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

NICOLE MAJESKI
SECRETARY

December 3, 2024

Ms. Teresa Lord, P.E., PTOE
Pennoni Associates, Inc.
121 Continental Drive, Suite 207
Newark, DE 19713

Dear Ms. Lord:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Delmarva Christian High School** (Tax Parcel: 135-20.00-26.00) 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 Group Project Engineer

AF:km
Enclosures
cc with enclosures: Justin Savini, Delmarva Christian Schools
Alan Decktor, Pennoni Associates, Inc.
David L. Edgell, Office of State Planning Coordination
Jamie Whitehouse, Sussex County Planning & Zoning
Joanne M. Arellano, Johnson, Mirmiran, & Thompson, Inc.
Mir Wahed, Johnson, Mirmiran, & Thompson, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Deputy Secretary / Director of Transportation Solutions (DOTS)
Mark Luszcz, Deputy Director, DelDOT Traffic, DOTS
Michael Simmons, Assistant Director, Project Development South, DOTS
Peter Haag, Chief Traffic Engineer, DelDOT Traffic, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, DelDOT Traffic, DOTS
Sean Humphrey, Traffic Engineer, DelDOT Traffic, DOTS
Matt Schlitter, South District Public Works Engineer, Maintenance & Operations
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Pamela Steinebach, Director, Planning
Todd Sammons, Assistant Director, Development Coordination, Planning
Wendy Polasko, Subdivision Engineer, Development Coordination, Planning
John Pietrobono, Sussex County Review Coordinator, Development Coordination, Planning
Derek Sapp, Sussex County Subdivision Reviewer, Development Coordination, Planning
Sireen Muhtaseb, TIS Group Manager, Development Coordination, Planning
Ben Fisher, TIS Group Engineer, Development Coordination
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning, Planning
Steve Bayer, Regional Transportation Planner, Statewide & Regional Planning

December 2, 2024

Ms. Annamaria Furmato
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
TIS Support Services – T202369005
Task Name: Task 17-16 Delmarva Christian High School
JMT No.: 19-01340-716

Dear Ms. Furmato:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the Delmarva Christian High School development which was prepared by Pennoni Associates, Inc. dated August 5, 2024. This review was assigned as Task Number 17-16. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual* and other Department standards.

The TIS evaluates the impacts of a proposed expansion of the existing 250 student private high school to be a private K-12 school with 900 students. The expansion is proposed on an approximately 50-acre parcel (Tax Parcel: 135-20.00-26.00), in the Town of Georgetown, Sussex County. The land is located north of Sussex Pines Road (Sussex Road 324) between Zoar Road (Sussex Road 48) and Wood Branch Road (Sussex Road 321). The land is currently zoned as ED and UR3 (Educational), and the developer does not plan to rezone.

Two full access points are proposed along Sussex Pines Road. Construction is anticipated to be completed in 2027.

Relevant and On-Going Projects and Studies

DelDOT has three relevant and ongoing projects within the study area.

The *Park Avenue Relocation, Phase 1* (DelDOT Contract No. T202004601) project involves the construction of a fourth leg at the South Bedford Street and Arrow Safety Road intersection with the fourth leg being the proposed Park Avenue. The construction aims to build a roundabout at the proposed intersection and widen Arrow Safety Road for servicing truck traffic. The roundabout construction was completed and the intersection is open to traffic. More details, including concept plans for this project, are available at the following link https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202004601.

The *Park Avenue Relocation, Phase 2* (DelDOT Contract No. T201904601) project involves the reconstruction of Park Avenue and Route 9 to provide appropriate turn lanes, signals and railroad

crossing improvements. The most recent project updates indicate that utility relocation will begin in Fall of 2024 with roadway construction scheduled to begin in Spring of 2026. More details, including concept plans for this project, are available at the following link https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201904601

The *Zoar Road at South Bedford Street Intersection Improvements* project is within the DelDOT CTP FY 25-FY 30. The project is set to have design funding beginning in Fiscal Year 2030. There is no current concept for this CTP project.

Summary of Analysis Results

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

The following intersection exhibits level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
4 - South Bedford Street (US Route 9) / Zoar Road (Sussex Road 48)	-	-	Case 1 – 2024 Existing
	-	-	Case 2 – 2027 without Development
	X	-	Case 3 – 2027 with development

4 - South Bedford Street / Zoar Road (See Table 5, Page 24)

The unsignalized South Bedford Street intersection with Zoar Road would exhibit LOS deficiencies during the AM peak hour under future conditions with the proposed development. Specifically, under Case 3 conditions during the AM peak hour, the intersection would operate at LOS F with approximately 76 seconds of delay per vehicle with a projected 95th percentile queue of approximately 313 feet.

Additional Case 3 scenarios were evaluated with the intersection as two-way stop-controlled with additional turn lanes, an all-way stop-control, an all-way stop-control with additional turn lanes, a traffic signal, and a single lane roundabout. The LOS deficiencies could be mitigated by the provision of a traffic signal or a single lane roundabout. A traffic signal justification study was completed for the intersection and the volume warrants would be met under Cases 2 and 3 conditions; however, the crash warrant would not be met. Per a 2022 memorandum prepared by DelDOT regarding crash trends at new signal locations, it was concluded that signal installations may reduce angle crashes but may increase rear-end, injury, and total crashes.

A future DelDOT improvement project is proposed at the Zoar Road and South Bedford Street intersection. The project is set to have design funding beginning in Fiscal Year 2030 and there is no current concept. Based on coordination with DelDOT Traffic, the installation of a traffic signal is not preferred at this location. As such, it is recommended that the developer contribute to the the *Zoar Road at South Bedford Street Intersection Improvements* project with the cost based on the installation of a roundabout.

3 - Sussex Pines Road / Zoar Road (See Table 4, Page 22)

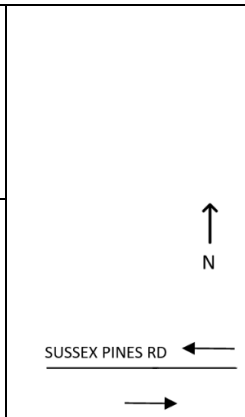
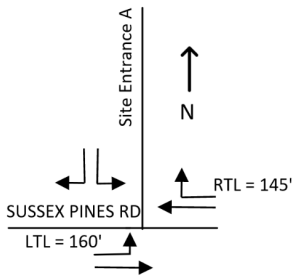
The unsignalized Sussex Pines Road intersection with Zoar Road does not exhibit LOS deficiencies under existing or future conditions with or without the proposed expansion. However, under Case 3 conditions during the weekday PM peak period, the calculated 95th percentile queue length along the westbound Sussex Pines Road approach is approximately 80 feet. With the provision of a separate left turn lane and right turn lane, the calculated 95th percentile queue length along the westbound Sussex Pines Road approach would reduce to approximately 30 feet. As such, it is recommended that the developer improve the Sussex Pines Road approach to provide separate turn lanes.

