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

JENNIFER COHAN
SECRETARY

October 25, 2016

Mr. Kyle Clevenger
Pennoni Associates, Inc.
121 Continental Drive
Suite 207
Newark, DE 19713

Dear Mr. Clevenger:

The enclosed Traffic Impact Study (TIS) review letter for the **Middle Creek Preserve** residential development (Tax Parcels 234-11.00-51.00, 54.00, 54.01, 54.02, 54.03; 234-12.00-14.00) 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 review letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel
Project Engineer

TEB:km
Enclosures
cc with enclosures: Mr. Mark Davidson, Pennoni Associates, Inc.
Mr. Lawrence Lank, Planning and Zoning, Sussex County
Ms. Janelle Cornwell, Planning and Zoning, Sussex County
Mr. Andrew Parker, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Ms. Annie Cordo, Deputy Attorney General
Mr. Robert McCleary, Director, Transportation Solutions (DOTS)
Mr. Drew Boyce, Director, Planning
Mr. Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS
Mr. Michael Simmons, Assistant Director, Project Development South, DOTS
Mr. J. Marc Coté, Assistant Director, Development Coordination
Mr. T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Mr. Peter Haag, Traffic Studies Manager, Traffic, DOTS
Mr. Adam Weiser, Safety Engineer, Traffic, DOTS
Mr. David Dooley, Service Development Planner, Delaware Transit Corporation
Mr. Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Ms. Donna Robinson, Administrative Assistant, Statewide & Regional Planning
Mr. Mark Galipo, Traffic Engineer, Traffic, DOTS
Mr. Steve Sisson, Sussex County Subdivision Coordinator, Development Coordination
Mr. Scott Johnson, Subdivision Manager, Development Coordination
Mr. Claudy Joinville, Project Engineer, Development Coordination

McCORMICK TAYLOR

October 25, 2016

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

RE: Agreement No. 1655
Traffic Impact Study Services
Task No. 1 Subtask 20A – Middle Creek Preserve (aka The Estates at Middle Creek)

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Middle Creek Preserve residential development prepared by Pennoni, dated August 2016. This development is also known as The Estates at Middle Creek, but for the purpose of this review letter it will be referred to as Middle Creek Preserve. This review was assigned as Task Number 1 (Subtask 20A). Pennoni prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of the Middle Creek Preserve residential development, proposed to be located on the north side of Angola Road (Sussex Road 277), east of Delaware Route 24 in Sussex County, Delaware. The proposed development would include 313 single-family detached homes on approximately 148 acres of land. One full access point is proposed on Angola Road, directly across from the existing entrance to the Angola by the Bay residential development. Construction is anticipated to be complete by 2027.

The land is currently zoned as AR-1 (Agricultural Residential) within Sussex County, and no rezoning is needed to permit the proposed land use.

DelDOT currently has one relevant project in the study area. The HSIP SR 24 at Camp Arrowhead Road and SR 24 at Robinsonville Road / Angola Road Intersection Improvements Project (State Contract No. T201200902), which is part of DelDOT's Hazard Elimination Program (HEP) (formerly Highway Safety Improvement Program (HSIP)), includes improvements at both of these intersections.

The improvements at the intersection of Delaware Route 24 and Camp Arrowhead Road (Sussex Road 279) / Fairfield Road will include the widening of the southbound Fairfield Road approach to provide separate left-turn, through and right-turn lanes. In addition, the improvements will include extending the left-turn and right-turn lanes on all approaches to meet storage requirements.

The improvements at the intersection of Delaware Route 24 and Angola Road / Robinsonville Road (Sussex Road 277) will include the widening of the northbound and southbound Angola

Road and Robinsonville Road approaches to provide separate left-turn, through and right-turn lanes. The eastbound and westbound Delaware Route 24 approaches will also be widened to provide separate left-turn, through and right-turn lanes. In addition, the improvements will include extending the left-turn and right-turn lanes on all approaches to meet storage requirements.

This HEP project is scheduled for preliminary engineering in FY17–FY18, right-of-way acquisition in FY19–FY20, and construction in FY21.

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

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	***Existing Traffic Control***	***Situations for which deficiencies occur***
Angola Road & Angola by the Bay Entrance / Proposed Site Access	Unsignalized	2027 PM & Saturday with Middle Creek Preserve (Case 3)
Delaware Route 24 & Angola Road / Robinsonville Road	Signalized	2027 Saturday without and with Middle Creek Preserve (Case 2 & 3)
Delaware Route 24 & Jolyns Way (Sussex Road 289)	Unsignalized	2027 Saturday without and with Middle Creek Preserve (Case 2 & 3)
Delaware Route 24 & Camp Arrowhead Road / Fairfield Road	Signalized	2027 AM & Saturday without and with Middle Creek Preserve (Case 2 & 3); 2027 Saturday without and with Middle Creek Preserve and DelDOT Improvements (Case 2 & 3)
Delaware Route 24 & Pinewater Road (aka Sloan Road) (Sussex Road 49)	Unsignalized	2027 Saturday without and with Middle Creek Preserve (Case 2 & 3)
Delaware Route 24 & Hollymount Road (Sussex Road 48)	Unsignalized	2016 Existing AM, PM & Saturday (Case 1); 2027 AM, PM & Saturday without and with Middle Creek Preserve (Case 2 & 3)

