

Appendix H

Traffic Impact Study

Traffic Impact Study

Proposed Meadows at Briarcliff Development

715 Sleepy Hollow Road
Town of Mount Pleasant, New York

PREPARED FOR:

Zappico Real Estate Development, LLC

17 Saw Mill River Road
Hawthorne, NY 10532

PREPARED BY:

Kimley-Horn Engineering and Landscape Architecture
of New York, P.C.

1 North Lexington Avenue, Suite 505
White Plains, NY 10601
914.368.9200



John Canning, P.E.
Associate

December 31, 2021
Project Number 112379000

Kimley»Horn

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY	1
1.1 Project Description	1
1.2 Study Methodology.....	1
1.3 Findings	2
1.4 Conclusions	3
2.0 INTRODUCTION.....	4
3.0 EXISTING CONDITIONS.....	6
3.1 Roadway Network	6
3.2 Description of Study Intersections	8
3.3 Pedestrian and Bicycle Activity and Routes	8
3.4 Parks and Trails.....	9
3.5 Public Transportation.....	10
3.6 School Bus Routes	11
3.7 Delivery Truck-related Traffic	12
3.8 Traffic Data Collection	12
4.0 FUTURE NO-BUILD CONDITIONS	16
4.1 Background Traffic Growth.....	16
5.0 PROJECT TRAFFIC	19
5.1 Trip Generation.....	19
5.2 Trip Distribution and Assignment.....	19
6.0 FUTURE BUILD TRAFFIC CONDITIONS	24
7.0 CAPACITY ANALYSIS.....	27
7.1 Intersection Capacity Analysis.....	27
8.0 POTENTIAL IMPACTS.....	30
8.1 Construction Activities	30
8.2 Sight Distances.....	30
8.3 Other Potential Impacts	31
9.0 CONCLUSIONS.....	33

APPENDIX

Synchro Capacity Analyses
FHWA Highway Capacity Calculation

FIGURES

Figure 1 – Project Location	5
Figure 2 – 2021 Existing AM Peak Hour Traffic Volumes.....	14
Figure 3 – 2021 Existing PM Peak Hour Traffic Volumes.....	15
Figure 4 – 2024 No-Build AM Peak Hour Traffic Volumes	17
Figure 5 – 2024 No-Build PM Peak Hour Traffic Volumes	18
Figure 6 – Project Trip Distribution	21
Figure 7 – Net Project-Generated AM Peak Hour Trips	22
Figure 8 – Net Project-Generated PM Peak Hour Trips	23
Figure 9 – 2024 Build AM Peak Hour Traffic Volumes	25
Figure 10 – 2024 Build PM Peak Hour Traffic Volumes	26

TABLES

Table 1 – Project-Generated Peak Hour Trips.....	19
Table 2 – LOS Criteria	27
Table 3 – Intersection Capacity Analysis Results.....	28

1.0 EXECUTIVE SUMMARY

This report has been prepared by Kimley-Horn Engineering and Landscape Architecture of New York, P.C. (“Kimley-Horn”) to document the potential traffic impacts associated with the proposed development of 29 additional single-family homes located on a 36.83-acre site at 715 Sleepy Hollow Road in the Town of Mount Pleasant, Westchester County, New York (the “Project” or the “Proposed Action”). This traffic impact study evaluates both existing and future traffic operating conditions surrounding the site both with and without the Project. The anticipated year of completion of this development is 2024.

This report also has been prepared as part of the Draft Environmental Impact Statement (DEIS) for the Proposed Action and is in accordance with the requirements of the New York State Environmental Quality Review Act (SEQRA) and the Scoping Document for the Proposed Action. The adopted Scope identifies the Study Area for this traffic analysis which consists of four (4) study intersections, and the required elements to be included in this report.

1.1 *Project Description*

The Project site is situated on the east side of Sleepy Hollow Road, west of the Pocantico Lake. The property is currently developed with one (1) single family residence, one (1) two-family residence and one pool house with access provided via a single driveway located approximately 160 feet south of Wilderness Way on Sleepy Hollow Road. The two existing homes will remain and the pool house will be converted to a single-family home as part of the project.

It is proposed to subdivide the property into 31 single-family lots, a net increase of 29 homes on the site. A new, private road will be constructed that will connect to Sleepy Hollow Road approximately 400 feet to the south of Wilderness Way, and will provide access to 30 of the homes. The existing two-family home on the property will continue to be accessed via the existing driveway.

1.2 *Study Methodology*

This study evaluates existing traffic conditions, as well as future conditions without the Project (“No-Build”) and with the Project (“Build”), at the four (4) study intersections listed below. The No-Build condition is the benchmark against which the potential impacts of the proposed Project are compared.

1. Sleepy Hollow Road & Long Hill Road East (Unsignalized)
2. Sleepy Hollow Road & Old Sleepy Hollow Road Extension (Unsignalized)
3. US Route 9 (Albany Post Road) & Sleepy Hollow Road (Unsignalized)
4. Sleepy Hollow Road & Site Driveway (Unsignalized)

Existing traffic volumes were established for the weekday AM and PM peak hours, which represent the periods for peak traffic activity at the proposed development.

To assess existing traffic conditions at the study intersections during the current COVID-19 pandemic, the New York State Department of Transportation (NYSDOT) publication *Traffic Data Collection Guidance during COVID-19 Pandemic* was followed. Turning movement counts were conducted at the three existing study intersections listed above and adjusted using NYSDOT hourly traffic volumes previously collected on the study roadways between 2015 and 2019.

Inquiries with the Town of Mount Pleasant, the Village of Briarcliff Manor and the Village of Sleepy Hollow Planning Consultants did not identify any planned or approved developments that would add a significant volume of traffic to the study intersections. To evaluate future conditions, the adjusted Existing peak-hour volumes were then grown to the year 2024 by 1.5% (total) to represent future conditions without the Project (“No-Build”).

The number of trips expected to be generated by the Project during the peak hours were forecast based on data contained in the Institute of Transportation Engineers’ (ITE) publication, *Trip Generation Manual*, 11th Edition. Project traffic was distributed to the study intersections and added to the No-Build volumes to represent future conditions with the Project (“Build”).

Synchro analyses were conducted for the Existing, No-Build and the Build traffic volume conditions and compared to intersection capacities to identify potential Project impacts.

An evaluation was also conducted of sight distances at the proposed driveway, as well as potential impacts on pedestrians, cyclists, public transportation, school bus activity and parking area and nearby recreations facilities. An evaluation was also conducted of potential construction traffic impacts and post construction truck delivery activity.

1.3 Findings

The Project is projected to result in a net increase of 20 vehicular trips (5 entering; 15 exiting) and 27 vehicular trips (17 entering; 10 exiting) dispersed to the roadway network during the AM and PM peak hours, respectively. It is estimated that, during the period of busiest construction activity, there will be, at most 17 construction-related vehicles accessing the site (7 delivery trips and 10 worker trips) during the peak hours. The addition of these trips will have almost no perceptible impact on pedestrians, cyclists, public transportation, school bus activity or parking area and nearby recreations facilities. The proposed driveway is located on a relatively straight and level section of Sleepy Hollow Road and will be provided with more than the required intersection and stopping sight distances to allow vehicles to enter and exit safely.

As with the other several hundred homes on Sleepy Hollow Road, Wilderness Way, Greenwood Court, Lewiston Court, Old Sleepy Hollow Road, Justine Court, Berkley Court, Avondale Court, Chestnut Hill Lane, Hollowtree Road, Peach Tree Lane, and Hall Road, delivery-related truck traffic would use US Route 9 and NY Route 9 A and then use Long Hill Road or Old Sleepy Hollow Road to approach the new homes. Almost all of the delivery vehicles (and sanitation vehicles) are likely to be combined with deliveries to other homes

in the above streets and, therefore, there will be little or no increase in truck traffic on the roadways in the neighborhood.

The results of the detailed traffic analyses revealed that level of service ("LOS")¹ "A" peak-hour traffic operating conditions will prevail at the study intersections of Sleepy Hollow Road with Long Hill Road East and with Old Sleepy Hollow Road Extension, with or without the project, and that the site driveway will also operate at level of service "A" during both peak hours. At the Sleepy Hollow Road intersection with US Route 9, the Sleepy Hollow Road approach will continue to operate at No-Build levels, with only a minor increase in delay during the PM peak hour.

1.4 *Conclusions*

Based on the analyses provided herein, it is concluded that the increase in traffic volumes associated with the proposed residential development will not have a significant adverse impact on traffic operating conditions at the study intersections, or on the surrounding roadways. Further, acceptable sight distances will be provided for drivers exiting the proposed site driveway or approaching the driveway on Sleepy Hollow Road. Therefore, no traffic impact mitigation measures are required, and none are proposed.

¹ Traffic operating conditions or LOS are graded by traffic engineering professionals on an "A" to "F" scale, with LOS "A" representing the best conditions and LOS "F" representing the worst conditions. The analyses conducted for this report suggests that as many as 120 homes could be developed on the subject property without any changes in Level of Service or without a significant adverse traffic impact at any location.

2.0 INTRODUCTION

This Traffic Impact Study has been prepared by Kimley-Horn to document the potential traffic impacts associated with the proposed development of 29 additional single-family homes located on a 36.83-acre site at 715 Sleepy Hollow Road in the Town of Mount Pleasant, Westchester County, New York. This report evaluates both existing and future traffic conditions surrounding the site both with and without the Project. The anticipated year of completion of this development is 2024.

This report also has been prepared as part of the Draft Environmental Impact Statement (DEIS) for the Proposed Action and is in accordance with the requirements of the New York State Environmental Quality Review Act (SEQRA) and the Scoping Document for the Proposed Action. The adopted Scope identifies the Study Area for this traffic analysis which consists of four (4) study intersections, and the required elements to be included in this report.

The Project site is situated on the east side of Sleepy Hollow Road, west of the Pocantico Lake, as illustrated in **Figure 1**. The property is currently developed with one (1) single family residence and one (1) two-family residence, with access provided via a single driveway located approximately 160 feet south of Wilderness Way on Sleepy Hollow Road.

It is proposed to subdivide the property into 31 single-family lots, a net increase of 29 homes on the site. A new, private road will be constructed that will connect to Sleepy Hollow Road approximately 400 feet to the south of Wilderness Way, and will provide access to 30 of the homes. The existing two-family home on the property will continue to be accessed via the existing driveway.

This study evaluates existing traffic conditions as well as future conditions without the Project (“No-Build”) and with the Project (“Build”). The No-Build condition is the benchmark against which the potential impacts of the proposed Project are compared. The following four (4) intersections were identified in the Scope as requiring detailed analysis:

1. Sleepy Hollow Road & Long Hill Road East (Unsignalized)
2. Sleepy Hollow Road & Old Sleepy Hollow Road Extension (Unsignalized)
3. US Route 9 (Albany Post Road) & Sleepy Hollow Road (Unsignalized)
4. Sleepy Hollow Road & Site Driveway (Unsignalized)



3.0 EXISTING CONDITIONS

3.1 Roadway Network

Evaluation of the traffic impacts associated with the proposed Project requires a thorough understanding of the existing roadway system in the vicinity of the site. The existing conditions observed in the study area include an inventory of the roadways, speed limits, on-street parking restrictions, intersection geometry, traffic control devices, pavement condition and markings. This information is provided below.

Sleepy Hollow Road is classified by the New York State Department of Transportation (“NYSDOT”) as an urban “Major Collector” roadway. Sleepy Hollow Road travels 3.38 miles from US Route 9 in the west to Scarborough Road in the north, traversing through the Town of Mount Pleasant and the Village of Briarcliff Manor. Within the study area, Sleepy Hollow Road is under the jurisdiction of the Town of Mount Pleasant and provides one travel lane per direction of 9 to 10 feet in width. The pavement is in good condition and the posted speed limit is 30 miles per hour (mph). South of Wilderness Way, approximately 6-inch paved shoulders are generally provided along either side of the road, beyond which is primarily a narrow grassy verge and then trees and bushes. North of Wilderness Way, asphalt curbing is generally provided along either side of the road in lieu of shoulder striping, beyond which is primarily a narrow grassy verge and then trees and bushes. There are no sidewalks nor shoulder space for on-street parking along either side of the roadway. Overnight on-street parking is restricted on all roads within the Town of Mount Pleasant between 3:00 and 6:00 AM from December 1st to March 31st.

The NYSDOT reports a 2019 estimated Average Annual Daily Traffic (“AADT”) volume of 1,084 on Sleepy Hollow Road in the vicinity of the site. According to the Federal Highway Administration’s 2017 *Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System*, Sleepy Hollow Road has a capacity of 11,700 vehicles per day and, as indicated in the Appendix, with an AADT of 1,084, currently operates at LOS “B” conditions.

