



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

NICOLE MAJESKI
SECRETARY

March 16, 2022

Mr. Michael Kaszyski, Jr.
Verdantas
5400 Limestone Road
Wilmington, DE 19808

Dear Mr. Kaszyski:

The enclosed Traffic Operational Analysis (TOA) review letter for the proposed **650 Churchmans Road (f.k.a. 100 Piccard Road)** (Tax Parcel: 10-024.00-025) 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 have found the TOA to conform to 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) 760-2124.

Sincerely,

Claudy Joinville
Project Engineer

CJ:km
Enclosures
cc with enclosures:

Mr. Michael Hagan, Churchmans 273, LLC
Mr. Scott Parker, Verdantas
Mr. Brian Clarke, Verdantas
Mr. David L. Edgell, Office of State Planning Coordination
Mr. Bradford Shockley, New Castle County Department of Land Use
Mr. Owen C. Robatino, New Castle County Department of Land Use
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Deputy Secretary, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Matthew Vincent, Chief of Project Development North, DOTS
Todd Sammons, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Jared Kauffmann, Service Development Planner, Delaware Transit Corporation
Anthony Aaglio, Planning Supervisor, Statewide & Regional Planning
Wendy Polasko, Subdivision Engineer, Development Coordination
Sireen Muhtaseb, New Castle Review Coordinator, Development Coordination
Jun Xie, Subdivision Manager, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Annamaria Fumato, Project Engineer, Development Coordination



March 16, 2022

Mr. Claudy Joinville
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202069012
Traffic Impact Study Services
Task 2A/5-2A - 650 Churchmans Road (f.k.a. 100 Piccard Road)

Dear Mr. Joinville:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Operational Analysis (TOA) for 650 Churchmans Road (f.k.a. 100 Piccard Road), prepared by Duffield Associates, Inc. originally dated October 2019 and updated in October 2021. This task was originally assigned as Task Number 2A and the review of the October 2021 revision was assigned as Task 5-2A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The original TOA dated October 2019 evaluated the impacts of a proposed 1,168,211 square-foot warehouse fulfillment distribution for this site. Based on the Record Major Land Development Plan prepared by Duffield Associates Inc., last revised May 6, 2020, the original site proposed four access points: two along Delaware Route 273, one along Churchmans Road, and one along Old Churchmans Road. The land use and site entrances previously proposed have been updated based on an update letter provided by Duffield Associates, Inc. dated October 2021.

The updated TOA evaluates the impacts of a proposed 890,348 square-foot warehouse fulfillment distribution center in New Castle County, Delaware. The site is located on the northeast corner of the intersection of Churchmans Road (Delaware Route 58) and Delaware Route 273, south of Old Churchmans Road (New Castle Road 342). Based on the Exploratory Resubdivision Plan prepared by Duffield Associates Inc., dated September 24, 2021, four access points are proposed: two along Delaware Route 273, one along Piccard Road, and one along Old Churchmans Road. Access from Churchmans Road onto Old Churchmans Road would be provided via the proposed Piccard Road. Although four access points are proposed, only the intersections of Churchmans Road with Piccard Road and Delaware Route 273 were evaluated in this TOA. The developer should coordinate with DelDOT regarding improvements required at the proposed site entrances along Delaware Route 273, Old Churchmans Road, and Piccard Road.

It should be noted that with the updated TOA only proposing a minor reduction in land use, the updated TOA did not provide any additional analysis files. As such, the comparison of analysis at



the end of this letter compares the TOA analysis previously provided assuming a 1,168,211 square-foot warehouse to the updated analysis assuming a 890,348 square-foot warehouse.

The proposed Piccard Road will be constructed along the northwest side of the parcel and connect Old Churchmans Road and Churchmans Road. The subject property is on an approximately 58.9-acre parcel. Per the May 2, 2019 DelDOT Scoping Meeting Memorandum, the property is zoned as I (Industrial) and the developer does not plan to rezone the land. It should be noted that the New Castle County Zoning Map designates the property as CR (Commercial Regional). Per the Scoping Meeting Memorandum, construction was anticipated to be complete in 2020. Presently, construction is expected to be complete in 2023 and the 2020 analyses are considered sufficient for the present review effort.

The TOA evaluates two future build scenarios with (Case 3a) and without (Case 3b) the recorded improvements. The recorded improvements include the modification of the southbound Churchmans Road approach to Delaware Route 273 to provide two left turn lanes, one through lane, and one right turn lane. The storage for the southbound left turn lanes would be a minimum of 1,000 feet. With the extension of the southbound left turn lanes, the HSBC Main Entrance would be reconfigured to provide only rights-in/rights-out movements.

DelDOT currently has one relevant and ongoing pavement rehabilitation project in the study area along Delaware Route 273 from US Route 13 to Delaware Route 1 (DelDOT Contract No. T201606120). A construction start date has not been established at this time.

DelDOT is also in the process of identifying constraints and developing concepts to improve the US Route 13 at Delaware Route 273 intersection (Hares Corner). As part of the 2018 Hazard Elimination Program Task I Presentation for Site S1, the US Route 13 at Delaware Route 273 intersection was recommended to be nominated as a DelDOT Project. At this time, a DelDOT contract number has not been assigned for this project.

Based on our review of the TOA, we have the following comments and recommendations:

Per the New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC), no study intersections exhibit level of service (LOS) deficiencies without 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 intersection exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements.

