Underhill Farms Application

REVIEW OF UNDERHILL FARMS TRAFFIC/TRANSPORTATION ANALYSES

Prepared for:
Town of Yorktown

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1. Introduction

Underhill Farms (370 Underhill Avenue; S/B/L 48.06-1-30) is a proposed mixed-use development on the site of the former Soundview Preparatory School that would consist of 48 townhouses, a 32-unit condominium building, a 68-unit apartment building, and 17,580 square feet of retail and office space.

This report provides Transpo Group's review of the Traffic/Transportation analyses presented by the applicant's professionals, specifically:

- Expanded Environmental Assessment Form (EAF) dated 1/23/23
- PM Peak Hour Traffic Summary dated 6/17/22
- Summary of Traffic Study dated 4/26/22
- Traffic Impact Study (TIS) dated 4/11/22, and supporting electronic Synchro traffic-analysis and MS-Excel trip-distribution datafiles

The EAF contains certain changes from the April-2022 TIS; for instance the total number of new site-generated vehicle trips during the PM peak hour is calculated in the TIS to be 175 and in the EAF to be 178. This specific example is linked with changes to the development program specified for the site. It is assumed that the newer EAF supersedes the earlier documents.

This review considers both the technical analyses prepared on behalf of the applicant (in Section 2), as well as in Section 3 general observations. Throughout this document, yellow highlighting indicates specific recommendations.

2. Review of Accuracy of Technical Analyses

2.1 Development Program

The amount of proposed development is the core input used to calculate the amount of travel to and from the site (see next section), as well as the parking demand.

The EAF's Trip Generation analyses (see next section) account for a total of 20,000 square feet of non-residential development (9,500 sq. ft. Office; 5,500 sq. ft. Retail; 5,000 sq. ft. Restaurant).

The EAF's Parking adequacy analysis accounts for a total of 19,000 square feet of non-residential development (11,000 sq. ft. Retail; 7,000 sq. ft. Office/Retail; 1,000 sq. ft. Restaurant).

We recommend that the Applicant revise the analyses of Trip Generation and/or Parking Demand inputs to reflect consistency with one another as well as the proposed development program.

2.2 Trip Generation

The determination of the increase/decrease of trips on the road system uses an approach known as "trip generation". This is a standard technique that draws on established relationships between amounts of development and number-of-trips, using the Institute of Transportation Engineers' Trip Generation Manual (11th edition). The number of new trips generated by the proposed development is then used to determine the possibility of impacts on the roadway network and need for possible improvement measures.

AM and PM peak hour weekday trip generation rates are published by ITE for both the hour with the highest number of trips into/out of the development site, as well as the hour with the highest amount of traffic on the adjacent roadway. In general, the former of these two rates is the higher one. We recommend that the applicant provide both of these trip generation calculations.

The applicant's trip generation analysis uses a 40% credit for "pass-by" trips for the Retail and Restaurant uses. This refers to an estimate of how many of the trips entering/exiting the site to access these uses

represent a stop as part of a longer trip, as opposed to a 'new' trip. A larger 'pass-by' credit has the effect of reducing the number of trips passing through nearby intersections, for which the applicant is responsible for possible improvement measures. NYSDOT typically permits a pass-by credit of 25%[1]. We recommend that the applicant reduce the pass-by credit for the Retail and Restaurant land-uses from 40% to 25%.

Finally, the applicant proposes to use the "Fine Dining" land use category (ITE code 931) for purposes of generating vehicle-trips to/from the proposed Restaurant on the site. The Trip Generation Manual contains published trip generation rates for various types of restaurants, with the Fine Dining trip generation on the lower end of the rates. We recommend that the applicant either provide documentation of enforceable mechanisms to ensure that the restaurant that ultimately occupies this space is consistent with the definition of the Fine Dining category, or revise the trip generation analysis to use a Restaurant category that reflects the reasonable worst-case scenario (i.e. higher trip generation rates) if the type of Restaurant that can occupy this site is as yet undetermined.

