



August 26, 2019

Mr. Ron Paradise, Director  
Planning and Development Services  
City of Deltona  
2345 Providence Boulevard  
Deltona, Florida 32725

**RE:     *Response to Comments Letter – Industrial Warehouse  
Kimley-Horn Project No. 046265011***

Dear Mr. Paradise:

Kimley-Horn and Associates, Inc. has reviewed the City's consultant comment letter dated August 8, 2019 and Volusia County's comment letter dated August 15, 2019 for the above referenced project. For your review, please consider our responses below to these remaining comments as they pertain to the traffic study submitted for the project:

City of Deltona Review Comments & Responses

- 1)       The document should be signed and sealed by a Florida P.E.

***Response: The revised traffic study dated 8/26/2019 includes signature and seal by a Florida P.E.***

- 2)       In the executive summary, the location for the proposed warehouse was mentioned on the east side of Normandy Boulevard, but it is actually on the west side of Normandy Boulevard, please revise.

***Response: The revised traffic study dated 8/26/2019 has corrected this typo.***

- 3)       The executive summary states that the number of proposed connections to/from the warehouse as four (4) full access connections. The third paragraph from the introduction section identifies three full access connections, and the methodology states there are two access connections. The site plan in Appendix B shows four (4) access connections as mentioned in the executive summary. The document should be reviewed and revised for consistency, as appropriate.

***Response: The revised traffic study dated 8/26/2019 has been revised to reflect four (4) access connections along Normandy Boulevard. The methodology in the Appendix has been replaced with the methodology approved by Volusia County, which shows four (4) access connections to Normandy Boulevard.***

- 4)       Is it reasonable to consider 1.1 million square feet (SF) will be constructed by 2020? This directly affects the background growth. While Florida Growth Management law does not require developers to pay for background facility improvements, it is not clear whether the applicant should be assessed a fair share of backlogged facility improvements if they create a surplus in capacity that the development utilizes and relies upon. A longer buildout period would naturally increase the background growth and use up capacity from the background improvements. A reasonable horizon year should be used.

**Response: The Applicant is experienced with developing facilities of this size. Proposed buildout of this site is feasible for 2020.**

- 5) It would be helpful to include a site plan figure in the body of the report similar to the one shown in the methodology.

**Response: The revised traffic study dated 8/26/2019 locates the latest site plan in Appendix A for ease of reference.**

- 6) There should be a description/discussion of the proposed uses(s). Warehouse is mentioned; however, the site plan seems to reflect more than simply warehouse – see notes included on site plan. Based on the anticipated uses(s), perhaps ITE's Warehouse Land Use is not the appropriate land use to compare with. A discussion of the proposed use would help address this.

**Response: The project is a single-user warehousing and distribution center which operates with an organized 24-hour schedule of on-site shift work to manage receiving and shipping operations and truck deliveries. Upon review of available ITE descriptions, the warehousing land use code is the closest related use, however, data provided by the end-user shows a greater overall impact than ITE data for warehouse would suggest. During methodology review, developer-based trip generation data for this site was provided to representatives at the City and County along with data from similar sites. Subsequent to the initial submittal of the traffic study dated 7/19/2019 to the City, use of the developer-based trip generation data was approved in the methodology as the best available data for the project. The revised traffic study dated 8/26/2019 locates the TIA methodology approved on 7/26/2019 in the Appendix.**

- 7) In the project trip generation section, a reference is made to the end user data provided on the appendix that estimates 2,596 daily net new external trips with 577 AM peak-hour trips and 1,043 PM peak-hour trips (this was included in the methodology on a count summary titled Non-Sortable FC – Peak Season. An explanation/discussion should be included in this section of how this data was generated. Is this an average of multiple days of sats, multiple sites, and what was/were the scale of the source sites? Trip generation is typically based on a trip rate from a similar use and should be based on the scale and type for use. For example, the site plan identifies 1.1 million SF of warehouse, but it also notes a mezzanine area (approximately 320,000 SF). This would increase the trip generation as depicted in the conceptual site plan depending on how that area will be used. Did the source site have a similar use?

**Response: During methodology review, developer-based trip generation data for this site was provided to representatives at the City and County along with data from similar sites. Subsequent to the initial submittal of the traffic study dated 7/19/2019 to the City, use of the developer-based trip generation data was approved in the methodology as the best available data for the project.**

- 8) The trip generation percentages were reviewed from the methodology and Figure 1. It is unclear how the vehicles were distributed at the interchanges of I-4 with SR-472 and I-4 with Saxon Boulevard. Inserts of these areas should be provided so that the percentage distribution through these areas can be verified.

