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

SHANTÉ A. HASTINGS
SECRETARY

July 11, 2025

Nicole Kline-Elsier, P.E., PTOE
Bowman Consulting Group, Ltd.
835 Springdale Drive, suite 200
Exton, PA 19341

Dear Ms. Kline-Elsier,

The enclosed Traffic Impact Study (TIS) review letter for the **Smyrna Wawa** (Tax Parcel: 1502200070, 1502200071) 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. 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

AF:km
Enclosures
cc with enclosures: Kathryn Cornforth, Wawa Inc.
Steve Fortunato, Bohler Engineering
David Kuklish, Bohler Engineering
Jena Cooper, Bohler Engineering
Braden Garrison, Bowman Consulting Group, Ltd.
David L. Edgell, Office of State Planning Coordination
Jeremy Rothwell, Town of Smyrna
Antoni Sekowski, New Castle County Department of Land Use
Dawn Thompson, 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

DelDOT Distribution

Lanie Clymer, Deputy Secretary
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
Anthony Aglio, Planning Supervisor, Active Transportation & Community Connections, Planning
Anson Gock, Planner, Statewide & Regional Planning, Planning
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
Randhir Sharma, New Castle Review Coordinator, Development Coordination
Michael White, New Castle Review Engineer, Development Coordination
Sireen Muhtaseb, TIS Engineer, Development Coordination
Ben Fisher, TIS Review Engineer, Development Coordination
Tijah Jones, TIS Review Engineer, Development Coordination

July 10, 2025

Ms. Sireen Muhtaseb, P.E.
TIS Group Manager
Delaware Department of Transportation
Development Coordination
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202369005
Traffic Impact Study Services
Task 17-11 Wawa Smyrna TIS

Dear Ms. Muhtaseb:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the Wawa Smyrna development which was prepared by Bowman Consulting Group, Ltd. dated March 14, 2024. This review was assigned as Task Number 17-11. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual* and other Department standards.

The TIS evaluates the impacts to replace the existing 3,329 square foot convenience store with a 5,585 square-foot convenience store with 16 fueling positions in New Castle County, Delaware. The development proposes an annexation into the Town of Smyrna. A trip generation comparison between the existing and proposed developments is on page 12.

The site is located on the northeast corner of the DuPont Parkway (US Route 13) intersection with Paddock Road (New Castle Road 30). The proposed site is on an approximate 3-acre parcel (Tax Parcel: 15-022.00-071) which is currently zoned as CR (Commercial Regional) in New Castle County. The developer plans to rezone the property to CCM (Corridor Commercial).

One full access entrance is proposed along Paddock Road and one rights-in/rights-out entrance is proposed along DuPont Parkway (US Route 13). Construction is anticipated to be complete in 2026.

Relevant and On-Going Projects and Studies

DelDOT completed the *US 13 North Smyrna Corridor Concept Study* which identified pedestrian, bicycle, and transit facility improvements along US Route 13 from Duck Creek Road to East North Street. The recommended improvements within the TIS study area include a shared-use path along both directions of DuPont Parkway (US Route 13) and a pedestrian crosswalk at each leg of the DuPont Parkway (US Route 13) intersection with Paddock Road and Joe Goldsborough Road. The *US 13, Duck Creek to SR 1* DelDOT project (DelDOT Contract No. T202012401) is currently on hold but will implement the improvements identified as part of the *US 13 North Smyrna Corridor Concept Study*. A construction start date has not been identified for the *US 13, Duck Creek to SR*

1 DelDOT project. However, the project is within the DelDOT CTP for FY25-FY30 and Preliminary Engineering is allocated to begin in FY 2026.

DelDOT is also coordinating on leased lighting along DuPont Parkway (US Route 13), from Glenwood Avenue to the Smyrna Rest Area.

Summary of Analysis Results

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

None of the site entrances exhibit level of service (LOS) deficiencies with or without the proposed development. The DuPont Parkway (US Route 13) intersection with Paddock Road does exhibit LOS deficiencies under Case 3 (2026 Future with development) conditions during the weekday AM peak period but is mitigated with signal timing optimization.

Although the Paddock Road intersection with Site Entrance B does not exhibit LOS deficiencies under existing or future conditions (with or without the proposed development), DelDOT requested that additional entrance scenarios be evaluated due to near misses at Site Entrance B. Specifically, the near misses involved vehicles exiting from Site Entrance B almost colliding with vehicles along eastbound Paddock Road. The additional entrance scenarios were also evaluated due to the long queue lengths calculated along the westbound Paddock Road approach to DuPont Parkway (US Route 13) which would spillback past Site Entrance B during the weekday AM and PM peak hours. Site Entrance B is located approximately 200 feet east of the DuPont Parkway (US Route 13) intersection. The additional entrance scenarios evaluated include:

a. Scenario 1
    i. DuPont Parkway (US Route 13) Site Entrance A as rights-in/rights-out
    ii. Paddock Road Site Entrance B as rights-in/rights-out

b. Scenario 2
    i. DuPont Parkway (US Route 13) Site Entrance A as rights-in/rights-out
    ii. Paddock Road Site Entrance B as rights-in/rights-out/lefts-out

c. Scenario 3
    i. DuPont Parkway (US Route 13) Site Entrance A as rights-in/rights-out
    ii. Paddock Road Site Entrance B as rights-in/rights-out/lefts-in