2.3 Analysis of Impacts of "Potential Other Development"

The TIS presents traffic volumes which are asserted to account for potential other development in the Yorktown Heights hamlet, specifically: Roma Redevelopment, the redevelopment of the vacant former K-Mart and Food Emporium buildings, as well as the Commerce Street Hotel.

The documents reviewed do not contain the parameters of this analysis, specifically the assumed amount of development on each of these sites, the trip generation calculations, and the trip distribution approach.

We recommend that the Applicant provide this information documenting the trip generation and distribution analyses for "Potential other Development" so that it can be reviewed. This is important because it relates to the extent to which the Underhill Farms applicant or the developers of other sites are liable for making improvements to the road network (e.g. the improvement at the 118/Underhill Avenue intersection), which appears to be a part of the applicant's proposal to contribute funds to cover only part of the costs of installing turn lanes at the Underhill Avenue/118 intersection.

2.4 Trip Distribution

Trip Distribution refers to the directions (to/from roadway X to the east, to/from roadway Y to the north, etc.) that the generated trips will take to and from the development site.

We recommend that the applicant clarify which uses of the site (townhomes, condominiums, restaurant, etc.) are proposed to be accessed by vehicles turning into/out of the western (narrower) vs. the eastern (wider) proposed access points. It appears to us that a very large proportion of vehicles accessing the site are likely to use the eastern driveway, with the main (possibly only) users of the western driveway being the townhomes. There is also a discrepancy between the arrival/departure figures; for instance Figure 11 of the EAF claims that 10% of traffic leaving the site will turn left from the western driveway and 10% will turn right from this same driveway, whereas Figure 13 shows more than twice the number turning right versus left (15 vehicles vs. 7). Increasing the proportion of right-turning vs. left-turning movements at this intersection has the effect of both making the level of service at this access point calculated to be better, and reducing the calculation of this applicant's impact on Level of Service at the 118/Underhill Ave intersection. We recommend that the applicant confirm this apparent discrepancy and if necessary revise the analysis.

[1] Examples include:
http://www.yorktownny.org/sites/default/files/fileattachments/planning/page/209/section_iii.k.__9-10-12.pdf ,
https://www.tarrytownny.gov/sites/g/files/vyhlif1306/f/uploads/39-51_traffic_study_initial_8_7_20.pdf , and
https://mynewcastle.org/DocumentCenter/View/610/12-04-2018-Applicant-Request-PDF

The EAF assumes that 15% of the site-generated vehicular traffic will access Underhill Farms through the proposed cross-access to Beaver Ridge, with 5% coming from Beaver Ridge itself, 5% from Allan Avenue, and the remaining 5% from Rt 118. In our opinion this 15% is a high estimate given the indirect routing through the Beaver Ridge property, and that it is particularly unlikely that 5% of the *vehicle*-trips will originate from the neighboring Beaver Ridge property. The effect of selecting a higher value for this item is to reduce the amount of site-generated traffic that is modeled as passing through the 118/Underhill Avenue intersection, and hence reducing this applicant's calculation of impact on this intersection. We recommend that the applicant substantiate the selection of 15% for this value.

2.5 Intersection Capacity Analyses

"Capacity Analysis" refers to the calculation of the Level of Service (classified in letter grades A through F) at the site access points and potentially impacted intersections in the vicinity of the proposed development. Capacity analysis was performed by the applicant using industry-standard Synchro software. We recommend that the capacity analyses should be revised by the applicant to reflect the recommended changes to the Trip Generation analysis (see Section 2.2).

The eastbound approach of the Rt 118/Underhill Avenue intersection is modeled by the Applicant as having a single lane that accommodates through traffic as well as both left-turning and right-turning traffic. This is inaccurate: the right-turning movement is yield-controlled and currently is allocated a short dedicated turn lane. Based on aerial photography, it appears that eastbound right-turning vehicles can pass up to approximately three eastbound through/left-turning vehicles stopped at this approach's stopline; see Figure 1. We recommend that the analysis be revised to reflect this channelized yield-controlled right turn. Using the applicant's Synchro input files, this revision by itself appears to result in the calculated existing-conditions PM Level of Service at this intersection going from 'D' (40 seconds of delay) to 'C' (33 seconds of delay).