<i>Intersection</i>	<i>Situations for which LOS deficiencies occur</i>
Churchmans Road (Delaware Route 58)/Piccard Road	2020 AM and PM with development with Recorded Improvements (Case 3a) 2020 PM with development without Recorded Improvements (Case 3b)



The Churchmans Road unsignalized intersection with Piccard Road exhibits LOS deficiencies during the AM and PM weekday peak hours under future conditions with the proposed development and recorded improvements at the Churchmans Road and Delaware Route 273 intersection. Without the recorded improvements, the Churchmans Road intersection with Piccard Road exhibits LOS deficiencies only during the PM weekday peak hour under future conditions with the proposed development. These deficiencies could be mitigated through the installation of a roundabout or a traffic signal.

It should be noted that with the proposed Piccard Road connection between Churchmans Road and Old Churchmans Road, additional traffic volume from the airport land uses located behind the proposed site may utilize the Churchmans Road/Piccard Road intersection. Additionally, *NCHRP Report 457: Evaluating Intersection Improvements: An Engineering Study Guide* states that heavy vehicles on a minor-road approach at an unsignalized intersection would increase overall delay and therefore an intersection with a significant number of heavy vehicles would benefit from signalization. As such to mitigate the LOS deficiencies and in coordination with DelDOT, it is recommended that the developer enter into a traffic signal agreement for the intersection of Churchmans Road and Piccard Road. The agreement should include constructing the proposed Piccard Road as the westbound approach and converting the intersection to be signalized.

Although the Churchmans Road signalized intersection with Delaware Route 273 operates at acceptable LOS under existing and future conditions, extensive queue lengths exist along the southbound Churchmans Road left turn lane. Specifically, under Cases 1, 2, and 3b conditions during the PM peak period, 95th percentile queue lengths of approximately 365 feet would exist along the southbound Churchmans Road left turn and through lanes. These queue lengths would not be accommodated within the existing storage lengths and would block visibility for vehicles turning left at the eastbound HSBC (Sallie Mae) Main Entrance located approximately 325 feet north of the northwest point of tangency of the intersection with Delaware Route 273. Therefore, it is recommended that the developer lengthen the southbound Churchmans Road left turn lane storage to 365 feet and configure the eastbound HSBC (Sallie Mae) Main Entrance to be rights-in/rights-out.

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.

1. The developer should provide a bituminous concrete overlay to the existing travel lanes along the northbound Churchmans Road 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 enter into a traffic signal agreement with DelDOT for the Churchmans Road/Delaware Route 273 intersection. The signal agreement should include



pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT’s discretion. For informational purposes, the intersection should be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Delaware Route 273	One left turn lane, two through lanes, and one right turn lane	No change
Westbound Delaware Route 273	One left turn lane, two through lanes, and one right turn lane	No change
Northbound Churchmans Road	One shared left turn/through lane and one right turn lane	No change
Southbound Churchmans Road	One left turn lane, one shared left turn/through lane, and one right turn lane	No change

- The developer should lengthen the southbound left turn lane storage at the Churchmans Road/Delaware Route 273 intersection to a minimum of 320 feet to accommodate the projected queue lengths. The developer should submit a plan to DelDOT’s Development Coordination Section depicting the design. The final design should be determined during the Entrance Plan review process.
- The developer should reconfigure the HSBC (Sallie Mae) Main Entrance to be a rights-in/rights-out entrance. A channelizing island to restrict left turning movements should be provided at the HSBC Main Entrance. The intersection reconfiguration should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound HSBC Main Entrance	One shared left turn/right turn lane	One right turn lane
Northbound Churchmans Road	One left turn lane and one through lane	One through lane
Southbound Churchmans Road	One through lane and one right turn lane	No change

Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage length is 290 feet (excluding taper) for the southbound Churchmans Road right turn lane. The existing southbound Churchmans Road right turn lane is approximately 125 feet long (excluding taper) and the developer should improve the intersection to match the recommended storage length. The final design of the site entrance should be determined during the Entrance Plan review process.



- The developer should construct the proposed Piccard Road to intersect Churchmans Road across from the existing HSBC (Sallie Mae) Rear Entrance and enter into a traffic signal agreement with DelDOT for the installation of a traffic signal. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound HSBC Rear Entrance	One shared left turn/right turn lane	One shared left turn/through lane and one right turn lane
Westbound Piccard Road	Approach does not exist	One shared left turn/through lane and one right turn lane
Northbound Churchmans Road	One shared left turn/through lane and one by-pass lane	One left turn lane, one through lane, and one right turn lane
Southbound Churchmans Road	One through lane and one right turn lane	One left turn lane, one through lane, and one right turn lane

Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage lengths (excluding taper) of the separate left turn and right turn lanes along Churchmans Road are listed below.

Approach	Left Turn Lane	Right Turn Lane
Northbound Churchmans Road	100 feet	290 feet
Southbound Churchmans Road	100 feet	240 feet

The existing southbound Churchmans Road right turn lane is approximately 100 feet long (excluding taper) and the developer should improve the intersection to match the recommended storage lengths. However, the right turn lane should be designated as a continuous right turn lane, as the driveway for Nucar Auto Collision is located approximately 170 feet north of the HSBC Rear Entrance. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage lengths. The traffic signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT’s discretion. A Signal Justification Study should be performed and the scope of the study will be identified at a later date at DelDOT’s discretion.

