McMAHON ASSOCIATES
350 Myles Standish Boulevard, Suite 103
Taunton, MA 02780
p 508-823-2245 | f 508-823-2246

PRINCIPALS
Joseph J. DeSantis, P.E., PTOE
John S. DePalma
Casey A. Moore, P.E.
Gary R. McNaughton, P.E., PTOE
Christopher J. Williams, P.E.

ASSOCIATES
John J. Mitchell, P.E.
R. Trent Ebersole, P.E.
Matthew M. Kozsuch, P.E.
Maureen Chlebek, P.E., PTOE
Dean A. Carr, P.E.
Jason T. Adams, P.E., PTOE
Christopher K. Bauer, P.E., PTOE
Mark A. Roth, P.E.
John R. Wichner, P.E., PTOE

FOUNDER
Joseph W. McMahon, P.E.

June 17, 2020

Beth Suedmeyer
Environmental Planner
Planning & Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, MA 01776

RE: Traffic Impact and Access Study Review
Cold Brook Crossing Residential Development
North Road (Route 117)
Sudbury, MA

McMahon Associates has completed the following review comment letter to address Responses to Comments from MDM Transportation Consultants, Inc. (MDM) to the original Peer Review of the Traffic Impact and Access Study (TIAS) for the proposed Cold Brook Crossing residential development. The original Peer Review was prepared by McMahon Associates and submitted to the Town of Sudbury on May 5, 2020. MDM provided Responses to Comments to the Town of Sudbury on June 2, 2020.

The proposed project consists of razing an existing vacant residential property and constructing 274 residential units, including151 mid-rise multifamily units and 123 townhome style units. The site is proposed to be accessed through one full access driveway on the north side North Road (Route 117), with an additional emergency access driveway located approximately 650 feet west of the main driveway. A total of 766 parking spaces are proposed for the site; including 392 surface parking spaces and 374 garage spaces.

Based on our review of the Responses to Comments from MDM, a majority of the comments from the original McMahon Peer Review letter have been addressed, and any remaining comments are listed below. For each comment that warranted a response, listed is the original McMahon Peer Review comment, MDM's responses, and the McMahon responses in **bold**.

<u>Original McMahon Comment #1:</u>
We agree that these intersections reflect key intersections within the vicinity of the site. However, as a majority of the site traffic is expected to come from the east via North Road (Route 117), we suggest that the Applicant consider including the intersection of Fitchburg Turnpike (Route 117) at Sudbury Road in

the study area. This signalized intersection is located less than a mile east of the proposed site driveway, just over the Town Line in Concord, MA.

In addition, the ENF identified the following additional study area intersections within the Towns of Sudbury and Concord where transportation improvements may be implemented:

- North Road (Route 117) at Cummings Office Park (142-150 North Road), Sudbury
- Fitchburg Turnpike (Route 117) at Plainfield Road, Concord

Comments from the Town of Concord also note that the following intersections should be considered when implementing traffic signal synchronization;

- Fitchburg Turnpike (Route 117) at Sudbury Road, Concord
- South Great Road (Route 117) at Concord Road (Route 126), Lincoln

MDM Response #1:
"An expanded analysis to include the Route 117 at Sudbury Road intersection in Concord that augments the submitted TIAS is included in the Attachments.

In summary, the incremental traffic associated with the proposed development is not expected to materially impact operating conditions at the signalized study intersection of Route 117 at Sudbury Road compared to No-Build conditions. The intersection will continue to operate below capacity at LOSC or better during the peak hours with a nominal increase in vehicle queues. The study intersection exhibited below-average crash rated based on historic crash data and is not listed as an HSIP location. The analysis indicates that neither capacity nor safety countermeasures were warranted to mitigate project impacts – a finding that is consistent with the analysis of other locations along North Road including that indicates leading to the submitted February 2020 TIAS which includes the intersections of Pantry Road/Dakin Road and Powder Hill Road/Mossman Road.

While project impacts at the study locations are immaterial and operations are deemed acceptable based on standard transportation engineering analysis practices, MDM notes that the executed Development Agreement between Developer and the Town of Sudbury includes a $1-million funding obligation for off-site traffic or other mitigation improvements, or improvements not related to costs to the applicant for turning lanes or other safety improvements at the entrance of the Melone Property Development site. This funding provides the Town the means of implementing off-site transportation initiatives at its discretion, including maintenance-related improvements at the Route 117 study intersections (including the expanded Concord location). Detailed inventory of existing signal equipment along North Road including the Concord location indicates such improvements could include repair/replacement or upgrading of signal equipment including associated signal detection equipment. Such upgrades if implemented would allow optimized operations during peak traffic periods, reducing delays and queuing relative to existing conditions. The Traffic Signal Evaluation dated November 21, 2018 prepared for the Town by Ocean State Signal provides specific recommendations for potential improvements, which MDM opines are not warranted by or necessary to support the limited project impacts."