The unsignalized intersection of Angola Road and Angola by the Bay / Proposed Site Access exhibits LOS deficiencies during future conditions with the proposed development. However, we do not recommend any further improvements be implemented by the developer at this intersection beyond those described below in Item No. 2. The planned improvements consist of adding the fourth leg to the intersection, adding eastbound and westbound left-turn lanes and extending the existing eastbound right-turn lane. The anticipated LOS deficiencies are limited to the northbound left-turn egress movement from Angola by the Bay. The deficiencies consist of a borderline LOS E during the weekday PM peak hour and LOS F during the Saturday mid-day peak hour only. The expected worst-case 95th percentile queue length on this approach is approximately five vehicles. The northbound approach already has separate left and right-turn

lanes and it does not appear that a traffic signal would be warranted at this intersection. Therefore, no additional mitigation is recommended beyond the lane additions described above. The northbound stop-controlled approach of Delaware Route 24 and Jolyns Way is expected to operate at LOS E during the Saturday mid-day peak hour in 2027, both without and with Middle Creek Preserve. However, approach volumes on this approach are expected to be less than 10 vehicles per hour. As per the DelDOT Development Coordination Manual, these LOS deficiencies are considered negligible and mitigation is not required.

The intersection of Delaware Route 24 and Camp Arrowhead Road / Fairfield Road is expected to operate at LOS E or F during the weekday AM and Saturday mid-day peak hours in 2027, both without and with Middle Creek Preserve. Accounting for the planned DelDOT HEP project improvements at this location, the intersection is still expected to operate at LOS E during the 2027 Saturday mid-day peak hour. However, due to the limited impact of the subject development on this intersection and the difficulty of implementing additional improvements due to geometric constraints, we do not recommend any further improvements be implemented by the developer at this intersection beyond those planned as part of the DelDOT project. New and modified turn lanes to be designed as part of the DelDOT HEP project should accommodate anticipated 95th percentile queue lengths to the extent possible.

The northbound approach of Delaware Route 24 and Pinewater Road (aka Sloan Road) is expected to operate at LOS F during the Saturday mid-day peak hour in 2027, both without and with Middle Creek Preserve. However, 95th percentile queue lengths are expected to be no greater than approximately 75 feet in both cases. Due to the relatively short anticipated queue lengths and limited situations in which this intersection is deficient, no mitigation appears necessary at this intersection. It is noted that the proposed signal at the intersection of Delaware Route 24 and Hollymount Road will create additional gaps in Delaware Route 24 traffic at the Pinewater Road intersection, thereby potentially alleviating the future Saturday peak hour side-street LOS deficiency. Furthermore, there is a possibility that Pinewater Road may be realigned as part of the Burton's Pond development to intersect with Delaware Route 24 opposite Hollymount Road (thereby forming a four-leg intersection instead of two offset T-intersections).

Should the County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should improve Angola Road along the site frontage in order to meet DelDOT's local road standards. These standards include but are not limited to eleven-foot travel lanes and five-foot shoulders. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lane's pavement section and recommend an overlay thickness to the developer's engineer if necessary.

2. The developer should improve the intersection of Angola Road and Angola by the Bay Entrance / Proposed Site Access. The proposed configuration is shown in the table below.

Approach	Current Configuration	Proposed Configuration
Northbound Angola by the Bay	One left-turn lane and one right-turn lane	One shared through/left-turn lane and one right-turn lane
Southbound Middle Creek Preserve	Does Not Exist	One shared left/through/right-turn lane
Eastbound Angola Road	One through lane and one right-turn lane	One left-turn lane, one through lane, and one right-turn lane
Westbound Angola Road	One shared through/left-turn lane	One left-turn lane and one shared through/right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths during the site plan review process.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Angola by the Bay	N/A	50 feet *
Southbound Middle Creek Preserve	N/A	N/A
Eastbound Angola Road	210 feet **	240 feet **
Westbound Angola Road	160 feet **	N/A

* turn-lane length based on storage length per queuing analysis, with 50-foot minimum. Existing turn-lane length appears to be sufficient.

** initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet.*

3. The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT's HSIP SR 24 at Camp Arrowhead Road and SR 24 at Robinsonville Road / Angola Road Intersection Improvements Project. The amount of the contribution should be determined through coordination with DelDOT's Development Coordination Section.

At the intersection of Delaware Route 24 and Camp Arrowhead Road / Fairfield Road, the improvements proposed as part of this DelDOT project would result in the following configuration:

Approach	Current Configuration	Proposed Configuration
Northbound Camp Arrowhead Road	One left-turn lane, one through lane and one right-turn lane	One left-turn lane, one through lane and one right-turn lane
Southbound Fairfield Road	One left-turn land and one shared through/right-turn lane	One left-turn lane, one through lane and one right-turn lane
Eastbound Delaware Route 24	One left-turn lane, one through lane and one right-turn lane	One left-turn lane, one through lane and one right-turn lane
Westbound Delaware Route 24	One left-turn lane, one through lane and one right-turn lane	One left-turn lane, one through lane and one right-turn lane

At the intersection of Delaware Route 24 and Angola Road / Robinsonville Road, the improvements proposed as part of this DelDOT project would result in the following configuration:

Approach	Current Configuration	Proposed Configuration
Northbound Angola Road	One shared through/left-turn lane and one right-turn lane	One left-turn lane, one through lane and one right-turn lane
Southbound Robinsonville Road	One shared through/left-turn lane and one right-turn lane	One left-turn lane, one through lane and one right-turn lane
Eastbound Delaware Route 24	One left-turn lane and one shared through/right-turn lane	One left-turn lane, one through lane and one right-turn lane
Westbound Delaware Route 24	One left-turn lane and one shared through/right-turn lane	One left-turn lane, one through lane and one right-turn lane

Turn lane lengths at both intersections will be extended as needed to meet storage requirements to be determined during the design of the DelDOT project.

4. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Delaware Route 24 and Hollymount Road. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. The developer should coordinate with DelDOT regarding a possible Traffic Signal Justification Study (TSJS), signal design details, equitable cost sharing, and implementation of the traffic signal. The agreement should provide for installation and activation of the signal at DelDOT's discretion. One or more other developers may enter into a traffic signal agreement for this intersection as well.

5. The following bicycle and pedestrian improvements should be included:

   a. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane on eastbound Angola Road at the Angola by the Bay / Middle Creek Preserve intersection.

b. Adjacent to the extended right-turn lane on eastbound Angola Road at the Angola by the Bay entrance, a minimum of a five foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.
c. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.
d. Utility covers should be made flush with the pavement.
e. If a clubhouse or other community facility is constructed as shown on the conceptual site plan, bike parking should be provided near the building entrances. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
f. A minimum 15-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Angola Road. Within the easement along Angola Road, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed along the site frontage. The shared-use path should have a minimum of a five-foot buffer from the roadway. The shared-use path should connect to pedestrian facilities on the adjacent properties or to the shoulder of Angola Road in accordance with DelDOT's *Shared Use Path and/or Sidewalk Termination Policy* dated June 19, 2014. The developer should coordinate with DelDOT's Development Coordination Section to determine exact locations and details of the shared-use path connections at the property boundaries.
g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings within the development. Type 3 curb ramps are discouraged.
h. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be considered within the development. These sidewalks should each be a minimum of five feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. These internal sidewalks should connect to the proposed frontage shared-use path.
i. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.
j. Recommendations regarding transit access provided by the Delaware Transit Corporation (DTC) should be incorporated into the site design. This includes designing the shared-use path along the site frontage to accommodate the future installation of a transit bus pad.

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 http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DelDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at Adam.Weiser@state.de.us.

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

Additional details on our review of this TIS are attached. Please contact me at (302) 738-0203 or through e-mail at ajparker@mtmail.biz if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.

Andrew J. Parker, P.E., PTOE
Project Manager

Enclosure

General Information

Report date: August 2016
Prepared by: Pennoni
Prepared for: Stonemark Ventures (BDRP, LLC.)
Tax parcel: 234-11.00-51.00, 54.00, 54.01, 54.02, 54.03; 234-12.00-14.00
Generally consistent with DelDOT's *Development Coordination Manual*: Yes

Project Description and Background

Description: The proposed residential development would include 313 single-family detached homes.
Location: The Middle Creek Preserve (aka The Estates at Middle Creek) residential development is proposed to be located on the north side of Angola Road (Sussex Road 277), east of Delaware Route 24 in Sussex County, Delaware. A site location map is included on Page 9.
Amount of land to be developed: approximately 147.61 acres of land
Land use approval(s) needed: Subdivision approval. The land is currently zoned as AR-1 (Agricultural Residential) within Sussex County, and no rezoning is needed to permit the proposed land use.
Proposed completion date: 2027
Proposed access locations: One full access point is proposed on Angola Road, directly across from the existing entrance to the Angola by the Bay residential development.
Daily Traffic Volumes (per DelDOT Traffic Summary 2015):

- 2015 Average Annual Daily Traffic on Angola Road: 3,725 vpd


Robinsonville Road
Camp Arrowhead Road
24
Conleys Chapel Road
John J. Williams Highway
Bay Ridge Woods
Wyndam
Angola Road
Lochwood
Angola by the Bay
Burton Pond
Pinewater Road
Site Location Map
Proposed Entrance
N
Not to Scale
Graphics is approximation only. Based on conceptual site plan dated 10/30/15.

2015 Delaware Strategies for State Policies and Spending

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

Investment Level 3

Investment Level 3 Areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities, but where development is not necessary to accommodate expected short-term population growth. The second category includes lands that are adjacent to fast-growing Investment Level 1 and 2 areas but are often impacted by environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state Agencies and local governments with land-use authority.

Generally, Investment Level 3 areas should not be developed until surrounding Investment Level 1 and 2 areas are substantially built out. From a housing perspective, Investment Level 3 areas are characterized by low density and rural homes. New housing developments in the short term would, in most cases, represent leap-frog development, which is undesirable. Higher density housing in Investment Level 3 areas is more appropriate once Level 2 areas are built out and utilities are available.

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed Middle Creek Preserve residential development is located within an Investment Level 3 area, and is to be developed as 313 single-family detached homes. This type of development is generally consistent with the character of Investment Level 3 areas. The nearby Delaware Route 24 corridor is becoming increasingly developed as more of the nearby Investment Level 1 and 2 areas are being built out. The redevelopment of this site should consider natural resources and the environment, emphasizing the protection of critical natural habitat and wildlife and stormwater-management/drainage areas. Assuming the planning and construction takes into account the environmentally sensitive area, the proposed development appears to generally comply with the policies stated in the 2015 "Strategies for State Policies and Spending."

Comprehensive Plan

Sussex County Comprehensive Plan:
(Source: Sussex County Comprehensive Plan Update, June 2008)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development parcel is within the Environmentally Sensitive Developing Area (categorized as a Growth Area).