Development Improvements

Should the Town of Georgetown 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.

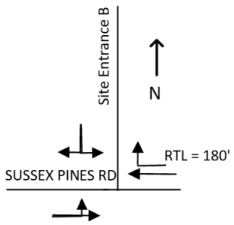
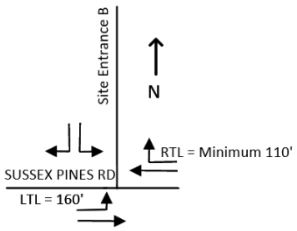
1. The developer shall improve the State-maintained Roads on which they front (Sussex Pines Road), within the limits of their frontage. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. "Frontage" means the length 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 Site Entrance A full access for the Delmarva Christian High School development along Sussex Pines Road approximately 1,000 feet east of Zoar Road. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Sussex Pines Road	One through lane		Eastbound Sussex Pines Road	One left turn lane and one through lane	
Westbound Sussex Pines Road	One through lane		Westbound Sussex Pines Rad	One through lane and one right turn lane	
Southbound Site Entrance A	Approach does not exist		Southbound Site Entrance A	One left turn lane and one right turn lane	

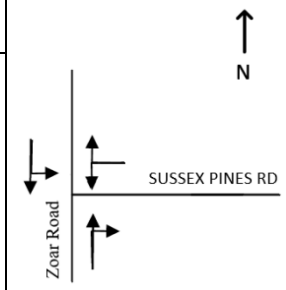
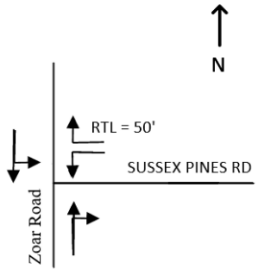
Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the westbound right turn lane is 145 feet and the eastbound left turn lane is 160 feet. The projected queues from the traffic analysis can be accommodated within the recommended storage lengths.

3. The developer should improve the existing unsignalized Site Entrance B full access for the Delmarva Christian High School development along Sussex Pines Road approximately 450 feet east of Zoar Road. Specifically, the developer should install an eastbound Sussex Pines Road left turn lane, maintain the westbound Sussex Pines Road right turn lane, and modify the southbound Site Entrance B approach to provide separate left turn and right turn lanes. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Sussex Pines Road	One shared left turn/through lane		Eastbound Nine Foot Road	One left turn lane and one through lane	
Westbound Sussex Pines Road	One through lane and one right turn lane		Westbound Nine Foot Road	One through lane and one right turn lane	
Southbound Site Entrance B	One shared left turn/right turn lane		Southbound Site Entrance A & B	One left turn lane and 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 110 feet and the eastbound left turn lane is 160 feet. The projected queues from the traffic analysis can be accommodated within the recommended storage lengths.

4. The developer should improve the existing unsignalized Sussex Pines Road intersection with Zoar Road to provide separate turn lanes along the Sussex Pines Road approach. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Westbound Sussex Pines Road	One shared left turn/right turn lane		Westbound Sussex Pines Road	One left turn lane and one right turn lane	
Northbound Zoar Road	One shared through/right turn lane		Northbound Zoar Road	No Change	
Southbound Zoar Road	One shared left turn/through lane		Southbound Zoar Road	No Change	

Based on the results from the traffic analysis, the recommended minimum storage length (excluding taper) of the westbound Sussex Pines Road right turn lane is 50 feet. The design of the westbound Sussex Pines Road right turn lane to include channelization should be considered. The exact design of the intersection would be determined during the Plan Review process. The projected queues from the traffic analysis can be accommodated within the recommended storage lengths.

5. The developer should provide DelDOT an equitable cost contribution towards the proposed *Zoar Road at South Bedford Street Intersection Improvements* CTP DelDOT Project. The equitable contribution amount is $57,080.

6. 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 Sussex Pines Road site frontage. Within the easement, 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. 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 frontage SUP into the site are required.

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

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

e. Internal bicycle racks should be provided

f. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Sussex Pines Road approaches to the site entrances.

g. 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.

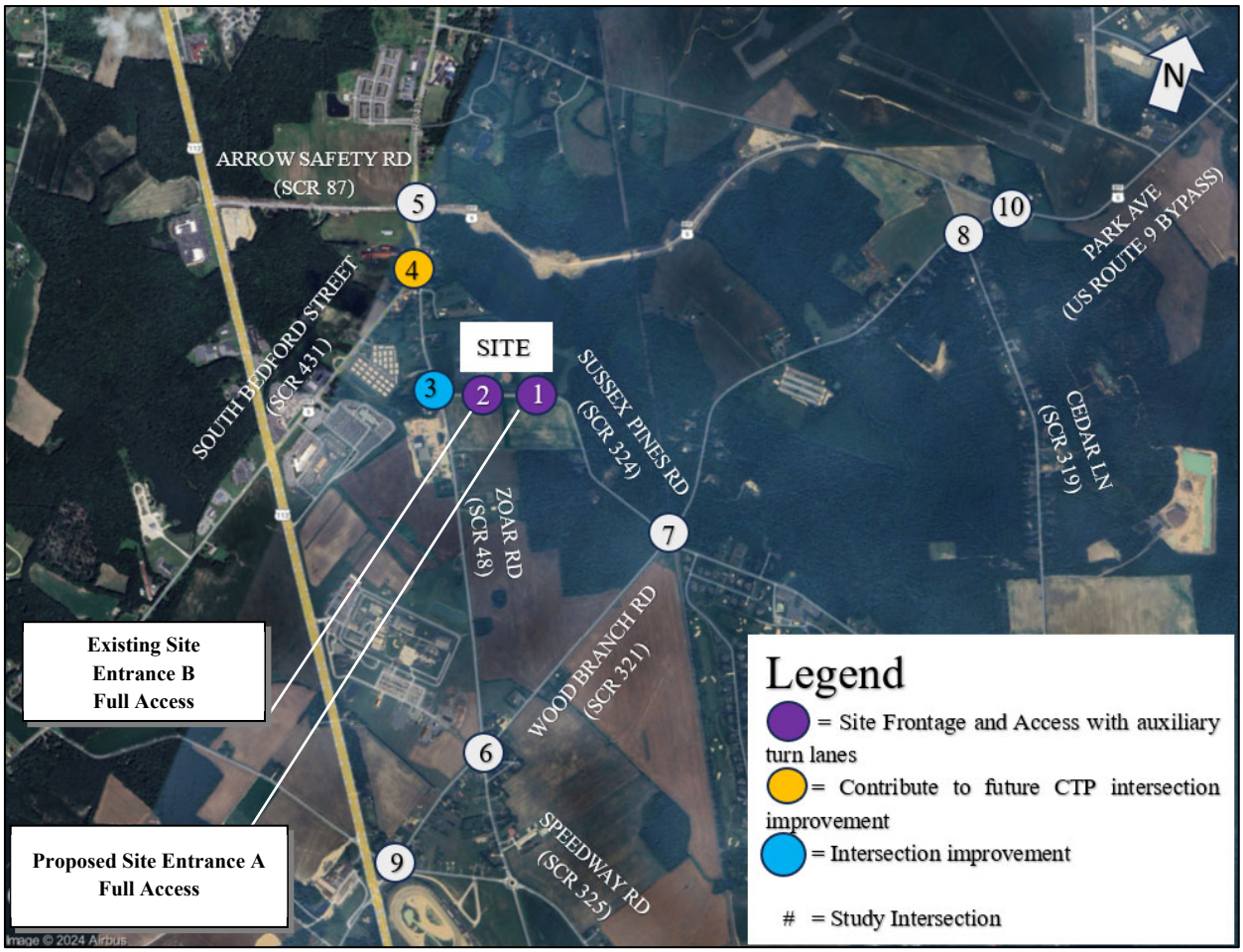
Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

