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F. A. Hesketh
& Associates, Inc.

January 15, 2021 (Revised Feb. 1, 2021)

2530 Berlin Turnpike, LLC
41 Lexington Circle
Southwick, MA 01077

Attn: Mr. Steve Ensign

Re: Proposed Car Wash
Berlin Turnpike and Kitts Lane
Newington, Connecticut
Our File: 20143

Dear Mr. Ensign:

Pursuant to your request and authorization, our office has prepared this letter to outline the potential impact of site generated traffic on local roadways, related to a proposed car wash on property located at 2530 Berlin Turnpike (Routes 5 / 15), in the Town of Newington, Connecticut. The site location is presented in Figure 1. This report is intended to accompany an application to the Newington Planning and Zoning Commission for site plan approval and to the ConnDOT District I Office for an application for an encroachment permit.

Proposed Site Plan

The site proposed for development is located on the east side of the Berlin Turnpike south of the signalized intersection of Kitts Lane. The property also has frontage on Kitts Lane. The proposed site plan was prepared by our office and is dated December 30, 2020, revised February 1, 2021. The plan depicts a 3,940 s.f. building located in the center of the parcel, with a single automated wash tunnel. There is drive aisle that circulates the building in a counter-clockwise direction. The tunnel is accessed from the west and exits to the east. Although only a single wash tunnel is provided, there are three parallel pay stations located

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on the north side of the building with three vehicle storage lanes which can accommodate a queue total of 20 vehicles at the pay stations and behind them. After the pay station the drive aisle merges to a single lane. There is storage for an additional eight vehicles between the pay station and the entrance to the tunnel. An escape lane is provided between the pay station and the tunnel to allow those that change their mind an opportunity to leave the site without passing through the tunnel. A two-way drive aisle is provided on the south side of the building. There are 14 vacuum stations and one accessible parking space located on the south side of the building. Three employee parking spaces are provided on the north side of the building in the vicinity of the pay station and tunnel exit. Access to the site is proposed by way of a full access driveway to Kitts Lane, located opposite the Stop & Shop Plaza driveway and a right turn enter/exit driveway to the Berlin Turnpike. The two driveways are proposed to operate under stop sign control.

Existing Conditions

The Berlin Turnpike is a state-maintained highway that traverses the state of Connecticut in a north/south direction. The roadway carries the designation of U.S. Route 5 and Connecticut Route 15. The Turnpike enters the Town of Newington from the Town of Berlin and extends north past the subject site, through a signalized intersection with Kitts Lane, and then continues north into the Town of Wethersfield. In the vicinity of the proposed site the Berlin Turnpike provides two travel lanes in each direction with a raised landscaped median separating the northbound and southbound lanes. The northbound approach widens to provide a third through lane immediately south of the site. The posted speed limit is 45 miles per hour. Land use in the area is primarily commercial.

Kitts Lane originates at East Robbins Avenue and extends in a southeast direction through a signalized intersection with the Berlin Turnpike and then continues in a southeasterly direction past the subject site and then into the Town of Wethersfield.

Kitts Lane provides a six lane cross section immediately south of the Turnpike, with two southbound and four northbound lanes. As the roadway continues south it narrows to a five lane cross section on its approach to the Stop & Shop Driveway, where Kitts Lane provides three southbound lanes, one dedicated for left turns into the Stop & Shop Driveway, and two northbound lanes. South of the Stop & Shop driveway the roadway provides a four-lane cross section, with two lanes in each direction. South of Anne Street the roadway narrows to a single lane in each direction.

The intersection of Kitts Lane and the Stop & Shop Driveway is a three way stop sign controlled intersection with the Stop & Shop driveway approaching from the east. Kitts Lane is not posted and therefore it is assumed that the roadway has a 25 miles per hour speed limit. Land use along this section of roadway is commercial. South of Anne Street the land use is mostly residential.

Background Traffic

The Connecticut DOT maintains a traffic volume count program on all state highways and some local roadways. Included in the database are counts conducted during March 2018 on Route 15 (the Berlin Turnpike), north of Ann Street, and on Kitts Lane south of Route 15 (Berlin Turnpike). The counts indicate that the Turnpike has an average daily traffic volume (ADT) of 34,800 vehicles per day with peak hour volumes of 2,239 during the morning peak hour (7:00 a.m.) and 3,738 vehicles during the afternoon peak hour (5:00 p.m.). Kitts Lane has an average daily traffic volume (ADT) of 8,100 vehicles per day with peak hour volumes of 336 during the morning peak hour (8:00 a.m.) and 793 vehicles during the afternoon peak hour (5:00 p.m.). The ConnDOT counts do not include Saturday Volumes. The counts are presented in Tables 1 and 2.

