

August 15, 2019

Bernard Cahill, Town Planner
Town of Shrewsbury
100 Maple Avenue
Shrewsbury, MA 01545

Subject: Transportation Peer Review Comments
Edgemere Crossing at Flint Pond
Shrewsbury, MA

Dear Mr. Cahill:

MDM Transportation Consultants, Inc. (MDM) is pleased to provide you with the following initial transportation review comments for the above-referenced project. These comments have been prepared based on a site visits in July 2019 and review of the documents identified below. To facilitate response by Applicant, review items requiring response are noted in ***Bold Italic***.

MDM finds that the Traffic Impact and Access Study (TIAS) has been prepared in general conformance with industry standards and reasonably quantifies existing/baseline traffic conditions for locations along Route 20, traffic generation characteristics for the Site, and traffic impacts/operations at the Site driveways and nearby study intersections. We note that our commentary in this peer review is limited to locations within the Town of Shrewsbury jurisdiction, acknowledging that more remote off-site transportation impacts will be subject to review and comment by the City of Worcester.

Notwithstanding certain requested clarification of trip distribution and parking analysis, our principal comments requiring substantive response by Applicant include (a) mitigation timing/coordination; and (b) site access and circulation. MDM requests that the Applicant elaborate on status of and commitments to improvements at the Route 20/Grafton Street intersection, development of an interim operating plan for the Site should occupancy occur prior to completion of Route 20 improvements, and documentation/commitment to a detailed traffic monitoring program with established operational thresholds to ensure efficient and safe traffic operations. Site access and on-site circulation comments regarding motorized vehicle, cyclist and pedestrian accommodations parallel those issued by the Planning Department.

Documents Reviewed

MDM has reviewed the following documents to gain an understanding of the project and determine if industry standards have been applied in determining the potential impacts of the project. The following relevant documents were reviewed:

- *Transportation Impact and Access Study, Edgemere Crossing at Flint Pond, Shrewsbury, Massachusetts*, prepared by VHB, dated June 2019
- *Site Plan for Edgemere Crossing and Flint Pond, 180-222 Hartford Turnpike, Shrewsbury, Massachusetts*, prepared by RJO'Connell Associates, dated June 19, 2019.

MDM has also reviewed and considered the following supplemental correspondence as part of its review and commentary:

- Shrewsbury Planning Department comment letter dated July 19, 2019
- MassDOT Comment Letter on the ENF, Edgemere Crossing at Flint Pond (EEA #16058) dated July 16, 2019.
- Road Safety Audit, Route 20 at Grafton Street, prepared by McMahan Associates dated April 2015.
- Road Safety Audit, Route 20 at Lake Street, prepared by VHB dated May 14, 2019
- Plan and Profile of Hartford Turnpike (Route 20) at Grafton Street, Shrewsbury 25% Submittal prepared by McMahan Associates dated February 2018.
- Plan and Profile of Route 20, Shrewsbury 10% Submittal prepared by VHB dated July 2018.

Proposed Development

The proposed site development, as presented in the TIAS and associated Site Plan, consists of 250 residential (rental apartment) units in nine (9) buildings supported by 458 parking spaces; an 80,000 sf Demoulas supermarket supported by 336 parking spaces; and 65,000 sf of various retail buildings supported by 409 parking spaces. Retail uses are planned in several buildings to include a drive-up bank (2,030 sf/23 spaces); pharmacy (13,120 sf/33 spaces); general retail building (24,250 sf/122 spaces); and endcap retail space adjacent to the supermarket (25,785 sf/231 spaces shared in the main parking field). Access to the Site is to be provided by a signalized driveway located opposite Lake Street and an unsignalized intersection located to the east of Lake Street which will be designed to restrict left-turn egress to Route 20.

Traffic Impact and Access Study Comments

Existing Conditions

1. *Study Area:* Commentary is limited to locations within the Town of Shrewsbury jurisdiction, acknowledging that more remote off-site transportation impacts will be subject to review and comment by the City of Worcester. Study locations within the Town of Shrewsbury include the Route 20 intersections at Edgemere Boulevard, Lake Street, Grafton Street and Route 140 Interchange and proposed Site Driveway. MassDOT comments that the Route 20/Purinton Street intersection should also be included as part of the upcoming MEPA Environmental Impact Report (EIR) filing.

