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

NICOLE MAJESKI
SECRETARY

November 10, 2022

Christopher Duke, P.E.
Becker Morgan Group, Inc.
100 Discovery Blvd, Suite 102
Newark, DE 19713

Dear Mr. Duke:

The enclosed revised Traffic Impact Study (TIS) review letter for the proposed **Carter Farm** (Tax Parcels: 11-061.00-001, 11-061.00-005, and 11-061.00-008) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2124.

Sincerely,

Claudy Joinville
Project Engineer

CJ:km
Enclosures
cc with enclosures:
Mr. Bill Krapf, Carter Farm, LLC
Mr. David L. Edgell, Office of State Planning Coordination
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Bradford Shockley, New Castle County Department of Land Use
Mr. Owen C. Robatino, New Castle County Department of Land Use
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Deputy Secretary, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Matthew Vincent, Chief of Project Development North, DOTS
Todd Sammons, Assistant Director, Development Coordination
Sireen Muhtaseb, TIS Group Manager, Development Coordination
Jared Kauffmann, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Wendy Polasko, Subdivision Engineer, Development Coordination
John Pietrobono, New Castle Review Coordinator, Development Coordination
Pao Lin, Subdivision Manager, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Annamaria Furmato, Project Engineer, Development Coordination

Revised November 10, 2022
August 11, 2022

Mr. Claudy Joinville
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202069012
Traffic Impact Study Services
Task 5-12A –Carter Farm TIS

Dear Mr. Joinville:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the Carter Farm development, which was prepared by Becker Morgan Group, Inc, dated April 2022. This review was assigned as Task Number 5-12A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed residential development in New Castle County, Delaware. The proposed development would consist of 240 units of mid-rise multi-family housing (apartments), 36 units of low-rise multi-family housing (townhouses), 95 age-restricted detached houses, and 255 single-family detached houses. The site is located on the south side of Bethel Church Road (New Castle Road 433) and west of Choptank Road (New Castle Road 435). The subject property is on an approximately 411.90-acre assemblage of parcels. The land is currently zoned as S (Suburban) and the developer does not plan to rezone the land.

Two access points are proposed: one full access on Bethel Church Road opposite Fairview Avenue and one full access on Choptank Road. The Millwood subdivision has a paper street that would connect to the Carter Farm development. Construction for the Carter Farm development is anticipated to be completed in 2028.

Since that April 2022 traffic study, the location of the full access on Bethel Church Road has been modified. Specifically, the full access on Bethel Church Road is proposed to be located approximately 1,500 feet east of Fairview Avenue. In coordination with DelDOT, an updated traffic study is not required as the modified entrance location would have a minimal impact to the operations at the study intersections. The recommendations within this letter are based on what is now proposed.

The site is located near the Southern New Castle County TID which was established in August 2014 for the area bounded by Lorewood Grove Road and the Chesapeake and Delaware (C&D) Canal to the north, Marl Pit Road to the south, Delaware Route 1 and US Route 13 to the east, and US Route 301, Delaware Route 72, and Delaware Route 896 to the west. Recommendations for

study intersections within the TID are summarized in the *Traffic Analysis for the Southern New Castle County TID Technical Report,* dated November 2013. The TID is currently in operation, however updated analysis is being conducted to determine if the recommended improvements from the November 2013 report are sufficient or if additional improvements are necessary. The updated analysis and study are scheduled to be completed in 2022.

DelDOT has several ongoing and recently completed projects within the study area. The *US 301 Corridor Improvements* project (including DelDOT Contract No. T200811301, T200911301, T200911302, T200911302, T200911308, T201011301, and T201011302) was divided into several sections which were recently constructed within the study area. The aim of the project was to reduce traffic congestion in the project area and improve highway safety by removing through traffic, especially heavy vehicle truck traffic, from the local roads. The project constructed a four-lane limited access toll road, US Route 301, on a new alignment which extends from the Maryland State Line, west of Middletown, to the vicinity of Armstrong Corner Road. The new US Route 301 continues northeast, crossing Summit Bridge Road and Boyds Corner Road before curving east and tying into Delaware Route 1 south of the Chesapeake and Delaware (C&D) Canal. Access to the new US Route 301 is provided via intersections south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road, and at Jamison Corner Road. Construction of the above-mentioned contracts was completed and the new US Route 301 opened to traffic in January 2019. Additional information can be found on the DelDOT project website at: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200511301#project-details1.

