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

SHANTÉ A. HASTINGS
SECRETARY

August 12, 2022
Revised: February 27, 2025

Mr. Alex Meitzler
Traffic Planning and Design, Inc.
111 E. Main Street, Suite A
Elkton, Maryland 21921

Dear Mr. Meitzler,

The enclosed Revised Traffic Impact Study (TIS) review letter for the **2120 Dupont Parkway – Royal Farms** (Tax Parcels: 1300800014, 1300800015, 1300800029) commercial 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 TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. The letter has been revised due to modifications to the proposed land uses. 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 Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Review Engineer

DelDOT

AF:km
Enclosures
cc with enclosures: Bill Mortorff, Royal Farms
Mark Ziegler, McBride & Ziegler, Inc
Christopher Craig, McBride & Ziegler, Inc
Lowell Hutchinson, McBride & Ziegler, Inc
Abigail Meyer, Traffic Planning and Design, Inc
Eric Kramer, Traffic Planning and Design, Inc
Shawn Tucker, Barns and Thornburg LLP
Marc Coté, Rossi Group
David L. Edgell, Office of State Planning Coordination
Antoni Sekowski, New Castle County Department of Land Use
Bradford Shockley, New Castle County Department of Land Use
Owen C. Robatino, New Castle County Department of Land Use
Mir Wahed, Johnson, Mirmiran, & Thompson, Inc.
Joanne M. Arellano, Johnson, Mirmiran, & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

Mark Luszcz, Chief Engineer, Transportation Solutions (DOTS)
Brad Eaby, Deputy Attorney General, DOTS
Matthew Vincent, Chief Project Development North, DOTS
Peter Haag, Chief Traffic Engineer, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Sean Humphrey, Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, M&O
Nathan Draper, Canal District Public Works Engineer, M&O
Jared Kauffman, Service Development Planner, DTC
Tremica Cherry, Service Development Planner, DTC
Pamela Steinebach, Director, Planning
Anthony Aglio, Planning Supervisor, Active Transportation & Community Connections, Planning
Steve Bayer, Planning Supervisor, Statewide & Regional Planning, Planning
Anson Gock, Planner, Statewide & Regional Planning, Planning
Todd Sammons, Assistant Director, Development Coordination, Planning,
Wendy Polasko, Subdivision Engineer, Development Coordination, Planning
Randhir Sharma, New Castle Review Coordinator, Development Coordination, Planning
Michael White, New Castle Review Engineer, Development Coordination, Planning
Sireen Muhtaseb, TIS Engineer, Development Coordination, Planning
Ben Fisher, TIS Review Engineer, Development Coordination, Planning
Tijah Jones, TIS Review Engineer, Development Coordination, Planning

Revised February 27, 2025
August 11, 2022

Ms. Sireen Muhtaseb
TIS Group Manager
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 11-9A – 2120 DuPont Parkway Royal Farms TIS Addendum

Dear Ms. Muhtaseb:

In August 2022, Johnson, Mirmiran, and Thompson (JMT) completed the review of the Traffic Impact Study (TIS) for the 2120 DuPont Parkway Royal Farms #379, prepared by Traffic Planning and Design, Inc., dated February 9, 2022 The task was assigned as Task Number 5-5A. Since that review, the developer proposed modifications to the site and submitted a TIS addendum, prepared by Traffic Planning and Design, Inc., dated November 16, 2022. The TIS addendum was assigned as Task Number 11-9A. The TIS and TIS addendum were prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*. This letter has been revised to reflect a change in the proposed land uses for the development and supersedes the recommendations from the August 11, 2022 letter. As the proposed land use changes are projected to generate an insignificant increase in daily trips and fewer AM peak hour trips, DelDOT has not required the traffic analysis to be updated by the applicant. A plan depicting the updated land uses and site entrance layouts is shown on Page 13.

The proposed development is located on the southeast corner of the intersection of US Route 13 and Port Penn Road (New Castle Road 2) in New Castle County, Delaware. The initial February 2022 TIS evaluates the impacts of a proposed 5,380 square-foot super convenience store with gas pumps, and one full access on Port Penn Road and a rights-in/rights-out access on US Route 13. The TIS review was completed, and a letter dated August 11, 2022, was prepared by JMT.

The November 2022 TIS addendum evaluates the impacts of a proposed 5,380 square-foot super convenience store with gas pumps, two 4,000 square foot fast-food restaurants with drive-thru windows, and 6,300 square feet of retail space. As part of the addendum, three entrances are proposed: one full access point on Port Penn Road and two rights-in/rights-out access points on US Route 13. Due to the increased trip generation of the development proposed in the TIS addendum, three additional intersections along US Route 13 were required to be studied (Hyetts Corner Road, Boyds Corner Road/Pole Bridge Road, and Cox Neck Road).

Since the completion of the November 2022 TIS addendum, the proposed development has been updated to be a 5,408 square-foot convenience store with a 16 fuel pump gas station, a 7,700 square foot auto parts store, a 2,446 square foot coffee shop with drive-thru, and a 2,535 square foot strip retail plaza. The following table summarizes a trip generation comparison between the November 2022 TIS addendum and the updated proposed development. The trip generation for the land uses included in the November 2022 TIS addendum was performed according to *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE). Since then, the *Trip Generation, 11th Edition: An ITE Informational Report*, was published by ITE. As such, the trip generation for the updated uses were calculated according to the 11th Edition.

2120 Dupont Parkway Royal Farms Trip Generation Comparison – Daily Trips

Land Use	**November 2022 TIS Addendum (ITE 10th Edition)**		**Updated Uses (ITE 11th Edition)**	
	Size	Weekday ADT	Size	Weekday ADT
Super Convenience Market/Gas Station (ITE 960)	5,380 SF	4,506	-	-
Convenience Store/Gas Station (ITE 945)	-	-	16-24 VFP 5,408 SF	6,943
Fast-Food Restaurant with Drive-Through Window (ITE – 934)	8,000 SF	3,768	-	-
Shopping Center (ITE – 820)	6,300 SF	238	-	-
Automobile Parts Sales (ITE – 843)	-	-	7,700 SF	420
Coffee/Donut Shop with Drive-Through (ITE – 937)	-	-	2,446 SF	1,307
Strip Retail Plaza (<40k) (ITE – 822)	-	-	2,535 SF	138
Total		**8,512**		**8,808**