**Response: Insets showing distribution of trips at the I-4 ramps are provided in Figures 3 through 6 in the revised traffic study dated 8/26/2019. Specifically, Intersection 3 and 4 shows the cumulation of existing, background and project turning movement volumes to total buildout turning movement volumes at I-4 & SR 472. The same is shown at Intersection 23 and 24 for I-4 & Saxon Boulevard. For further clarification, turning movement volume worksheets are provided in Appendix E to show full development of the turning movement volumes at every study area intersection.**

- 9) For roadway segment analysis, the reference materials mentioned in Tables 2 and 3 of the 2018 Volusia county Annual Average Daily Traffic & Historical Counts Report and the tables used to determine the Level of service (LOS) from the 2013 FDOT Quality/LOS handbook should be included in the appendices.

**Response: The revised traffic study dated 8/26/2019 includes the 2018 Volusia County Annual Average Daily Traffic & Historical Counts Report and the Level of Service (LOS) tables from the 2013 FDOT Quality/LOS Handbook in Appendix J.**

- 10) In Table 2, an extra column for “Two-Way Peak Hour Volumes” should be added to Table 3.

**Response: The revised traffic study dated 8/26/2019 provides a column for “Two-Way Peak Hour Volumes” and removes the columns for directional volumes within segment analysis tables.**

- 11) In Tables 2 and 3, the peak hour service capacity for Main Street (Lake Helen) from I-4 to Lakeview Drive should be 470 instead of 950 as reported in the table. Also, in Table 2, Note 4 pertains to PM peak, please explain why that is included in Table 2, or move to table 3 if appropriate.

**Response: Consistent with the Lake Helen Comprehensive Plan, the minimum LOS standard for segments within the City jurisdiction is LOS D. The service capacity was adjusted to 950 to reflect this. A note has been added to Tables 2 and 3 indicating this adjustment.**

- 12) Table 3 (Existing Two-Way PM Peak Hour Volumes) the directional volumes are 50/50. Is this accurate? If not, a note should be added to explain why this is so. Also, note 3 states that the volumes are based on the 2018 Volusia County Report. Why was existing data not based on existing turning movement counts similar to the AM volumes in Table 2? Were the PM 2020 peak Season volumes for future background conditions based on these also?

**Response: The revised traffic study dated 8/26/2019 provides a column for “Two-Way Peak Hour Volumes” and removes the columns for directional volumes within Table 2 and 3. AM peak hour data is based on intersection volumes collected for the study which was otherwise unavailable from the County. PM peak hour data used 2018 Volusia County segment data as requested by the County and agreed to in the study methodology. Future background conditions are calculated based on the two-way volumes in the revised traffic study.**

- 13) It was mentioned on page 3 of the report that Orange Camp Road from US 17/92 to I-4 will be analyzed as part of this TIA. Tables 2 and 3 only include the segment between Blue Lake Avenue and I-4. Should the analysis also include the segment between US 17/92 and Blue

Lake Avenue?

**Response: The revised traffic study dated 8/26/2019 provides revised Tables 2 and 3 which shows the additional two segments of Orange Camp Road from US 17/92 to Princeton Road and from Princeton Road to Blue Lake Avenue.**

- 14) The intersections listed on page 4 of the report mention Normandy Boulevard and Project Access Locations (3). There should be 4 access locations instead.

**Response: The revised traffic study dated 8/26/2019 updates the number of driveways to four.**

- 15) In the roadway segment analysis section (page 8 of the report) the roadway segments are listed that do not meet the adopted LOS standard?

- i) The segments depicted are only for the PM peak hour. The roadway segment on Main Street between I-4 and Lake Drive operates at LOC "D" versus the adopted LOS of "C" and should be added to the list of segments.
- ii) The segment of I-4 from Seminole County Line to SR 472 should be Interstate 4 from Seminole County Line to Saxon Boulevard.

**Response: The revised traffic study dated 8/26/2019 was updated to show segments listed as existing condition deficiencies to include consideration of AM and PM peak hours. As noted in the response to Comment 11, the Lake Helen Comprehensive Plan indicates that the adopted LOS for Main Street (I-4 to Lake Drive) is LOS D, and therefore Main Street is not over capacity. The segments of Interstate 4 listed as exceeding their adopted LOS service capacities has been corrected.**

- 16) The description in the second paragraph of the intersection analysis states that "additionally, several intersections are shown to operate with individual traffic movements having a volume to capacity ratio (V/C) exceeding 1.0, as summarized in Table 4." It would be helpful to include the associated movement next to the v/c ratio in the "max movement v/c" column (e.g., 0.85 (EBR)). This will help to assess whether the proposed project impacts the critical movements.

**Response: The revised traffic study dated 8/26/2019 includes the associated movement corresponding to the maximum v/c ratio within Table 4.**

- 17) In table 4, intersection 24 (I-4 EB ramp and Saxon Boulevard), intersection delays for the AM and PM peak hours are reported as 12.5 and 104.9 seconds, respectively. They should be 15.9 and 108.2 seconds as shown in the HCM 2000 output in the appendix. This should be revised.

**Response: Table 4 has been revised to show the correct delay for intersection 24 within revised traffic study dated 8/26/2019.**

- 18) In the Committed Transportation Improvements section, it is not clear why the 2040 LRTP improvements are introduced. These were not mentioned in the methodology and they are not funded or committed improvements. An explanation of how these were used in the analysis should be included or they should be removed.