The *SR 896 and Bethel Church Road Interchange* project (DelDOT Contract No. T200911305) will be implemented independently from the *US 301 Corridor Improvements* project and is intended to improve the safety and operation of the intersection of Summit Bridge Road and Bethel Church Road. The project is anticipated to include the removal of the existing signal at the Bethel Church Road and Summit Bridge Road intersection and the conversion to a grade-separated intersection. Additionally, the eastbound and westbound Bethel Church Road approaches are anticipated to be terminated with cul-de-sacs prior to the intersection with Summit Bridge Road. Design work is scheduled to begin in FY 2023. Construction is tentatively anticipated to begin in 2027. More information can be found at DelDOT's website: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200911305.

In conjunction with the *SR 896 and Bethel Church Road Interchange* project, the *US 301 Spur Road* project is planned to include a 4.5-mile, limited-access highway that will start from the US 301 Mainline at approximately 2/3 of a mile south of Armstrong Corner Road and connect to Summit Bridge Road at the proposed Summit Bridge Road/Bethel Church Road interchange. The eastbound Bethel Church Road approach would be realigned, and ramps would be added to connect to the proposed Spur Road. Additionally, DelDOT is undergoing monitoring efforts for the US 301 Spur Road. Specifically, DelDOT is monitoring traffic volumes, crash data, and land use information along the corridor with the goal of determining when to construct the Spur Road.

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

The New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) apply to all signalized, all-way-stop, and roundabout intersections. The proposed development would meet the UDC LOS Standards for all intersections that were required by New Castle County to be analyzed.

However, separate from the UDC but based on the LOS evaluation criteria as stated in DelDOT's *Development Coordination Manual*, the following study intersections exhibit LOS deficiencies and would require the implementation of physical roadway and/or traffic control improvements.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
Bethel Church Road/Dillon Circle	X		Case 3 – 2028 with Development
Summit Bridge Road (New Castle Road 16)/Bethel Church Road	X	X	Case 2– 2028 without Development
	X	X	Case 3 – 2028 with Development
Choptank Road/Clayton Manor Drive	X	X	Case 3 – 2028 with Development
Summit Bridge Road/Boyds Corner Road (New Castle Road 15)/Churchtown Road	X		Case 2– 2028 without Development
	X		Case 3 – 2028 with Development
Boyds Corner Road/Ratledge Road (New Castle Road 414)	X	X	Case 2– 2028 without Development
	X	X	Case 3 – 2028 with Development
Choptank Road/Armstrong Corner Road (New Castle Road 429)		X	Case 3 – 2028 with Development

The existing unsignalized Bethel Church Road intersection with Dillon Circle exhibits LOS deficiencies during the AM peak hour under future conditions with the proposed development. Specifically, the eastbound Dillon Circle approach would operate at LOS E with a delay of 44.1 seconds per vehicle and a calculated 95th percentile queue length of approximately 50 feet. The deficiencies at the intersection could be mitigated with the installation of a traffic signal or a single lane roundabout. However, the volumes executing turning movements from Dillon Circle onto Bethel Church Road would not meet the volume-based traffic signal warrants (a maximum of 48 left turning vehicles from Dillon Circle during the PM peak hour under Case 3 conditions). As such, due to the extensive scope of the improvements it would be unreasonable to require the developer to improve the intersection. Additionally, based on correspondence with DelDOT Project Development section, this intersection may be impacted by the *Summit Bridge Road / Bethel Church Road Interchange* project (DelDOT Contract No. T200911305). Therefore, we do not recommend that the developer implement any improvements at this intersection.

The existing signalized Summit Bridge Road intersection with Bethel Church Road exhibits LOS deficiencies during the AM and PM peak hours under future conditions, with or without the proposed development. However, as part of the *SR 896 and Bethel Church Road Interchange* project, the intersection will be converted to a grade-separated interchange. Therefore, we do not recommend that the developer implement any improvements at this intersection. However, it is recommended that the developer be responsible to fund an equitable portion of the improvements made to the intersection as part of the *SR 896 and Bethel Church Road Interchange* (DelDOT Contract No. T200911305) project.

