



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

JENNIFER COHAN  
SECRETARY

October 11, 2018

Ms. Betty Tustin  
The Traffic Group, Inc.  
104 Kenwood Court  
Berlin, Maryland 21811

Dear Ms. Tustin:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Acadia (f.k.a. Insight at Lewes Point)** (Tax Parcels 234-11.00-60.00, 62.03 & 64.00) 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 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,

A handwritten signature in black ink that reads "Troy Brestel".

Troy Brestel  
Project Engineer

TEB:km  
Enclosures

cc with enclosures: Mr. J. Hutchins Haese, Insight Land Company, L.L.C.  
Ms. Constance C. Holland, Office of State Planning Coordination  
Ms. Janelle Cornwell, Sussex County Planning and Zoning  
Mr. Andrew Parker, McCormick Taylor, Inc.  
DelDOT Distribution

## DelDOT Distribution

Brad Eaby, Deputy Attorney General

Robert McCleary, Director, Transportation Solutions (DOTS)

Drew Boyce, Director, Planning

Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS

Michael Simmons, Assistant Director, Project Development South, DOTS

J. Marc Coté, Assistant Director, Development Coordination

T. William Brockenbrough, Jr., County Coordinator, Development Coordination

Peter Haag, Traffic Studies Manager, Traffic, DOTS

Alastair Probert, South District Engineer, South District

Gemez Norwood, South District Public Works Manager, South District

Steve Sisson, Sussex Subdivision Review Coordinator, Development Coordination

David Dooley, Service Development Planner, Delaware Transit Corporation

Mark Galipo, Traffic Engineer, Traffic, DOTS

Sarah Coakley, Principal Planner, Statewide & Regional Planning

Anthony Aglio, Planning Supervisor, Statewide & Regional Planning

Susanne Laws, Sussex County Subdivision Reviewer, Development Coordination

Claudy Joinville, Project Engineer, Development Coordination



October 10, 2018

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

RE: Agreement No. 1773  
Traffic Impact Study Services  
**Task No. 1A Subtask 10A – Acadia**

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Acadia residential development (formerly known as Insight at Lewes Point) prepared by The Traffic Group, Inc. dated March 20, 2018. The Traffic Group prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of the Acadia residential development, proposed to be located on the northwest side of Delaware Route 24, south of Conleys Chapel Road (Sussex Road 280B), and southwest of Robinsonville Road (Sussex Road 277), approximately 800 feet northwest of the intersection of Delaware Route 24 and Robinsonville Road / Angola Road in Sussex County, Delaware. The proposed development would consist of 234 single-family detached homes on a 118.81 acre assemblage of parcels. It is noted the TIS analysis was based on 238 homes. Two full access driveways are proposed; one along Robinsonville Road and another along Dorman Road (Sussex Road 288A).

The land is currently zoned AR-1 (agricultural residential) within Sussex County, and the developer seeks to develop under the existing zoning.

DelDOT currently has one active project within the study area. DelDOT's Hazard Elimination Program (HEP), formerly Highway Safety Improvement Program (HSIP), includes improvements at the intersections of Delaware Route 24 and Camp Arrowhead Road (Sussex Road 279) / Fairfield Road, and Delaware Route 24 and Robinsonville Road / Angola Road. Planned improvements at both intersections are part of State Contract No. T201200902.

The improvements at the intersection of Delaware Route 24 and Camp Arrowhead Road / Fairfield Road will include 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 Robinsonville Road / Angola Road will include widening the northbound Angola Road and southbound 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 left-turn and right-turn lanes will be extended on all approaches to meet storage requirements.

This HEP project is scheduled for final design starting in Spring 2019, right-of-way acquisition starting in Spring 2019, and construction starting in late 2020.

It is also noted that the proposed development is located within the boundary of the Henlopen Transportation Improvement District (TID) as presently contemplated by Sussex County and DelDOT. The TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projections and future development within the designated district. When intersection improvements are identified as part of the Henlopen TID, contributions would be required from the developer of Acadia. Presently, DelDOT and the County are still working toward establishing the TID but when and if that is done, it may be appropriate for the developer to exchange some of the obligations addressed in this letter for an obligation to contribute to the TID.

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:

<i>Intersection</i>	<i>Existing Traffic Control</i>	<i>Situations for which deficiencies occur</i>
Conleys Chapel Road and Beaver Dam Road	One-way stop control (T-intersection)	2024 PM without Acadia (case 2); 2024 AM, PM & Saturday with Acadia (case 3)
Beaver Dam Road and Hollymount Road	All-way stop	2024 PM without and with Acadia (case 2 & 3)
Delaware Route 24 and Robinsonville Road / Angola Road	Signalized	2017 existing Saturday (case 1); 2024 AM, PM & Saturday without and with Acadia (case 2 & 3)

The unsignalized intersection of Conleys Chapel Road and Beaver Dam Road exhibits LOS deficiencies during future conditions without and with the proposed development. With construction of Acadia, the westbound Conleys Chapel Road approach is expected to operate at LOS F in the weekday PM peak hour and at LOS E in the weekday AM and Saturday midday peak hours. The future PM peak hour 95<sup>th</sup> percentile queue length would be approximately nine vehicles. The applicant had proposed to partially mitigate these LOS deficiencies by constructing a westbound right-turn lane, which would alleviate all LOS deficiencies except during the PM peak hour. The westbound approach would improve from approximately 115 seconds of delay to

52 seconds of delay, with the queue reduced from nine vehicles to less than five vehicles. Although the proposed improvement of adding a westbound right-turn lane would still result in a LOS deficiency, potential alternative mitigation measures that may completely address the LOS issues such as converting the intersection to all-way stop control, a roundabout, or a signal have various drawbacks and appear not to be feasible and/or appropriate for this location. As described below in Item No. 5, DelDOT requires a monetary contribution towards a future improvement project at this intersection in lieu of developer-led construction of a westbound right-turn lane.