**Response: Planned improvements are provided for informational purposes only.**

- 19) Synchro PM peak hour Existing Volumes: Intersection 7 (Kentucky Avenue & Graves Avenue), minor discrepancies in volumes were found between Figure 5 and the Synchro sheet. This should be corrected.

**Response: The discrepancies within Figure 5 and the Synchro outputs have been corrected within the revised traffic study dated 8/26/2019.**

- 20) In the Traffic Volume Development section (page 14 of the report), it is stated, “as to not double count 2020 future background traffic, a 50% reduction was applied to future background growth to calculate future traffic volumes.” This was not agreed upon in the methodology. Further, it is not clear how this is applied. This does not seem appropriate for this area and the time frame proposed for the development buildout. This should be explained further, and an example of how it is used should be included so that its implementation can be verified.

**Response: This language has been removed and background growth has been applied in accordance with the approved methodology in the revised traffic study dated 8/26/2019.**

- 21) The second paragraph in the “Future Buildout Roadway Segment Analysis” section describes that there are three additional roadway segments that will exceed the adopted LOS due to the project. Based on the information provided, this should be 6.

- i) Two segments related to the PM peak hour were mentioned in the bullet points. The additional segment of Elkcam Boulevard between Normandy Boulevard and Fort Smith Boulevard also failed in the future Buildout conditions and should be included. A statement is made that both of the roadway segments are noted in the River to sea TPO 2040 LRTP as requiring increased capacity to support future traffic projections within the area but are not funded for construction within the next three years. As such, these capacity improvements cannot be relied upon as committed. The potential additional traffic from the warehouse is projected to increase the v/c ratio from 0.97 to 1.08 on Kentucky Avenue between SR 472 and Graves Avenue and v/c ratio of 0.99 to 1.07 on Elkcam Boulevard between Normandy Boulevard and Fort Smith Boulevard. Mitigation measures need to be included to address these deficiencies.
- ii) Why were the failing roadway segments in the AM peak hour not discussed or explained in the report? For example, the LOS for the segment of Saxon Boulevard between FDOT Park & Ride and I-4 goes from “e” to “F” with an increase in v/c ratio. Also, segments on Howland Boulevard between I-4 and Catalina Boulevard were projected to go from LOS “D” to “F” in the future background conditions. These should be addressed in this section.

**Response: (i) The segment of Elkcam Boulevard from Normandy Boulevard to Fort Smith Boulevard was over capacity under future background conditions and mistakenly shown as LOS D in Table 6. This has been corrected in the revised traffic study dated 8/26/2019. Language regarding the proposed mitigation measures for the segments of Kentucky Avenue and Saxon Boulevard was included in the conclusion and executive summary; that information has been included in the Future Buildout Roadway Segment Analysis section in the revised traffic study dated 8/26/2019.**

***(ii) All segments that were shown to be failing under AM peak hour buildout conditions were also failing under PM peak hour buildout conditions. The referenced segments of Saxon Boulevard and Howland Boulevard which are not failing under background AM conditions are shown as failing under background PM conditions. It is assumed that capacity improvements made to mitigate background PM condition deficiencies would also increase the AM capacity of the segments, thereby addressing the failing AM background and buildout conditions on those segments.***

22) In Table 5,

- i) Headers say, "PM Peak Hour Project Traffic" and "Future Buildout PM Peak Hour Traffic Conditions". Please revise PM to AM.
- ii) On Normandy Boulevard between Graves avenue and the Project Access Location, and from the Project Access Location to Rhode Island Avenue, the distribution was reported as 48% (north) and 41% (south), respectively. Figure 1 depicts these percentages as 56% and 44%, respectively. Why are these percentages different? This affects the reports project impact on these links. This comment is applicable to Table 6.

***Response: The revised traffic study dated 8/26/2019 was updated to show corrected labels on Table 5. Project distribution on Normandy Boulevard in Table 5 and 6 were corrected to be consistent with Figure 1.***

23) In Table 7, intersection 24 (I-4 EB Ramp and Saxon Boulevard), intersection delays for AM peak hour without and with improvements were reported as 20.3 and 17.2 seconds, respectively. They should be 24.7 and 22.6 seconds based on the HCM 2000 output in the appendix. Please revise.

***Response: Table 7 has been revised to show the correct delay for intersection 24 within the revised traffic study dated 8/26/2019.***

24) In Table 7, intersection 2 (Kentucky Avenue and SR 472): the sentence ends with the word "additional", please finish the sentence with the other proposed improvements.

***Response: The sentence in Table 7 has been revised in the revised traffic study dated 8/26/2019.***

25) In Tables 7 and 8 (future background conditions):

- i) It is not clear what triggers when an improvement is needed. Is it based on LOS of "E" or "F" or is it based on the v/c ratio greater than 1.0? Also, if an improvement is made in the AM was it carried over to the PM. In a least one case there was a LOS "E" and no improvements were recommended.
- ii) For the intersection of Howland Boulevard and Graves Avenue, an extra left-turn lane was proposed on all movements. Based on the volumes for the SBL movement (75 vph in the AM and 62 vph in the PM), two left-turn lanes seem excessive. How were the improvements for background conditions identified? If extra improvements are provided for background, then the project traffic will not pay its fair share of those improvements.

