



STATE OF DELAWARE  
**DEPARTMENT OF TRANSPORTATION**  
800 BAY ROAD  
P.O. BOX 778  
DOVER, DELAWARE 19903

JENNIFER COHAN  
SECRETARY

June 17, 2019

Mr. Michael Kaszyski  
Duffield Associates, Inc.  
5400 Limestone Road  
Wilmington, DE 19808

Dear Mr. Kaszyski:

The enclosed Traffic Operational Analysis (TOA) letter for the **New Castle Logistics Park** (Tax Parcel 12-013.00-007) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They prepared the TOA in accordance with DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel  
Project Engineer

TEB:km  
Enclosures

cc with enclosures: Mr. Todd Frey, Duffield Associates, Inc.  
Ms. Constance C. Holland, Office of State Planning Coordination  
Mr. George Haggerty, New Castle County Department of Land Use  
Mr. Owen Robotino, New Castle County Department of Land Use  
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.  
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.  
Mr. Will Mobley, Johnson, Mirmiran & Thompson, Inc.  
DelDOT Distribution

## DelDOT Distribution

Brad Eaby, Deputy Attorney General

Robert McCleary, Director, Transportation Solutions (DOTS)

Drew Boyce, Director, Planning

Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS

Pamela Steinebach, Assistant Director, Project Development North, DOTS

J. Marc Coté, Assistant Director, Development Coordination

T. William Brockenbrough, Jr., County Coordinator, Development Coordination

Peter Haag, Traffic Studies Manager, Traffic, DOTS

Kevin Canning, Canal District Engineer, Canal District

Matthew Vincent, Canal District Public Works Engineer, Canal District

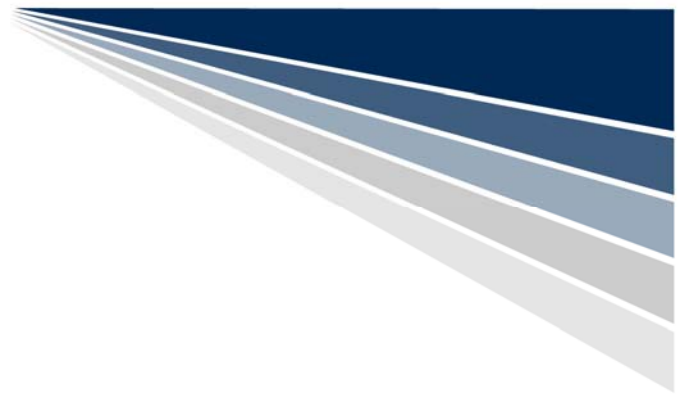
David Dooley, Service Development Planner, Delaware Transit Corporation

Sireen Muhtaseb, New Castle Review Coordinator, Development Coordination

Mark Galipo, Traffic Engineer, Traffic, DOTS

Anthony Aglio, Planning Supervisor, Statewide & Regional Planning

Claudy Joinville, Project Engineer, Development Coordination



June 14, 2019

Mr. Troy Brestel  
Project Engineer  
Development Coordination  
DelDOT Division of Planning  
P O Box 778  
Dover, DE 19903

RE: Agreement No. 1774  
Project Number T201769002  
Traffic Impact Study Services  
**Task 5-New Castle Logistics Park**

Dear Mr. Brestel:

Johnson, Mirmiran and Thompson (JMT) has completed the Traffic Operational Analysis (TOA) for New Castle Logistics Park. This task was assigned Task Number 5. The report is prepared in a manner generally consistent with DelDOT’s *Development Coordination Manual*.

The TOA evaluates the impacts of a proposed industrial development in New Castle County, Delaware. The development would consist of approximately 2,008,760 square feet of industrial space. The proposed site is located on the northeast corner of the intersection of US Route 13 (New Castle Road 34) and Delaware Route 7 (New Castle Road 5)/Delaware Route 72 (New Castle Road 46). Five access points are proposed: one rights-in/rights-out entrance on Delaware Route 72, one full access and a rights-in/rights-out entrance on Delaware Route 7, and two full access entrances on School House Road (New Castle Road 406). The subject property is on an approximately 169.95-acre parcel (Tax parcel #12-013.00-007) that is currently split-zoned as HI (Heavy Industrial) and CR (Regional Commercial). The County plans to rezone the CR portion of the land to HI. Construction of Phase One (934,960 square feet of industrial space) is anticipated to be complete in 2020, with the remaining phases anticipated to be complete by 2024.

It should be noted that the analysis for this TOA was performed using previously proposed building floor areas. Since the analysis was performed, these floor areas have been updated. The floor areas used for the TOA and the currently proposed floor areas are presented in the following table:

Building #	Proposed floor area for TOA (SF)	Currently proposed floor Area (SF)
1	619,082	577,829
2	208,844	217,748
3	934,960	1,003,456
4	243,984	207,837
Total	2,006,870	2,006,870



The currently proposed building floor areas will shift site traffic from the two School House Road entrances to the other three entrances along Delaware Route 7 and Delaware Route 72, as well as the Delaware Route 72 intersections with School House Road and US Route 13/ Delaware Route 7. Although this shift in traffic would affect delays and could affect LOS at these intersections, we do not anticipate these changes to be significant. Therefore, the change in proposed building floor areas will not affect the recommendations made in this TOA.

The Cases 4 and 5 analyses in the TOA incorporate roadway improvements planned as part of the SR 72, McCoy Road to SR 71 DelDOT improvement project (DelDOT Project No. T200601102). The improvement project will add an additional travel lane in each direction of Delaware Route 72 between the Delaware Route 71 and McCoy Road intersections. A two-way left-turn lane will be added within the project area with auxiliary turn lanes provided at the signalized intersections. Pedestrian and bicycle facilities will also be added. The advanced utility work associated with the project (DelDOT Project No. T201401101) is expected to begin in Spring of 2019. The design of the roadway widening is currently underway with the construction projected to begin in Fall of 2022. The anticipated end of construction is in Fall of 2024.

Based on the traffic operational analysis, we have the following comments and recommendations:

The New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) apply to all signalized, all-way-stop, and roundabout intersections. Based on the analysis results none of the signalized intersections require the implementation of physical roadway and/or traffic control improvements.

Additionally, separate from the UDC but based on the LOS evaluation criteria as stated in Chapter 2 of DelDOT’s *Development Coordination Manual*, movements at the following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements.

<b>Intersection</b>	<b>Situations for which LOS deficiencies occur</b>
Site Entrance A/Delaware Route 72	2024 Weekday PM With Full Development (Case 5)
Delaware Route 72/School House Road	2019 Weekday PM Existing (Case 1) 2020 Weekday PM Without Development (Case 2) 2020 Weekday PM With Phase One Development (Case 3) 2024 Weekday PM With Phase One Development (Case 4) 2024 Weekday PM With Full Development (Case 5)

The Site Entrance A/Delaware Route 72 intersection exhibits LOS deficiencies under Case 5 conditions during the weekday PM peak period. Specifically, the southbound Site Entrance A approach would operate at LOS E and have a delay of 48.4 seconds per vehicle. Both a roundabout and traffic signal would mitigate the deficiencies. However, the installation of a roundabout or traffic signal is not recommended as the deficiency occurs along the southbound Site Entrance A approach and would not impact operations along Delaware Route 72. Additionally, the calculated



95<sup>th</sup> percentile queue length during Case 5 conditions along the southbound approach would be approximately 120 feet which would not impact on-site circulation.