- The developer should extend the channelizing left turn island along the southbound US Route 13 approach to Delaware Route 273 to prohibit vehicles from Old Churchmans Road access to the southbound US Route 13 left turn lanes. The developer should submit a plan



to DelDOT's Development Coordination Section depicting the design. The final design should be determined during the Entrance Plan review process.

7. The following bicycle, pedestrian, and transit improvements should be included:
 - a. A minimum fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Churchmans Road and Delaware Route 273 site frontages. Within the easement, the developer should construct a ten-foot wide shared-use path that meets current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the shared-use path. If feasible, the path 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 shared-use paths.
 - b. ADA compliant curb ramps and marked crosswalks should be provided along the Site Entrance approach to Delaware Route 273. The use of diagonal curb ramps is discouraged.
 - c. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the northbound Churchmans Road approach to Piccard Road and the westbound Delaware Route 273 approaches to the Site Entrances.
 - d. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/shared-use paths or should be flush with the pavement.
 - e. 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.
 - f. Where internal sidewalks are located alongside of the parking spaces, a buffer, physical barrier, or signage should be added to eliminate vehicular overhang onto the sidewalk.
 - g. The developer should coordinate with DART on the feasibility of providing a bus stop with an ADA compliant 5 feet by 8 feet concrete pad along the Delaware Route 273 site frontage adjacent to the proposed entrance. If a bus stop is provided, the developer should provide a connection to the bus stop from the required ten-foot wide shared-use path along Delaware Route 273. If DART requires a bus pad with shelter, the pad would need to be extended to include two 1-Loop Bike Racks (see DelDOT Detail M-



- 4). The developer should coordinate with DART during the plan review process to determine the bus stop location and design.

8. Due to the proximity of the proposed development to the New Castle Airport, we recommend that deed restrictions be required similar to the attached Avigation Nuisance Easement and Non-Suit Covenant. The applicant should contact Mr. Sam Sherman at (302) 739-2251 at DeIDOT's Statewide and Regional Planning Section to determine whether the proposed development is within the Runway Protection Zone. If so, restrictions may apply.

9. Only the intersections along Churchmans Road were evaluated in this TOA. As such, the developer should coordinate with DeIDOT regarding improvements required at the proposed site entrances along Delaware Route 273, Old Churchmans Road, and Piccard Road.

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

Improvements in this TOA may be considered "significant" under DeIDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DeIDOT's website at 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. Jeff VanHorn, Assistant Director for Traffic Operations and Management. Mr. VanHorn can be reached at (302) 659-4606 or by email at Jeffrey.VanHorn@delaware.gov.

Additional details on our review of 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 over a light blue horizontal line.

Joanne M. Arellano, P.E., PTOE

cc: Mir Wahed, P.E., PTOE
Nate Rahaim, P.E.

Enclosure

General Information

Report date: October 2019; Update Letter: October 6, 2021

Prepared by: Duffield Associates, Inc.

Prepared for: Churchman's 273 LLC

Tax Parcel: 10-024.00-025

Generally consistent with DelDOT's *Development Coordination Manual (DCM)*: Yes

Project Description and Background

Description: The developer seeks to develop a 890,348 square-foot general warehousing facility.

Location: The subject site is located on the northeast corner of the intersection of Churchmans Road (Delaware Route 58) and Delaware Route 273, south of Old Churchmans Road (New Castle Road 342).

Amount of Land to be developed: An approximately 58.9-acre parcel.

Land Use approval(s) needed: Entrance Plan.

Proposed completion date: 2023.