**Response: Intersection improvements in Table 7, 8, 9 and 10 are recommended to achieve acceptable level of service at the intersection approach corresponding with the adopted standard of the roadway segment where practical. Additionally, recommendations were made to avoid saturated conditions ( $v/c$  ratio  $> 1.0$ ). Turning volumes at the intersection of Howland Blvd & Graves were transposed incorrectly in Synchro in the traffic study submitted previously. Volumes (and recommended improvements) were updated in the revised traffic study dated 8/26/2019.**

26) In Table 8,

- i) Intersection 24 (I-4 EB Ramp and Saxon Boulevard), intersection delays for PM peak hour without and with improvements were reported as 104.9 and 33.2 seconds, respectively. They should be 152.1 and 34.3 seconds based on the HCM 2000 output in the appendix. Please revise.
- ii) Intersection 25 (Normandy Boulevard and Saxon Boulevard), intersection delay for PM peak hour with improvements were reported as 58.9 seconds, it should be 60.9 seconds based on the HCM 2000 output in the appendix. Please revise.

**Response: Table 8 has been revised to show the correct delay for intersection 24 and 25 within the revised traffic study dated 8/26/2019.**

27) In Table 9,

- i) Intersection 24 (I-4 EB Ramp and Saxon Boulevard), the intersection delays for AM peak hour was reported as 17.7 seconds, it should be 22.4 seconds instead. Please revise.
- ii) Intersection 9 (Howland Boulevard and Graves Avenue), the intersection delay for AM peak hour with improvements were reported as 70.3 seconds with LOS "E" and  $v/c$  ratio of 1.03, it should be 50.7 seconds with LOS 'D' and  $v/c$  ratio of 1.05 instead. Please revise and explain how the higher  $v/c$  ratio with improvements is better than without improvements.
- iii) Intersection 28 (Normandy Boulevard and Driveway 1), should be taken out from the signalized intersections sections. Also, intersection 31 (Normandy Boulevard and Driveway 4) should be moved to the unsignalized intersections section in the same table.

**Response: Table 9 has been revised to show the correct delay for intersections 24 and 9 within the revised traffic study dated 8/26/2019. Additionally, volumes and analysis at the intersection 9 have been corrected. Intersections 28 and 31 are now categorized appropriately.**

28) In Table 10,

- i) Intersection 15 (Normandy Boulevard and Elkcam Boulevard), the intersection delay for PM peak hour was reported as 15.8 seconds with LOS 'B'. It should be 21.7 seconds with LOS 'C' instead.
- ii) Intersection 24 (I-4 EB Ramp and Saxon Boulevard), the intersection delay for PM peak hour was reported as 33.1 seconds, it should be 35 seconds instead. Please revise.
- iii) Intersection 25 (Normandy Boulevard and Saxon Boulevard), the intersection delay for PM

peak hour without improvements was reported as 71.4 seconds, it should be 73 seconds instead. Please revise.

- iv) Intersection 28 (Normandy Boulevard and Driveway 1) should be taken out from the signalized intersections sections. Also, intersection 31 (Normandy Boulevard and Driveway 4) should be moved to the unsignalized intersections section in the same table.

**Response: Table 10 has been revised to show the correct delay for intersections 15, 24, and 25 within the revised traffic study dated 8/26/2019. Intersections 28 and 31 are now categorized appropriately.**

- 29) In Table 10, intersections 12 and 14 have movements operating at v/c ratios of 1.02 and 1.00, respectively. No improvements were recommended. Please explain.

**Response: Table 10 has been revised to show improvements for intersection movements with oversaturated conditions.**

- 30) In Table 11,
  - i) At the intersection of SR 472 and N Kentucky Avenue, the required additional total turn lane length for the proposed additional southbound left-turn should be  $525 - 350 = 175$  feet.
  - ii) At the intersection of Graves Avenue and Kentucky Avenue, the required additional total turn lane length for the proposed additional southbound left-turn should be  $510 - 320 = 190$  feet.
  - iii) At the intersection of Graves Avenue and Normandy Boulevard, the required additional total turn lane length for the proposed additional westbound left-turn should be  $435 - 400 = 35$  feet
  - iv) At the intersection of Graves Avenue and Howland Boulevard, the required additional total turn lane length for the proposed additional northbound left-turn should be  $670 - 280 = 390$  feet and the proposed additional eastbound left-turn should be  $390 - 330 = 60$  feet.

**Response: Table 11 has been revised to show the correct turn lane lengths for the appropriate intersection improvements within the revised traffic study dated 8/26/2019.**

- 31) The description in the site access analysis states that the access to the property is proposed via three proposed full access connections (one for truck traffic and two for all other vehicles entering/exiting the warehouse). It should be four access connections instead with one access for trucks and three others for all other vehicles. Please revise the description.