The Delaware Route 72/School House Road intersection exhibits LOS deficiencies under existing Weekday PM peak hour conditions and would exhibit LOS deficiencies under the future Weekday PM peak hour conditions with or without the proposed development. The LOS deficiencies take place along the southbound School House Road approach to Delaware Route 72. The approach would operate at LOS F during Cases 1, 2, 3, 4, and 5. Specifically, the projected 95<sup>th</sup> percentile queue length under Case 5 conditions would be approximately 715 feet and the approach delay would be 306.7 seconds per vehicle.

The installation of either a roundabout or a traffic signal would mitigate these LOS deficiencies. The intersection meets the Peak Hour Warrant described in Section 4C of the Manual on Uniform Traffic Control Devices (MUTCD). This warrant is intended for use in unusual cases, such as industrial complexes, and so a traffic signal is justified. However, the long queues along the southbound School House Road approach only occur during approximately 15 minutes of the PM peak hour. As such, JMT conducted multi-period analyses during the Case 5 conditions with the intersection configured as a roundabout as well as a signal. With a roundabout, the intersection would operate at LOS B but the peak 15-minute period would operate at LOS D with 33.6 seconds of delay per vehicle and a calculated 95<sup>th</sup> percentile queue length along the southbound School House Road approach of approximately 480 feet. With a signal, the intersection would operate at LOS D but the peak 15-minute period would operate at LOS F with 100.4 seconds of delay per vehicle and a calculated 95<sup>th</sup> percentile queue length along the southbound School House Road approach of approximately 1,360 feet.

A roundabout with a southbound right turn yield-controlled bypass lane at the Delaware Route 72/School House Road intersection would mitigate the LOS deficiencies along the southbound School House Road approach. However, due to the high number of large trucks expected to access the site as well as the proximity of several utility poles to the intersection, the installation of a roundabout at this location may not be cost effective.

As such, it is recommended that the developer modify the southbound School House Road approach to Delaware Route 72 to provide one left turn lane and one right turn lane. Although the southbound School House Road approach would operate with LOS F, the delay would reduce from 306.7 seconds per vehicle to 87.7 seconds per vehicle under Case 5 conditions. Additionally, the calculated 95<sup>th</sup> percentile queue length along the southbound approach would reduce from approximately 715 feet to approximately 345 feet.

Should New Castle County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development. It should be noted that Delaware Route



72 is designated as a north/south roadway, but for the purpose of this study Delaware Route 72 will be referred to as an east/west roadway.

1. The developer should provide a bituminous concrete overlay to the westbound Delaware Route 72 existing travel lanes along the site frontage in the area affected by entrance plan construction, including any auxiliary lanes, at DelDOT’s discretion. DelDOT should analyze the existing lanes’ pavement section and recommend an overlay thickness to the developer’s engineer, if necessary.
2. The developer should provide a bituminous concrete overlay to the northbound Delaware Route 7 existing travel lanes along the site frontage in the area affected by entrance plan construction, including any auxiliary lanes, at DelDOT’s discretion. DelDOT should analyze the existing lanes’ pavement section and recommend an overlay thickness to the developer’s engineer, if necessary.
3. The developer should provide a bituminous concrete overlay, if needed due to striping changes along the roadway, to the School House Road existing travel lanes along the site frontage from approximately 2,500 feet north of the Delaware Route 72/School House Road intersection to approximately 3,750 feet north of the Delaware Route 72/School House Road intersection at DelDOT’s discretion. DelDOT should analyze the existing lanes’ pavement section and recommend an overlay thickness to the developer’s engineer, if necessary.
4. The developer should construct a rights-in/rights-out site entrance for the proposed New Castle Logistics Park development on Delaware Route 72 along the south side of the property, approximately 900 feet east of the intersection with US Route 13/Delaware Route 7, to be consistent with the proposed lane configurations as shown in the table below:

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Eastbound Delaware Route 72	One through lane	One through lane
Westbound Delaware Route 72	One through lane	One through lane and one right turn lane
Southbound Site Access A	Approach does not exist	One right turn lane

Based on DelDOT’s *Development Coordination Manual* and the updated Auxiliary and Bypass Lane Warrants from October 23, 2017, the recommended minimum storage length (excluding taper) is 215 feet for the westbound Delaware Route 72 right turn lane.



5. The developer should construct a full access site entrance for the proposed New Castle Logistics Park development on Delaware Route 7 along the west side of the property. Based on the Site Plan, the entrance is proposed approximately 2,250 feet north of the intersection with Delaware Route 72. However, the developer should coordinate with DelDOT Development Coordination Section to identify the exact location as there is an existing median opening approximately 1,800 feet north of the intersection with Delaware Route 72 that may conflict with the proposed entrance location. The full access entrance should be consistent with the proposed lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Westbound Site Access B	Approach does not exist	One left turn lane and one right turn lane
Northbound Delaware Route 7	Two through lanes	Two through lanes and one right turn lane
Southbound Delaware Route 7	Two through lanes	Two through lanes and one left turn lane

Based on DelDOT’s *Development Coordination Manual* and the updated Auxiliary and Bypass Lane Warrants from October 23, 2017, the recommended minimum storage lengths (excluding taper) are 330 feet for the northbound Delaware Route 7 right turn lane and 315 feet for the southbound Delaware Route 7 left turn lane. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage length.

6. The developer should construct a rights-in/rights-out site entrance for the proposed New Castle Logistics Park development on Delaware Route 7 along the west side of the property, approximately 3,350 feet north of the intersection with Delaware Route 72, to be consistent with the proposed lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Westbound Site Access C	Approach does not exist	One right turn lane
Northbound Delaware Route 7	One through lane	One through lane and one right turn lane
Southbound Delaware Route 7	Two through lanes	Two through lanes

Based on DelDOT’s *Development Coordination Manual* and the updated Auxiliary and Bypass Lane Warrants from October 23, 2017, the recommended minimum storage length (excluding taper) is 330 feet for the northbound Delaware Route 7 right turn lane.



