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November 14, 2016

Ms. Melissa Maupin  
District Permit Manager  
PennDOT Engineering District 5-0  
1002 Hamilton Street  
Allentown, PA 18101

RE: Response to Comments  
**Walmart – Walnutport (Lehigh Township)**  
Lehigh Township, Northampton County, PA  
**Application Number: 112807**  
McMahon Project No. 912250.12

Dear Ms. Maupin:

McMahon Associates, Inc. offers the following responses to the review letter authored by PennDOT, dated September 22, 2016 for the above referenced project. In addition, enclosed is a revised Transportation Impact Study (TIS), dated November 2016, which addresses these comments. It should be noted that this study has been revised to also reflect comments from the Township's most recent review letter, dated September 9, 2016 (enclosed).

It should be noted that no changes to the proposed development sizes, development phasing, or proposed access have occurred, in comparison to the previous TIS (August 2016).

**General**

***Comment #1: Be sure to include a discussion of any changes to the TIS that are not identified in the responses to comments at the beginning of the response letter.***

Response: Will comply. The only other changes made to the TIS besides those addressing the PennDOT review letter (September 22, 2016) are the comments and their responses identified in the Township's review letter (September 9, 2016).

***Comment #2: As a reminder, an Access Covenant will be required to limit SR 0145 access to proposed Road. No additional site access to SR 0145 will be permitted. The Department requires an Exhibit A be attached to the Access Covenant. This is a plot plan, drawn from the***

*HOP plans and/or ROW plans depicting the property frontage to be affected by the access covenant. Typically, the frontage to be affected is depicted with a line described as Limit of Covenant on the plot-plan diagram. A sample has been provided for you in the Attachments section.*

Response: Will comply. The Applicant is aware of this reminder and the Access Covenant will be prepared during the HOP plan process.

**Comment #3:** *As previously requested, revise the concept plan to show back-to-back left turn lanes between Birch and the proposed signalized intersection to maximize the storage lengths and eliminate the need for gore striping. It is noted that the concept plan was revised to provide less gore area, however, revise the plan to eliminate the gore area. Also revise the Overall Site Plan to match.*

Response: Will comply. The concept plans for the intersection of Riverview Drive (SR 0145) & Washington Drive, Riverview Drive (SR 0145) & Birch Drive, and proposed access has been revised to indicate back-to-back left turn lanes. It should be noted that the concept plans show a mountable median delineating these left-turn lanes. The Applicant requests the Department's guidance on whether the mountable median is preferred, or if it should be replaced with pavement markings. The Land Development plans will be revised to reflect the Department's preference on the mountable median versus pavement markings.

**Comment #4:** *Please continue to provide Township review comments and/or approvals with your resubmission. In particular, the Department would like Township's position on the roundabout alternative as well as feedback on the potential realignment of Birch Drive through the site to align opposite Washington and also serve at the site access (in lieu of the proposed new access).*

Response: Will comply. The Township review letter, authored by Hanover Engineering Associates, dated September 9, 2016, is enclosed. The Township has not provided any interest for the construction of a roundabout to-date. It is our understanding that the concept of the Birch Drive realignment through the site may have been raised by a previous Township Engineer who represented the Township several years ago. The Township has not expressed an interest in this realignment in any recent discussions or public meetings. The Applicant will work with the Township to obtain the Township's position on these two items.

### **Application**

***Comment #1: As a reminder, please provide proof of ownership in the form of a deed or agreement of sale to verify that the Highway Occupancy Permit application for the proposed driveway is in the name of the current property owner.***

Response: Will comply. An Agreement of Sale between the property owner (L.U.R.R.S.) and the Applicant (Walmart Real Estate Business Trust) has been included in this submission.

### **Transportation Impact Study/Transportation Impact Assessment**

***Comment #1: The roundabout versus signal evaluation in the TIS should include a concept plan of the roundabout that dimensions and labels all aspects of the roundabout. Provide an explanation on the advantages and disadvantages for the roundabout and signalization for the particular location, and include the municipality's comments and preference. The arguments in the TIS against the roundabout alternative are not acceptable: fuel trucks can be accommodated by roundabouts, and site marketability and assumed customer preference are not valid arguments against the roundabout option.***

Response: Appendix W of the revised TIS includes a concept plan of the roundabout, including dimensions of the inscribed circle, dimensions of the lane and shoulder widths, and legend. The Township has not provided any interest for the construction of a roundabout to-date in review letters, recent discussions, or public meetings. It should be noted, as stated in the TIS, that the proposed signalization and various geometric improvements result in ILOS B or better for all peak hours in future 2029 conditions, and LOC C or better for all individual movements for all peak hours in future 2029 conditions.