Old Sleepy Hollow Road Extension is a north-south oriented local roadway that travels 0.48 miles from Sleepy Hollow Road in the north to Old Sleepy Hollow Road in the south. Old Sleepy Hollow Road Extension is under the jurisdiction of the Town of Mount Pleasant and has a posted speed limit of 30 mph. It provides one travel lane per direction of 9 to 10 feet in width and the pavement is in fair to good condition. Approximately 6-inch paved shoulders are provided along either side of the road, beyond which is vegetation. There are no sidewalks nor shoulder space for on-street parking provided along either side of the roadway.

The NYSDOT reports a 2019 estimated AADT volume of 960 on Old Sleepy Hollow Road Extension. According to the Federal Highway Administration’s 2017 *Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System*, Old Sleepy Hollow Road has a capacity

of 11,700 vehicles per day and, as indicated in the Appendix, with an AADT of 960, currently operates at LOS "B" conditions.

Long Hill Road East/Long Hill Road West is an east-west oriented local roadway that travels 2.34 miles from South State Street/Beech Hill Road in the east to Scarborough Road in the west. The roadway is known as Long Hill Road East to the east of Hirst Road. Long Hill Road East is under the jurisdiction of the Village of Briarcliff Manor and has a posted speed limit of 30 mph. In the study area, the roadway provides one travel lane per direction varying in width from 11 to 16 feet and the pavement is in fair to good condition. There are no sidewalks or shoulder space for on-street parking provided along either side of the road. West of Sleepy Hollow Road, asphalt curbs are provided on either side of the road, beyond which is a grass verge and then vegetation. East of Sleepy Hollow Road, there are no curbs and the grass verge is replaced with stone walls and guide rail, behind which is vegetation.

The NYSDOT does not report any AADT volumes on Long Hill Road East in the vicinity of the site. An estimated AADT volume of 3,388 on Long Hill Road East in the vicinity of the site was calculated using the existing adjusted AM peak hour volumes provided in Figure 2 below. According to the Federal Highway Administration's 2017 *Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System*, Long Hill Road East has a capacity of 11,700 vehicles per day and, as indicated in the Appendix, with an AADT of almost 3,400, currently operates at LOS "B" conditions.

US Route 9 (Albany Post Road) is a north/south oriented roadway that is classified by the NYSDOT as an urban "Principal Arterial Other" roadway. Within New York State, US Route 9 travels northerly from the George Washington Bridge in Manhattan to its terminus in Champlain, New York, near the Canadian border (a point-to-point distance of 288 miles). US Route 9 is under the jurisdiction of the NYSDOT. Within the study area, to the south of Country Club Lane, the roadway provides two travel lanes in the northbound direction and one travel lane in the southbound direction, each of 10 to 11 feet in width. To the north of Country Club Lane, US Route 9 provides one travel lane per direction of 9 to 11 feet in width with a 11- to 12-foot-wide striped center median that is used in some areas as a shared two-way left-turn lane. The pavement is in fair to good condition and the posted speed limit is 40 mph. Approximately 6-inch paved shoulders are generally provided along either side of the road, beyond which is grass or vegetation. There are no sidewalks provided along US Route 9 and on-street parking is not provided along either side of the roadway.

The NYSDOT reports a 2015 AADT volume of 19,330 on US Route 9, north of Sleepy Hollow Road. According to the Federal Highway Administration's 2017 *Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System*, US Route 9 has a capacity of 22,300 vehicles per day and, as indicated in the Appendix, with an AADT of 19,330, currently operates at LOS "D" conditions.

3.2 Description of Study Intersections

The existing lane geometry at the study intersections is described in detail below.

Sleepy Hollow Road & Long Hill Road East – Long Hill Road East forms the eastbound and westbound approaches to this unsignalized, four-legged intersection, while Sleepy Hollow Road forms the northbound and southbound approaches. All four approaches provide a shared left/through/right-turn lane and are controlled by a stop sign. No sidewalks or crosswalks are provided at the intersection.

Sleepy Hollow Road & Old Sleepy Hollow Road Extension – Sleepy Hollow Road forms the eastbound and westbound approaches to this unsignalized, three-legged intersection, while Old Sleepy Hollow Road Extension forms the northbound approach. The eastbound Sleepy Hollow Road approach provides a shared through/right-turn lane, while the westbound approach provides a shared left-turn/through lane. The northbound Old Sleepy Hollow Road Extension approach is controlled by a stop sign and provides a shared left/right-turn lane. No sidewalks or crosswalks are provided at the intersection.

US Route 9 (Albany Post Road) & Sleepy Hollow Road – US Route 9 forms the northbound and southbound approaches to this unsignalized, three-legged intersection, while Sleepy Hollow Road forms the westbound approach. The northbound US Route 9 approach provides a through lane and a shared through/right-turn lane, while the southbound approach provides a shared left-turn/through lane. The westbound Sleepy Hollow Road approach is controlled by a stop sign and provides a shared left/right-turn lane. No sidewalks or crosswalks are provided at the intersection.

Sleepy Hollow Road & Site Driveways – Sleepy Hollow Road forms the northbound and southbound approaches to the existing and the proposed future site driveways. Both driveways, which will be separated by approximately 200 feet are/will be unsignalized. The westbound driveway approaches provide a shared left/right-turn lane and the new driveway will be controlled by a stop sign. The northbound Sleepy Hollow Road approach will provide a shared through/right-turn lane, while the southbound approach will provide a shared left-turn/through lane. No sidewalks or crosswalks will be provided at either driveway.

3.3 Pedestrian and Bicycle Activity and Routes

As indicated above, there are no designated pedestrian or bicycle facilities located on any of the study roadways and crosswalks are not provided at any of the study intersections. As detailed hereafter, surveys of activity on the study area roadways revealed only 1 pedestrian per hour at either of the two Sleepy Hollow Road study intersections nearest the site. Only two pedestrians were observed at the intersection of Sleepy Hollow Road with US Route 9 during the combined morning and afternoon survey periods. No bicycle activity was documented.

A review of bicycle and pedestrian facilities² in the vicinity of the site revealed that the nearest pedestrian trails are:

- In the Rockefeller State Park Preserve;
- Along the east side of Pocantico Lake;
- In Rockwood Hall State Park;

Both cyclists and pedestrians can use the Old Croton Aqueduct, which is located to the west of the Project. In addition, a paved, off-road pedestrian and bicycle path, the North County Trailway, is located approximately 1.5 miles to the east of the Project and travels in a north/south direction. The Trailway, along with the connecting South County Trailway, spans 36.2 linear miles through Westchester County. The nearest parking lot for the North County Trailway is located on NYS Route 117 near the interchange with NYS Route 100. Finally, Mountain biking trails are provided at Graham Hills Park in Pleasantville, located 3.3 miles east of the Project.

3.4 Parks and Trails

There are several hiking trails in the vicinity of the Project. The expansive Rockefeller State Park Preserve is located to the south of the Project and contains dozens of trails and hiking paths for passive recreation activities such as horseback riding, walking, hiking, and birdwatching. Parking lots are provided within the Preserve adjacent to the visitor center which is accessed from NYS Route 117. The parking lots have striped parking for up to approximately 140 vehicles (4 of which are ADA/handicapped parking spaces).

The Pocantico River Trail is within the Preserve and the trailhead is accessed from Old Sleepy Hollow Road Extension, just north of its intersection with Old Sleepy Hollow Road. The trail connects to several other trails within the Preserve. Trail users who start at the trailhead generally park in unpaved shoulders along both sides of Old Sleepy Hollow Road which can accommodate approximately 25 vehicles.

Pocantico Lake Park is located to the south and east of the Project site. The Park is on County-owned land and is used for passive recreational activities such as hiking, fishing and horseback riding. Access to Pocantico Lake Park is provided approximately 0.7 miles east of the Project site at the end of Old Sleepy Hollow Road (at the northern end of Pocantico Lake). The Park can also be accessed from Old Sleepy Hollow Road near its intersection with Old Sleepy Hollow Road Extension and from Pocantico Lake Road. As the Park does not provide designated parking areas, visitors generally park along unpaved shoulders near each access point.

² <https://www.traillink.com/trailsearch/?zipcode=10591>

3.5 Public Transportation

The Project site is located within a seven-minute drive from Metro-North Railroad's (MNR) Scarborough station on the Hudson Line and a nine-minute drive away from the Pleasantville station on the Harlem Line. MNR provides fast, frequent rail service between Grand Central Terminal in New York City and Poughkeepsie and Wassaic on the Hudson and Harlem Lines, respectively.

On the Hudson Line, there are 78 trains that stop at the Scarborough rail station each weekday (37 northbound trains and 41 southbound trains). In addition, there are 53 daily trains on weekends and holidays that stop at the Scarborough rail station (26 northbound trains; 27 southbound trains). Peak express service is not provided; service between the MNR Scarborough station and Grand Central Terminal takes 65 minutes or less. A review of the weekday train schedules reveals that there are 17 trains that arrive or depart the Scarborough station during peak commuter morning hours (6:00 to 9:00 AM) and 13 trains during peak commuter evening hours (3:00 to 6:00 PM).

On the Harlem Line, there are 67 trains that stop at the Pleasantville rail station each weekday (32 northbound trains and 35 southbound trains). In addition, there are 50 daily trains on weekends and holidays that stop at the Pleasantville rail station (25 northbound trains; 25 southbound trains). On Saturday, there is one additional southbound train for a total of 51 daily Saturday trains. Peak express service between the MNR Pleasantville station and Grand Central Terminal takes 50 minutes or less. A review of the weekday train schedules reveals that there are 12 trains that arrive or depart the Pleasantville station during peak commuter morning hours and 13 trains during peak commuter evening hours.

In addition to the MNR train stations, Westchester County's Bee-Line Bus system operates routes #11 and #13 along US Route 9. In the vicinity of the Project, bus stops are located at the intersection of US Route 9 with Sleepy Hollow Road.

Route #11 operates on weekdays only and provides service between the Croton-Harmon MNR station in Croton-on-Hudson and White Plains. There are two (2) scheduled southbound buses during the morning commuter hours (7:00 to 9:00 AM) and two (2) northbound buses during the evening commuter hours (4:30 to 6:30 PM).

Route #13 operates between Ossining and Rye, providing 30 scheduled buses at the US Route 9 intersection with Sleepy Hollow Road on weekdays (15 northbound buses; 15 southbound buses), 26 scheduled buses on Saturdays (13 northbound; 13 southbound), and 22 buses on Sundays (10 northbound; 12 southbound).

3.6 School Bus Routes

There are three school districts that are within the study area: the Pocantico Hills Central School District, Briarcliff Manor Union Free School District, and the Public Schools of the Tarrytowns School District. The transportation departments at each District were contacted to identify school bus stops and bus routes that operate along the roadway network surrounding the Project site, as summarized below.

Pocantico Hills Central School District - For elementary and middle school students in the Pocantico Hills Central School District, school bus route #6 has three (3) bus stops along Sleepy Hollow Road³, picking students up between 7:50 and 7:53 AM and dropping students off at home between 3:20 and 3:23 PM, and each bus travels through the study intersection of Sleepy Hollow Road with Old Sleepy Hollow Road Extension.

Route #2 operates for high school students within the Pocantico Hills Central School District who attend Briarcliff High School. In the morning, Route #2 has one bus stop along Sleepy Hollow Road, picking students up at 7:57 AM and traveling through the intersection with Old Sleepy Hollow Road Extension. In the afternoon, the Pocantico Hills Central School District provides three (3) buses which leave Briarcliff High School at 3:00, 3:45, and 5:30 PM to bring students home, each traveling through the intersection of Sleepy Hollow Road with Old Sleepy Hollow Road Extension and stopping at the bus stop along Sleepy Hollow Road.

The District's school buses for Pleasantville High School do not traverse the study area.

Briarcliff Manor Union Free School District - For the District's Todd Elementary School, school bus Route C has three (3) bus stops along Sleepy Hollow Road (at Tower Hill Road, Chestnut Hill Lane, and Peach Tree Lane), picking students up between 7:25 and 7:32 AM and dropping students off at home between 2:33 and 2:40 PM. Route C also has three (3) bus stops along Long Hill Road East, picking students up between 7:34 and 7:42 AM and dropping students off at home between 2:23 and 2:31 PM, traveling through the intersection with Sleepy Hollow Road.

Route #12 transports students from the Briarcliff Middle and High School campus and has 11 bus stops along Sleepy Hollow Road (at Tower Hill Road, Wilderness Way, Chestnut Hill Lane, Peach Tree Lane, Hall Road, and individual houses in between), picking students up between 8:03 and 8:13 AM and dropping students off at home between 3:24 and 3:35 PM. Route #12 also has bus stops at the intersections of Long Hill Road East with Sleepy Hollow Road and with Hidden Oak Road, picking students up at 8:14 and 8:15 AM, respectively, and dropping students off at home at 3:22 and 3:23 PM, respectively.

³ Two (2) bus stops are located at residences on Sleepy Hollow Road opposite the Project's frontage and one (1) bus stop is located at a residence approximately $\frac{1}{4}$ mile to the west of Sleepy Hollow Road Extension.

Public Schools of the Tarrytowns – The Public Schools of the Tarrytowns, which is located to the west and south of the Project site, has indicated that approximately 5 school buses travel along the study area roadways. However, the District has not yet responded to the request for more details on the bus routes and bus stop locations.