7. The developer should construct a full access site entrance for the proposed New Castle Logistics Park development on School House Road along the east side of the property, approximately 3,750 feet north of the intersection with Delaware Route 72, to be consistent with the proposed lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Site Access D	Approach does not exist	One shared left turn/right turn lane
Northbound School House Road	One through lane	One shared left turn/through lane
Southbound School House Road	One through lane	One shared through/right turn lane

8. Any improvements needed for the existing shared entrance with the Formosa Plastics property will be determined through the Entrance Plan review process.
9. The developer should modify the School House Road intersection with Delaware Route 72 to be consistent with the proposed lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Delaware Route 72	One shared left turn/through lane	No change
Westbound Delaware Route 72	One shared through/right turn lane	No change
Southbound School House Road	One shared left turn/right turn lane	One left turn lane and one right turn lane

The recommended storage length (excluding taper) is 345 feet for the southbound School House Road right turn lane. The calculated queue length from the HCS analysis can be accommodated within the recommended storage length. The developer should submit a plan to DelDOT’s Development Coordination and other pertinent sections depicting the intersection design. The final design of the intersection should be determined during the Entrance Plan review process.

10. Consistent with Section 5.2.5.6. of DelDOT’s *Development Coordination Manual*, the entrances and on-site aisles should be designed to accommodate the trucks expected to traverse the site. The developer should coordinate with DelDOT during the Entrance Plan review to confirm the design meets the design vehicle chosen for the proposed development.





11. The following bicycle, pedestrian, and transit improvements should be included:

- a. A minimum fifteen-foot wide permanent easement from the edge of the existing right-of-way should be dedicated to DelDOT along the Delaware Route 72 and Delaware Route 7 site frontages.
- b. ADA compliant curb ramps and a marked crosswalk should be provided along the Site Entrance A approach to Delaware Route 72, the Site Entrance B and Site Entrance C approaches to Delaware Route 7, and the Site Entrance D and Site Entrance E approaches to School House Road. The use of diagonal curb ramps is discouraged.
- c. Where internal sidewalks are located alongside of perpendicular or angular parking spaces, a buffer, physical barrier, or signage should be added to eliminate vehicular overhang onto the sidewalk.
- d. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Delaware Route 72 approach to Site Entrance A, as well as along the Delaware Route 7 approaches to Site Entrance B and Site Entrance C.
- e. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks or should be flush with the pavement.
- f. Bike parking racks should be provided near the building entrances. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
- g. A bus stop with an ADA compliant 5 feet by 8 feet concrete pad along the Delaware Route 72 site frontage adjacent to the proposed entrance should be provided. The developer should coordinate with DART during the plan review process to determine the bus stop location and design. If a bus stop is provided, the developer should construct a minimum 5-foot wide sidewalk that meets current AASHTO and ADA standards that would be located adjacent to the Delaware Route 72 site entrance and provide a connection to the bus stop. A minimum five-foot setback should be maintained from the edge of the pavement to the sidewalk. If feasible, the sidewalk should be placed behind utility poles, and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination section during the plan review process to identify the exact location of the sidewalk.



Please note that this TOA generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's Plan Review process.

Improvements in this TOA may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at [https://www.deldot.gov/Publications/manuals/de\\_mutcd/index.shtml](https://www.deldot.gov/Publications/manuals/de_mutcd/index.shtml). For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Mark Buckalew of DelDOT's Traffic Section. Mr. Buckalew can be reached at (302) 894-6353 or by email at [Mark.Buckalew@state.de.us](mailto:Mark.Buckalew@state.de.us).

Additional details on the TOA are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,  
Johnson, Mirmiran, and Thompson, Inc.

A handwritten signature in black ink, appearing to read 'Joanne M. Arellano', is written in a cursive style.

Joanne M. Arellano, P.E., PTOE

cc: Mir Wahed, P.E., PTOE  
Enclosure

## **General Information**

**Report date:** June 2019

**Prepared by:** JMT

**Prepared for:** New Castle Logistics Park

**Tax Parcel:** 12-013.00-007

**Generally consistent with DelDOT's *Development Coordination Manual*:** Yes.

## **Project Description and Background**

**Description:** The developer seeks to develop an approximately 2,008,760 square foot industrial park.

**Location:** The subject property is located on the northeast corner of the intersection of US Route 13 (New Castle Road 34) and Delaware Route 7 (New Castle Road 5)/Delaware Route 72 (New Castle Road 46) in New Castle County.

**Amount of Land to be developed:** The subject property is on an approximately 169.95-acre parcel.

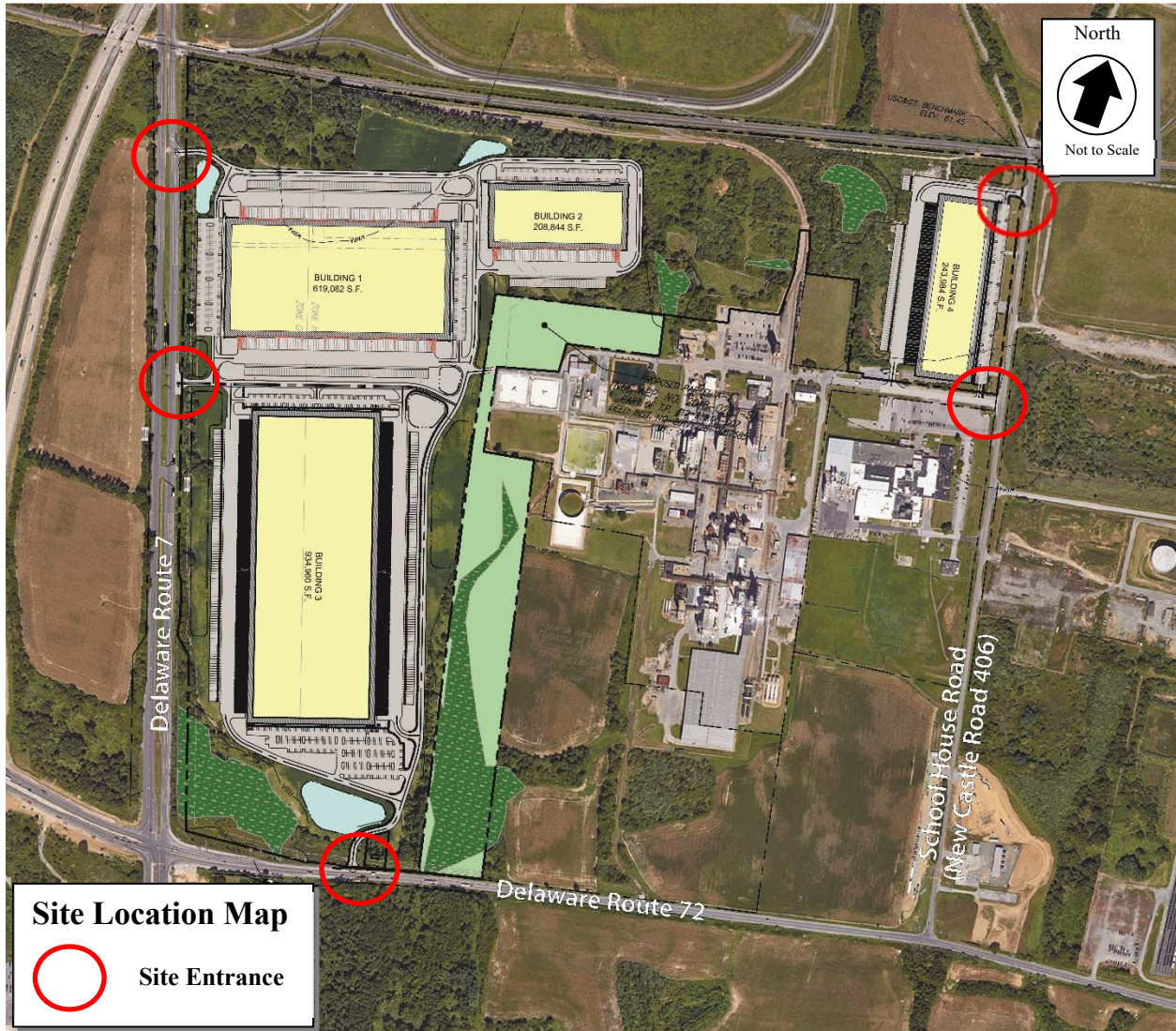
**Land Use approval(s) needed:** Entrance Plan approval.