**Response: The revised traffic study dated 8/26/2019 has been revised to reflect four (4) access connections along Normandy Boulevard, of which one access is designated for trucks.**

- 32) The Recommended Intersection Mitigation Figure on page 30 is labeled as Figure 5 but should be Figure 9. Please revise. Also, add the proposed geometry at the new driveways from the site (intersections numbers 28 through 31).

**Response: Figure 9 has been updated accordingly within the revised traffic study dated 8/26/2019.**

- 33) Site analysis section, Normandy Boulevard at Driveway 1: the description in the last sentence has to be changed since the northbound left turn was proposed.

**Response: No northbound left turn lane is proposed for Driveway 1.**

- 34) In the preliminary signal warrant analysis section,
- i) It was observed that for driveways 3 and 4, the northbound left-turn lane into the driveway was considered as the minor street instead of the driveways. This is not consistent with the application of Signal Warrant analysis procedure in the MUTCD. Please revise the analysis as appropriate.
  - ii) For the intersection of Normandy Boulevard at Driveway 4, it is stated that, “the projected PM peak-hour traffic volumes at buildout meet peak hour signal warrant criterion for signalization at the intersection.” This is not the case. The volumes do not meet the peak-hour volume warrant. Please revise.
  - iii) The MUTCD notes that the improper or unjustified traffic control signals can result in significant increase in the frequency of rear-end collisions. Traffic control signals were proposed at driveways 2 and 3 in the report. Since exclusive right-turn lanes are provided at driveway 2, 3, and 4, right-turn volumes can be discounted in the warrant analysis. Application of MUTCD warrant analysis would suggest that only driveway 2 would meet the warrant criteria for the peak-hour warrant. Further, if a traffic signal is constructed as part of the project based on projected volumes, paragraph 11 (section 4C.01) of the MUTCD proffers the following guidance: “a traffic control signal installed under projected conditions should have an engineering study done within 1 year of putting the signal into stop-and-go operation to determine if the signal is justified. If not justified, the signal should be taken out of stop-and-go operation or removed.”

**Response: The revised traffic study dated 8/26/2019 was updated with the following revisions or considerations:**

- i. **The analysis has been updated to show Normandy Boulevard as the major street and each driveway as the minor street.**
  - ii. **The statement regarding the warrant results at Driveway 4 has been revised accordingly.**
  - iii. **Exclusive southbound right-turn lanes along Normandy Boulevard are proposed to be installed at each of the four (4) driveway locations. The signal warrant analysis has been revised to exclude these right-turn volumes from consideration. We acknowledge the post signal installation guidelines outlined in the MUTCD.**
- 35) In the alternative mode analysis section, the study indicates that buses will enter driveway 2 and exit driveway 3 to pick-up and drop off people. This needs to be verified with the transit provider since that may now want to travel off-route to make this stop. If the transit provider does not commit to this, proper connections should be provided from the site to the nearest

approved transit stop along Normandy Boulevard.

**Response: The revised traffic study dated 8/26/2019 was updated to remove this specific language. The Applicant will continue to work with the City on the logistics of how the site will incorporate the existing transit route.**

- 36) It was stated in the “Required Transportation Improvements” section of the methodology that ‘proportionate shares will be included within the traffic study and calculated per Florida Statutes HB 319 adopted May 30, 2019. This information was not provided in the body of the report.

**Response: Cost estimates for future improvements and associated proportionate share calculations are being provided to the City and County separate from the traffic study.**

- 37) The conceptual site plan in Appendix B notes that permissible uses include sale of products, materials, and merchandise including liquor and grocery/food items of all types, in addition to storage and distribution (normal warehouse). This was not mentioned in the methodology. The City should confirm that they agree with the stated permissible uses on the conceptual site plan since these additional uses would affect the trip generation and the appropriate ITE Land Use Category.

**Response: The revised traffic study dated 8/26/2019 provides the latest site plan in Appendix A without the “sale of products” language.**

- 38) The main area plus office area which is  $1,043,110 + 51,785 \text{ SF} = 1,094,895 \text{ SF}$  instead of 1,094,865 SF as shown on the site plan.

**Response: The revised traffic study dated 8/26/2019 provides the latest site plan in Appendix A with 1,078,342 square feet of use.**

- 39) The site plan should include the calculations for the proposed number of parking spots as provided in the overall site data (point 5) for the warehouse.

**Response: The proposed number of parking spaces for the site are end-user requested quantities based on known need for this specific project prototype.**

- 40) Appendix E (Intersection Volume Development Worksheets).

- i) None of the intersection volume development sheets for the 2020 peak season traffic could be verified. The methodology indicates that the 2020 volumes should be equal to the 2019 Peak season Volumes \* Growth Factor, please explain. This will affect future background and project traffic which has to be revised.
- ii) Please describe how the vested trips were calculated in the volume development sheets? How were these trips distributed at the intersections?