MDM concurs that these study locations are appropriate and in context with the likely traffic impacts for the Project and are consistent with recommended study area identified by MassDOT; noting that Applicant should expand the study locations to include Route 20/Purinton Street as per MassDOT comments.

2. *Traffic Volumes:* Traffic volumes for study locations were conducted in January 2019 for the weekday AM, PM and Saturday Midday peak hours, adjusted to reflect seasonal correction factors derived from nearby MassDOT permanent count stations. MDM has reviewed these seasonally-adjusted data against October 2018 count data for Route 20 from prior studies¹. The seasonally-adjusted traffic volumes presented in the TIAS are highly consistent with and slightly higher than historical data for the Route 20 corridor under average or slightly above average conditions. Accordingly, seasonally-adjusted data in the TIAS presents a reasonable representation of typical/average traffic volume conditions along Route 20 for analysis purposes.

3. *Accidents/Crash Data:* The TIAS presents relevant crash data for the study intersections for the period 2012-2016 and confirms that there are two locations within the Town of Shrewsbury that are classified by MassDOT as high crash locations: Route 20 at Grafton Street and Route 20 at Lake Street. Both locations are listed as Highway Safety Improvement Program (HSIP) crash clusters. Road Safety Audits (RSAs) have been completed for both locations (2015/Grafton Street and 2019/Lake Street) which identify relevant/potential safety improvements. Improvements at these locations are proposed as part of MassDOT Project #602102 (Grafton Street) and the Applicant's participation in the MassWorks Route 20 corridor improvements that include Lake Street along the Site frontage.

¹ *Traffic Impact and Access Study, Proposed Centech Park North, Subdistrict A*, prepared by MDM Transportation Consultants, Inc. dated April 2019 (includes October 2018 count data for Route 20 corridor).

Review of RSAs and preliminary (10% and 25% Designs) for the subject locations indicate that long-term improvements are proposed to address identified safety deficiencies, subject to ongoing coordination between the Applicant and MassDOT. However, a date certain for completion of Route 20 corridor improvements is not well established and Applicant acknowledges that improvements may not be completed to coincide with initial occupancy of the Project. As there are notable safety concerns that exist at both locations, any initial occupancy of the Project prior to completion of Route 20 corridor improvements should be subject to a detailed interim operations plan and associated monitoring to ensure that safety concerns are addressed prior to completion of Route 20 improvements. Of particular concern is the Grafton Street intersection, which may have a longer implementation timeline than the Route 20 frontage improvements.

MDM recommends that the Applicant develop a detailed interim operations plan that identifies traffic controls, traffic management measures and potential Site occupancy limitations as necessary to ensure Project-generated traffic is fully supported along Route 20, pedestrian accessibility is provided to/from the Site at initial occupancy and that appropriate safety measures are in place until such time as corridor improvements are completed. Refer to detailed comments under Transportation Monitoring Program below.

4. *Vehicle Speeds:* Route 20 in the Site vicinity is posted at 40 miles per hour; however, no measurement of average or 85th percentile travel speeds are provided in the TIAS to validate design considerations for Site access, sight lines, lane transitions and signal clearance times. Given the significant downgradient of Route 20 headed westbound and general observations by MDM actual travel speeds may be significantly higher than regulatory limits. *Accordingly, MDM recommends that a speed study be conducted by Applicant to determine average and 85th percentile travel speeds for purposes of validating design assumptions and possible consideration of traffic controls/signs that encourage motorist compliance with regulatory speed limits.*

5. *Driveway Sight Distance:* No discussion of driveway sight distance requirements is provided in the TIAS. *Evaluation of sight line requirements for Site driveways should be provided based on measured/ambient 85th percentile travel speeds along with a statement confirming compliance with applicable sight line criteria. The Site Layout Plan should clearly indicate intersection sight triangles and include a note citing that "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."*

6. *Public Transportation:* The TIAS identifies area public transportation provided by the Worcester Regional Transit Authority (WRTA) and the proximity of the MBTA Grafton Commuter Rail Station; however, no services immediately proximate to the study area are currently available. Applicant commits to evaluating feasibility of expanding WRTA service to the Site in discussions with the Town and WRTA.