**Proposed completion date:** Phase One (934,960 square feet) is expected to be complete in 2020 and the remaining phases are expected to be complete in 2024.

**Proposed access locations:** Five access points are proposed: one rights-in/rights-out on Delaware Route 72, one full access and one rights-in/rights-out access on Delaware Route 7, and two full access points on School House Road (New Castle Road 406).

- 2019 Average Annual Daily Traffic on Delaware Route 72: 5,733 vehicles per day.
- 2019 Average Annual Daily Traffic on Delaware Route 7: 5,146 vehicles per day.
- 2019 Average Annual Daily Traffic on School House Road: 1,607 vehicles per day.

**Site Map**



*\*Graphic is an approximation based on the Land Development Plan prepared by Duffield Associates, dated February 4, 2019.*

## **Livable Delaware**

*(Source: Delaware Strategies for State Policies and Spending, 2015)*

### **Location with respect to the Strategies for State Policies and Spending Map of Delaware:**

The proposed development is located within the Investment Level 2 and 3 areas.

#### **Investment Level 2**

Investment Level 2 areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. They serve as transition areas between Level 1 and the state's more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Level 2 Areas share similar priorities as with the Level 1 Areas where the aim remains to: make context sensitive transportation system capacity enhancements, preserve existing facilities, make safety enhancements, make transportation system capacity improvements, create transit system enhancements, ensure ADA accessibility, and close gaps in the pedestrian system. Other priorities for Level 2 Areas include: Corridor Capacity Preservation, off-alignment multi-use paths, interconnectivity of neighborhoods and public facilities, and signal-system enhancements.

#### **Investment Level 3**

Investment Level 3 Areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities where development is not necessary to accommodate expected population growth during a five-year planning period (or longer). The second category includes lands that are adjacent to or intermingled with fast-growing areas within counties or municipalities that are otherwise categorized as Investment Levels 1 or 2. Investment Level 3 is further characterized by areas with new development separated from existing development by a substantial amount of vacant land that is not contiguous with existing infrastructure, areas that are experiencing some development pressure, areas with existing but disconnected development, and possible lack of adequate infrastructure.

The state will consider investing in infrastructure within Investment Level 3 Areas once the Investment Level 1 and 2 Areas are substantially built out, or when the infrastructure or facilities are logical extensions of existing systems and deemed appropriate to serve a particular area. The priorities in the Level 3 Areas are for DelDOT to focus on regional movements between towns and other population centers. Local roadway improvements will be made by developers and

property owners as development occurs. Lower priority is given to transportation system–capacity improvements and transit-system enhancements.

**Proposed Development’s Compatibility with Livable Delaware:**

The proposed development is primarily located in the Investment Level 2 area. According to Livable Delaware, Level 2 focuses on new and expansion of facilities located in these areas. In addition, developing the portion of Investment Level 3 area will serve the Investment Level 2 area. Therefore, the proposed development is generally consistent with the 2015 update of the Livable Delaware “Strategies for State Policies and Spending.”

**Comprehensive Plans**

(Source: New Castle County 2012 Comprehensive Plan Update)

**New Castle County Comprehensive Plan:**

Per the *New Castle County Comprehensive Plan*, the existing and future land use of the subject property is Office/Commercial/Industrial (OCI) and Heavy Industrial.

**Proposed Development’s Compatibility with the New Castle County Comprehensive Plan:**

The proposed development will consist of industrial use. As such, the proposed use appears to be generally compatible with the *New Castle County Comprehensive Plan*.

**Trip Generation**

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 10<sup>th</sup> Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 130 (Industrial Park)

The peak period trip generation utilized in the TOA for the proposed development is included in Table 1.

**Table 1**  
New Castle Logistics Park Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
1,346 Employee Industrial Park (ITE Code 130)	3,787	467	76	543	105	419	524
<b>Net New Trips</b>		<b>467</b>	<b>76</b>	<b>543</b>	<b>105</b>	<b>419</b>	<b>524</b>

**Intersections examined:**

1. Site Entrance A/Delaware Route 72 (New Castle Road 46)
2. Site Entrance B/Delaware Route 7 (New Castle Road 5)
3. Site Entrance C/Delaware Route 7
4. Site Entrance D/School House Road (New Castle Road 406)
5. Site Entrance E/School House Road
6. US Route 13 (New Castle Road 34)/Delaware Route 7/Delaware Route 72
7. Northbound Delaware Route 1 Ramps/Delaware Route 72
  - a. Signalized intersection
  - b. Merge of westbound right and eastbound left
  - c. Merge onto northbound Delaware Route 1
8. Southbound Delaware Route 1 Ramps/Delaware Route 72
  - a. Signalized intersection
  - b. Merge of westbound left and eastbound right
  - c. Merge onto southbound Delaware Route 1
9. Delaware Route 72/School House Road
10. Delaware Route 7/Lower Twin Lane Road (New Castle Road 406)

**Conditions examined:**

1. Case 1 – Existing (2019)
2. Case 2 – 2020 without development
3. Case 3 – 2020 with development of Phase One (934,960 square feet)
4. Case 4 – 2024 with development of Phase One
5. Case 5 – 2024 with full development

**Peak hours evaluated:** Weekday morning and weekday evening

**Committed Developments considered:**

1. Fort DuPont Redevelopment (50 single-family detached houses, 105 townhouses, 100 condominiums, 161 low-rise apartments, 85-bed assisted living facility, 25-room hotel, 13,000 square foot museum, 141,000 square foot office space, 4,720 square foot government office building, 75,572 square foot retail, and 9,800 square foot quality restaurant).
2. Peoples Industrial Park (Phase One build of 180,000 square feet of industrial park and Total build out of 2,885,110 square feet of industrial park).
3. Highpointe at St. Georges (62 unbuilt single-family detached houses out of a total 175).