For each scenario, the DuPont Parkway (US Route 13) intersection with Site Entrance A and the Paddock Road intersection with Site Entrance B would operate at acceptable LOS. However, the DuPont Parkway (US Route 13) intersection with Paddock Road would operate at LOS E (73 seconds of delay per vehicle under Scenario 1, 59 seconds of delay per vehicle under Scenario 2, and 64 seconds of delay per vehicle under Scenario 3). As part of the Duck Creek Business Campus TIS review letter dated July 18, 2014, both the eastbound Joe Goldsborough Road and the westbound Paddock Road approaches to DuPont Parkway (US Route 13) were recommended to be widened. Specifically, the eastbound Joe Goldsborough Road approach was recommended to

be widened to provide one left-turn lane and one shared through/right-turn lane and the westbound Paddock Road approach was recommended to be widened to provide one left turn lane, one through lane, and one right-turn lane. With those improvements, the intersection would improve to operate at acceptable LOS during all peak hours under Scenarios 1, 2, and 3.

The Duck Creek Business Campus TIS review letter indicates that the implementation of the recommended additional lanes can be deferred until the Duck Creek Business Campus entrance along Paddock Road is constructed. Under existing conditions, an entrance to the Duck Creek Business Campus is not available along Paddock Road. Therefore, it is not recommended that the Wawa Smyrna development construct the additional lanes along the Joe Goldsborough Road and Paddock Road approaches. However, it is recommended that the Wawa Smyrna development enter into an agreement with DelDOT to contribute to the Traffic Signal Revolving Fund (TSRF) for the DuPont Parkway (US Route 13) intersection with Paddock Road/Joe Goldsborough Road.

With or without the additional lanes along Paddock Road and Joe Goldsborough Road, the westbound Paddock Road approach queue would spill back past Site Entrance B. Site Entrance B is located approximately 200 feet east of the DuPont Parkway (US Route 13) intersection and the calculated 95th percentile queue length along the westbound Paddock Road approach is approximately 450 feet under all scenarios. Additionally, based on field conditions, there are sight distance constraints when exiting Site Entrance B onto Paddock Road due to a row of trees along Paddock Road that obstruct the view of oncoming westbound traffic. Furthermore, the future installation of an additional lane along the westbound Paddock Road approach to DuPont Parkway (US Route 13) by the Duck Creek Business Campus would increase the needed sight distance to execute left outs from Entrance B. As such, it is recommended that the Wawa Smyrna development restripe the northbound right turn lane along the northbound DuPont Parkway (US Route 13) approach to Paddock Road to not be yield controlled and that left turn movements out of Site Entrance B be restricted. The existing bypass lane along the westbound Paddock Road approach to Site Entrance B should be maintained.

Development Improvements

Should the Town of Smyrna 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.

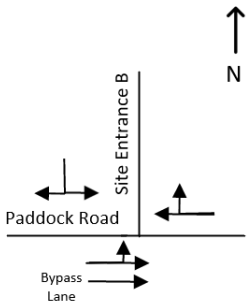
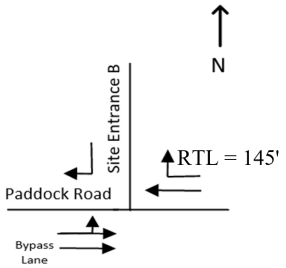
1. The developer shall improve the State-maintained Roads on which they front (DuPont Parkway (US Route 13) and Paddock Road), within the limits of their frontage. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. "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 coordinate with DelDOT's Development Coordination Section during the Site Plan review regarding the right-of-way dedications/reservations necessary for the additional lanes along Paddock Road that are to be constructed as part of the Duck Creek Business Campus development.

3. The developer should maintain the existing unsignalized Site Entrance A rights-in/rights-out only access for the Wawa Smyrna development along DuPont Parkway (US Route 13), approximately 355 feet north of Paddock Road. Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the northbound right turn lane is 410 feet. However, due to storage length limitations as a result of the distance between Site Entrance A and the Paddock Road intersection, a minimum storage length (excluding taper) of 300 feet is recommended. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

4. The developer should reconstruct the existing unsignalized Site Entrance B, located approximately 200 feet east of the DuPont Parkway (US Route 13) intersection, to a rights-in/rights-out/lefts-in access only for the Wawa Smyrna development along Paddock Road. The existing bypass lane along Eastbound Paddock Road should be maintained. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Paddock Road	One shared left turn/through lane and one bypass lane		Eastbound Paddock Road	No Change	
Westbound Paddock Road	One shared through/right turn lane		Westbound Paddock Road	One through lane and one right turn lane	
Southbound Site Entrance B	One shared left turn/right turn lane		Southbound Site Entrance B	One right turn lane	

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the westbound right turn lane is 145 feet which is based on a radius greater than 50 feet as identified on the September 2023 Site Plan. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

5. The developer should restripe the northbound US Route 13 right turn lane onto Paddock Road with a stop bar and remove the YIELD condition. 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.