Figure 1: Aerial photography showing channelized right-turn of eastbound Underhill Avenue approach to NY 118 (source: Google Maps)

The applicant's capacity analysis uses a value of 0.95 for the "Peak Hour Factor" (PHF) for all turning movements in the analysis. Values closer to 1.0 have the effect of resulting in calculations of better LOS,

and lower values have the effect of resulting in calculations of worse LOS (note that the default PHF value in Synchro is 0.92, rather than 0.95). We recommend that the analysis be revised to include separate calculations of PHF for each turning-movement based on traffic count data, consistent with best practices as well as recent practice within Yorktown[2].

2.6 Scope of Traffic Analysis

The applicant's traffic study for Underhill Farms does not analyze possible impacts to traffic flow at the "Triangle" intersection, which is the main bottleneck within the Yorktown Heights road system and is located approximately ½ mile to the north of the project site. It also does not consider the potential for possible impacts at the 118/Downing Drive intersection located between Underhill Farms and the Triangle intersection. The applicant's offer of $450K (see Section 2.7 below) towards traffic improvements appears to be focused on the Underhill/118 intersection, and does not contribute to the cost of potential improvements at those other nearby intersections.

However, the applicant's analysis does consider traffic from other potential development sites in the vicinity of the Triangle intersection, including sites on the other side of it (specifically the Roma Building located immediately north of it), making the argument that this traffic contributes to the need for improvements at the Underhill/118 intersection. The Roma Building's 2018 traffic study likewise did not analyze the intersection of Underhill/118.

2.7 Applicant's offer of $450K towards improving Underhill/118 intersection

The EAF proposes a set of improvement measures that does not include adding turn lanes to the Underhill/118 intersection, and concludes that with the smaller proposed improvement measures in place traffic associated with the Underhill Farms site will not cause significant impacts. We recommend that the applicant revise the traffic analysis as set forth in this report, which will provide the information needed to form a view of whether we concur.

In the EAF, the applicant offers $450K to Yorktown towards the costs of improving the Underhill/118 intersection by adding turn lanes to some movements which currently use lanes that are shared with through traffic. Specifically, two improvement options have been presented:

1) Alternate 1 (cost estimate of $800K prepared by the applicant): Adds left turn lanes eastbound and westbound and a right turn lane southbound.
2) Alternate 2 (cost estimate of $1.5M prepared by the applicant): Same as Option #1, but also adds left turn lanes northbound and southbound.

As context, the complementary eastbound left and southbound right are the heaviest turning movements at this intersection (at 363 and 231 vehicles/hour, per the applicant's analysis of Existing Conditions). All other turning movements that would be provided additional turning lanes under these Alternates 1 or 2 are much lower (none exceeds 40 vehicles/hour in Existing Conditions).

The applicant argues that existing traffic congestion (LOS) at this intersection would be substantially improved by either of the Alternates. For illustrative purposes: if the applicant's traffic analyses were to be accepted by the Town as-is (notwithstanding the issues identified in this review), the improvement in traffic flow at this intersection would be noticeable (LOS 'B' after construction of the smaller 'Alternate 1' set of improvements vs LOS 'D' today, as claimed by the applicant). The detailed result will vary pending resolution of the technical issues, but this general conclusion appears unlikely to change.

[2] This is consistent with the specification of separate PHFs for each turning movement in the analysis of the nearby "Triangle" intersection (Rt 118/202/Commerce St) performed in the traffic study for the "Roma Building", dated 10/24/2018.