2120 Dupont Parkway Royal Farms Trip Generation Comparison – AM Trips

Land Use	November 2022 TIS Addendum (ITE 10th Edition)				Updated Uses (ITE 11th Edition)			
	Size	AM Trips			Size	AM Trips		
		In	Out	Total		In	Out	Total
Super Convenience Market/Gas Station (ITE 960)	5,380 SF	224	223	447	-	-	-	-
Convenience Store/Gas Station (ITE 945)	-	-	-	-	16-24 VFP 5,408 SF	247	247	494
Fast-Food Restaurant with Drive-Through Window (ITE – 934)	8,000 SF	164	158	322	-	-	-	-
Shopping Center (ITE – 820)	6,300 SF	4	2	6	-	-	-	-
Automobile Parts Sales (ITE – 843)	-	-	-	-	7,700 SF	11	8	19
Coffee/Donut Shop with Drive-Through (ITE – 937)	-	-	-	-	2,446 SF	107	103	210
Strip Retail Plaza (<40k) (ITE – 822)	-	-	-	-	2,535 SF	4	2	6
Total		**392**	**383**	**775**		**369**	**360**	**729**

2120 DuPont Parkway Royal Farms Trip Generation Comparison – New Trips

Land Use	ADT	AM Peak Hour		
		In	Out	Total
TIS Addendum Total New Trips (ITE 10th Edition)	8,512	392	383	775
Updated Uses Total New Trips (ITE 11th Edition)	8,808	369	360	729
Difference Total New Trips	**+296**	**-23**	**-23**	**-46**

The subject property is on an approximately 14.10-acre assemblage of parcels that is zoned as CN (Neighborhood Commercial) and the developer does not plan to rezone the land. Construction for the development was anticipated to be completed in 2023 at the time that the TIS and TIS addendum were completed.

Relevant and On-Going Projects and Studies

There are no ongoing DelDOT Capital Projects in the study area. However, the study area, specifically the intersections of US Route 13 with Port Penn Road, Hyetts Corner Road, and Boyds Corner Road/Pole Bridge Road, is being evaluated in the *Southern New Castle County Transportation Improvement District Study* (SNCC TID). The Southern New Castle County TID Traffic Study was initially performed in 2004, updated in 2013, and is undergoing updates at the time of this review. The original traffic study was used to determine the roadway and intersection improvement needs for the area with the expectation of future development to occur. The study area is bounded by the Chesapeake and Delaware Canal and Scott Run, US Route 13, the Delmarva Secondary rail line, and Marl Pit Road. Approximately 30 committed developments are being considered for the latest update. More information regarding the TID can be found on the following website:https://deldot.gov/Programs/transportation-improvement-districts/index.shtml?dc=tidsunderoperation

Per coordination with the Special Events Manager of DelDOT Traffic Safety, the site on the northeast corner of the intersection of US Route 13 and Port Penn Road, colloquially known as "Frightland", holds several events each year such as the Mud Run Jr. in early June and the Adult Mud Run in September, which draw large crowds and may impact the study area. The event that would have the greatest impact is a haunted house attraction that runs from the last weekend in September through the first week of November, open Friday, Saturday, and Sunday. At the height of the season the event can attract thousands of individuals. There are two entrances to the Frightland property on Port Penn Road. The western entrance/exit is nearby to the proposed site entrance on Port Penn Road. This may conflict with traffic entering and exiting onto Port Penn Road to and from the proposed Royal Farms, but could be managed, specifically during special events, by law enforcement assigning right of way for traffic entering and exiting Frightland and the proposed Royal Farms.

Summary of Analysis Results

Per a January 12, 2023 meeting with New Castle County, the Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) are not applicable to the proposed development. Based on our review of the TIS addendum, we have the following comments and recommendations:

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
US Route 13/Port Penn Road	X		Case 2 – 2023 without Development
	X	X	Case 3 – 2023 with Development
US Route 13/Hyetts Corner Road		X	Case 2 – 2023 without Development
		X	Case 3 – 2023 with Development
US Route 13/Boyds Corner Road/Pole Bridge Road		X	Case 2 – 2023 without Development
		X	Case 3 – 2023 with Development

US Route 13/Port Penn Road (See Table 4, Page 27, Development Improvement #5 & 6)
The signalized US Route 13 intersection with Port Penn Road would exhibit LOS deficiencies during the AM peak hour under future conditions with or without the proposed development, and during the PM peak hour under future conditions with the proposed development. Specifically, the intersection would operate at LOS F with a delay of approximately 97.5 seconds per vehicle during the AM peak hour under Case 3 conditions. The deficiencies could be mitigated with the provision of a second left turn lane along the northbound US Route 13 approach. With this improvement, the intersection would improve to operate at LOS D with approximately 41.9 seconds of delay per vehicle during the AM peak hour under Case 3 conditions. However, the provision of a second left turn lane along northbound US Route 13 would require the widening of the Delaware Route 1 ramp to provide dual receiving lanes which may not be feasible.

With maintaining the lane configurations along US Route 13 and the provision of one left turn lane, one through lane, and one right turn lane along the westbound Port Penn Road approach, the intersection would improve to operate at LOS E with approximately 77.3 seconds of delay per vehicle during the AM peak hour under Case 3 conditions. Although the provision of separate lanes along the westbound approach would not improve the intersection to operate at acceptable LOS, the intersection delay per vehicle would be reduced by approximately 20.2 seconds.

Furthermore, the US Route 13 and Port Penn Road intersection is being studied as part of the Southern New Castle County TID and long-term improvements to the intersection should be determined as part of that study. As such, we recommend the developer improve the intersection to provide one left turn lane, one through lane, and one right turn lane along the westbound Port Penn Road approach.

US Route 13/Hyetts Corner Road (See Table 5, Page 29, Development Improvement #7)
The signalized US Route 13 intersection with Hyetts Corner Road would exhibit LOS deficiencies during the PM peak hour under future conditions with or without the development. Specifically, the intersection would operate at LOS E with a delay of approximately 57.9 seconds per vehicle during the PM peak hour under Case 3 conditions. The deficiencies could be mitigated with the provision of a separate right turn lane along the eastbound Hyetts Corner Road approach. With

this improvement, the intersection would improve to operate at LOS D with approximately 37.5 seconds of delay per vehicle during the PM peak hour under Case 3 conditions.

However, the Windsor South at Hyetts Corner development constructed a 250 feet (excluding taper) right turn lane along the eastbound Hyetts Corner Road approach to US Route 13. As such, it is not recommended that the developer construct any improvements at the intersection. It is recommended that the developer enter into an agreement with DelDOT to contribute to the Traffic Signal Revolving Fund (TSRF) for the US Route 13 and Hyetts Corner Road intersection.

