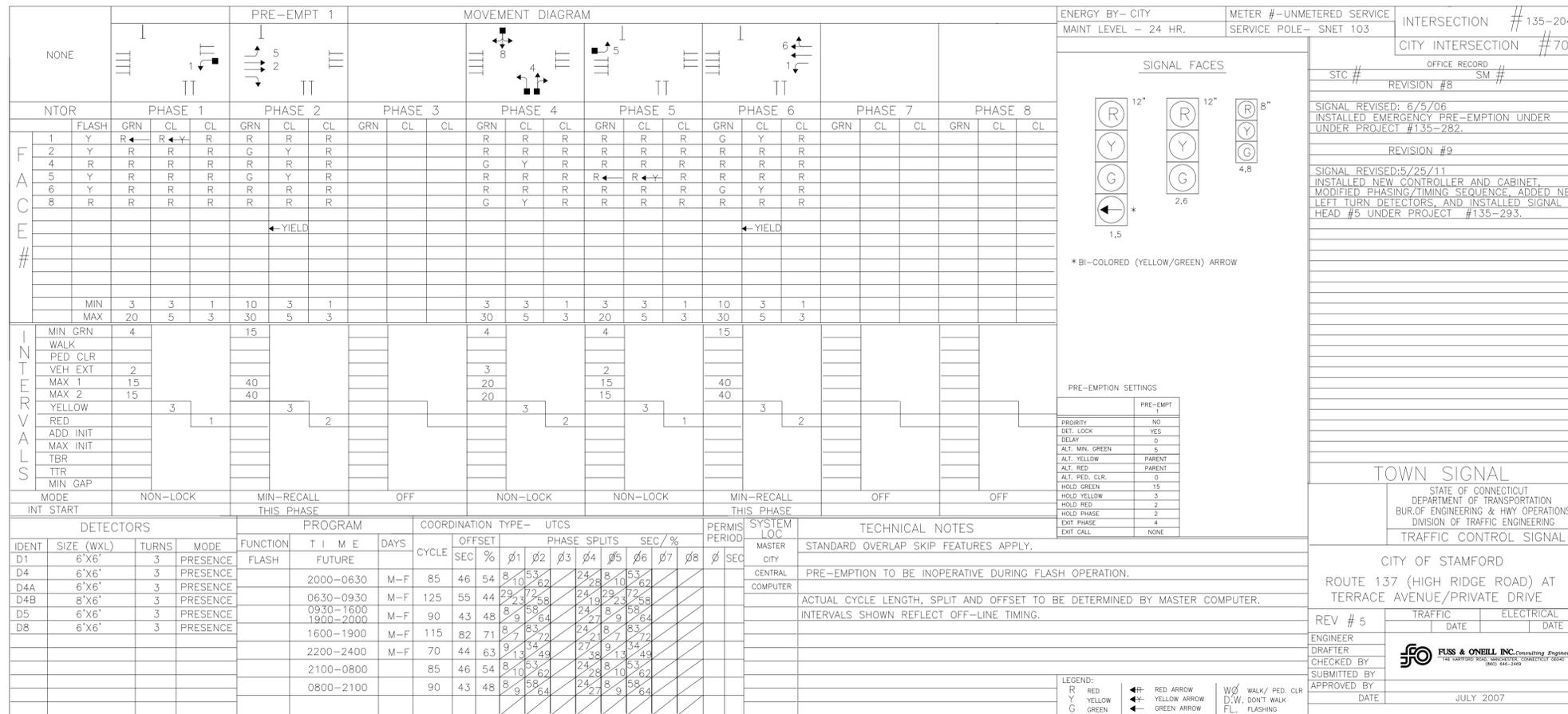
TABLE 3

Intersection Operation Summary - Vehicular Levels of Service / Average Delay (sec/veh)

		Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
		2023		2023		2023		2023	
Lane Use		Background LOS	Delay	Combined LOS	Delay	Background LOS	Delay	Combined LOS	Delay
Traffic Signal - High Ridge Road (SR 137) at Terrace Avenue / Southern Site Driveway									
Overall		A	9.9	B	11.3	B	10.5	B	14.1
Terrace Avenue	EB	E	60.8	E	62.5	C	30.3	D	35.2
Southern Site Driveway	WBL	D	53.5	E	65.0	E	66.9	E	68.1
	WBTR	C	30.1	C	33.0	C	30.3	C	32.9
	NBL	A	4.5	A	4.8	A	3.4	A	4.3
High Ridge Road (SR 137)	NBT	A	6.8	A	7.4	A	7.7	B	12.1
	NBR	A	2.0	A	2.1	A	0.0	A	1.7
	SBL	A	3.6	A	4.3	A	3.5	A	5.9
	SBTR	A	9.2	A	9.8	A	7.2	A	8.6
Unsignalized TWSC - High Ridge Road (SR 137) at Northern Site Driveway									
Northern Site Driveway	WBR	B	12.4	B	12.8	C	17.1	C	18.0

TABLE 4Intersection Operation Summary - Vehicular 50th / 95th Percentile Queue (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour				Weekday Afternoon Peak Hour			
			2023 Background		2023 Combined		2023 Background		2023 Combined	
			50 th	95 th	50 th	95 th	50 th	95 th	50 th	95 th
Traffic Signal - High Ridge Road (SR 137) at Terrace Avenue / Southern Site Driveway										
Terrace Avenue	EB	900	66	119	77	134	29	77	49	98
Southern Site Driveway	WBL	300	11	33	32	69	64	113	82	136
	WBTR	500	3	23	13	44	34	81	52	102
	NBL	100	5	13	5	14	3	11	4	13
High Ridge Road (SR 137)	NBT	570	140	214	146	227	199	455	336	525
	NBR	150	3	18	4	23	0	0	0	11
	SBL	250	11	27	15	34	1	6	6	17
	SBTR	>1000	304	451	315	470	161	249	178	280
Unsignalized TWSC - High Ridge Road (SR 137) at Northern Site Driveway										
Northern Site Driveway	WBR	165	--	3	--	5	--	5	--	10



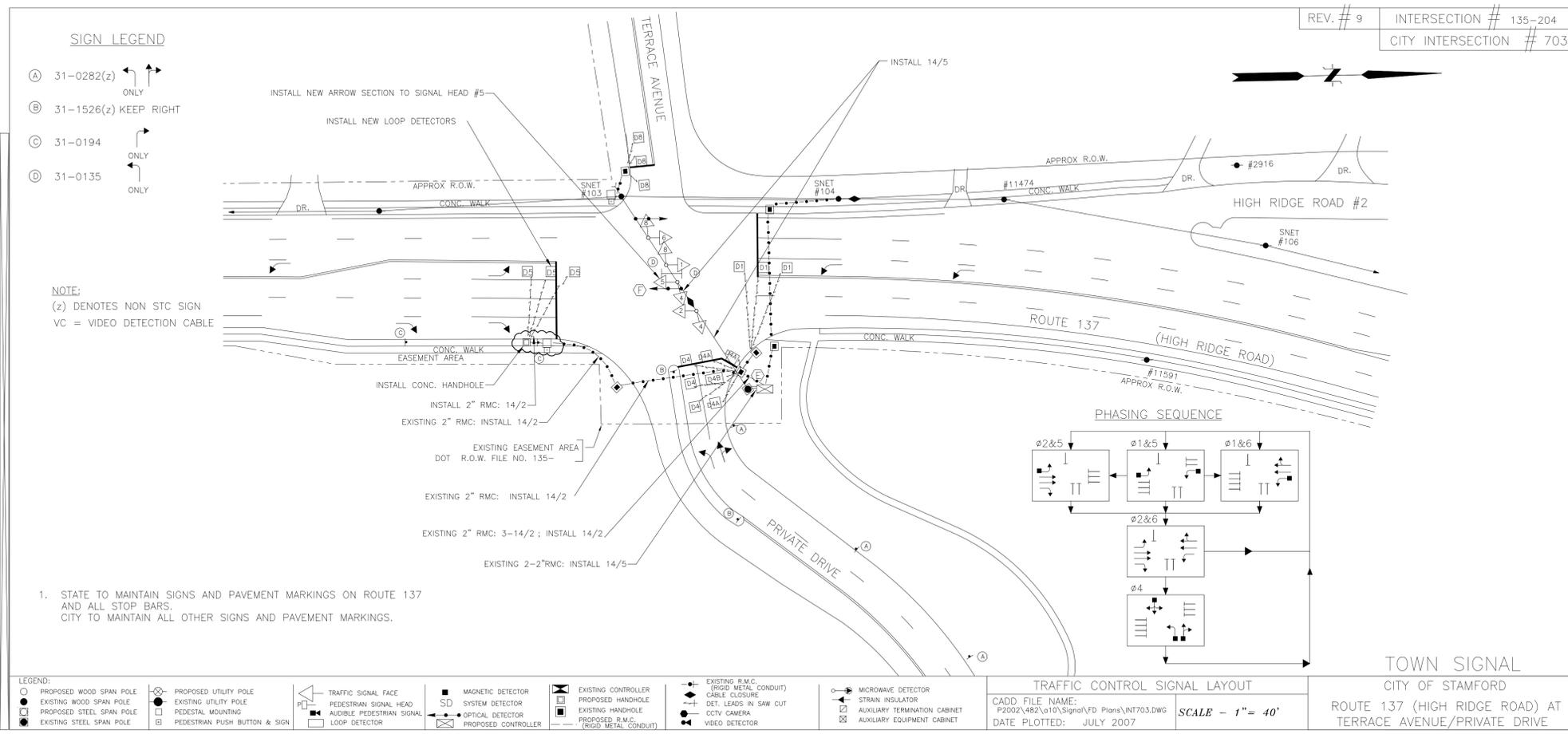
CONSTRUCTION NOTES
(REVISION #6)