Growth Areas, including the Environmentally Sensitive Developing Area, are designed to accommodate concentrated levels of development. The Environmentally Sensitive Developing

Area has been designated by Sussex County for large areas around Rehoboth Bay, Indian River Bay, and Little Assawoman Bay (the inland bays). This designation recognizes two characteristics of these areas. First, these regions are among the most desirable locations in Sussex County for new housing, as reflected in new construction data and real estate prices. Second, these regions contain ecologically important wetlands and other coastal lands that help absorb floodwaters and provide extensive habitat for native flora and fauna. These areas also have great impacts upon the water quality of the bays and inlets and upon natural habitats.

The challenge in these regions is to safeguard genuine natural areas and mitigate roadway congestion without stifling the tourism and real estate markets that: a) provide many jobs; b) create business for local entrepreneurs; and c) help keep local tax rates reasonable. The County has major initiatives to extend public sewer service to replace failing on-site systems in many of these areas. Very careful control of stormwater runoff is an extremely important concern to keep sediment and other pollutants out of the inland bays.

The following major guidelines should apply to future growth in Environmentally Sensitive Developing Areas:

Permitted Uses – Environmentally Sensitive Developing Areas are areas that can accommodate development provided special environmental concerns are addressed. A range of housing types should be permitted in Environmentally Sensitive Areas, including single-family homes, townhouses and multi-family units. Retail and office uses are appropriate but larger shopping centers and office parks should be confined to selected locations with access to arterial roads. Careful mixtures of homes with light commercial and institutional uses can be appropriate to provide for convenient services and to allow people to work close to home. Major new industrial uses are not proposed in these areas. Industrial zones are regulated by the Delaware Coastal Zone Act, which restrict heavy industry and bulk transfer.

Densities – The Environmentally Sensitive Developing Areas function as an "overlay" area to several underlying zoning districts. It may be advisable for legal reasons to convert this overlay area into regular zoning districts, while maintaining the current standards. Most of the Environmental Sensitive Developing Areas should continue to allow 2 homes per acre. The option should exist to go up to 4 units per acre if the developer uses optional density bonuses. Smaller lots and flexibility in dimensional standards should be allowed if the developer uses a cluster option that results in permanent preservation of a substantial percentage of the tract.

The County may also consider an additional layer of protection in the Environmentally Sensitive Developing Areas. Tidal wetland area could be subtracted from the total tract size so that "net" tract size is used as the basis for calculating how much development is allowed.

All applicants for developments of a minimum size (as specified in zoning) should continue to be required to provide information that analyzes the development's potential environmental impacts, including effects on stormwater runoff, nitrogen and phosphorous loading, wetlands, woodlands, wastewater treatment, water systems, and other matters that affect the ecological sensitivity of the inland bays.

Infrastructure – Central water and sewer facilities are strongly encouraged. If central utilities are not possible, permitted densities should be limited to 2 units per acre.

Proposed Development's Compatibility with Comprehensive Plan: The proposed Middle Creek Preserve residential development is planned to be developed as 313 single-family detached homes on a 147.61-acre assemblage of parcels (approximately 2.1 homes per acre). The site is currently zoned AR-1 / ESDDOZ (Agricultural Residential) within Sussex County, and no rezoning is needed to permit the proposed land use. The purpose of this zoning district is to protect agricultural lands and activities and other valuable natural resources. Low-density housing is permitted along with churches, recreational facilities, and accessory uses as may be necessary or is normally compatible with residential surroundings. The proposed development appears to comply with the characteristics of Growth Areas in general as well as the *Permitted Uses* for the Environmentally Sensitive Developing Area.

While the type of use proposed for this site appears to be permitted in this location, there are specific regulations that must be followed. In particular, there are regulations and densities pertaining to the proposed housing that need to be met and/or approved through the Sussex County site plan review process. As such, this development raises questions regarding consistency with the Sussex County Comprehensive Plan, and thus requires additional discussion.

Relevant Projects in the DelDOT Capital Transportation Program

DelDOT currently has one relevant project in the study area. The HSIP SR 24 at Camp Arrowhead Road and SR 24 at Robinsonville Road / Angola Road Intersection Improvements Project (State Contract No. T201200902), which is part of DelDOT's Hazard Elimination Program (HEP) (formerly Highway Safety Improvement Program (HSIP)), includes improvements at both of these intersections.

The improvements at the intersection of Delaware Route 24 and Camp Arrowhead Road (Sussex Road 279) / Fairfield Road will include the widening of the southbound Fairfield Road approach to provide separate left-turn, through and right-turn lanes. In addition, the improvements will include extending the left-turn and right-turn lanes on all approaches to meet storage requirements.

The improvements at the intersection of Delaware Route 24 and Angola Road / Robinsonville Road (Sussex Road 277) will include the widening of the northbound and southbound Angola Road and Robinsonville Road approaches to provide separate left-turn, through and right-turn lanes. The eastbound and westbound Delaware Route 24 approaches will also be widened to provide separate left-turn, through and right-turn lanes. In addition, the improvements will include extending the left-turn and right-turn lanes on all approaches to meet storage requirements.

