YOUR GOALS. OUR MISSION.

Memorandum

To: Jill A. Garcia, Wilson Borough Manager

From: Bruce Klein, P.E.

Date: September 5, 2024

Re: Traffic Engineering Review #3
Proposed Warehouse Development
1525 Wood Avenue
Wilson Borough, Northampton County, Pennsylvania

We have completed a traffic review for the proposed Warehouse Development located at 1525 Wood Avenue in Wilson Borough, Pennsylvania. The following documents were included as part of this review **(items in bold are new and were submitted after our previous review letter dated July 31, 2024):**

- TIS Transmittal Letter, dated May 1, 2024, prepared by KCI Technologies, Inc.
- Transportation Impact Study (Cycle 2), dated December 2023, prepared by KCI Technologies, Inc.
- Crash Analysis, included with May 5, 2024 Submission, prepared by KCI Technologies, Inc.
- PennDOT TIS (Cycle 2) Comments, dated January 25, 2024, prepared by PennDOT Engineering District 5-0
- Site Plans, dated April 1, 2023**,** prepared by Bogia Engineering Inc.
- Applicant's Response Letter to PennDOT's Cycle 2 Comments, dated June 17, 2024, prepared by KCI Technologies, Inc.
- Transportation Impact Study (Cycle 3), dated June 2024, prepared by KCI Technologies, Inc.
- **Site Plans, revised August 7, 2024, prepared by Bogia Engineering Inc.**
- **Applicant's Response Letter to T&M's Traffic Engineering Review #2, dated August 16, 2024, prepared by Bogia Engineering Inc.**

Based on our review, we offer the following revised/new comments in bold:

<u>Building Alternatives</u>

1. The TIS Transmittal Letter states that the current Cycle 2 TIS (which was revised to address initial PennDOT comments) is for a 221,000 SF high-cube fulfillment center warehouse (sort style facility) whereas the previous Cycle 1 TIS submission to PennDOT was for a 1,007,000 SF GFA high-cube fulfillment center warehouse (non-sort style facility). Additionally, following municipal review of the Cycle 2 TIS, the TIS will be revised and resubmitted as Cycle 3 concurrently to PennDOT and the municipalities for review. That is, based on the final site plan and anticipated tenant, the Cycle 3 TIS will be revised back to the original 1,007,000 SF GFA high-cube fulfillment center warehouse (non-sort style facility) layout.

Changes to land use and building size would impact trip generation, trip distribution, and supporting LOS analyses. For this reason, a trip generation comparison table of the two different land uses and building size alternatives has been prepared below for reference:

TRIP GENERATION COMPARISON										
Land Use Code	Description	Amount	Units	Weekday ADT	AM Peak Hour			PM peak Hour		
					IN	OUT	Total	IN	OUT	Total
155	High-Cube Fulfillment Center (non-sort)	1,007,000	SF	1823	122	29	151	63	98	161
155	High-Cube Fulfillment Center (sort)	221,000	SF	1423	156	36	192	103	162	265

As shown above, the high-cube fulfillment center warehouse (non-sort style facility) alternative will result in a decrease in the number of peak hour trips with an increase in the number of weekday daily trips compared to the high-cube fulfillment center warehouse (sort style facility) alternative.

Since the supporting Traffic Report analyzes the AM and PM peak hours only, we concur with the TIS Transmittal Letter's conclusion that the overall recommendations of the Cycle 2 TIS are not anticipated to change significantly based on the revision back to the high-cube fulfillment center warehouse (non-sort style facility). It is however noted that the high-cube fulfillment center warehouse (non-sort style facility) alternative provides significantly more truck loading spaces and is therefore anticipated to generate significantly more truck traffic overall compared to the currently analyzed high-cube fulfillment center warehouse (sort style facility). The Borough reserves the right for additional comment once the Cycle 3 TIS has been received.
Addressed. A Cycle 3 TIS which reflects a 1,006,880 SF GFA high-cube fulfillment center warehouse (non-sort style facility) has been provided for review. The previously issued (June 24, 2024) traffic comments have been updated accordingly below.