**Response: The intersection volume development worksheets provided in Appendix E show the existing intersection counts and an adjustment for peak season to generate 2019 peak season volumes used in the existing condition analysis (FDOT’s peak season correction factor report in provided in Appendix K). Then, a County-approved link-by-link growth factor developed from historical count data in the methodology process (see Appendix B) was applied to develop 2020 peak season volumes. Vested traffic provided**

**for each study area segment by the City and the County (Appendix G) was then added at each approach volumes proportionate to existing approach volume movements to develop 2020 Non-Project Traffic for use in the background conditions analysis. Finally, project trips were added in accordance with the approved project trip generation totals and project distribution to develop 2020 Total Build-out Volumes.**

- 41) For the SYNCHRO analyses, at the intersection of S Kentucky Avenue & Graves Avenue, the eastbound left-turn movement was coded as protected phase, but it is permissive + protected phasing based on the signal timing sheet. The analysis should be revised, and the report updated accordingly.

**Response: The Synchro 10 analysis of the intersection of Kentucky Avenue & Graves Avenue has been updated within the revised traffic study dated 8/26/2019.**

- 42) For the SYCHRO analyses, the volumes coded in the 2020 PM peak future background conditions, there were numerous intersections that used volumes inconsistent with the volume development sheets (and Figure 5). Examples include the following intersections: Dr. MLK Junior Beltway at Orange Camp Road, N Kentucky Avenue at SR 472, Howland Boulevard st Graves avenue, Veterans Memorial Parkway at Graves Avenue, Catalina Boulevard at Howland Boulevard. Please review each location and revise, as necessary.

**Response: The Synchro 10 analysis for 2020 PM peak hour future background has been updated within the revised traffic study dated 8/26/2019.**

- 43) The 2020 PM Peak buildout condition at the intersections of Normandy Boulevard and Driveway 3 identifies that the eastbound approach of the driveway fails, even under signalizations. Please explain why further improvements were not recommended (e.g. further signal optimization) .

**Response: Driveway 3 has been updated to directional access (right-in/right-out/left-in) and analysis has been updated in the revised traffic study dated 8/26/2019.**

#### Volusia County Review Comments & Responses

- 1) The third paragraph on page 1 of the introduction states that access to the property is proposed via three proposed full access connections to Normandy Boulevard.; however, the conceptual plan and analysis later in the TIA documents 4 access driveways. Please rectify.

**Response: The revised traffic study dated 8/26/2019 has been revised to reflect four (4) access connections along Normandy Boulevard.**

- 2) Developer and City comment: Committed projects: All four developer improvements for Halifax Crossings and Deltona Village at the Howland Blvd/Graves Avenue intersection cannot be considered committed. Please confirm what can be used in the analysis. To our knowledge, only the westbound right-turn lane and eastbound left-turn lane (i.e., creating dual eastbound left-turn lanes) can be considered committed.

**Response: The revised traffic study dated 8/26/2019 has been revised to reflect only the WBRT and EBLT lanes in the background condition (before improvements).**

- 3) Page 5, Proposed Shift Operations: Please clarify when the shifts' peak hour traffic will occur. The latter half of the paragraph is confusing and conflicts with the first half unless better explained.

**Response: The revised traffic study dated 8/26/2019 has been revised to better explain anticipated operations at the site including how the shift work results in three distinct peak generator hours. Additionally, trip generation calculations from the end user were provided in the approved methodology and shown to be conservative when compared to the closest available ITE land use code description (warehousing).**

- 4) Figures 3-8: Staff is having difficulty verifying how the existing turning movement counts were calculated in figures 3 through 8. Please provide documentation as to how the existing counts were determined.

**Response: Figure 3-8 have been updated in the revised traffic study to address City and County comments. The intersection volume development worksheets provided in Appendix E show the existing intersection counts and an adjustment for peak season to generate 2019 peak season volumes used in the existing condition analysis. The intersection volume development worksheets provided in Appendix E show the existing intersection counts and an adjustment for peak season to generate 2019 peak season volumes used in the existing condition analysis (FDOT's peak season correction factor report in provided in Appendix K). Then, a County-approved link-by-link growth factor developed from historical count data in the methodology process (see Appendix B) was applied to develop 2020 peak season volumes. Vested traffic provided for each study area segment by the City and the County (Appendix G) was then added at each approach volumes proportionate to existing approach volume movements to develop 2020 Non-Project Traffic for use in the background conditions analysis. Finally, project trips were added in accordance with the approved project trip generation totals and project distribution to develop 2020 Total Build-out Volumes.**

- 5) Figure 6: The existing traffic volumes in the turning movement counts (TMCs) are lower (some significantly lower) than the county's 2018 count data. Please redo all TMC analysis to use the agreed upon PM peak hour count data.