The all-way stop-controlled intersection of Beaver Dam Road and Hollymount Road exhibits LOS deficiencies during future conditions without and with the proposed development. With construction of Acadia, the overall intersection is anticipated to operate at LOS F during the PM peak hour, with the southbound approach having particularly significant delays and queue lengths. The developer proposes to mitigate these LOS deficiencies by constructing a southbound right-turn lane. If this turn lane is added, we recommend that it be constructed as a channelized turn with yield control; this configuration should allow drivers to more easily identify who has the right-of-way at the intersection at any given time. Additionally if the turn lane is added, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane.

While the developer-proposed improvement for the intersection of Beaver Dam Road and Hollymount Road described immediately above would mitigate the LOS deficiencies, the alternative of converting the intersection to a single-lane roundabout was also investigated. Based on the analysis, it is anticipated that a roundabout would operate well at this location, with the overall intersection expected to operate at LOS A during the weekday AM, weekday PM, and Saturday mid-day peak hours. This represents an improvement over the expected operations of the configuration proposed in the TIS. In addition, the crash data indicates that 15 of the 24 crashes that occurred at this intersection over a three-year period were angle crashes. A single-lane roundabout would greatly reduce the likelihood of angle crashes at this intersection and may be easier to navigate than an all-way stop with multiple lanes on the southbound approach. It is noted that either a southbound right-turn lane or a roundabout may impact an existing fire hydrant, utility box, and irrigation system on the northwest corner of the intersection.

While both mitigation alternatives described above were evaluated for the intersection of Beaver Dam Road and Hollymount Road, as noted below in Item No. 6 the decision on which improvement to implement (a southbound right-turn lane or a single-lane roundabout) will be based on an upcoming recommendation from the Henlopen TID study. Whichever improvement is ultimately recommended, the developer would make an equitable share contribution toward implementation of the selected improvement.

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 Robinsonville Road, Dorman Road and Conleys Chapel Road along the site frontages 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. On Robinsonville Road, the improvements should extend south to tie into the improvements DelDOT will build at the Delaware Route 24 intersection as part of State Contract No. T201200902. 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 realign Dorman Road as needed within the site frontage to provide a right-angle intersection with Conleys Chapel Road, thereby addressing the skewed geometry of the existing intersection. No turn lanes are required at this intersection. The developer should coordinate with DelDOT’s Development Coordination Section to determine final design details for this improvement.
3. The developer should construct Site Access A on Robinsonville Road. The proposed configuration is shown in the table below.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Northbound Robinsonville Road	One through lane	One left-turn lane and one through lane
Southbound Robinsonville Road	One through lane	One through lane and one right-turn lane
Eastbound Site Access A	Does not exist	One shared left-turn/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.

<b>Approach</b>	<b>Left-Turn Lane</b>	<b>Right-Turn Lane</b>
Northbound Robinsonville Road	160 feet *	N/A
Southbound Robinsonville Road	N/A	145 feet *
Eastbound Site Access	N/A	N/A

\* turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet*

4. The developer should construct Site Access B on Dorman Road. The proposed configuration is shown in the table below.

Approach	Current Configuration	Proposed Configuration
Northbound Dorman Road	One through lane	One shared through/right-turn lane
Southbound Dorman Road	One through lane	One left-turn lane and one through lane
Westbound Site Access B	Does not exist	One shared left-turn/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 Dorman Road	N/A	N/A
Southbound Dorman Road	95 feet *	N/A
Westbound Site Access B	N/A	N/A

\* turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet*

5. Before applying for the 101<sup>st</sup> building permit, the developer shall contribute \$109,848 toward a DelDOT project to improve the intersection of Conleys Chapel Road and Beaver Dam Road. The project shall include addition of a westbound right-turn lane on Conleys Chapel Road. DelDOT may require a security to assure that the contribution is provided.
6. For the intersection of Beaver Dam Road and Hollymount Road, the developer should coordinate with DelDOT regarding an equitable share contribution toward improvements at this intersection. The specific improvements are still to be determined, but will consist of either a separate right-turn lane on the southbound Beaver Dam Road approach or converting the intersection to a single-lane roundabout. The decision on which improvement to implement will be based on an upcoming recommendation from the Henlopen TID study. If the recommendation is for a southbound right-turn lane, the initial recommended minimum turn-lane length is 125 feet (excluding taper). The developer should coordinate with DelDOT’s Development Coordination Section during the site plan review process regarding the future improvement for this intersection, including type and timing of mitigation, design details, and amount of the contribution.

7. 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.
8. 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 southbound Robinsonville Road at the proposed site entrance.
  - b. Adjacent to the proposed right-turn lane on southbound Robinsonville Road at the proposed site 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 Dorman Road, Robinsonville Road, and Conleys Chapel Road.
  - g. Within the easements along Dorman Road, Robinsonville Road, and Conleys Chapel Road, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed along each site frontage. Each shared-use path should have a minimum of a five-foot buffer from the roadway. Each shared-use path should connect to the shoulder improvements 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.
  - h. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings within the development. Type 3 curb ramps are discouraged.
  - i. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed 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 frontage shared-use paths.
  - j. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.



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://deldot.gov/Publications/manuals/de\\_mutcd/index.shtml](http://deldot.gov/Publications/manuals/de_mutcd/index.shtml).

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 site plan review process.

Additional details on our review of this TIS are attached. Please contact me at (610) 640-3500 or through e-mail at [ajparker@mccormicktaylor.com](mailto:ajparker@mccormicktaylor.com) if you have any questions concerning this review.