6. The developer should enter into an agreement with DelDOT to contribute to the Traffic Signal Revolving Fund (TSRF) at the US Route 13 intersection with Paddock Road. The contribution amount is $124,197.00

7. The developer should modify the DuPont Parkway (US Route 13) median crossover approximately 270 feet north of Site Entrance A to only allow U-turn and left turn movements along DuPont Parkway (US Route 13). A concrete island should be installed at the median crossover to formalize the movements.

8. The developer should install a concrete curb between the northbound DuPont Parkway (US Route 13) through lane and left turn lane at the median crossover approximately 270 feet north of Site Entrance A to prevent motorists exiting Site Entrance A from accessing the median crossover. The concrete curb should start at the median crossover and extend past Site Entrance A.

9. A cross access easement to the eastern parcel (Tax Parcel 28-002.00-039) should be provided.

10. 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 DuPont Parkway (US Route 13) and Paddock Road site frontages. Along the frontage, the developer should construct a ten-foot-wide shared use path (SUP). The SUP 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 SUP/sidewalk. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.

    b. Internal connections from the SUP along both DuPont Parkway (US Route 13) and Paddock Road into the site are required.

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

d. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the DuPont Parkway (US Route 13) and Paddock Road approaches to the site entrances.

e. 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.

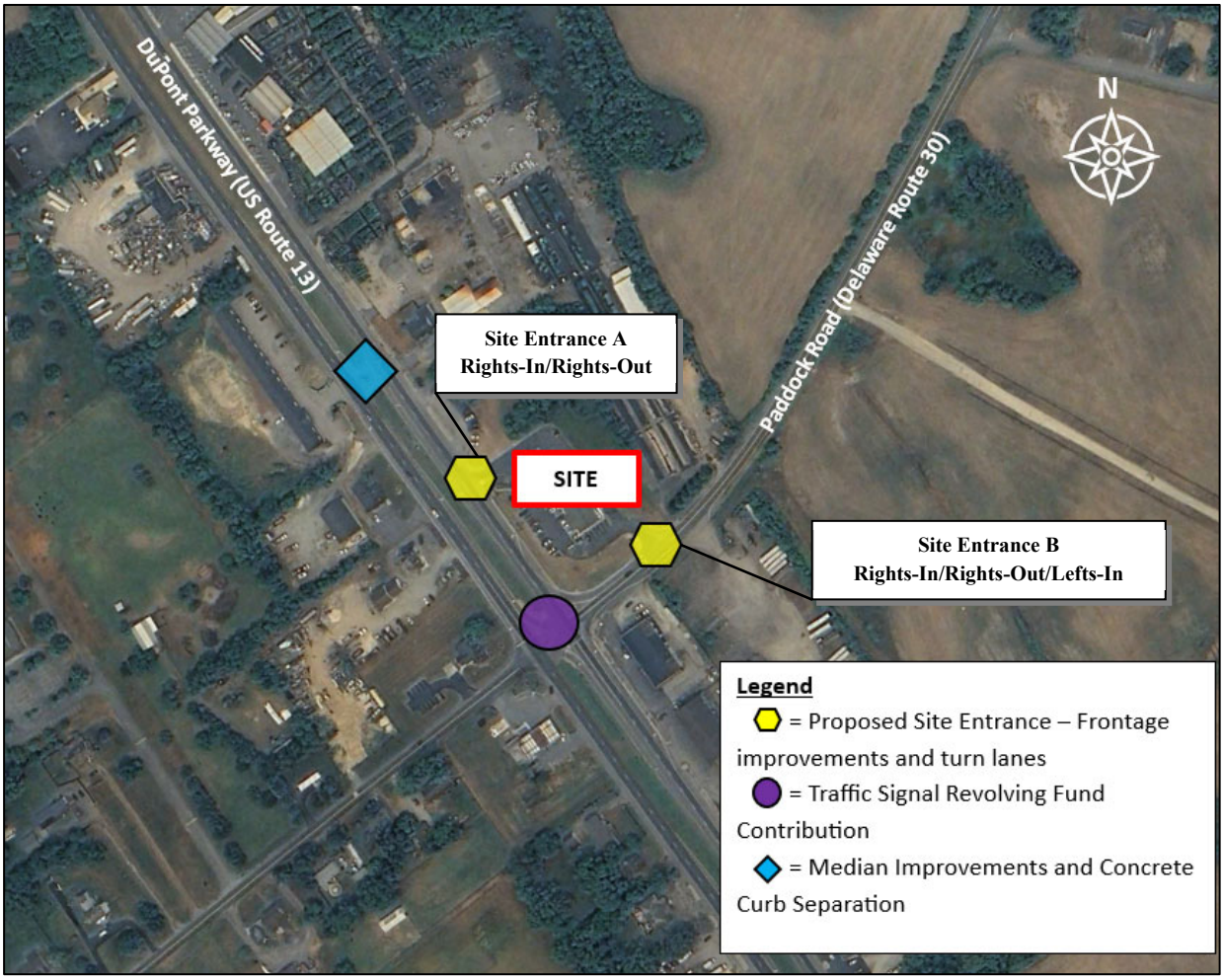
Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

cc: Annamaria Furmato, EIT
Mir Wahed, P.E., PTOE
Nate Rahaim, P.E., PTOE
Enclosure