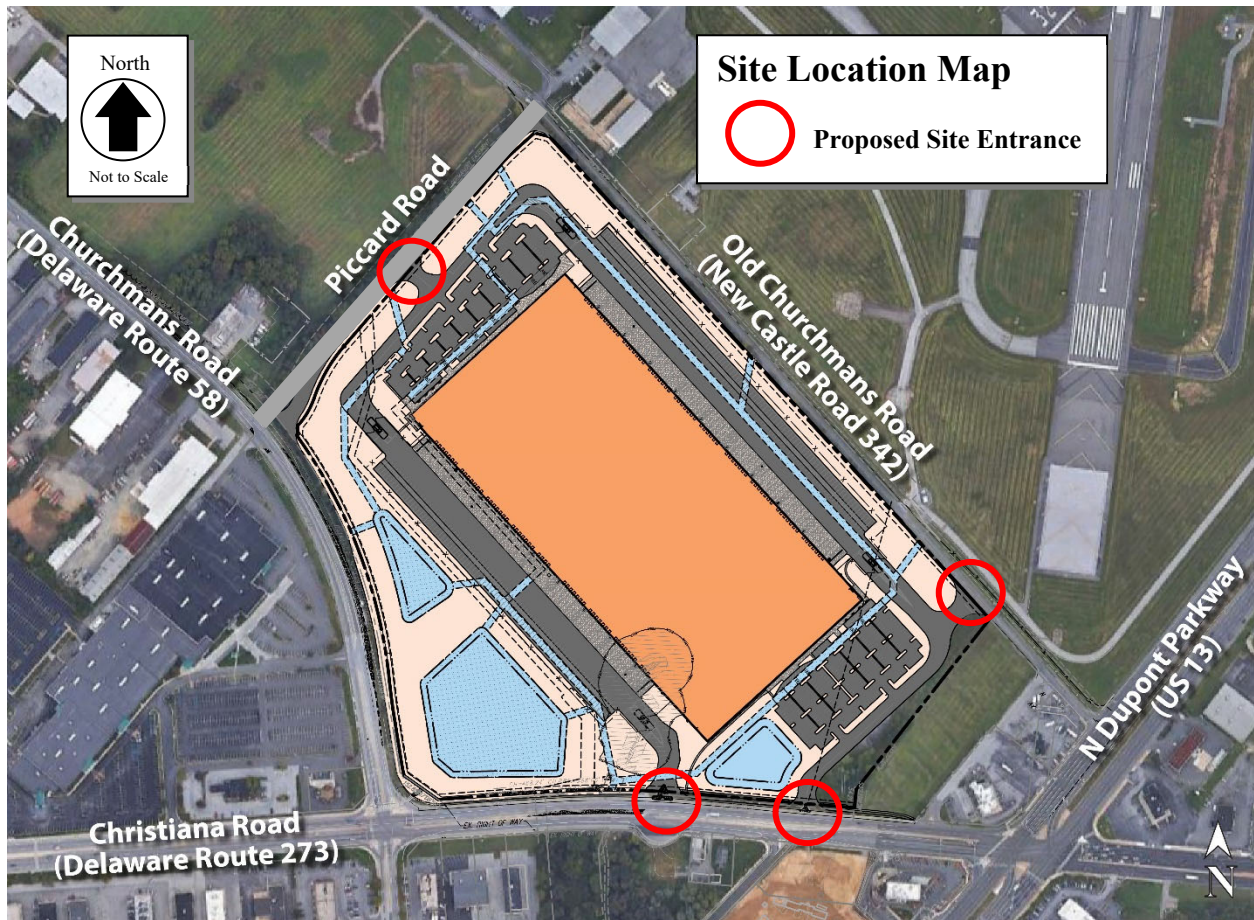
Proposed access location: Four access points are proposed: two full access entrances (one each on Old Churchmans Road and Piccard Road) and two right-in/right-out entrances (both on SR 273 with one serving employees and one serving trucks only).

Daily Traffic Volumes:

- 2018 Average Annual Daily Traffic on Delaware Route 273: 31,225 vehicles per day.*
- 2019 Average Annual Daily Traffic on Churchmans Road (Delaware Route 58): 10,139 vehicles per day.
- 2019 Average Annual Daily Traffic on Old Churchmans Road (New Castle Road 342): 517 vehicles per day.

*Daily traffic volumes for Delaware Route 273 attained from the 2018 DelDOT Vehicle Volume Summary.

Site Map



**Graphic is an approximation based on the Exploratory Resubdivision Plan prepared by Duffield Associates Inc., dated September 24, 2021*

Relevant and On-going Projects

DelDOT currently has one relevant and ongoing pavement rehabilitation project in the study area along Delaware Route 273 from US Route 13 to Delaware Route 1 (DelDOT Contract No. T201606120). A construction start date has not been established at this time.

DelDOT is also in the process of identifying constraints and developing concepts to improve the US Route 13 at Delaware Route 273 intersection (Hares Corner). As part of the 2018 Hazard Elimination Program Task I Presentation for Site S1, the US Route 13 at Delaware Route 273 intersection was recommended to be nominated as a DelDOT Project. At this time, a DelDOT contract number has not been assigned for this project.

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 1 area.

Investment Level 1

These areas are often municipalities, towns, or urban/urbanizing places in counties where density is generally higher than in surrounding areas. In 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. Overall, it is the state's intent to use its spending and management tools to maintain and enhance community character, to promote well-designed and efficient new growth, and to facilitate redevelopment in Investment Level 1 Areas.

In Level 1 Areas the state's first priority will be for preserving existing facilities and making safety improvements. Level 1 areas will also be the highest priority for context sensitive transportation system capacity enhancements, transit-system enhancements, ADA accessibility, and for closing gaps in the pedestrian system, including the Safe Routes to School projects. Further, Level 1 areas are the first priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity between neighborhoods and public facilities.

Proposed Development's Compatibility with Livable Delaware:

The proposed development is located in the Investment Level 1 area. According to Livable Delaware, Level 1 areas support and encourage a wide range of uses and enhance community identity and integrity. The proposed development is a warehouse fulfillment distribution center which will help to diversify the area. Additionally, new facilities are promoted to be located in Level 1 areas. 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 Zoning Map*, the subject property is zoned as CR (Commercial Regional) and the developer does not plan to rezone the land. Per the *New Castle County Comprehensive Plan Future Land Use Map*, the proposed development is in an area designated for Office/Commercial/Industrial Development (OCI).

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

Per the *New Castle County Comprehensive Plan Future Land Use Map*, the proposed development is in an area designated for Office/Commercial/Industrial Development. The proposed development is a warehouse fulfillment distribution center. Therefore, the proposed development is generally consistent with the *New Castle County Comprehensive Plan*.

Trip Generation

The trip generation provided by the TOA separates employee and truck traffic information. To develop the truck trips, the TOA used site specific data from nearby surrounding sites. The TOA used trip generation rates/equations contained in the *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 150 (warehousing) to develop the employee trips. However, as these rates/equations provided by ITE are the estimated total number of vehicles accessing the site, the TOA essential double counted the truck traffic. As such, Table 1a displays the updated trip generation values identified by JMT. It should be noted, the updated TOA did not provide additional Saturday trip generation values so JMT calculated the truck traffic using similar percentages of total site traffic previously provided by the TOA.

