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January 2, 2018

Mr. David R. Consigli  
Zoning Board of Appeals  
Town of Milford  
Town Hall  
52 Main Street  
Milford, MA 01757

RE: Transportation Peer Review

Dear Mr. Consigli:

BSC Group has been retained as a sub-contractor to Comprehensive Environmental Inc., to provide peer review services regarding traffic and transportation impacts for the proposed residential development entitled "Robsham Village". The Proponent proposes to construct 300 residential apartment units on an existing approximately 117-acre site, to be located at 462-466 East Main Street (Route 16) in Milford, Massachusetts.

BSC Group has performed the peer review based on the following information:

- Traffic Impact and Access Study, Robsham Village, Proposed Residential Development, Milford, Massachusetts, Vanasse Hangen Brustlin, July 14, 2017
- Robsham Village Permit Plan Set, dated October 23, 2017
- Various letters from Town of Milford representatives in response to the Comprehensive Permit Application:
  - Engineering Office
  - Fire Department
  - Planning Board
  - Planning Office
  - Police Department
- Field visit performed on Tuesday December 12, 2017

BSC offers the following comments on the Traffic Impact and Access Study (TIAS):

Study Area

1. The TIAS states that the study area was selected "based on discussions with Planning, Engineering, and Police Departments at the Town of Milford" and the area was confirmed with MassDOT District 3 offices.
2. The description for East Main Street (Route 16) states that "The posted speed limit on Route 16 eastbound is 45 miles per hour (MPH). Posted speed limit signs were not visible in the westbound direction." Based on the field visit, a posted speed limit of 40

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MPH was available in both the eastbound and westbound directions on East Main Street (Route 16) in the vicinity of the project.

#### Traffic Volumes

3. Turning movement counts were collected in February 2017 during the weekday morning (7-9AM) and afternoon (4-6PM) commuter peak hours. These times are consistent with standard procedures. These volumes were increased by one percent in order to account for the seasonal variation in volumes; BSC concurs with this action.

#### Crash History

4. The TIAS provides crash information for the intersection of East Main Street at Fortune Boulevard / Beaver Street. The report also summarizes the segment crash information along Route 16 between I-495 and Adams Street. BSC Group requests intersection crash information at the remaining study area intersections, including the intersections of Route 16 at Zain Circle, Whispering Pine Drive, and Adams Street. Crash rates should be calculated for these locations and compared to the MassDOT District and statewide averages.
5. The TIAS indicates that crash data was also requested from the Milford Police Department. BSC Group requests an update to the crash data based on any additional information provided by the Town.

#### Future Conditions

6. The future conditions were projected under a seven-year planning horizon. BSC Group concurs with this timeline, which is consistent with current MassDOT standards.
7. Future No Build conditions were estimated by applying a one-percent annual growth rate and adding vehicle trips from specific known developments in the area. BSC Group concurs with this methodology.

#### Trip Generation

8. Table 3 summarizes the estimated number of vehicle trips for the proposed development. Trips for the proposed development were estimated using rates from the Institute of Transportation Engineers (ITE) Trip Generation, which is the standard methodology used by traffic engineers to estimate trips, when specific site-development volumes are not available. Since the preparation of the TIAS in July 2017, ITE has released the 10<sup>th</sup> edition of the Trip Generation Manual. BSC Group recommends comparing the estimated number of trips for the proposed development using the rates included in the 10<sup>th</sup> edition.
9. Please confirm the number of Weekday Daily trips shown in Table 3 for the Trip Generation Summary.

#### Trip Distribution

10. BSC Group generally concurs with the methodology used to estimate the trip distribution patterns. The TIAS indicates that specific Journey to Work data has been



included in the Appendix, but this information appears to be missing. Please provide the specific data used to estimate the trip distribution patterns.

#### Site Access

11. The Proponent is proposing to locate the Site driveway across from the existing intersection of Whispering Pine Drive with East Main Street (Route 16). The site frontage appears to extend approximately 150 feet east and 500 feet west of the proposed driveway location. BSC Group recommends that the Proponent consider the implications of moving the driveway further west, including driveway offset distances, ease of access for current residents on Whispering Pine Drive, and sight distance impacts. BSC Group understands that East Main Street (Route 16) is under the state's jurisdiction and MassDOT's approval is required for the location of the access and any work done within the state highway layout.
12. Please confirm that the proposed Site driveway will be median-divided. The Layout and Materials Plan (C4.1) included in the submission does not show a median.

#### Sight Distance Analysis

13. During the field visit on December 12, 2017, BSC Group performed independent sight distance measurements at the approximate location of the proposed driveway, to be located across from Whispering Pine Drive.

The Table below compares the Stopping Sight Distances shown in the TIAS versus those measured by BSC Group.

Direction	From TIAS Table 6		BSC Group Analysis	
	Minimum Required (feet)	Measured (feet)	Minimum Required (feet)	Measured in Field (feet)
Route 16 eastbound towards proposed Site Driveway	325	>700	325	365
Route 16 westbound towards proposed Site Driveway	290	>700	301 <sup>a</sup>	805

<sup>a</sup>based on posted speed limit of 40 MPH

As can be seen in the above Table, BSC Group measured 365 feet for the SSD traveling eastbound on Route 16, compared to the >700 feet shown in the TIAS. Please confirm the measured SSD measurements as they are shown in the TIAS.

