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Ref.: 22054

August 24, 2022

Mr. Peter Matchak, Director of Planning
Town of Ashland
101 Main Street
Ashland, MA 01721

Reg.: Traffic Peer Review
Proposed Coffee Shop with Drive-Through Window
399 Union Street, Ashland, MA

Dear Peter:

Ron Müller & Associates (RMA) has initiated an independent peer review of the traffic impact and access study and site plan prepared for the proposed coffee shop with drive-through window to be constructed at 399 Union Street in Ashland, Massachusetts.

The submitted traffic impact study and site plan were reviewed with respect to traffic impacts and site access and compared with state guidelines and standard traffic engineering practice. Based on a review of the submitted materials, we have some comments and recommendations that require further action from the applicant. Once these items are addressed, we will be able to finalize the traffic review of the project. The following lists the documents reviewed as part of the independent peer review:

- *Traffic Impact Study; Proposed Coffee Shop with Drive-Through Window, 399 Union Street (Route 135), Ashland, MA;* prepared by McMahon Associates; July 2022.

- *Site Plan for 399 Union Street Proposed Coffee Shop, Ashland, MA;* prepared by J.K. Holmgren Engineering; dated June 1, 2022.

The comments below follow the same outline as the submitted traffic study for ease of reading.

TRAFFIC IMPACT STUDY REVIEW

Project Description

1. The proposed coffee shop will be located at 399 Union Street (Route 135) in Ashland, MA. The site currently consists of a Walgreens Pharmacy with a drive-through window. This pharmacy is proposed to be razed and replaced with a 2,575 square foot Starbucks with drive-through window. Access to the site will remain via the existing full access driveways on Summer Street and Union Street as well as a right-turn exit only driveway on Union Street. The full access driveway on Summer Street is referred to as the North Site Driveway, the full access driveway on Union Street is referred to as the East Site Driveway and the right-turn exit only driveway on Union Street is referred to as the West Site Driveway. The site will provide a total of 41 parking spaces.

Baseline Conditions

2. The traffic study focused on the following intersections:

    - West Union Street/Union Street (Route 135) at Summer Street
    - Summer Street at Cherry Street
    - Summer Street at North Site Driveway
    - Union Street (Route 135) at West Site Driveway
    - Union Street (Route 135) at Ashland Square Plaza Driveway
    - Union Street (Route 135) at East Site Driveway

    Based on the site location, expected use, and area roadway network, the study area is appropriate for analysis.

1. The study provided a description of the area roadway network. Manual traffic counts were performed in June 2022 during the weekday AM and PM peak periods at the study area intersections. **Coffee/donut shops typically generate the greatest volume of traffic during the weekday AM peak period and the Saturday peak period. Given the retail and commercial nature of the surrounding uses, we recommend that the Saturday peak hour also be evaluated.**

2. Seasonal adjustments were reviewed based on MassDOT's Weekday Seasonal Factors Report for urban principal arterials, urban minor arterials and urban collectors. Based on the data, traffic volumes in June are shown to be higher than average. To provide a conservative assessment no seasonal factors were applied to the baseline traffic volumes.

Based on a review of MassDOT permanent count station on the Massachusetts Turnpike (I-90) near the site, AET 08 and AET 09, traffic during the month of June is approximately four percent above annual average month conditions. Therefore, RMA concurs that no seasonal adjustment be applied to the baseline traffic conditions.

3. Given the current traffic conditions associated with the coronavirus pandemic, the traffic study should take into account a pandemic adjustment to ensure that the traffic volumes represent normal, pre-COVID traffic conditions. Based on the traffic study a COVID adjustment was not applied to the traffic volumes. **The applicant should review historic traffic data to determine if a COVID adjustment should be applied to the traffic volumes. Different adjustment factors may be appropriate for the various peak hours.**

4. Accident data were reviewed and summarized within the traffic study. The five-year period between 2015 and 2019 was reviewed. Based on the crash data, there does not appear to be any significant safety issues at any of the study area intersections. RMA concurs with these findings.

