TRANSPORTATION ENGINEERS & PLANNERS

McMahon Associates
350 Myles Standish Boulevard, Suite 103
Taunton, MA 02780
P. 508.823.2245
mcmahonassociates.com

June 8, 2021

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

RE: Transportation Engineering Peer Review Services
Campus Master Plan Special Permit
Centech Park
384-386 South Street
Shrewsbury, MA
Issues Summary

McMahon is reviewing the site plans and TIAS for the proposed Centech Park Campus Master Plan (herein referred to as the "Project") located at 384-386 South Street in the Town of Shrewsbury, Massachusetts. The following table lists each of the issues and the current status of each:

Issue	Resolved	Notes
1. Project Description Building Size	No	We request that the Applicant confirm the total square footage of the campus building to be consistent for the TIAS and the site plans.
2. Study Area Roadways and Intersections– Route 140/Route 20 Intersection	No	This interchange was not included as part of the analysis in the TIAS. We request that the Applicant provide clarification as to why the Route 140/US Route 20 interchange was not included in the study area.
3. Traffic Volumes– Historical Data	No	We generally concur with the counted peak periods and the use of historic TMC data for the TIAS. However, we request that the Applicant verify class times and schedules at the UMass campus, if possible, to ensure that peak traffic volumes at the campus align with the network peak hours and that there are no unusual midday peak hours.
4. Traffic Volumes – Seasonal Factors	No	We recommend that the Applicant confirm that the county-wide seasonal factor applied is appropriate for the study area by reviewing available count data from MassDOT at a continuous count station in the vicinity of the site.

Issue	Resolved	Notes
5. Safety– Route 9/South Street Crash Rate	No	We acknowledge that the crash rate at the Route 9/South Street intersection is significantly above average, which is indicative of safety deficiencies. However, the countermeasures proposed as part of the RSA for this intersection are expected to adequately address these existing deficiencies and reduce the observed intersection crash rate over time. Some additional low-cost/medium safety payoff countermeasures identified in the RSA have not yet been implemented, such as painting of southbound double left-turn lane extension lines and relocation of the "Advance Traffic Signal" sign on the Route 9 westbound approach. These countermeasures, along with other medium and high safety payoff countermeasures, should be implemented in a timely manner to ensure that safety deficiencies at this intersection are not exacerbated by the addition of Project-related traffic under future conditions.
6. Safety– Route 20/Centech Boulevard & Route 9 WB/Route 9 Connector WB	No	We request that the Applicant evaluate the potential for low-cost countermeasures to address safety concerns at the signalized US Route 20/Centech Boulevard intersection, as well as the unsignalized Route 9 Westbound/Route 9 Westbound Connector intersection. While the crashes at these locations were generally low-severity, both intersections experienced crash rates that are slightly above average.
7. Sight Distance– Site Driveway at Route 20	No	The TIAS notes that trucks to and from the Project site will be directed to the US Route 20 Driveway and will not be permitted to use the South Street Driveway. Combination trucks have more conservative gap acceptance parameters and will change the sight distance requirements considerably. As such, we request that the Applicant revise the sight distance calculations for the US Route 20 Driveway to reflect a combination truck as the design vehicle.
8. Background Growth– Annual Background Growth Rate	No	We request that the Applicant review more recent traffic data collected after 2013, if available, to calculate the annual background growth rate. Furthermore, it is recommended that the calculated background growth rate be confirmed with the Town of Shrewsbury and with the Central Massachusetts Regional Planning Commission (CMRPC).
9. Background Growth– UPS Grafton Facility	No	We request the Applicant provide a status update of the UPS Grafton Facility project and consider what impacts, if any, that project will have on the study area intersections included in this project's TIAS.