Table 1a
650 Churchmans Road (f.k.a. 100 Piccard Road) Trip Generation- LUC 150

Land Use	ADT	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
890,348 SF Warehouse Employee Traffic	1,274	94	28	122	27	59	86	19	11	30
890,348 SF Warehouse Truck Traffic	275	22	7	29	19	64	83	9	6	15
Total	1,549	116	35	151	46	123	169	28	17	45

A comparison of the total trips between the October 2019 TOA and the October 2021 revision was conducted. As depicted in Table 1b, the updated trip generation values is expected to generate significantly less traffic when compared to the facility specific trip generation provided by the developer’s engineer as part of the October 2019 TOA.

Table 1b
650 Churchmans Road (f.k.a. 100 Piccard Road) Trip Generation Comparison

Land Use	ADT	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
October 2021 Update - 890,348 SF Warehouse	1,549	116	35	151	46	123	169	28	17	45
October 2019 TOA - 1,168,211 SF Warehouse (Facility Specific Trip Generation)	3,462	135	37	172	332	176	507	252	246	498
Total	-1,913	-19	-2	-21	-286	-53	-338	-224	-229	-453

Overview of TOA

Intersections examined:

1. Churchmans Road/Piccard Road
2. Churchmans Road/Delaware Route 273

Conditions examined:

1. Case 1 – Existing (2019)
2. Case 2 – 2020 without development
3. Case 3a – 2020 with development and recorded improvements
4. Case 3b – 2020 with development without recorded improvements

Committed Developments considered:

1. Dutch Inn (a.k.a. 11 S. DuPont Highway) (4,969 square-foot Chick-fil-A with drive-through window, a 2,500 square-foot Starbucks, and a 12,000 square-foot specialty retail center)
2. Parkway Industrial Park (21,600 square feet of warehouse space)
3. Entrepreneurs Park (125,000 square feet of light industrial space)

Note: The Hertrich of New Castle site was listed as a Committed Development in the May 2, 2019 DelDOT Scoping Meeting Memorandum as an expansion is proposed on that site. However, it was omitted as a committed development in the TOA as construction of the proposed expansion has already been completed.

Peak hours evaluated: Weekday morning, Weekday evening, and Saturday midday peak hours.

Intersection Descriptions

1. Churchmans Road/Piccard Road

Type of Control: Existing unsignalized intersection (T-intersection); proposed signalized intersection (four-legged intersection)

Eastbound Approach: (HSBC Rear Entrance) Existing one shared left turn/through/right turn lane, stop controlled; proposed one shared left turn/through lane and one right turn lane

Westbound Approach: (Piccard Road) Proposed two left turn lanes and one shared through/right turn lane

Northbound Approach: (Churchmans Road) Existing one shared left turn/through lane and one by-pass lane; proposed one left turn lane, one through lane, and one right turn lane

Southbound Approach: (Churchmans Road) Existing one through lane and one right turn lane; proposed one left turn lane, one through lane, and one right turn lane

2. Churchmans Road/Delaware Route 273

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (Delaware Route 273) Existing one left turn lane, two through lanes, and one channelized right turn lane

Westbound Approach: (Delaware Route 273) Existing one left turn lane, two through lanes, and one channelized right turn lane

Northbound Approach: (Churchmans Road) Existing one shared left turn/through lane and one channelized right turn lane

Southbound Approach: (Churchmans Road) Existing one left turn lane, one shared left turn/through lane and one channelized right turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Delaware Transit Corporation (DTC) currently provides existing services within the study area via DART Routes 13 and 51. Per the DelDOT Gateway, a bus stop exists for DART Routes 13 and 51 at the southeast corner of the Churchmans Road (Delaware Route 58) and Delaware Route 273 intersection. DART Route 13 provides 38 round trips on weekdays from 4:35 AM to 12:22 AM, 26 round trips on Saturdays from 6:52 AM to 9:04 PM, and 12 round trips on Sundays from 8:15 AM to 8:56 PM. DART Route 51 provides 17 round trips on weekdays from 5:30 AM to 9:59 PM.

Planned transit service: Per a conference call on February 12, 2020 with Mr. John Calnan, Planner at DART, the developer should provide a bus stop along westbound Delaware Route 273 adjacent to the proposed access or provide a bus stop on-site. Pedestrian sidewalks should be connected to the proposed bus stop. Additionally, the developer should improve the existing bus

stop along eastbound Delaware Route 273 across from the site entrance to provide an ADA compliant bus pad.

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 273 and traverses through one study intersection (Churchmans Road). The Connector Bicycle Route exists along Churchmans Road and traverses through all three of the study intersections (Site Entrance, Piccard Road, and Delaware Route 273). Additionally, the East Coast Greenway Route exists along Churchmans Road and traverses through all three of the study intersections (Site Entrance, Piccard Road, and Delaware Route 273). Pedestrian facilities currently exist at one of the study intersections: Churchmans Road and Delaware Route 273.