US Route 13/Boyds Corner Road/Pole Bridge Road (See Table 6, Page 30)
The signalized US Route 13 intersection with Boyds Corner Road/Pole Bridge Road would exhibit LOS deficiencies during the PM peak hour under future conditions with or without the development. Specifically, the intersection would operate at LOS F with a delay of approximately 80.3 seconds per vehicle. As part of the Southern New Castle County TID, this intersection is proposed to be improved to provide four through lanes along the southbound US Route 13 approach and two left turn lanes, two through lanes, and one right turn lane along the westbound Pole Bridge Road approach. With these improvements, the intersection would improve to operate at LOS D with approximately 54.5 seconds of delay per vehicle during the PM peak hour under Case 3 conditions. As the existing intersection would exhibit deficiencies with or without the proposed development and the deficiencies would be mitigated to LOS D by the improvements proposed as part of the Southern New Castle County TID, it is not recommended that the developer implement any improvements at this intersection.

Port Penn Road/Site Entrance A (See Table 2, Page 25, Development Improvement #2)
Although the proposed site entrances operate at acceptable LOS without physical improvements at the intersection of US Route 13 and Port Penn Road, projected queue lengths and existing auxiliary lanes at the adjacent signalized intersection of US Route 13 and Port Penn Road may impact the proposed site entrances. Site Entrance A is proposed along Port Penn Road, approximately 360 feet east of the intersection with US Route 13. During the AM peak hour under Case 3 conditions, the westbound Port Penn Road approach to US Route 13 would exhibit a projected 95th percentile queue length of approximately 815 feet and impact operations at the proposed Site Entrance A.

Due to the projected queue lengths along the westbound Port Penn Road approach to US Route 13, JMT evaluated the restriction of left out movements from Site Entrance A. With the restriction of lefts-out at Site Entrance A, the proposed Site Entrance B and Site Entrance C intersections with US Route 13 would exhibit deficiencies during the AM peak hour under future conditions with the proposed development. The deficiencies at US Route 13/Site Entrance B would occur along the westbound Site Entrance B approach with delays of 100.9 seconds per vehicle and a projected 95th percentile queue length of approximately 210 feet which may impact on-site operations. The deficiencies at US Route 13/Site Entrance C would occur along the westbound Site Entrance C approach with delays of 54.8 seconds per vehicle and a projected 95th percentile queue length of approximately 115 feet. Additionally, the northbound left-turn lane at the US Route 13 and Port Penn Road intersection is separated from the northbound through lanes by a concrete island that extends south of the proposed Site Entrance C. As such, vehicles utilizing Site Entrance B and Site

Entrance C to access southbound US Route 13 would have to execute a U-turn at the median crossover approximately 4,400 feet north of the Port Penn Road intersection.

With Site Entrance A full movement and the provision of a separate left turn lane, through lane, and right turn lane along the westbound Port Penn Road approach to US Route 13, the projected 95th percentile queue length along the westbound Port Penn Road approach would spillback past proposed Site Entrance A but would be reduced from approximately 820 feet to approximately 385 feet. Additionally, based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the eastbound Port Penn Road right turn lane is 290 feet at Site Entrance A. As such, it is recommended that Site Entrance A be full movement and be located along the easternmost portion of the Port Penn Road site frontage. Additionally, to minimize drivers utilizing the left turn lane for the site entrance to traverse onto the left turn lane for southbound US Route 13 at the Port Penn Road intersection, the developer should design the westbound Port Penn Road site frontage to provide a separation between the left turn at Site Entrance A from the left turn lane onto US Route 13.

US Route 13/Site Entrance B (See Table 3, Page 26, Development Improvement #3)
The existing northbound US Route 13 right turn lane onto Port Penn Road extends approximately 400 feet south of the southeast point of tangency of the intersection. The proposed Site Entrance B rights-in/rights-out entrance should be located at least 450 feet south of the intersection of US Route 13 with Port Penn Road to reduce impacts to the existing northbound US Route 13 right turn lane onto Port Penn Road.

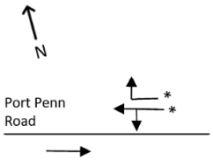
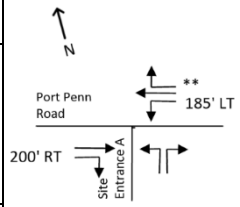
Development Improvements

Should New Castle County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan, unless a Design Deviation is requested and approved by the Department. 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. The following items should be implemented at the same time as site construction once all agency approvals and permits are secured and completed in accordance with DelDOT's Standards and Specifications.

1. The developer shall improve the State-maintained Roads on which they front (US Route 13 and Port Penn Road), within the limits of their frontage. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. "Frontage" means the length along the state right-of-way of a single property tract where an entrance is proposed or required. If a single property tract has frontage along multiple roadways, any segment of roadway including an entrance shall be improved to meet DelDOT's Functional Classification criteria as found in Section 1.1 of the Development Coordination Manual and elsewhere therein, and/or improvements established in the Traffic Operational Analysis and/or Traffic Impact Study. "Secondary Frontage" means the length along the state right-of-way of a single property tract where no entrance is proposed or required. The segment of roadway may be upgraded by improving

the pavement condition of the existing roadway width. The Pavement Management Section and Subdivision Section will determine the requirements to improve the pavement condition.

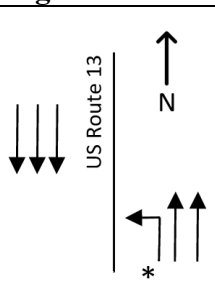
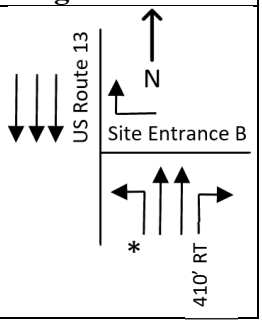
2. The developer should construct an unsignalized full access site entrance (Site Entrance A) for the proposed Royal Farms development on Port Penn Road, approximately 360 feet east of the northeast point of tangency of the intersection with US Route 13. The developer should design the westbound Port Penn Road site frontage to provide a separation between the left turn at Site Entrance A from the left turn lane onto US Route 13. A plan should be submitted to DelDOT during Entrance Plan review depicting the design which may not include providing pavement markings between the two left turn lanes. The intersection should be consistent with the lane configurations shown in the table below:

Approach	Current Configuration		Proposed Configuration	
Eastbound Port Penn Road	One through lane		One through lane and one right turn lane	
Westbound Port Penn Road	One shared left turn/through lane and one right turn lane*		One left turn lane, one through lane, and one right turn lane**	
Northbound Site Entrance A	Approach does not exist		One left turn lane and one right turn lane	

*The left turn and right turn movements are for the adjacent US Route 13 intersection.
**The right turn movement is for the adjacent US Route 13 intersection.