- ALL TRAFFIC SIGNAL EQUIPMENT IS EXISTING EXCEPT AS NOTED.
- SIGNAL PLAN WAS DIGITIZED FROM EXISTING TRAFFIC SIGNAL PLAN. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING CONDITIONS.
- THE CONTRACTOR SHALL STAKE ALL RIGHT OF WAY PRIOR TO EXCAVATION.
- ALL WORK, EQUIPMENT AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD DETAILS AND SPECIFICATIONS OF THE CITY OF STAMFORD AND ConnDOT.
- THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF STAMFORD AT (203) 977-5809 TO HAVE THE WATER CONTROL BUREAU LOCATE SANITARY AND STORM SEWERS AND LATERALS.
- ALL SALVAGEABLE TRAFFIC SIGNAL EQUIPMENT SHALL BE RETURNED TO THE CITY OF STAMFORD, TRAFFIC SIGNAL MAINTENANCE FACILITY ON CRESCENT STREET. CONTACT MR. JOE ANDREWS AT (203) 977-4704 THREE WEEKS PRIOR TO CONSTRUCTION TO COORDINATE.
- SIGNAL APPURTENANCES WHEN IN OR ADJACENT TO SIDEWALKS SHALL BE FIELD LOCATED TO PROVIDE A FREE PATH OF NOT LESS THAN THREE FEET.
- INSTALL HANDHOLES APPROXIMATELY ONE FOOT BEHIND CURB OR EDGE OF ROAD UNLESS NOTED OTHERWISE. ALL HANDHOLES TO BE TYPE II, UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL REPLACE ENTIRE SECTION OF SIDEWALK AND/OR CURBING DAMAGED DUE TO INSTALLATION AND/OR REMOVAL OF CONDUITS, HANDHOLES, OR FOUNDATIONS
- INSTALL LOOP D5 DETECTORS IN THE LEFT TURN LANE AT THE NB APPROACH. LOOPS TO BE INSTALLED IN CENTER OF LANE AND 8' APART. INSTALL NEW HANDHOLE, RMC AND 14/2 CABLE AS SHOWN.
- THE CONTRACTOR SHALL MAINTAIN EXISTING SERVICE AND COMMUNICATIONS TO THE CONTROLLER. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING BOTH THE SERVICE AND COMMUNICATION CABLING.
- INSTALL EIGHT PHASE TRAFFIC SIGNAL CONTROLLER WITH INTERNAL PRE-EMPTION CAPABILITIES IN NEW TYPE C CABINET WITH DOOR OPENING STREET SIDE (TOWARDS HIGH RIDGE ROAD) ON EXISTING CONTROLLER FOUNDATION. INSTALL CONCRETE PAD ON DOOR SIDE OF CABINET PER TYPICAL DETAIL SHEET.
- CONTRACTOR TO ADD 12" BI-COLOR YELLOW/GREEN LED LEFT TURN ARROW SEGMENT TO EXISTING 3-SECTION NO.5 SIGNAL HEAD. CONTRACTOR TO ENSURE BASE OF SIGNAL HEAD IS A MINIMUM OF 17 FEET ABOVE THE ROADWAY.

TOWN SIGNAL
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUR. OF ENGINEERING & HWY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING
TRAFFIC CONTROL SIGNAL

CITY OF STAMFORD
ROUTE 137 (HIGH RIDGE ROAD) AT
TERRACE AVENUE/PRIVATE DRIVE

REV #	DATE	DESCRIPTION
5		TRAFFIC ELECTRICAL
9	JULY 2007	



CONTRACTOR AS-BUILT PLAN-3/29/13

FINAL DESIGN
RELEASED FOR CONSTRUCTION

CONNECTICUT
DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: PHASE F TRAFFIC SIGNAL SYSTEM HARDWARE UPGRADE	TOWN: STAMFORD	PROJECT NO.:	135-293
DRAWING TITLE: TRAFFIC SIGNAL PLAN SHEET	DRAWING NO.:	TCS-24	SHEET NO.:
REVISIONS		FUS & O'NEILL INC. Consulting Engineers 140 HARTFORD ROAD, SUITE 200, STAMFORD, CT 06404 (860) 442-2440	

REV # 9
CITY INTERSECTION # 703
INTERSECTION # 135-204

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

High Ridge Road at North Site Drive
 Stamford, Connecticut

File Name : 22592
 Site Code : 22592
 Start Date : 2/10/2022
 Page No : 1

Groups Printed- Lights - Trucks - Cars

Start Time	High Ridge Road From North					North Site Dr From East					High Ridge Road From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	213	0	0	213	3	0	0	0	3	3	173	0	0	176	0	0	0	0	0	392
07:15 AM	0	281	1	0	282	1	0	0	0	1	1	198	0	0	199	0	0	0	0	0	482
07:30 AM	0	262	0	0	262	1	0	0	1	2	2	235	0	0	237	0	0	0	0	0	501
07:45 AM	0	279	0	0	279	0	0	0	0	0	3	207	0	0	210	0	0	0	0	0	489
Total	0	1035	1	0	1036	5	0	0	1	6	9	813	0	0	822	0	0	0	0	0	1864
08:00 AM	0	316	0	0	316	2	0	1	0	3	3	186	0	0	189	0	0	0	0	0	508
08:15 AM	0	390	2	0	392	2	0	2	0	4	0	164	0	0	164	0	0	0	0	0	560
08:30 AM	0	258	1	0	259	0	0	2	0	2	3	176	0	0	179	0	0	0	0	0	440
08:45 AM	0	263	0	0	263	0	0	0	0	0	2	170	0	0	172	0	0	0	0	0	435
Total	0	1227	3	0	1230	4	0	5	0	9	8	696	0	0	704	0	0	0	0	0	1943
Grand Total	0	2262	4	0	2266	9	0	5	1	15	17	1509	0	0	1526	0	0	0	0	0	3807
Apprch %	0	99.8	0.2	0		60	0	33.3	6.7		1.1	98.9	0	0		0	0	0	0		
Total %	0	59.4	0.1	0	59.5	0.2	0	0.1	0	0.4	0.4	39.6	0	0	40.1	0	0	0	0	0	
Lights	0	2178										1450									
% Lights	0	96.3	100	0	96.3	88.9	0	100	100	93.3	100	96.1	0	0	96.1	0	0	0	0	0	96.2
Trucks	0	10	0	0	10	1	0	0	0	1	0	19	0	0	19	0	0	0	0	0	30
% Trucks	0	0.4	0	0	0.4	11.1	0	0	0	6.7	0	1.3	0	0	1.2	0	0	0	0	0	0.8
Cars	0	74	0	0	74	0	0	0	0	0	0	40	0	0	40	0	0	0	0	0	114
% Cars	0	3.3	0	0	3.3	0	0	0	0	0	0	2.7	0	0	2.6	0	0	0	0	0	3