Traffic Impact

2. Traffic counts were performed on Wednesday, February 22, 2023, during the AM and PM peak hours at the study intersections which were agreed upon by PennDOT District 5-0 and the municipalities during the scoping process. It is noted that these counts appear to represent typical traffic conditions in the study area.
No action required.

3. A Crash Analysis was performed at the 12 study intersections and along the site frontage. The analysis concludes that no crashes occurred at either of the two proposed Site Driveway locations or along the site frontage within the most recent five-year period. It is understood that none of the crashes which occurred at the off-site study locations were due to site impacts, and for this reason, crash mitigation does not appear necessary.
No action required.

4. Trip generation for the proposed 1,006,880 SF GFA Warehouse Development has been calculated using ITE Trip Generation Manual, 11th Edition rates for L.U. 155 – High-Cube Fulfillment Center Warehouse (Non-Sort). The definition for this land use describes a building that typically has at least 200,000 gross square feet of floor area and is used primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. More specifically, a "non-sort" facility is a fulfillment center that ships large box items that are processed primarily

with automation rather than through manual means. It is noted that this land use definition appears to accurately describe the proposed Cycle 3 project site.
No action required.

5. The Traffic Report states that the proposed site will generate 151 "new" vehicle trips (20 truck trips) during the AM peak hour and 161 "new" vehicle trips (10 truck trips) during the PM peak hour based on the most current ITE data. For additional clarity, the following shall be provided/addressed:
    a. The ITE Trip Generation Handbook, 3rd Edition (Appendix I) provides truck trip percentage data in the range of 9% - 29% for warehouse land uses during the AM and PM peak hours. There is concern that the 13% AM peak hour and 6% PM peak hour truck trip figures utilized in the traffic analysis may underrepresent actual site conditions, especially when considering the number of truck loading bays and truck parking spaces provided Site Plan. The Applicant shall provide testimony to justify the anticipated truck trip percentages utilized in the analysis.
    b. The Applicant shall confirm that appropriate truck percentage factors have been accounted for in the supporting level of service analysis.
    c. A Truck routing diagram shall be provided to graphically identify the anticipated truck routes to/from the proposed site via the surrounding roadway network. This graphic shall be prepared on an aerial image with colorized linework to represent the respective truck routes and should show municipal boundary lines.

    Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

6. Review of the adjacent road network shows that there is no direct access to the proposed site from Route 22 eastbound or from the proposed site to Route 22 westbound at the Route 22 & Wood Avenue interchange. There is a concern with site traffic utilizing local residential roadways, such as Bushkill Street, North 16th Street, and North 13th Street, to perform non-designated U-turn maneuvers for site access, as opposed to utilizing the Route 22 & South 25th Street interchange located approx. 1 mile southwest of the project site. The Applicant shall explore options to restrict site traffic (trucks and employee passenger vehicles) from utilizing local residential roadways to gain site access to/from the west.
    Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

6.1. The "proposed truck site trip assignment" figure (Figure B) included in the Traffic Report shows that site generated truck traffic is anticipated to utilize the Western Site Driveway along Hackett Avenue. The Applicant shall perform the necessary analysis and provide testimony to confirm that the existing bridge/culvert along Hackett Avenue located between Wood Avenue and the Western Site Driveway can support heavy truck traffic.
    Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

7. The Traffic Report proposes several off-site improvements to accommodate site access and traffic impacts at both Site Driveways, Wood Avenue & 13th Street & Route 22 East Ramps, and Hackett Avenue & Wood Avenue. The report states that the Applicant will be covering all costs associated with these offsite improvements however, the Applicant shall also confirm that all proposed off-site improvements will be completed before the site is occupied.
    Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