cc: Mir Wahed, P.E., PTOE
Hojjat Barati, EIT
Enclosure

Recommendations Map



General Information

Report date: August 5, 2024
Prepared by: Pennoni Associates, Inc.
Prepared for: Delmarva Christian High School
Tax parcels: 135-20.00-26.00, and 31.00
Generally consistent with DelDOT's Development Coordination Manual (DCM): Yes

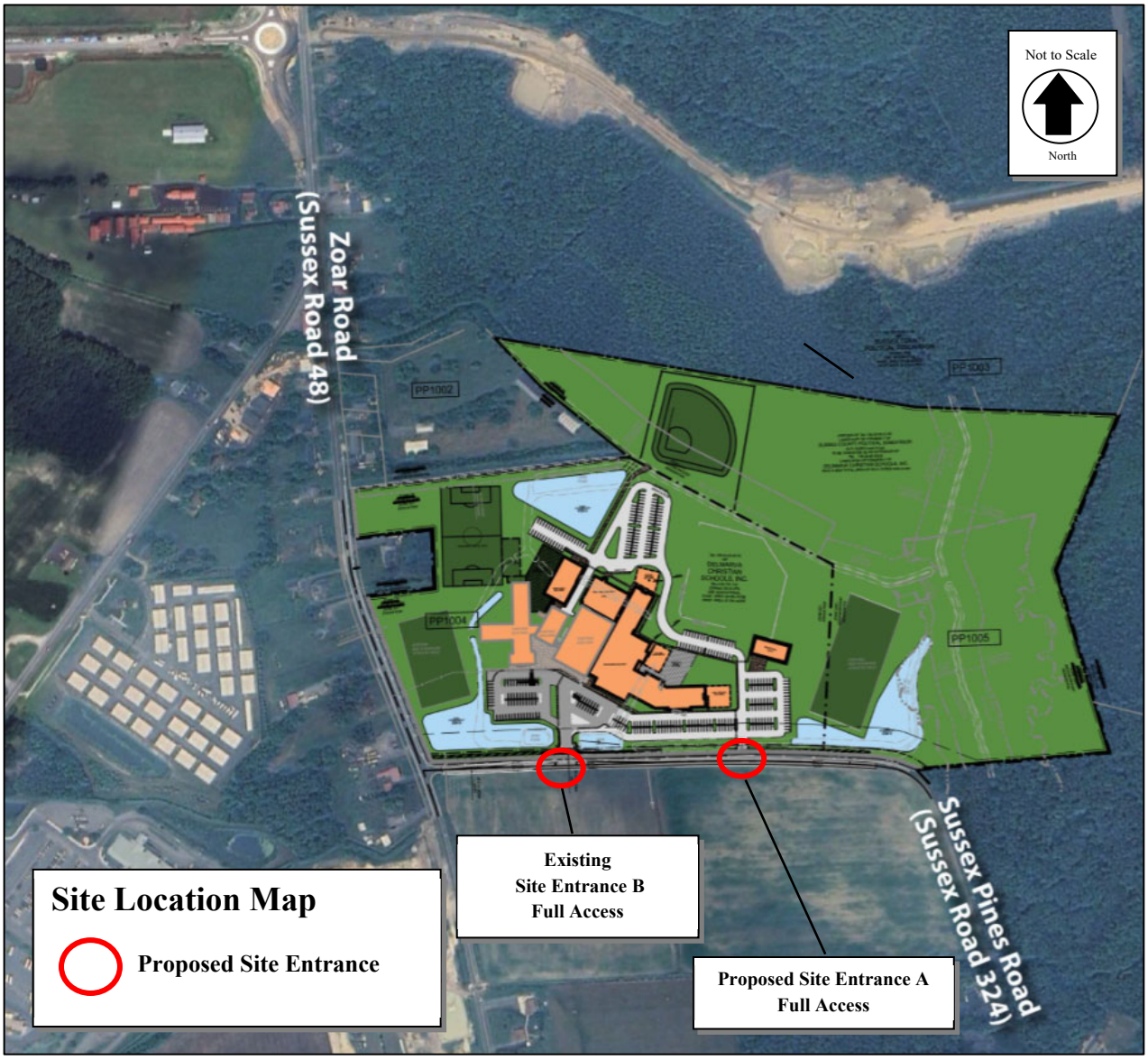
Project Description and Background

Description: The existing 240 student private high school is proposed to be a private K-12 school with 900 students.
Location: The site is located north of Sussex Pines Road (Sussex Road 324) between Zoar Road (Sussex Road 48) and Wood Branch Road (Sussex Road 321).
Amount of land to be developed: An approximately 50-acre parcel.
Land use approval(s) needed: Entrance Plan.
Proposed completion date: 2027.
Proposed access locations: One existing full movement access and one proposed full movement access on Sussex Pines Road.
Daily traffic volumes:

- 2023 Average Annual Daily Traffic on Sussex Pines Road: 1,092 vehicles per day.