***Comment #2: The Department will require the 450-foot eastbound left turn lane along SR 0145 at the proposed access per Publication 46 lane length requirements. A two-way center left turn lane pattern should be provided for the access at the end of the left turn lane.***

Response: Will comply. The TIS has been updated to provide a 450-foot eastbound left-turn lane into the proposed site access. The concept plan has also been revised to reflect this change.

***Comment #3: Synchro has fields for adjusted critical and follow up headways, not base critical and follow up headways. This means that to use the Publication 46 default headways properly, these values must be adjusted prior to being entered into Synchro. Base Synchro does not adjust base headways. Therefore, the base critical headways must be***

*adjusted for heavy vehicles and grade, and the base follow-up headways must be adjusted for heavy vehicles. Refer to HCM2010, Equations 19-30 and 19-31. Provide calculations for the headway values used in the analyses.*

Response: Per e-mail correspondence with PennDOT's review consultant on Thursday, October 20, 2016, this comment should be disregarded. The e-mail correspondence can be seen in Appendix T.

**Comment #4:** *Revise the control type at the intersection of Best Ave. (SR 0145) & Maple St./K-Mart Access to be Semi-Actuated / Uncoordinated in lieu of Pretimed per the permit plan.*

Response: Will comply. The analysis has been updated to show the intersection of Best Avenue (S.R. 0145) and Maple Street/K-Mart Access to be Semi-Actuated/Uncoordinated.

**Comment #5:** *Revise the memory for the main street at all signalized intersections to be minimum recall during all scenario analyses.*

Response: Will comply. The analysis has been updated to show minimum recall at all signalized intersections.

**Comment #6:** *Add a column to all Table 2 95th Percentile Queue Matrices summary tables to show the required length per Publication 46 calculations for quick comparison purposes. If lanes weren't required per Publication 46, note this as such. These results should be readily available in the tables and/or narrative.*

Response: An extra column with the Publication 46 calculations have been added to all tables where an improvement is warranted. If no improvements were warranted, Publication 46 lane warrants were not conducted for that movement. Specifically, Publication 46 lane warrants were added for the northbound left-turn lane on Best Avenue (SR 0145) at Main Street (SR 4022).

**Comment #7:** *Upon approval of the TIS, provide a revised signal permit plan for any intersection where retiming is proposed. Timing should reflect the opening year condition.*

Response: Will comply. Revised Signal Permit Plans will be submitted during the HOP phase of the application.

**Comment #8:** *Provide additional discussion and supporting information on how the site generated traffic was distributed in the narrative. The TIS states that the distribution was based on existing traffic patterns and location of the major roadways and site access.*

*However, it appears that existing traffic volumes for all three peak hours analyzed indicate a more even distribution of traffic from all major roadways.*

Response: Will comply. The TIS has been updated to include additional discussion on how the traffic was distributed. It should be noted that PennDOT e-mail correspondence on Thursday, October 20, 2016 deems the updated discussion to be sufficient. The email correspondence is included in Appendix T.

***Comment #9: Provide more detail regarding the proposed development sizes and phasing in the Executive Summary and Introduction.***

Response: Will comply. The proposed development sizes and phasing has been discussed and is reflected in the Executive Summary as well as the Introduction.

***Comment #10: Distribute traffic volumes from the other development along SR 248 at the intersection with Maple Drive.***

Response: Will comply. The volumes were distributed to the intersection of SR 248 and Maple Drive, as shown in Appendices H, K, and N.

***Comment #11: All Township comments on the TIS must be addressed to the satisfaction of the Township.***

Response: Will comply. The Township's comments were addressed and responses are included with this submission.

***Comment #12: Revise the improvement listed for the northbound left turn lane at the intersection of Best Ave. (SR 0145) & Main Street (SR 4022) to reflect that it is being lengthened from 150 to 325 rather than being newly constructed.***

Response: Will comply. The TIS has been revised to indicated the proposed lengthening of this lane in the Executive Summary and Recommendations sections.

***Comment #13: Level of service (LOS) drops occur as a result of the proposed development. The applicant is responsible for mitigating the following traffic impacts attributable to the proposed development to no-build levels of service.***

***Main Street (SR 4022) & Washington Street 2024 NBL/R PM (C 19.3 to E 40.1)  
Main Street (SR 4022) & Washington Street 2029 NBL/R PM (C 22.3 to F 54.2)  
Best Ave. (SR 0145) & Main St. (SR 4022) 2024 NBL PM (B 16.9 to C 32.0)***

*Best Ave. (SR 0145) & Main St. (SR 4022) 2029 NBL PM (B 19.5 to D 42.8)*

*Best Ave. (SR 0145) & Main St. (SR 4022) 2029 NBL SAT (B 15.2 to C 27.1)*

*All alternatives must be explored (i.e. signalization, turning lanes, etc.) to mitigate these LOS drops. If the required improvements are determined to be impractical or infeasible, following are three opportunities for the applicant to pursue:*