The existing unsignalized Choptank Road intersection with Clayton Manor Drive exhibits LOS deficiencies during the AM and PM peak hours under future conditions with the proposed development. Specifically, these deficiencies occur along the eastbound Clayton Manor Drive approach with delays of 38.0 seconds of delay per vehicle and a projected 95th percentile queue of approximately 50 feet during the PM peak hour under Case 3 conditions. The deficiencies at the intersection could be mitigated with the installation of a traffic signal or a single lane roundabout. However, due to the short queue length and minimal delay projected at the intersection, as well as the nature of Clayton Manor Drive, and the extensive scope of the improvements, we do not recommend that the developer implement any improvements at this intersection.

The existing signalized Summit Bridge Road intersection with Boyds Corner Road/Churchtown Road exhibits LOS deficiencies during the AM peak hour under future conditions with or without the proposed development. These deficiencies could be mitigated by providing an additional through lane along the northbound Summit Bridge Road approach. Additionally, widening along northbound Summit Bridge Road, north of the intersection with Boyds Corner Road, would be needed to maintain the westbound right turn acceleration lane. With the provision of an additional through lane along northbound Summit Bridge Road and widening north of the intersection, the intersection would improve to operate at LOS D (40.4 seconds of delay per vehicle) or better under Case 3 conditions. However, due to the extensive scope of these improvements, it would be unreasonable to require the developer to construct these improvements. Additionally, the intersection is part of the Southern New Castle County TID study area and volumes at this intersection may be reduced in the future due to the anticipated Spur Road construction. Therefore, we do not recommend the developer implement any improvements at this intersection.

The existing unsignalized Boyds Corner Road intersection with Ratledge Road exhibits LOS deficiencies during the AM and PM peak hours under future conditions, with or without the proposed development. These deficiencies occur along the southbound Ratledge Road approach, with delays of 1,000 seconds per vehicle or more and 95th percentile queues up to approximately 1,140 feet during the AM peak hour under Case 3 conditions. These LOS deficiencies could be mitigated by signalization of the intersection and widening the southbound Ratledge Road approach to provide one left turn lane and one right turn lane. With the implementation of a signal, the intersection would operate at LOS D (47.7 seconds of delay per vehicle) or better under Case 3 conditions. As this intersection is part of the Southern New Castle County TID study area, we do not recommend the developer implement any improvements at this intersection. However, it is recommended that the developer enter into a traffic signal agreement for the Boys Corner Road intersection with Ratledge Road.

The existing unsignalized Choptank Road intersection with Armstrong Corner Road exhibits LOS deficiencies during the PM peak hour under future conditions with the proposed development. These deficiencies occur along the westbound Armstrong Corner Road approach, with delays of 46.3 seconds per vehicle and projected 95th percentile queue of approximately 140 feet during the PM peak hour under Case 3 conditions. These LOS deficiencies could be mitigated with the installation of a traffic signal or a single lane roundabout. Although a signal would mitigate the LOS deficiencies at the intersection, the provision of a single lane roundabout would be aligned with the character of the roadway, as there are single lane roundabouts along Choptank Road north and south of the Armstrong Corner Road intersection. Therefore, we recommend that the developer coordinate with DelDOT on the implementation of a roundabout installation.

Should New Castle County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. 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 shall improve Bethel Church Road and Choptank Road within the limits of their frontage to meet DelDOT's standards for their Functional Classification as found in Section 1.1 of the *Development Coordination Manual* and elsewhere therein. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. Frontage is defined in Section 1 of the *Development Coordination Manual*, which states "This length includes the length of roadway perpendicular to lines created by the projection of the outside parcel corners to the roadway." Questions on or appeals of this requirement should be directed to the DelDOT Subdivision Review Coordinator in whose area the development is located.

2. The developer should construct an unsignalized full access for the proposed Carter Farm development along Bethel Church Road, approximately 1,500 feet east of the northeast point of tangency at Fairview Avenue. The intersection should be consistent with the lane configurations shown in the table below.