*AADT is per ATR count data from the Delmarva Christian High School Expansion TIS.

Site Map



**Graphic is an approximation based on the Preliminary Key Sheet prepared by Pennoni Associates, Inc. dated February 26, 2024.*

Relevant and On-going Projects

DelDOT has three relevant and ongoing projects within the study area.

The *Park Avenue Relocation, Phase 1* (DelDOT Contract No. T202004601) project involves the construction of a fourth leg at the South Bedford Street and Arrow Safety Road intersection with the fourth leg being the proposed Park Avenue. The construction aims to build a roundabout at the proposed intersection and widen Arrow Safety Road for servicing truck traffic. The roundabout construction was completed and the intersection is open to traffic. More details, including concept

plans for this project, are available at the following link https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202004601.

The *Park Avenue Relocation, Phase 2* (DelDOT Contract No. T201904601) project involves the reconstruction of Park Avenue and Route 9 to provide appropriate turn lanes, signals and railroad crossing improvements. The most recent project updates indicate that utility relocation will begin in Fall of 2024 with roadway construction scheduled to begin in Spring of 2026. More details, including concept plans for this project, are available at the following link https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201904601

The *Zoar Road at South Bedford Street Intersection Improvements* project is within the DelDOT CTP FY 25-FY 30. The project is set to have design funding beginning in Fiscal Year 2030. There is no current concept for this CTP project.

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 2.

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 2. Level 2 areas are the most favorable locations for redevelopment and increasing pedestrian accessibility. The proposed development is an expansion of an existing 250-student private high school to a 900-student k-12 private school. The proposed development plans to install a shared use path on its frontage, as well as pedestrian crossing across the existing and proposed site entrances. Therefore, the proposed development is consistent with the 2020 update of *Livable Delaware Strategies for State Policies and Spending*.

Comprehensive Plan

(Source: Plan Georgetown, 2021 Comprehensive Plan Update, Town of Georgetown)

Georgetown Comprehensive Plan:
Per the Existing and Future Land Use Map, the subject property is zoned as institutional and utilities.

Proposed development's compatibility with Georgetown Comprehensive Plan:
The developer is proposing an expansion to an existing high school and is not proposing a rezoning. As such, the development is consistent with the Georgetown Comprehensive Plan.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 11th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 532 (Private K-12 School) and ITE Land Use Code 534 (Private High School).

Table 1
Delmarva Christian High School Trip Generation

Land Use	ADT	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Proposed 900 Student – Private K-12 School (ITE 532)	2,232	448	263	711	192	266	458
Existing 250 Student - Private High School (ITE 534)	543	97	68	165	39	61	100
Total New Trips	**1,689**	**351**	**195**	**546**	**153**	**205**	**358**

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

Overview of TIS

Intersections examined:

1. Sussex Pines Road (Sussex Road 324) and Site Entrance A
2. Sussex Pines Road and Site Entrance B
3. Sussex Pines Road and Zoar Road (Sussex Road 48)
4. South Bedford Street (US Route 9/Sussex Road 431) and Zoar Road
5. South Bedford Street and Arrow Safety Road (Sussex Road 87)/Park Avenue (Sussex Road 318)
6. Wood Branch Road (Sussex Road 321) and Zoar Road
7. Sussex Pines Road (Sussex Road 324) and Wood Branch Road
8. Wood Branch Road and Cedar Lane (Sussex Road 318)
9. Speedway Road (Sussex Road 325) and Wood Branch Road
10. Park Avenue (US Route 9) and Wood Branch Road

Conditions examined:

1. Case 1 – 2024 existing
2. Case 2 – 2027 without development
3. Case 3 – 2027 with development

Committed developments considered:

1. Leeward Chase – 106 Single-Family Detached houses.
2. King Farm Industrial Park – 250,000 square feet of Industrial Park space
3. Greenlea Place – 127 Single-Family Detached houses
4. Sussex County Family Courts – 107,325 square feet Family Court Building
5. Shortleaf Preserve (formerly known as Mason Property) – 136 Single-Family Detached houses and 98 Single-Family Attached Houses
6. Oaks at Georgetown – 58 Single-Family Detached houses and 309 Single-Family Attached Houses.

The committed development information contained within the TIS report supersedes the October 12, 2023, Scoping Meeting Memorandum.

Peak hours evaluated: Weekday AM and weekday PM.

Intersection Descriptions

1. **Sussex Pines Road (Sussex Road 324) and Site Entrance A**
   Type of Control: Proposed full movement entrance.
   Eastbound Approach: (Sussex Pines Road) Existing one through lane. Proposed one left turn lane and one though lane.
   Westbound Approach: (Sussex Pines Road) Existing one through lane. Proposed one right turn lane and one through lane.

Southbound Approach: (Site Entrance A) Proposed one shared left turn/right turn lane, stop-controlled.

**Proposed lane configurations are improvements identified within the Delmarva Christian High School TIS Report.*

2. **Sussex Pines Road and Site Entrance B**
   Type of Control: Existing two-way stop-controlled intersection.
   Eastbound Approach: (Sussex Pines Road) Existing one shared left turn/through lane. Proposed one left turn lane and one through lane.
   Westbound Approach: (Sussex Pines Road) Existing one through lane and one right turn lane. Proposed one through lane and one right turn lane.
   Southbound Approach: (Site Entrance B) Existing one shared left turn/right turn lane, stop-controlled.

   **Proposed lane configurations are improvements identified within the Delmarva Christian High School TIS Report.*

3. **Sussex Pines Road and Zoar Road (Sussex Road 48)**
   Type of Control: Existing two-way stop-controlled intersection.
   Westbound Approach: (Sussex Pines Road) Existing one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Zoar Road) Existing one shared through/right turn lane.
   Southbound Approach: (Zoar Road) Existing one shared left turn/through lane.

4. **South Bedford Street (US Route 9/Sussex Road 431) and Zoar Road**
   Type of Control: Existing two-way stop-controlled intersection.
   Westbound Approach: (South Bedford Street) Existing one shared left turn/right turn lane.
   Northbound Approach: (Zoar Road) Existing one shared through/right turn lane, stop-controlled.
   Southbound Approach: (Zoar Road) Existing one shared left turn/through lane.

5. **South Bedford Street and Arrow Safety Road (Sussex Road 87)/Park Avenue (Sussex Road 318)**
   Type of Control: Existing Roundabout.
   Eastbound Approach: (Arrow Safety Road) Existing one shared left turn/through/right turn lane.
   Westbound Approach: (Park Avenue) Existing one shared left turn/through/right turn lane.
   Northbound Approach: (South Bedford Street) Existing one shared left turn/through/right turn lane.