The following describes the school buses observed passing through the study intersections

- 35 school buses were observed passing through the intersection of Long Hill Road East with Sleepy Hollow Road during the 2-hour morning survey period and 12 were observed during the 3-hour afternoon survey period.
- 5 school buses were observed passing along Sleepy Hollow Road in front of the site and through the intersection of Sleepy Hollow Road with Sleepy Hollow Road Extension during the 2-hour morning survey period and 4 were observed during the 3-hour afternoon survey period.
- 7 school buses were observed turning onto or off of Sleepy Hollow Road from US Route 9 during the 2-hour morning survey period and none were observed during the 3-hour afternoon survey period.

3.7 Delivery Truck-related Traffic

As with the other several hundred⁴ homes on Sleepy Hollow Road, Wilderness Way, Greenwood Court, Lewiston Court, Old Sleepy Hollow Road, Justine Court, Berkley Court, Avondale Court, Chestnut Hill Lane, Hollowtree Road, Peach Tree Lane, and Hall Road, delivery-related truck traffic would use US Route 9 and NY Route 9 A and then use Long Hill Road or Old Sleepy Hollow Road to approach the new homes. Almost all of the delivery vehicles (and sanitation vehicles) are likely to be combined with deliveries to other homes in the above streets and, therefore, there will be little or no increase in truck traffic on the roadways in the neighborhood.

3.8 Traffic Data Collection

To assess existing traffic conditions at the study intersections during the current COVID-19 pandemic, the New York State Department of Transportation (NYSDOT) publication *Traffic Data Collection Guidance during COVID-19 Pandemic* was followed.

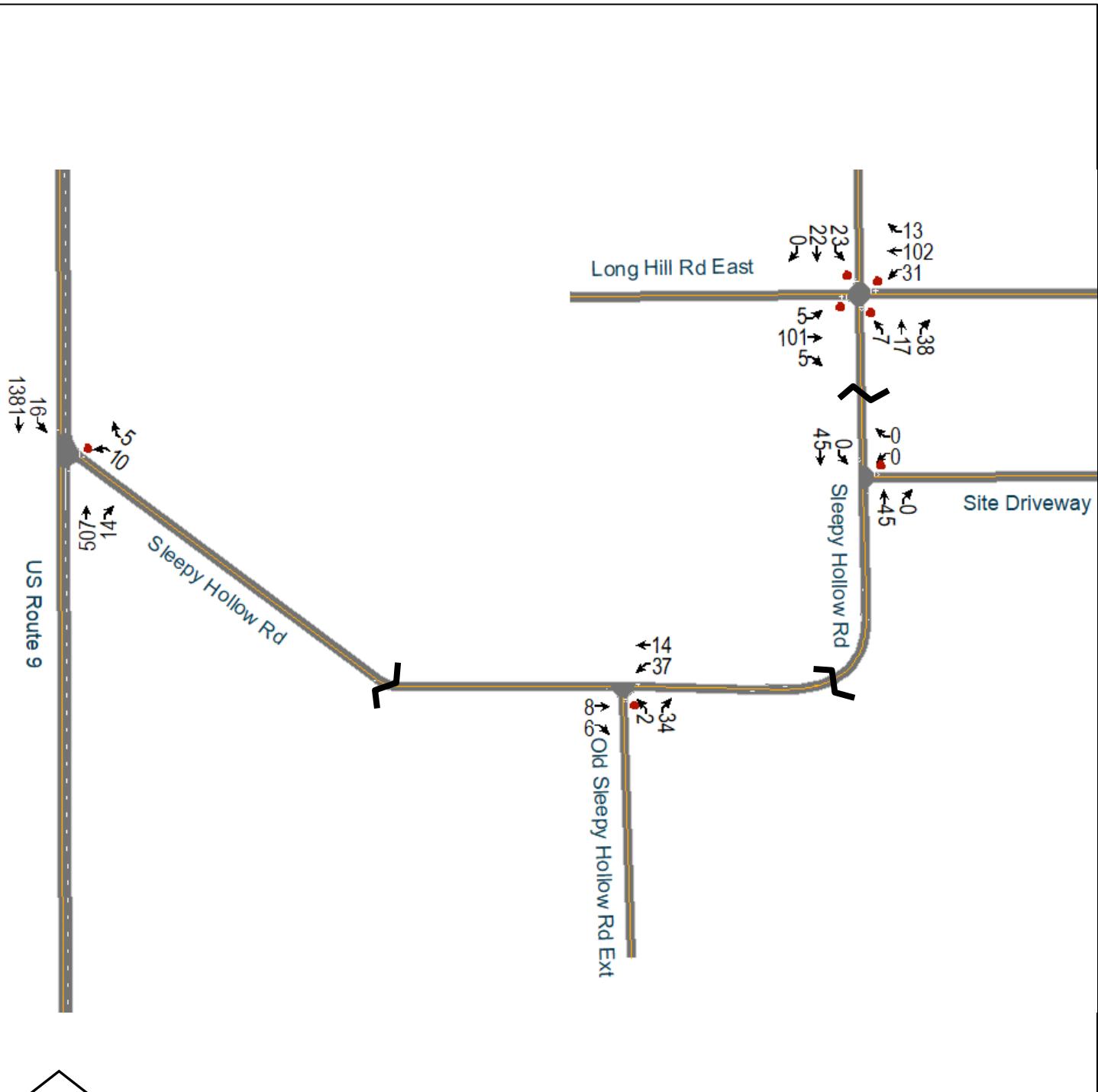
Turning movement and pedestrian counts were conducted at the study intersections of Sleepy Hollow Road with Long Hill Road East and with Old Sleepy Hollow Road Extension on Wednesday, March 24, 2021 and at the third study intersection (US Route 9 & Sleepy Hollow Road) on Monday, December 20, 2021 between 7:15 and 9:15 AM and 3:00 and 6:00 PM. At the study intersections of Sleepy Hollow Road with Long Hill Road East and with Old Sleepy Hollow Road Extension, the volumes indicated that the weekday morning peak hour occurred from 8:00 to 9:00 AM and the weekday evening peak hour occurred from 3:00 to 4:00

⁴ Slightly more than 300 homes

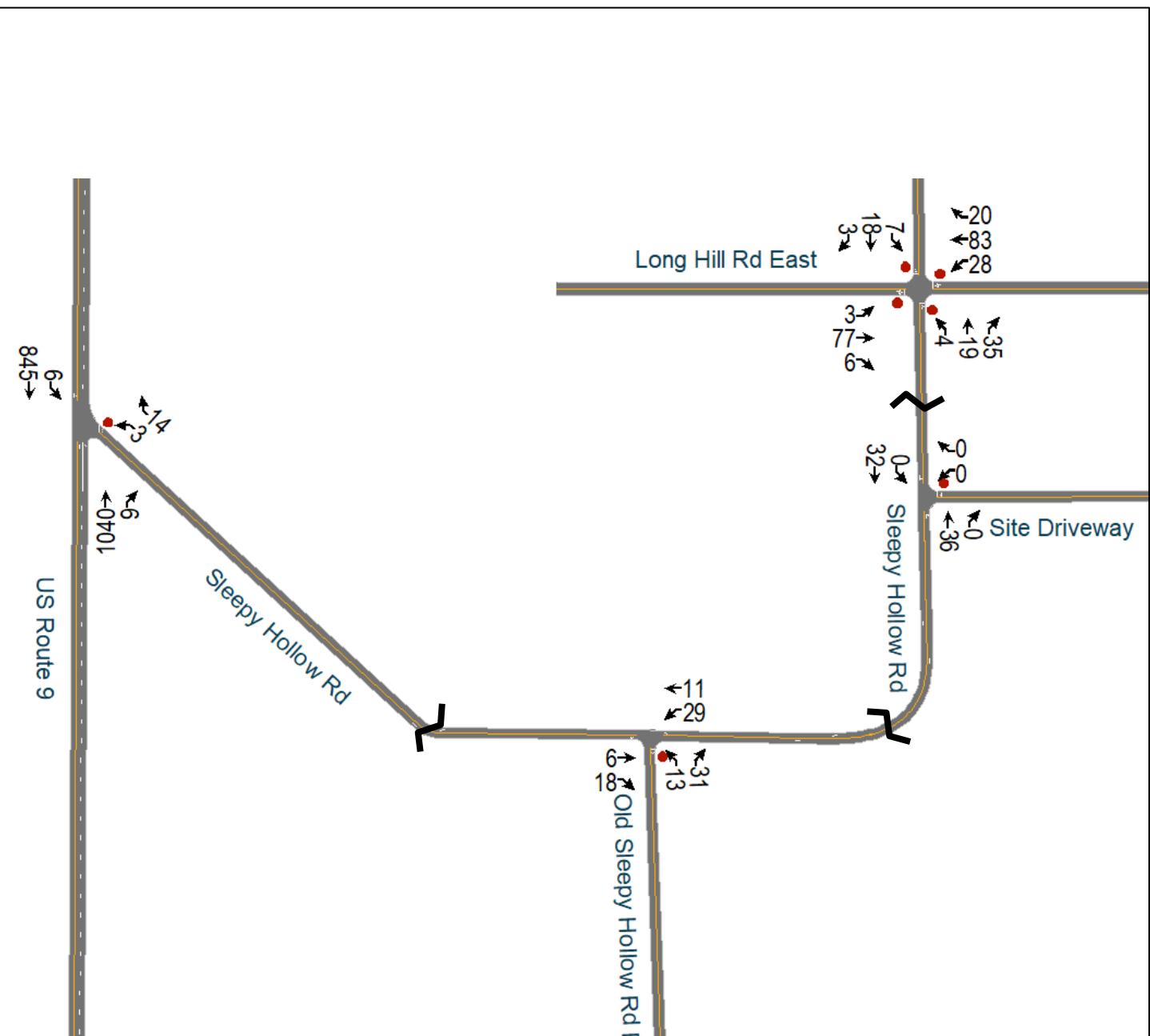
PM. The US Route 9 and Sleepy Hollow Road study intersection indicated that the weekday morning peak hour occurred from 7:30 to 8:30 AM and the weekday evening peak hour occurred from 4:45 to 5:45 PM.

In addition to the turning movement counts, Automatic Traffic Recorder (ATR) counts were conducted on Sleepy Hollow Road to the south of Wilderness Way (in the vicinity of the proposed site driveway) for a one-week period from March 23 to March 29, 2021. The ATR counts collected volume and speed data for both travel directions on Sleepy Hollow Road.

Following NYSDOT guidelines, the counted volumes were compared to NYSDOT hourly traffic data that were previously collected on the study roadways between 2015 and 2019. The 2021 counted peak hour volumes at the study intersections of Sleepy Hollow Road with Long Hill Road East and with Old Sleepy Hollow Road Extension were increased to match the proximate NYSDOT peak-hour volumes with the result that the adjusted traffic volumes are 25% and 20% higher during the weekday AM and PM peak hours, respectively, than the counted traffic volumes. At the study intersection of US Route 9 with Sleepy Hollow Road, the 2021 counted peak hour traffic volumes were increased similarly to match NYSDOT traffic volumes to the north and east of the intersection with the result that the adjusted traffic volumes are 50% and 33% higher during the weekday AM and PM peak hours, respectively, than the counted traffic volumes. The resulting 2021 adjusted Existing peak hour traffic volumes are provided in **Figures 2 and 3**.