Planned bicycle and pedestrian facilities: Per email correspondence on February 4, 2020 from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- A 10-foot wide shared-use path should be provided along all roadway frontages.
- If DART recommends a bus pad with shelter near the site, the pad should be extended to include two 1-Loop Bike Racks (see DelDOT Detail M-4).
- Per the DCM, the site shall dedicate right-of-way per the roadway classification and establish a 15-foot wide permanent easement along the property frontage.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if the right turn lane is warranted, then a bike lane shall be incorporated along the right turn lane.

Bicycle Level of Traffic Stress in Delaware: Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the map on the DelDOT Gateway.

- Churchmans Road (Delaware Route 58) – LTS: 3 and 4
- Delaware Route 273 – LTS: 3 and 4
- Old Churchmans Road (New Castle Road 342) – LTS 3

Crash Evaluation

Per the crash data included in the TOA from September 4, 2016 to September 4, 2019, a total of 66 crashes occurred within the study area. Of the 66 crashes, 40 were rear end crashes and 11 were angle crashes. 10 crashes resulted in injuries. No fatal crashes were reported within the study area during the 3-year time period.

Previous Comments

Comments from DelDOT regarding the traffic volumes from the Preliminary Traffic Operational Analysis (PTOA) were not addressed in the final October 2019 TOA. JMT updated these volumes accordingly, and the updated volumes have been used in the JMT analysis.

General HCS Analysis Comments

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

1. For the intersection analyses, the TOA used HCS7 version 7.8, whereas JMT used HCS7 version 7.8.5
2. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in the Case 2 and Case 3 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. The TOA utilized 3% for every movement during every case.
3. Per DelDOT's *Development Coordination Manual* and coordination with DelDOT Planning, JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph along roadways and site entrances, whereas the TOA did not.
4. Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for the Case 1 scenario and a future PHF for Cases 2 and 3 scenarios 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. The TOA used 0.92 for every case.
5. JMT utilized updated Cases 2 and 3 volumes. As discussed with DelDOT, the updated volumes were created to address some volume development inconsistencies identified in the TOA report.
6. JMT utilized updated Case 3 volumes to account for a reduction in the development size to 890,348 square feet for general warehousing facility. The TOA analysis maintained the original development size of 1,168,211 square feet as the reduction in development size was not deemed significant. When developing the Case 3 volumes, JMT also utilized updated distributions based on the new entrance locations per Duffield's October 6, 2021 letter. The TOA utilized distributions based on the original entrances proposed.
7. The Case 3a scenario incorporates the recorded improvement to modify the southbound Churchmans Road approach to Delaware Route 273 to provide two left turn lanes, one through lane, and one right turn lane. The storage for the southbound left-turn lanes would be a minimum of 1,000 feet in length, extending past the HSBC Main Entrance/Site Entrance intersection with Churchmans Road. Therefore, the HSBC Main Entrance/Site Entrance approaches to Churchmans Road would provide only rights-in/rights-out movements. The Case 3b scenario does not incorporate the recorded improvement at the Churchmans Road/Delaware Route 273 intersection.
8. The analysis results highlighted in gray indicate the improvements JMT recommended in this TOA Review Letter.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Operational Analysis for 650 Churchmans Road (f.k.a. 100 Piccard Road)
Report Dated October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection ¹	LOS per TOA			LOS per JMT		
	Weekday AM	Weekday PM	Saturday MIDDAY	Weekday AM	Weekday PM	Saturday MIDDAY
Churchmans Road (Delaware Route 58) / Piccard Road						
2018 Existing (Case 1) ²						
Northbound Churchmans Road Left	A (8.2)	A (9.7)	A (8.0)	A (8.4)	A (9.7)	A (8.0)
Eastbound HSBC (Sallie Mae) Rear Entrance Approach	C (22.7)	C (21.6)	B (13.6)	D (25.8)	C (15.0)	B (12.2)
2020 without development of 650 Churchmans Road (f.k.a. 100 Piccard Road) (Case 2) ²						
Northbound Churchmans Road Left	A (8.3)	A (9.8)	A (8.1)	A (8.3)	A (9.8)	A (8.1)
Eastbound HSBC (Sallie Mae) Rear Entrance Approach	C (23.8)	C (22.5)	B (14.1)	C (22.8)	C (15.7)	B (12.6)

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

² For Cases 1 and 2, JMT analyzed the eastbound approach as having one shared left-turn/right-turn lane. The TOA analyzed the eastbound approach with one left-turn and one right-turn lane.

Table 2 (Continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Operational Analysis for 650 Churchmans Road (f.k.a. 100 Piccard Road)
Report Dated October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection	LOS per TOA			LOS per JMT		
	Weekday AM	Weekday PM	Saturday MIDDAY	Weekday AM	Weekday PM	Saturday MIDDAY
Churchmans Road (Delaware Route 58) / Piccard Road						
2020 with development with Recorded Improvements (Case 3a) ^{3, 4, 5}						
Northbound Churchmans Road Left	A (8.6)	B (10.1)	A (8.1)	A (8.6)	B (10.0)	A (8.1)
Southbound Churchmans Road Left	A (9.9)	A (8.4)	A (8.1)	A (9.9)	A (8.3)	A (8.0)
Eastbound HSBC Rear Entrance Approach	F (62.1)	F (64.1)	C (19.4)	F (61.0)	F (56.5)	C (17.8)
Westbound Piccard Road Approach	F (56.8)	F (59.3)	C (17.5)	F (50.7)	F (71.0)	C (15.1)
2020 with development with Recorded Improvements (Case 3a) <i>with two-way center left turn lane</i> ^{3, 4, 5, 6}						
Northbound Churchmans Road Left	-	-	-	A (8.6)	B (10.0)	A (8.1)
Southbound Churchmans Road Left	-	-	-	A (9.9)	A (8.3)	A (8.0)
Eastbound HSBC Rear Entrance Approach	-	-	-	D (29.2)	C (23.2)	B (14.0)
Westbound Piccard Road Approach	-	-	-	D (25.6)	D (26.7)	B (12.7)