Southbound Approach: (South Bedford Street) Existing one shared left turn/through/right turn lane.

6. **Wood Branch Road (Sussex Road 321) and Zoar Road**
   Type of Control: Existing all-way stop control.
   Eastbound Approach: (Zoar Road) Existing one shared left turn/through/right turn lane.
   Westbound Approach: (Zoar Road) Existing one shared left turn/through/right turn lane.
   Northbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.
   Southbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.

7. **Sussex Pines Road (Sussex Road 324) and Wood Branch Road**
   Type of Control: Existing two-way stop-controlled intersection.
   Eastbound Approach: (Sussex Pines Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Westbound Approach: (Sussex Pines Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Northbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.
   Southbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.

8. **Wood Branch Road and Cedar Lane (Sussex Road 318)**
   Type of Control: Existing all-way stop-controlled intersection.
   Eastbound Approach: (Cedar Lane) Existing one shared left turn/through/right turn lane.
   Westbound Approach: (Cedar Lane) Existing one shared left turn/through/right turn lane.
   Northbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.
   Southbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.

9. **Speedway Road (Sussex Road 325) and Wood Branch Road**
   Type of Control: Existing two-way stop-controlled intersection.
   Eastbound Approach: (Speedway Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Westbound Approach: (Speedway Road) Existing one shared left turn/through/right turn lane, stop-controlled.

Northbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.
Southbound Approach: (Wood Branch Road) Existing one shared left turn/through/right turn lane.

10. Park Avenue (US Route 9) and Wood Branch Road
Type of Control: Existing two-way stop-controlled intersection.
Eastbound Approach: (Park Avenue) Existing one shared through/right turn lane.
Westbound Approach: (Park Avenue) Existing one shared left turn/through lane.
Northbound Approach: (Wood Branch Road) Existing one shared left turn/right turn lane, stop-controlled.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, no transit stops are located within the study area.

Planned transit service: Per email correspondence from Jared Kauffman, DART Fixed-Route Planner, on August 20, 2024, DART has no comments regarding this site.

Existing bicycle and pedestrian facilities: Per DelDOT's Sussex County Bicycle Map Zoar Road is a statewide bicycle route.

Planned bicycle and pedestrian facilities: Per email correspondence from John Fiori, DelDOT's Pedestrian Coordinator, on August 26, 2024, DelDOT has the following recommendations:

- Referring to the State Strategies and Spending Map this site is within Level 2. A 10 foot wide shared use path (SUP) shall be required along all roadway frontages with angled terminations to the shoulders.
- Also provide SUP along eastern side of Zoar Road from Bedford Street to Wood Branch Road including pedestrian crossings at the intersections.
- Provide internal pedestrian connections from the SUP.
- This site shall dedicate right-of-way per the roadway classification and establish a 15 foot wide permanent easement along all property roadway frontages.
- The existing right turn lane shall be enhanced to include a separate 5 foot wide bike lane and follow the striping as per the DE MUTCD, Figure 9C-1E.
- Due to the site expansion and increase in trips, will need to determine if a separate right turn lane is required along Sussex Pines Road at the intersection of Zoar Road. If a right turn lane is warranted, then a separate 5 foot wide bike lane shall be required.
- 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).

- There could be additional and/or revised comments once project is discussed at a pre-submittal meeting and/or plans are submitted for LONO/ENT review/approval.

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 frontages are summarized below. The Bicycle LTS was determined utilizing DelDOT's Gateway.

- Sussex Pines Road LTS: 4

Crash Evaluation

Per the crash data included in the TIS from April 1, 2019, to April 16, 2024, provided by the Delaware Department of Transportation (DelDOT), a total of 9 crashes were reported within the corridors studied. There were no fatal crashes in the area.

Per the TIS, the crashes reported were one rear-end, four angle, and four not a collision between two vehicles.

Previous Comments

No additional comments based on the July 16, 2024, DelDOT Preliminary TIS review letter.

Sight Distance Evaluation

No sight distance constraints were noted at the proposed site entrance locations per a field visit conducted on August 12, 2024.

All-Way Stop and Traffic Signal Justification Study

JMT conducted an all-way stop and signal justification study at the Zoar Road (Sussex Road 48) and South Bedford Steet ((US Route 9/Sussex Road 431)) intersection. The study takes into account the impacts of a proposed expansion of the existing Delmarva Christian High School 250 student private high school to be a private K-12 school with 900 students and evaluated three cases (Case 1 – Existing (2024), Case 2 – 2027 Future without Development, and Case 3 – 2027 Future with Development).

Based on the results, interim all-way stop is warranted as a traffic signal is warranted under Warrants #2 (Four-Hour Vehicular Volume) and #3 (Peak Hour Volume) for Cases 1, 2, and 3 by

analyzing the intersection with the current configuration (i.e. one lane each approach). Additionally, a traffic signal is warranted under Warrant #2 (Four-Hour Vehicular Volume) for Case 3 and is warranted under Warrant #3 (Peak Hour Volume) for both Cases 2 and 3 by analyzing the intersection with the proposed configuration (i.e. separate turn lanes). The crash warrant is not met based on crash data from the last 5 years.

General Synchro Analysis Comments

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

1) Both JMT and the TIS used Synchro 12 to complete the analysis.

2) JMT utilized a saturation flow rate of 1750 (vphpl) for Sussex County, while the TIS utilized 1900 (vphpl).

3) Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for the case 1 scenario and a future PHF for case 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.

4) JMT and the TIS utilized the existing heavy vehicle percentage for each movement greater than 100 vph in the Case 1 - Existing analysis.

5) 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.

6) 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 utilized existing heavy vehicle percentages.

7) Both JMT and the TIS assumed a heavy vehicle percentage of 3% for site traffic.