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

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the westbound Bethel Church Road left turn lane and the eastbound Bethel Church Road right turn lane is 135 feet and 145 feet, respectively.

The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

3. The developer should construct an unsignalized full access for the proposed Carter Farm development along Choptank Road, approximately 3,000 feet north of the intersection with Clayton Manor Drive. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound Site Entrance B	Approach does not exist	One shared left turn/right turn lane
Northbound Choptank Road	One through lane	One left turn lane and one through lane
Southbound Choptank Road	One through lane	One through lane and one right turn lane

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the northbound Choptank Road left turn lane is 145 feet. Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the southbound Choptank Road right turn lane is 190 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

4. The developer should construct an interconnection to the adjacent Millwood subdivision. The site should also be redesigned to discourage cut through traffic between the Millwood subdivision and Choptank Road. The developer should coordinate with DelDOT's Development Coordination Section regarding the location of the interconnection.

5. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements to the intersection of Summit Bridge Road and Bethel Church Road as part of the *SR 896 and Bethel Church Road Interchange* (DelDOT Contract No. T200911305) project. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the improvements.

6. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Boyds Corner Road and Ratledge Road. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. At DelDOT's discretion, the developer may contribute to the Traffic Signal Revolving Fund in lieu of a traffic signal agreement.

7. The developer should enter into an agreement to build or participate in the construction of a single lane roundabout at the intersection of Choptank Road and Armstrong Corner Road.

The roundabout design should follow *NCHRP: Report 672 2nd Edition – Roundabouts: An Information Guide*, DelDOT's *Road Design Manual*, and DelDOT's *Design Guidance Memorandum Number 1-26* for roundabouts. The roundabout should also be designed to accommodate pedestrians and bicyclists. Additionally, lighting at the roundabout should be evaluated per DelDOT's lighting guidelines. The developer should coordinate with DelDOT's Development Coordination Section regarding the agreement during the Entrance Plan review process. The agreement should identify when the final design and construction of the roundabout should be completed.

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

    a. A minimum of fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Bethel Church Road and Choptank Road site frontages. Within the easements, the developer should construct a ten-foot wide shared-use path (SUP) with connections to the adjacent pedestrian facilities. The SUP should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the SUP. If feasible, the SUP should be placed behind utility poles and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.

    b. The SUP along the Bethel Church Road site frontage should connect to Giller Lane and continue to the roundabout at the Bethel Church Road/Choptank Road intersection.

    c. At least one internal connection of a sidewalk or SUP at the site entrances from the SUP along Bethel Church Road and Choptank Road should be provided.

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

    e. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Bethel Church Road approaches to Site Entrance A and the Choptank Road approaches to Site Entrance B.

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

9. Due to the proximity of the proposed development to the Summit Aviation Airport, we recommend that deed restrictions be required similar to the attached Avigation Nuisance Easement and Non-Suit Covenant. The applicant should contact Mr. Steve Bayer at (302) 760-4834 from DelDOT's Office of Aeronautics to determine whether the proposed development is within the Runway Protection Zone. If so, restrictions may apply.

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 Plan Review process.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at https://www.deldot.gov//Publications/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction, please contact Mr. Jeff VanHorn, Assistant Director for Traffic Operations and Management. Mr. VanHorn can be reached at (302) 659-4606 or by email at Jeffrey.VanHorn@delaware.gov.

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

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

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

Enclosure

General Information

Report date: April 2022
Prepared by: Becker Morgan Group, Inc.
Prepared for: Carter Farm, LLC
Tax Parcels: 11-061.00-001, 11-061.00-005, and 11-061.00-008
Generally consistent with DelDOT's *Development Coordination Manual (DCM)*: Yes