Sincerely,

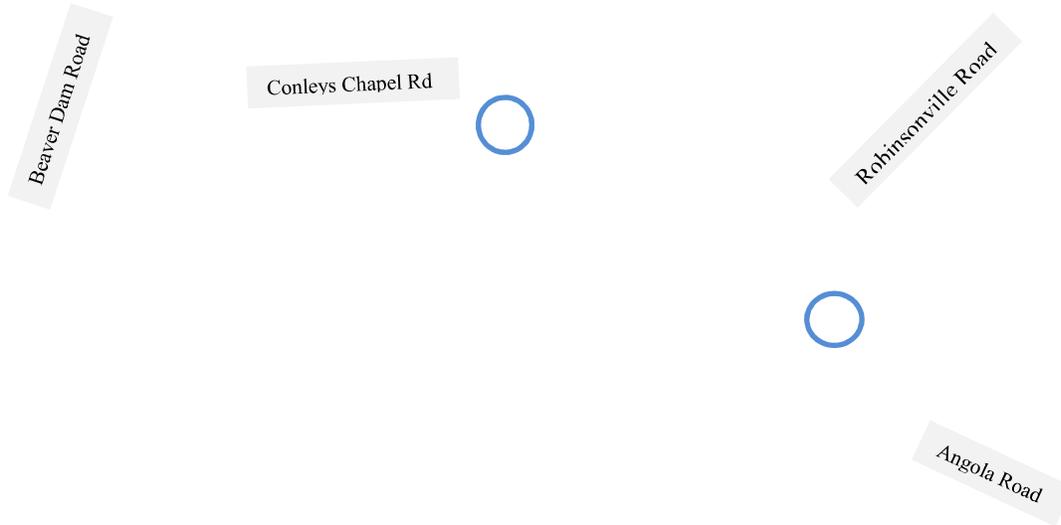
**McCormick Taylor, Inc.**

A handwritten signature in black ink, appearing to read "Andrew J. Parker".

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

Enclosure





Graphics are approximation only. Based on  
conceptual site plan dated 11/2/17

## **2015 Delaware Strategies for State Policies and Spending**

### **Location with respect to the Strategies for State Policies and Spending Map of Delaware:**

The proposed Acadia development is located within two investment level areas, Investment Level 3 and Investment Level 4.

#### *Investment Level 3*

Investment Level 3 areas fall into two categories. The first category covers land that is 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. From a housing perspective, Investment Level 3 areas are characterized by low density and rural homes.

#### *Investment Level 4*

Investment Level 4 areas are predominantly rural or agricultural and contain much of Delaware's open space and natural areas. These areas are home to agribusiness activities, farm complexes, and small settlements/unincorporated communities. Investment Level 4 areas may also have scattered single-family detached residential homes. Existing transportation facilities and services will be maintained by the state while they continue to manage the transportation system in a manner that will support the preservation of the natural environment and agricultural business. Construction of new homes, and development unrelated to the areas' needs is discouraged; housing policies will focus on maintenance and rehabilitation of existing homes and communities. In addition, the Department of Education does not support the construction of new educational facilities in Investment Level 4 areas. The educational needs of Investment Level 4 areas would likely need to be met through facilities located in Investment Level 1-3 areas.

In general, the state will limit its investments in public infrastructure systems; investments should address existing public health, safety, or environmental risks, preserve rural character and natural resources, and discourage further development that is unrelated to the area's needs.

### **Proposed Development's Compatibility with Strategies for State Policies and Spending:**

The proposed Acadia residential development is comprised of 234 single-family detached homes and is located within Investment Level 3 and Investment Level 4 areas. New housing developments are discouraged in Investment Level 4 areas and should meet significant qualifications regarding timing, phasing, site characteristics, and agency programs in Investment Level 3 areas. The state would be responsible for providing many public services to the residents of the development, such as school construction and transportation, police and fire/EMS services, and additional maintenance of the transportation system. Given the location of the development in an Investment Level 4 area, the state generally does not intend to make these significant investments. Rather, the state intends to support agricultural activities and protect the rural and natural character of these areas. Based on the *2015 Delaware Strategies for State*

*Policies and Spending* document, the proposed development does not appear to be compatible with an Investment Level 4 area and additional discussion is required.

### **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 parcels are within a “low density area” (categorized as a “rural area”). In these areas, the county expects farming to co-exist with certain types of residential uses. Similar to all other lands designated as low density areas in Sussex County, the site of the proposed development is zoned AR-1 (agricultural residential). This zoning designation allows for single-family detached homes at two homes per acre on lots containing a minimum of ½ acre if the development connects to central sewers. Otherwise, single-family detached homes are permitted on minimum ¾ acre lots. Two homes per acre are also allowed where a cluster-style plan is used and 30% of the tract is preserved in permanent open space.

Based on the Sussex County Comprehensive Plan, the following major guidelines should apply to future growth in low density areas:

Permitted uses – The primary land uses should be agricultural activities and single-family detached homes. Business or industrial uses should only be permitted to support or address the needs of these two uses.

Densities – The minimum lot size should be ½ acre for lots with central sewer service and ¾ acre for lots with on-site septic systems. A cluster-style plan should permit overall site densities of two homes per acre, provided significant open space is preserved and the development connects to a central sewer.

Infrastructure – Developments where lots are smaller than ¾ acre should require connection to a central sewer.

**Proposed Development’s Compatibility with Comprehensive Plan:** The Acadia residential development would consist of 234 single-family detached homes on a 118.81-acre assemblage of parcels. It appears that a cluster style development is proposed, considerable open space is preserved, and the tract connects to a central community system sewer. Therefore, the comprehensive plan allows for a maximum overall site density of two homes per acre. The construction of 234 single-family homes on 118.81 acres results in an overall site density of just under two homes per acre. The site is currently zoned AR-1 (agricultural residential) within Sussex County, and no rezoning is proposed. 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. While there are issues relating to the use and size of the proposed development in this rural area that require further discussion, based on

the elements described above it appears the proposed development may be compatible with the current version of the Sussex County Comprehensive Plan.

### **Relevant Projects in the DelDOT Capital Transportation Program**

DelDOT currently has one active project within the study area. DelDOT's Hazard Elimination Program (HEP), formerly Highway Safety Improvement Program (HSIP), includes improvements at the intersections of Delaware Route 24 and Camp Arrowhead Road (Sussex Road 279) / Fairfield Road, and Delaware Route 24 and Robinsonville Road / Angola Road. Planned improvements at both intersections are part of State Contract No. T201200902.

The improvements at the intersection of Delaware Route 24 and Camp Arrowhead Road / Fairfield Road will include 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 Robinsonville Road / Angola Road will include widening the northbound Angola Road and southbound 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 left-turn and right-turn lanes will be extended on all approaches to meet storage requirements.

This HEP project is scheduled for final design in Spring 2019, right-of-way acquisition starting in Spring 2019, and construction starting in late 2020.