*Condition 1, Marginal LOS Degradation Local Land Use and Transportation Plan, is applicable when the overall intersection LOS within range of LOS B to LOS C for rural areas, and LOS B to LOS D for urban areas.*

*Condition 2, Significant LOS Degradation Alternative Transportation Plan, is applicable when the overall intersection LOS below LOS C for rural areas and below LOS D for urban areas.*

*Condition 3, Design Waiver LOS: Given the many mitigation alternatives available to applicants, the Department will grant a very small percentage of these waivers.*

*Refer to Step 11 of the Departments Policies and Procedures for Transportation Impact Studies, dated January 28, 2009, for the requirements for each of these conditions.*

Response: Signal retiming was conducted at the intersection of Main Street (S.R. 4022) and Best Avenue (S.R. 0145) to mitigate the traffic impacts compared to no-build conditions. In addition, the northbound left-turn lane will be lengthened to the required length via Publication 46 (325 feet). A concept plan showing these improvements can be found in Appendix Y of the included TIS. Regarding the intersection of Main Street (SR 4022) & Washington Street, the Applicant will coordinate with the Department on an Alternative Transportation Plan.

**Comment #14:** *Provide required Intersection Sight Distance (ISD) for combination trucks at the intersection of Riverview Drive (SR 0145) & Birch Drive in addition to the passenger vehicle calculations. Ensure available sight distances were obtained at a distance of 15 feet from the edge of the traveled way for Intersection Sight Distance calculations.*

Response: The ISD calculations have been included as a separate Table 10 in the revised TIS. The sight distance measurements were taken 15 feet back from the edge of the travel way for Riverview Drive (S.R. 0145). It should also be noted that the Applicant is restricting all site-related trucks to the signalized intersection only. All trucks accessing Birch Drive are from existing conditions. The available sight distance at the site accesses as well as at the intersection of Riverview (S.R. 0145) and Birch should be verified during the detailed engineering of the site access designs.

***Comment #15: Utilize 2019 opening year volumes for the conflict factor calculations. Also, remove right turn volumes from the conflict factor calculations where the right turn movement is channelized and revise the number of opposing lanes to 1.***

Response: Will comply. The conflict factor calculations have been updated to reflect the above changes, as shown in Appendix X.

***Comment #16: Ensure all signal warrant analyses in the Signal Warrant Study and Appendix R use the correct number of lanes for moving traffic on the major and minor street approaches. Specifically, revise the number of lanes for the major and minor street approaches at the intersection of Riverview Drive (SR 0145) & Birch Drive to 1 lane in lieu of 2 lanes.***

Response: Will Comply. The signal warrant analysis for all intersections has been updated to show 1 lane in lieu of 2 lanes for all major and minor street approaches, including the intersection of Riverview Drive (SR 0145) & Birch Drive, as shown in Appendix R of the revised TIS, dated November 2016.

***Comment #17: Clearly indicate the analysis year (opening year) in the Traffic Signal Warrant Analysis Workbook summary sheets for all signal warrant analyses in the Signal Warrant Study and Appendix R.***

Response: Will comply. A note has been added to the signal warrant analysis worksheets indicating an analysis year of 2019 (opening year), as shown in Appendix R.

***Comment #18: Appendix R indicates that Warrant 3 (Peak Hour) is applicable at the intersections of Riverview Drive (SR 0145) & Birch Drive and Main Street (SR 4022) & Washington Street. Warrant 3 (Peak Hour Volume Warrant) is not applicable or satisfied since the proposed development is not an unusual case such as an office complex, manufacturing facility or industrial complex which attract or discharge a large amount of vehicles over a short period of time. Revise the signal warrant analyses in Appendix R to include appropriate warrants such as the 8 and 4-hour warrants.***

Response: Will comply. Warrant 3 was deemed not applicable and 4-hour warrants were conducted at both intersections. The excel spreadsheets that calculate the 4-hour traffic volumes used in the 4-hour warrants are included in Appendix R.

***Comment #19: Include the full signal warrant investigation for the proposed signal in Appendix R rather than as a separate report, and include a discussion on the results in the narrative of the TIS. (This will also need to be included in the formal Signal Design Report if and when completed.) The signal warrant report indicates that Warrant 3 (Peak Hour) and***

*Warrant PA-1 (ADT Volume Warrant) are applicable and satisfied at the intersection of Riverview Drive (SR 0145) & Washington Drive / Site Access 1. Warrant 3 (Peak Hour Volume Warrant) is not applicable or satisfied since the proposed development is not an unusual case such as an office complex, manufacturing facility or industrial complex which attract or discharge a large amount of vehicles over a short period of time. Revise the report accordingly.*

Response: Will comply. The entire signal warrant investigation was revised (dated October 28, 2016) and included in the beginning of Appendix R. Warrant 3 was deemed not applicable. The intersection of Riverview Drive (S.R. 0145) and Washington Drive/Site Access 1 satisfies the four-hour and eight-hour signal warrants.