MDM acknowledges the Applicant's commitment as part of its Transportation Demand Management programming to engage in discussions with the Town and the WRTA to consider the Site as a potential service stop, including a commitment to provide appropriate accommodations within the Site such as a bus shelter. Applicant should document its coordination efforts and outcomes with specific locations for potential bus accommodations/shelter locations on the Site Plans. MDM also recommends that Applicant engage in discussions with the Shrewsbury Council on Aging to incorporate the Site as a destination as part of its available van service for eligible Town residents.

Future Conditions

7. *Traffic Growth:* Future traffic volumes are projected to a 7-year horizon using 1 percent annualized growth plus permitted but unbuilt area projects that include a senior residential development on Lake Street and retail/medical marijuana facility on Rout 20. MDM concurs that these growth factors are consistent with protocols customary to the industry and present a reasonable basis for estimating "No Build" traffic volume conditions for purposes of the Project TIAS.

MDM further notes that use of a 1 percent annualized growth rate is conservatively higher than the historic growth rate based on growth trends in the area which is flat or slightly declining. Accordingly, annualized growth assumption used in the TIAS inherently accounts for other non-specific area development projects. Once such project is the Centech North commercial development along South Street which is currently undergoing MEPA review; trips associated with this project were reviewed for potential inclusion in the Edgemere Crossing at Flint Pond evaluation based on the submitted traffic study² but determined to fall within the annualized growth assumptions of the TIAS. Hence, we conclude that the background growth assumptions employed in the Applicant's TIAS are reasonable for future-year analysis purposes.

² *Traffic Impact and Access Study, DEIR Transportation Component, Centech Park North, Shrewsbury MA prepared by MDM Transportation Consultants, Inc. dated August 2019.*

8. *Trip Generation*: Trip estimates for the Project are appropriately based on characteristics published by the Institute of Transportation Engineers (ITE) in *Trip Generation* 10th Edition for supermarket, retail and residential land uses. Trip estimates are adjusted following accepted ITE methodology cited in the Trip Generation Handbook 2nd Edition to reflect internal capture trips and pass-by trips. Net new trip generation is estimated to range from 385 to 663 vehicle-trips for weekday peak hours and 874 vehicle-trips for Saturday Midday peak hours using this methodology.

Closer review of the internal capture trips for the Project (ie, trips shared among retail and residential uses) indicates an effective capture rate of 8 to 9 percent of gross trip activity for the Project, which is within guidelines published by ITE. Likewise, effective pass-by rates (trips drawn from the existing adjacent street traffic) range from 24 to 34 percent of gross retail trips, also within guidelines published by ITE.

As a practical matter, actual trip activity of the Project may vary from estimates on the basis of specific retail tenants and uses. For instance, in the case of a Demoulas supermarket empirical data for its Woburn Massachusetts Store as documented in prior studies³ indicates trip activity that exceeds generic ITE rates for supermarket use. Likewise, the Applicant's TIAS assumes a pharmacy use, bank and undefined general retail space that may be subject to change based on market conditions.

While the ITE-based trip generation approach as presented in the TIAS is suitable for permitting purposes and mitigation programming and follows industry standards, post-occupancy monitoring is recommended to measure actual Project performance against projected Site trip levels and distribution. Refer to comments under Transportation Monitoring for suggested requirements.

9. *Trip Distribution*: Regional trip patterns for Site traffic presented in the TIAS are based on US Census Journey-to-Work data for the residential component and we generally concur with the resulting estimated residential trip patterns on this basis.

No trip distribution calculations or gravity modeling is provided in the TIAS for the retail and supermarket components – the most significant traffic generating uses for the Project. We concur with the TIAS statement that it is unlikely for customers of competing supermarket uses to bypass a similar store to visit the proposed supermarket. *The presence of competing supermarket uses in particular should be considered by the Applicant as part of a gravity*

³ *Traffic Impact and Access Study, Woburn Mall Mixed Use Development, Woburn MA* prepared by MDM Transportation Consultants, Inc. dated January 2019.

model to validate distribution patterns, noting that a substantial proportion of the Town's population (and those located to the east of the Project) are perhaps more directly served by numerous competing stores along the Route 9 corridor. Revised trip distribution may require adjustment to the subsequent analysis, or at least a sensitivity analysis to determine whether deviation from the assumed retail trips distribution would result in any material differences in TIAS findings.