Issue	Resolved	Notes
10. Trip Generation – ITE Land Use Codes	No	We request that the Applicant discuss why the trip generation estimates for the campus building using the fitted curve was not utilized or clarify why the average trip generation rate was used instead.
11. Trip Generation – Building Size	No	As mentioned previously, the square footage of the campus building noted in the TIAS does not match that square footage indicated on the most recent site plan. Depending on the revision to the TIAS or the site plans for the actual size of the building, the trip generation estimates may need to be revised to reflect the most recent site plan. McMahon acknowledges, however, that the trip generation estimates for the campus building as shown provide a conservative estimate.
12. Trip Generation – Peak Hours	No	It is requested that the Applicant identify the peak hours used as a basis for the analysis.
13. Trip Distribution – Project Trips	No	We request that the Applicant consider providing separate distributions for Project employees and Project truck trips, as Journey-to-Work data may not be applicable to the latter. We also recommend that the truck trip distribution be based on the populations of the surrounding municipalities that are to be serviced by the Project.
14. Traffic Analysis – Methodology	No	We request that the Applicant use the Synchro 10 methodology for the analysis of the signalized intersections, as HCM 2000 methodology is fairly outdated and has been superseded by more up-to-date methodologies. Furthermore, it is our opinion that the HCM 2000 methodology is not appropriate for use at unsignalized intersections for the same reason. As such, it is requested that the Applicant utilize HCM 6th Edition methodology at all unsignalized intersections in the study area. Consistency should be achieved between intersections with similar types of traffic control.
15. Traffic Analysis – Peak Hour Factors	No	We request that the Applicant calculate the approach PHFs and revise the capacity analysis as needed. Furthermore, MassDOT TIA guidelines state that the PHF under future conditions should be set to a default value of 0.92, unless professional engineering judgment dictates otherwise. We request that the applicant revise the 2028 No Build and 2028 Build capacity analyses to reflect a PHF of 0.92.

Issue	Resolved	Notes
16. Traffic Analysis – Route 140/Route 9 WB Intersection	No	For the intersection of Route 140 at the Route 9 Westbound Connector, we request that eastbound right turns be set to "free" in Synchro for the 2021 Existing, 2028 No Build and 2028 Build capacity analyses, as this movement is under yield control and channelized under existing conditions as it is currently set to "permissive."
17. Traffic Analysis – Route 140/Route 9 WB Connector Intersection	No	For the intersection of Route 140 at the Route 9 Westbound Connector, we request that a southbound right-turn overlap be coded on Phase 4 (eastbound left turns), consistent with existing conditions observed during McMahon's field review. This change should be applied to the 2021 Existing, 2028 No Build and 2028 Build conditions.
18. Traffic Analysis – South Street at Charles River Lab Driveway	No	For the intersection of South Street at the Charles River Laboratories Driveway/UMass Driveway, the eastbound left turn volume should be 40 vehicles under 2021 Existing conditions. It is currently shown as four vehicles.
19. Traffic Analysis – Route 9 at South Street	No	For the intersection of Route 9 at South Street, the weekday morning and weekday afternoon peak hour volumes in the 2028 Build Conditions capacity analysis do not match the volumes shown in Figure 8. Similarly, the 2028 Build weekday morning peak hour volumes at the intersection of South Street at the Charles River Laboratories Driveway/UMass Driveway do not match the volumes in Figure 8. We request that the applicant revise the capacity analysis accordingly.
20. Traffic Analysis – Signal timing optimization	No	The intersection of Route 9 at South Street is shown to decrease from level-of-service (LOS) E under 2028 No Build conditions to LOS F under 2028 Build conditions. Furthermore, the LOS some movements at other signalized intersections are shown to experience significant delay under future conditions, including the intersections of US Route 20 at South Street/Green Street and Centech Boulevard/Cherry Street. We suggest that the Applicant consider reviewing and proposing additional mitigation measures to reduce delay, such as signal timing optimization. Alternatively, the Applicant could consider modeling the proposed intersection improvements for the US Route 20 corridor project to mitigate delays and queueing.

Issue	Resolved	Notes
21. Traffic Analysis – Stop Controlled Intersections	No	Stop-controlled movements at several unsignalized intersections are shown to experience high delays under 2021 Existing, 2028 No Build and 2028 Build conditions. In particular, stop-controlled eastbound movements at the intersection of Route 140 at the Route 9 Eastbound Connector is shown to exceed 600 seconds of delay. We request that the Applicant consider conducting a gap acceptance study at this intersection as a means of calibrating the Synchro model and providing more realistic delays.
22. Vehicular Site Circulation – Signage	No	It is requested that signage for the employee only and truck only entrances be provided on the site plans.
23. Deliveries and Operations – Turning Movement Diagrams	No	We request that the Applicant provide a turning movement diagram to show a delivery truck and emergency vehicle safely navigating and exiting the proposed site without blocking proposed spaces and confirm specified loading areas.
24. Deliveries and Operations – Dumpster Location	No	We request that the dumpster locations be designated on the plans.
25. Site Lighting – Stamped Plan	No	We request that the Applicant provide a lighting plan stamped by a professional engineer licensed in the Commonwealth of Massachusetts, with photometric light levels, showing the location and style of proposed outdoor light fixtures for the site.

Very truly yours,

Steven C. Findlen
Senior Project Manager