NOT TO SCALE



NOT TO SCALE

Kimley»Horn
New York

Proposed Meadows at
Briarcliff Development
Traffic Impact Study

2021 Existing PM Peak Hour
Traffic Volumes

FIGURE
3

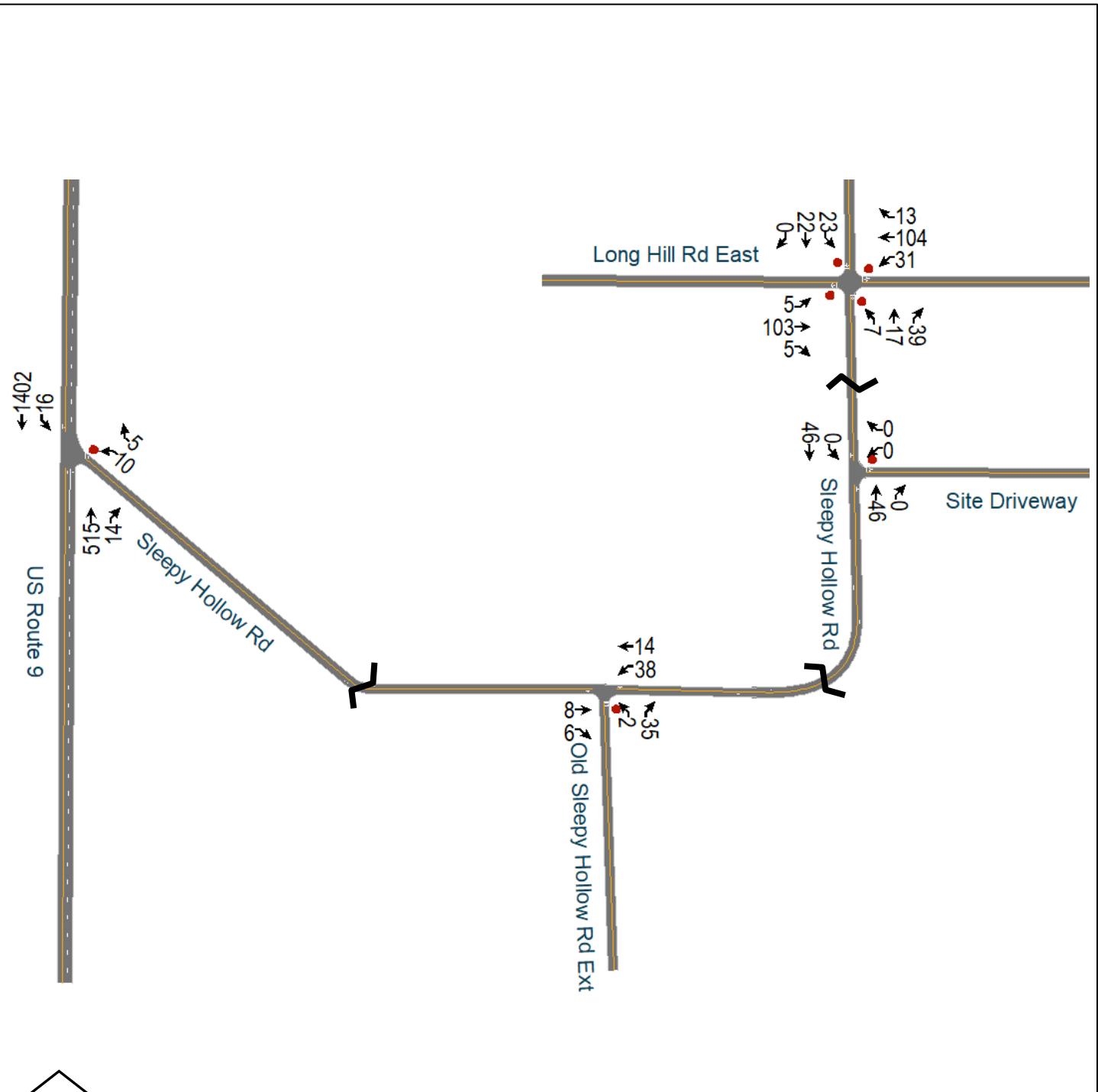
4.0 FUTURE NO-BUILD CONDITIONS

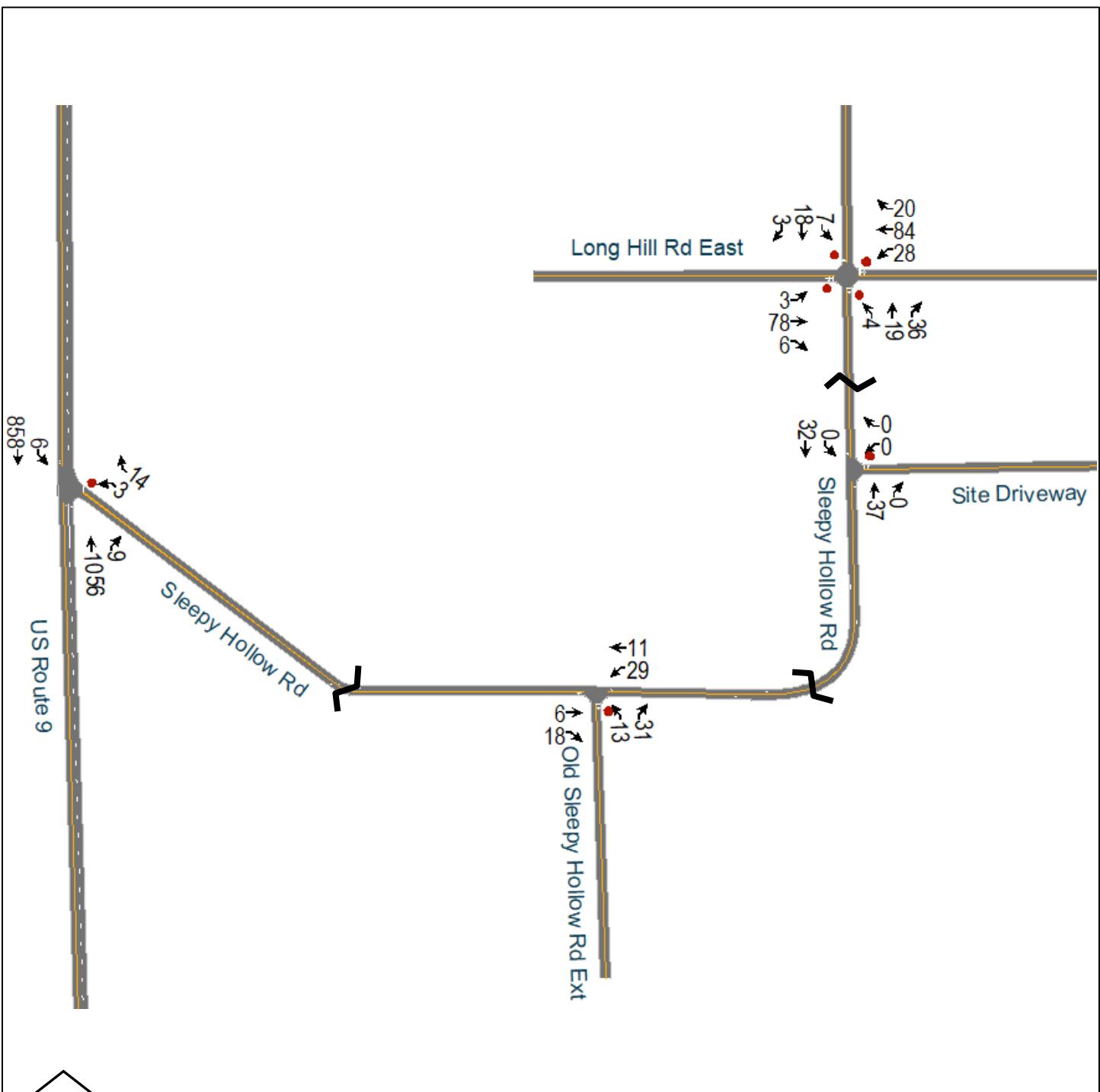
The future No-Build conditions are the forecast traffic conditions that are expected to occur without the proposed development. This includes background traffic growth and traffic associated with any other planned / approved developments.

The Town of Mount Pleasant, the Village of Briarcliff Manor and the Village of Sleepy Hollow's Planning Consultants were contacted to see if there are any planned or approved developments that would add a significant volume of traffic to the study intersections. No vicinity developments have been identified by any of the jurisdictions.

4.1 *Background Traffic Growth*

Background traffic growth represents typical traffic growth not associated with any planned development. Growth rate information by County was provided by NYSDOT, which indicated that an annual growth rate of 0.49 or less per year would be appropriate along roadways of similar classification. The 2021 Existing volumes were increased by 0.5% per year (a 1.015 total growth factor). The resulting volumes represent the 2024 No-Build peak hour traffic volumes shown on **Figures 4 and 5**.





5.0 PROJECT TRAFFIC

Project traffic is the number of vehicular trips forecast to be generated by the proposed development. This Project traffic is calculated and dispersed throughout the road network and onto the study intersections by using trip generation, trip distribution, and trip assignment.

5.1 *Trip Generation*

The property is currently developed with one (1) single family residence and one (1) two-family residence and a pool house with access provided via a single driveway located approximately 160 feet south of Wilderness Way on Sleepy Hollow Road.

It is proposed to subdivide the property into 31 single-family lots, a net increase of 29 homes on the site. A new, private road will be constructed that will connect to Sleepy Hollow Road approximately 400 feet to the south of Wilderness Way, and which will provide access to 30 of the homes. The pool house will be converted to a single-family home and the existing two-family home on the property will continue to be accessed via the existing driveway.

To evaluate the potential traffic impact of the Project, it is necessary to determine the traffic volumes expected to be generated by the development. A review was undertaken of the available trip generation data sources, including the reference published by the Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition. This widely-utilized reference source contains trip generation rates for the related existing and proposed use: "Single-Family Detached Housing" (Land Use Code 210). The trip generation projections for the net increase of 29 homes are summarized in **Table 1** below.

Table 1 – Project-Generated Peak Hour Trips

Land Use	Size (DU)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Single-Family Detached Housing	29	5	15	20	17	10	27

Source: ITE Trips Generation Manual, 11th Edition

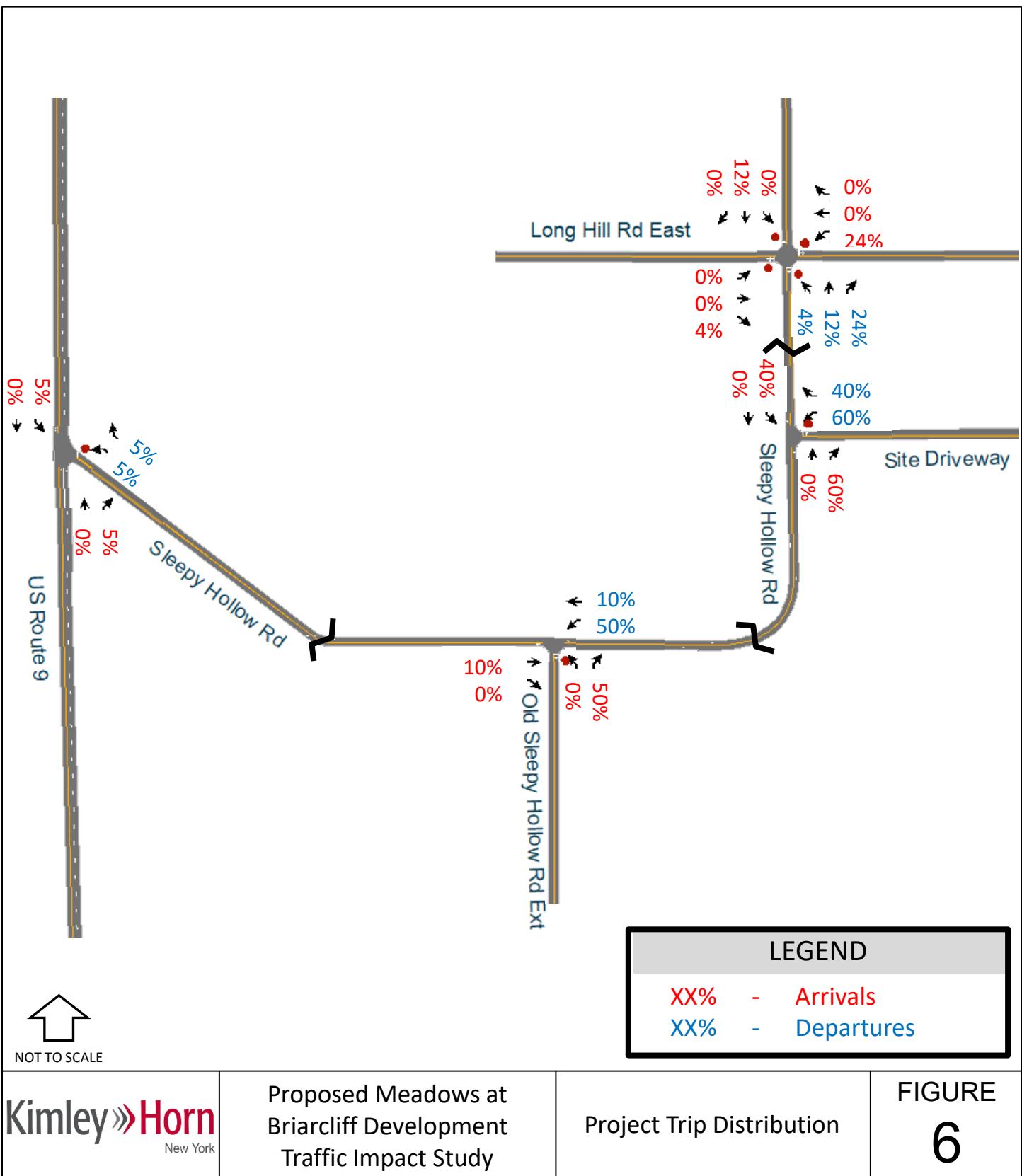
As can be seen from Table 1 above, the addition of 29 new homes will generate a total of 20 trips in the weekday AM peak hour and 27 trips in the weekday PM peak hour.