This HEP project is scheduled for preliminary engineering in FY17–FY18, right-of-way acquisition in FY19–FY20, and construction in FY21.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Ninth Edition, published by the Institute of Transportation Engineers (ITE). The following land uses were utilized to estimate the amount of new traffic generated for this development:

- 313 Single-Family Detached Homes (ITE Land Use Code 210)

Table 1
MIDDLE CREEK PRESERVE PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			SAT Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
313 single-family detached homes	57	172	229	185	108	293	155	132	287
TOTAL TRIPS	**57**	**172**	**229**	**185**	**108**	**293**	**155**	**132**	**287**

Table 2
MIDDLE CREEK PRESERVE DAILY TRIP GENERATION

Land Use	Weekday Daily			Saturday Daily		
	In	Out	Total	In	Out	Total
313 single-family detached homes	1500	1500	3000	1467	1467	2934
TOTAL TRIPS	**1500**	**1500**	**3000**	**1467**	**1467**	**2934**

Overview of TIS

Intersections examined:

1) Angola Road & Angola by the Bay Entrance / Proposed Site Access
2) Delaware Route 24 & Angola Road / Robinsonville Road
3) Delaware Route 24 & Jolyns Way (Sussex Road 289)
4) Delaware Route 24 & Camp Arrowhead Road / Fairfield Road
5) Delaware Route 24 & Pinewater Road (aka Sloan Road) (Sussex Road 49)
6) Delaware Route 24 & Hollymount Road (Sussex Road 48)

Conditions examined:

1) 2016 existing conditions (Case 1)
2) 2027 without Middle Creek Preserve residential development (Case 2)
3) 2027 with Middle Creek Preserve residential development (Case 3)

Peak hours evaluated: Weekday morning and evening and Saturday mid-day peak hours

Committed developments considered:

1) Love Creek Elementary School (720 student elementary school)
2) Pelican Landing (100,000 sf shopping center and 5,000 sf fast-food restaurant)
3) Marsh Island (152 single-family detached homes)
4) Marsh Farm Estates (104 single-family detached homes)
5) Windswept (115 single-family detached homes)
6) Love Creek Marina (153 townhomes/condos, 100-room hotel, and 7,500 sf quality restaurant)

Intersection Descriptions

1) Angola Road & Angola by the Bay Entrance / Proposed Site Access

Type of Control: existing two-way stop-controlled (three-leg intersection); proposed two-way stop-controlled (four-leg intersection)
Northbound approach: (Angola by the Bay Entrance) existing one left-turn lane and one right-turn lane, stop-controlled; proposed one shared through/left-turn lane and one right-turn lane, stop-controlled
Southbound approach: (Proposed Site Access) proposed one shared left/through/right-turn lane, stop-controlled
Eastbound approach: (Angola Road) existing one through lane and one right-turn lane, proposed one left-turn lane, one through lane and one right-turn lane
Westbound approach: (Angola Road) existing one shared through/left-turn lane, proposed one left-turn lane and one shared through/right-turn lane

2) Delaware Route 24 & Angola Road / Robinsonville Road

Type of Control: signalized four-leg intersection
Northbound approach: (Angola Road) one shared through/left-turn lane and one right-turn lane
Southbound approach: (Robinsonville Road) one shared through/left-turn lane and one right-turn lane
Eastbound approach: (DE Route 24) one left-turn lane and one shared through/right-turn lane with right turn channelization
Westbound approach: (DE Route 24) one left-turn lane and one shared through/right-turn lane

3) Delaware Route 24 & Jolyns Way

Type of Control: two-way stop controlled (T-intersection)
Northbound approach: (Jolyns Way) one shared left/right-turn lane, stop-controlled
Eastbound approach: (DE Route 24) one shared through/right-turn lane
Westbound approach: (DE Route 24) one shared through/left-turn lane

4) Delaware Route 24 & Camp Arrowhead Road / Fairfield Road
Type of Control: signalized four-leg intersection
Northbound approach: (Camp Arrowhead Road) one left-turn lane, one through lane, and one right-turn lane
Southbound approach: (Fairfield Road) one left-turn lane and one shared through/right-turn lane
Eastbound approach: (DE Route 24) one left-turn lane, one through lane, and one right-turn lane
Westbound approach: (DE Route 24) one left-turn lane, one through lane, and one right-turn lane

5) Delaware Route 24 & Pinewater Road (aka Sloan Road)
Type of Control: two-way stop controlled (T-intersection)
Northbound approach: (Pinewater Road aka Sloan Road) one shared left-turn/right-turn lane, stop-controlled
Eastbound approach: (DE Route 24) one through lane and one right-turn lane
Westbound approach: (DE Route 24) one shared through/left-turn lane and one by-pass lane

6) Delaware Route 24 & Hollymount Road
Type of Control: two-way stop controlled (T-intersection)
Southbound approach: (Hollymount Road) one shared left-turn/right-turn lane, stop-controlled
Eastbound approach: (DE Route 24) one shared through/left-turn lane
Westbound approach: (DE Route 24) one through lane and one right-turn lane

Safety Evaluation

Crash Data: Crash data for the six study intersections was obtained for June 22, 2013 through June 22, 2016. The data includes crashes that occurred within a one-tenth mile radius of the study intersections.

At the proposed site entrance (Angola Road & Angola by the Bay Entrance), the crash data request returned a total of one crash for the three-year period. This crash involved a vehicle colliding with a deer in the roadway under dark, unlit conditions. No injuries were reported in this crash.