It is also noted that the proposed development is located within the boundary of the Henlopen Transportation Improvement District (TID) as presently contemplated by Sussex County and DelDOT. The TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projections and future development within the designated district. When intersection improvements are identified as part of the Henlopen TID, contributions would be required from the developer of Acadia. Presently, DelDOT and the County are still working toward establishing the TID but when and if that is done, it may be appropriate for the developer to exchange some of the obligations addressed in this letter for an obligation to contribute to the TID.

## 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:

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

Table 1  
ACADIA 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
Site Access A	19	58	77	63	37	100	52	45	97
Site Access B	25	74	99	81	48	129	67	57	124
<b>TOTAL TRIPS</b>	<b>44</b>	<b>132</b>	<b>176</b>	<b>144</b>	<b>85</b>	<b>229</b>	<b>119</b>	<b>102</b>	<b>221</b>

Table 2  
ACADIA DAILY TRIP GENERATION

Land Use	Weekday Daily			Saturday Daily		
	In	Out	Total	In	Out	Total
238 single-family detached homes	1154	1155	2309	1108	1109	2217
<b>TOTAL TRIPS</b>	<b>1155</b>	<b>1155</b>	<b>2310</b>	<b>1109</b>	<b>1109</b>	<b>2218</b>

## Overview of TIS

### Intersections examined:

- 1) Robinsonville Road & Proposed Site Access A
- 2) Dorman Road & Proposed Site Access B
- 3) Dorman Road & Conleys Chapel Road (Sussex Road 280B)
- 4) Conleys Chapel Road & Beaver Dam Road (Sussex Road 285)
- 5) Beaver Dam Road & Stockley Road (Sussex Road 280)
- 6) Beaver Dam Road & Hollymount Road (Sussex Road 48)
- 7) Conleys Chapel Road & Robinsonville Road
- 8) Delaware Route 24 & Robinsonville Road / Angola Road
- 9) Delaware Route 24 & Jolyns Way (Sussex Road 289)
- 10) Delaware Route 24 & Camp Arrowhead Road / Fairfield Road

**Conditions examined:**

- 1) 2017 existing conditions (case 1)
- 2) 2024 without Acadia residential development (case 2)
- 3) 2024 with Acadia residential development (case 3)

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

**Committed developments considered:**

Group A (Developments impacting Beaver Dam Road):

- 1) Dellwood (100 single-family detached houses)
- 2) Coastal Club (412 single-family detached houses (260 unbuilt) & 280 residential condominiums/townhouses (163 unbuilt))
- 3) Pelican Point (400 single-family detached houses (332 unbuilt))
- 4) Independence (450 single-family detached houses (198 unbuilt))
- 5) Vineyards at Nassau Valley (192 apartment units, 72 condominiums/townhouses, 57 single-family detached houses)
- 6) Lewes Crossing (192 single-family detached houses (82 unbuilt))
- 7) Woodbridge (188 single-family detached houses)
- 8) The Woods at Burton Pond (165 single-family detached houses)
- 9) Heron Bay (326 single-family detached houses (64 unbuilt))

Group B (Developments impacting Delaware Route 24):

- 1) Cape Henlopen Elementary School (720-student elementary school)
- 2) Pelican Landing (88,000 square-foot shopping center)
- 3) Marsh Island (152 single-family detached houses)
- 4) Marsh Farm Estates (104 single-family detached houses)
- 5) Saddle Ridge (81 single-family detached houses)
- 6) Rehoboth Point Yacht Club (188 condominiums and 5,000 square-foot restaurant)

**Intersection Descriptions**

**1) Robinsonville Road & Proposed Site Access A**

**Type of Control:** no existing intersection; proposed one-way stop (T-intersection)

**Northbound approach:** (Robinsonville Road) existing one thru lane; proposed one thru lane and one left-turn lane

**Southbound approach:** (Robinsonville Road) existing one thru lane; proposed one right-turn lane and one thru lane

**Eastbound approach:** (Proposed Site Access A) proposed shared left-turn/right-turn lane, stop-controlled

- 2) **Dorman Road & Proposed Site Access B**  
**Type of Control:** no existing intersection; proposed one-way stop (T-intersection)  
**Northbound approach:** (Dorman Road) existing one thru lane; proposed one shared thru/right-turn lane  
**Southbound approach:** (Dorman Road) existing one thru lane; proposed one thru lane and one left-turn lane  
**Eastbound approach:** (Proposed Site Access) proposed shared left-turn/right-turn lane, stop controlled
  
- 3) **Dorman Road & Conleys Chapel Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Dorman Road) one shared left-turn/right-turn lane, stop controlled  
**Eastbound approach:** (Conleys Chapel Road) one shared through/right-turn lane  
**Westbound approach:** (Conleys Chapel Road) one shared through/left-turn lane
  
- 4) **Conleys Chapel Road & Beaver Dam Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Beaver Dam Road) one shared thru/right-turn lane  
**Southbound approach:** (Beaver Dam Road) existing one shared thru/left-turn lane  
**Westbound approach:** (Conleys Chapel Road) one shared left-turn/right-turn lane, stop controlled
  
- 5) **Beaver Dam Road & Stockley Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Beaver Dam Road) one shared thru/left-turn lane  
**Southbound approach:** (Beaver Dam Road) one shared thru/right-turn lane  
**Eastbound approach:** (Stockley Road) one shared left-turn/right-turn lane, stop controlled
  
- 6) **Beaver Dam Road & Hollymount Road**  
**Type of Control:** all-way stop (four-leg intersection)  
**Northbound approach:** (Beaver Dam Road) one shared left-turn/thru/right-turn lane, stop-controlled  
**Southbound approach:** (Beaver Dam Road) one shared left-turn/thru/right-turn lane, stop-controlled  
**Eastbound approach:** (Hollymount Road) one shared left-turn/thru/right-turn lane, stop-controlled  
**Westbound approach:** (Hollymount Road) one shared left-turn/thru/right-turn lane, stop-controlled

- 7) **Conleys Chapel Road & Robinsonville Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Robinsonville Road) one shared thru/left-turn lane  
**Southbound approach:** (Robinsonville Road) one through lane and one channelized right-turn lane  
**Eastbound approach:** (Conleys Chapel Road) one shared left-turn/right-turn lane, stop controlled
  
- 8) **Delaware Route 24 & Robinsonville Road / Angola 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
  
- 9) **Delaware Route 24 & Jolyns Way**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Jolyns Road) 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
  
- 10) **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

### **Safety Evaluation**

**Crash Data:** McCormick Taylor reviewed the Delaware Crash Analysis Reporting System (CARS) data that was provided in Appendix B of the TIS. The data includes reportable crashes that occurred within a one-tenth mile radius of the study intersections from March 12, 2015 through March 12, 2018.