**Intersection Descriptions**

**1. Site Entrance A/Delaware Route 72\***

**Type of Control:** Proposed two-way stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Delaware Route 72) Existing one through lane

**Westbound Approach:** (Delaware Route 72) Existing one through lane, proposed one through lane and one right turn lane

**Southbound Approach:** (Site Entrance A) Proposed one right turn lane, stop controlled  
*\*Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.*

2. **Site Entrance B/Delaware Route 7**

**Type of Control:** Proposed two-way stop-controlled intersection (T-intersection)

**Westbound Approach:** (Site Entrance B) Proposed one left turn and one right turn lane, stop controlled

**Northbound Approach:** (Delaware Route 7) Existing two through lanes, proposed two through lanes and one right turn lane

**Southbound Approach:** (Delaware Route 7) Existing two through lanes, proposed one left turn lane and two through lanes

3. **Site Entrance C/Delaware Route 7**

**Type of Control:** Proposed two-way stop-controlled intersection (T-intersection)

**Westbound Approach:** (Site Entrance C) Proposed one right turn lane, stop controlled

**Northbound Approach:** (Delaware Route 7) Existing two through lanes, proposed two through lanes and one right turn lane

**Southbound Approach:** (Delaware Route 7) Existing two through lanes

4. **Site Entrance D/School House Road**

**Type of Control:** Proposed two-way stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Site Entrance D) Proposed one shared left turn/right turn lane, stop controlled

**Northbound Approach:** (School House Road) Existing one shared left turn/through lane

**Southbound Approach:** (School House Road) Existing one shared through/right turn lane

5. **Site Entrance E/School House Road**

**Type of Control:** Existing two-way stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Site Entrance E) Existing one shared left turn/right turn lane, stop controlled

**Northbound Approach:** (School House Road) Existing one shared left turn/through lane

**Southbound Approach:** (School House Road) Existing one shared through/right turn lane



6. **US Route 13/Delaware Route 7/Delaware Route 72\***

**Type of Control:** Existing signalized intersection (four-leg intersection)

**Eastbound Approach:** (Delaware Route 72) Existing one left turn lane, two through lanes, and one channelized right turn lane

**Westbound Approach:** (Delaware Route 72) Existing one left turn lane, two through lanes, and one channelized right turn lane

**Northbound Approach:** (US Route 13/Delaware Route 7) Existing two left turn lanes, two through lanes, and one channelized right turn lane

**Southbound Approach:** (US Route 13/Delaware Route 7) Existing one left turn lane, one through lane, and one channelized right turn lane

*\*Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.*

7. **Northbound Delaware Route 1 Ramps/Delaware Route 72\***

**Type of Control:** Existing signalized intersection (diverging diamond interchange)

**Eastbound Approach:** (Delaware Route 72) Existing one left turn lane and two through lanes

**Westbound Approach:** (Delaware Route 72) Existing two through lanes and one right turn lane

**Northbound Approach:** (Northbound Delaware Route 1 Exit Ramp) Existing two left turn lanes and one channelized right turn lane

*\*Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.*

8. **Southbound Delaware Route 1 Ramps/Delaware Route 72\***

**Type of Control:** Existing signalized intersection (diverging diamond interchange)

**Eastbound Approach:** (Delaware Route 72) Existing two through lanes and one right turn lane

**Westbound Approach:** (Delaware Route 72) Existing one left turn lane and two through lanes

**Southbound Approach:** (Southbound Delaware Route 1 Exit Ramp) Existing two left turn lanes and one channelized right turn lane

*\*Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.*

9. **Delaware Route 72\*/School House Road**

**Type of Control:** Existing two-way stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Delaware Route 72) Existing one shared left turn/through lane

**Westbound Approach:** (Delaware Route 72) Existing one shared through/right turn lane

**Southbound Approach:** (School House Road) Existing one shared left turn/right turn lane, stop controlled

*\*Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.*

#### 10. Delaware Route 7/Lower Twin Lane Road

**Type of Control:** Existing two-way stop-controlled intersection (four-leg intersection)

**Eastbound Approach:** (Lower Twin Lane Road) Existing one shared left turn/through/right turn lane, stop controlled

**Westbound Approach:** (Lower Twin Lane Road) Existing one shared left turn/through/right turn lane, stop controlled

**Northbound Approach:** (Delaware Route 7) Existing one shared left turn/through/right turn lane

**Southbound Approach:** (Delaware Route 7) Existing one shared left turn/through/right turn lane

#### Transit, Pedestrian, and Bicycle Facilities

**Existing transit service:** Delaware Transit Corporation (DTC) currently provides existing services via DART Routes 25, 44, 45, 47, 53, and 301 within the study area. Designated bus stops for these DART Routes do not exist at any of the study intersections.

**Planned transit service:** JMT contacted Mr. David Dooley, Planner at the DTC. Per email correspondence on March 22, 2019 from Mr. Dooley, DART has transit service along Delaware Route 72 and has proposed to expand the service along that roadway. As such, a new bus stop should be installed along Delaware Route 72 at the intersection with Site Entrance A. A 5 foot by 8 foot bus pad with a sidewalk connection to a pedestrian pathway is recommended to be installed. The developer should coordinate with DART to determine the exact location of the new bus stop.

**Existing bicycle and pedestrian facilities:** According to DelDOT's *New Castle County Bicycle Map*, regional and connector bicycle routes exist within the study area. The regional bicycle route exists along Delaware Route 72 and traverses through four of the study intersections (US Route 13/Delaware Route 7, Northbound Delaware Route 1 Ramps, Southbound Delaware Route 1 Ramps, and School House Road). The connector bicycle route exists along US Route 13/Delaware Route 7 and traverses through two of the study intersections (Delaware Route 72 and Lower Twin Lane Road). Pedestrian facilities exist at the Delaware Route 72 intersections with Northbound Delaware Route 1 Ramps and Southbound Delaware Route 1 Ramps.

**Planned bicycle and pedestrian facilities:** Per email correspondence on March 22, 2019 from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- A 10-foot wide shared use path with a minimum 5-foot buffer from edge of pavement should be provided along the Delaware Route 7 and Delaware Route 72 site frontages.

- The site shall dedicate right-of-way per the roadway classification and establish a 15-foot wide permanent easement along the Delaware Route 7, Delaware Route 72, and School House Road site frontages.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities.

**Bicycle Level of Service and Bicycle Compatibility Index:** According to the League of Illinois Bicyclists (LIB), Bicycle Level of Service (BLOS) is an emerging national standard for quantifying the bike-friendliness of a roadway by measuring on-road bicyclist comfort levels for specific roadway geometries and traffic conditions. Utilizing the 10-year projected AADT along the Delaware Route 7 site frontage with a 55 miles per hour speed limit and the provision of a 5-foot wide bike lane, the BLOS with the build out construction of the proposed development is summarized below. Utilizing the 10-year projected AADT along the Delaware Route 72 site frontage with a 50 miles per hour speed limit and the provision of a 5-foot wide bike lane, the BLOS with the build out construction of the proposed development is summarized below. The BLOS was determined utilizing the calculators published on the LIB website: <http://rideillinois.org/blos/blosform.htm>

- Delaware Route 7 – BLOS: A (below 1.50)
- Delaware Route 72 – BLOS: A (below 1.50)
- School House Road – BLOS: D (3.51-4.50)

### **Previous Comments**

None.