Table 2
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
1 - Sussex Pines Road (Sussex Road 324) / Site Entrance A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3 – 2027 with Development				
Eastbound Sussex Pines Road - Left Turn	A (8.0)	A (7.6)	A (8.0)	A (7.6)
Southbound Site Entrance A Approach	B (11.6)	B (10.5)	B (11.7)	B (10.6)

[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 Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
2 - Sussex Pines Road / Site Entrance B	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Eastbound Sussex Pines Road - Left Turn	A (7.5)	A (7.4)	A (7.6)	A (7.5)
Southbound Site Entrance B Approach	A (9.2)	A (9.9)	A (9.2)	A (9.9)
Case 2 – 2027 without Development				
Eastbound Sussex Pines Road - Left Turn	A (7.5)	A (7.4)	A (7.5)	A (7.5)
Southbound Site Entrance B Approach	A (9.2)	A (9.9)	A (9.1)	A (9.8)
Case 3 – 2027 with Development				
Eastbound Sussex Pines Road - Left Turn	A (8.3)	A (7.9)	A (8.1)	A (7.8)
Southbound Site Entrance B Approach	B (14.6)	B (14.3)	B (12.2)	B (12.1)

Table 4
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
3 - Sussex Pines Road / Zoar Road (Sussex Road 48)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Westbound Sussex Pines Road Approach	B (10.4)	B (12.7)	B (10.4)	B (12.8)
Southbound Zoar Road - Left Turn	A (7.8)	A (7.8)	A (7.8)	A (7.8)
Case 2 – 2027 without Development				
Westbound Sussex Pines Road Approach	B (10.7)	B (13.5)	B (10.7)	B (12.4)
Southbound Zoar Road - Left Turn	A (7.9)	A (7.9)	A (7.9)	A (7.8)
Case 3 – 2027 with Development[2]				
Westbound Sussex Pines Road Approach	C (18.7)	D (27.3)	C (18.8)	C (19.0)
Westbound Sussex Pines Road Approach 95th Percentile Queue Length	-	-	62.5’	77.5’
Southbound Zoar Road - Left Turn	A (8.6)	A (8.2)	A (8.5)	A (8.1)
Southbound Zoar Road - Left Turn 95th Percentile Queue Length	-	-	17.5’	12.5’

[2] JMT utilized a PHF of 0.88 for future PM peak hour analysis, whereas the TIS used the existing PHF.

Table 4 (Continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
3 - Sussex Pines Road / Zoar Road (Sussex Road 48)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3 – 2027 with Development[3] *with turn lanes*				
Westbound Sussex Pines Road - Left Turn	-	-	C (24.1)	C (20.9)
Westbound Sussex Pines Road - Left Turn 95th Percentile Queue Length	-	-	20’	30’
Westbound Sussex Pines Road - Right Turn	-	-	B (10.5)	B (10.1)
Westbound Sussex Pines Road - Right Turn 95th Percentile Queue Length	-	-	20’	20’
Southbound Zoar Road - Left Turn	-	-	A (8.5)	A (8.1)
Southbound Zoar Road -Left Turn 95th Percentile Queue Length	-	-	17.5’	12.5’
Case 3 – 2027 with Development *with turn lanes only along Sussex Pines Road*				
Westbound Sussex Pines Road - Left Turn	-	-	D (27.0)	C (22.4)
Westbound Sussex Pines Road - Left Turn 95th Percentile Queue Length	-	-	22.5’	32.5’
Westbound Sussex Pines Road - Right Turn	-	-	B (11.0)	B (10.4)
Westbound Sussex Pines Road - Right Turn 95th Percentile Queue Length	-	-	22.5’	20’
Southbound Zoar Road - Left Turn	-	-	A (8.5)	A (8.1)
Southbound Zoar Road -Left Turn 95th Percentile Queue Length	-	-	17.5’	12.5’

[3] JMT conducted an additional scenario with turn lanes along each approach.

Table 5
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
4 - South Bedford Street (US Route 9/Sussex Road 431) / Zoar Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Westbound Zoar Road Approach	C (18.5)	B (13.0)	C (18.5)	B (12.9)
Westbound Zoar Road Approach 95th Percentile Queue Length[4]	82.5	32.5	82.5	30.0
Southbound South Bedford Road Left Turn	A (8.8)	A (8.4)	A (8.8)	A (8.4)
Southbound South Bedford Road Left Turn 95th Percentile Queue Length	20.0	17.5	20.0	17.5
Case 2 – 2027 without Development[5]				
Westbound Zoar Road Approach	D (33.7)	C (15.6)	C (24.1)	C (15.4)
Westbound Zoar Road Approach 95th Percentile Queue Length	162.5	47.5	112.5	45.0
Southbound South Bedford Road Left Turn	A (9.4)	A (8.8)	A (9.2)	A (8.8)
Southbound South Bedford Road Left Turn 95th Percentile Queue Length	27.5	22.5	22.5	22.5
Case 3 – 2027 with Development[4]				
Westbound Zoar Road Approach	F (173.7)	C (19.6)	F (76.1)	C (19.1)
Westbound Zoar Road Approach 95th Percentile Queue Length	510.0	87.5	312.5	85.0
Southbound South Bedford Road Left Turn	B (10.7)	A (9.1)	B (10.2)	A (9.1)
Southbound South Bedford Road Left Turn 95th Percentile Queue Length	55.0	30.0	47.5	30.0

[4] The reported 95th Percentile Queue Lengths are in feet.

[5] JMT utilized a PHF of 0.92 for future AM peak hour analysis, whereas the TIS used the existing PHF.

Table 5 (continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
4 - South Bedford Street (US Route 9/Sussex Road 431) / Zoar Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3 – 2027 with Development, *Two-Way Stop Control, separate turn lanes for all approaches*[2,6]				
Westbound Zoar Road - Left Turn Lane	-	-	F (78.2)	E (40.0)
Westbound Zoar Road - Left Turn Lane 95th Percentile Queue Length	-	-	30.0	10.0
Westbound Zoar Road - Right Turn Lane	-	-	C (18.4)	B (12.9)
Westbound Zoar Road - Right Turn Lane 95th Percentile Queue Length	-	-	100.0	47.5
Southbound South Bedford Road - Left Turn Lane	-	-	B (10.2)	A (9.1)
Southbound South Bedford Road - Left Turn Lane 95th Percentile Queue Length	-	-	47.5	30.0
Case 3 – 2027 with Development, *All-Way Stop Control*[2,7]				
Westbound Zoar Road Approach	-	-	C (25.0)	C (15.6)
Westbound Zoar Road Approach 95th Percentile Queue Length	-	-	145.0	72.5
Northbound South Bedford Road Approach	-	-	D (26.8)	C (15.8)
Northbound South Bedford Road Approach 95th Percentile Queue Length	-	-	150.0	75.0
Southbound South Bedford Road Approach	-	-	F (180.6)	F (99.3)
Southbound South Bedford Road Approach 95th Percentile Queue Length	-	-	805.0	562.5
Overall			F (100.4)	F (60.6)

[6] JMT analyzed the intersection considering a separate left turn lane and through lane for S. Bedford Road Southbound, a separate right turn lane and through lane for S. Bedford Road Northbound, and a separate left turn and right turn lanes for Zoar Road.
[7] JMT analyzed the intersection as an all-way stop controlled intersection with the existing lane configuration.