10. *Operations Analysis:* Operational analyses are presented in the TIAS follow generally accepted traffic engineering practices and protocols, indicating ample capacity at study intersections to accommodate Project trip increases assuming implementation of Route 20 corridor improvements and planned improvements at the Route 140 Interchange. *MDM recommends that the Applicant develop a detailed interim operations plan that identifies traffic controls, traffic management measures and potential Site occupancy limitations as necessary to ensure Project-generated traffic is fully supported along Route 20, pedestrian accessibility is provided to/from the Site at initial occupancy and that appropriate safety measures are in place until such time as corridor improvements are completed. Refer to detailed comments under Transportation Monitoring Program below.*

11. *Site Parking:* The TIAS presents a summary of estimated average parking demand for the Project based on ITE Parking Generation 4th Edition rates and Town ordinance requirements, indicating that aggregate parking supply for both land use types will exceed ITE average demand and local ordinance requirements.

(a) MDM notes that more current ITE parking rates are available (ITE Parking Generation 5th Edition) that should be considered by the Applicant to estimate both average and 85th percentile (peak) parking demands for the Project to determine appropriate supply ratios – particularly for the retail/supermarket components.

Residential Parking Supply

The proposed residential parking supply for the project represents a parking ratio of approximately 1.8 spaces per residential unit which MDM finds more than adequate to accommodate anticipated peak parking demands per ITE Parking Generation (5th Edition) standards. Residential parking supply is also reasonably distributed among the nine (9) residential buildings, generally located within 300 feet of unit entrances.

(b) Applicant should clarify effective parking supply rates for each building unit based on relative proximity of surface spaces to determine the likelihood of curbside parking, noting

areas where effective unit parking ratios are lower than 1.5 and may result in curbside parking activity. Applicant should also consider measures to limit or restrict curbside parking to facilitate passenger, bicycle, service and emergency response vehicles on Project roadways – particularly near Site driveways including the residential clubhouse vicinity.

Retail Parking Supply

Initial review of ITE 5th Edition parking demands for retail and supermarket uses indicates a peak (85th percentile) demand that ranges from just under 600 spaces on Weekdays and Weekends to 800 vehicles on Fridays. This appears to be well correlated to the aggregate supply of 868 spaces for retail use, leaving some excess supply.

(c) To validate parking distribution, MDM recommends that a more detailed assessment of hourly peak parking demands be conducted by retail use (supermarket, pharmacy, bank, general retail) based on ITE 5th Edition average and 85th percentile rates and Urban Land Institute (ULI) time-of day parking factors. Projected peak parking demands by use should be summarized and compared to parking supply proximate to each use to determine areas of parking likely to be over or under-utilized during average and peak conditions. Should analysis indicate high likelihood of excess parking in portions of the Site, this may provide a basis for designating employee parking to those under-utilized areas to better accommodate patron use proximate to each retail building and/or flexibility to reduce parking supply and incorporate enhanced pedestrian connections to the main retail structure from the main parking field.

Pedestrian and Bicycle Accommodation Improvements

12. Specific comments on pedestrian and bicycle accommodation within the Site are noted below under Access and Circulation. External to the Site, MDM acknowledges that the multi-use path along the Site frontage and along Route 20, together with 5' roadway shoulders along Route 20 as presented in the Route 20 10% Design Plan will provide a viable means of accommodating and encouraging pedestrian and bicycle connection to area land uses.

Applicant should elaborate of possible means of pedestrian and bicycle connectivity to the Village at Orchard Meadows residential community located immediately east of the Site via Purinton Street. Pedestrian and bicycle connections (sidewalks, bike sharrows, path connections) that encourage this mode of travel to/from the Site should be considered by the Applicant as a mutual benefit that aligns with the goals of the TDM programming for the project and the MassDOT goal of encouraging multi-modal travel for mixed-use developments.