McMahon Response #1:
Based on the capacity analysis attachments provided in the expanded analysis, the eastbound and westbound approaches on Fitchburg Turnpike (Route 117) were analyzed as three-lane approaches, including an exclusive left-turn lane, through lane, and right-turn lane. Based on our review, the right-turn lane operates as a channelized right-turn lane under yield control. It is not anticipated that updating the lane configuration in the analysis to include an exclusive left-turn lane, and a shared through and right-turn lane would have a significant impact to the overall results. No further action is required.

Original McMahon Comment #5:
We suggest that the Applicant review the most recent five years of competed crash data available through MassDOT, which would include data for 2013 to 2017. We also suggest that crash data along North Road (Route 117) in the vicinity of the proposed site driveway is reviewed. Crash rates should be compared to both the District and Statewide averages to assess potential safety concerns.

MDM Response #5:
"Crash data was obtained from MassDOT for the Town of Sudbury for the five-year period 2015 through 2019 (the most recent full year of data currently available from MassDOT) for the study intersections and the roadway segment along North Road in the vicinity of Site (Sudbury Town Line and Northwood Road). The crash data is summarized in Table R1 with detailed data provided in the Attachments.

As summarized in Table R1, the study intersection and the roadway segment in the vicinity of the proposed driveway experienced crash rates that are below the MassDOT District 3 averages; therefore, no immediate safety countermeasures are warranted based on the crash history at the study locations. Furthermore, none of the study intersection nor the roadway segment are listed as 2015-2017 HISP locations."

McMahon Response #5:
Based on information presented on the MassDOT Crash Database site, "any crash records or data provided for the years after 2017 are subject to change at any time and are not to be considered up-to-date or complete". Therefore, it is suggested that crash data for the years 2018 and 2019 not be included in the calculation of the crash rates as they are not considered to be finalized. The last five years of finalized crash data should include data from 2013-2017.

Original McMahon Comment #6:
Based on sight distance measurements taken in the field, we agree that the proposed driveway location meets the AASHTO minimum sight distance requirements. It is recommended that all proposed landscaping and signage remain under a height of two-feet, and are placed as to not obstruct sight lines.

MDM Response #6:
"MDM concurs, no further response required."

McMahon Response #6:
Based on the MDM response, it is expected that all landscaping and signage is to remain under a height of two-feet and to be located as to not obstruct sight lines. No further response required.

Original McMahon Comment #8:
We agree that the trip generation estimates and distributions for the Maynard Crossing development are applied to the study area appropriately. Due to the Cold Brook Crossing site's close proximity to the Town of Concord, we suggest that the Applicant contact the Town of Concord Planning Department to confirm that there are no additional developments that should be included in the traffic volume projections.

MDM Response #8:
"The Town of Concord Planning Department noted the creation of two residential building lots on Route 117 adjacent to Nashawtuc Country Club. These developments are accounted for in the background growth rate. The TIAS findings remain valid, no further response necessary."

McMahon Response #8:
McMahon concurs that traffic associated with these developments would be represented in the background growth rate. No further response required.

Original McMahon Comment #10:
We recommend that the Applicant confirm what the intent is with the remaining developable land. If there is a possibility of additional development being proposed, we suggest that the TIAS be revised to include a scenario which represents a full build out of the site to include these units.

MDM Response #10:
"The remaining developable land is intended to consist of 6 additional townhome units. Table R2 provides sensitivity trip generation analysis including the additional units in addition to the age-restricted units compared to the trip generation presented in the January TIAS.

As shown in Table R2, the sensitivity trip generation analysis indicates lower trip activity than the highly conservative estimates presented in the January 2020 TIAS. Therefore, the finding of the TIAS remain valid and no further analysis is required."

McMahon Response #10:
McMahon agrees that the trip generation applied in the TIAS presents a conservative analysis based on the information presented in Table R2. No further response required.

Original McMahon Comment #12:
Although it is not expected to have a notable impact on the capacity analysis results, to present a conservative analysis, it is suggested that the capacity analysis be revised to show all new trips accessing the site through the study area intersections.

MDM Response #12:
"The trip distribution patterns based on US Census Journey-to-work data and existing travel patterns indicate that 10% of the new site trips will utilize local roadways between the study intersection of North Road at Dakin Road/Pantry Road and North Road at Powder Mill Road/Mossman Road. The trips that would travel through the study area intersection were appropriately applied in the TIAS, therefore, no further analysis is required."

McMahon Response #12:
Although it would be conservative to assign all site generated trips to the study area intersections, it is not expected that the site-generated trips that MDM has assigned to local roads based on the Journey-to-work data will have a significant impact on the overall capacity analysis results. Therefore, we are in agreement with the MDM response that it is not necessary to revise the analysis to include this five percent to the trips assigned to the study area intersections. No further response is required.