We recommend the following with respect to this offer:

1) We recommend that the applicant provide documentation demonstrating its calculation of the $450K offer towards improvements at the Underhill/118 intersection.
2) We recommend that any cost estimate for the Underhill/118 intersection that underpins the proposed $450K contribution be revisited, in light of large unanticipated highway construction cost increases that have occurred post-pandemic. As context, USDOT's national highway construction cost index increased 37% from Q4 of 2020 to Q2 of 2022 (latest published data[3]).
3) We recommend that the applicant's revised traffic analysis form the basis for determining whether the proposed development would have traffic impacts, which may conclude that the Underhill Farms developer is required to add turn lanes as an appropriate improvement.

Finally, the applicant's traffic engineer has provided the detailed information (quantities and unit costs) that were used to develop the applicant's $800K and $1.5M cost estimates referenced above. Transpo is now reviewing this data and preparing updated cost estimates; we will provide this analysis via separate memorandum.

2.8 Traffic Signal Upgrades

In the EAF the applicant proposes to purchase communications modems, camera actuation, and adaptive software for the traffic signals at Underhill Avenue/118 and 118/Kear/Allen. We recommend that the applicant provide the specifications for these proposed items.

2.9 Feedback from NYSDOT

We understand that NYSDOT has been invited to provide comments on the applicant's traffic analysis and has indicated that it would do so, but this feedback has not yet been provided. NYSDOT's feedback will be an important input to the revised traffic analysis, given the site's adjacent to the state highway network.

2.10 Parking

As noted in Section 2.1 above, the parking analysis uses 1,000 square feet as the size of the restaurant, rather than the 5,000 square feet restaurant size which is used in the Trip Generation analysis. This and any remaining discrepancies needs to be reconciled in order to reach a determination of the adequacy of the proposed parking provision.

The EAF proposes shared-parking between the residential and retail uses on Underhill Farms, as well as between the residential use on Underhill Farms and the Senior Center located immediately adjacent on the Beaver Ridge property.

We recommend that the applicant provide calculations to demonstrate that the amount of shared parking that is proposed is reasonable given the time-of-day/day-of-week parking profiles of the respective land uses.

We also recommend that a shared-parking plan be provided by the applicant which describes any signed parking restrictions on the Underhill Farms site, as well as management/enforcement mechanisms (including for parking that would be located on Underhill Farms property and shared by residents of Underhill Farms as well as users the senior center on the Beaver Ridge property).

The condominium building proposes tandem parking. It would be reasonable to expect that residents of the Condo building may seek to avoid using the 'inner' tandem parking spaces in which the parked

[3] https://explore.dot.gov/views/NHIInflationDashboard/NHCCI

vehicle will be 'blocked in', and instead to use the nearby surface parking which does not require moving one of their cars to access another. Another issue with the proposed tandem parking is that the average provision of parking is 1.5 parking spaces per unit in the condo-building, but it would be necessary for two tandem parking spaces to be controlled by the same household. Does this mean that some units will be marketed as having two private parking spaces and others will be marketed as only having one parking space? If so, would there be mechanisms to prevent condo residents allocated one parking space from parking in parking spaces intended for other uses on the site? We recommend that the applicant clarify.

3. General observations

3.1 Proximity of Underhill Farms' main building to the portions of the hamlet east of Rt 118

The site layout as proposed shows a double-loaded parking aisle between the primary mixed-use building and Rt 118. Ideally in a hamlet environment, to support pedestrian connectivity the on-site parking would be provided to the rear of the buildings rather than along the street frontage. This would be consistent with Yorktown's Comprehensive Plan's vision[4] that the Town's hamlets "become more pedestrian friendly". Placing the main buildings closer to Rt 118 would enhance pedestrian connectivity between Underhill Farms and the portions of the hamlet to the east of Rt 118. It would, however, require that circulation and building placement be substantially modified.

The EAF states that sidewalks are proposed by the applicant along the site's frontage from Glenrock Street to Allan Avenue. This is consistent with the Town's Comprehensive Plan's vision that the Town's hamlets should become more pedestrian-friendly. We note that this proposed sidewalk network is not typical layout of sidewalks fronting close to the roadway; the proposed sidewalks are less direct and require crossing the internal streets. We recommend that:

1) Consideration be given to including a sidewalk connection along the southern curbline of the internal roadway to the south of the main mixed use building (highlighted by purple arrow in Figure 2.) This would allow pedestrians walking along this segment to avoid two crossings of this southern internal roadway.
2) The sidewalk network appears to be proposed to be located on private property at distance from the public right-of-way. It should be confirmed that the sidewalks between Glenrock and Beaver Ridge/Allan will be made accessible to the public at all times (or any restrictions clarified).