Recommendations Map



General Information

Report date: March 14, 2024
Prepared by: Bowman Consulting Group, Ltd.
Prepared for: Wawa Inc.
Tax parcel: 15-022.00-071
Generally consistent with DelDOT's Development Coordination Manual (DCM): Yes

Project Description and Background

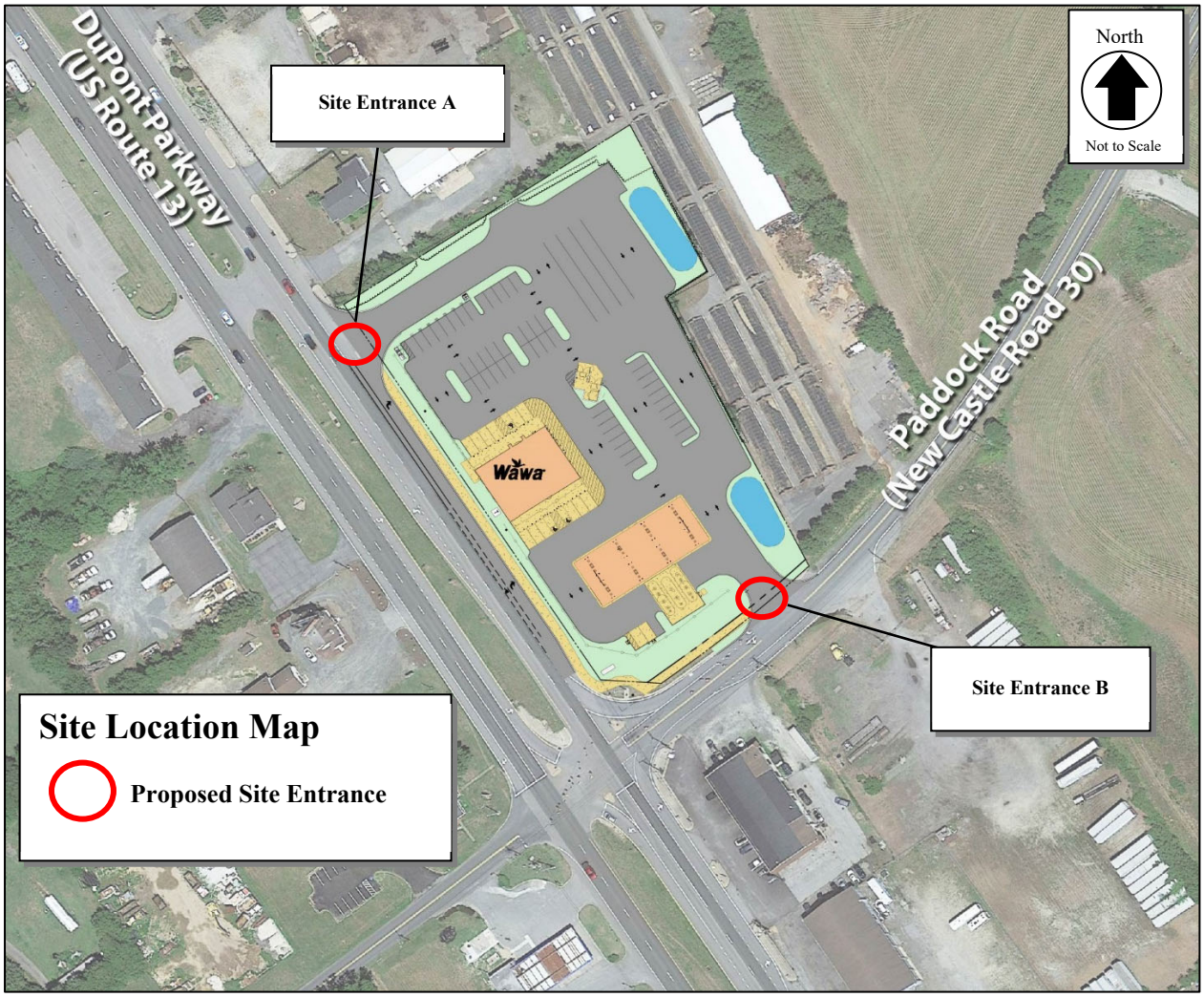
Description: The proposed development consists of a 5,585 square-foot convenience store/gas station with 16 vehicle fueling positions.
Location: The site is located on the northeast corner of the DuPont Parkway (US Route 13) and Paddock Road intersection in New Castle County, Delaware. The developer proposes for the site to be annexed into the Town on Smyrna.
Amount of land to be developed: An approximately 3-acre parcel.
Land use approval(s) needed: Entrance Plan, Rezoning.
Proposed completion date: 2026
Proposed access locations: Two access points are proposed: one full access on Paddock Road and one rights-in/rights-out on DuPont Parkway (US Route 13).

Daily traffic volumes:

- 2023 Average Annual Daily Traffic on Paddock Road: 2,283 vehicles per day.
- 2023 Average Annual Daily Traffic on DuPont Parkway (US Route 13): 11,463 vehicles per day.