Transportation Demand Management (TDM) Programming

13. TDM Programming: MDM concurs with Applicant's framework for TDM programming, noting the expectation of achieving at least a five (5) percent reduction in vehicle-trips as compared to the projected ITE-based trip generation estimates.

To achieve the stated trip reduction goal, all potential means of encouraging non-auto and reducing single-occupant vehicle use should be seriously considered by the Applicant for inclusion in the TDM program. One concrete way of achieving such a goal as noted above in Comment No.12 is to consider and propose means of pedestrian and bicycle connectivity to the Village at Orchard Meadows residential community located immediately east of the Site via Purinton Street.

Transportation Monitoring Program

14. Applicant proposes an annual Traffic Monitoring Program (TMP) to begin six months after initial occupancy over a 5-year period with reporting to MassDOT and MassDEP.

(a) Post-occupancy monitoring should present comparison of actual Project performance against projected Site trip levels and patterns (distribution of trips) cited in the TIAS and TDM effectiveness. Such monitoring will provide a basis for adjusting signal timing/phasing, TDM programming or other mitigation actions to reflect actual Project performance. The Town should be a recipient/reviewer of these monitoring reports with commitment by Applicant to report on actual Site performance relative to TIAS projections and to identify and implement specific countermeasures such as signal timing/phasing adjustments to address operational conditions that fall below certain thresholds (for example, LOS D operations or queue extents that exceed lane storage capacity). The monitoring report should also document the effectiveness/participation in TDM measures with comparison to stated goal of 5 percent reduction from ITE-based trip generation estimates, with a commitment to augment or adjust TDM programming as appropriate to achieve this goal.

(b) MDM recommends that the Applicant develop a detailed interim operations plan that identifies traffic controls, traffic management measures and potential Site occupancy limitations as necessary to ensure Project-generated traffic is fully supported along Route 20, pedestrian accessibility is provided to/from the Site at initial occupancy and that appropriate safety measures are in place until such time as corridor improvements are completed. An occupancy level/limit should be identified by the Applicant based on operational and safety

thresholds to ensure adequate capacity is available (LOS D or better operations) and safety trends (crash rates, adjusted to reflect type and severity) remain at or below average levels during the interim period following initial Site occupancy. The interim operating plan should also identify safety and/or operational countermeasures that may be considered and applied to address identified deficiencies including but not limited to police details, supplemental warning signs, operational restrictions, etc. The interim operations plan monitoring and reporting should take place within the first 60 days of Site occupancy/operation to ensure appropriate operational and safety controls are in place and effectively supporting initial Site operations, with recommended adjustments thereto if required to address operational or safety threshold exceedances.

Access and Circulation Comments

15. *Site Access Design:* Proposed Site driveways at Route 20 are subject to MassDOT review and approval and as proposed are consistent with the preliminary (10 percent) design plans that served as the basis for a MassWorks grant to corridor improvements. Several considerations are noted that should be addressed by the Applicant as follows:

- (a) *Sight Lines:* MDM recommends that the applicable sight line triangles be shown on the Site Layout Plan along with measured sight lines to confirm that minimum sight line criteria are met, and if possible the ideal Intersection Sight Distance (ISD). The sight line triangles should not encroach onto adjoining (private) property to achieve sight line criteria. The Site Layout Plan should also include a note citing that "Signs, landscaping and other features located within sight triangle areas shall be designed, installed and maintained so as not to exceed 2.5-feet in height. Snow windrows located within sight triangle areas that exceed 3.5-feet in height or that would otherwise inhibit sight lines shall be promptly removed."