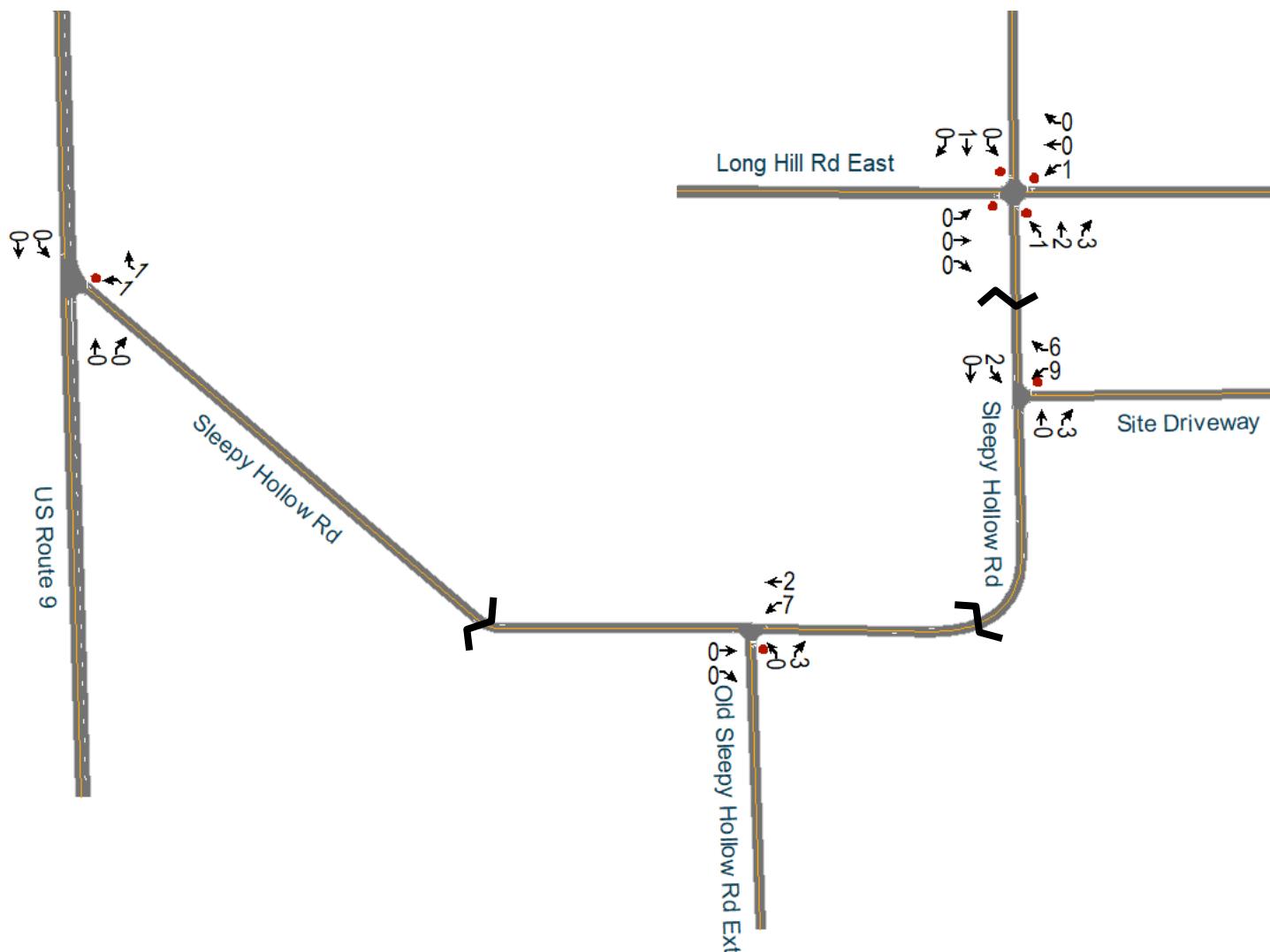
5.2 *Trip Distribution and Assignment*

Trip distribution has been forecast by evaluating the existing traffic patterns, reviewing the density of the development in the general area and considering how they will interact with the proposed development. Virtual travel times were reviewed using Google maps to ascertain how motorists will travel between the site and trip origins/destinations. The trip distribution along the roadway network is forecast to be:

- 40% to/from the north along Sleepy Hollow Road
- 10% to/from the west along Sleepy Hollow Road (west of Old Sleepy Hollow Road Extension)
 - 5% to/from the north along US Route 9
 - 5% to/from the south along US Route 9
- 50% to/from the south and east along Old Sleepy Hollow Road Extension
 - 22% to/from the south along Sleepy Hollow Road Extension
 - 28% to/from the east along Old Sleepy Hollow Road (to and from NYS 9A)

The Trip Distribution at the study intersections is illustrated in **Figure 6** and the Net Project-Generated Trips for the proposed development, which are summarized in **Figures 7 and 8**, were determined by applying the project-generated vehicular trips (shown in Table 1) to the arrival and departure percentages (shown in Figure 6).





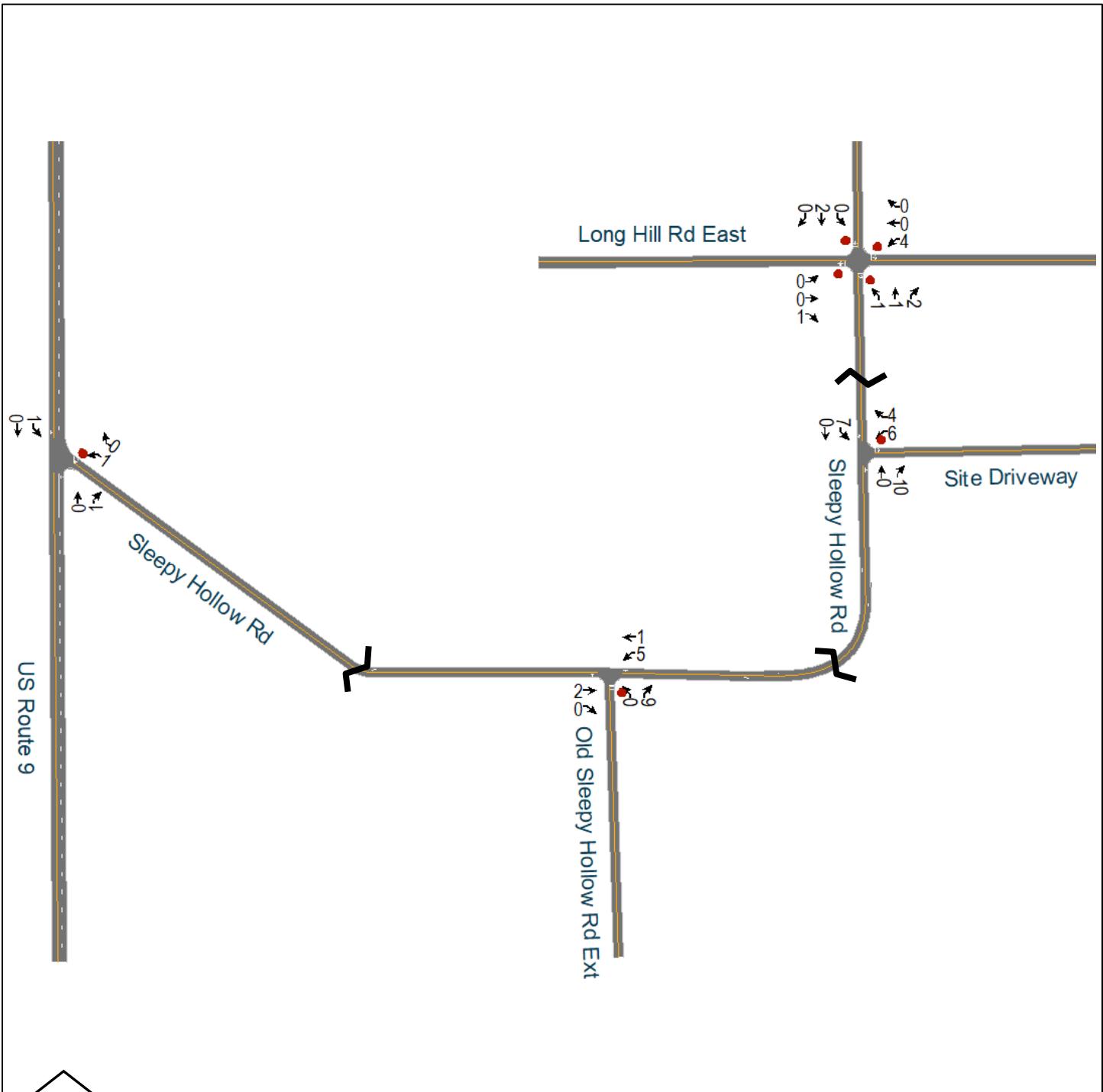
NOT TO SCALE

Kimley»Horn
New York

Proposed Meadows at
Briarcliff Development
Traffic Impact Study

Net Project-Generated
AM Peak Hour Trips

FIGURE
7



NOT TO SCALE

Kimley»Horn
New York

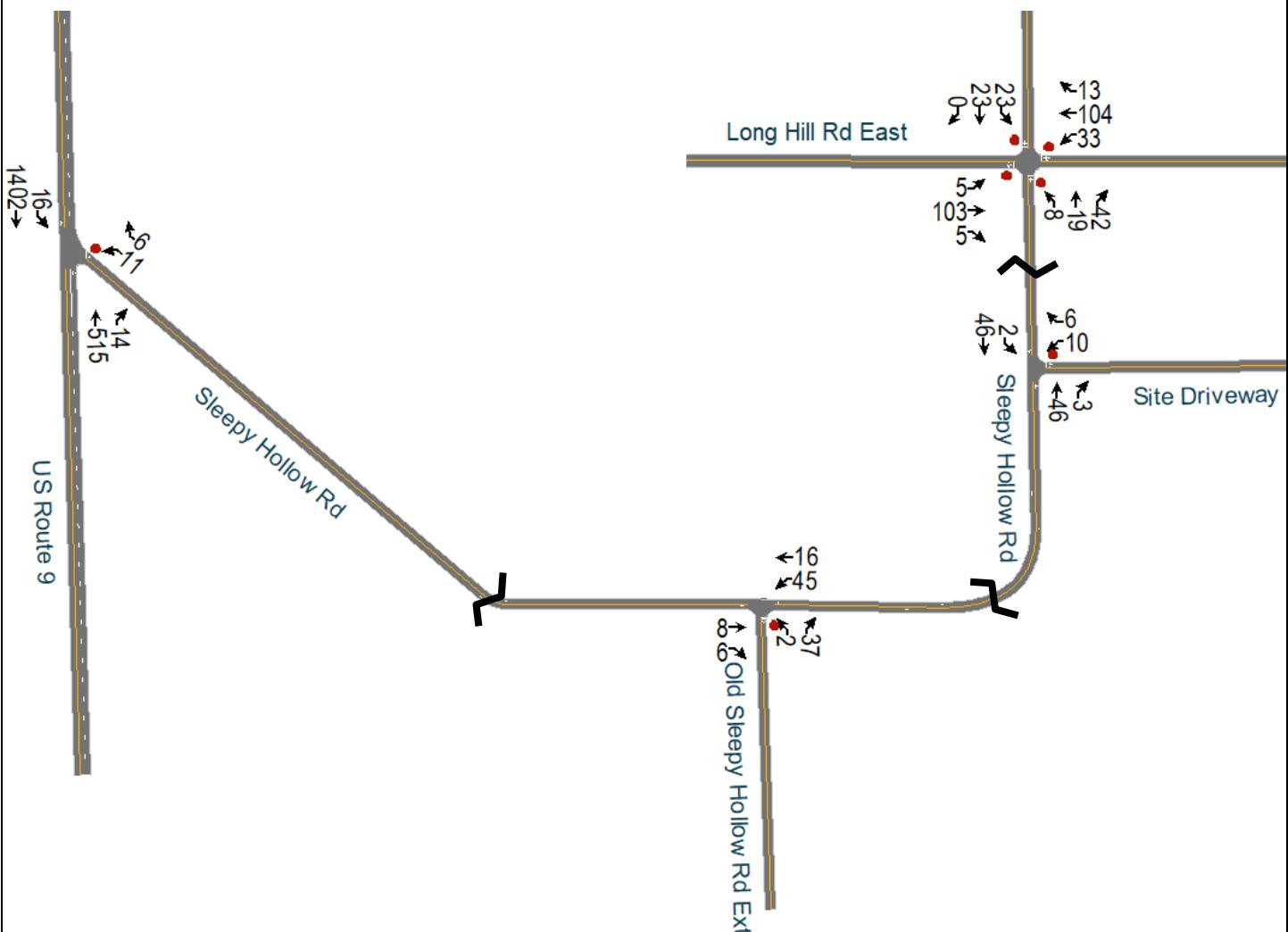
Proposed Meadows at
Briarcliff Development
Traffic Impact Study

Net Project-Generated
PM Peak Hour Trips

FIGURE
8

6.0 FUTURE BUILD TRAFFIC CONDITIONS

The Future Build conditions are defined as the forecast traffic conditions on the roadway network in the year 2024, with the proposed development. This includes background traffic growth and trips generated by the proposed development. The No-Build volumes shown on Figures 4 and 5 were added to the net project trips shown on Figures 7 and 8, resulting in the Build Peak Hour Traffic Volumes shown on **Figure 9 and 10**.