8. The PennDOT turn lane warrant analysis results for the intersection of Hackett Avenue & Wood Avenue conclude that an eastbound left-turn lane is warranted along Wood Avenue however, the Traffic Report notes that constructing a left-turn lane at this location is infeasible due to proximity of the Route 22 overpass, ROW, and environmental constraints. The report further notes that an eastbound left-turn lane is provided along Wood Avenue at the Eastern Site Driveway (primary access point) to accommodate site ingress movements arriving from the west along Wood Avenue. We concur with the report's assessment that a left-turn lane which provides PennDOT minimum design criteria at this location is infeasible and appears unnecessary based on review of the concept plans included in Appendix I and supporting level of service analysis. Submit written confirmation that this issue has been resolved with PennDOT.
Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

9. The Traffic Report shows that no-build Levels of Service (LOS) D or better will be maintained at most study intersection approach movements during the AM and PM peak hours of the 2030 horizon year condition. The most significant increase in approach delay where levels of service D or better were maintained occurs at the intersection of South 25th Street & Wood Avenue / Route 22 East Ramp with 4.3 seconds of additional delay for the eastbound left/thru movement during the PM peak hour. **No further action is required.**

9.1. The "detailed level of service (overall intersection)" table (Table 6) included in the Cycle 3 Traffic Report shows that the existing condition levels of service have improved compared to the same table in the Cycle 2 Traffic Report. The Applicant shall clarify why the Cycle 3 existing condition analysis results have changed since the previous Cycle 2 report. It is our understanding that the existing 2023 analysis should have remained constant.
Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

10. The intersections of Hackett Avenue & Wood Avenue and Wood Avenue & North 13th Street experience more significant increases in approach delay with the following notable LOS E and LOS F conditions:
    a. Hackett Avenue & Wood Avenue: The Applicant is proposing mitigation at this location which includes separated left and right-turn lanes at the Hackett Avenue southbound approach. The proposed mitigation restores no-build levels of service during build conditions however, it is noted that the southbound approach will operate at a LOS E (39.4 seconds max.) during the PM peak hour of the 2030 horizon year which is indicative of borderline failing conditions. The Traffic Report identifies that a traffic signal is not currently warranted based on volumes however, traffic counts will be performed 6 months after the opening of the proposed facility, a post-development warrant analysis will be performed, and a traffic signal will be installed by the Applicant if warranted. The post-development signal warrant analysis and potential construction shall be made a condition of approval and submitted to the Borough at the time of completion for further review.
    b. Wood Avenue & North 13th Street: While not a direct result of the proposed site trips, several approach movements operate at LOS E (60.3 seconds max.) during the AM peak hour and LOS F (287.9 seconds max.) during the PM peak hour of the 2030 horizon year which is indicative of failing operating conditions. Since this intersection is located outside the Borough of Wilson, we defer further review to PennDOT and the City of Easton.

    Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

11. The Traffic Report shows that all approaches between Hackett Avenue & the Western Site Driveway will operate at Levels of Service B or better during Build and 20230 Horizon Year conditions which is within acceptable limits. **No further action is required.**

12. The Traffic Report shows that all approaches between Wood Avenue & the Eastern Site Driveway will operate at Levels of Service C or better during Build and 2030 Horizon Year conditions which is within acceptable limits. **No further action is required.**

13. The Traffic Report shows that the most significant 95th percentile vehicle queue increase would be approximately 46' at any of the study intersection approach movements during the AM and PM peak hours during build conditions. It is noted that the available storage lengths generally appear to be capable of accommodating these additional vehicle queues. We concur with the Traffic Report's conclusion that where vehicle queues do extend beyond the available storage lane length, site traffic would be responsible for contributing only 1-2 additional vehicle lengths. **No further action is required.**

Off-Street Parking

14. The Site Plan provides a total of 398 passenger vehicle parking spaces for the proposed 1,006,880 SF GFA Warehouse Facility. Per Section 170-100.D of the Borough's Ordinance, in lieu of calculating the required minimum number of off-street parking spaces set forth in Section 170-95.A (Off-Street Parking), the applicant may calculate the parking demand based on acceptable standards such those as published in the most current ITE Parking Generations Manual or another acceptable standard, including studies from a project with similar parking requirements. The ITE Parking Generation Manual average rate parking demand is provided below for reference:

    ITE Parking Generation Manual, 5th Edition (Average Rate):
    L.U. 150 – Warehousing
    0.39 spaces per 1,000 SF gross floor area = 0.39 spaces * (1,006,880 SF / 1,000 SF) = 392 spaces
    Average Parking Demand = 392 spaces

    The above calculations show that the proposed off-street parking supply would be capable of accommodating the anticipated average parking demand per ITE data. It is noted that the ITE parking rates for L.U. 150 – Warehousing includes study samples for all warehouse facility types, with varying levels of automation, employee count, and operation characteristics. That is, ITE identifies that the rates presented should be used as a design guide and not applied directly as a design requirement.