³ The recorded improvements include the modification of the southbound Churchmans Road approach to Delaware Route 273 to provide two left turn lanes, one through lane, and one right turn lane. The storage for the southbound left-turn lanes would be a minimum of 1,000 feet in length, extending past the HSBC (Sallie Mae) Main Entrance/Site Entrance intersection with Churchmans Road. Therefore, the HSBC (Sallie Mae) Main Entrance/Site Entrance approaches to Churchmans Road would provide only rights-in/rights-out movements.

⁴ JMT modified the northbound through volumes to account for the modification of the HSBC (Sallie Mae) Main Entrance to be rights-in/rights out whereas the TOA did not.

⁵ During the PM peak period, JMT modified the eastbound left-turn volumes to take into account the removal of the HSBC (Sallie Mae) Main Entrance left-out movements. As such, the volumes associated with the eastbound left-turns at the HSBC (Sallie Mae) Main Entrance were redistributed to the HSBC (Sallie Mae) Rear Entrance. The TIS did not take this into account.

⁶ This scenario configured Churchmans Road with a two-way center left turn lane through the intersection which allows for a two-stage maneuver along the side street.

Table 2 (Continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Operational Analysis for 650 Churchmans Road (f.k.a. 100 Piccard Road)
Report Dated October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection ¹	LOS per TOA			LOS per JMT		
	Weekday AM	Weekday PM	Saturday MIDDAY	Weekday AM	Weekday PM	Saturday MIDDAY
Churchmans Road (Delaware Route 58) / Piccard Road						
2020 with development without Recorded Improvements (Case 3b) ⁷						
Northbound Churchmans Road Left	A (8.3)	A (9.8)	A (8.1)	A (8.3)	A (9.8)	A (8.1)
Southbound Churchmans Road Left	A (9.9)	A (8.4)	A (8.1)	A (9.9)	A (8.3)	A (8.1)
Eastbound HSBC Rear Entrance Approach	E (39.3)	E (46.9)	C (18.1)	D (34.1)	D (27.8)	C (15.2)
Westbound Piccard Road Approach	E (37.3)	E (45.7)	C (16.5)	D (34.2)	F (54.6)	B (14.7)
2020 with development without Recorded Improvements (Case 3b) with two-way center left turn lane ⁶						
Northbound Churchmans Road Left	-	-	-	A (8.3)	A (9.8)	A (8.1)
Southbound Churchmans Road Left	-	-	-	A (9.9)	A (8.3)	A (8.1)
Eastbound HSBC Rear Entrance Approach	-	-	-	C (20.1)	C (18.7)	B (12.8)
Westbound Piccard Road Approach	-	-	-	C (20.1)	C (22.7)	B (12.5)

⁷ The TOA analysis without the recorded improvements redistributed eastbound left turns from the HSBC (Sallie Mae) Main Entrance to the HSBC (Sallie Mae) Rear Entrance. However, as there is no barrier preventing this movement, JMT conducted the analysis including the eastbound left-turns at the HSBC Main Entrance.

Table 2 (Continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Operational Analysis for 650 Churchmans Road (f.k.a. 100 Piccard Road)
Report Dated October 2019
Prepared by Duffield Associates, Inc.

Roundabout ¹	LOS per TOA			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Middy	Weekday AM	Weekday PM	Saturday Middy
Churchmans Road (Delaware Route 58) / Piccard Road⁸						
2020 with development with Recorded Improvements (Case 3a)						
Northbound Churchmans Road Approach	-	-	-	C (17.7)	A (6.9)	A (5.4)
Southbound Churchmans Road Approach	-	-	-	A (7.9)	C (15.1)	A (5.4)
Eastbound HSBC Rear Entrance Approach	-	-	-	A (4.8)	A (9.6)	A (4.4)
Westbound Piccard Road Approach	-	-	-	A (8.5)	A (6.0)	A (4.2)
Overall Intersection	-	-	-	B (14.4)	B (11.7)	A (5.3)
2020 with development without Recorded Improvements (Case 3b)						
Northbound Churchmans Road Approach	-	-	-	B (13.7)	A (6.4)	A (5.3)
Southbound Churchmans Road Approach	-	-	-	A (6.7)	B (13.1)	A (5.2)
Eastbound HSBC Rear Entrance Approach	-	-	-	A (4.7)	A (8.5)	A (4.1)
Westbound Piccard Road Approach	-	-	-	A (7.6)	A (5.7)	A (4.1)
Overall Intersection	-	-	-	B (11.3)	B (10.4)	A (5.2)

⁸ For this scenario, the intersection was analyzed as a single-lane roundabout.