*Comment #20: It is acceptable, for this isolated case, that Synchro 8 Percentile results were tabulated at the intersections with separate channelized right-turn lanes (proposed signalized intersection of Riverview Drive (SR 0145) & Washington Drive / Site Access 1 and existing signalized intersection of Best Avenue (SR 0145) & Maple Street / K-Mart Access) due to the results (no delay) at the right turn movements. Include the reasoning for this in the Capacity/Level-of-Service Analysis section of the report.*

Response: Will comply. The TIS has been revised to reflect this change.

*Comment #21: Include the homogeneous reports for the segments of all State Roads included in the crash analysis and provide a summary of the segment crash rates compared to the homogeneous rates for all segments studied. Also, include a copy of the PennDOT cover letter or email for the crash reports in the Crash Summary Report.*

Response: Will comply. The homogenous reports are included in Appendix B of the Crash Summary Report. Crash Rate tables for all midblock crashes have been added to the Section 2.0 of the Crash Summary Report. The email for the crash reports has been included as the first page of Appendix A of the revised Crash Summary Report, dated November 2016.

*Comment #22: The crash analysis of the intersections studied includes calculation of the intersections crash rate per million entering vehicles. The homogeneous report gives crash rates in crashes per million vehicle miles, including the page labeled intersection. Million entering vehicles (MEV) and million vehicle miles (MVM) are not comparable crash rates. Please remove comparisons of crash rates with different units. Instead, provide a crash diagram for any intersection with 5 or more crashes over the 5 year period. Include discussion of any patterns and any measures that could be taken to correct safety issues.*



Response: Will comply. The crash rate comparisons were removed and replaced with crash diagrams. The Crash diagrams have been added to the revised Crash Summary Report, dated November 2016.

***Comment #23: On the cover of the Crash Summary Report, include the following statement exactly: Confidential Traffic Engineering and Safety Study: This document is the property of the Commonwealth of Pennsylvania Department of Transportation. The data and information contained herein are part of a traffic engineering and safety study. This safety study is only provided to those official agencies or persons who have responsibility in the highway transportation system and may only be used by such agencies or persons for traffic safety-related planning or research. This document and information are confidential pursuant to 75 PA C.S. §3754 and 23 U.S.C. §409 and may not be published, reproduced, released or discussed without the written permission of the Pennsylvania Department of Transportation. Refer to Publication 46, page 11.1-11, for guidance.***

Response: Will comply. The above text has been added to the front cover of the revised Crash Summary Report, dated November 2016.

***Comment #24: Ensure all turn lane analyses use the correct number of approach lanes in the analyses. For example, turn lane warrants at all intersections in this study should be analyzed on two-lane roadways, not four-lane roadways.***

Response: Will comply. The turn lane warrant analyses have been updated using a two-lane roadway for all intersections where turn lane warrants are necessary. This revision is reflected in Appendix Q.

***Comment #25: Although the westbound left turn lane on SR 248 at the intersection with Maple Drive is warranted during PM and SAT peak hour existing conditions, the proposed development adds traffic to the intersection during Phase 1 and satisfies warrants during the AM peak hour. Therefore, the westbound left turn lane on SR 248 should be constructed by the applicant.***

Response: The proposed development does not have a level of service impact to the intersection of SR 248 & Maple Drive. In addition, the Township is imposing a Traffic Impact Fee per its Ordinance for the construction of off-site improvements such as this requested improvement. The proposed development is contributing well under 100 peak hour trips to this intersection which is the threshold for inclusion in the study area of the TIS. At the TIS Scoping meeting held June 14, 2013, it was noted that although the trip

generation of the proposed development was being reduced as compared to that shown in the original TIS from 2007, some intersections that were studied as part of the original TIS may remain in the study area to provide information to the Township for the purposes of applying the Applicant's Traffic Impact Fees to off-site intersections. The Applicant is not proposing the left-turn lane at this intersection.

***Comment #26: Provide a legible copy of the site plan in the TIS.***

Response: A legible copy of the site plan is included with TIS (Figure 2), along with a full-size plan in the pocket of the hard copy of the TIS.

We trust that these responses address your comments regarding the Transportation Impact Study. In addition, McMahon has enclosed a revised TIS, dated November 2016, for review by your office. Please feel free to contact me with any questions.

Sincerely,



John R. Wichner, P.E., PTOE  
Senior Project Manager

JRW/agr/tk

Enclosures

cc: Hanover Engineering Associates, Inc.  
Adam Benosky, RLA, Bohler Engineering, Inc.