    Furthermore, a review of similar sites and studies performed within the traffic engineering community show that non-sort style warehouse facilities typically provide parking in the range of 1 space per 2,500 to 5,000 SF gross floor area, whereas the proposed site provides parking at a rate of 1 space per ~2,600 SF gross floor area which is within this range. The Applicant shall provide testimony to support adequacy of the 403 proposed off-street parking spaces. This shall include information on the anticipated employee count and the number of shifts per day.
    Continuing comment. The Applicant's response letter notes that this comment will be addressed by KCI Technologies, Inc when they update the Traffic Impact Study.

15. Review of the proposed Site Plan shows that 398 off-street passenger vehicle parking spaces are provided whereas the parking calculation on the cover sheets indicates that 514 spaces are provided. The Applicant shall revise this discrepancy and confirm that the parking calculations reflect the requirements set forth in

Section 170-100.D of the Borough Ordinance. Truck loading spaces shall not count towards parking requirements/calculations.
Addressed. The Site Plans provide 403 off-street passenger vehicle parking spaces which is consistent with the parking supply identified in the revised parking calculation summary on the Cover sheet.

16. Per Section 170-95.B of the Borough Ordinance, every commercial, industrial, resort, or other building which requires the receipt or distribution by vehicles of materials or merchandise shall provide one off-street loading space for each 10,000 square feet of gross building ground floor area or part thereof, and each such space shall be at least 400 square feet in area. This equates to a 101-loading space requirement for the proposed 1,006,880 SF GFA Warehouse Facility. The Site Plan indicates that a total of 193 loading spaces are provided which exceeds the requirement with a 92-loading space excess. The Applicant shall provide testimony to support the proposed loading space supply.
Addressed. The Applicant's response letter notes that the proposed loading space supply is based on buildings of similar size/use and current market demands. It is understood that the proposed loading space supply is designed to accommodate site specific demands and the Ordinance requirement is exceeded. No further action is required.

Site Plan

17. The proposed off-site improvements identified in the Traffic Report shall be shown on the Site Plans for consistency and additional perspective to the overall site layout.
Continuing comment. The Applicant's response letter notes that the proposed off-site improvements identified in the Traffic Report are shown on the Site Plans however none of the off-street improvements (proposed curb, striping, etc.) along Hackett Avenue or Wood Avenue are depicted. These improvements shall be shown and coordinated with the Site Plan to ensure a consistent final proposed condition.

18. All proposed signage, striping, and pavement markings shall be clearly labeled on the Site Plans.
Partially addressed. Proposed signage has been labeled and several striping details have been provided in the Construction Detail plan sheets. The following shall be addressed:
    a. **Provide a construction detail for a typical crosswalk marking including stripe widths/dimensions, stripe color, and identify that the nearest edge of an adjacent stop bar shall be located a minimum of 4' behind the nearest crosswalk line.**
    b. **Provide a construction detail for a typical standard parking space including stripe widths/dimensions and stripe color.**
    c. **Replace the proposed R3-1 "NO RIGHT TURN" and M4-4 "TRUCK" signs at the Hackett Avenue Site Driveway with a single R3-9b "TRUCKS NO RIGHT/LEFT TURN" sign for clarity. This sign shall be placed on a separate signpost adjacent to the R1-1 "STOP" sign. Sign details shall be revised accordingly.**

19. Internal drive aisle widths, parking space dimensions, and loading area dimensions, shall be periodically labeled throughout the Site Plans.
Partially addressed. Additional dimensions have been provided however several drive aisle widths, specifically in the southern parking lot area, vary between 23.3' and 24.7'. The Site Plans shall be revised to show consistent, whole number parking lot drive aisle widths.