NOT TO SCALE

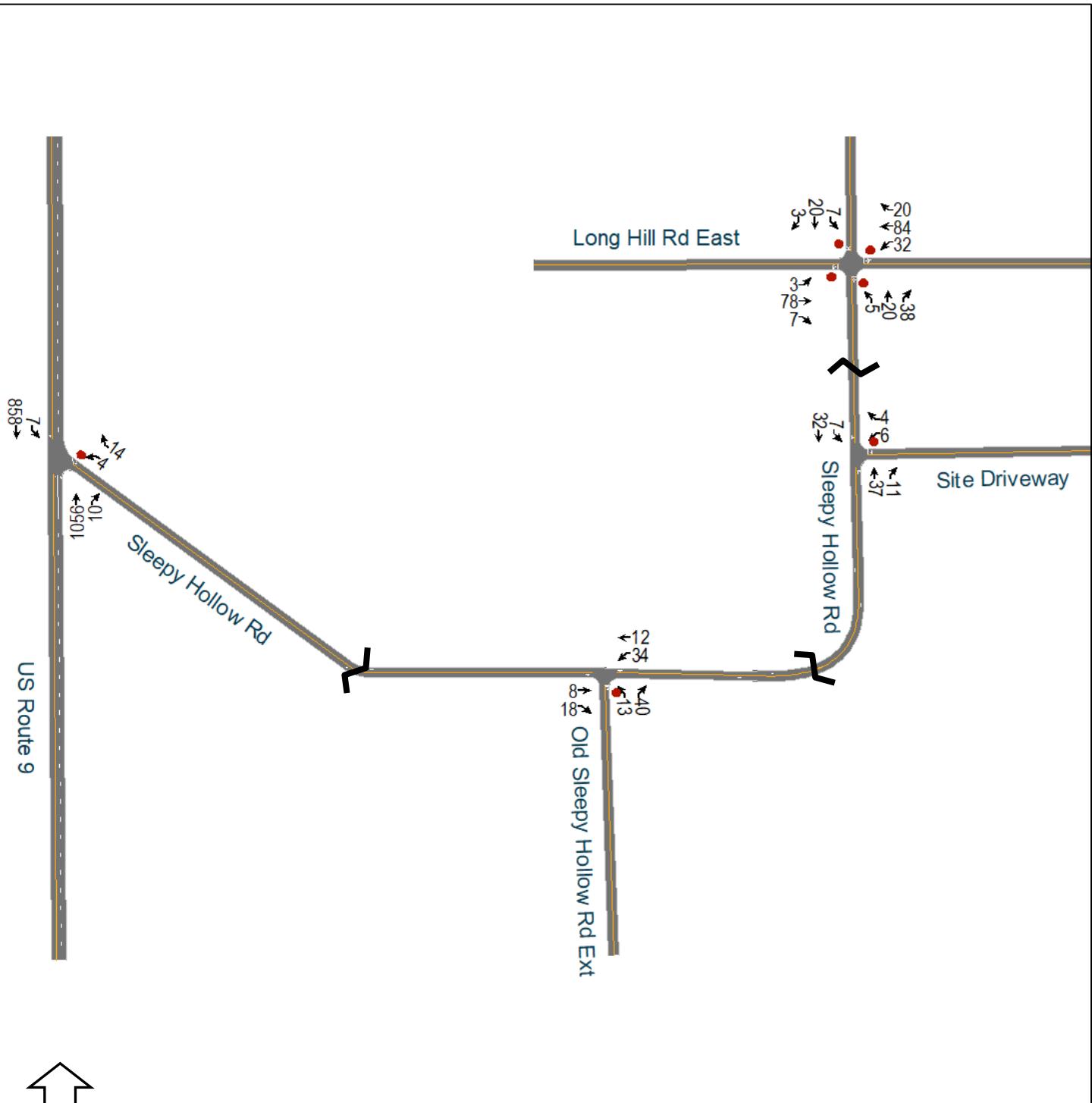
Note: Site Driveway trips include trips from the 1 existing residence that will use this driveway

Kimley»Horn
New York

Proposed Meadows at
Briarcliff Development
Traffic Impact Study

2024 Build AM Peak
Hour Traffic Volumes

FIGURE
9



NOT TO SCALE



Note: Site Driveway trips include trips from the 1 existing residence that will use this driveway

7.0 CAPACITY ANALYSIS

7.1 Intersection Capacity Analysis

An intersection capacity analysis was conducted with the Existing, No-Build and Build peak-hour traffic volumes (shown on Figures 2-5, 9, and 10) to assess the quality of the traffic flow at the study intersections. The criteria used to analyze the study intersections is based on the evaluation criteria contained in the Transportation Research Board's *Highway Capacity Manual* ("HCM") 6th Edition. The term "level of service" ("LOS") is used to denote the different operating conditions that occur at an intersection under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay, and freedom to maneuver. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

Synchro 11 software was used to model the study intersections based on the parameters mentioned above. Synchro 11 software is widely used by traffic engineering professionals, is approved for use by the NYSDOT, and is consistent with the procedures in the HCM.

For unsignalized intersections, such as the study intersections, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus, the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or side driveway. For the purposes of this analysis, control delay is defined as the total elapsed time that includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

The control delay criteria for the range of service levels for unsignalized intersections are shown below in **Table 2**.

Table 2 – LOS Criteria	
Level-of-Service (LOS)	Control Delay Per Vehicle
	Unsignalized Intersections
A	≤ 10.0 seconds
B	>10.0 and ≤ 15.0 seconds
C	>15.0 and ≤ 25.0 seconds
D	>25.0 and ≤ 35.0 seconds
E	>35.0 and ≤ 50.0 seconds
F	>50.0 seconds

Source: Transportation Research Board. *Highway Capacity Manual*.

The results of the intersection analysis for the Existing, No-Build and Build volume conditions for the AM and PM peak hours are summarized in **Table 3** below. The Synchro worksheets are provided in the Appendix.

Table 3 – Intersection Capacity Analysis Results

Intersection	Approach	AM Peak Hour			PM Peak Hour		
		Existing LOS (Delay)	No-Build LOS (Delay)	Build LOS (Delay)	Existing LOS (Delay)	No-Build LOS (Delay)	Build LOS (Delay)
Sleepy Hollow Road & Long Hill Road East (Unsignalized)	EB LTR	A (8.1)	A (8.2)	A (8.2)	A (7.8)	A (7.8)	A (7.9)
	WB LTR	A (8.6)	A (8.6)	A (8.6)	A (8.2)	A (8.2)	A (8.3)
	NB LTR	A (7.9)	A (7.9)	A (8.0)	A (7.6)	A (7.6)	A (7.7)
	SB LTR	A (8.2)	A (8.2)	A (8.3)	A (7.8)	A (7.8)	A (7.9)
Sleepy Hollow Road & Old Sleepy Hollow Road Extension (Unsignalized)	EB TR	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	WB LT	A (5.4)	A (5.5)	A (5.5)	A (5.3)	A (5.3)	A (5.5)
	NB LR	A (8.7)	A (8.7)	A (8.7)	A (8.8)	A (8.8)	A (8.9)
Sleepy Hollow Road & Site Driveway (Unsignalized)	WB LR	-	-	A (8.9)	-	-	A (8.9)
	NB TR	-	-	A (0.0)	-	-	A (0.0)
	SB LT	-	-	A (0.3)	-	-	A (1.4)
US Route 9 & Sleepy Hollow Road (Unsignalized)	WB LR	F (86.6)	F (92.1)	F (88.6)	D (26.1)	D (26.9)	D (31.3)
	NB TR	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
	SB LT	A (1.6)	A (1.8)	A (1.8)	A (0.3)	A (0.3)	A (0.4)

Note: LOS = Level of Service. Delay is shown in seconds per vehicle.

It is noted that no analysis was conducted of the site's existing driveway as it serves just two homes and the pool house, the proposed new driveway will serve 30 homes and is projected to experience Level-of-Service "A" conditions and the existing driveway will experience better traffic operating conditions. A descriptive summary of the Synchro analysis results shown in Table 3 for each study intersection is provided below.

Sleepy Hollow Road & Long Hill Road East

- Under Existing conditions at this unsignalized intersection, all four approach movements operate at level of service (LOS) "A" during the weekday AM and PM peak hours.
- In the future under No-Build conditions (without the proposed Project, but with forecast increases in existing traffic volumes), the individual movements will continue to operate at existing levels of service during both peak hours. Changes in individual movement delays will be imperceptible (0.1 seconds or less).
- Under future Build conditions (with the proposed Project traffic), the individual movements will continue to operate at No-Build levels of service during both peak hours. Changes in individual movement delays will be imperceptible (0.1 seconds or less).

Sleepy Hollow Road & Old Sleepy Hollow Road Extension

- Under Existing conditions at this unsignalized intersection, all three approach movements operate at level of service LOS "A" during the weekday AM and PM peak hours.

- In the future under No-Build conditions (without the proposed Project, but with forecast increases in existing traffic volumes), the individual movements will continue to operate at existing levels of service during both peak hours. Individual movement delays will remain effectively unchanged.
- Under future Build conditions (with the proposed Project traffic), the individual movements will continue to operate at No-Build levels of service during both peak hours. Changes in individual movement delays will be imperceptible (0.2 seconds or less).

Sleepy Hollow Road & Site Driveway

- Under future Build conditions (with the proposed Project traffic), the Site Driveway will experience LOS "A" conditions during both peak hours. Delays to main line traffic on Sleepy Hollow Road will be minimal (1.4 seconds or less).

US Route 9 & Sleepy Hollow Road

- Under Existing conditions at this unsignalized intersection, the northbound and southbound movements operate at level of service (LOS) "A" during the weekday AM and PM peak hours, while the Sleepy Hollow Road westbound movement operates at a LOS "F" during the AM peak hour and a LOS "D" during the PM peak hour. Although the Sleepy Hollow Road approach operates at LOS "F" during the AM peak hour, the volumes exiting onto US Route 9 are low (15) and the volume to capacity ratio⁵ (v/c ratio) of 0.27 indicates that the roadway is operating with available capacity.
- In the future under No-Build conditions (without the proposed Project, but with forecast increases in existing traffic volumes), the individual movements will continue to operate at existing levels of service during both peak hours. Delays on the Sleepy Hollow Road approach will increase by 5.5 seconds during the weekday AM peak hour and by 0.8 seconds during the PM peak hour. There will be an imperceptible increase in the v/c ratio for the westbound approach during the AM peak hour (from 0.27 Existing to 0.28 No-Build).
- Under future Build conditions (with the proposed Project traffic), the individual movements will continue to operate at No-Build levels of service during both peak hours. Delays on the Sleepy Hollow Road approach will be similar to No-Build delays during the AM and PM peak hours. The Project will add only 2 trips to the Sleepy Hollow Road approach during the AM peak hour and only 1 trip during the PM peak hour. The v/c ratio for the westbound approach will see a slight increase (from 0.28 No-Build to 0.31 Build), however, the approach will continue to have significant reserve capacity.

As described above, the results of the Synchro analyses indicate that the Project's traffic will not have a significant adverse impact on traffic operations at the study intersections or on the surrounding roadways.

⁵ The v/c ratio is a performance measure and, in general, measures the level of congestion on a roadway, approach or movement. A v/c ratio of 1.00 represents an approach or movement that is at capacity.

8.0 POTENTIAL IMPACTS

8.1 Construction Activities

The Project will result in the construction of 29 new homes on the property and a new private road providing access to the site. The construction schedule estimates that the maximum trips generated to the site will be during the first year of construction. It is anticipated that no more than 10 worker vehicles will be on site at any given time. This number is supported by the fact that most of the labor force carpools having 2-4 people per vehicle. Most likely 5-7 vehicles can be assumed for the labor force in addition to an additional vehicle for the project manager, project engineer, surveyor, and municipal inspector. If all are on site at the same time, then 10 worker vehicles can be assumed daily. During this maximum construction activity period, there will be approximately 5 to 10 daily truck deliveries of materials and an average of 20 workers on site. Construction will occur on weekdays from approximately 8:00 a.m. to 4:30 p.m.⁶ It is estimated that during the morning peak hour there will be at most 17 construction-related vehicles accessing the site (7 delivery trips and 10 worker trips). During the afternoon peak hour, there is expected to be a similar level of worker and delivery traffic activity.

Construction traffic impact, which will be temporary, will occur over the course of approximately 3 years. As detailed herein, the existing roadways have ample capacity and were able to support the construction of the existing 300+ homes in the neighborhood. Therefore, any impacts associated with construction traffic are expected to be minimal.

8.2 Sight Distances

A sight distance analysis was conducted at the location of the proposed site driveway on Sleepy Hollow Road to determine if adequate intersection and stopping sight distances are provided. The sight distance requirements were determined based on criteria provided in the American Association of State Highway and Transportation Officials' (AASHTO) publication, *A Policy on Geometric Design of Highways and Streets*, 6th Edition (2011). Speed survey data conducted in March 2021 on Sleepy Hollow Road near the proposed site driveway indicates an 85th percentile speed of 38 mph northbound and 37 mph southbound, which is above the posted speed limit of 30 mph.