5. The existing weekday AM and PM peak hour traffic volumes are shown on Figures 2 and 3. The overall network peak hour was used for analysis purposes. Although individual intersection peak hours are typically used to provide a conservative analysis, the use of the network peak hour is acceptable in this case as it would not alter the conclusions of the study.

Future Conditions

6. Future roadway improvements were investigated as part of the future conditions analysis. Based on discussions with the Town of Ashland, two roadway improvement projects were identified. The first project is the Downtown Streetscape Improvements project which proposes to improve pedestrian accommodations along Main Street and Front Street. The project includes curb replacement and modification, the installation of accessible sidewalks, drainage improvements and traffic signal upgrades at multiple intersections along Main Street. The project also includes pavement mill and overlay and new pavement markings along Summer Street, including at the intersection with Cherry Street, and extending just before the intersection with West Union Street/Union Street.

   The second project includes roadway improvements as part of the construction of the new public safety building at 1 East Union Street. As part of this project, a traffic signal is proposed at the intersection of the public safety building driveway and East Union Street, approximately one mile east of the signalized intersection of West Union Street/Union Street at Summer Street. Along with the traffic signal installation, five other traffic signals along Union Street are proposed to be upgraded with the installation of an adaptive traffic signal system and coordination. The five intersections included as part of the improvements are West Union Street at Memorial Drive/Voyagers Lane, West Union Street/Union Street at

Summer Street, Union Street at Main Street, Union Street at Homer Avenue/Chestnut Street, and Union Street at Fountain Street.

The signal plans for the coordination are currently in the design phase and are not yet publicly available and therefore the timing and phasing were not updated in the No-Build and Build analyses. Although not analyzed, it is expected that operations at the intersection of West Union Street and Union Street are anticipated to improve as a result of the traffic signal coordination.

7. A 7-year design horizon was used for the No-Build and Build condition analyses consistent with MassDOT's *Transportation Impact Assessment Guidelines.* An annual growth rate of 1.0 percent per year was used to project the future No-Build volumes. The study used the Metropolitan Area Planning Council MAPC data to determine an appropriate growth rate. **It is recommended that the traffic data that were used to determine an annual growth rate be included within the Appendix of the traffic study.**

8. The traffic study included the following planned developments within the Town of Ashland:

   - 0 Memorial Drive – 180 age restricted residential units.
   - 81 West Union Street – construction of approximately 5,000 square feet of office space and 5,000 square feet of retail spaces and contractor yard buildings with 33 employees.

   Given the proximity of the site to Hopkinton, it is recommended that the applicant contact the town to see if any developments there would have an impact on traffic volumes within the study area.

9. The anticipated trip generation of the development was estimated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual* for Coffee/Donut Shop with Drive-Through Window (Land Use Code 937). Table 1 shows the weekday AM and PM peak hour traffic volumes. **It is recommended that the table be updated to include daily and Saturday peak hour trip generation.**

10. A comparison was made between the trips being generated by the existing pharmacy use on site and the proposed coffee shop. The table shows that the proposed coffee shop will generate significantly more traffic (215 additional vehicle trips) during the weekday AM peak hour than the existing pharmacy use on site. During the weekday PM peak hour, the coffee shop is expected to generate 38 additional vehicle trips over the existing pharmacy. **This same trip generation comparison should be made for Saturday peak hour conditions.**

11. Not all vehicle trips generated by a coffee shop represent new trips. Studies have shown that coffee shops generate most of their business from the traffic already present on the adjacent

roadway. This traffic is referred to as pass-by trips. Based on the applicant's review of ITE data, it was noted that there is no pass-by data for ITE LUC 937, however, using a similar land use, LUC 934 (Fast-Food Restaurant with Drive-Through Window), pass-by trips account for 50 percent of weekday MA peak hour trips and 55 percent of weekday PM peak hour trips.