20. R1-1 "STOP" signs and stop bars shall be installed at all proposed Site Driveway approaches which intersect with the public street network.

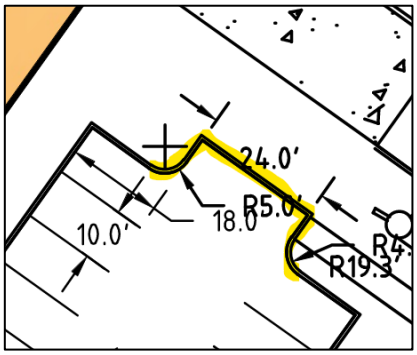
Partially addressed. R1-1 "STOP" signs have been added at both Site Driveway approaches as requested however stop bars shall also be provided.

21. A 50' long double yellow centerline shall be provided along all proposed Site Driveway approaches which intersect with the public street network to delineate two-way access patterns.
Continuing comment. A 50' long double yellow centerline shall be provided at both Site Driveway approaches.

22. The Applicant should consider installing R1-1 "STOP" signs and stop bars at internal parking lot approaches which intersect the main access aisles to better delineate internal movement patterns.
Partially addressed. Specific to the southern parking lot, stop signs shall be provided at all parking lots aisle approaches which intersect with the two primary parking lot access points (see sketch below).

23. Striped crosswalks are shown throughout the southern passenger vehicle parking lot however, it is unclear where sidewalk or curb ramps are proposed. All proposed concrete sidewalk material shall be hatched and dimensioned throughout the Site Plans. It is recommended that all proposed sidewalks be 5' wide minimum to satisfy ADA passing space requirements.
Continuing comment. The Applicant's response letter notes that sidewalk will be provided along the building frontage once door locations are finalized. The finalized sidewalk layout shall be submitted for review when complete.

24. It does not appear that passenger vehicles will be able to exit from the parking spaces located in the far west corner of the southern parking lot or the far east corner of the northern parking lot. Additional pavement area to accommodate parking space egress movements (like what has been provided at the end of other dead-end parking aisles) shall be provided at these two locations.
Continuing comment. A space for reverse turns maneuvers shall be provided at the end of all dead-end parking lot aisles for vehicles departing from the end parking spaces, similar to what is shown in the sketch below.



25. The Applicant shall clarify how trash/recycling collection operations will be managed. All proposed trash/recycling areas shall be shown and labeled on the Site Plans.
Addressed. Trash collection areas have been labeled on the Site Plan.

26. It is recommended that sidewalk be provided along all building frontage which runs adjacent to the passenger vehicle parking lots.
Continuing comment. The Applicant's response letter notes that sidewalk will be provided along the building frontage once door locations are finalized. The finalized sidewalk layout shall be submitted for review when complete.

27. Detailed ADA Grading plans shall be provided at all proposed curb ramp locations to confirm ADA design requirements are met. These plans shall include spot elevations, slopes, and sidewalk dimensions as necessary for construction.
Continuing comment. The Applicant's response letter notes that ADA grading details have been provided in the Construction Detail sheets however no curb ramp details are depicted. ADA curb ramps shall be identified on the Site Plans and details shall be provided for construction per original comment above.

28. The primary building entrance(s) and office space(s) shall be shown within the building footprint for additional clarity. Additionally, an ADA accessible route shall be maintained between all parking lots and the building entrance(s).
Partially Addressed. Preliminary office space locations have been shown in the four corners of the warehouse building. Applicant shall demonstrate an accessible route between parking and building entrances.

29. Several sign panel details (R1-1, R5-1, R6-1R, and R6-2L) are provided in the construction detail sheets, however it is unclear where these signs are proposed on the Site Plans. The Applicant shall clarify where these signs will be installed or remove the details as necessary.
Addressed. Sign details have been revised to depict only signs proposed on the Site Plans.