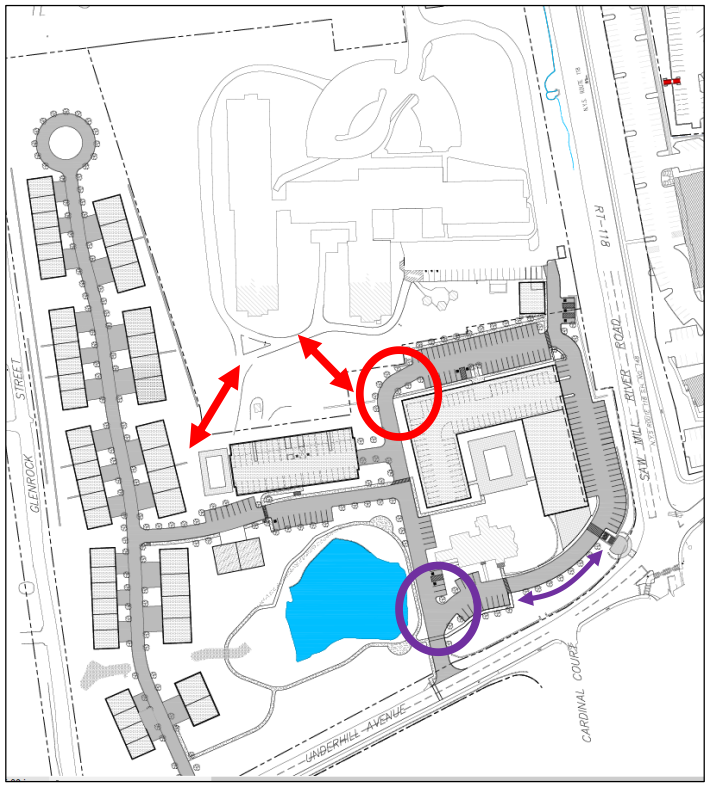
3.2 Access roadway near northwest corner of main building

The red circle drawn in Figure 2 highlights the northwest corner of the main proposed building, where the main loop access roadway is near to this corner of the building. We recommend that the applicant confirm that the line of sight for drivers using this roadway is adequate to safely avoid colliding with a person walking on the loop roadway, taking into account the obstruction to view from the building corner. It appears that one speed table is proposed in this area along the north-south roadway segment at the end of this curve; it may be desirable to include another on the east-west segment at the beginning of this curve.

[4] Page 3-1 of adopted 2010 Comprehensive Plan

It appears that sidewalks are not proposed along the red-circled section of the loop roadway. We recommend that they be considered at this portion of the site -- this would for instance enhance pedestrian connectivity between the senior center and the proposed recreation area around the lake.

Figure 2: Site Plan with selected locations highlighted (source: Submission by applicant dated 12/20/22)



3.3 Pedestrian connectivity to Beaver Ridge at northwest of Underhill Farms site

Policy 3-11 of Yorktown's Comprehensive Plan encourages cross-access arrangements.

A cross-access roadway is proposed by the applicant at the northeast of the site, connecting to the Beaver Ridge site. However, no connections from Underhill Farms to the north are proposed at other points.

Figure 2 above also shows two red arrows which depict possible locations for pedestrian/trailway access to Beaver Ridge. The western of these arrows is at the location of an existing disturbance dating to at

least 1990 (per the County's aerial photography) which appears to have previously provided cross-access between these two properties onwards to Underhill Avenue.

Cross-access arrangements, even if limited to pedestrians and possibly cyclists, can avoid long, inefficient routing that is undesirable in a hamlet context.