Of particular concern for safety evaluations are fatal crashes and crashes involving pedestrians or pedalcyclists. During the study period, no fatal crashes were reported. One crash involved a pedalcyclist. A breakdown of all crashes by intersection is provided below.

### 1. Proposed Site Access & Robinsonville Road

Since this intersection does not currently exist, it was not included in the crash data analysis.

### 2. Proposed Site Access & Dorman Road

Since this intersection does not currently exist, it was not included in the crash data analysis.

### 3. Dorman Road & Conleys Chapel Road

No crashes occurred within one-tenth mile of the intersection during the crash study period.

### 4. Beaver Dam Road & Conleys Chapel Road

At the intersection of Dorman Road & Conleys Chapel Road, there was a total of one crash. The crash did not result in personal injury or fatality. There were no alcohol related crashes. The type of crash was rear to side (100%). The crash occurred during daylight hours with dry surface conditions. The primary contributing circumstance was driver inattention, distraction, or fatigue (100%).

### 5. Beaver Dam Road & Stockley Road

At the intersection of Beaver Dam Road & Stockley Road, there was a total of four crashes. Of the four crashes, two (50%) resulted in personal injury. There were no alcohol related crashes. One personal injury crash included a pedalcyclist. The types of crashes were angle (25%), sideswipe, same direction (50%), and not a collision between two vehicles (25%). The crashes occurred during dark-not lighted (25%) and daylight (75%) hours with dry (75%) or wet (25%) surface conditions. The primary contributing circumstances included failed to yield right of way (75%), and driver inattention, distraction, or fatigue (25%).

### 6. Beaver Dam Road & Hollymount Road

At the intersection of Beaver Dam Road Hollymount Road, there was a total of 24 crashes. Of the 24 crashes, ten (42%) resulted in personal injury. None of the crashes involved a pedestrian or a pedalcyclist. There were two (8%) alcohol related crashes. The types of crashes were angle (62.5%), front to rear (20.8%), not a collision between two vehicles (12.5%), and sideswipe, opposite direction (4.2%). The crashes occurred during daylight (83%) or dark-lighted (17%) hours. The crashes occurred on a variety of surface conditions, including dry (75%), wet (17%), snow (4%), and ice/frost (4%). The most common primary contributing circumstances included passed stop sign (25%), driver inattention, distraction, or fatigue (21%), disregard traffic signal (17%), and driving in a careless or reckless manner (8%).

#### 7. Conleys Chapel Road & Robinsonville Road

At the intersection of Conleys Chapel Road and Robinsonville Road, there was a total of 2 crashes. None of the crashes resulted in personal injury or involved a pedestrian or pedalcyclist. There were no alcohol-related crashes. The types of crashes were sideswipe, opposite direction (50%) and not a collision between two vehicles (50%). The crashes occurred during daylight (50%) or dark-not lighted (50%) hours on dry surface conditions. The primary contributing circumstances included driver inattention, distraction, or fatigue (50%) and mechanical defects (50%).

#### 8. Delaware Route 24 & Robinsonville Road / Angola Road

At the intersection of Robinsonville Road and DE 24, there was a total of 24 crashes. Of the 24 crashes, five (21%) resulted in personal injury, of which one (4%) was alcohol related. The types of crashes were front to rear (42%), not a collision between two vehicle (29%), angle (17%), front to front (8%), and sideswipe, opposite direction (4%). The crashes occurred during daylight (62%), dark-lighted (16.67%), dark-not lighted (16.67%), or dusk (4.17%) conditions. The surface conditions included dry (92%), and wet (8%). The primary contributing circumstances included driver inattention, distraction, or fatigue (42%), other (12.5%), disregard traffic signal (12.5%), following too close (12.5%), driving under the influence (8.3%), and made improper turn (4.2%).

#### 9. Delaware Route 24 & Jolyns Way

At the intersection of DE 24 and Jolyns Way, there was a total of one crash. The crash did not result in personal injury and was non-alcohol related. The crash type was not a collision between two vehicles. The crash occurred during daylight conditions on wet surface conditions. The primary contributing circumstance was other.

#### 10. Delaware Route 24 & Camp Arrowhead Road / Fairfield Road

At the intersection of DE 24 and Camp Arrowhead Road, there was a total of 20 crashes. Of the 20 crashes, two (10%) resulted in personal injury. One (5%) crash was alcohol related, and did not result in personal injury. The types of crashes included front to rear (60%), angle (20%), sideswipe, same direction (10%), front to front (5%), and not a collision between two vehicles (5%). The crashes occurred during daylight (85%) or dark-lighted (15%) conditions. The crashes occurred on dry (75%) or wet (25%) surface conditions. The primary contributing circumstances included following too close (25%), driver inattention, distraction, or fatigue (25%), unknown (15%), disregard traffic signal (10%), improper lane change (5%), driving in a careless or reckless manner (5%), and improper backing (5%).

**Sight Distance:** There is a slight horizontal curve on Robinsonville Road at the approximate location of the proposed site driveway. The impacts of this horizontal curve on available sight distance should be analyzed as part of the site plan review process to confirm that adequate sight distance will be available for all proposed movements at this intersection.

It appears there is a slight sight distance issue at the intersection of Conleys Chapel Road and Robinsonville Road for vehicles turning left from Robinsonville Road. Vegetation on the southeast corner of Delaware Route 24 and 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 there are few potential visual obstructions. Sight distance is adequate throughout the study area, other than the issues 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 Traffic Group contacted representatives of the Delaware Transit Corporation (DTC) to determine existing and planned transit services near the proposed development. DART does not currently serve this immediate area and has no plans for future service at the site. The nearest existing transit service runs along Delaware Route 24 (John J Williams Highway) and includes DART routes 207 and 215. The nearest existing transit stops are located on Delaware Route 24 at Peddlers Village (nearly 2 miles from the proposed residential development).