## **General Analysis Comments**

(See table footnotes on the following pages for specific comments)

1. For the analysis, HCS7 software (Version 7.8) and VISSIM software were used. Signalized and unsignalized intersection results were based on HCM 6<sup>th</sup> Edition methodology.
2. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement in the Cases 2, 3, 4 and 5 future scenario analyses, unless the existing heavy vehicle percentage was greater than 3% and there was no significant increase of vehicles along that movement, in which case the existing heavy vehicle percentage was used for analysis of future scenarios.
3. Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for Case 1 and a future PHF for Cases 2, 3, 4, and 5 of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher.
4. Cases 4 and 5 incorporate the improvements planned as part of the *SR 72, McCoy Road to SR 71* DelDOT improvement project (DelDOT Project No. T200601102).
5. To maintain a conservative analysis, JMT used a 60% heavy vehicle percentage for each movement entering and exiting the site at the proposed site entrances.
6. Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.

Table 2  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
Site Entrance A/Delaware Route 72 <sup>2,3,4</sup>		
2020 With Development of Phase One (Case 3)		
Southbound Site Entrance A Right	B (11.1)	C (22.5)
2024 With Development of Phase One (Case 4)		
Southbound Site Entrance A Right	B (12.0)	D (27.9)
2024 With Full Development (Case 5)		
Southbound Site Entrance A Right	B (12.2)	E (48.4)

<sup>1</sup> For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds

<sup>2</sup> The southbound Site Entrance A approach was configured as one right turn lane. The westbound Delaware Route 72 approach was configured as one through lane and one right turn lane.

<sup>3</sup> Although Delaware Route 72 is a north/south roadway, it has been designated east/west for the purposes of this TOA.

<sup>4</sup> To maintain a conservative analysis, JMT used a 60% heavy vehicle percentage for each movement entering and exiting the site at the proposed site entrances.

Table 2 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Roundabout <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Site Entrance A/Delaware Route 72</b> <sup>4</sup>		
2024 With Full Development (Case 5) with Mitigation <sup>5</sup>		
Eastbound Delaware Route 72 Approach	A (9.1)	A (6.4)
Westbound Delaware Route 72 Approach	A (6.1)	B (13.2)
Southbound Site Entrance Approach	A (7.3)	D (29.0)
Overall	A (7.9)	B (13.0)

Signalized Intersection <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Site Entrance A/Delaware Route 72</b> <sup>4</sup>		
2024 With Full Development (Case 5) with Signalization <sup>6</sup>	A (7.6)	D (39.4)

<sup>5</sup> Mitigation scenario includes modification of the entrance to be a one-lane roundabout.

<sup>6</sup> Signalization scenario includes modification of the entrance to be full access and signalized with a 60 second cycle length.

Table 3  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Site Entrance B/Delaware Route 7 <sup>4,7</sup></b>		
2020 With Development of Phase One (Case 3)		
Westbound Site Entrance B Approach	C (15.5)	C (15.5)
Southbound Delaware Route 7 Left Turn	B (11.0)	A (9.5)
2024 With Development of Phase One (Case 4)		
Westbound Site Entrance B Approach	C (17.0)	C (17.8)
Southbound Delaware Route 7 Left Turn	B (11.6)	B (10.1)
2024 With Full Development (Case 5)		
Westbound Site Entrance B Approach	C (21.9)	C (22.0)
Southbound Delaware Route 7 Left Turn	B (14.1)	B (10.3)

<sup>7</sup> The westbound Site Entrance B approach was configured as one left turn lane and one right turn lane. The northbound Delaware Route 7 approach was configured as two through lanes and one right turn lane. The southbound Delaware Route 7 approach was configured as one left turn lane and two through lanes.

Table 4  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
Site Entrance C/Delaware Route 72 <sup>4,8</sup>		
2020 With Development of Phase One (Case 3)		
Westbound Site Entrance C Right	B (13.5)	B (13.1)
2024 With Development of Phase One (Case 4)		
Westbound Site Entrance C Right	B (14.5)	B (15.0)
2024 With Full Development (Case 5)		
Westbound Site Entrance C Right	B (14.4)	C (15.8)

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<sup>8</sup> The westbound Site Entrance C approach was configured as one right turn lane. The northbound Delaware Route 7 approach was configured as one through lane and one right turn lane.



Table 5  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Site Entrance D/School House Road</b> <sup>4,9</sup>		
2020 With Development of Phase One (Case 3)		
Eastbound Site Entrance D Approach	A (8.8)	A (8.9)
Northbound School House Road Left Turn	A (7.8)	A (7.7)
2024 With Development of Phase One (Case 4)		
Eastbound Site Entrance D Approach	A (8.8)	A (8.9)
Northbound School House Road Left Turn	A (7.8)	A (7.7)
2024 With Full Development (Case 5)		
Eastbound Site Entrance D Approach	A (8.9)	A (8.9)
Northbound School House Road Left Turn	A (7.8)	A (7.8)

<sup>9</sup> The eastbound Site Entrance D approach was configured as one shared left turn/right turn lane. The northbound School House Road approach was configured as one shared left turn/through lane. The southbound School House Road approach was configured as one shared through/right turn lane.

Table 6  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Site Entrance E/School House Road <sup>4,10</sup></b>		
2020 With Development of Phase One (Case 3)		
Eastbound Site Entrance E Approach	A (8.9)	A (9.0)
Northbound School House Road Left Turn	A (7.8)	A (7.8)
2024 With Development of Phase One (Case 4)		
Eastbound Site Entrance E Approach	A (8.9)	A (9.0)
Northbound School House Road Left Turn	A (7.8)	A (7.8)
2024 With Full Development (Case 5)		
Eastbound Site Entrance E Approach	A (8.9)	A (9.1)
Northbound School House Road Left Turn	A (7.9)	A (7.8)

<sup>10</sup> The eastbound Site Entrance E approach was configured as one shared left turn/right turn lane. The northbound School House Road approach was configured as one shared left turn/through lane. The southbound School House Road approach was configured as one shared through/right turn lane.

Table 7  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Signalized Intersection <sup>1</sup>	LOS per VISSIM <sup>11</sup>	
	Weekday AM	Weekday PM
US Route 13/Delaware Route 7/Delaware Route 72 <sup>3</sup>		
2019 Existing (Case 1)	C (27.6)	D (38.0)
2020 Without Development (Case 2)	C (27.8)	C (32.1)
2020 With Development of Phase One (Case 3)	C (30.9)	D (35.2)
2024 With Development of Phase One (Case 4)	C (34.6)	D (39.2)
2024 With Full Development (Case 5)	D (35.9)	D (48.3)

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<sup>11</sup> LOS results reported from VISSIM analyses are based on HCM 6<sup>th</sup> edition methodology. Delay results reported from VISSIM analyses are the averaged delay results from five (5) 60-minute simulation runs using VISSIM 11 software.