At the study intersections with Delaware Route 24, the crash data request returned a total of 60 crashes for the three-year period. There was one fatal crash, which involved a pedestrian crossing Delaware Route 24 near Camp Arrowhead Road. Of the 60 total crashes, 15 crashes (25%) resulted in personal injury. One injury crash involved a pedestrian at the intersection of Delaware Route 24 & Angola Road/Robinsonville Road. The most common types of crashes were rear-end crashes (48%), angle crashes (18%), and crashes involving a single vehicle (18%). The majority of crashes occurred during daylight (72%) with dry pavement conditions (83%). The primary contributing circumstances include driver inattention/distraction/fatigue (40%), following too

close (10%), deer in the roadway (8%), and disregarding a traffic signal (8%). A breakdown of crashes by intersection with Delaware Route 24 is as follows:

- Delaware Route 24 & Angola Road / Robinsonville Road
  - 23 crashes reported (including 1 pedestrian injury)
- Delaware Route 24 & Jolyns Way
  - 2 crashes reported
- Delaware Route 24 & Camp Arrowhead Road / Fairfield Road
  - 22 crashes reported (including 1 pedestrian fatality)
- Delaware Route 24 & Pinewater Road (aka Sloan Road) & Holly Mount Road
  - 13 crashes reported (could not always differentiate location for these two closely-spaced intersections)

Sight Distance: No significant sight distance issues have been reported or indicated by crash data. There are horizontal curves on Delaware Route 24 approaching Pinewater Road (aka Sloan Road) and Hollymount Road from both directions. There is also a small embankment on the northeast quadrant of the Pinewater Road (aka Sloan Road) intersection. However, sight distance appears sufficient at both locations.

Vegetation including trees on the southeast corner of Delaware Route 24 & Jolyns Way may obstruct sight distance for drivers looking left when stopped on Jolyns Way, although it appears there is room for drivers to move up closer to Delaware Route 24 to improve their sight distance.

The study area generally consists of straight and flat roadways and, other than at the Jolyns Way intersection, there are few potential visual obstructions. Sight distance is adequate throughout the study area (other than perhaps at Jolyns Way due to the issue described above). No problematic sight distance issues have been reported or indicated by crash data, and no major problems were observed during field observations.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: The Delaware Transit Corporation (DTC) operates a seasonal DART bus route (Route 207) and a new year-round bus route (Route 215), effective February 2016, in the study area. Route 207 serves Rehoboth / Long Neck / Pot-Nets from mid-May to mid-September. Route 215 runs between Rehoboth/Lewes and Millsboro via Delaware Route 24 with two round-trips in the morning and three in the afternoon. The nearest bus stops are located along Delaware Route 24 westbound approximately 500' west of Camp Arrowhead Road and along Delaware Route 24 eastbound approximately 500' east of Camp Arrowhead Road. Neither bus stop has a waiting pad, bench, shelter, or other amenities.

Planned transit service: Pennoni contacted a representative of the Delaware Transit Corporation (DTC) to determine future transit service in the area and any transit facilities for the proposed development. No fixed route service is currently planned along Angola Road, however, flex service (which may deviate up to one mile from the regular route along Delaware Route 24) may travel to the site. DTC has requested the provision of sidewalk along the site frontage

connecting to the main entrance. This sidewalk should be designed to accommodate future installation of a transit bus pad.

Existing bicycle and pedestrian facilities: There are no marked bicycle lanes throughout the study area along Delaware Route 24 or any of the minor streets in the vicinity of Delaware Route 24. Delaware Route 24 provides 8'-10' shoulders in each direction for bicycle traffic, while the minor streets do not have shoulders. According to the Sussex County bicycle map, Delaware Route 24 is classified as a "High Traffic Regional Bicycle Route with a Bikeway" throughout the study area. Camp Arrowhead Road from Delaware Route 24 to Waterview Road, Angola Road from Delaware Route 24 to Camp Arrowhead Road, and Robinsonville Road from Delaware Route 24 to Conleys Chapel Road are all classified as "Connector Bicycle Route Suggestions without a Bikeway."

There are no existing pedestrian facilities throughout the study area. There are no marked crosswalks, curb ramps, or pedestrian signals at the signalized intersections. There are no sidewalks along Delaware Route 24 or any of the minor streets in the study area. There were two crashes involving pedestrians noted in the crash data analysis (resulting in one injury and one fatality). These crashes suggest the need to evaluate safer pedestrian infrastructure throughout the study area.

Planned bicycle and pedestrian facilities: Pennoni attempted to contact a representative of DelDOT's Divison of Planning to determine pedestrian and bicycle accommodations for the proposed development but did not receive a response. Since design work has not started on the planned DelDOT HSIP improvements, it is unclear at this time what if any bicycle and/or pedestrian infrastructure will be added to the signalized intersections of Delaware Route 24 & Angola Road / Robinsonville Road and/or Delaware Route 24 & Camp Arrowhead Road / Fairfield Road.

The developer plans to improve the existing intersection of Angola Road & Angola by the Bay entrance / proposed site access. The improvements would include an 8' shoulder for bicyclists along the site frontage. A dedicated bicycle lane will be striped along eastbound Angola Road between the eastbound through lane and the eastbound right-turn lane.

A 10' wide multi-use path is also planned along the site frontage on Angola Road. Internal ADA compliant sidewalks, curb ramps, and crosswalks will be provided in the development and will link to the proposed multi-use path.

Previous Comments

All comments from DelDOT's Scoping Letter, Traffic Count Review, Preliminary TIS (PTIS) Review and other correspondence appear to have been addressed in the Final TIS submission.