After a review of the ITE data, we would recommend that LUC 938 (Coffee/Donut Shop with Drive-Through Window and No Indoor Seating) be used as it more closely resembles the proposed use. These data suggest a pass-by trip rate of 90 percent, which is much higher than the pass-by rates used in the study. The trip generation assumptions used in the report are therefore more conservative and accordingly acceptable.

12. The traffic study describes that the trip distribution of the coffee shop was based on existing travel patterns and logical travel routes. As such, 10 percent of the site traffic is expected to/from the north on Cherry Street, 30 percent of the site traffic is expected to/from the north on Summer Street, 45 percent of the site traffic is expected to/from the southwest on W. Union Street and 15 percent of the site traffic is expected to/from the east on Union Street. **It is unclear if the distribution of pass-by traffic is expected to follow the same pattern, or the distribution of traffic on the adjacent street, which is the appropriate methodology. It is recommended that the applicant include information regarding the distribution of pass-by traffic and also show pass-by trips on the site generated networks.**

13. Figures 9 and 10 show the weekday AM and PM Build networks. The total volume entering and exiting the site does not equal the total site generated trips. **It is recommended that the networks be updated to reflect the correct volume of trips into and out of the site.**

Traffic Operations Analysis

14. Capacity analyses were performed at the study area intersections under Existing, No-Build and Build conditions during weekday AM and PM peak hour conditions. **It is recommended that Saturday peak hour conditions also be evaluated.**

Site Access and Circulation

15. The proposed drive-through lane will accommodate a total of 12 vehicles in queue with an adjacent bypass lane that will also be used by site traffic exiting the site at the East Site Driveway. The applicant noted that this storage length exceeds the requirements within Section 5.1.4.5 of the Town of Ashland's bylaws. Based on a published study[1] of drive-

[1] *Drive-Through Queue Generation;* Mike Spack, PE, PTOE; CountingCars.com; February 2012.

through queuing at a number of different land uses, the average maximum queue at coffee shops was found to be 11 vehicles and the 85th percentile maximum queue was 13 vehicles. The study was performed at six different coffee shops including four Starbucks and two Caribou coffee shops located in Minnesota and Kansas. More locally, drive-through queue studies have been performed by RMA at four different Dunkin' Donuts coffee shops located in Malden, Kingston, and Dracut, Massachusetts and in Milford, New Hampshire. The maximum observed queue at these locations was 13 vehicles during the weekday AM peak hour, six vehicles during the weekday PM peak hour, and 10 vehicles during the Saturday peak hour.

Based on this information, the provided queue storage on site is not adequate to accommodate the maximum queue. Alternatives to increasing the available queue storage could include shifting the pick-up window to the north side of the building, moving the right-out only driveway further west, or closing the right-out-only westerly site driveway. Furthermore, and based on field observations, Starbucks stores may experience greater queue lengths than what was noted in the study. **It is recommended that queue observations be made at other Starbucks locations in the area to determine if the provided queueing space on site is adequate to accommodate demand.**

Sight Distance Evaluation

16. Sight distances were measured at the existing site driveway location and compared to the minimum requirements as established by the American Association of State Highway and Transportation Officials (AASHTO) based on the posted speed limits on the adjacent streets. It should be noted that actual observed (85th percentile) speeds should be used to establish the minimum sight distance requirements, not the posted speed limit. **Since the available sight distances at the Union Street East Site Driveway are limited, it is recommended that the applicant collect vehicle speed data on Union Street east of the site to ensure that sight lines at this driveway will exceed minimum requirements based on the 85th percentile speeds.**

SITE PLAN REVIEW

17. The site plan includes a Vehicle Movement Plan showing that a fire truck can access the site. **It should be confirmed that the fire truck shown represents the Town of Ashland's Tower One fire truck.** The plan only shows the swept path of the firetruck into and out of the site and does not show circulation around the building. **The applicant should show the truck circulation through the site. Furthermore, the applicant should work with the**

Ashland Fire Department to assess the potential need for accessibility to all sides of the building.