**Planned transit service:** Based on coordination with DTC representatives, there are currently no plans to provide transit service to the proposed development.

**Existing bicycle and pedestrian facilities:** According to the Sussex County bicycle map, Beaver Dam Road is classified as a “high traffic connector bicycle route with a bikeway.” Delaware Route 24 is classified as a “high traffic regional bicycle route with bikeway.” Robinsonville Road and Conleys Chapel Road are both classified as “connector bicycle routes without a bikeway.”

There are few existing pedestrian facilities throughout the study area. There are no marked crosswalks, curb ramps, or pedestrian signals at the study intersections. There are no sidewalks along any of the roadways in the study area. One mid-block crosswalk is provided across Beaver Dam Road just south of Ritter Lane that connects St. George’s Chapel and cemetery.

**Planned bicycle and pedestrian facilities:** The Traffic Group contacted a representative of DelDOT’s Local Systems Planning Section to determine pedestrian and bicycle accommodations for the proposed development. Anthony Aglio requested shoulders through the frontages to meet functional classification standards, along with bicycle lanes through entrance right-turn lanes and at intersections if any improvements are warranted and shoulders exist on the roadway prior to the intersection. He indicated that easements would be required along the site frontages.

The developer plans to construct the intersections of Robinsonville Road & Proposed Site Access and Dorman Road & Proposed Site Access. The improvements for Robinsonville Road & Proposed Site Access would include a southbound right-turn lane and a northbound left-turn

lane. The improvements for Dorman Road & Proposed Site Access would include a northbound shared through/right-turn lane and a southbound left-turn lane.

Based on DelDOT's *Development Coordination Manual* (section 3.5.4.2), it appears that a shared-use path and/or sidewalk will be required along the site frontage and that sidewalks will be required along at least one side of the internal street network.

### **Previous Comments**

All comments from DelDOT's scoping letter, traffic count review, preliminary TIS (PTIS) review and other correspondence appear to be addressed in the final TIS submission.

### **General HCS Analysis Comments**

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

- 1) For the two signalized intersections on Delaware Route 24, McCormick Taylor requested traffic signal timing charts from the DelDOT Traffic Management Center, and we coded the traffic signal timings based on the charts provided by the TMC. Plan 2/2/1 (100 second cycle length) was coded for the existing AM, PM, and Saturday peak hours. Signal timing charts were not included in the TIS, and the source of the traffic signal timings used in the analyses is unclear.
- 2) For the two signalized intersections on Delaware Route 24, the TIS set the arrival types on the eastbound and westbound Delaware Route 24 approaches to 4. Based on the spacing of the two signals (over 9,000-feet apart) and guidance in the Highway Capacity Manual, McCormick Taylor set these arrival types to the default value of 3.
- 3) For the two signalized intersections on Delaware Route 24, McCormick Taylor utilized the lane widths and right turn on red volumes presented in the TIS. Some lane widths and right turn on red volumes used in the TIS analyses are inconsistent with the values presented elsewhere in the study.
- 4) 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 (as per DelDOT's Development Coordination Manual).
- 5) For existing conditions, the TIS and McCormick Taylor determined and utilized overall intersection peak hour factors (PHF). For future conditions, the TIS and McCormick Taylor generally assumed existing PHF for all intersections other than the proposed site entrances. At the site entrances, future PHF were based on the DelDOT Development Coordination Manual.

- 6) For analyses of all intersections, the TIS and McCormick Taylor used a base saturation flow rate of 1,750 pc/hr/ln per DelDOT's Development Coordination Manual.
- 7) McCormick Taylor's analyses incorporated field-measured roadway grades. It appears that the TIS assumed 0% roadway grades throughout the study area.
- 8) Both the TIS and McCormick Taylor used the most recent version of Highway Capacity Software (HCS7, version 7.5).

Table 3  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Proposed Unsignalized Intersection <sup>1</sup> One-Way Stop Control (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM <sup>2</sup>	Saturday Mid-Day <sup>3</sup>	Weekday AM	Weekday PM	Saturday Mid-Day
<b>1) Robinsonville Road &amp; Proposed Site Access A</b> 2024 with Acadia (case 3)						
Eastbound Site Access	B (11.2)	B (10.8)	B (11.7)	B (11.2)	B (11.7)	B (12.2)
Northbound Robinsonville Road - Left	A (7.7)	A (7.7)	A (8.2)	A (7.7)	A (8.2)	A (8.1)

<sup>1</sup> 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.

<sup>2</sup> The TIS used the AM traffic volumes.

<sup>3</sup> The TIS used the PM traffic volumes.

Table 4  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Proposed Unsignalized Intersection <sup>4</sup> One-Way Stop Control (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>2) Dorman Road &amp; Proposed Site Access B</b>						
2024 with Acadia (case 3)						
Westbound Site Access	A (9.0)	A (8.7)	A (8.8)	A (9.0)	A (8.7)	A (8.8)
Southbound Dorman Road - Left	A (7.4)	A (7.5)	A (7.5)	A (7.4)	A (7.5)	A (7.5)

<sup>4</sup> 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 5  
PEAK HOUR LEVELS OF SERVICE (LOS)  
based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>5</sup> One-Way Stop Control (T-intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>3) Dorman Road &amp; Conleys Chapel Road</b>						
2017 existing (case 1)						
Westbound Conleys Chapel Road - Left	A (7.5)	A (7.5)	A (7.4)	A (7.5)	A (7.5)	A (7.4)
Northbound Dorman Road	A (9.1)	A (9.6)	A (9.1)	A (9.1)	A (9.6)	A (9.1)
2024 without Acadia (case 2)						
Westbound Conleys Chapel Road - Left	A (7.6)	A (7.6)	A (7.5)	A (7.6)	A (7.6)	A (7.5)
Northbound Dorman Road	A (9.5)	B (10.2)	A (9.5)	A (9.5)	B (10.2)	A (9.5)
2024 with Acadia (case 3)						
Westbound Conleys Chapel Road - Left	A (7.7)	A (7.9)	A (7.7)	A (7.7)	A (7.9)	A (7.7)
Northbound Dorman Road	B (10.8)	B (12.0)	B (11.2)	B (10.8)	B (12.0)	B (11.2)