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the eastbound Port Penn Road right turn lane is 290 feet. However, due to the close proximity of the proposed entrance to the US Route 13/Port Penn Road intersection, we recommend that DelDOT require a minimum storage length of 200 feet (excluding taper) for the eastbound Port Penn Road right turn lane. Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the westbound Port Penn Road left turn lane is 185 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

3. The developer should construct an unsignalized rights-in/rights-out access (Site Entrance B) for the proposed Royal Farms development along US Route 13, a minimum of approximately 450 feet south of the southeast point of tangency of the intersection with Port Penn Road. The intersection should be consistent with the lane configurations shown in the table below.

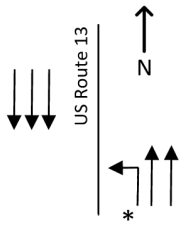
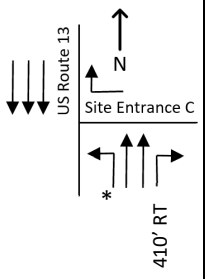
Approach	Current Configuration		Proposed Configuration	
Westbound Site Entrance B	Approach does not exist		One right turn lane	
Northbound US Route 13	One left turn lane* and two through lanes		One left turn lane*, two through lanes, and one right turn lane	

*The left turn lane is for the adjacent Port Penn Road intersection.

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the northbound US Route 13 right turn lane is 410 feet.

As the proposed entrance location would conflict with the existing northbound US Route 13 right turn lane at the Port Penn Road intersection, the developer should submit a plan to DelDOT Development Coordination Section to coordinate the design of the entrance with the design of the northbound right turn lane at the Port Penn Road intersection. The northbound US Route 13 right turn lane into Site Entrance B should be constructed as a separate right turn lane from the northbound US Route 13 right turn lane onto Port Penn Road.

4. The developer should construct an unsignalized rights-in/rights-out access (Site Entrance C) for the proposed Royal Farms development along US Route 13, a minimum of approximately 960 feet south of the southeast point of tangency of the intersection with Port Penn Road. The intersection should be consistent with the lane configurations shown in the table below.

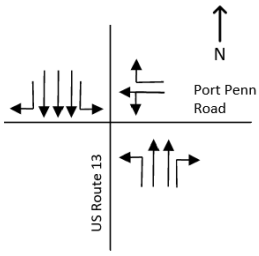
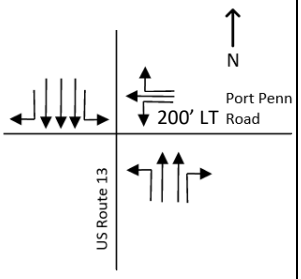
Approach	Current Configuration		Proposed Configuration	
Westbound Site Entrance C	Approach does not exist		One right turn lane	
Northbound US Route 13	One left turn lane* and two through lanes		One left turn lane*, two through lanes, and one right turn lane	

*The left turn lane is for the adjacent Port Penn Road intersection.

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the northbound US Route 13 right turn lane is 410 feet.

As the proposed entrance location would conflict with the proposed northbound US Route 13 right turn lane at the Site Entrance B intersection, the developer should submit a plan to DelDOT Development Coordination Section to coordinate the design of the entrance with the design of the northbound right turn lane at the Site Entrance B intersection.

5. The developer should construct a left turn lane along the westbound Port Penn Road approach to US Route 13. The intersection should be consistent with the lane configurations shown in the table below:

Approach	Current Configuration		Proposed Configuration	
Westbound Port Penn Road	One shared left turn/through lane and one right turn lane		One left turn lane, one through lane, and one right turn lane	
Northbound US Route 13	One left turn lane, two through lanes, and one right		No change	
Southbound US Route 13	One left turn lane, three through lanes, and one right turn lane		No change	

Based on the queue results from the HCS analysis, the recommended minimum storage length (excluding taper) of the westbound left turn lane is 385 feet. However, due to the proximity of Site Entrance A to the US Route 13/Port Penn Road intersection, we recommend that DelDOT require a minimum storage length of 200 feet (excluding taper) for the westbound Port Penn Road left turn lane. Prior to Entrance Plan approval, the developer should submit a plan to DelDOT Development Coordination Section to confirm the design of the intersection.

6. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and Port Penn Road.

7. The developer should enter into an agreement with DelDOT to contribute to the Traffic Signal Revolving Fund (TSRF) at the US Route 13 and Hyetts Corner Road intersection. The contribution amount is $8,948.00.

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

    a. A minimum of fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the US Route 13 and Port Penn

Road site frontages. Along the frontage, the developer should construct a five-foot wide sidewalk. The sidewalk should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the sidewalk. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the sidewalk.

b. Signalized pedestrian crossings should be provided along the northerly and easterly legs of the US Route 13 intersection with Port Penn Road.

c. At least one internal connection of a sidewalk is required from both the sidewalk along US Route 13 and Port Penn Road.

d. Where internal sidewalks are located alongside of parking spaces, a buffer, physical barrier, or signage should be added to eliminate vehicular overhang onto the sidewalk.

e. Internal bicycle racks should be provided.

f. ADA compliant curb ramps and marked crosswalks should be provided along the site entrances.

g. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Port Penn Road approaches to Site Entrance A and the right turn lane along the northbound US Route 13 approach to Site Entrance B.

h. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks or should be flush with the pavement.

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

Improvements in this TIS 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.