We recommend that the Town discuss with the applicant whether cross-access concepts such as those indicated in Figure 2 are practical.

3.4 Intersection of Cardinal Court and Underhill Avenue

We understand from discussions with Yorktown's Planning Department that Cardinal Court was once a through-roadway which was converted into a cul-de-sac when the present-day Rt 118 was built in the mid-20th century. Cardinal Court has two single-family homes located along its west side, for which the access onto Underhill Avenue is the only means of access.

The distance between the Underhill Avenue/118 intersection and the Underhill Avenue/Cardinal Court intersections is ~140'. Per the Synchro analysis provided by the applicant (which is subject to revision, as noted above), their estimate is that in the Existing Conditions analysis the 50th-percentile queue length on Underhill Avenue approaching Rt 118 is 185' in the PM peak hour. Because this exceeds the 140' spacing to Cardinal Court, this means that during more than half of the cycles of the traffic light during the PM peak hour eastbound traffic is queued up past Cardinal Court. This condition then would become exacerbated by the additional traffic that would pass through this intersection when Underhill Farms is built.

In drawings included in the TIS, the applicant proposed "Do not block the box" striping (large white 'X' striped onto the pavement, along with new signage) at both points of access to Underhill Farms on Underhill Avenue. We recommend that similar treatment be considered for Cardinal Court.

The intersection of Cardinal Court and Underhill Avenue is a difficult location, due to the proximity to the traffic light at Rt. 118, it would remain difficult if a turning lane is added onto Underhill Avenue that would widen Underhill. Alternative options for improving access to Cardinal Court may include providing a connection from Cardinal Court onto Rt. 118 to the south of Underhill Avenue and converting the intersection of Cardinal/Underhill to right-in/right-out, however this would be a larger and more complex project. For instance, if an opening were provided from the southern end of Cardinal Court onto Route 118, it would be at a sharp angle, and a roughly 10' change in elevation down to Rt 118 would need to be traversed.

3.5 Internal intersection immediately east of the lake

The site plan shows a proposed internal street intersection in close proximity to the intersection of the main site access with Underhill Avenue (highlighted in the purple circle in Figure 2).

We recommend consideration of aligning this intersection to be approximately a 90-degree intersection. In addition to avoiding introducing a skewed intersection and potentially reducing impervious coverage, this would also have the additional beneficial effect of moving it further away from the intersection with Underhill Avenue. This would, however, mean reconfiguring the parking spaces on this portion of the site. Alternatively, the main loop roadway which is currently proposed for two-way operation could have one-way operation which would eliminate turning movements from this intersection entirely.

3.6 Possibility of access onto Rt. 118

Underhill Farms is a corner property, fronting both Underhill Avenue and Rt 118, with the latter under the jurisdiction of NYSDOT.

Pursuant to discussions with Yorktown's Planning Department, we understand that NYSDOT has acquired easements that would prevent properties fronting Rt 118 from providing access points onto Rt 118, including Underhill Farms.

An access point onto Rt 118 which could be as far as ~250' (and/or could be right-in/right-out) from the Underhill Avenue intersection appears unlikely to adversely affect the safety or efficiency of traffic flow on Rt 118, and would help reduce the amount of traffic traveling through the problematic Underhill/118 intersection. Rt 118 in this area is straight and level, with good sight lines in all directions. We recommend that the pros/cons of possible secondary access onto Rt 118 be revisited with NYSDOT, to ascertain whether NYSDOT agrees.

3.7 Provision for Deliveries

We recommend that the provision for deliveries by truck (both to the retail/office/restaurant uses as well as parcel-deliveries to the residences) be clarified. This includes loading locations for both main buildings, anticipated number of truck movements per day, maximum size of delivery vehicles anticipated on-site, and ensuring that this vehicle can navigate the curve on the internal roadway at the northwest corner of the main building (see also section 3.2). It also includes a conceptual description of where the occasional moving truck for residents moving into/out of the apartment and condo buildings will load/unload without unreasonably affecting vehicle and pedestrian circulation.