For intersection sight distances, the available sight distance on a minor street or driveway should provide drivers with a sufficient view of the intersecting highway to allow vehicles to enter or exit the intersection without "unduly interfering with major-road traffic operations" which is assumed to mean without excessively slowing through traffic (i.e., vehicles traveling at near the operating speed).

Per AASHTO, based on the 85th percentile speeds, a sight distance of 420 feet looking to the left and 410 feet looking to the right is recommended for a motorist exiting the site driveway. Measurements reveal that

⁶ Construction activities will be limited by whatever restrictions are applicable from the Town Code.

545 feet of sight distance can be provided to the left and 410 feet to the right. The views to the left and right may require some minor vegetation removal to achieve these sight distances.

Stopping sight distance, the length of roadway that is visible to the driver, should be of sufficient length to allow a vehicle traveling at or near the operating speed to stop safely before reaching a stationary object in its path. In cases where sufficient intersection sight distance is not available, the stopping sight distance is the limiting factor in determining if an intersection or approach will provide sufficient sight distance.

For stopping sight distance, AASHTO recommends 265 feet of stopping sight distance for a driver traveling northbound on Sleepy Hollow Road and 270 feet for a southbound driver on Sleepy Hollow Road. Field measurements indicate that the stopping sight distance for a driver travelling in either direction on Sleepy Hollow Road is over 400 feet.

Therefore, based on the sight distance analyses, the proposed site driveway will have sufficient sight distance.

8.3 Other Potential Impacts

Pedestrian and Bicycle Activity

Due to the lack of pedestrian facilities and shoulders, there is minimal pedestrian and bicycle activity on the study area roadways. The surveys conducted at the study intersections revealed a total of 7 pedestrians during the entire 7-hour survey period. The Project will add up to 26 trips which will be dispersed on area roadways. Therefore, the additional Project traffic will not have a significant adverse impact on pedestrian or bicycle activity in the area.

Hiking and Trailhead Parking

The new residents will have the opportunity to use the nearby trails if so desired. Assuming, conservatively, that 10 percent of the Project's peak hour exiting trips or entering trips will drive to or from the trailhead parking areas⁷ (described in Section 3.4), that would result in only 2 additional vehicles at the trailheads at any one time, and probably no more than one additional vehicle at any trail head at any given time. Therefore, given the low volumes, the Project is not anticipated to have a significant adverse impact on any of the many trailhead parking areas.

Public Transportation

The Project's residents will be able to travel by train from the nearby Scarborough or Pleasantville Metro-North Railroad stations or travel by bus via the Bee-line Bus routes along US Route 9. Although public transit usage by the Project's residents' is unknown, conservatively assuming 1 rail commuter per household, there would be 28 riders added who would be dispersed to the Scarborough and Pleasantville

⁷ Vehicles traveling to the trail heads will not be there at the same time as vehicles traveling from the trail heads.

stations. These riders would likely not take the same train to and from work, further dispersing the riders. As such, it is not anticipated that the Project will have a significant impact on public transportation.

Delivery Trucks

As previously discussed, as with other homes in the area, delivery trucks from Federal Express, UPS, etc. will also deliver to the Project's new residences. Typically, delivery drivers will service an area simultaneously rather than making multiple trips over the course of a day to one area. As such, it is not anticipated that the new residences will significantly increase delivery traffic in the area. Therefore, delivery traffic is not anticipated to result in a significant adverse impact on traffic operations along area roadways. The same applies for refuse collection.

School Bus impacts

As with other Pocantico Hills School District homes in the area, school children will be picked up and dropped off by the many existing school buses that currently serve the area. Therefore, school bus impacts from the proposed development will be minimal.

9.0 CONCLUSIONS

Based on the analysis provided herein, it is concluded acceptable sight distances will be provided for drivers exiting the proposed site driveway or approaching the driveway on Sleepy Hollow Road and that the increase in traffic volumes associated with the proposed development will not have a significant adverse impact on traffic operations at any of the study intersections. Therefore, no traffic impact mitigation measures are required and none are proposed.

Appendix

- Synchro Analysis Reports
- FHWA Highway Capacity Calculation



Synchro Analysis Reports

2021 Existing Volumes
1: Sleepy Hollow Rd & Long Hill Rd East

AM Peak Hour

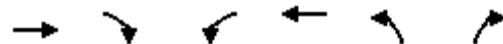
01/04/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	101	5	31	102	13	7	17	38	23	22	0
Future Volume (vph)	5	101	5	31	102	13	7	17	38	23	22	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	5	111	5	34	112	14	8	19	42	25	24	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	121	160	69	49								
Volume Left (vph)	5	34	8	25								
Volume Right (vph)	5	14	42	0								
Hadj (s)	0.01	0.15	-0.15	0.24								
Departure Headway (s)	4.4	4.5	4.5	4.9								
Degree Utilization, x	0.15	0.20	0.09	0.07								
Capacity (veh/h)	792	771	752	685								
Control Delay (s)	8.1	8.6	7.9	8.2								
Approach Delay (s)	8.1	8.6	7.9	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay					8.3							
Level of Service					A							
Intersection Capacity Utilization				29.3%		ICU Level of Service				A		
Analysis Period (min)				15								

2021 Existing Volumes
2: Old Sleepy Hollow Rd Ext & Sleepy Hollow Rd

AM Peak Hour
01/04/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1	1	1	1	1	1
Traffic Volume (veh/h)	8	6	37	14	2	34
Future Volume (Veh/h)	8	6	37	14	2	34
Sign Control	Free			Free	Stop	
Grade	-6%			-7%	9%	
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56
Hourly flow rate (vph)	14	11	66	25	4	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		25		176	20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		25		176	20	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		96		99	94	
cM capacity (veh/h)		1603		784	1064	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	25	91	65			
Volume Left	0	66	4			
Volume Right	11	0	61			
cSH	1700	1603	1041			
Volume to Capacity	0.01	0.04	0.06			
Queue Length 95th (ft)	0	3	5			
Control Delay (s)	0.0	5.4	8.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.4	8.7			
Approach LOS		A				
Intersection Summary						
Average Delay		5.8				
Intersection Capacity Utilization		19.5%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	5	507	14	16	1381
Future Volume (Veh/h)	10	5	507	14	16	1381
Sign Control	Stop		Free			Free
Grade	1%		0%			4%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	11	5	557	15	18	1518
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2118	286		572		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2118	286		572		
tC, single (s)	6.9	7.0		4.2		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	74	99		98		
cM capacity (veh/h)	42	708		990		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	16	371	201	1536		
Volume Left	11	0	0	18		
Volume Right	5	0	15	0		
cSH	59	1700	1700	990		
Volume to Capacity	0.27	0.22	0.12	0.02		
Queue Length 95th (ft)	24	0	0	1		
Control Delay (s)	86.6	0.0	0.0	1.6		
Lane LOS	F			A		
Approach Delay (s)	86.6	0.0		1.6		
Approach LOS	F					
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization		95.4%		ICU Level of Service		F
Analysis Period (min)		15				

2021 Existing Conditions
1: Sleepy Hollow Rd & Long Hill Rd East

PM Peak Hour

01/04/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	77	6	28	83	20	4	19	35	7	18	3
Future Volume (vph)	3	77	6	28	83	20	4	19	35	7	18	3
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	89	7	32	95	23	5	22	40	8	21	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	99	150	67	32								
Volume Left (vph)	3	32	5	8								
Volume Right (vph)	7	23	40	3								
Hadj (s)	-0.02	0.06	-0.25	0.07								
Departure Headway (s)	4.3	4.3	4.2	4.6								
Degree Utilization, x	0.12	0.18	0.08	0.04								
Capacity (veh/h)	816	817	794	726								
Control Delay (s)	7.8	8.2	7.6	7.8								
Approach Delay (s)	7.8	8.2	7.6	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay					8.0							
Level of Service					A							
Intersection Capacity Utilization				24.1%		ICU Level of Service				A		
Analysis Period (min)				15								



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1	1	1	1	1	1
Traffic Volume (veh/h)	6	18	29	11	13	31
Future Volume (Veh/h)	6	18	29	11	13	31
Sign Control	Free			Free	Stop	
Grade	-6%			-7%	9%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	21	34	13	15	36
Pedestrians					2	
Lane Width (ft)				11.0		
Walking Speed (ft/s)				3.5		
Percent Blockage				0		
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		30		100	20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		30		100	20	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		98		98	97	
cM capacity (veh/h)		1593		882	1051	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	28	47	51			
Volume Left	0	34	15			
Volume Right	21	0	36			
cSH	1700	1593	995			
Volume to Capacity	0.02	0.02	0.05			
Queue Length 95th (ft)	0	2	4			
Control Delay (s)	0.0	5.3	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.3	8.8			
Approach LOS		A				
Intersection Summary						
Average Delay		5.6				
Intersection Capacity Utilization		18.9%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	14	1040	9	6	845
Future Volume (Veh/h)	3	14	1040	9	6	845
Sign Control	Stop		Free			Free
Grade	1%		0%			4%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	15	1118	10	6	909
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2044	564		1128		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2044	564		1128		
tC, single (s)	6.9	7.0		4.2		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	94	97		99		
cM capacity (veh/h)	48	466		609		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	18	745	383	915		
Volume Left	3	0	0	6		
Volume Right	15	0	10	0		
cSH	189	1700	1700	609		
Volume to Capacity	0.10	0.44	0.23	0.01		
Queue Length 95th (ft)	8	0	0	1		
Control Delay (s)	26.1	0.0	0.0	0.3		
Lane LOS	D		A			
Approach Delay (s)	26.1	0.0		0.3		
Approach LOS	D					
Intersection Summary						
Average Delay		0.4				
Intersection Capacity Utilization		59.2%		ICU Level of Service		B
Analysis Period (min)		15				

No-Build Conditions
1: Sleepy Hollow Rd & Long Hill Rd East

AM Peak Hour

01/04/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	103	5	31	104	13	7	17	39	23	22	0
Future Volume (vph)	5	103	5	31	104	13	7	17	39	23	22	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	5	113	5	34	114	14	8	19	43	25	24	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	123	162	70	49								
Volume Left (vph)	5	34	8	25								
Volume Right (vph)	5	14	43	0								
Hadj (s)	0.01	0.15	-0.16	0.24								
Departure Headway (s)	4.4	4.5	4.5	4.9								
Degree Utilization, x	0.15	0.20	0.09	0.07								
Capacity (veh/h)	790	770	751	683								
Control Delay (s)	8.2	8.6	7.9	8.2								
Approach Delay (s)	8.2	8.6	7.9	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay					8.3							
Level of Service					A							
Intersection Capacity Utilization				29.4%		ICU Level of Service				A		
Analysis Period (min)				15								

No-Build Conditions
2: Old Sleepy Hollow Rd Ext & Sleepy Hollow Rd

AM Peak Hour

01/04/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1	2	3	4	5	6
Traffic Volume (veh/h)	8	6	38	14	2	35
Future Volume (Veh/h)	8	6	38	14	2	35
Sign Control	Free			Free	Stop	
Grade	-6%			-7%	9%	
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56
Hourly flow rate (vph)	14	11	68	25	4	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		25		180	20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		25		180	20	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		96		99	94	
cM capacity (veh/h)		1603		778	1064	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	25	93	66			
Volume Left	0	68	4			
Volume Right	11	0	62			
cSH	1700	1603	1041			
Volume to Capacity	0.01	0.04	0.06			
Queue Length 95th (ft)	0	3	5			
Control Delay (s)	0.0	5.5	8.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.5	8.7			
Approach LOS		A				
Intersection Summary						
Average Delay		5.9				
Intersection Capacity Utilization		19.5%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	5	515	14	16	1402
Future Volume (Veh/h)	10	5	515	14	16	1402
Sign Control	Stop		Free			Free
Grade	1%		0%			4%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	11	5	566	15	18	1541
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2150	290		581		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2150	290		581		
tC, single (s)	6.9	7.0		4.2		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	72	99		98		
cM capacity (veh/h)	40	703		982		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	16	377	204	1559		
Volume Left	11	0	0	18		
Volume Right	5	0	15	0		
cSH	57	1700	1700	982		
Volume to Capacity	0.28	0.22	0.12	0.02		
Queue Length 95th (ft)	25	0	0	1		
Control Delay (s)	92.1	0.0	0.0	1.8		
Lane LOS	F			A		
Approach Delay (s)	92.1	0.0		1.8		
Approach LOS	F					
Intersection Summary						
Average Delay		2.0				
Intersection Capacity Utilization		96.6%		ICU Level of Service		F
Analysis Period (min)		15				