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

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

cc: Mir Wahed, P.E., PTOE
Janna Brown, P.E., PTOE

Enclosure

Recommendations Map

General Information

Report date: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.
Prepared for: Royal Farms, Jeff Bainbridge
Tax Parcels: 13-008.00-014, 015, and 029
Generally consistent with DelDOT's *Development Coordination Manual (DCM)*: Yes

Project Description and Background

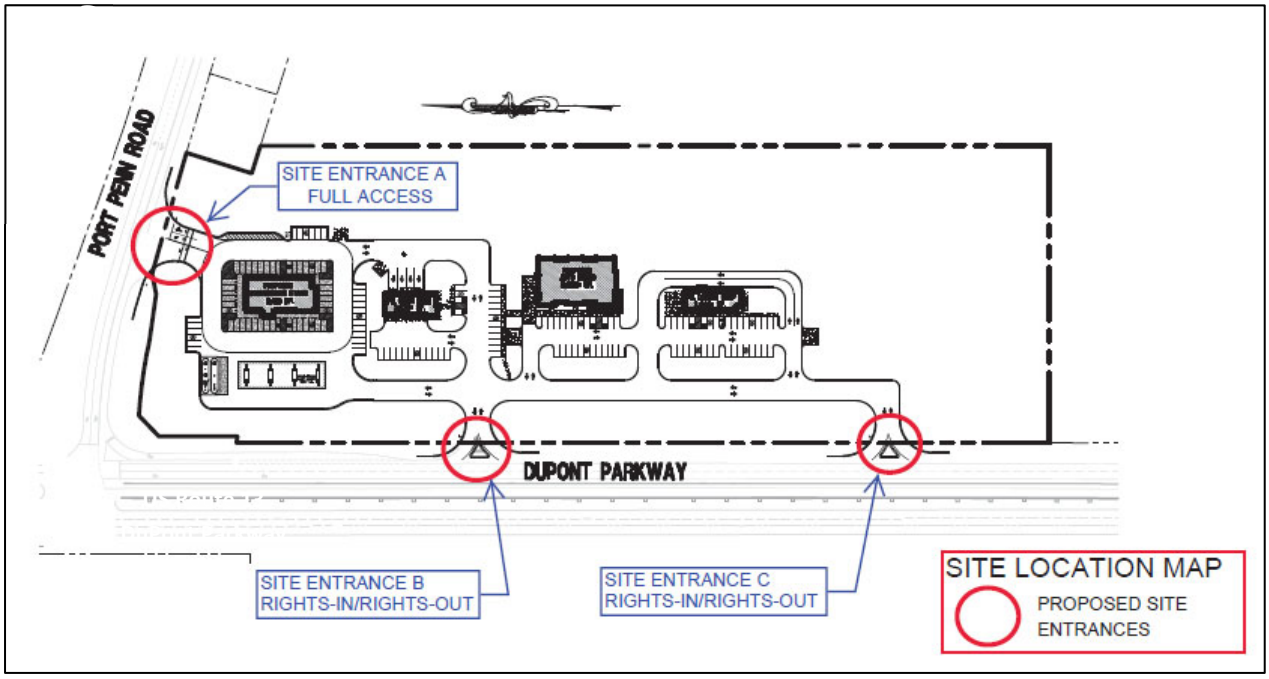
Description: The proposed development consists of a 5,380 square-foot super convenience store with gas pumps and a 14,300 square-foot retail facility consisting of two 4,000 square-foot fast-food restaurants with drive-through windows and a 6,300 square-foot retail space.
Location: The site is located on the southeast corner of the intersection of US Route 13 and Port Penn Road (New Castle Road 2), in New Castle County, Delaware.
Amount of Land to be developed: An approximately 14.10-acre assemblage of parcels.
Land Use approval(s) needed: Entrance Plan.
Proposed completion date: 2023.
Proposed access locations: Three access points are proposed: one full access on Port Penn Road and two rights-in/rights-out access on US Route 13.

Daily Traffic Volumes:

- 2021 Average Annual Daily Traffic on US Route 13: 30,149 vehicles per day
- 2021 Average Annual Daily Traffic on Port Penn Road: 2,547 vehicles per day

*AADT is sourced from ATR data provided by the TIS Report. Data taken from six full days starting September 21, 2021.

Site Map



**Graphic provided by McBride & Ziegler Inc. on February 19, 2025.*

Relevant and On-going Projects

There are no ongoing DelDOT Capital Projects in the study area. However, the study area, specifically the intersections of US Route 13 with Port Penn Road, Hyetts Corner Road, and Boyds Corner Road/Pole Bridge Road, is being evaluated in the *Southern New Castle County Transportation Improvement District Study* (SNCC TID). The Southern New Castle County TID Traffic Study was initially performed in 2004, updated in 2013, and is undergoing updates at the time of this review. The original traffic study was used to determine the roadway and intersection improvement needs for the area with the expectation of future development to occur. The study area is bounded by the Chesapeake and Delaware Canal and Scott Run, US Route 13, the Delmarva Secondary rail line, and Marl Pit Road. Approximately 30 committed developments are being considered for the latest update. More information regarding the TID can be found on the following website:https://deldot.gov/Programs/transportation-improvement-districts/index.shtml?dc=tidsunderoperation

Per coordination with the Special Events Manager of DelDOT Traffic Safety, the site on the northeast corner of the intersection of US Route 13 and Port Penn Road, colloquially known as "Frightland", holds several events each year such as the Mud Run Jr. in early June and the Adult Mud Run in September, which draw large crowds and may impact the study area. The event that would have the greatest impact is a haunted house attraction that runs from the last weekend in September through the first week of November, open Friday, Saturday, and Sunday. At the height of the season the event can attract thousands of individuals. There are two entrances to the Frightland property on Port Penn Road. The western entrance/exit is directly across from the

proposed site entrance on Port Penn Road. This would be in direct conflict with traffic entering and exiting onto Port Penn Road to and from the proposed Royal Farms, but could be managed, specifically during special events, by law enforcement assigning right of way for traffic entering and exiting Frightland and the proposed Royal Farms.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, 2020)

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed development is located within Investment Level 3 and Investment Level 4.

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). In these instances, development in Investment Level 3 may be least appropriate for new growth and development in the near term. 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. Environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues most often impact these lands. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state agencies and local government with land-use authority. 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. DelDOT also supports the development and implementation of Transportation Improvement Districts in Investment Level 3 areas. 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.

Investment Level 4

Delaware's Investment Level 4 Areas are rural in nature and are where the bulk of the state's open space/natural areas and agricultural industry is located. These areas contain agribusiness activities, farm complexes, and small settlements. They typically include historic crossroads or points of trade, often with rich cultural ties. Delaware's Investment Level 4 Areas are also the location of scattered residential uses, featuring almost entirely single-family detached residential structures. Delaware's Investment Level 4 Areas also include many unincorporated communities, typically with their own distinctive character and identity. Investment Level 4 Areas depend on a transportation system primarily of secondary roads linked to roadways used as regional thoroughfares for commuting and trucking.

It is the state's intent to discourage additional urban and suburban development in Investment Level 4 Areas unrelated to agriculture and to the areas' needs. In Investment Level 4 Areas, the state's investments and policies should retain the rural landscape and preserve open spaces and farmlands, support farmland-related industries, and establish defined edges to more concentrated development. The focus for the Level 4 Areas will be to preserve and maintain existing facilities in safe working order, corridor-capacity preservation, and the enhancement of transportation facilities to support agricultural business. The lowest priority is given to transit system enhancements.