Table 8  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Signalized Intersection <sup>1</sup>	LOS per VISSIM <sup>11</sup>	
	Weekday AM	Weekday PM
<b>Northbound Delaware Route 1 Ramps/Delaware Route 72 <sup>3</sup></b>		
2019 Existing (Case 1)	B (14.5)	C (22.4)
2020 Without Development (Case 2)	B (14.9)	C (22.7)
2020 With Development of Phase One (Case 3)	B (14.5)	C (22.3)
2024 With Development of Phase One (Case 4)	C (24.3)	B (18.8)
2024 With Full Development (Case 5)	C (24.5)	B (19.2)

Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

<b>Merge of westbound right and eastbound left</b>	<b>LOS per VISSIM<sup>12,13</sup></b>	
	Weekday AM	Weekday PM
<b>Northbound Delaware Route 1 Ramps/Delaware Route 72<sup>3</sup></b>		
2019 Existing (Case 1)	B (11.0)	A (8.1)
2020 Without Development (Case 2)	B (11.1)	A (8.6)
2020 With Development of Phase One (Case 3)	B (11.4)	A (9.2)
2024 With Development of Phase One (Case 4)	B (15.2)	B (14.1)
2024 With Full Development (Case 5)	B (15.6)	B (14.5)

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<sup>12</sup> For the weave analyses, the numbers in parentheses following levels of service are average density, measured in vehicle per mile per lane.

<sup>13</sup> LOS results reported from VISSIM analyses are based on HCM 6<sup>th</sup> edition methodology. Density results reported from VISSIM analyses are the averaged density results from five (5) 60-minute simulation runs using VISSIM 11 software.

Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

<b>Merge onto northbound Delaware Route 1</b>	<b>LOS per VISSIM <sup>12,13</sup></b>	
<b>Northbound Delaware Route 1 Ramps/Delaware Route 72 <sup>3</sup></b>	Weekday AM	Weekday PM
2019 Existing (Case 1)	C (22.6)	B (13.6)
2020 Without Development (Case 2)	C (23.1)	B (13.9)
2020 With Development of Phase One (Case 3)	C (23.9)	B (14.2)
2024 With Development of Phase One (Case 4)	C (27.2)	B (17.0)
2024 With Full Development (Case 5)	C (26.9)	B (17.2)

Table 9  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Signalized Intersection <sup>1</sup>	LOS per VISSIM <sup>11</sup>	
	Weekday AM	Weekday PM
<b>Southbound Delaware Route 1 Ramps/Delaware Route 72 <sup>3</sup></b>		
2019 Existing (Case 1)	C (21.6)	C (21.9)
2020 Without Development (Case 2)	C (21.4)	C (25.3)
2020 With Development of Phase One (Case 3)	C (20.3)	C (29.8)
2024 With Development of Phase One (Case 4)	C (24.6)	C (25.6)
2024 With Full Development (Case 5)	C (24.9)	C (25.9)

Merge of westbound left and eastbound right	LOS per VISSIM <sup>12,13</sup>	
	Weekday AM	Weekday PM
<b>Southbound Delaware Route 1 Ramps/Delaware Route 72 <sup>3</sup></b>		
2019 Existing (Case 1)	A (5.3)	A (6.7)
2020 Without Development (Case 2)	A (5.3)	A (7.1)
2020 With Development of Phase One (Case 3)	A (5.3)	A (7.2)
2024 With Development of Phase One (Case 4)	A (6.2)	B (10.9)
2024 With Full Development (Case 5)	A (6.4)	B (11.3)

Table 9 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

<b>Merge onto southbound Delaware Route 1</b>	<b>LOS per VISSIM <sup>12,13</sup></b>	
	<b>Southbound Delaware Route 1 Ramps/Delaware Route 72 <sup>3</sup></b>	<b>Weekday AM</b>
2019 Existing (Case 1)	B (10.6)	B (18.8)
2020 Without Development (Case 2)	B (10.7)	B (19.2)
2020 With Development of Phase One (Case 3)	B (10.7)	B (19.2)
2024 With Development of Phase One (Case 4)	B (11.3)	C (22.6)
2024 With Full Development (Case 5)	B (11.4)	C (22.6)



Table 10  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road</b> <sub>14,15</sub>		
2019 Existing (Case 1)		
Eastbound Delaware Route 72 Left Turn	A (7.8)	A (8.8)
Southbound School House Road Approach	B (11.1)	F (77.4)
2020 Without Development (Case 2)		
Eastbound Delaware Route 72 Left Turn	A (7.9)	A (8.9)
Southbound School House Road Approach	B (11.5)	F (87.7)
2020 Without Development (Case 2) <i>with School House Road auxiliary lanes</i> <sup>16</sup>		
Eastbound Delaware Route 72 Left Turn	A (7.9)	A (8.9)
Southbound School House Road Approach	B (11.1)	E (36.5)

<sup>14</sup> To maintain a conservative analysis, the heavy vehicle percentage of vehicles entering/exiting School House Road took into account the 60% heavy vehicle percentage of the site traffic for Cases 3, 4, and 5.

<sup>15</sup> Due to the low existing peak hour factor during the PM peak hour, the peak hour factor for the PM peak hour future Cases 2, 3, 4, and 5 was increased proportionally to the volume increases to maintain a conservative analysis.

<sup>16</sup> The eastbound Delaware Route 72 approach was configured as one shared left turn/through lane. The westbound Delaware Route 72 approach was configured as one shared through/right turn lane. The southbound School House Road approach was configured as one left turn lane and one right turn lane.

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road <sup>14,15</sup></b>		
2020 Without Development (Case 2) <i>with auxiliary lanes</i> <sup>17</sup>		
Eastbound Delaware Route 72 Left Turn	A (7.9)	A (8.9)
Southbound School House Road Approach	B (11.0)	E (35.9)
2020 With Development of Phase One (Case 3)		
Eastbound Delaware Route 72 Left Turn	A (8.3)	A (9.2)
Southbound School House Road Approach	B (12.6)	F (156.1)
2020 With Development of Phase One (Case 3) <i>with School House Road auxiliary lanes</i> <sup>16</sup>		
Eastbound Delaware Route 72 Left Turn	A (8.3)	A (9.2)
Southbound School House Road Approach	B (12.0)	F (51.8)
2020 With Development of Phase One (Case 3) <i>with auxiliary lanes</i> <sup>17</sup>		
Eastbound Delaware Route 72 Left Turn	A (8.3)	A (9.2)
Southbound School House Road Approach	B (11.8)	F (50.7)

<sup>17</sup> The eastbound Delaware Route 72 approach was configured as one left turn lane and one through lane. The westbound Delaware Route 72 approach was configured as one through lane and one right turn lane. The southbound School House Road approach was configured as one left turn lane and one right turn lane.