14. It should be noted that, as stated in Comment 2, the posted speed limit along Route 16 in the vicinity of the project is 40 MPH. Standard practice is to determine the minimum required sight distances based upon the higher of the posted speed limit or the 85th percentile speed limit. Therefore, BSC Group suggests that for vehicles traveling in the eastbound direction on Route 16, the minimum required SSD be based upon the recorded 85th percentile speed of 42 MPH (as stated in the TIAS) and for vehicles traveling in the westbound direction on Route 16, the minimum required SSD be based upon the posted speed limit of 40 MPH.



15. Based on the field visit, BSC Group concurs that the Intersection Sight Distance (ISD) was not able to be measured in the field due to the existing vegetation. The TIAS appendix provides a Sight Distance figure showing the areas to be kept clear in order to maintain lines of sight for vehicles exiting the proposed driveway. As with the SSD, BSC Group recommends that the minimum ISD requirements be recalculated based upon the higher of the posted speed limit or the 85th percentile speed limit. This would result in a larger minimum desired ISD for vehicles looking left and turning right onto Route 16.
16. As stated in the TIAS, the ISD looking to the left of the site driveway traverses the adjacent site property. Today, sight lines are not restricted by the property, however the measured available distance, if it were to be limited by this property in the future, is measured as 275 feet. The TIAS states that this distance is approximately equal to the required SSD. However, the required SSD when calculated according to the posted speed limit of 40 MPH is 301 feet, resulting in an available ISD that is 26 feet below the minimum ISD equivalent to SSD. BSC Group recommends that an easement may need to be acquired from the adjacent property in order to maintain clear sight lines.
17. It should be noted that the profile of Route 16 to the east of the Site Driveway is characterized by both horizontal and vertical curvature. The desired ISD looking in this direction may also be restricted by the existing vertical curvature, in addition to the adjacent property limitations, as stated in the TIAS.

#### Signal Warrant Analysis

18. Signal warrant analyses were conducted based on the future Build condition volumes. Please provide additional information as to how the 8-hour Build condition volumes were projected.
19. The TIAS indicates that the signal warrant analysis worksheets are included in the Appendix. This information appears to be missing; please provide.

#### Left-turn Lane Warrant Analysis

20. The TIAS indicates that a left-turn lane warrant analysis was completed and that the worksheets are included in the Appendix. This information appears to be missing; please provide.
21. A left-turn lane is warranted according to the analysis provided in the TIAS. The Conclusions section states that the Proponent is committed to fund the design and construction of, among other improvements, an eastbound left-turn lane on Route 16 to accommodate vehicles waiting to turn into the site. BSC Group suggests that the Proponent conduct a revised capacity analysis at the intersection to evaluate the operational impacts of such a left-turn lane. In addition, conceptual roadway plans should be prepared to show how this left-turn lane will be placed on the roadway and what, if any, impacts the additional lane will have on right-of-way.

#### Traffic Operations Analysis

22. Table 7 indicates that the overall delay at the signalized intersection of East Main Street



(Route 16) at Fortune Boulevard / Beaver Street is expected to increase by no more than 3 seconds due to the proposed project. At the unsignalized intersection of East Main Street (Route 16) at Whispering Pine Drive / Proposed Site Driveway, the Whispering Pine Drive approach is expected to experience a delay increase from 25 to 48 seconds during the weekday morning peak hour and from 30 to 75 seconds during the weekday afternoon peak hour. Figures 8 and 9 project that a total of 5 and 20 vehicles will exit Whispering Pine Drive under the future Build condition during the weekday morning and afternoon peak hours, respectively. BSC Group agrees with the methodology used to evaluate the operating conditions at the study area intersections.

23. The Proponent also conducted a gap analysis in order to evaluate whether there will be enough available gaps in the traffic stream along Route 16 to accommodate the vehicles generated by the proposed Project. BSC Group concurs with the methodology used to conduct the gap analysis. The results indicate that the available gaps will be able to accommodate up to 272 vehicles during the weekday morning peak hour and 305 vehicles during the weekday afternoon peak hour. By comparison, the TIAS estimates that the number of vehicles expected to exit the side streets (both Whispering Pine Drive and the proposed site driveway) will be 140 vehicles during the weekday morning peak hour and 70 during the weekday afternoon peak hour.

#### Pedestrian Safety

24. The Proponent is proposing a sidewalk along the frontage of the Site, on the north side of East Main Street and along the west side of the Site driveway. Additionally, bus pull-outs are proposed on both sides of East Main Street west of the Site driveway, with a potential bus shelter on the north side of East Main Street. BSC recommends that the Proponent consult the MBTA Bus Stop Planning and Design Guidelines on the design and location of the bus shelter.
25. The Proponent should reconcile the differences in the location of the sidewalk along the Site driveway shown in the Civil and the Architectural drawings.
26. The Proponent is proposing a crosswalk on East Main Street, west of the Site driveway. BSC Group recommends that advance warning signs and signs identifying the location of the proposed crosswalk should be shown on the Plans. The crosswalk detail included in the Site Plans should be updated to reflect the latest MUTCD signs. If warranted and approved by the MassDOT, the Proponent should install Rectangular Rapid Flash Beacon (RRFB) to enhance the proposed pedestrian crosswalk.
27. The Site Plans does not include sufficient design detail for BSC Group to comment on pedestrian access ramps at specific locations. The Proponent should provide the location of individual pedestrian ramps and their design for review.
28. Proponent should clarify how a person parked in one of the four exterior handicap parking spaces near the North Entrance will access the building via an accessible path.



Please do not hesitate to contact our office with any inquiries you may have.

Sincerely,

BSC Group, Inc.

Sam Offei-Addo, P.E., PTOE  
Senior Project Manager/Senior Associate

cc: Thomas J. Loughlin, P.E.

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