*AADT is calculated from daily volume data contained within the TIS report. Data taken from six full days starting November 3, 2023.

Site Map



**Graphic is an approximation based on the Wawa Smyrna Site Plan – Overview prepared by Bohler dated September 20, 2023.*

Relevant and On-going Projects

DelDOT completed the *US 13 North Smyrna Corridor Concept Study* which identified pedestrian, bicycle, and transit facility improvements along US Route 13 from Duck Creek Road to East North Street. The recommended improvements within the TIS study area include a shared-use path along both directions of DuPont Parkway (US Route 13) and a pedestrian crosswalk at each leg of the DuPont Parkway (US Route 13) intersection with Paddock Road and Joe Goldsborough Road. The *US 13, Duck Creek to SR 1* DelDOT project (DelDOT Contract No. T202012401) is currently on hold but will implement the improvements identified as part of the *US 13 North Smyrna Corridor Concept Study*. A construction start date has not been identified for the *US 13, Duck Creek to SR 1* DelDOT project. However, the project is within the DelDOT CTP for FY25-FY30 and Preliminary Engineering is allocated to begin in FY 2025.

DelDOT is also coordinating on leased lighting along DuPont Parkway (US Route 13), from Glenwood Avenue to the Smyrna Rest Area.

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 mainly within Investment Level 2 with a small portion of the site within Investment Level 1.

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 a variety of 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, and to promote well-designed and efficient new growth 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. Investment Level 1 Areas are ideal locations for Transportation Improvement Districts as well as Complete Community Enterprise Districts. Further, Level 1 areas are the first priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity of neighborhoods and public facilities.

Investment Level 2

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

In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use its

spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

Level 2 Areas share similar priorities as with the Level 1 Areas where the aim remains to: make context sensitive transportation system capacity enhancements, preserve existing facilities, make safety enhancements, make transportation system capacity improvements, create transit system enhancements, ensure ADA accessibility, and close gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 2 Areas are ideal locations for Transportation Improvement Districts and Complete Community Enterprise Districts. Other priorities for Level 2 Areas include: Corridor Capacity Preservation, off-alignment multi-use paths, interconnectivity of neighborhoods and public facilities, and signal-system enhancements.

Proposed development's compatibility with Livable Delaware:
The proposed development is located within Investment Level 1 and Level 2. Investment Level 1 and Level 2 areas are the most favorable locations for redevelopment and increasing pedestrian accessibility. The proposed development is a redevelopment of an existing convenience market without vehicle fueling, to a convenience market with 16 vehicle fueling positions. Additionally, the proposed development plans to install a shared use path on its perimeter along Paddock Road and DuPont Parkway and a bike lane along DuPont Parkway. Therefore, the proposed development is consistent with the 2020 update of Livable Delaware Strategies for State Policies and Spending.

Comprehensive Plan

(Source: New Castle County Comprehensive Plan, 2022)

New Castle County Comprehensive Plan:
Per the Current Zoning Map, the development is zoned as Commercial Regional. Per the Future Land Use Map, the developed is zoned as Business Flex.

Proposed development's compatibility with New Castle County Comprehensive Plan:
The Comprehensive Plan states that Business Flex areas consist of nonresidential developments including commercial, office and business districts. The developer plans to rezone the proposed development to Corridor Commercial which is not included within the Business Flex zoning districts. The Corridor Commercial zoning district is within the Type 1 Commercial Corridor Development zone. Therefore, the development is not consistent with the 2022 update of New Castle County Comprehensive Plan. However, the development is proposing an annexation into the Town of Smyrna.

(Source: Town of Smyrna Comprehensive Plan, 2020)

Town of Smyrna Comprehensive Plan:
The developer proposes an annexation into the Town of Smyrna. The Comprehensive Plan does not have data regarding the location of the development.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 11th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 945 (Convenience Store/Gas Station) and ITE Land Use Code 851 (Convenience Store).

Table 1
Wawa Smyrna Trip Generation

Land Use	ADT	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Proposed 5,585 square-foot Convenience Store/Gas Station (ITE 945)	7,174	255	256	511	221	220	441	196	196	392
Existing 3,329 square-foot Convenience Store (ITE 851)	-2,538	-104	-104	-208	-83	-81	-164	-132	-131	-263
Net Total Trips	**4,636**	**151**	**152**	**303**	**138**	**139**	**277**	**64**	**65**	**129**
Pass-by Trips	**-439**	**-115**	**-116**	**-231**	**-104**	**-104**	**-208**	**-48**	**-49**	**-97**
New Trips	**4,197**	**36**	**36**	**72**	**34**	**35**	**69**	**16**	**16**	**32**

Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

Overview of TIS

Intersections examined:

1. Site Entrance A / DuPont Parkway (US Route 13)
2. Site Entrance B / Paddock Road (New Castle Road 30)
3. DuPont Parkway / Paddock Road / Joe Goldsborough Road (New Castle Road 487)

Conditions examined:

1. Case 1 – 2023 existing
2. Case 2 – 2026 without development
3. Case 3 – 2026 with development

Committed developments considered:

1. Duck Creek Business Campus – 420,000 square feet general office; 273,000 square feet warehouse; 337,000 square feet distribution facility; 350,000 square feet light industrial.
2. Tappahanna at Watson Farm – 300 low-rise apartments; 136 townhomes.