Project Description and Background

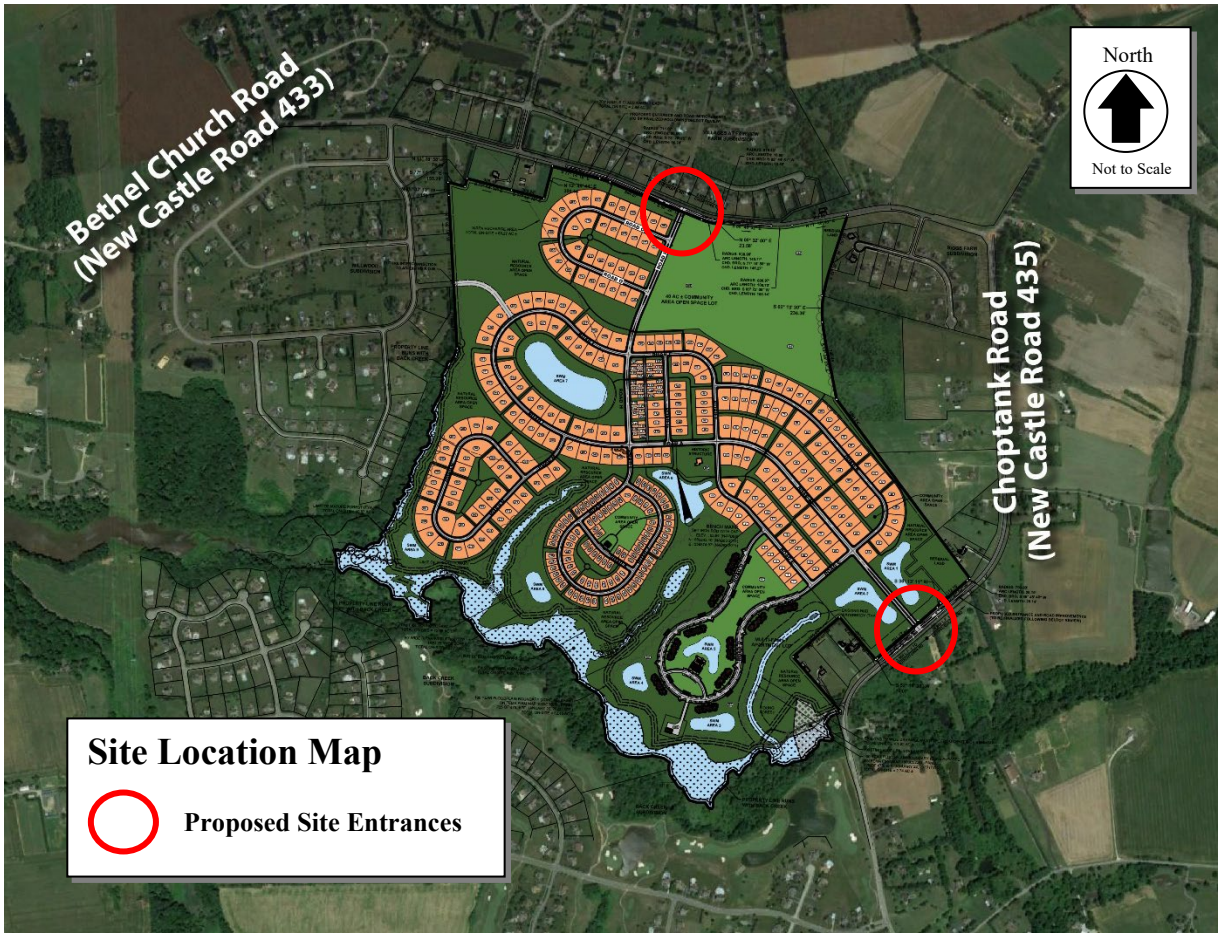
Description: The proposed development consists of 240 units of low-rise multi-family housing (apartments), 36 units of low-rise multi-family housing (townhouses), 95 age-restricted detached houses, and 255 single-family detached houses.
Location: The land is located on the south side of Bethel Church Road (New Castle Road 433) and west of Choptank Road (New Castle Road 435), in New Castle County, Delaware.
Amount of Land to be developed: An approximately 411.90-acre assemblage of parcels.
Land Use approval(s) needed: Entrance Plan.
Proposed completion date: 2028.
Proposed access locations: Two full access points are proposed: one on Bethel Church Road opposite Fairview Avenue and one on Choptank Road.