18. The eastern Union Street driveway allows full access to and egress from the site. This driveway is located immediately adjacent to the drive-through queue lane. **The applicant should conduct an AutoTurn (or similar) analysis of vehicle turning movements to assure that entering and exiting vehicles are not in conflict with each other. The applicant should consider moving the drive-through lane further away from this driveway (north) to allow more maneuverability, considering that a significant volume of traffic will be using the bypass lane to enter and exit via the east site driveway.**

19. Site traffic destined to the east on Union Street will need to use the bypass lane to access the east site driveway. This section of the bypass lane is only 11 feet in width. **Considering the amount of use that the bypass lane will get, the applicant should increase the width of the bypass lane to a consistent 12 feet.**

20. The drive-through/bypass lane along the Union Street frontage proposes a reverse-curve alignment that could lead to sideswipe accidents, given the expected use of the bypass lane. **The applicant should investigate straightening out this section of the drive-through/bypass lane.**

21. The site plan requires all traffic entering from Union Street to use the bypass lane to circulate around the building to access the parking area or the drive-through lane. This requires all of that traffic to pass directly in front of the Summer Street driveway where entering site vehicles may have limited view of this conflicting traffic. **The site plan should be revised to minimize this conflict and provide proper traffic control. One alternative (in conjunction with Comment 23) could be to eliminate the Union Street east site driveway. However, this would have an impact on the West Union Street/Union Street at Summer Street intersection by adding traffic to the eastbound left-turn movement that would have to be evaluated.**

22. Vehicles entering the east site driveway are not allowed to turn left due to the one way counter clockwise circulation of the drive-through lane. Based on the site plan, it is unclear to motorists accessing the site from this driveway that they cannot turn left. **The plan should be revised via signing and striping to make this turn restriction clear.**

23. Under existing conditions, vehicles make illegal left turns from the right out only driveway on Union Street. **This right-out driveway should be modified to prevent illegal left turns into and out of this driveway. Consideration should be given to extending the Union Street median island to prevent these turns. In conjunction with Comment 15, one alternative would be to shift this driveway further west and allow both right turns into and right turns out of this driveway.** This would have the benefit of minimizing the

volume of traffic that has to circulate around the building when coming from Union Street while also providing increased vehicle queue storage at the drive-through lane.

24. **Do Not Enter (R5-1) signs should be placed on both sides of the drive-through/bypass exit lanes facing into the parking lot.**

25. **It is unclear why one-way drive aisles are proposed in the parking lot. It appears that the drive aisles are 24 feet in width that can accommodate two-way traffic and therefore minimize customer confusion. The angled parking spaces at the Union Street and Summer Street intersection could be reconfigured into 90-degree parking and thereby eliminate the need for one-way traffic.**

26. Sidewalks currently exists along Summer Street and Union Street along the site frontage. **It is recommended that ADA compliant wheelchair ramps with detectable warning panels be constructed across the site driveways.** There are two crosswalks internal to the site that provide access to the coffee shop. **It is also recommended that these crosswalks be ADA compliant.**

27. **It is recommended that the drive-through lanes be clearly marked through signing and striping including DRIVE THRU pavement markings with pavement arrows.**

28. **How will deliveries to the store be made and with what size truck? The applicant should include an AutoTurn (or similar) analysis of delivery vehicles to and from the site.**

29. **It is recommended that sightlines at the existing/proposed site driveway intersections with Summer Street and with Union Street be shown on the site plans. It is further recommended that any proposed landscaping, fences, walls or signs in the vicinity of the site driveways be kept low (maximum 2 feet in height from street level), or set back outside of the sight triangles so as not to impede the available sight distances.**

Once the above comments have been addressed, we will be able to finalize our independent traffic peer review of the proposed residential project. Please feel free to contact me if you have any questions regarding this review.

Sincerely,

Ron Müller & Associates

Kirsten Braun, P.E.
Associate