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road <sup>14,15</sup></b>		
2024 With Development of Phase One (Case 4)		
Eastbound Delaware Route 72 Left Turn	A (8.6)	A (9.6)
Southbound School House Road Approach	B (14.6)	F (238.3)
2024 With Development of Phase One (Case 4) <i>with School House Road auxiliary lanes <sup>16</sup></i>		
Eastbound Delaware Route 72 Left Turn	A (8.6)	A (9.6)
Southbound School House Road Approach	B (13.8)	F (68.6)
2024 With Development of Phase One (Case 4) <i>with auxiliary lanes <sup>17</sup></i>		
Eastbound Delaware Route 72 Left Turn	A (8.6)	A (9.6)
Southbound School House Road Approach	B (13.4)	F (67.0)
2024 With Full Development (Case 5)		
Eastbound Delaware Route 72 Left Turn	A (8.9)	A (9.8)
Southbound School House Road Approach	C (15.8)	F (306.7)
2024 With Full Development (Case 5) <i>with School House Road auxiliary lanes <sup>16</sup></i>		
Eastbound Delaware Route 72 Left Turn	A (8.9)	A (9.8)
Southbound School House Road Approach	B (14.7)	F (87.7)

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road <sup>14,15</sup></b>		
2024 With Full Development (Case 5) <i>with auxiliary lanes</i> <sup>17</sup>		
Eastbound Delaware Route 72 Left Turn	A (8.9)	A (9.8)
Southbound School House Road Approach	B (14.1)	F (85.0)

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Single Lane Roundabout <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road <sup>14,15</sup></b>		
2020 Without Development (Case 2) <sup>18</sup>		
Overall Intersection	A (6.5)	A (10.4)
2020 Without Development (Case 2) <i>with Southbound Bypass Lane</i> <sup>19</sup>		
Overall Intersection	A (6.5)	A (9.2)
2020 With Development of Phase One (Case 3) <sup>18</sup>		
Overall Intersection	A (7.1)	B (12.8)
2020 With Development of Phase One (Case 3) <i>with Southbound Bypass Lane</i> <sup>19</sup>		
Overall Intersection	A (7.1)	B (10.5)
2024 With Development of Phase One (Case 4) <sup>18</sup>		
Overall Intersection	A (8.5)	B (14.0)
2024 With Development of Phase One (Case 4) <i>with Southbound Bypass Lane</i> <sup>19</sup>		
Overall Intersection	A (8.5)	B (11.7)

<sup>18</sup> The intersection was modeled as a single lane roundabout.

<sup>19</sup> The intersection was modeled as a single lane roundabout with a right turn bypass lane along the southbound School House Road approach.

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Single Lane Roundabout <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road <sup>14,15</sup></b>		
2024 With Full Development (Case 5) <sup>18</sup>		
Overall Intersection	A (9.2)	C (16.6)
2024 With Full Development (Case 5) <i>with Southbound Bypass Lane</i> <sup>19</sup>		
Overall Intersection	A (9.2)	B (13.0)

Single Lane Roundabout <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road <sup>14,15</sup></b>		
2024 With Full Development (Case 5) <i>with Southbound Bypass Lane</i> <sup>19</sup>		
Multi-period Peak 15-minute Overall Intersection <sup>20</sup>	A (9.6)	D (33.6)
Multi-period Average 15-minute Overall Intersection <sup>20</sup>	A (8.6)	B (13.7)

<sup>20</sup> A multi-period analysis was performed to evaluate the performance of a single lane roundabout with a southbound bypass lane during Case 5. The analysis was performed for a 15-minute interval because of long queues observed in the field during the PM peak hour.

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

Signalized Intersection <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road</b> <sup>14,15,21,22</sup>		
2020 Without Development (Case 2)	A (6.8)	C (23.2)
2020 With Development of Phase One (Case 3)	A (7.1)	C (30.0)
2024 With Development of Phase One (Case 4)	A (7.9)	C (30.6)
2024 With Full Development (Case 5)	A (8.0)	D (35.1)

Signalized Intersection <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 72 <sup>3</sup>/School House Road</b> <sup>14,15,20,21</sup>		
2024 With Full Development (Case 5) <i>with Southbound Bypass Lane</i> <sup>18</sup>		
Multi-period Peak 15-minute Overall Intersection <sup>23</sup>	B (10.6)	F (100.4)
Multi-period Average 15-minute Overall Intersection <sup>23</sup>	A (7.9)	C (34.2)

<sup>21</sup> The intersection was modeled as signalized with a 60 second cycle length.

<sup>22</sup> The eastbound Delaware Route 72 approach was configured as one left turn lane and one through lane. The westbound Delaware Route 72 approach was configured as one through lane and one right turn lane. The southbound School House Road approach was configured as one left turn lane and one right turn lane.

<sup>23</sup> A multi-period analysis was performed to evaluate the performance of a signalized intersection during Case 5. The analysis was performed for a 15-minute interval because of long queues observed in the field during the PM peak hour.

Table 11  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
Prepared by JMT

<b>Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup></b>	<b>LOS per HCS</b>	
	<b>Weekday AM</b>	<b>Weekday PM</b>
<b>Delaware Route 7/Lower Twin Lane Road</b>		
2019 Existing (Case 1)		
Eastbound Lower Twin Lane Road Approach	B (10.2)	B (12.9)
Westbound Lower Twin Lane Road Approach	B (11.4)	B (11.9)
Northbound Delaware Route 7 Left Turn	A (7.6)	A (8.6)
Southbound Delaware Route 7 Left Turn	A (8.0)	A (8.0)
2020 Without Development (Case 2)		
Eastbound Lower Twin Lane Road Approach	B (10.2)	B (13.3)
Westbound Lower Twin Lane Road Approach	B (11.6)	B (12.2)
Northbound Delaware Route 7 Left Turn	A (7.7)	A (8.7)
Southbound Delaware Route 7 Left Turn	A (8.1)	A (8.0)
2020 With Development of Phase One (Case 3)		
Eastbound Lower Twin Lane Road Approach	B (10.8)	B (14.6)
Westbound Lower Twin Lane Road Approach	B (12.0)	B (13.3)
Northbound Delaware Route 7 Left Turn	A (7.9)	A (8.8)
Southbound Delaware Route 7 Left Turn	A (8.2)	A (8.2)



Table 11 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for New Castle Logistics Park  
Report Dated: June 2019  
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Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per HCS	
	Weekday AM	Weekday PM
<b>Delaware Route 7/Lower Twin Lane Road</b>		
2024 With Development of Phase One (Case 4)		
Eastbound Lower Twin Lane Road Approach	B (11.8)	C (17.3)
Westbound Lower Twin Lane Road Approach	B (13.2)	C (15.9)
Northbound Delaware Route 7 Left Turn	A (8.2)	A (9.0)
Southbound Delaware Route 7 Left Turn	A (8.4)	A (8.6)
2024 With Full Development (Case 5)		
Eastbound Lower Twin Lane Road Approach	B (12.5)	C (18.4)
Westbound Lower Twin Lane Road Approach	B (13.7)	C (16.9)
Northbound Delaware Route 7 Left Turn	A (8.3)	A (9.1)
Southbound Delaware Route 7 Left Turn	A (8.4)	A (8.8)