**Response: Intersection movements were collected in the field and used as a baseline for all intersection analyses. Volusia County staff was questioned about this comment to which staff explained that the comment was a result of a misunderstanding of how the intersection volumes were developed. Please see comment response #4 above.**

- 6) Data Collection: AM peak hour counts were taken in June when school was out. They are likely much lower than when school is in session given the adjacent location of Deltona High School. This also needs to be discussed &/or engineer needs to verify if this is an issue with the new start of high school at 8:30 AM.

**Response: The weekday AM peak hour morning generator for the site occurs between 6:30AM to 7:30AM. Therefore, conflicts with morning traffic generated by the nearby Deltona High School will be minimal with school beginning at 8:30AM.**

- 7) General: turn lanes will be especially needed for the truck traffic entering the site at Driveway 1 on Normandy Boulevard. The effect of heavy trucks slowing on Normandy Boulevard will lead

to roadway failure on the Thru lane making for an unsafe condition.

**Response: An ingress right-turn lane at Driveway 1 will be provided to accommodate trucks.**

- 8) After analyzing the proposed trip distribution figure on page 6, it is unclear on the trip distribution percentages within the SR 472 & I-4 interchange. Please add an inset showing the proposed distributions for this area.

**Response: Insets showing existing, background and project trips at the I-4 ramps are provided in Figures 3 through 6 in the revised traffic study dated 8/26/2019. For further clarification, turning movement volume worksheets are provided in Appendix E to show full development of the turning movement volumes at every study area intersection including percent project distribution.**

- 9) TMC and Segment Tables: Please separate project traffic into 1) truck traffic and 2) other vehicle traffic based on the methodology's distribution. Currently, the TIA uses the total peak hour traffic (1,043) and is applies it to "non-truck" Distribution. This discounts the truck distribution. The TMCs and segments need to account for truck traffic exclusively being routes on the segments in the SR 472 interchange area rather than being distributed on the area's network like the other vehicles' trip trips. Separation is also important when analyzing turn lane needs for trucks.

**Response: The revised traffic study dated 8/26/2019 shows separation distribution and assignment for truck and non-truck volumes in the buildout segment analyses tables. Additionally, volume development worksheets in Appendix E have been updated similarly to show truck volumes separately on those intersections with project truck movements anticipated.**

- 10) Page 14, Traffic Volume Development: A 50% discount was applied to the future background growth in effort to avoid double counting vested trips. This was not approved in the methodology and should be discussed with City and County staff.

**Response: This language has been removed and background growth has been applied in accordance with the approved methodology in the revised traffic study dated 8/26/2019.**

- 11) After reviewing the Peak hour buildout total traffic volumes in figures 3-8, staff is having a difficult time replicating the volumes provided. Please explain how these values were generated.

**Response: From comment response #4 above - Figure 3-8 have been updated in the revised traffic study to address City and County comments. The intersection volume development worksheets provided in Appendix E show the existing intersection counts and an adjustment for peak season to generate 2019 peak season volumes used in the existing condition analysis. The intersection volume development worksheets provided in Appendix E show the existing intersection counts and an adjustment for peak season to generate 2019 peak season volumes used in the existing condition analysis (FDOT's peak season correction factor report is provided in Appendix K). Then, a County-approved link-by-link growth factor developed from historical count data in the**

***methodology process (see Appendix B) was applied to develop 2020 peak season volumes. Vested traffic provided for each study area segment by the City and the County (Appendix G) was then added at each approach volumes proportionate to existing approach volume movements to develop 2020 Non-Project Traffic for use in the background conditions analysis. Finally, project trips were added in accordance with the approved project trip generation totals and project distribution to develop 2020 Total Build-out Volumes.***

- 12) Please verify the lane configuration design of the 2020 Synchro Buildout Conditions for all of the signalized intersections. The PM peak hour files have discrepancies with what is proposed in the future buildout analysis.

***Response: The revised traffic study dated 8/26/2019 has been reviewed and revised to ensure consistency between the report table and the 2020 Synchro Buildout Conditions.***

- 13) In the SYNCHRO analysis, the intersection of Howland Blvd and Graves Ave is not properly oriented, and the traffic volumes seem to be off 90 degrees, Please update the analysis for all scenarios. Eastbound right-turn lanes from Graves to Howland is consistent with the 586. Revising the volumes may impact the overall intersection MOE's and need for appropriate turn lanes. For example, do we need dual left turn lanes for 82 vehicles vs 337 vehicles?

***Response: The revised traffic study dated 8/26/2019 includes corrected orientation at the intersection at Howland Boulevard & Graves Avenue.***

- 14) Existing SYNCHRO analysis: Normandy Blvd from South Ave to Graves Avenue is shown with Two SB lanes and 1 NB Lane. Update the roadway with one lane in each direction within those limits for all scenarios unless the future condition requires it.