30. A typical regulatory and warning sign detail shall be provided which depicts a 7' minimum (6' minimum for supplemental plaques) sign panel mounting height and 2' minimum sign panel offset from the edge of pavement per MUTCD Section 2A.15 & 2A.16 requirements.
Partially addressed. A signpost detail has been provided but a minimum sign panel mounting height has not been identified. The detail shall be revised per original comment above.

31. A typical ADA compliant parking space detail shall be provided which identifies stripe colors, widths, and space dimensions.
    Partially addressed. An ADA parking space detail has been provided however the parking space lines, buffer hatch, and interior solid color of the accessibility symbol shall be called out as blue color on the detail.

Access and Circulation

32. Tables 3 & 4 in the Traffic Report indicate that PennDOT's minimum sight distance requirements are met at both proposed Site Driveway locations, however sight lines are not shown on the Site Plans. A sight line plan shall be prepared which graphically shows and dimensions the available lines of sight at both proposed Site Driveways. The clear lines of sight shall be free of obstructions including existing vegetation, proposed landscaping, and roadway geometry.
    Continuing comment. The Applicant's response letter indicates that intersection sight distance lines will be addressed in the PennDOT HOP drawings which are in progress by KCI Technologies, Inc. The finalized intersection sight line plans shall be submitted for review when complete.

33. The National Association of Industrial and Office Properties truck facility design guidelines states that counterclockwise truck circulation is preferred. It is noted that the current Site Plans offers counterclockwise truck circulation access from both proposed Site Driveways. **No further action is required.**

34. The National Association of Industrial and Office Properties truck facility design guidelines also states that 131' of truck yard space is required for adjacent trucks to maneuver into and out of loading bays spaced at 13' on-center as proposed. It is currently unclear whether the proposed truck yard width and loading bay spacing can accommodate adjacent truck parking. The Site Plans shall therefore be revised to show truck loading bay spacing and truck yard widths.
    Partially addressed. Truck loading yards (loading bay length plus truck access aisle width) have been dimensioned however the proposed truck yard is only 130' wide whereas 131' is required to comply with the National Association of Industrial and Office Properties truck facility design guidelines. It is therefore recommended that all truck yard widths be increased by 1' to comply with this guidance. Additionally, all truck loading bay doors shall be shown and periodically dimensioned on the Site Plans to ensure 13' center to center separation.

35. Vehicle Circulation plans have been provided at the end of the Site Plan set. The following items shall be addressed:
    a. The currently submitted Vehicle Circulation plans do not show any design vehicle movements. These plan sheets shall be revised to show the anticipated Delivery Vehicle performing all permitted ingress/egress turn movements at both Site Driveways, internal circulation around the site, and movements to/from the critical (end) loading bays located around the perimeter of the building structure.
       Addressed. The Vehicle Circulation Plans have been revised to show vehicle turn movements.
    b. Warehouse sites are typically designed for WB-67 Tractor Trailer Trucks. The Applicant shall confirm that a WB-50 Tractor Trailer Truck is the largest vehicle which will be permitted on the proposed site.
       Continuing comment. The Applicant's response letter indicates that a WB-67 is the largest Delivery vehicle anticipated on-site however the provided truck circulation plans depict a WB-50.

The Applicant shall clarify and revise the Delivery vehicle circulation plans to depict a WB-67 if that is the largest anticipated Delivery vehicle.

c. Additional vehicle circulation plans shall be provided which depict a Garbage Truck accessing the designated trash/recycling collection area(s) and traversing around the site in once continuous movement.
Addressed. The Garbage Truck vehicle circulation plan is acceptable as shown.

d. The Applicant shall coordinate with the local Fire Department to determine emergency vehicle access/circulation and fire lane signage/striping requirements.
Continuing comment. The Applicant shall obtain approval from the Borough's Fire Department.

e. The design vehicle turn movements shown at the two Site Driveways shall be overlayed on the proposed off-site improvement plans identified in the Traffic Report to account for final proposed ingress and egress lane configurations.

Please contact our office with any concerns or questions regarding this review.

cc: Stanley J. Margle, III, Wilson Borough Solicitor
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