The committed development information contained within the TIS report supersedes the October 19, 2023, Scoping Meeting Memorandum.

Peak hours evaluated: Weekday AM, weekday PM and Saturday midday.

Intersection Descriptions

1. **Site Entrance A / DuPont Parkway (US Route 13)**
   Type of Control: Existing rights-in/rights-out entrance.
   Northbound Approach: (DuPont Parkway) Existing one left turn lane*, two through lanes and one right turn lane.
   Westbound Approach: (Site Entrance A) Existing one right turn lane.

   *Existing northbound left turn lane is for the median crossover located along US Route 13, approximately 270 feet north of Site Entrance A.

2. **Site Entrance B / Paddock Road (New Castle Road 30)**
   Type of Control: Existing two-way stop controlled intersection.
   Southbound Approach: (Paddock Road) Existing one shared through/right turn lane.
   Northbound Approach: (Paddock Road) Existing one shared left turn/through lane and one bypass lane.
   Eastbound Approach: (Site Entrance B) Existing one shared left turn/right turn lane.

3. **DuPont Parkway / Paddock Road / Joe Goldsborough Road (New Castle Road 487)**
   Type of Control: Existing signalized intersection.
   Southbound Approach: (DuPont Parkway) Existing one channelized left turn lane, two through lanes and one right turn lane.
   Northbound Approach: (DuPont Parkway) Existing one channelized left turn lane, two through lanes and one channelized right turn lane.
   Eastbound Approach: (Joe Goldsborough Road) Existing one shared left turn/through/right turn lane. Proposed one left turn lane and one shared through/right turn lane.*
   Westbound Approach: (Paddock Road) Existing one shared left-turn/through lane and one channelized right turn lane. Proposed one left turn lane, one through lane and one channelized right turn lane.*

   **Proposed lane configurations are improvements identified within the Wawa Smyrna TIS Report.*

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, DART operates Routes 120, 301 and 302 along DuPont Parkway (US Route 13). No bus stops exist at the study intersections. The Smyrna Rest

Area and Park and Ride is located along DuPont Parkway (US Route 13), approximately 1,800 feet north of the site.

Planned transit service: Per email correspondence from Jared Kauffman, DART Fixed-Route Planner, on May 2, 2024, it is recommended that a direct pedestrian pathway be provided into the building from the shared use paths.

Existing bicycle and pedestrian facilities: Per DelDOTs New Castle County Bicycle Map DuPont Parkway, Paddock Road and Joe Goldsborough are considered connector bicycle routes. No pedestrian facilities exist within the study area.

Planned bicycle and pedestrian facilities: Per email correspondence from Linda Osiecki, DelDOT's Pedestrian Coordinator, on May 9, 2024, DelDOT has the following recommendations:

- Provide shared use path for US Route 13 and Paddock Road frontages.
    - Extend frontage shared use path to both property lines for the entrances.
- Provide pedestrian access into the site from the frontage shared use path.
- Provide pedestrian crossings of Paddock Road, Joe Goldsborough Road (Route 487) and US Route 13 at the signalized intersection.

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 DelDOT's Gateway.

- DuPont Parkway (US Route 13) LTS: 3 and 4
- Paddock Road LTS: 4

Crash Evaluation

Per the crash data included in the TIS from December 4, 2020, to December 4 2023, provided by the Delaware Department of Transportation (DelDOT), a total of 32 crashes were reported within the study area. Of the 32 crashes, one fatality occurred. The fatal crash occurred between a vehicle and a pedestrian in daylight with clear and dry conditions.

Per the TIS, the crashes reported were 12 rear-end, two head-on, ten angle, five sideswipe, and three not a collision between two vehicles.

Previous Comments

All comments from the January 11, 2024 Preliminary TIS Review Letter were addressed in the Final TIS.

Sight Distance Evaluation

A sight distance constraint was noted at the proposed Site Entrance B location per a field visit conducted on March 26, 2024. The sight distance constraint occurs when exiting Site Entrance B onto Paddock Road. The constraint is due to a row of trees on Paddock Road, blocking the view of oncoming westbound traffic.

General Synchro Analysis Comments

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

1) Both the TIS and JMT used HCM 7th Edition Results from Synchro 12 software to complete the analysis.

2) Per DelDOT's *Development Coordination Manual*, JMT utilized the future intersection PHF 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 used the existing PHF if higher, whereas the TIS utilized various PHF.

3) JMT utilized the existing heavy vehicle percentage for each movement greater than 100 vph in the Case 1 existing scenario while the TIS utilized the existing heavy vehicle percentage for each movement.

4) 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 in the analyses whereas the TIS utilized the existing heavy vehicle percentage.

5) Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in 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 used different values.

6) Both JMT and the TIS utilized existing signal timings for existing conditions (Case 1).

7) Both JMT and the TIS utilized a Saturation Flow Rate of 1,750 vehicles per hour per lane.