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

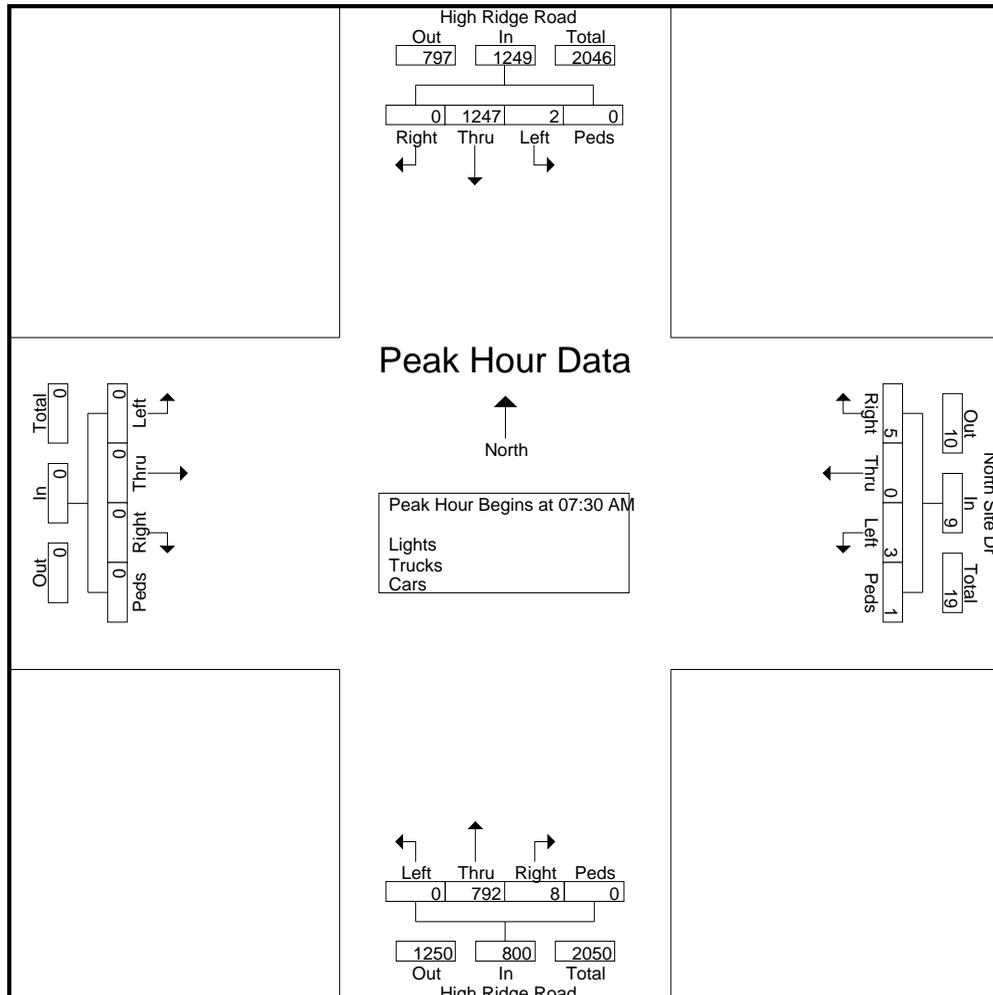
File Name : 22592
Site Code : 22592
Start Date : 2/10/2022
Page No : 2

Start Time	High Ridge Road From North					North Site Dr From East					High Ridge Road From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	0	262	0	0	262	1	0	0	1	2	2	235	0	0	237	0	0	0	0	0	501
07:45 AM	0	279	0	0	279	0	0	0	0	0	3	207	0	0	210	0	0	0	0	0	489
08:00 AM	0	316	0	0	316	2	0	1	0	3	3	186	0	0	189	0	0	0	0	0	508
08:15 AM	0	390	2	0	392	2	0	2	0	4	0	164	0	0	164	0	0	0	0	0	560
Total Volume	0	1247	2	0	1249	5	0	3	1	9	8	792	0	0	800	0	0	0	0	0	2058
% App. Total	0	99.8	0.2	0		55.6	0	33.3	11.1		1	99	0	0		0	0	0	0		
PHF	.000	.799	.250	.000	.797	.625	.000	.375	.250	.563	.667	.843	.000	.000	.844	.000	.000	.000	.000	.000	.919



Connecticut Counts LLC

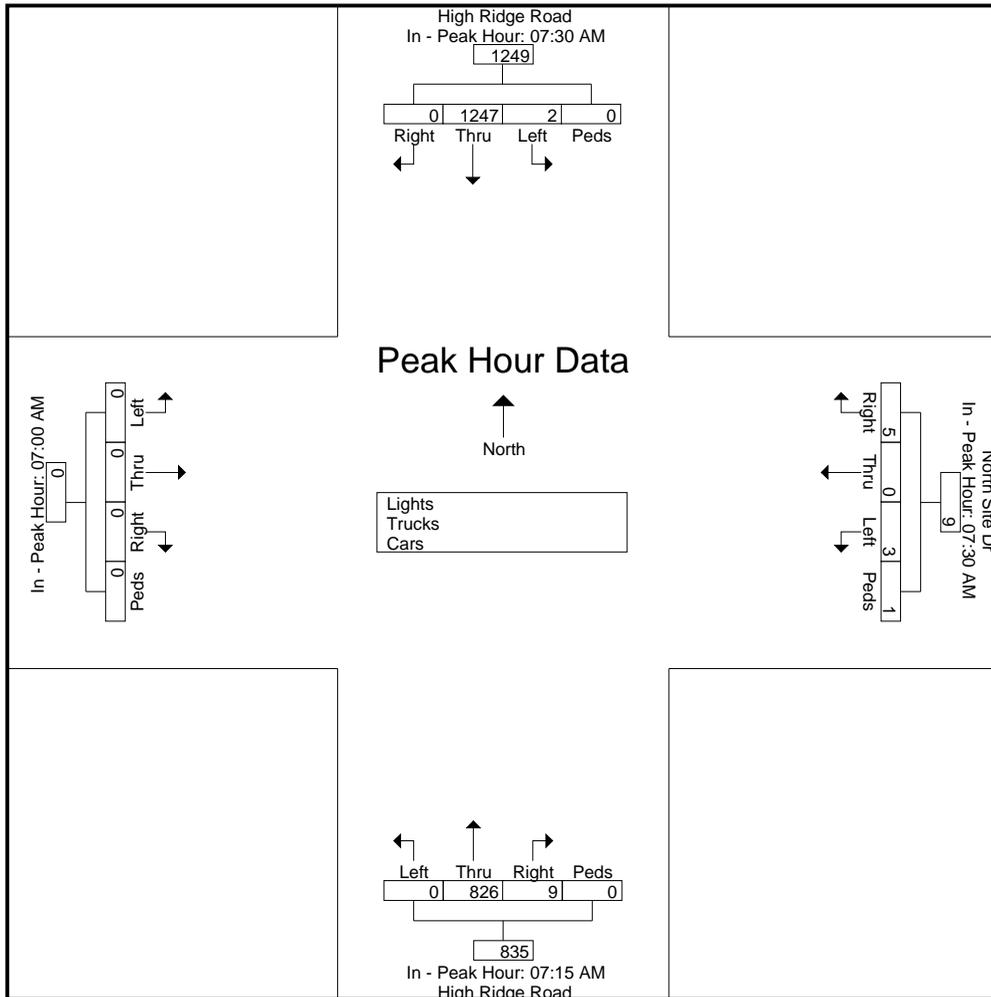
Kensington, Connecticut 06037
(860) 828-1693

File Name : 22592
 Site Code : 22592
 Start Date : 2/10/2022
 Page No : 3

Start Time	High Ridge Road From North					North Site Dr From East					High Ridge Road From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM					07:30 AM					07:15 AM					07:00 AM				
+0 mins.	0	262	0	0	262	1	0	0	1	2	1	198	0	0	199	0	0	0	0	0
+15 mins.	0	279	0	0	279	0	0	0	0	0	2	235	0	0	237	0	0	0	0	0
+30 mins.	0	316	0	0	316	2	0	1	0	3	3	207	0	0	210	0	0	0	0	0
+45 mins.	0	390	2	0	392	2	0	2	0	4	3	186	0	0	189	0	0	0	0	0
Total Volume	0	1247	2	0	1249	5	0	3	1	9	9	826	0	0	835	0	0	0	0	0
% App. Total	0	99.8	0.2	0		55.6	0	33.3	11.1		1.1	98.9	0	0		0	0	0	0	
PHF	.000	.799	.250	.000	.797	.625	.000	.375	.250	.563	.750	.879	.000	.000	.881	.000	.000	.000	.000	.000



Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

High Ridge Rd at North Site Drive
 Stamford, Connecticut

File Name : 22593
 Site Code : 22593
 Start Date : 2/9/2022
 Page No : 1

Groups Printed- Lights - Trucks - Buses

Start Time	High Ridge Rd From North					North Site Drive From East					High Ridge Rd From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	204	0	0	204	3	0	0	2	5	0	238	0	0	238	0	0	0	0	0	447
04:15 PM	0	180	0	0	180	0	0	0	0	0	0	268	0	0	268	0	0	0	0	0	448
04:30 PM	0	195	0	0	195	1	0	0	2	3	0	268	0	0	268	0	0	0	0	0	466
04:45 PM	0	161	1	0	162	1	0	0	0	1	0	231	0	0	231	0	0	0	0	0	394
Total	0	740	1	0	741	5	0	0	4	9	0	1005	0	0	1005	0	0	0	0	0	1755
05:00 PM	0	206	0	0	206	3	0	1	0	4	0	266	0	0	266	0	0	0	0	0	476
05:15 PM	0	220	0	0	220	3	0	1	0	4	0	324	0	0	324	0	0	0	0	0	548
05:30 PM	0	201	0	0	201	2	0	1	0	3	0	283	0	0	283	0	0	0	0	0	487
05:45 PM	0	223	0	0	223	4	0	0	1	5	0	244	0	0	244	0	0	0	0	0	472
Total	0	850	0	0	850	12	0	3	1	16	0	1117	0	0	1117	0	0	0	0	0	1983
Grand Total	0	1590	1	0	1591	17	0	3	5	25	0	2122	0	0	2122	0	0	0	0	0	3738
Apprch %	0	99.9	0.1	0		68	0	12	20		0	100	0	0		0	0	0	0		
Total %	0	42.5	0	0	42.6	0.5	0	0.1	0.1	0.7	0	56.8	0	0	56.8	0	0	0	0	0	
Lights	0	1568										2110									
% Lights	0	98.6	100	0	98.6	100	0	100	100	100	0	99.4	0	0	99.4	0	0	0	0	0	99.1
Trucks	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Trucks	0	0.2	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Buses	0	19	0	0	19	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	31
% Buses	0	1.2	0	0	1.2	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0.8

Connecticut Counts LLC

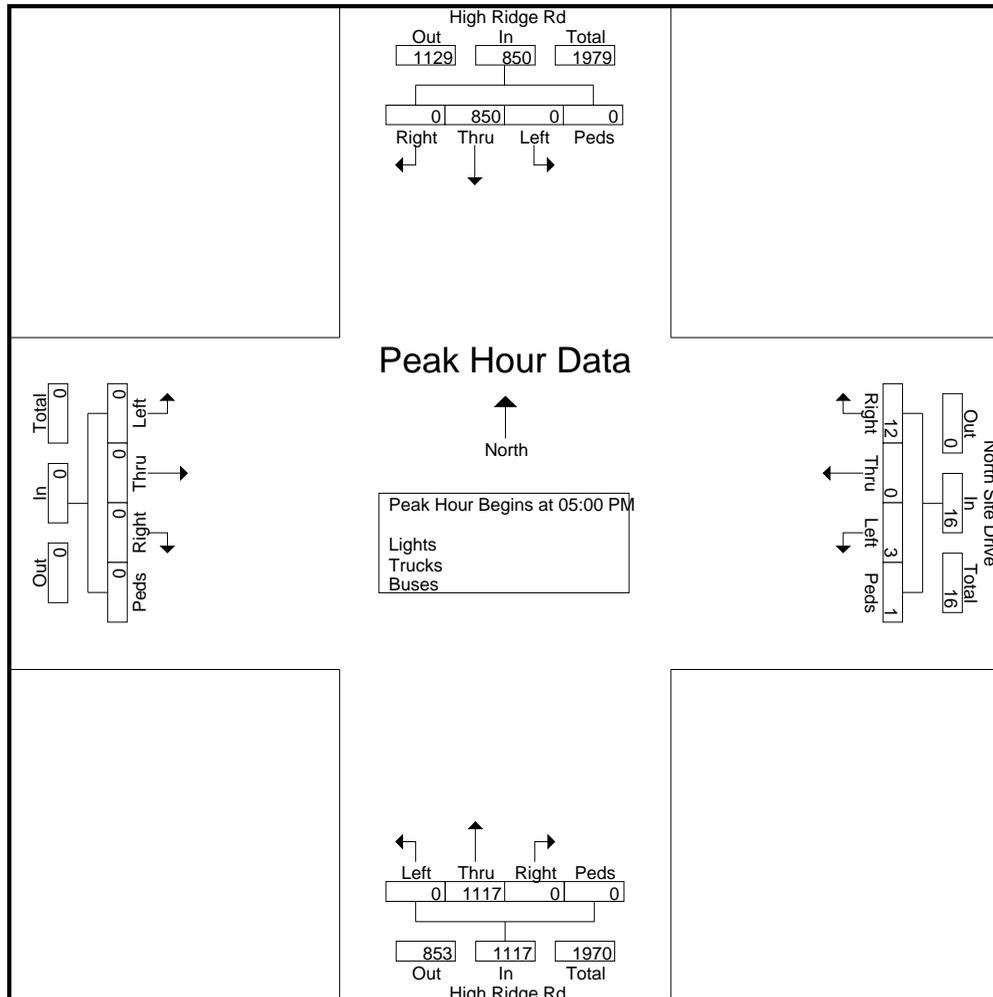
Kensington, Connecticut 06037
(860) 828-1693

File Name : 22593
Site Code : 22593
Start Date : 2/9/2022
Page No : 2

Start Time	High Ridge Rd From North					North Site Drive From East					High Ridge Rd From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 05:00 PM

05:00 PM	0	206	0	0	206	3	0	1	0	4	0	266	0	0	266	0	0	0	0	0	476
05:15 PM	0	220	0	0	220	3	0	1	0	4	0	324	0	0	324	0	0	0	0	0	548
05:30 PM	0	201	0	0	201	2	0	1	0	3	0	283	0	0	283	0	0	0	0	0	487
05:45 PM	0	223	0	0	223	4	0	0	1	5	0	244	0	0	244	0	0	0	0	0	472
Total Volume	0	850	0	0	850	12	0	3	1	16	0	1117	0	0	1117	0	0	0	0	0	1983
% App. Total	0	100	0	0		75	0	18.8	6.2		0	100	0	0		0	0	0	0		
PHF	.000	.953	.000	.000	.953	.750	.000	.750	.250	.800	.000	.862	.000	.000	.862	.000	.000	.000	.000	.000	.905