<sup>5</sup> 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 Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>6</sup> One-Way Stop Control (T-intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM <sup>7</sup>	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>4) Conleys Chapel Road &amp; Beaver Dam Road</b>						
2017 existing (case 1)						
Westbound Conleys Chapel Road	B (13.3)	C (15.2)	B (13.0)	B (13.3)	C (15.2)	B (13.0)
Southbound Beaver Dam Road – Left	A (8.6)	A (8.1)	A (8.2)	A (8.6)	A (8.1)	A (8.2)
2024 without Acadia (case 2)						
Westbound Conleys Chapel Road	C (23.2)	E (40.3)	C (24.0)	C (23.2)	E (40.3)	C (24.0)
Southbound Beaver Dam Road – Left	A (9.2)	A (9.1)	A (9.0)	A (9.2)	A (9.1)	A (9.0)
2024 with Acadia (case 3)						
Westbound Conleys Chapel Road	D (31.6)	F (114.8)	E (44.0)	E (39.5)	F (114.8) <sup>8</sup>	E (44.0)
Southbound Beaver Dam Road – Left	A (9.3)	A (9.5)	A (9.3)	A (9.3)	A (9.5)	A (9.3)
2024 with Acadia (case 3) <i>with westbound right-turn lane</i>						
Westbound Conleys Chapel Road	C (21.0)	F (51.6)	D (26.7)	C (21.6)	F (51.6) <sup>9</sup>	D (26.7)
Southbound Beaver Dam Road – Left	A (9.3)	A (9.5)	A (9.3)	A (9.3)	A (9.5)	A (9.3)

<sup>6</sup> 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.

<sup>7</sup> In the case 3 AM scenarios, the TIS used the Saturday traffic volumes for the westbound approach.

<sup>8</sup> The 95<sup>th</sup> percentile queue length is expected to be approximately 9 vehicles (225 feet) long.

<sup>9</sup> The 95<sup>th</sup> percentile queue length is expected to be approximately 5 vehicles (125 feet) long.

Table 7  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>10</sup> One-Way Stop Control (T-intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>5) Beaver Dam Road &amp; Stockley Road</b>						
2017 existing (case 1)						
Eastbound Stockley Road	C (16.2)	B (14.8)	B (12.8)	C (16.2)	B (14.8)	B (12.8)
Northbound Beaver Dam Road - Left	A (7.9)	A (8.5)	A (7.9)	A (7.9)	A (8.5)	A (7.9)
2024 without Acadia (case 2)						
Eastbound Stockley Road	D (28.9)	C (23.9)	C (18.3)	D (28.9)	C (23.9)	C (18.3)
Northbound Beaver Dam Road – Left	A (8.4)	A (9.2)	A (8.4)	A (8.4)	A (9.2)	A (8.4)
2024 with Acadia (case 3)						
Eastbound Stockley Road	D (33.2)	D (26.8)	C (19.6)	D (33.2)	D (26.8)	C (19.6)
Northbound Beaver Dam Road - Left	A (8.5)	A (9.4)	A (8.6)	A (8.5)	A (9.4)	A (8.6)

<sup>10</sup> 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 8  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>11</sup> All-Way Stop Control (Four-Leg Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>6) Beaver Dam Road &amp; Hollymount Road</b>						
2017 existing (case 1)						
Eastbound Hollymount Road	B (14.4)	B (12.0)	A (10.0)	B (14.4)	B (12.0)	A (10.0)
Westbound Hollymount Road	B (10.1)	A (10.0)	A (8.9)	B (10.1)	A (10.0)	A (8.9)
Northbound Beaver Dam Road	B (10.9)	B (10.1)	A (9.4)	B (10.9)	B (10.1)	A (9.4)
Southbound Beaver Dam Road	B (11.2)	C (16.9)	B (10.8)	B (11.2)	C (16.9)	B (10.8)
Overall Intersection	B (12.2)	B (14.2)	B (10.1)	B (12.2)	B (14.2)	B (10.1)
2024 without Acadia (case 2)						
Eastbound Hollymount Road	D (30.6)	C (23.1)	B (15.0)	D (30.6)	C (23.1)	B (15.0)
Westbound Hollymount Road	B (13.4)	B (12.8)	B (10.9)	B (13.4)	B (12.8)	B (10.9)
Northbound Beaver Dam Road	C (16.9)	B (15.0)	B (13.2)	C (16.9)	B (15.0)	B (13.2)
Southbound Beaver Dam Road	D (26.4)	F (95.2)	C (21.8)	D (26.4)	F (95.2)	C (21.8)
Overall Intersection	C (24.3)	F (56.6)	C (17.3)	C (24.3)	F (56.6)	C (17.3)
2024 with Acadia (case 3)						
Eastbound Hollymount Road	E (37.5)	D (28.5)	C (17.2)	E (37.5)	D (28.5)	C (17.2)
Westbound Hollymount Road	B (14.3)	B (13.2)	B (11.4)	B (14.3)	B (13.2)	B (11.4)
Northbound Beaver Dam Road	C (18.2)	C (15.6)	B (14.1)	C (18.2)	C (15.6)	B (14.1)
Southbound Beaver Dam Road	E (36.0)	F (124.3)	D (27.4)	E (36.0)	F (124.3)	D (27.4)
Overall Intersection	D (30.6)	F (72.2)	C (20.6)	D (30.6)	F (72.2)	C (20.6)

<sup>11</sup> 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 8 (continued)  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>12</sup> All-Way Stop Control (Four-Leg Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>6) Beaver Dam Road &amp; Hollymount Road</b>						
2024 with Acadia (case 3) <i>with southbound right-turn lane</i>						
Eastbound Hollymount Road	D (30.5)	D (26.5)	C (15.9)	D (30.7)	D (26.6)	C (15.9)
Westbound Hollymount Road	B (13.1)	B (12.8)	B (10.9)	B (13.2)	B (12.8)	B (10.9)
Northbound Beaver Dam Road	C (17.0)	C (15.6)	B (13.6)	C (17.0)	C (15.6)	B (13.6)
Southbound Beaver Dam Road	B (15.0)	C (20.5)	B (13.6)	C (15.3)	C (20.5)	B (13.7)
Overall Intersection	C (20.3)	C (20.7)	B (14.0)	C (20.5)	C (20.8)	B (14.0)