Proposed Development's Compatibility with Livable Delaware:
The proposed site is located in Investment Level 3 and Investment Level 4 areas. The Investment Level 4 area consists of a small portion of the proposed site at the northwestern corner. The proposed super convenience store with gas pumps and 14,300 square-foot retail facility is within Investment Level 3. Investment Level 3 is characterized by areas with new development separated from existing development by a substantial amount of vacant land. Also, Investment Level 3 areas support growth adjacent to fast-growing areas within counties or municipalities, and areas without proper infrastructure. Therefore, the proposed development is generally consistent with the 2020 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plan

(Source: New Castle County Comprehensive Plan 2050)

New Castle County Comprehensive Plan:
Per the *New Castle County Comprehensive Plan Zoning Map,* the proposed development is currently zoned as Suburban. Per the *New Castle County Comprehensive Plan Future Land Use Map,* the proposed development is designated as Business Flex.

Proposed Development's Compatibility with the New Castle County Comprehensive Plan:
The *New Castle County Comprehensive Plan* states that Business Flex areas consist of existing and potential nonresidential development. These areas are essential to the county's continued economic growth. Therefore, the proposed development is generally consistent with the *New Castle County Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development within the November 16, 2022 TIS Addendum was determined by using the comparable land use and 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 960 (Super Convenience Market/Gas Station), ITE Land Use Code 934 (Fast-Food Restaurant with Drive-Through Window) and ITE Land Use Code 820 (Shopping Center). Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

Table 1
2120 DuPont Parkway – Royal Farms Trip Generation – November 16, 2022 TIS Addendum

Land Use	ADT	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
5,380 SF Super Convenience Market/Gas Station (ITE - 960)	4,506	224	223	447	187	186	373
8,000 SF Fast-Food Restaurant with Drive-Through Window (ITE – 934)	3,768	164	158	322	136	125	261
6,300 SF Shopping Center (ITE – 820)	238	4	2	6	12	12	24
Pass-by Trips	-	-249	-249	-498	-212	-212	-424
Total New Trips	**8,512**	**143**	**134**	**277**	**123**	**111**	**234**

Overview of TIS

Intersections examined:

1. Site Entrance A / Port Penn Road (New Castle 2)
2. Site Entrance B / US Route 13
3. US Route 13 / Delaware Route 1 Northbound Ramp / Port Penn Road
4. US Route 13 / Hyetts Corner Road (New Castle Road 413)
5. US Route 13 / Boyds Corner Road / Pole Bridge Road (New Castle Road 420)
6. US Route 13 / Cox Neck Road (New Castle Road 411)
7. Site Entrance C / US Route 13

Conditions examined:

1. Case 1 – 2021 existing
2. Case 2 – 2023 without development

3. Case 3 – 2023 with development

Committed Developments considered:

1. Whitehall
    a. 76,317 SF retail
    b. 2,750 SF general office
    c. 36,400 SF elementary school
    d. 1,484 single-family detached houses
    e. 1,139 low-rise multifamily houses
2. Whitehall Scott Run Business Park (1,835,360 SF industrial park and 75,000 SF retail)
3. Bayberry North (98 single-family detached houses and 16 low-rise multifamily houses)
4. Windsor at Hyetts Corner (48 single-family detached houses)
5. Winchelsea (148 single-family detached houses and 326 low-rise multifamily houses)
6. Bayberry Town Center
    a. 184 single-family detached houses
    b. 145 low-rise multifamily houses
    c. 31,000 SF general office space
    d. 61,200 SF athletic club
    e. 186,345 SF retail
7. Bayberry South
    a. 544 single-family detached houses
    b. 74 low-rise multifamily houses
    c. 143 age-restricted single-family detached houses
8. Boyds Corner Farm (Coburn Farm)
    a. 113 single-family detached houses
    b. 94,000 SF retail
    c. 17,300 SF general office space
9. Shannon Cove (40 single-family detached houses)
10. Windsor Commons (316 low-rise multifamily houses)
11. Baker Farms (108 single-family detached houses and 74 low-rise multifamily houses)
12. Pennfield (137 age-restricted single-family detached houses)
13. Huber's Crossing (119,385 SF retail)
14. Baymont Farms (224 age-restricted single-family detached houses)
15. High Hook (8 single-family detached houses)
16. Ponds at Odessa (53 single-family detached houses and 76 low-rise multifamily houses)

*Note: Committed development information provided in the TIS supersedes the information provided in the December 2, 2021, DelDOT Scoping Meeting Memorandum.

Peak hours evaluated: Weekday morning and weekday evening peak hours.

Intersection Descriptions

1. **Site Entrance A / Port Penn Road (New Castle 2)**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Port Penn Road) Existing one through lane; proposed one through lane and one right turn lane.
Westbound Approach: (Port Penn Road) Existing one shared left turn/through lane and one right turn lane.
Northbound Approach: (Site Entrance A) Proposed one shared left/right turn lane, stop controlled.

* A private business entrance is located at the southbound leg of the intersection.
** The westbound approach right turn lane is for the signalized intersection of US Route 13 / Delaware Route 1 Northbound Ramp / Port Penn Road.

2. **Site Entrance B / US Route 13**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Site Entrance B) Proposed one right turn lane, stop controlled.
   Northbound Approach: (US Route 13) Existing two through lanes; proposed two through lanes and one right turn lane.

3. **US Route 13 / Delaware Route 1 Northbound Ramp / Port Penn Road**
   Type of Control: Existing signalized intersection (Four-legged).
   Eastbound Approach: (Delaware Route 1 Northbound Ramp) Existing one receiving lane.
   Westbound Approach: (Port Penn Road) Existing one shared left turn/through lane and one right turn lane.
   Northbound Approach: (US Route 13) Existing two through lanes and one right turn lane.
   Southbound Approach: (US Route 13) Existing one left turn lane, three through lanes and one right turn lane.

4. **US Route 13 / Hyetts Corner Road (New Castle Road 413)**
   Type of Control: Existing signalized intersection (Three-legged).
   Eastbound Approach: (Hyetts Corner Road) Existing one shared left turn/right turn lane.
   Northbound Approach: (US Route 13) Existing one left turn lane and two through lanes.
   Southbound Approach: (US Route 13) Existing one left turn lane, two through lanes and one right turn lane.

   * The southbound approach left turn lane allows for vehicles to make u-turns onto northbound US Route 13.