Due to the recent Covid restrictions, the conduct of manual turning movement counts at this time would not provide reliable results. Therefore, we have estimated the traffic for the existing shopping center by using the Institute of Transportation Engineers (ITE) *Trip Generation* Report. The Trip Generation worksheets are included in the appendix. A directional distribution for the shopping center was estimated and the plaza volumes were distributed to the local roadway network based on that distribution. These numbers are presented in Figure A in the Appendix. By adding the Stop & Shop Plaza volumes to the ConnDOT volumes, the existing traffic volumes for the study area can be represented. These volumes are presented in Figure 2.

A review of recent ConnDOT counts indicates that traffic volumes in the area have increased approximately 3% per year between the years 2015 to 2018. The proposed development if approved is anticipated to be completed and open for business during 2022. We therefore have increased the volumes 3% per year for a total of 12% to a design year of 2022. Figure 3 presents the 2022 background traffic volumes for the study area during peak hours.

Site Generated Traffic

In order to determine the trip generation for the proposed site, the Institute of Transportation Engineers (ITE) *Trip Generation* Report was consulted. *Trip Generation* presents trip generation estimates for many land uses based on counts conducted at existing facilities throughout the country. Included within the ITE database is Land Use Code 948: Automated Car Wash. Trip generation for the land use is based on the square footage of the building and the number of service bays. Using the ITE Data the facility would be expected to generate 78 trips during the afternoon peak hour and 120 trips during the Saturday peak hour.

The proposed operator has indicated that based on the typical service rate of the proposed equipment, they anticipate a maximum peak hour volume of 60 customers. This will result in a total of 120 trips, made up of 60 entering and 60 exiting movements. The equipment has the capability to run as high as 90 vehicles an hour, but this rate results in a less effective wash. Therefore they will maintain a maximum rate of 60 vehicles an hour, except when the demand results in long queues. For purposes of this analysis we have used 120 trips, made up of 60 entering and 60 exiting movements for analysis purposes. The Trip generation results are summarized in Table 2.

It is anticipated that most customers will live in a five mile radius of the facility. We anticipate that vehicles will approach the site with a distribution of 40% from the turnpike south of the site, 40% from the turnpike north od the site, 15% from Kitts lane south f the site, and 5% from the Stop & Shop Plaza from the east. Traffic will exit the site in the same percentages. The directional distribution is shown in Figure 4. Applying this distribution to the site generated traffic volumes in Table 2 provides the turning movements into the site driveway for each peak hour. These volumes are also presented in Figure 4. By adding the site generated traffic in Figure 4 to the background traffic volumes in Figure 3 the combined traffic volumes can be determined. These volumes are presented in Figure 5.

Capacity Analysis

Capacity analyses were conducted for the background and combined traffic volumes for the intersections of Kitts Lane with the Stop & Shop Plaza and the proposed site driveway and for the combined traffic volumes fo the Berlin Tunpike and the site driveway. The analysis was completed utilizing the intersection capacity analysis program called SYNCHRO. The analyses were conducted for the both the afternoon and Saturday peak hours.

The intersection of Kitts Lane and the Stop & Shop Plaza driveway is an existing un-signalized "T" intersection with Kitts Lane oriented in the north/south direction. The Stop & Shop plaza driveway approaches from the east. All approaches operate under stop sign control. The Southbound approach provides a dedicated left turn lane and two through lanes. The northbound approach provides a single through lane and a shared through/right turn lane. The plaza driveway provides a two lane approach. Due to limitations in the software, the southbound approach was analyzed with a dedicated left turn lane and a single through lane. The analysis indicates that all movements operate at a LOS A or B during peak hours under the background traffic volumes.

With the introduction of the proposed development, the intersection will become a four-way intersection. All approaches will continue to operate under stop sign control. The plaza driveway will be restriped to provide a shared through/left turn lane and an exclusive right turn lane. The analysis indicates that all movements operate at a LOS B during peak hours, with the exception of the southbound shared through/right turn lane and the westbound right turn, which will operate at a LOS C during the Saturday peak hour. Average delays are less than 16 seconds for those movements.