Table 2 (Continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Operational Analysis for 650 Churchmans Road (f.k.a. 100 Piccard Road)
Report Dated October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TOA			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Churchmans Road (Delaware Route 58) / Piccard Road ^{9,10,11}						
2020 with development with Recorded Improvements (Case 3a) ^{3,5}	B (19.1)	B (19.3)	B (11.4)	B (16.2)	C (24.1)	B (12.9)
2020 with development without Recorded Improvements (Case 3b) ⁷	B (18.7)	B (16.5)	B (11.8)	B (16.8)	B (19.2)	A (9.6)

⁹ This scenario incorporates the modification of the intersection to be signalized. JMT analyzed with a 120 seconds signal cycle length with protected and permissive left turns along the Churchmans Road approach and split phase operation along the HSBC Rear Entrance/Piccard Road approaches. The TOA analyzed with varying signal cycle lengths and protected only left turns along Churchmans Road and split phase operation along the HSBC Rear Entrance/Piccard Road approaches.

¹⁰ JMT used a volume of 1 in the analysis for any movements with zero volumes from the TOA volume diagrams.

¹¹ The TOA configured the westbound approach to have two left turn lanes whereas JMT configured the westbound approach with one left turn lane.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Operational Analysis for 650 Churchmans Road (f.k.a. 100 Piccard Road)
Report Dated October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TOA			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Churchmans Road (Delaware Route 58) / Delaware Route 273 ^{12, 13, 14}						
2018 Existing (Case 1)	C (23.1)	D (49.5)	C (30.2)	C (29.4)	D (42.8)	C (28.7)
2020 without development (Case 2)	C (24.4)	D (51.9)	C (31.0)	C (29.4)	D (44.8)	C (29.2)
2020 with development with Recorded Improvements (Case 3a)	C (20.9)	C (33.8)	C (24.0)	C (30.0)	D (44.8)	C (29.1)
2020 with development without Recorded Improvements (Case 3b)	C (25.4)	D (52.9)	C (31.5)	C (30.3)	D (39.8)	C (29.3)

¹² JMT did not include the southbound right-turn and westbound right-turn movements, since they are channelized right-turns with adequate acceleration lanes whereas the TOA did include those movements.

¹³ JMT used an arrival type of 4 along the Delaware Route 273 movements due to the coordination along the corridor at the intersection.

¹⁴ JMT applied 50% for the percent in shared turn lane along the southbound Churchmans Road approach per field observations.

Avigation Nuisance Easement & Non-Suit Covenant

This indenture made this _____ day of _____, 20____, by and between _____, hereinafter referred to as Grantor, and _____ hereinafter referred to as Grantee, witnesseth:

WHEREAS the Grantor is the owner in fee of a certain parcel of land (“the Property”) in the County of _____, State of Delaware; and

WHEREAS said parcel of land is near or adjacent to _____, an operating airport (“Airport”); and

WHEREAS the Grantee is the owner of said airport; and

WHEREAS the Grantor proposes to make a use of said Property and to develop thereon the following:

, which use and development require approval by Municipal and County authorities subject to the applicable provisions of law; and

WHEREAS the Grantor has been advised that the subject Property is located adjacent to the Airport; that the present and future impacts of Airport operations might be considered annoying to users of the Property for its stated purpose and might interfere with the unrestricted use and enjoyment of the Property in its intended use; that these Airport impacts might change over time, for example and not by way of limitation by an increase in the number of aircraft using the Airport, louder aircraft, seasonal variations, and time-of-day variations; that changes in Airport, air traffic control operating procedures or in Airport layout could result in increased noise impacts; and that the Grantor’s and users’ own personal perceptions of the noise exposure could change and that his or her sensitivity to aircraft noise could increase;

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements and conditions contained herein, the parties hereto agree as follows:

Grantor does hereby grant a permanent nuisance and avigation easement (“Easement”) to Grantee over all of the following described real estate:

By virtue of this agreement, the Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to Grantee or any successor agency legally authorized to operate said airport, any and all claims for damage of any kind whatsoever incurred as a result of aircraft using the Easement granted herein regardless of any future changes in volume or character of aircraft overflights, or changes in airport design and operating policies, or changes in air traffic control procedures.

The Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, does further hereby covenant and agree with the Grantee, its successors and assigns, that it will not, from and after the effective date hereof, sue, prosecute, molest, or trouble the Grantee, its successors and assigns, in

These covenants and agreements shall run with the land of the Grantor, as hereinabove described, for the benefit of the Grantee, and its successors and assigns in the ownership, use and operation of the aforesaid Airport.

Grantee, its successors and assigns, shall have and hold said Easement and all rights appertaining thereto until said Airport shall be abandoned and shall cease to be used for airport purposes.

If any provision of this Easement or any amendments hereto, or the application thereof to any person, thing or circumstances is held invalid, such invalidity shall not affect the provisions or application of this Easement or such amendments that can be given effect without the invalid provisions or application, and to this end the provisions of this Easement and such amendments are declared to be severable.

IN WITNESS WHEREOF, the Grantor has hereunto set its hand and seal the day and year first above written.

_____(SEAL)

_____(SEAL)

NOTARY ACKNOWLEDGEMENT

STATE OF DELAWARE

ss.

COUNTY OF KENT

BE IT REMEMBERED that on this ____ day of _____, 20____ personally, came before me, the subscriber, a Notary Public for the State and County aforesaid, _____, party(ies) to this Indenture, known to me personally to be such, and acknowledged this Indenture, to his/her (their) act or deed.

GIVEN under my Hand and Seal of office the day and year first above written.

Notary Public, State of Delaware

My Commission Expires _____