5. **US Route 13 / Boyds Corner Road / Pole Bridge Road (New Castle Road 420)**
   Type of Control: Existing signalized intersection (Four-legged).
   Eastbound Approach: (Boyds Corner Road) Existing two left turn lanes, two through lanes and one channelized right turn lane.
   Westbound Approach: (Pole Bridge Road) Existing one left turn lane, one shared left turn/through lane, one through lane and one channelized right turn lane.
   Northbound Approach: (US Route 13) Existing two left turn lanes, three through lanes and one channelized right turn lane.
   Southbound Approach: (US Route 13) Existing two left turn lanes, three through lanes, and one channelized right turn lane.

6. **US Route 13 / Cox Neck Road (New Castle Road 411)**
   Type of Control: Existing signalized intersection (Three-legged).
   Westbound Approach: (Cox Neck Road) Existing one left turn lane and one right turn lane.
   Northbound Approach: (US Route 13) Existing one left turn lane, two through lanes and one right turn lane.
   Southbound Approach: (US Route 13) Existing one left turn lane and two through lanes.

7. **Site Entrance C / US Route 13**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Site Entrance C) Proposed one right turn lane, stop controlled.
   Northbound Approach: (US Route 13) Existing two through lanes; proposed two through lanes and one right turn lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, there are no bus routes that run through the study area.

Planned transit service: Per email correspondence on December 5, 2022, with Mr. Jared Kauffman, Fixed Route Planner for DART, the Delaware Transit Corporation does not have any transit specific comments for this project.

Existing bicycle and pedestrian facilities: According to DelDOT's New Castle County Bicycle Map, several study roadways are considered bicycle routes. Port Penn Road, US Route 13 north of Port Penn Road and south of Cox Neck Road, and Cox Neck Road are considered statewide bicycle routes. US Route 13 south of Port Penn Road, Pole Bridge Road, and Boyds Corner Road are considered connector bicycle routes. Bicycle lanes exist on US Route 13 in the northbound and southbound directions. Pedestrian crosswalks exist at the US Route 13 intersection with Boyds Corner Road and Pole Bridge Road.

Planned bicycle and pedestrian facilities: Per email correspondence dated January 4, 2023 and March 10, 2022, from Mr. John Fiori, DelDOT's Bicycle Coordinator and Ms. Linda Osiecki, DelDOT's Pedestrian Coordinator, the following improvements were recommended:

- Per the DelDOT SUP/Sidewalk Policy a non-motorized facility is not required unless an existing facility abuts to the property, or the site generates over 2,000-trips per day. Although there are no existing facilities, it is recommended to install a 10-foot wide shared-use path along both property frontages with an angled termination into the shoulder where shoulder/bike lane is at least 5 feet wide.
    - If the SUP is installed, crosswalks will be required at both entrances.
- It is recommended that a pedestrian crossing of Port Penn Road with pedestrian signals and SUP connections on both sides be installed.
- An internal connection from the SUP along both entrances will be required.
- It is requested that internal bicycle racks be installed.
- Per the Development Coordination Manual (DCM) the site shall dedicate right-of-way per the roadway classification and establish a 15-foot-wide permanent easement along all property roadway frontages.
- Pedestrian crossings of all intersections with US Route 13 with pedestrian signals and SUP connections on both sides.
- There is an existing bike lane along US Route 13 and through the right turn lane. Therefore, 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 separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).

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 Bicycle On-Road Network Level of Traffic Stress map from the April 2018 Blueprint for a Bicycle-Friendly Delaware document which can be found on the following website:
https://deldot.gov/Publications/plans/bikeandped/pdfs/DelDOTBikePlan043018FINAL.pdf

- US Route 13 LTS: 4
- Port Penn Road LTS: 4

Crash Evaluation

Per the crash data included in the TIS from October 6, 2018, to October 6, 2021, provided by the Delaware Department of Transportation (DelDOT), a total of 144 crashes were reported within the

study area. Of the 144 crashes reported, one fatality occurred. The fatal crash was reported at the US Route 13 and Port Penn Road intersection as an angle collision caused by the driver disregarding the traffic signal. The conditions at the time of the fatal crash were dark-lightened, clear sky, and dry weather.

The US Route 13 intersection with Boyds Corner Road and Pole Bridge Road had 59 crashes reported including 24 rear-end, one head-on, nine angle, 14 sideswipe, one rear to side, one unknown, and 9 not a collision between two vehicles.

The US Route 13 and Port Penn Road intersection had 43 crashes reported including 24 rear-end, one head on, seven angle, five sideswipe, one other, and five not a collision between two vehicles.

The US Route 13 and Hyetts Corner Road intersection had 17 crashes reported including 11 rear-end, one sideswipe, one unknown, and four not a collision between two vehicles.

The area near the proposed Site Entrance B and US Route 13 intersection had 15 crashes reported including 13 rear-end, one head-on, and one not a collision between two vehicles.

The remaining intersections each reported less than 10 crashes within the three-year study period.

Previous Comments

All comments from the PTIS have been addressed in the Final TIS.

Sight Distance Evaluation

No sight distance constraints were noted at the site entrances per a field visit conducted on December 7, 2022.

General HCS Analysis Comments

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

1) JMT used version 7.9.5 of HCS7 to complete the analysis, whereas the TIS utilized HCM 6th Edition outputs from Synchro 10.

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 analysis, 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 the analysis of future scenarios, whereas the TIS did not.

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 in the analyses, whereas the TIS did not.

4) Per DelDOT's *Development Coordination Manual,* JMT and the TIS 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.

5) JMT incorporated right-turn-on-red vehicles per hour at the signalized intersections based on the provided manual turning movement count.

6) For the signalized intersection analysis, both JMT and the TIS utilized a saturation flow rate of 1,900 vehicles per lane per hour.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS [2]**		**LOS per JMT**	
Site Entrance A / Port Penn Road [3]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 with Development (Case 3) *with full access [4]*				
Westbound Port Penn Road Left Turn	A (7.8)	A (8.0)	A (7.8)	A (8.2)
Northbound Site Entrance A Approach	C (17.4)	C (15.4)	C (19.7)	C (19.5)
2023 with Development (Case 3) *with rights-in/rights-out/lefts-in only [5]*				
Westbound Port Penn Road Left Turn	-	-	A (7.9)	A (8.2)
Northbound Site Entrance A Approach	-	-	B (11.7)	B (12.7)

[1] For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] JMT utilized version 7.9.5 of HCS7 to complete analysis per the September 30, 2021 DelDOT Scoping Meeting Memorandum, whereas the TIS utilized Synchro 10.
[3] JMT modeled the eastbound and westbound Port Penn Road approaches with shared lanes, whereas the TIS modeled the approaches with separate turn lanes.
[4] The TIS and JMT analyzed Site Entrance A as a full access entrance onto Port Penn Road.
[5] JMT conducted an additional analysis considering the restriction of lefts-out at the Port Penn Road intersection.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS** [2]		**LOS per JMT**	
Site Entrance B / US Route 13 [6]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 with Development (Case 3) *with full access along Port Penn Road* [4]				
Westbound Site Entrance B Approach	D (26.5)	C (15.5)	D (25.9)	C (15.5)
2023 with Development (Case 3) *with rights-in/rights-out/lefts-in only along Port Penn Road* [5]				
Westbound Site Entrance B Approach	-	-	F (100.9)	C (23.9)

[6] Both JMT and the TIS modeled the intersection with a separate right turn lane along northbound US Route 13.