Connecticut Counts LLC

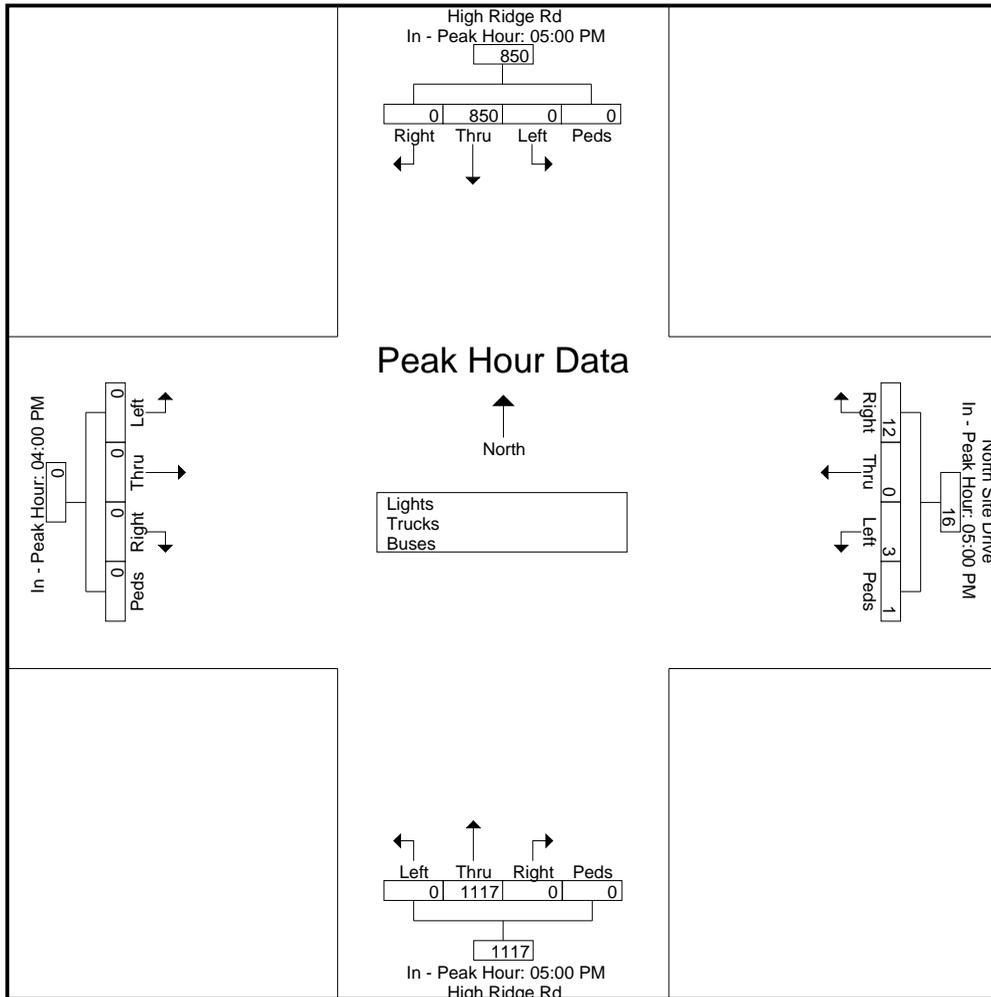
Kensington, Connecticut 06037
(860) 828-1693

File Name : 22593
Site Code : 22593
Start Date : 2/9/2022
Page No : 3

Start Time	High Ridge Rd From North					North Site Drive From East					High Ridge Rd From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM					05:00 PM					05:00 PM					04:00 PM				
+0 mins.	0	206	0	0	206	3	0	1	0	4	0	266	0	0	266	0	0	0	0	0
+15 mins.	0	220	0	0	220	3	0	1	0	4	0	324	0	0	324	0	0	0	0	0
+30 mins.	0	201	0	0	201	2	0	1	0	3	0	283	0	0	283	0	0	0	0	0
+45 mins.	0	223	0	0	223	4	0	0	1	5	0	244	0	0	244	0	0	0	0	0
Total Volume	0	850	0	0	850	12	0	3	1	16	0	1117	0	0	1117	0	0	0	0	0
% App. Total	0	100	0	0		75	0	18.8	6.2		0	100	0	0		0	0	0	0	
PHF	.000	.953	.000	.000	.953	.750	.000	.750	.250	.800	.000	.862	.000	.000	.862	.000	.000	.000	.000	.000



Jianhong Wang

From: Hiller, Todd <Todd.Hiller@ct.gov>
Sent: Tuesday, February 15, 2022 1:19 PM
To: Jianhong Wang
Cc: Sojka, Gary J; Patel, Dhruval H.
Subject: RE: Traffic Volumes Review Request: Stamford

[Caution - External Sender]

Hi Jianhong,

The documents you sent over are acceptable. The proposed annual growth rate of 0.7% is also acceptable for your projections. Feel free to reach out if you have any other questions.

Have a great day,

Todd



Currently Teleworking-Please contact me via email or Microsoft Teams

From: Sojka, Gary J <Gary.Sojka@ct.gov>
Sent: Monday, February 14, 2022 11:45 AM
To: Hiller, Todd <Todd.Hiller@ct.gov>; Patel, Dhruval H. <Dhruval.Patel@ct.gov>
Subject: FW: Traffic Volumes Review Request: Stamford

Gary J. Sojka

*Transportation Supervising Planner
Connecticut Department of Transportation
Bureau of Policy and Planning
2800 Berlin Turnpike
Newington, CT 06111
Email: gary.sojka@ct.gov
telephone: (860) 594-2025*

From: Jianhong Wang <JWang@TigheBond.com>
Sent: Friday, February 11, 2022 12:08 PM
To: Sojka, Gary J <Gary.Sojka@ct.gov>
Cc: Jacobson, Richard C <Richard.Jacobson@ct.gov>; Patel, Dhruval H. <Dhruval.Patel@ct.gov>
Subject: Traffic Volumes Review Request: Stamford

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Gary,

As referenced in the email chain below, Tighe & Bond is working on a project on State Route 137 at 225 High Ridge Road (225 HRR) in Stamford. The 225 HRR site is currently certified by OSTA under Certificates #255 and 255A and Administrative Decision #604 and 697 for 200,000 square feet of general office space. The application proposes to replace 14,630 square feet of general office with a 180-student Goddard School in the southwest corner of the existing building. Due to the proposed change in land use, an OSTA AD approval will be required. The site driveways will remain at the existing locations including a right-in/right-out only driveway to the north and a signalized driveway opposite to Terrace Avenue to the south. No changes to Route 137 are proposed.

In addition, as you are aware, a senior living facility was recently constructed at 201 High Ridge Road that shares the signalized driveway opposite to Terrace Avenue with the 225 High Ridge Road site. A Traffic Access and Impact Study for the senior living facility at 201 High Ridge Road was conducted by FP Clark and approved by CTDOT/OSTA and the City of Stamford.

Based on the project information, we request a review of the following documents attached to facilitate the OSTA AD submission and traffic study of the area:

- A. Baseline Volumes: Due to the impact of the pandemic, we are proposing to utilize the previously approved 2021 Build Conditions Traffic Volumes from the 201 HRR study to establish the Baseline Conditions Traffic Volumes at the shared driveway intersection with High Ridge Road and Terrace Avenue to the south. In addition, Tighe & Bond conducted a TMC of the right-in/right-out only driveway to the north this past week. We adjusted the through volumes on HRR at the northern site driveway to balance with the previously approved traffic volumes on HRR. The previously approved 2021 Build Conditions Traffic Volumes, the recently collected TMC at the northern site driveway intersection, and the Baseline Conditions Traffic Volume Figures are attached for your review.
- B. Background Volumes: We will utilize 0.7% annual growth rate based on recent direction from your office. Given that the 2021 Build Conditions Traffic Volume from the 201 High Ridge Rd TIA included the site-generated traffic of the development, and no other recently approved/pending developments would add significant traffic to the area, the annual traffic growth rate (0.7%) is considered sufficient to project the baseline traffic volumes to the 2023 Project Buildout Year.
- C. 225 High Ridge Road Site Re-occupancy Adjustments: The 225 HRR site is currently 75% leased. We adjusted the traffic volumes at the northern site driveway to account for the unleased space (factor of 1.33). The southern site driveway volumes included an adjustment for occupancy as part of the 201 HRR study and were therefore not adjusted.
- D. Trip Generation, Net New Trips, Combined Volumes: Site generated traffic estimates for the existing office building and proposed Goddard School are provided in the attached table. The trip distribution is consistent with the regional percentages approved for the 201 High Ridge Road Study as shown in the attached figure. The distributed net site traffic volumes and 2023 Combined traffic volumes are also provided for review.

Please let us know if you have any questions and have a nice weekend!

Jianhong

Jianhong Wang, PE, PTOE, RSP1

Senior Engineer



o. 203.712.1113 | m. 949.241.6737

1000 Bridgeport Avenue, 3rd Floor, Shelton, CT 06484
w: tighebond.com | halvorsondesign.com



From: Sojka, Gary J <Gary.Sojka@ct.gov>
Sent: Wednesday, February 9, 2022 7:45 AM
To: Jianhong Wang <JWang@TigheBond.com>; Jacobson, Richard C <Richard.Jacobson@ct.gov>
Cc: Patel, Dhruval H. <Dhruval.Patel@ct.gov>
Subject: RE: Request for Information - Growth Rate and Planned/Approved Developments in Stamford

[Caution - External Sender]

Jianhong,

Please see attached. The report stated that the development would be open in 2021. I would check with the city on the status. It is a minor generator regardless so we would not require you to add it for a background condition.