Original McMahon Comment #14:
We recommend that the Applicant confirm the signal timings with the latest traffic signal plan for North Road (Route 117) at Dakin Road/Pantry Road and update the capacity analysis appropriately.

MDM Response #14:
"The signal timings used in the analysis of the North Road (Route 117) intersection with Dakin Road/Pantry Road reflect the existing signal controller settings as documented in the traffic signal inventory conducted for the Town of Sudbury by Ocean State Signal in a technical memorandum of November 12, 2018 (see Attachments). These represent the latest known traffic signal timings for the intersection. Field review of the signal operations appear to be consistent with the inventory, noting that the signal is actuated and as such subject to varying green time allocation based on time of day and volume conditions. Update of the capacity analysis as presented in the TIAS is not warranted; no further response required.

While project impacts at the study location are immaterial and operations are deemed acceptable based on standard transportation engineering analysis practices, MDM notes that the executed Development Agreement between the Developer and the Town of Sudbury includes a $1-million funding obligation for off-site traffic or other mitigation improvements, or improvements not related to costs to the applicant for turning lanes or other safety improvements at the entrance of the Melone Property Development site. This funding provides the Town the means of implementing off-site transportation initiatives at its discretion, including maintenance-related improvements at the Route 117 study intersection (including the expanded Concord location). Detailed inventory of existing signal

equipment along North Road including the Concord location indicates such improvements could include repair/replacement or upgrading of signal equipment including associates signal detection equipment. Such upgrades if implemented would allow optimized operations during peak traffic periods, reducing delays and queuing relative to existing conditions. The Traffic Signal Evaluation dated November 21, 2018 prepared for the Town by Ocean State Signal provides specific recommendations for potential improvements, which MDM opines are not warranted by or necessary to support the limited project impacts."

McMahon Response #14:

Although the technical memorandum provided as an attachment and prepared by Ocean State Signal does not provide reference to the clearance intervals, we concur that the discrepancies in clearance intervals used for the capacity analysis with the field measurement conducted by McMahon are not expected to impact the overall results of the intersection operations. No further action is required.

Original McMahon Comment #15:

The capacity analysis indicates that the proposed development is not expected to have a significant impact on the traffic operates operations at the existing study area intersections. We suggest that additional mitigation measures be considered for potential impacts to additional study area intersections and the proposed site driveway based on recommendations from this review.

MDM Response #15:

"The project impacts are immaterial to area intersections including the supplemental location in Concord (Route 117 at Sudbury Road) and as such do not warrant additional mitigative actions. While project impacts at study locations are immaterial and operations at area intersections impacted by the project are deemed acceptable based on standard transportation engineering analysis practices, MDM notes that the executed Development Agreement between the Developer and the Town of Sudbury includes a $1-million funding obligation for off-site traffic or other mitigation improvements, or improvements not related to costs to the applicant for turning lanes or other safety improvements at the entrance of the Melone Property Development site. Implementation of improvements at off-site locations if deemed appropriate by the Town may be achieved by means of funding provided by the Developer as part of the executed Development Agreement."

McMahon Response #15:
McMahon concurs with the MDM response, and agree that due to the minimal impacts to the traffic operations as a result of the proposed development, an analysis of off-site improvements would only be appropriate at the request of the Town. No further response required.

Original McMahon Comment #16:
We suggest that the Applicant include any proposed mitigation in their capacity analysis. Analyzing the proposed mitigation alternative should also confirm the storage length requirements for the eastbound left-turn lane. Additional mitigation alternatives that we suggest the Applicant consider include:

- Providing a two-lane exit at the site driveway to include a separate left-turn and right-turn lanes.
- Completing a signal warrant analysis at the site driveway to verify the appropriate traffic control. If a traffic signal is warranted, the project team should explore the feasibility of constructing a new traffic signal.

MDM Response #16:
"Proposed mitigation is limited to access improvements along Route 117 at the Site Driveway that conform to the executed Development Agreement between the Developer and the Town which includes an exclusive left-turn lane. A capacity analysis of the site driveway with left-turn lane along Route 117 is provided in the Attachments, indicating LOS C or better operations during peak hours. The design of the storage lane allows for queue storage of more than 4 vehicles (notwithstanding that average left-turn queues are only one vehicle) which allows for proper lane tapering and deceleration requirements based on the regulatory travel speeds along North Road. The engineering design submitted to be provided to the Town for approval of the improvements will include applicable taper and lane storage calculations.

The Site Driveway has been designed to provide a single wide egress lane; separate turn lanes are not justified based on the limited project volumes and are not preferred due to potential sight line blockages that could occur if such a design were provided.

A review of a 4-hour traffic signal warrant (see Attachments) indicates that traffic signals are not warranted at the Site Driveway intersection along North Street."

McMahon Response #16:
McMahon concurs with the analysis provided for the site driveway, no further response required.

If you have any questions regarding our review, please feel free to contact me.

Very truly yours,

Jeffrey T. Bandini, P.E., PTOE
Project Manager