Table 4a
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Signalized Intersection [1]	**LOS per TIS** [2]		**LOS per JMT**	
US Route 13 / Port Penn Road [7]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1) *with DelDOT Timing*	-	-	D (45.4)	D (44.8)
2021 Existing (Case 1) *with Optimization* [8]	D (45.6)	D (41.4)	D (37.8)	C (33.8)
2023 without Development (Case 2) *with Optimization* [8]	F (90.8)	E (56.1)	E (73.1)	D (45.2)
2023 without Development (Case 2) *with Improvement I* [9]	-	-	E (60.9)	D (44.0)
2023 without Development (Case 2) *with Improvement II* [10]	-	-	C (29.6)	C (25.6)
2023 with Development (Case 3) *with Optimization* [8]	F (107.8)	E (66.5)	F (97.5)	E (60.5)
2023 with Development (Case 3) *with rights-in/rights-out/lefts-in only along Port Penn Road* [5]	-	-	E (67.0)	D (45.4)
2023 with Development (Case 3) *with Improvement I* [9]	-	-	E (77.3)	D (54.6)
2023 with Development (Case 3) *with Improvement II* [10]	-	-	D (41.9)	D (34.8)

[7] JMT utilized an arrival type of 4 along US Route 13 to account for the signal coordination along the corridor, whereas the TIS used the default arrival type of 3.

[8] Signal optimization scenario includes optimizing split times while maintaining existing cycle lengths from the DelDOT timing sheets.

[9] JMT performed an additional analysis which configured the intersection with one left turn lane, one through lane, and one right turn lane along the westbound Port Penn Road intersection. All other intersection approaches were maintained as existing.

[10] JMT performed an additional analysis which configured the intersection with two left turn lanes along the northbound US Route 13 approach. All other intersection approaches were maintained as existing.

Table 4b
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Signalized Intersection [1]	**LOS per TIS [2]**		**LOS per JMT**	
US Route 13 / Port Penn Road[11]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 without Development (Case 2) *with Optimization [8]*	-	-	E (61.3)	C (34.9)
2023 without Development (Case 2) *with Improvement I [9]*	-	-	D (49.6)	C (33.5)
2023 with Development (Case 3) *with Optimization [8]*	-	-	F (80.9)	D (48.7)
2023 with Development (Case 3) *with Improvement I [9]*	-	-	E (62.5)	D (45.4)

[11] JMT conducted an additional calculation based on HCM 6th Edition of the intersection delay without the Northbound US Route 13 left turn lane.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Signalized Intersection [1]	**LOS per TIS** [2]		**LOS per JMT**	
US Route 13 / Hyetts Corner Road [7]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1) *with DelDOT Timing*	-	-	B (12.0)	B (11.2)
2021 Existing (Case 1) *with Optimization* [8]	C (26.3)	B (15.4)	A (9.8)	A (6.3)
2023 without Development (Case 2) *with Optimization* [8]	E (73.8)	F (107.5)	C (26.6)	E (55.8)
2023 without Development (Case 2) *with Improvement I* [12]	-	-	B (14.1)	D (38.6)
2023 with Development (Case 3) *with Optimization* [8]	E (75.2)	F (112.8)	D (40.8)	E (57.9)
2023 with Development (Case 3) *with Improvement I* [12]	-	-	B (19.4)	D (37.5)

[12] The Improvement I scenario includes providing a separate right turn lane along the eastbound Hyetts Corner Road approach.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Signalized Intersection [1]	**LOS per TIS [2]**		**LOS per JMT**	
US Route 13 & Boyds Corner Road/Pole Bridge Road [7]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1) *with DelDOT Timing*	-	-	C (31.5)	D (36.1)
2021 Existing (Case 1) *with Optimization [8]*	D (37.1)	D (39.1)	C (29.5)	C (33.4)
2023 without Development (Case 2) *with Optimization [8]*	D (49.9)	F (114.1)	D (37.7)	F (78.0)
2023 without Development (Case 2) *with SNCC TID Improvements [13]*	-	-	C (33.6)	D (47.3)
2023 with Development (Case 3) *with Optimization [8]*	D (50.3)	F (117.0)	D (38.0)	F (80.3)
2023 with Development (Case 3) *with SNCC TID Improvements [13]*	-	-	C (34.0)	D (47.6)

[13] JMT conducted an additional analysis incorporating the improvements planned as part of the Southern New Castle County TID.

Table 7
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Signalized Intersection [1]	**LOS per TIS** [2]		**LOS per JMT**	
US Route 13 / Cox Neck Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1) *with DelDOT Timing*	-	-	C (20.6)	C (25.6)
2021 Existing (Case 1) *with Optimization* [8]	C (25.3)	B (17.5)	B (16.4)	B (17.9)
2023 without Development (Case 2) *with Optimization* [8]	C (22.3)	B (14.6)	B (18.4)	B (16.8)
2023 with Development (Case 3) *with Optimization* [8]	C (22.3)	B (14.9)	B (18.4)	B (17.2)

Table 8
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for 2120 DuPont Parkway Royal Farms #379
Report Dated: November 16, 2022
Prepared by: Traffic Planning and Design, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS** [2]		**LOS per JMT**	
Site Entrance C / US Route 13 [14]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 with Development (Case 3) *with full access along Port Penn Road* [4]				
Westbound Site Entrance C Approach	D (25.4)	C (15.1)	D (26.5)	C (15.7)
2023 with Development (Case 3) *with rights-in/rights-out/lefts-in only along Port Penn Road* [5]				
Westbound Site Entrance C Approach	-	-	F (54.8)	C (19.5)

[14] Both JMT and the TIS modeled the intersection with a separate right turn lane along northbound US Route 13.