- (b) *Easterly Driveway: The easterly (unsignalized) driveway includes a raised delineating island that extends well into the proposed MassDOT layout; Applicant should confirm whether MassDOT will allow such encroachment or raised island as such features typically raise concern for wintertime plowing operations and maintenance and preclude a "recovery lane" for vehicles that ultimately opt to continue eastbound on Route 20. MDM further recommends that the raised island feature (as may be modified per MassDOT review) incorporate a more restrictive design that physically precludes illegal left-turn movements from the Site onto Route 20 given the high speed nature of travel and location near the "down-gradient" of westbound travel. As currently designed, there is some likelihood that patrons or residents parked closest to this driveway destined west could easily attempt an illegal left-turn rather than negotiate the Site to the main (signalized) driveway – particularly during "off-peak" hours.*

- (c) *Internal Driveway Turn Restrictions: The proximity of northernmost residential driveway to the Easterly Site driveway raises conflict concerns; MDM concurs with Town comments to extend the raised island into the Site to preclude turning movements that are in close proximity to the easterly driveway at Route 20. The extension of the raised island would also facilitate a pedestrian crossing at this area of the Site to accommodate the desire line between the residential buildings and the proposed pharmacy building.*

- (d) *Internal Easterly Driveway Curblin Alignment: The Site Plan should be adjusted to reflect an appropriate alignment/lane transition from the easterly driveway entrance into the Site and past the first driveway serving the main parking field. As currently designed, the curblin east of the proposed pharmacy building abruptly extends into the alignment of the easterly driveway entry lane raising a safety concern.*

- (e) *Easterly Main Parking Field Entry Drive: The nexus of this internal one-way driveway at the main parking field (immediately adjacent to the pharmacy building north driveway) is confusing and should be reconsidered. MDM concurs with the Town comment that Applicant should consider converting this driveway to a pedestrian connection to the Site from the Route 20 shared-use path to better accommodate pedestrians and reduce vehicular conflicts within the Site.*

16. *Site Circulation:*

(a) Applicant should confirm that the Site Layout Plan provides sufficient maneuvering area to accommodate the Town's largest responding fire apparatus (ladder truck) and service vehicles (SU-30 type design vehicles or equivalent) by conducting AutoTurn® vehicle turn analysis/exhibits.

(b) Applicant should consult with the Shrewsbury Fire Department to determine requirements for emergency vehicle circulation around proposed apartment buildings; as currently designed, certain buildings only access along the building frontage. The need for additional structured/reinforced travel ways sufficient to accommodate emergency apparatus along additional building areas should be determined.

(c) MDM concurs with Town comment for Applicant to consider roundabout features at major 4-way intersections within the Site; such features would negate the need for raised pedestrian tables and provide integrated pedestrian crossings within the roundabout.

17. *General Site Plan Comments (Transportation):*

(a) School bus waiting areas should be provided at an appropriate locations near the Site driveway(s) subject to discussions with the Shrewsbury School Department. These areas may also serve as a waiting area for WRTA bus service along Route 20 subject to Applicant discussions with WRTA.

(b) Consideration should be given to installing electric vehicle (EV) charging stations within the Project Site at convenient and easily accessible locations to encourage EV use.

(c) Americans with Disabilities Act (ADA) compliant wheelchair ramps and crossings appear to be provided at all pedestrian crossings internal to the Project site. To further enhance pedestrian mobility and visibility to motorists, Applicant should also consider continuous sidewalks or raised crosswalks/tables along high volume pedestrian routes including the main supermarket entries, and intersections at either end of the main circulating aisle serving the supermarket/main parking field. An additional protected, centrally located pedestrian walkway in the main parking field connecting to the

Barnard Cahill
August 15, 2019
Page: 13

primary supermarket "desire line" is also suggested to reduce pedestrian/vehicle conflicts.

(d) MDM concurs that Applicant should consider use of roundabout design features at key internal intersections as a means of reducing vehicle conflicts at high volume locations. Such design features may preclude the need for raised crosswalk tables at certain locations noted above.

(e) Location and number of bike racks serving retail uses should be identified to support and encourage bicycle use to and within the Site, with provisions for clearly marked bicycle lanes and/or "Sharrows" markings on Site circulating aisles that lead to the multi-use path and bicycle accommodations along Route 20.

MDM appreciates the opportunity to provide Transportation Planning & Engineering Services to the Town of Shrewsbury and look forward to discussing our findings at the upcoming Planning Board hearing. If you have any questions or concerns, please feel free to contact this office.

Sincerely,



Robert J. Michaud, P.E.
Managing Principal

MDM