Table 5 (continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection All-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
4 - South Bedford Street (US Route 9/Sussex Road 431) / Zoar Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3 – 2027 with Development, *separate turn lanes for all approaches* [2,8]				
Westbound Zoar Road Approach	-	-	D (28.9)	C (16.4)
Westbound Zoar Road - Left Turn Lane 95th Percentile Queue Length	-	-	172.5	80.0
Northbound South Bedford St. Road Approach	-	-	D (33.7)	C (16.0)
Northbound South Bedford St. - Through Lane 95th Percentile Queue Length	-	-	187.5	75.0
Southbound South Bedford St. Approach	-	-	E (39.8)	C (20.4)
Southbound South Bedford St. - Left Turn Lane 95th Percentile Queue Length	-	-	272.5	115.0
Overall	-	-	E (35.4)	C (18.5)
Case 3 – 2027 with Development, *Signalized Intersection* [1,2,9,10]				
LOS (Delay)	-	-	D (38.4)	B (14.4)
Westbound Zoar Road Approach 95th Percentile Queue Length	-	-	73.0	57.0
Northbound South Bedford St. Through Lane 95th Percentile Queue Length	-	-	150.0	96.0
Northbound South Bedford St. Right Turn 95th Percentile Queue Length	-	-	9.0	11.0
Southbound South Bedford St. Through Lane 95th Percentile Queue Length	-	-	116.0	137.0
Southbound South Bedford St. Left Turn 95th Percentile Queue Length	-	-	331.0	222.0

[8] JMT analyzed the intersection as an all-way stop-controlled intersection with a separate left turn lane and through lane along the S. Bedford Southbound approach, a separate right and left turn lanes along the Zoar Road, and a separate right turn lane and through lane along the S. Bedford northbound approach.

[9] JMT analyzed the intersection as a signalized intersection with a separate left turn lane and through lane along the S. Bedford Southbound approach, a shared right and left turn lanes along the Zoar Road, and a separate right turn lane and through lane along the S. Bedford northbound approach.

[10] JMT analyzed the intersection as an actuated-uncoordinated signalized control intersection with cycle length of 60 seconds include the left turn phasing (i.e. protected, permitted, and protected-permissive).

Table 5 (continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
4 - South Bedford Street (US Route 9/Sussex Road 431) / Zoar Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3 – 2027 with Development[2,9,10]				
LOS (Delay)	-	-	D (38.4)	B (14.4)
Westbound Zoar Road Approach 95th Percentile Queue Length	-	-	73.0	57.0
Northbound South Bedford St. - Through Lane 95th Percentile Queue Length	-	-	150.0	96.0
Northbound South Bedford St. - Right Turn 95th Percentile Queue Length	-	-	9.0	11.0
Southbound South Bedford St. - Through Lane 95th Percentile Queue Length	-	-	116.0	137.0
Southbound South Bedford St. - Left Turn 95th Percentile Queue Length	-	-	331.0	222.0
Roundabout[1]				
Case 3 – 2027 with Development[11]				
Westbound Zoar Road Approach	-	-	B (11.3)	A (7.5)
Westbound Zoar Road Approach 95th Percentile Queue Length	-	-	75.0	25.0
Northbound South Bedford St. Approach	-	-	B (12.9)	A (8.5)
Northbound South Bedford St. Approach 95th Percentile Queue Length	-	-	75.0	50.0
Southbound South Bedford St. Approach	-	-	B (10.2)	A (9.5)
Southbound South Bedford St. Approach 95th Percentile Queue Length	-	-	100.0	100.0
Overall	-	-	B (11.2)	A (8.8)

[11] JMT analyzed the intersection as a single lane roundabout.

Table 6
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Roundabout[1,12]	**LOS per TIS**		**LOS per JMT**	
5 - South Bedford Street / Arrow Safety Road (Sussex Road 48) / Park Avenue (Sussex Road 318)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Eastbound Arrow Safety Road Approach	A (6.4)	A (7.4)	A (6.4)	A (7.4)
Westbound Park Avenue Approach	B (11.0)	A (6.8)	B (11.0)	A (6.8)
Northbound South Bedford St. Approach	A (8.8)	A (7.7)	A (8.8)	A (7.7)
Southbound South Bedford St. Approach	A (8.9)	B (11.6)	A (8.9)	B (11.6)
Overall	A (9.2)	A (9.3)	A (9.2)	A (9.3)
Case 2 – 2027 without Development				
Eastbound Arrow Safety Road Approach	A (8.0)	A (9.4)	A (8.0)	A (9.4)
Westbound Park Avenue Approach	B (14.7)	A (9.0)	B (14.7)	A (9.0)
Northbound South Bedford St. Approach	B (12.6)	A (9.9)	B (12.6)	A (9.9)
Southbound South Bedford St. Approach	B (12.2)	C (17.4)	B (12.2)	C (17.4)
Overall	B (12.6)	B (13.0)	B (12.6)	B (13.0)
Case 3 – 2027 with Development				
Eastbound Arrow Safety Road Approach	B (12.0)	B (11.3)	B (12.0)	B (11.3)
Westbound Park Avenue Approach	C (18.2)	B (10.7)	C (18.2)	B (10.7)
Northbound South Bedford St. Approach	C (15.8)	B (12.2)	C (15.8)	B (12.2)
Southbound South Bedford St. Approach	C (16.3)	C (24.4)	C (16.3)	C (24.4)
Overall	C (15.9)	C (16.9)	C (15.9)	C (16.9)

[12] Due to the lack of count data, JMT and the TIS assumed a PHF of 0.92 and HV% as 3 for all cases.