8) Based on comments received from DelDOT after the submission of the TIS, JMT evaluated the following additional entrance scenarios for the Case 3 conditions where Site Entrance B was reconfigured as:
    a. Scenario 1 – Site Entrance B reconfigured to be a rights-in/rights-out only entrance.
    b. Scenario 2 – Site Entrance B reconfigured to be a rights-in/rights-out/lefts-out only entrance.
    c. Scenario 3 – Site Entrance B reconfigured to be a rights-in/rights-out/lefts-in only entrance.

9) The analysis highlighted in gray represent the JMT recommendations as part of the TIS Review letter.

Table 2
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Smyrna Wawa
Report Dated: March 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**			**LOS per JMT**		
1. Site Entrance A (RI/RO) and DuPont Parkway (US Route 13)	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
Case 1 - Existing 2023						
Westbound Site Entrance A Approach	C (15.5)	B (12.8)	B (11.2)	C (15.5)	B (12.8)	B (11.2)
Case 2 - 2026 without Development						
Westbound Site Entrance A Approach	C (18.5)	C (16.5)	B (12.6)	C (17.2)	C (16.5)	B (12.8)
Case 3 – 2026 with Development						
Southbound Site Entrance A Approach	C (22.9)	C (18.3)	B (12.9)	C (20.5)	C (18.3)	B (13.2)
Case 3 – 2026 with Development *with Scenario 1*						
Southbound Site Entrance A Approach	-	-	-	C (24.3)	C (19.8)	B (13.5)
Case 3 – 2026 with Development *with Scenario 2*						
Southbound Site Entrance A Approach	-	-	-	C (20.5)	C (18.3)	B (13.2)
Case 3 – 2026 with Development *with Scenario 3*						
Southbound Site Entrance A Approach	-	-	-	C (22.5)	C (19.1)	B (13.4)

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

Table 3
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Smyrna Wawa
Report Dated: March 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**			**LOS per JMT**		
2. Site Entrance B / Paddock Road (New Castle Road 30)	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
Case 1 - Existing 2023						
Eastbound Paddock Road Left Turn	A (7.7)	A (8.1)	A (7.6)	A (7.7)	A (8.1)	A (7.6)
Southbound Site Entrance B Approach	A (12.0)	B (11.7)	A (9.9)	B (12.0)	B (11.7)	A (9.9)
Case 2 - 2026 without Development						
Eastbound Paddock Road Left Turn	A (7.9)	A (8.8)	A (7.9)	A (7.9)	A (8.7)	A (7.9)
Southbound Site Entrance B Approach	A (16.3)	C (15.2)	B (11.1)	C (16.4)	B (14.6)	B (11.1)
Case 3 - 2026 with development						
Eastbound Paddock Road Left Turn	-	-	-	A (8.2)	A (9.1)	A (7.9)
Eastbound Paddock Road Queue	-	-	-	15	13	8
Southbound Site Entrance B Approach	-	-	-	C (22.5)	C (17.2)	B (11.2)
Case 3 - 2026 with development *and Auxiliary Lanes along Paddock Road* [2]						
Eastbound Paddock Road Left Turn	A (8.2)	A (9.2)	A (8.0)	A (8.2)	A (9.1)	A (7.9)
Eastbound Paddock Road Queue	15	15	10	15	13	8
Southbound Site Entrance B Approach	C (20.1)	C (18.0)	B (11.6)	C (20.3)	C (16.7)	B (11.1)
Case 3 – 2026 with Development *with Scenario 1*						
Southbound Site Entrance B	-	-	-	A (9.7)	B (12.9)	A (9.6)
Case 3 – 2026 with Development *with Scenario 2*						
Southbound Site Entrance B	-	-	-	B (12.5)	B (14.3)	B (10.2)
Case 3 – 2026 with Development *with Scenario 3*						
Southbound Site Entrance B	-	-	-	A (9.9)	B (13.2)	A (9.7)
Eastbound Paddock Road Left Turn	-	-	-	A (8.2)	A (9.1)	A (7.9)
Eastbound Paddock Road Queue	-	-	-	16	13	8

[2] The intersection was configured with a separate left turn lane and through lane along the eastbound Paddock Road approach and a separate right turn lane and through lane along the westbound Paddock Road approach.

Table 4
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Smyrna Wawa
Report Dated: March 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1, 3]	**LOS per TIS**			**LOS per JMT**		
3. DuPont Parkway / Paddock Road / Joe Goldsborough Road (New Castle Road 487)[4]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
Case 1 - Existing 2023						
LOS (Delay)	C (23.5)	C (25.8)	C (22.1)	B (15.5)	B (17.8)	B (15.5)
Westbound Paddock Road Left Turn/Through Queue	140	208	124	140	208	124
Westbound Paddock Road Right Turn Queue	0	0	0	0	0	0
Southbound DuPont Parkway Left Turn Queue	45	23	27	45	23	27
Case 2 – 2026 without Development[5]						
LOS (Delay)	D (40.3)	C (27.0)	C (22.3)	D (44.0)	C (28.8)	C (25.0)
Westbound Paddock Road Left Turn/Through Queue	98	153	81	155	286	151
Westbound Paddock Road Right Turn Queue	0	66	7	0	0	0
Southbound DuPont Parkway Left Turn Queue	347	54	63	451	53	56
Case 3 – 2026 with Development[5]						
LOS (Delay)	-	-	-	E (75.1)	D (38.7)	C (28.5)
Westbound Paddock Road Left Turn/Through Queue	-	-	-	216	416	185
Westbound Paddock Road Right Turn Queue	-	-	-	0	63	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	553	164	71
Case 3 – 2026 with Development *with signal optimization*[5]						
LOS (Delay)	-	-	-	D (53.5)	D (37.2)	C (22.7)
Westbound Paddock Road Left Turn/Through Queue	-	-	-	383	372	183
Westbound Paddock Road Right Turn Queue	-	-	-	0	66	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	576	154	92