Gary J. Sojka

*Transportation Supervising Planner
Connecticut Department of Transportation
Bureau of Policy and Planning
2800 Berlin Turnpike
Newington, CT 06111
Email: gary.sojka@ct.gov
telephone: (860) 594-2025*

From: Jianhong Wang <JWang@TigheBond.com>
Sent: Tuesday, February 08, 2022 5:10 PM
To: Jacobson, Richard C <Richard.Jacobson@ct.gov>
Cc: Sojka, Gary J <Gary.Sojka@ct.gov>; Patel, Dhruval H. <Dhruval.Patel@ct.gov>
Subject: RE: Request for Information - Growth Rate and Planned/Approved Developments in Stamford

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Hi Rick,

It came to my attention that there is another approved development located at 210 Long Ridge Road for assisted living (OSTA AD 690), which is close to our site. Do you happen to know when the 210 Long Ridge Road redevelopment will be built (our project buildout year is early 2023). Based on review of the latest aerial imagery on Nearmap, it doesn't seem there is any construction going on with the 210 Long Ridge Road building yet.

Thanks in advance for your inputs!

Jianhong Wang, PE, PTOE, RSP1

Senior Engineer



o. 203.712.1113 | m. 949.241.6737

1000 Bridgeport Avenue, 3rd Floor, Shelton, CT 06484

w: tighebond.com | halvorsondesign.com



From: Jacobson, Richard C <Richard.Jacobson@ct.gov>

Sent: Thursday, February 3, 2022 8:51 AM

To: Jianhong Wang <JWang@TigheBond.com>

Cc: Sojka, Gary J <Gary.Sojka@ct.gov>; Patel, Dhruval H. <Dhruval.Patel@ct.gov>

Subject: Re: Request for Information - Growth Rate and Planned/Approved Developments in Stamford

[Caution - External Sender]

Jianhong,

Hi, An annual growth rate of 0.7% per year can be used for the next five years. Attached is a development we approved in 2019 that you may have to consider.

Rick Jacobson

Transportation Planner II

Bureau of Policy-and Planning

Connecticut Department of Transportation

richard.jacobson@ct.gov

(860) 594-2035

From: Jianhong Wang <JWang@TigheBond.com>

Sent: Tuesday, February 01, 2022 3:09 PM

To: Sojka, Gary J <Gary.Sojka@ct.gov>

Subject: Request for Information - Growth Rate and Planned/Approved Developments in Stamford

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Hi Gary,

Tighe & Bond is working on the traffic study for a development in the vicinity of High Ridge Road/Terrace Avenue intersection in Stamford. The traffic counts will be collected next week and the project buildout year will be 2023. As part of our data collection for the study, we are looking to review the growth rate and planned/recently approved developments in the area that we should include in our future traffic conditions. Any information on the scope, timing, and traffic volumes of these developments that you could provide will be appreciated.

Thank you in advance for your assistance.

Jianhong

Jianhong Wang, PE, PTOE, RSP1

Senior Engineer

Tighe&Bond

o. 203.712.1113 | m. 949.241.6737

1000 Bridgeport Avenue, 3rd Floor, Shelton, CT 06484

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CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).¹ The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥ 1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

¹*Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥ 1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	Signalized Intersection Criteria	Unsignalized Intersection Criteria	V/C Ratio >1.00 ^a
	Average Control Delay (Seconds per Vehicle)	Average Control Delay (Seconds per Vehicle)	
A	≤ 10	≤ 10	F
B	>10 and ≤ 20	>10 and ≤ 15	F
C	>20 and ≤ 35	>15 and ≤ 25	F
D	>35 and ≤ 55	>25 and ≤ 35	F
E	>55 and ≤ 80	>35 and ≤ 50	F
F	>80	>50	F

Note: ^aFor approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Background Conditions Weekday AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	44	23	14	4	9	40	952	68	95	1521	32
Future Volume (vph)	21	44	23	14	4	9	40	952	68	95	1521	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)		1%			-1%			0%			0%	
Storage Length (ft)	0		0	300		0	100		150	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			50			50			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.965			0.893				0.850		0.997	
Flt Protected		0.988		0.950			0.950			0.950		
Satd. Flow (prot)	0	1767	0	1778	1672	0	1711	3421	1531	1711	3411	0
Flt Permitted		0.918		0.553			0.108			0.246		
Satd. Flow (perm)	0	1642	0	1035	1672	0	194	3421	1531	443	3411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			10				59			3
Link Speed (mph)		25			25			40				40
Link Distance (ft)		567			503			594				749
Travel Time (s)		15.5			13.7			10.1				12.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	48	25	15	4	10	43	1035	74	103	1653	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	96	0	15	14	0	43	1035	74	103	1688	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2		2	6		
Detector Phase	4	4		4	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	15.0	15.0	4.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	20.0	20.0	8.0	20.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	72.0	72.0	29.0	72.0	
Total Split (%)	19.2%	19.2%		19.2%	19.2%		23.2%	57.6%	57.6%	23.2%	57.6%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		4.0	5.0	5.0	4.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	
Act Effct Green (s)		11.8		11.8	11.8		99.4	93.1	93.1	101.8	95.7	
Actuated g/C Ratio		0.09		0.09	0.09		0.80	0.74	0.74	0.81	0.77	
v/c Ratio		0.58		0.15	0.08		0.20	0.41	0.06	0.24	0.65	
Control Delay		60.8		53.5	30.1		4.5	6.8	2.0	3.6	9.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		60.8		53.5	30.1		4.5	6.8	2.0	3.6	9.2	
LOS		E		D	C		A	A	A	A	A	
Approach Delay		60.8			42.2			6.4			8.9	
Approach LOS		E			D			A			A	

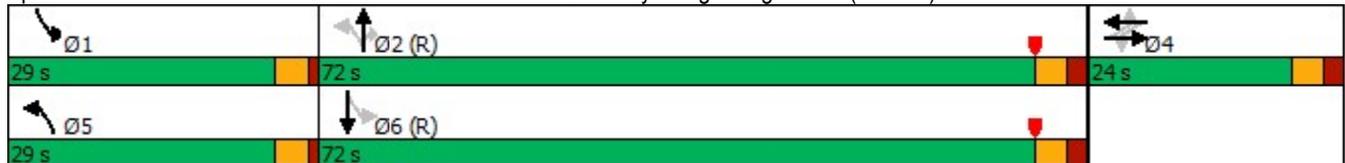
101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Background Conditions Weekday AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		66		11	3		5	140	3	11	304	
Queue Length 95th (ft)		119		33	23		13	214	18	27	451	
Internal Link Dist (ft)		487			423			514			669	
Turn Bay Length (ft)				300			100		150	250		
Base Capacity (vph)		259		157	262		465	2548	1155	622	2612	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.37		0.10	0.05		0.09	0.41	0.06	0.17	0.65	

Intersection Summary

Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	125
Offset:	55 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	9.9
Intersection LOS:	A
Intersection Capacity Utilization	69.6%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)



201: High Ridge Road (SR 137) & Northern Site Driveway
 2023 Background Conditions Weekday AM Peak

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Vol, veh/h	0	11	968	11	0	1637
Future Vol, veh/h	0	11	968	11	0	1637
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	1052	12	0	1779

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	532	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.84	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	499	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	499	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	499
HCM Lane V/C Ratio	-	-	0.024
HCM Control Delay (s)	-	-	12.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.1