Sight Distance

The Connecticut Department of Transportation has published its requirements for the application of sight distances at intersections and driveways as adopted in December of 2003. In general, the intersection sight distance (ISD) is the available sight distance allowing a driver approaching an intersection to observe the vehicles on the crossing roadway or opposing direction. Therefore, the ISD varies according to the speed of traffic and distance crossed while performing the maneuver. A summary of the guidelines is contained in the appendix.

Our observations at the proposed site driveways indicates that the available sight distances, when measured at a point 10 feet from the curb line are in excess of 400 feet

in each direction. These sight distances meet the current ConnDOT requirement for an approach speed of 30 miles per hour. Kitts Lane is assumed to be posted at 25 mph. It is important to note that the intersection operates under all-way stop sign control. The existing ISD on the Turnpike is in excess of 900 feet. The 900 foot sight distance is adequate for an approach speed in excess of 70 mph.

Queuing

A standard Poison queue analysis was conducted for the proposed car wash automated wash lane to determine the required vehicle stacking distance for this site. The results of that analysis are presented in Table 5. The operator of the facility indicates that they will operate the tunnel with a service rate of 60 vehicles an hour during normal operations. During peak hours, they can adjust the service rate to a rate of 90 vehicles an hour. Therefore, the queueing analysis was conducted based on a service rate of 40 seconds per vehicle (90 veh/hr) and a peak hour demand volume of 60 vehicles. The analysis indicates the expected queue length would be 2 vehicles with an average waiting time of 80 seconds per vehicle. The probability that the queue would exceed ten (10) vehicles is approximately 1%. We recognize that there will be several days when demand may exceed the ability of the wash to process vehicles. This situation will likely occur on six to seven days a year, for a period of one to two hours. Therefore, sufficient queueing is proposed to accommodate that situation.

The proposed site plan provides approximately 200 feet of vehicle storage split into three lanes for a total of 440 feet, behind the pay stations. The available storage can comfortably accommodate a total of twenty (20) vehicles at an average of 20 feet per vehicle. There is an additional 120 feet between the pay stations and the tunnel, a space capable of accommodating an additional eight vehicles. Therefore, queuing is available for a total of 28 vehicles.

Accident Data

The University of Connecticut Crash Data Repository gathers and compiles traffic accident data for all state highways and some major local roadways. A list of accidents occurring on Kitts Lane east of the Berlin Turnpike from January 1st, 2017 through December 31, 2019 includes the most recent 3 years of available data. The accident list is included in the appendix.

A total of nine (9) accidents were recorded during the three-year time period reviewed. There were three accidents at Ann Street, two at Crown Ridge, and one each at the Stop & Shop driveway, Cypress Road, Griswold Avenue and Woodridge Drive. There were three angle accidents, three rear end accidents, one sideswipe same direction, and two fixed object accidents. Of the nine (9) total accidents seven (7) were property damage only, and two (2) involved suspected injuries. There were no reported fatalities.

Conclusions

The proposed development is projected to generate a total of 120 trips during peak hours. A capacity analysis indicates that the intersections of Kitts Lane and the site driveway and the site driveway and the Berlin Turnpike will operate at acceptable levels of service during peak hours. The site driveways are properly located with respect to adjacent intersections and available sight distances and are properly designed to accommodate the anticipated driveway volumes.

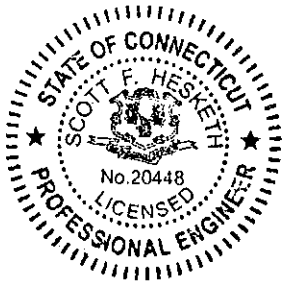
Based on this information it is my professional opinion that the existing roadway network has enough excess capacity to accommodate the anticipated traffic for the proposed development. The site driveways are properly located and designed to accommodate the anticipated traffic volumes.

We appreciate the opportunity to provide this information to you. A representative from our firm will be available to present testimony before local commissions if needed. If you require any additional information, please do not hesitate to contact our office.

Very truly yours,

F. A. Hesketh & Associates, Inc.

Scott F. Hesketh, P.E.
Manager of Transportation Engineering



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