***Response: The revised traffic study dated 8/26/2019 anticipates a 4-lane section on Normandy Blvd from the Project to Graves Avenue in the future condition. Synchro files have been updated to reflect this anticipated future condition.***

- 15) SYNCHRO analysis: Please explain why default of 2% trucks was used for all links. A review of two roads indicates much higher truck percentages. For example, along SR 472 [according to FDOT's "Florida traffic online" website (<http://tdaappsprod.dot.state.fl.us/fto/>)] truck percentages are 4.4% west of MLK and 4.5% east of MLK; whereas, along Saxon Boulevard percentages are 2.8% west of VMP and 8% east of VMP.

***Response: Percent heavy vehicle data was collected during the AM peak and PM peak hours during traffic count data collection at all study area intersections and is provided in Appendix C of the revised traffic study dated 8/26/2019. This peak hour heavy vehicle data was used in the Synchro analyses. FDOT's daily truck percentages were not used as daily truck percentage can vary greatly from the peak hour truck percentage.***

- 16) SYNCHRO Future Buildout w/Improvements: Provide proper storage of the NB lefts in the analysis for the intersection of SR 472 at Kentucky Ave.

***Response: The revised traffic study dated 8/26/2019 has been updated to determine the appropriate amount of queue length needed for the NBL movement at the intersection of SR 472 & Kentucky Avenue.***

- 17) As noted on page 27 in future buildout conditions and on page 37 in the conclusion section, there will need to be construction of a second eastbound right-turn lane at the intersection of Graves Avenue and Normandy Boulevard. However, Table 11 indicates that this intersection will propose dual eastbound right turn lanes, an additional westbound left-turn lane, and what appears to be an additional northbound left-turn lane. Currently, Graves Ave. is a 2-lane road with one receiving lane from Normandy Boulevard., and Normandy Blvd. is a 2-lane road with one receiving lane from Graves Ave with no mentioning of widening wither roadway in the future conditions. Was this taken into account for future design?

**Response: The revised traffic study dated 8/26/2019 provides the necessary capacity improvements at study area intersections and roadway segments to realize an acceptable level of service in future conditions. As shown in the revised study, receiving lanes on Normandy Boulevard and westbound Graves Avenue will be needed in the final design to realize acceptable level of service. The Synchro files and intersection analysis provided with the study reflect this improvement scenario. The final design of the intersection (including receiving lanes) will be coordinated with the City and County for feasibility.**

- 18) Table 10: the following improvements recommended: Construction of a second northbound right-turn lane at the intersection of Graves Avenue & Veterans' Memorial Parkway. How would this be accomplished if graves Avenue is still a 2-lane roadway?

**Response: A second receiving lane can be provided to merge into the existing two-lane section of Graves Avenue to the east.**

- 19) Table 11 (Recommended Intersection Storage Length Summary) will need to include an analysis of both I-4 @ SR 472 ramps.

**Response: The revised traffic study dated 8/26/2019 includes recommended turn lane lengths for the intersections at SR 472 & I-4 ramps.**

- 20) Please re-analyze Table 11. The required deceleration length for County maintained roadways differs from local and FDOT regulations, County maintained rural roadways (uncurbed roadway segments) with a posted speed limit of 45 mph require minimum deceleration lengths of 320 feet, county maintained urban roadways (curbed roadway segments) require a minimum deceleration length of 240 feet. Also, there are numerous intersections within the table that identify no exiting turn lanes where turn lanes exist.

**Response: The revised traffic study dated 8/26/2019 includes updated turn lane lengths in Table 11.**

- 21) The conclusion section on Page 37 indicates that Kentucky Ave. will require construction of an additional travel lane between SR 472 to Graves Ave and Saxon Blvd will require an additional travel lane between Tivoli and Providence. Why is only one additional travel lane proposed for these two roadways?

**Response: This language has been updated in the revised traffic study dated 8/26/2019 to clarify that the recommended mitigation measures was intended to mean an additional travel lane in each direction.**

- 22) The TIA conclusion on pg. 27 indicates that driveways two and three on Normandy Blvd. meet the peak hour signal warrant at project buildout. However, the signal analysis on Page 35 indicates that driveways 2, 3, and 4 meet the peak hour signal warrant. Please clarify.

**Response: The revised traffic study dated 8/26/2019 concludes a signal is warranted at Driveway #2 only. Driveway #3 is now proposed with a directional median (right-in/right-out/left-in only).**

- 23) Advisory PFS CALCULATION: County staff is currently reviewing and calculating construction costs for the PFS proposal and will provide comments to the City under separate cover. However, our preliminary review indicates that the construction cost throughout the calculation were based upon rural typical section; whereas, there is a mix of rural (lower costs) & urban (higher costs) typical sections. Also, construction cost didn't include the costs of interstate bridge widenings.


**Response: County's input will be reviewed upon receipt.**

- 24) Response to Comments: Please provide a Response to Comments letter with the revised TIA.

**Response: This comment response letter to City and County comments is accompanied with a revised traffic study dated 8/26/2019.**

We trust these responses, along with the attachments listed below, will provide the additional information as requested. Please feel free to contact our office if you have any questions.

Sincerely,  
**KIMLEY-HORN**



James M. Taylor, PE

Attachments: Revised Traffic Impact Analysis

Cc: File

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