No-Build Conditions
1: Sleepy Hollow Rd & Long Hill Rd East

PM Peak Hour

01/04/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	78	6	28	84	20	4	19	36	7	18	3
Future Volume (vph)	3	78	6	28	84	20	4	19	36	7	18	3
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	90	7	32	97	23	5	22	41	8	21	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	100	152	68	32								
Volume Left (vph)	3	32	5	8								
Volume Right (vph)	7	23	41	3								
Hadj (s)	-0.02	0.06	-0.25	0.07								
Departure Headway (s)	4.3	4.3	4.3	4.6								
Degree Utilization, x	0.12	0.18	0.08	0.04								
Capacity (veh/h)	815	816	793	724								
Control Delay (s)	7.8	8.2	7.6	7.8								
Approach Delay (s)	7.8	8.2	7.6	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay					8.0							
Level of Service					A							
Intersection Capacity Utilization				24.2%		ICU Level of Service				A		
Analysis Period (min)				15								

No-Build Conditions
2: Old Sleepy Hollow Rd Ext & Sleepy Hollow Rd

PM Peak Hour

01/04/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↓	↖	↙	↖	↗
Traffic Volume (veh/h)	6	18	29	11	13	31
Future Volume (Veh/h)	6	18	29	11	13	31
Sign Control	Free			Free	Stop	
Grade	-6%			-7%	9%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	21	34	13	15	36
Pedestrians					2	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		30		100	20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		30		100	20	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		98		98	97	
cM capacity (veh/h)		1593		882	1051	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	28	47	51			
Volume Left	0	34	15			
Volume Right	21	0	36			
cSH	1700	1593	995			
Volume to Capacity	0.02	0.02	0.05			
Queue Length 95th (ft)	0	2	4			
Control Delay (s)	0.0	5.3	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.3	8.8			
Approach LOS		A				
Intersection Summary						
Average Delay		5.6				
Intersection Capacity Utilization		18.9%		ICU Level of Service		A
Analysis Period (min)		15				

No-Build Conditions
4: US Route 9 & Sleepy Hollow Rd

PM Peak Hour

01/04/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	14	1056	9	6	858
Future Volume (Veh/h)	3	14	1056	9	6	858
Sign Control	Stop		Free			Free
Grade	1%		0%			4%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	15	1135	10	6	923
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2075	572		1145		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2075	572		1145		
tC, single (s)	6.9	7.0		4.2		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	93	97		99		
cM capacity (veh/h)	45	460		600		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	18	757	388	929		
Volume Left	3	0	0	6		
Volume Right	15	0	10	0		
cSH	182	1700	1700	600		
Volume to Capacity	0.10	0.45	0.23	0.01		
Queue Length 95th (ft)	8	0	0	1		
Control Delay (s)	26.9	0.0	0.0	0.3		
Lane LOS	D		A			
Approach Delay (s)	26.9	0.0		0.3		
Approach LOS	D					
Intersection Summary						
Average Delay		0.4				
Intersection Capacity Utilization		59.9%		ICU Level of Service		B
Analysis Period (min)		15				

Build Conditions

1: Sleepy Hollow Rd & Long Hill Rd East

AM Peak Hour

01/04/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	103	5	33	104	13	8	19	42	23	23	0
Future Volume (vph)	5	103	5	33	104	13	8	19	42	23	23	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	5	113	5	36	114	14	9	21	46	25	25	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	123	164	76	50								
Volume Left (vph)	5	36	9	25								
Volume Right (vph)	5	14	46	0								
Hadj (s)	0.01	0.15	-0.15	0.24								
Departure Headway (s)	4.4	4.5	4.5	4.9								
Degree Utilization, x	0.15	0.20	0.09	0.07								
Capacity (veh/h)	785	766	748	681								
Control Delay (s)	8.2	8.6	8.0	8.3								
Approach Delay (s)	8.2	8.6	8.0	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay					8.3							
Level of Service					A							
Intersection Capacity Utilization				29.4%		ICU Level of Service				A		
Analysis Period (min)				15								

Build Conditions

2: Old Sleepy Hollow Rd Ext & Sleepy Hollow Rd

AM Peak Hour

01/04/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	8	6	45	16	2	37
Future Volume (Veh/h)	8	6	45	16	2	37
Sign Control	Free			Free	Stop	
Grade	-6%			-7%	9%	
Peak Hour Factor	0.56	0.56	0.56	0.56	0.56	0.56
Hourly flow rate (vph)	14	11	80	29	4	66
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		25		208	20	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		25		208	20	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		95		99	94	
cM capacity (veh/h)		1603		744	1064	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	25	109	70			
Volume Left	0	80	4			
Volume Right	11	0	66			
cSH	1700	1603	1039			
Volume to Capacity	0.01	0.05	0.07			
Queue Length 95th (ft)	0	4	5			
Control Delay (s)	0.0	5.5	8.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.5	8.7			
Approach LOS		A				
Intersection Summary						
Average Delay		5.9				
Intersection Capacity Utilization		20.0%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	6	46	3	2	46
Future Volume (Veh/h)	10	6	46	3	2	46
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	7	50	3	2	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	106	52			53	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106	52			53	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	896	1022			1566	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	53	52			
Volume Left	11	0	2			
Volume Right	7	3	0			
cSH	941	1700	1566			
Volume to Capacity	0.02	0.03	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.9	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	8.9	0.0	0.3			
Approach LOS	A					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		14.0%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	6	515	14	16	1402
Future Volume (Veh/h)	11	6	515	14	16	1402
Sign Control	Stop		Free			Free
Grade	1%		0%			4%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	12	7	566	15	18	1541
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2150	290		581		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2150	290		581		
tC, single (s)	6.9	7.0		4.2		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	70	99		98		
cM capacity (veh/h)	40	703		982		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	19	377	204	1559		
Volume Left	12	0	0	18		
Volume Right	7	0	15	0		
cSH	61	1700	1700	982		
Volume to Capacity	0.31	0.22	0.12	0.02		
Queue Length 95th (ft)	28	0	0	1		
Control Delay (s)	88.6	0.0	0.0	1.8		
Lane LOS	F			A		
Approach Delay (s)	88.6	0.0		1.8		
Approach LOS	F					
Intersection Summary						
Average Delay		2.1				
Intersection Capacity Utilization		96.6%		ICU Level of Service		F
Analysis Period (min)		15				

Build Conditions

1: Sleepy Hollow Rd & Long Hill Rd East

PM Peak Hour

01/10/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	78	7	32	84	20	5	20	38	7	20	3
Future Volume (vph)	3	78	7	32	84	20	5	20	38	7	20	3
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	90	8	37	97	23	6	23	44	8	23	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	101	157	73	34								
Volume Left (vph)	3	37	6	8								
Volume Right (vph)	8	23	44	3								
Hadj (s)	-0.03	0.06	-0.24	0.07								
Departure Headway (s)	4.3	4.3	4.3	4.6								
Degree Utilization, x	0.12	0.19	0.09	0.04								
Capacity (veh/h)	809	810	787	719								
Control Delay (s)	7.9	8.3	7.7	7.9								
Approach Delay (s)	7.9	8.3	7.7	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay					8.0							
Level of Service					A							
Intersection Capacity Utilization				24.7%		ICU Level of Service				A		
Analysis Period (min)				15								



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↓	↖	↙	↖	↗
Traffic Volume (veh/h)	8	18	34	12	13	40
Future Volume (Veh/h)	8	18	34	12	13	40
Sign Control	Free			Free	Stop	
Grade	-6%			-7%	9%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	9	21	40	14	15	47
Pedestrians					2	
Lane Width (ft)					11.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume		32		116	22	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol		32		116	22	
tC, single (s)		4.1		6.4	6.2	
tC, 2 stage (s)						
tF (s)		2.2		3.5	3.3	
p0 queue free %		97		98	96	
cM capacity (veh/h)		1590		861	1048	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	30	54	62			
Volume Left	0	40	15			
Volume Right	21	0	47			
cSH	1700	1590	996			
Volume to Capacity	0.02	0.03	0.06			
Queue Length 95th (ft)	0	2	5			
Control Delay (s)	0.0	5.5	8.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.5	8.9			
Approach LOS		A				
Intersection Summary						
Average Delay		5.8				
Intersection Capacity Utilization		19.2%		ICU Level of Service		A
Analysis Period (min)		15				



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		W		W	W
Traffic Volume (veh/h)	6	4	37	11	7	32
Future Volume (Veh/h)	6	4	37	11	7	32
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	4	40	12	8	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	97	46			52	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	97	46			52	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			99	
cM capacity (veh/h)	902	1029			1567	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	11	52	43			
Volume Left	7	0	8			
Volume Right	4	12	0			
cSH	945	1700	1567			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.9	0.0	1.4			
Lane LOS	A		A			
Approach Delay (s)	8.9	0.0	1.4			
Approach LOS	A					
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		17.7%		ICU Level of Service		A
Analysis Period (min)		15				

Build Conditions
4: US Route 9 & Sleepy Hollow Rd

PM Peak Hour

01/10/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	14	1056	10	7	858
Future Volume (Veh/h)	4	14	1056	10	7	858
Sign Control	Stop		Free			Free
Grade	1%		0%			4%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	15	1135	11	8	923
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2080	573		1146		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2080	573		1146		
tC, single (s)	6.9	7.0		4.2		
tC, 2 stage (s)						
tF (s)	3.5	3.3		2.2		
p0 queue free %	91	97		99		
cM capacity (veh/h)	45	460		600		
Direction, Lane #	WB 1	NB 1	NB 2	SB 1		
Volume Total	19	757	389	931		
Volume Left	4	0	0	8		
Volume Right	15	0	11	0		
cSH	156	1700	1700	600		
Volume to Capacity	0.12	0.45	0.23	0.01		
Queue Length 95th (ft)	10	0	0	1		
Control Delay (s)	31.3	0.0	0.0	0.4		
Lane LOS	D			A		
Approach Delay (s)	31.3	0.0		0.4		
Approach LOS	D					
Intersection Summary						
Average Delay		0.5				
Intersection Capacity Utilization		60.7%		ICU Level of Service		B
Analysis Period (min)		15				



FHWA Highway Capacity Calculation

Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System

October 2017



U.S. Department of Transportation
Federal Highway Administration

US Route 9

Table 15. Signalized highway generalized service volume table.

Number Lanes	% Green Time	Speed Limit	Level of Service			
			B Service Volume	C Service Volume	D Service Volume	E Service Volume
2	40	35	12,800	14,900	16,400	18,700
		40	12,600	14,400	15,900	17,700
		45	12,000	14,200	15,500	17,400
		50	11,800	13,800	15,200	16,700
		55	12,300	14,100	15,400	16,900
		60	12,700	14,300	15,500	17,100
	45	35	14,600	16,900	18,500	21,100
		40	14,400	16,300	18,000	20,000
		45	13,900	16,100	17,600	19,700
		50	13,600	15,700	17,200	18,900
		55	14,200	16,000	17,400	19,100
		60	14,600	16,200	17,600	19,300
	50	35	16,500	18,900	20,700	23,600
		40	16,300	18,300	20,100	22,300
		45	15,700	18,100	19,600	22,000
		50	15,500	17,700	19,200	21,100
		55	16,100	17,900	19,500	21,400
		60	16,400	18,100	19,600	21,500
	55	35	18,400	20,900	22,900	26,000
		40	18,100	20,300	22,200	24,700
		45	17,600	20,000	21,700	24,300
		50	17,400	19,600	21,300	23,400
		55	17,900	19,900	21,500	23,600
		60	18,300	20,100	21,700	23,800
	60	35	20,300	22,900	25,100	28,500
		40	20,000	22,200	24,400	27,000
		45	19,500	22,000	23,800	26,600
		50	19,300	21,500	23,300	25,600
		55	19,800	21,800	23,600	25,800
		60	20,200	22,100	23,800	26,100

Sleepy Hollow Road, Long Ridge Hill Road and Old Sleepy Hollow Road

Table 16. Stop sign-controlled highways generalized service volume table.

Land Use	Functional System	Level of Service		
		B Service Volume	C Service Volume	D Service Volume
Rural	Collector	5,900	9,300	10,600
	Minor Arterial	6,800	10,200	11,500
	Collector	5,900	9,300	10,600
Urban	Princ. Arterial	5,200	8,500	9,800
	Minor Arterial	1,900	5,200	6,400
	Collector		2,800	4,000
				4,800

Table 17. Rural two-lane highways generalized service volume table.

Speed Limit	Terrain	Truck Pct.	Level of Service		
			B Service Volume	C Service Volume	D Service Volume
45	Flat	0	3,600	8,700	13,900
		2	3,500	8,700	13,900
		4	3,500	8,700	13,900
		6	3,500	8,700	13,900
		8	3,400	8,600	13,900
		10	3,400	8,600	13,900
	Rolling	0	3,600	8,700	13,900
		2	3,500	8,600	13,900
		4	3,400	8,500	13,900
		6	3,300	8,400	13,900
		8	3,300	8,200	13,900
		10	3,200	8,100	13,900
	Mountainous	0	3,600	8,700	13,900
		2	3,200	7,700	12,300
		4	2,800	7,000	11,100
		6	2,600	6,300	10,100
		8	2,400	5,800	9,300
		10	2,200	5,400	8,500