Unsignalized Intersection <sup>12</sup> Roundabout Analysis	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>6) Beaver Dam Road &amp; Hollymount Road</b>						
2024 with Acadia (case 3) <i>with single-lane roundabout</i>						
Eastbound Hollymount Road	A (7.7)	A (8.7)	A (6.6)	A (7.7)	A (8.6)	A (6.7)
Westbound Hollymount Road	A (7.6)	A (6.1)	A (5.6)	A (7.6)	A (6.1)	A (5.6)
Northbound Beaver Dam Road	A (7.9)	A (6.8)	A (6.2)	A (7.8)	A (6.8)	A (6.2)
Southbound Beaver Dam Road	A (7.4)	B (10.1)	A (7.0)	A (7.4)	B (10.1)	A (7.0)
Overall Intersection	A (7.6)	A (8.9)	A (6.6)	A (7.6)	A (8.8)	A (6.7)

<sup>12</sup> 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 9  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>13</sup> One-Way Stop Control (T-intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>7) Conleys Chapel Road &amp; Robinsonville Road <sup>14</sup></b>						
2017 existing (case 1)						
Eastbound Conleys Chapel Road	A (10.0)	B (10.5)	B (11.6)	A (9.9)	B (10.5)	B (11.4)
Northbound Robinsonville Road – Left	A (7.5)	A (7.9)	A (7.9)	A (7.4)	A (7.7)	A (7.7)
2024 without Acadia (case 2)						
Eastbound Conleys Chapel Road	B (10.9)	B (12.0)	B (14.1)	B (10.8)	B (11.9)	B (13.6)
Northbound Robinsonville Road – Left	A (7.6)	A (8.1)	A (8.1)	A (7.5)	A (7.8)	A (7.9)
2024 with Acadia (case 3)						
Eastbound Conleys Chapel Road	B (11.2)	B (12.8)	C (15.2)	B (11.1)	B (13.1)	B (14.6)
Northbound Robinsonville Road – Left	A (7.6)	A (8.2)	A (8.2)	A (7.5)	A (7.9)	A (7.9)

<sup>13</sup> 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.

<sup>14</sup> McCormick Taylor coded the Robinsonville Road southbound right-turn as channelized; the TIS did not.

Table 10  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>15</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>8) Delaware Route 24 &amp; Robinsonville Road / Angola Road</b> <sup>16</sup>						
2017 existing (case 1)	C (23.7)	C (22.5)	D (45.0)	C (31.9)	C (34.1)	F (86.8)
2024 without Acadia (case 2)	E (70.6)	E (69.5)	F (113.9)	F (94.3)	F (94.8)	F (171.9)
2024 without Acadia (case 2 – with DelDOT Improvements)	D (36.1)	C (33.9)	D (36.5)	D (43.3)	D (52.8)	D (45.6)
2024 with Acadia (case 3)	E (73.0)	F (93.7)	F (120.8)	F (102.3)	F (117.0)	F (183.6)
2024 with Acadia (case 3 – with DelDOT Improvements)	D (38.3)	C (34.7)	D (36.9)	D (43.7)	D (52.2)	D (45.5)

<sup>15</sup> 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.

<sup>16</sup> The traffic volumes for this intersection were taken from a previous study for the “Middle Creek Preserve” residential development. The volumes were then adjusted by DelDOT to reflect the traffic in the surrounding intersections in the study area. Given these adjustments from the original traffic count, McCormick Taylor assumed a PHF of 0.92 for all peak hours based on guidance in the DelDOT Development Coordination Manual.

Table 11  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>17</sup> One-Way Stop Control (T-intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>9) Delaware Route 24 &amp; Jolyns Way</b>						
2017 existing (case 1)						
Westbound Jolyns Way	C (18.0)	C (15.5)	C (22.4)	C (16.7)	B (14.6)	C (20.3)
Southbound DE 24 - Left	A (9.1)	A (8.5)	A (9.6)	A (9.1)	A (8.5)	A (9.6)
2024 without Acadia (case 2)						
Westbound Jolyns Way	C (22.7)	C (19.7)	D (32.5)	C (20.5)	C (18.0)	D (28.2)
Southbound DE 24 - Left	A (9.6)	A (8.9)	B (10.4)	A (9.6)	A (8.9)	B (10.4)
2024 with Acadia (case 3)						
Westbound Jolyns Way	C (23.9)	C (20.7)	D (34.7)	C (21.5)	C (18.8)	D (29.9)
Southbound DE 24 - Left	A (9.7)	A (9.0)	B (10.5)	A (9.7)	A (9.0)	B (10.5)

Table 12

<sup>17</sup> 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.

PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Acadia  
Report dated March 20, 2018  
Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>18</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM <sup>19</sup>	Saturday Mid-Day
<b>10) Delaware Route 24 &amp; Camp Arrowhead Road / Fairfield Road</b>						
2017 existing (case 1)	C (22.2)	B (11.5)	B (19.1)	C (20.8)	B (15.3)	B (16.8)
2024 without Acadia (case 2)	C (25.6)	B (17.3)	C (20.5)	C (26.3)	C (23.9)	C (20.4)
2024 without Acadia (case 2 – with DelDOT Improvements)	C (25.0)	B (17.2)	C (26.4)	C (29.5)	C (24.8)	D (36.6)
2024 with Acadia (case 3)	C (26.9)	C (20.2)	C (21.0)	C (26.2)	C (27.8)	C (21.2)
2024 with Acadia (case 3 – with DelDOT Improvements)	C (26.3)	C (20.1)	C (32.5)	C (34.2)	C (28.8)	D (41.1)

<sup>18</sup> 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.

<sup>19</sup> Based on the traffic counts, McCormick Taylor used a PHF of 0.97. The TIS used 0.90.