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Background Conditions Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	4	47	80	39	46	24	1467	16	11	983	26
Future Volume (vph)	32	4	47	80	39	46	24	1467	16	11	983	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)		1%			-1%			0%				0%
Storage Length (ft)	0		0	300		0	100		150	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			50			50			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.924			0.919				0.850		0.996	
Flt Protected		0.981		0.950			0.950			0.950		
Satd. Flow (prot)	0	1680	0	1778	1720	0	1711	3421	1531	1711	3408	0
Flt Permitted		0.812		0.647			0.219			0.118		
Satd. Flow (perm)	0	1391	0	1211	1720	0	394	3421	1531	212	3408	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49			44				57			5
Link Speed (mph)		25			25			40				40
Link Distance (ft)		567			503			594				749
Travel Time (s)		15.5			13.7			10.1				12.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	36	4	52	89	43	51	27	1630	18	12	1092	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	0	89	94	0	27	1630	18	12	1121	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2		2	6		
Detector Phase	4	4		4	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	15.0	15.0	4.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	20.0	20.0	8.0	20.0	
Total Split (s)	24.0	24.0		24.0	24.0		8.0	83.0	83.0	8.0	83.0	
Total Split (%)	20.9%	20.9%		20.9%	20.9%		7.0%	72.2%	72.2%	7.0%	72.2%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		4.0	5.0	5.0	4.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	
Act Effct Green (s)		13.4		13.4	13.4		91.9	89.7	89.7	90.0	85.9	
Actuated g/C Ratio		0.12		0.12	0.12		0.80	0.78	0.78	0.78	0.75	
v/c Ratio		0.45		0.63	0.39		0.07	0.61	0.01	0.05	0.44	
Control Delay		30.3		66.9	30.3		3.4	7.7	0.0	3.5	7.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		30.3		66.9	30.3		3.4	7.7	0.0	3.5	7.2	
LOS		C		E	C		A	A	A	A	A	
Approach Delay		30.3			48.1			7.6			7.1	
Approach LOS		C			D			A			A	

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Background Conditions Weekday PM Peak

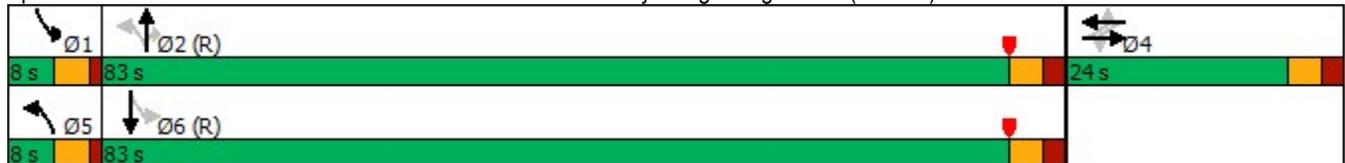


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		29		64	34		3	199	0	1	161	
Queue Length 95th (ft)		77		113	81		11	455	0	6	249	
Internal Link Dist (ft)		487			423			514			669	
Turn Bay Length (ft)				300			100		150	250		
Base Capacity (vph)		271		201	321		373	2678	1210	229	2561	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.34		0.44	0.29		0.07	0.61	0.01	0.05	0.44	

Intersection Summary

Area Type:	Other
Cycle Length:	115
Actuated Cycle Length:	115
Offset:	82 (71%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.63
Intersection Signal Delay:	10.5
Intersection LOS:	B
Intersection Capacity Utilization	60.4%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)



201: High Ridge Road (SR 137) & Northern Site Driveway
 2023 Background Conditions Weekday PM Peak

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Vol, veh/h	0	20	1535	0	0	1013
Future Vol, veh/h	0	20	1535	0	0	1013
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	1668	0	0	1101

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	834	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.84	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	319	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	319	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

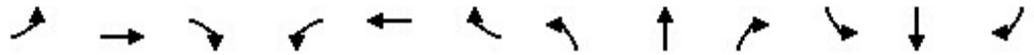
Approach	WB	NB	SB
HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	319
HCM Lane V/C Ratio	-	-	0.068
HCM Control Delay (s)	-	-	17.1
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.2

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Combined Conditions Weekday AM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	55	23	39	17	15	40	952	90	117	1521	32
Future Volume (vph)	21	55	23	39	17	15	40	952	90	117	1521	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)		1%			-1%			0%			0%	
Storage Length (ft)	0		0	300		0	100		150	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			50			50			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.969			0.929				0.850		0.997	
Flt Protected		0.989		0.950			0.950			0.950		
Satd. Flow (prot)	0	1776	0	1778	1739	0	1711	3421	1531	1711	3411	0
Flt Permitted		0.923		0.512			0.107			0.243		
Satd. Flow (perm)	0	1658	0	958	1739	0	193	3421	1531	438	3411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			16				78			3
Link Speed (mph)		25			25			40				40
Link Distance (ft)		567			503			594				749
Travel Time (s)		15.5			13.7			10.1				12.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	60	25	42	18	16	43	1035	98	127	1653	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	42	34	0	43	1035	98	127	1688	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2		2	6		
Detector Phase	4	4		4	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	15.0	15.0	4.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	20.0	20.0	8.0	20.0	
Total Split (s)	24.0	24.0		24.0	24.0		29.0	72.0	72.0	29.0	72.0	
Total Split (%)	19.2%	19.2%		19.2%	19.2%		23.2%	57.6%	57.6%	23.2%	57.6%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		4.0	5.0	5.0	4.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	
Act Effct Green (s)		12.7		12.7	12.7		98.0	91.7	91.7	101.3	94.7	
Actuated g/C Ratio		0.10		0.10	0.10		0.78	0.73	0.73	0.81	0.76	
v/c Ratio		0.61		0.43	0.18		0.20	0.41	0.09	0.30	0.65	
Control Delay		62.5		65.0	33.0		4.8	7.4	2.1	4.3	9.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		62.5		65.0	33.0		4.8	7.4	2.1	4.3	9.8	
LOS		E		E	C		A	A	A	A	A	
Approach Delay		62.5			50.7			6.9			9.4	
Approach LOS		E			D			A			A	

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Combined Conditions Weekday AM Peak

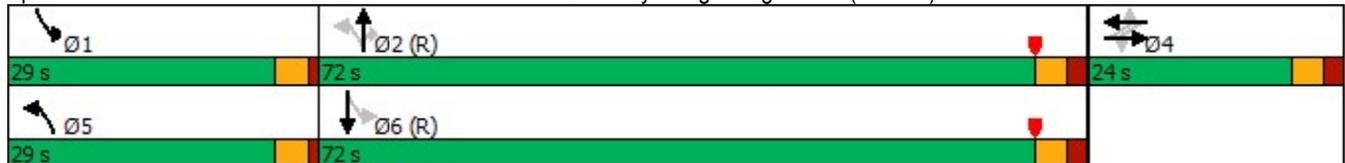


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		77		32	13		5	146	4	15	315	
Queue Length 95th (ft)		134		69	44		14	227	23	34	470	
Internal Link Dist (ft)		487			423			514			669	
Turn Bay Length (ft)				300			100		150	250		
Base Capacity (vph)		260		145	277		463	2510	1144	616	2585	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.42		0.29	0.12		0.09	0.41	0.09	0.21	0.65	

Intersection Summary

Area Type: Other
 Cycle Length: 125
 Actuated Cycle Length: 125
 Offset: 55 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 11.3
 Intersection LOS: B
 Intersection Capacity Utilization 70.2%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)



201: High Ridge Road (SR 137) & Northern Site Driveway
 2023 Combined Conditions Weekday AM Peak

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Vol, veh/h	0	30	974	11	0	1659
Future Vol, veh/h	0	30	974	11	0	1659
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	33	1059	12	0	1803

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	536	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.84	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	496	-	-	0
Stage 1	0	-	-	-	0
Stage 2	0	-	-	-	0
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	496	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	496
HCM Lane V/C Ratio	-	-	0.066
HCM Control Delay (s)	-	-	12.8
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.2

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Combined Conditions Weekday PM Peak

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	17	47	103	51	52	24	1467	41	36	983	26
Future Volume (vph)	32	17	47	103	51	52	24	1467	41	36	983	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Grade (%)		1%			-1%			0%				0%
Storage Length (ft)	0		0	300		0	100		150	250		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			50			50			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.934			0.924				0.850		0.996	
Flt Protected		0.983		0.950			0.950			0.950		
Satd. Flow (prot)	0	1702	0	1778	1730	0	1711	3421	1531	1711	3408	0
Flt Permitted		0.837		0.617			0.219			0.103		
Satd. Flow (perm)	0	1449	0	1155	1730	0	394	3421	1531	185	3408	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			38				57			5
Link Speed (mph)		25			25			40				40
Link Distance (ft)		567			503			594				749
Travel Time (s)		15.5			13.7			10.1				12.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	36	19	52	114	57	58	27	1630	46	40	1092	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	114	115	0	27	1630	46	40	1121	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4			2		2	6		
Detector Phase	4	4		4	4		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	15.0	15.0	4.0	15.0	
Minimum Split (s)	9.0	9.0		9.0	9.0		8.0	20.0	20.0	8.0	20.0	
Total Split (s)	24.0	24.0		24.0	24.0		8.0	83.0	83.0	8.0	83.0	
Total Split (%)	20.9%	20.9%		20.9%	20.9%		7.0%	72.2%	72.2%	7.0%	72.2%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	2.0	2.0	1.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		4.0	5.0	5.0	4.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	
Act Effct Green (s)		16.3		16.3	16.3		87.2	82.9	82.9	87.5	83.1	
Actuated g/C Ratio		0.14		0.14	0.14		0.76	0.72	0.72	0.76	0.72	
v/c Ratio		0.46		0.70	0.42		0.08	0.66	0.04	0.19	0.46	
Control Delay		35.2		68.1	32.9		4.3	12.1	1.7	5.9	8.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		35.2		68.1	32.9		4.3	12.1	1.7	5.9	8.6	
LOS		D		E	C		A	B	A	A	A	
Approach Delay		35.2			50.5			11.7			8.5	
Approach LOS		D			D			B			A	