Table 7
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection All-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
6 - Zoar Road / Wood Branch Road (Sussex Road 321)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Eastbound Zoar Road Approach	B (10.7)	B (10.7)	B (11.5)	A (10.0)
Westbound Zoar Road Approach	A (10.0)	B (10.2)	B (10.5)	A (9.2)
Northbound Wood Branch Road Approach	B (10.2)	A (9.3)	B (10.8)	A (9.2)
Southbound Wood Branch Road Approach	A (9.5)	B (10.5)	A (9.9)	A (9.6)
Overall	B (10.2)	B (10.3)	B (10.8)	A (9.6)
Case 2 – 2027 without Development				
Eastbound Zoar Road Approach	B (11.6)	B (11.6)	B (11.8)	B (10.6)
Westbound Zoar Road Approach	B (10.7)	B (10.8)	B (10.9)	A (9.6)
Northbound Wood Branch Road Approach	B (10.7)	A (9.7)	B (10.9)	A (9.4)
Southbound Wood Branch Road Approach	A (9.9)	B (11.1)	A (10.0)	A (9.9)
Overall	B (10.9)	B (11.0)	B (11.1)	A (10.0)
Case 3 – 2027 with Development				
Eastbound Zoar Road Approach	B (13.5)	B (12.9)	B (13.7)	B (11.7)
Westbound Zoar Road Approach	B (11.6)	B (11.2)	B (11.8)	A (10.0)
Northbound Wood Branch Road Approach	B (12.9)	B (10.5)	B (13.0)	B (10.2)
Southbound Wood Branch Road Approach	B (10.5)	B (11.5)	B (10.6)	B (10.3)
Overall	B (12.5)	B (11.8)	B (12.7)	B (10.8)

Table 8
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
7 - Sussex Pines Road / Wood Branch Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Eastbound Sussex Pines Road Approach	B (10.6)	B (11.3)	B (10.5)	B (11.3)
Westbound Sussex Pines Road Approach	B (10.5)	B (10.6)	B (10.5)	B (10.4)
Northbound Wood Branch Road - Left Turn	A (7.4)	A (7.6)	A (7.5)	A (7.6)
Southbound Wood Branch Road - Left Turn	A (7.4)	A (7.4)	A (7.5)	A (7.4)
Case 2 – 2027 without Development				
Eastbound Sussex Pines Road Approach	B (10.7)	B (11.5)	B (10.6)	B (11.5)
Westbound Sussex Pines Road Approach	B (10.6)	B (10.7)	B (10.6)	B (10.2)
Northbound Wood Branch Road - Left Turn	A (7.4)	A (7.6)	A (7.5)	A (7.6)
Southbound Wood Branch Road - Left Turn	A (7.4)	A (7.4)	A (7.5)	A (7.4)
Case 3 – 2027 with Development				
Eastbound Sussex Pines Road Approach	B (12.3)	B (13.1)	B (12.2)	B (13.1)
Westbound Sussex Pines Road Approach	B (11.4)	B (11.1)	B (11.4)	B (10.9)
Northbound Wood Branch Road - Left Turn	A (7.7)	A (7.7)	A (7.8)	A (7.8)
Southbound Wood Branch Road - Left Turn	A (7.4)	A (7.4)	A (7.5)	A (7.4)

Table 9
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection All-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
8 - Cedar Lane (Sussex Road 318) / Wood Branch Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Eastbound Cedar Lane Approach	A (7.7)	A (9.5)	A (7.8)	A (7.8)
Westbound Cedar Lane Approach	A (8.2)	A (7.6)	A (7.8)	A (7.7)
Northbound Wood Branch Road Approach	A (8.1)	A (7.9)	A (8.2)	A (8.0)
Southbound Wood Branch Road Approach	A (8.3)	A (8.4)	A (8.3)	A (8.5)
Overall	A (8.2)	A (8.2)	A (8.1)	A (8.2)
Case 2 – 2027 without Development				
Eastbound Cedar Lane Approach	A (7.8)	A (9.6)	A (7.9)	A (7.8)
Westbound Cedar Lane Approach	A (8.3)	A (7.6)	A (7.8)	A (7.7)
Northbound Wood Branch Road Approach	A (8.2)	A (8.0)	A (8.3)	A (8.1)
Southbound Wood Branch Road Approach	A (8.4)	A (8.6)	A (8.4)	A (8.6)
Overall	A (8.3)	A (8.4)	A (8.2)	A (8.3)
Case 3 – 2027 with Development				
Eastbound Cedar Lane Approach	A (8.3)	A (10.0)	A (8.4)	A (8.2)
Westbound Cedar Lane Approach	A (8.9)	A (8.0)	A (8.4)	A (8.1)
Northbound Wood Branch Road Approach	A (9.1)	A (8.8)	A (9.2)	A (9.0)
Southbound Wood Branch Road Approach	A (10.0)	A (9.3)	A (10.0)	A (9.5)
Overall	A (9.5)	A (9.0)	A (9.4)	A (9.1)

Table 10
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
9 - Wood Branch Road / Speedway Road (Sussex Road 325)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Eastbound Speedway Road Approach	B (12.5)	B (12.6)	B (12.5)	B (12.6)
Westbound Speedway Road Approach	B (14.9)	B (11.8)	B (15.0)	B (11.8)
Northbound Wood Branch Road - Left Turn	A (7.4)	A (7.5)	A (7.5)	A (7.6)
Southbound Wood Branch Road - Left Turn	A (7.5)	A (7.3)	A (7.6)	A (7.4)
Case 2 – 2027 without Development				
Eastbound Speedway Road Approach	B (12.6)	B (12.7)	B (12.2)	B (12.8)
Westbound Speedway Road Approach	C (15.2)	B (11.9)	B (14.4)	B (12.0)
Northbound Wood Branch Road - Left Turn	A (7.4)	A (7.5)	A (7.5)	A (7.6)
Southbound Wood Branch Road - Left Turn	A (7.5)	A (7.3)	A (7.6)	A (7.4)
Case 3 – 2027 with Development				
Eastbound Speedway Road Approach	B (14.7)	B (14.0)	B (13.9)	B (14.1)
Westbound Speedway Road Approach	C (19.1)	B (12.9)	C (17.4)	B (13.0)
Northbound Wood Branch Road - Left Turn	A (7.5)	A (7.6)	A (7.5)	A (7.7)
Southbound Wood Branch Road - Left Turn	A (7.7)	A (7.4)	A (7.7)	A (7.4)

Table 11
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for Delmarva Christian High School Expansion
Report Dated: August 5, 2024
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
Wood Branch Road / Park Avenue (US Route 9)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – Existing 2024				
Westbound Park Avenue - Left Turn	A (8.0)	A (8.5)	A (8.0)	A (8.5)
Northbound Wood Branch Road Approach	B (10.5)	B (11.9)	B (10.7)	B (11.8)
Case 2 – 2027 without Development				
Westbound Park Avenue - Left Turn	A (8.2)	A (8.7)	A (8.2)	A (8.7)
Northbound Wood Branch Road Approach	B (11.3)	B (12.6)	B (11.4)	B (12.4)
Case 3 – 2027 with Development				
Westbound Park Avenue - Left Turn	A (8.7)	A (9.0)	A (8.7)	A (8.9)
Northbound Wood Branch Road Approach	B (12.2)	B (14.0)	B (12.4)	B (13.6)