General HCS Analysis Comments

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

1) For unsignalized intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized intersections, the TIS and McCormick Taylor applied HV by lane group using existing data. The TIS and McCormick Taylor generally assumed future HV to be the same as existing HV at all intersections. Both the TIS and McCormick Taylor assumed 3% HV for future movements to and from the proposed site access point.

2) For existing conditions, the TIS and McCormick Taylor determined, for each intersection, overall intersection peak hour factors (PHF). For future conditions, the TIS and McCormick Taylor assumed existing PHF for all intersections other than the proposed site entrance. At that location, both the TIS and McCormick Taylor assumed a PHF of 0.88.

3) For future conditions with the Middle Creek Preserve Development, the TIS assumed one shared left-turn/through/right-turn lane exiting the proposed development. McCormick Taylor assumed separate left-turn and right-turn lanes. The site plan provided in the TIS appears to show enough room for two lanes at the egress to Angola Road.

4) For analyses of all signalized intersections, the TIS and McCormick Taylor used a base saturation flow rate of 1,750 pcphpl per DelDOT's Development Coordination Manual.

5) The HCS analyses included in the TIS did not always reflect the lane widths observed in the field by McCormick Taylor. McCormick Taylor's HCS analyses incorporated our field-measured lane widths.

6) The TIS and McCormick Taylor used different signal timings when analyzing the signalized intersections in some cases.

7) McCormick Taylor and the TIS used different Right-Turn-On-Red (RTOR) volumes for signalized intersections in some cases. The TIS appears to have grown RTOR volumes by a factor for future cases. McCormick Taylor general input RTOR volumes from the existing traffic counts. McCormick Taylor also input right turn overlaps at the signalized intersections. See footnotes in the HCS results for more specific information.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Middle Creek Preserve
Report dated August 2016
Prepared by Pennoni

Unsignalized Intersection [1] Two-Way Stop Control	**LOS per TIS**			**LOS per McCormick Taylor**		
Angola Road & Angola by the Bay / Proposed Site Access	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2016 Existing (Case 1)						
Westbound Angola Road – Left	A (7.4)	A (7.7)	A (7.8)	A (7.4)	A (7.7)	A (7.8)
Northbound Angola by the Bay	B (10.2)	B (10.4)	B (11.8)	B (10.2)	B (10.4)	B (11.8)
2027 without Middle Creek Preserve (Case 2)						
Westbound Angola Road – Left	A (7.4)	A (8.0)	A (8.1)	A (7.5)	A (8.1)	A (8.1)
Northbound Angola by the Bay	B (11.5)	B (12.0)	B (14.4)	B (11.5)	B (12.1)	B (14.5)
2027 with Middle Creek Preserve (Case 3) [2,3]						
Eastbound Angola Road – Left	A (7.9)	A (8.0)	A (8.1)	A (7.9)	A (8.1)	A (8.2)
Westbound Angola Road – Left	A (7.4)	A (8.1)	A (8.1)	A (7.5)	A (8.2)	A (8.1)
Northbound Angola by the Bay	C (22.7)	E (36.7)	F (71.7)	C (22.9)	E (37.1)	F (73.2)
Southbound Site Access	B (11.1)	A (9.9)	B (10.6)	B (11.2)	A (9.9)	B (10.7)

[1] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[2] For the with Middle Creek Preserve scenario, the TIS assumed one shared left-turn/through/right-turn lane on the Middle Creek Preserve egress. McCormick Taylor assumed separate left-turn and right-turn lanes. The provided site plan appears to show sufficient room for separate lanes on this approach. If sufficient room is provided for two lanes, the egress is likely to operate as two separate lanes, regardless of pavement markings on the approach.
[3] The northbound left movement is expected to operate with unacceptable LOS in the weekday PM and Saturday peak hours with the Middle Creek Preserve development. 95th percentile queue lengths on this approach are expected to be approximately two and five vehicles in these peak hours, respectively.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Middle Creek Preserve
Report dated August 2016
Prepared by Pennoni

Signalized Intersection [4]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 24 & Angola Road / Robinsonville Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2016 Existing (Case 1)	B (13.5)	B (14.0)	C (23.6)	B (13.5)	B (14.0)	C (23.4)
2027 without Middle Creek Preserve (Case 2)	C (20.9)	C (21.2)	E (77.9)	C (21.3)	C (22.5)	F (81.1)
2027 without Middle Creek Preserve (Case 2) *With DelDOT Improvements* [5]	C (23.0)	C (24.6)	C (33.2)	C (21.0)	C (23.7)	C (32.3)
2027 with Middle Creek Preserve (Case 3)	C (34.5)	D (36.6)	F (111.3)	C (34.9)	D (39.9)	F (113.9)
2027 with Middle Creek Preserve (Case 3) *With DelDOT Improvements* [5]	C (25.2)	C (28.3)	D (42.0)	C (25.6)	C (27.2)	D (44.8)

[4] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[5] McCormick Taylor used right turn on red volumes from the existing traffic counts and included right turn overlap phases in the analysis.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Middle Creek Preserve
Report dated August 2016
Prepared by Pennoni