[3] The queues reported in the table are 95th Percentile queues using Synchro methodology measured in feet.

[4] As the intersection is located along US Route 13, JMT utilized an HCM Platoon Ratio of 4 to account for the improved coordination expected along the corridor whereas the TIS utilized the default value of 3.

[5] JMT modeled the intersection with the existing geometry as well as the side streets with split phase operations and the signal splits were maintained consistent with the existing DelDOT signal timing plans. The TIS did not model a scenario with the existing geometry under Case 3 conditions.

Table 4 (continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Smyrna Wawa
Report Dated: March 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1, 3]	**LOS per TIS**			**LOS per JMT**		
3. DuPont Parkway / Paddock Road / Joe Goldsborough Road (New Castle Road 487)[4]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
Case 3 – 2026 with Development *with Improvements*[6]						
LOS (Delay)	D (50.0)	C (31.7)	C (24.0)	-	-	-
Westbound Paddock Road Left Turn Queue	152	205	103	-	-	-
Westbound Paddock Road Through Queue	70	67	41	-	-	-
Westbound Paddock Road Right Turn Queue	0	62	7	-	-	-
Southbound DuPont Parkway Left Turn Queue	448	187	84	-	-	-
Case 3 – 2026 with Development *with Scenario 1*						
LOS (Delay)	-	-	-	E (72.6)	D (35.8)	C (22.2)
Westbound Paddock Road Left Turn/Through Queue	-	-	-	372	446	222
Westbound Paddock Road Right Turn Queue	-	-	-	0	53	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	617	204	122
Case 3 – 2026 with Development *with Scenario 1 and improvements*[7]						
LOS (Delay)	-	-	-	D (52.0)	C (24.5)	B (17.0)
Westbound Paddock Road Left Turn Queue	-	-	-	276	311	179
Westbound Paddock Road Through Queue	-	-	-	99	101	71
Westbound Paddock Road Right Turn Queue	-	-	-	0	53	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	425	173	93

[6] The TIS modeled the westbound Paddock Road approach with a separate left turn lane and through lane and the eastbound Joe Goldsborough Road approach with a separate left turn lane and a shared through/right turn lane consistent with the offsite improvements identified at this location. The TIS also modeled the intersection with a protected lead left turn signal phase along the westbound approach, concurrent permissive left turns along the side streets, and optimized signal splits.

[7] JMT configured the intersection with a separate left turn lane, through lane, and right turn lane along the westbound Paddock Road approach and a separate left turn lane and a shared through/right turn lane along Joe Goldsborough Road approach consistent with the offsite improvements identified at this location. Split phase signal operations were maintained along the side streets to provide a more pedestrian friendly signal phasing.

Table 4 (continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Smyrna Wawa
Report Dated: March 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1, 3]	**LOS per TIS**			**LOS per JMT**		
3. DuPont Parkway / Paddock Road / Joe Goldsborough Road (New Castle Road 487)[4]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
Case 3 – 2026 with Development *with Scenario 2*						
LOS (Delay)	-	-	-	E (59.3)	C (34.9)	C (21.9)
Westbound Paddock Road Left Turn/Through Queue	-	-	-	383	446	222
Westbound Paddock Road Right Turn Queue	-	-	-	0	53	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	611	132	108
Case 3 – 2026 with Development *with Scenario 2 and improvements[7]*						
LOS (Delay)	-	-	-	D (38.7)	C (24.2)	B (16.8)
Westbound Paddock Road Left Turn Queue	-	-	-	276	320	179
Westbound Paddock Road Through Queue	-	-	-	99	103	71
Westbound Paddock Road Right Turn Queue	-	-	-	0	114	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	414	97	82
Case 3 – 2026 with Development *with Scenario 3*						
LOS (Delay)	-	-	-	E (64.3)	C (34.8)	C (22.0)
Westbound Paddock Road Left Turn/Through Queue	-	-	-	372	446	222
Westbound Paddock Road Right Turn Queue	-	-	-	0	94	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	576	168	116
Case 3 – 2026 with Development *with Scenario 3 and improvements[7]*						
LOS (Delay)	-	-	-	D (45.7)	C (25.2)	B (17.8)
Westbound Paddock Road Left Turn Queue	-	-	-	276	311	179
Westbound Paddock Road Through Queue	-	-	-	99	101	71
Westbound Paddock Road Right Turn Queue	-	-	-	0	69	0
Southbound DuPont Parkway Left Turn Queue	-	-	-	425	130	95