101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)
 2023 Combined Conditions Weekday PM Peak

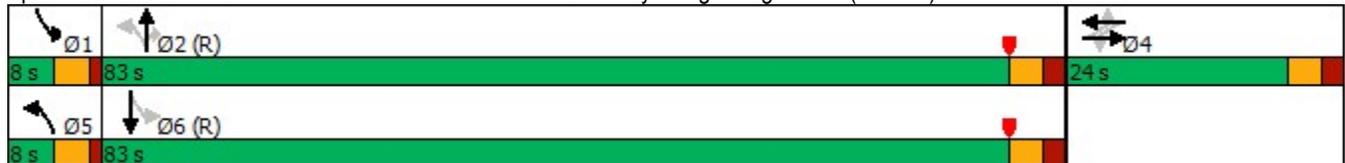


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		49		82	52		4	336	0	6	178	
Queue Length 95th (ft)		98		136	102		13	525	11	17	280	
Internal Link Dist (ft)		487			423			514			669	
Turn Bay Length (ft)				300			100		150	250		
Base Capacity (vph)		279		199	331		358	2516	1141	212	2509	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.38		0.57	0.35		0.08	0.65	0.04	0.19	0.45	

Intersection Summary

Area Type:	Other
Cycle Length:	115
Actuated Cycle Length:	115
Offset:	82 (71%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	14.1
Intersection LOS:	B
Intersection Capacity Utilization	61.3%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 101: Terrace Avenue/Southern Site Driveway & High Ridge Road (SR 137)



201: High Ridge Road (SR 137) & Northern Site Driveway
 2023 Combined Conditions Weekday PM Peak

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Vol, veh/h	0	37	1541	0	0	1038
Future Vol, veh/h	0	37	1541	0	0	1038
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	-1	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	40	1675	0	0	1128

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	838	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.84	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	317	-	-	0
Stage 1	0	-	-	-	0
Stage 2	0	-	-	-	0
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	317	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	-	317
HCM Lane V/C Ratio	-	-	0.127
HCM Control Delay (s)	-	-	18
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.4



Goddard Systems, Inc., 1016 West Ninth Avenue, King of Prussia, PA 19406 | 610-265-8510 • Fax: 610-265-8867 | GoddardSystems.com

To whom it may concern:

The Goddard Schools nationally see a peak volume from 7 - 9:30 AM for student drop off, and then it is spread across the times of 2 - 6 PM for student pickup. This is because the Goddard Schools do not have a “start” time for the day, rather it is when the parents find it convenient to drop off/pickup and align to their individual work schedules. Our drop off lasts approximately 5-10 minutes, and this is because each parent is required to walk their child inside and sign them in to the school. They then walk them to their individual classroom and then the parents can leave. Pickup is handled in much the same way; the parent picks their child up from their classroom and signs them out of the school. This process is much safer to practice as parents pickup children directly from the classroom vs. kids waiting in the parking lot or by the sidewalk.

Our teachers arrive in staggered schedules, depending on need within the school. The highest peak of teachers is from approximately 10am-4pm. The staff coming to support the school for lunch coverage will come between 11-3. Teachers will be required to use parking spaces further away from the building entrance, leaving those spaces for parent drop-off and pickup.

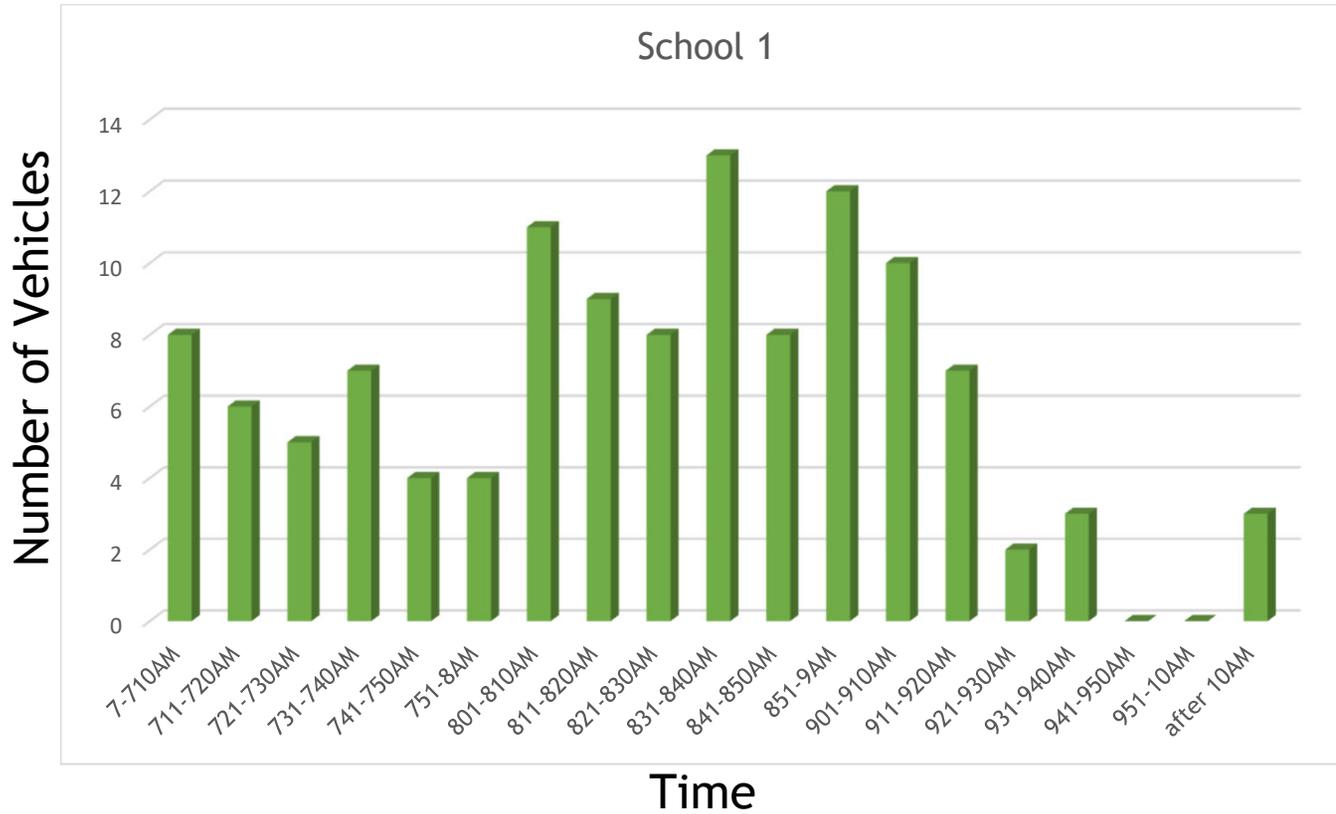
We also know that with our schools across the country, approximately 10-25% of our teachers will take public transportation or get dropped off by someone else.

If you have any further questions regarding our national parking averages or our required procedures for drop off and pickup, please feel free to contact me.

Sincerely,

Erin Witt
Site Development Manager

Estimated Drop off Schedule



The graph above shows an estimated dropoff for a school with a capacity of 186 students. Our system runs with an average of 5-10% of the students out sick/on vacation every day and roughly 10-15% are siblings that arrive in the same vehicle. The information above is projected for this location, however this is subject to change based on the timing of the actual families this location will serve.