Unsignalized Intersection [6] Two-Way Stop Control (T-intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 24 & Jolyns Way	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2016 Existing (Case 1)						
Westbound DE 24 – Left	A (9.1)	A (8.5)	A (9.6)	A (9.1)	A (8.5)	A (9.6)
Northbound Jolyns Way	C (18.0)	C (15.5)	C (22.3)	C (18.0)	C (15.5)	C (22.3)
2027 without Middle Creek Preserve (Case 2)						
Westbound DE 24 – Left	A (9.7)	A (9.0)	B (10.9)	A (9.7)	A (9.0)	B (11.0)
Northbound Jolyns Way	C (23.4)	C (20.3)	E (39.9)	C (23.7)	C (20.5)	E (40.6)
2027 with Middle Creek Preserve (Case 3)						
Westbound DE 24 – Left	A (9.9)	A (9.1)	B (11.1)	A (10.0)	A (9.1)	B (11.2)
Northbound Jolyns Way	D (25.2)	C (21.7)	E (44.1)	D (25.6)	C (22.0)	E (44.9)

[6] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Middle Creek Preserve
Report dated August 2016
Prepared by Pennoni

Signalized Intersection [7]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 24 & Camp Arrowhead Road / Fairfield Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2016 Existing (Case 1)	C (27.7)	B (19.3)	B (17.9) [8]	C (26.9)	B (18.8)	C (22.5) [10]
2027 without Middle Creek Preserve (Case 2)	E (56.4)	C (28.7)	F (97.7)	E (67.6)	C (33.6)	F (102.6) [10]
2027 without Middle Creek Preserve (Case 2) *With DelDOT Improvements* [9]	D (39.4)	C (23.1)	E (69.9)	D (45.1)	C (31.8)	E (69.8) [10]
2027 with Middle Creek Preserve (Case 3)	E (68.1)	C (33.0)	F (107.0)	F (80.6)	D (40.4)	F (112.0) [10]
2027 with Middle Creek Preserve (Case 3) *With DelDOT Improvements* [9]	D (48.3) [11]	C (25.3)	E (77.7)	D (54.0)	C (34.1)	E (77.1) [10]

[7] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[8] Existing Saturday analysis completed by Pennoni does not appear to include the protected portion of the westbound left turn.
[9] McCormick Taylor used right turn on red volumes from the existing traffic counts and included right turn overlap phases in the analysis.
[10] Right turn on red volumes appear to be missing for several approaches in the traffic counts. McCormick Taylor calculated right turn on red volumes as a fraction of all right turns (based on the AM traffic counts).
[11] The HCS analysis report in the TIS Appendix E appears to have removed actuated phasing for the Case 3 AM peak hour with DelDOT Improvements.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Middle Creek Preserve
Report dated August 2016
Prepared by Pennoni

Unsignalized Intersection [12, 13] Two-Way Stop Control (T-intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 24 & Pinewater Road (aka Sloan Road)	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2016 Existing (Case 1)						
Westbound DE 24 - Left	A (8.9)	A (8.7)	A (9.8)	A (8.9)	A (8.8)	A (9.9)
Northbound Pinewater Road	B (13.6)	B (13.8)	C (24.1)	C (17.7)	C (19.5)	D (33.7)
2027 without Middle Creek Preserve (Case 2)						
Westbound DE 24 - Left	A (9.3)	A (9.5)	B (11.4)	A (9.4)	A (9.6)	B (11.6)
Northbound Pinewater Road	C (15.9)	C (17.3)	F (58.5)	C (22.3)	D (27.1)	F (80.0)
2027 with Middle Creek Preserve (Case 3)						
Westbound DE 24 - Left	A (9.4)	A (9.9)	B (11.9)	A (9.5)	B (10.0)	B (12.0)
Northbound Pinewater Road	C (18.1)	C (20.5)	F (79.9)	C (24.9)	D (32.4)	F (109.9)

[12] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[13] It appears that Pennoni analyzed this approach as a "flared approach" with a flared minor-street storage of 1 vehicle. For a conservative analysis, McCormick Taylor did not include a flared approach.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Middle Creek Preserve
Report dated August 2016
Prepared by Pennoni

Unsignalized Intersection [14] Two-Way Stop Control (T-intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 24 & Hollymount Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2016 Existing (Case 1)						
Eastbound DE 24 – Left	A (8.4)	A (9.4)	A (9.1)	A (8.3)	A (9.4)	A (9.1)
Southbound Hollymount Road	D (26.7)	E (36.9)	F (82.0)	E (36.6)	F (62.1)	F (176.6)
2027 without Middle Creek Preserve (Case 2)						
Eastbound DE 24 – Left	A (8.9)	B (10.2)	B (10.1)	A (8.8)	B (10.3)	B (10.2)
Southbound Hollymount Road	F (64.1)	F (217.8)	F (669.7)	F (120.8)	F (411.2)	F (1216.5)
2027 with Middle Creek Preserve (Case 3)						
Eastbound DE 24 – Left	A (9.2)	B (10.4)	B 10.4)	A (9.1)	B (10.5)	B (10.5)
Southbound Hollymount Road	F (98.9)	F (418.7)	F (1034.1)	F (194.0)	F (714.5)	F (1825.8)

Signalized Intersection (T-intersection) [14, 15]	**LOS per McCormick Taylor**		
Delaware Route 24 & Hollymount Road	Weekday AM	Weekday PM	Saturday Mid-Day
2027 with Middle Creek Preserve (Case 3)	B (11.8)	B (12.6)	B (16.4)

[14] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[15] McCormick Taylor analyzed the intersection of Delaware Route 24 & Hollymount Road with signalization. With a signal, the intersection is expected to operate at overall acceptable LOS in all peak hours. It is noted that installation of a traffic signal at this location will also have impacts at the intersection of Delaware Route 24 & Pinewater Road (aka Sloan Road). These impacts should be investigated further in the design phase.