Daily Traffic Volumes:

- 2021 Average Annual Daily Traffic on Bethel Church Road: 4,500
- 2021 Average Annual Daily Traffic on Choptank Road: 7,262

*AADT is sourced from data provided by DelDOT Gateway

Site Map



**Graphic is an approximation based on the Overall Site Plan prepared by Becker Morgan Group dated May 4, 2021, last revised September 15, 2022.*

Relevant and On-going Projects

The site is located near the Southern New Castle County TID which was established in August 2014 for the area bounded by Lorewood Grove Road and the Chesapeake and Delaware (C&D) Canal to the north, Marl Pit Road to the south, Delaware Route 1 and US Route 13 to the east, and US Route 301, Delaware Route 72, and Delaware Route 896 to the west. Recommendations for study intersections within the TID are summarized in the *Traffic Analysis for the Southern New Castle County TID Technical Report,* dated November 2013. The TID is currently in operation, however updated analysis is being conducted to determine if the recommended improvements from the November 2013 report are sufficient or if additional improvements are necessary. The updated analysis and study are scheduled to be completed in 2022.

DelDOT has several ongoing and recently completed projects within the study area. The *US 301 Corridor Improvements* project (including DelDOT Contract No. T200811301, T200911301, T200911302, T200911302, T200911308, T201011301, and T201011302) was divided into several sections which were recently constructed within the study area. The aim of the project was to

reduce traffic congestion in the project area and improve highway safety by removing through traffic, especially heavy vehicle truck traffic, from the local roads. The project constructed a four-lane limited access toll road, US Route 301, on a new alignment which extends from the Maryland State Line, west of Middletown, to the vicinity of Armstrong Corner Road. The new US Route 301 continues northeast, crossing Summit Bridge Road and Boyds Corner Road before curving east and tying into Delaware Route 1 south of the Chesapeake and Delaware (C&D) Canal. Access to the new US Route 301 is provided via intersections south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road, and at Jamison Corner Road. Construction of the above-mentioned contracts was completed and the new US Route 301 opened to traffic in January 2019. Additional information can be found on the DelDOT project website at: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200511301#project-details1.

The *SR 896 and Bethel Church Road Interchange* project (DelDOT Contract No. T200911305) will be implemented independently from the *US 301 Corridor Improvements* project and is intended to improve the safety and operation of the intersection of Summit Bridge Road and Bethel Church Road. The project is anticipated to include the removal of the existing signal at the Bethel Church Road and Summit Bridge Road intersection and the conversion to a grade-separated intersection. Additionally, the eastbound and westbound Bethel Church Road approaches are anticipated to be terminated with cul-de-sacs prior to the intersection with Summit Bridge Road. Design work is scheduled to begin in FY 2023. Construction is tentatively anticipated to begin in 2027. More information can be found at DelDOT's website: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200911305.

In conjunction with the *SR 896 and Bethel Church Road Interchange* project, the *US 301 Spur Road* project is planned to include a 4.5-mile, limited-access highway that will start from the US 301 Mainline at approximately 2/3 of a mile south of Armstrong Corner Road and connect to Summit Bridge Road at the proposed Summit Bridge Road/Bethel Church Road interchange. The eastbound Bethel Church Road approach would be realigned, and ramps would be added to connect to the proposed Spur Road. Additionally, DelDOT is undergoing monitoring efforts for the US 301 Spur Road. Specifically, DelDOT is monitoring traffic volumes, crash data, and land use information along the corridor with the goal of determining when to construct the Spur Road.

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

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

The proposed development is located within Investment Level 2.

Investment Level 2

These areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. They serve as transition areas between Level 1 and the state's

more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use its spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

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

Proposed Development's Compatibility with Livable Delaware:

The proposed site is located in Investment Level 2. Investment Level 2 areas should promote a full range of housing types. As the site proposes multi-family apartments and townhouses, age-restricted housing, and single-family homes, it is generally consistent with the 2020 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plan

(Sources: New Castle County 2050 Comprehensive Plan)

New Castle County Comprehensive Plan:

Per the *New Castle County Comprehensive Plan Zoning Map,* the proposed development is currently zoned as Suburban. Per the *New Castle County Comprehensive Plan Future Land Use Map,* the proposed development is in an area designated as Residential.

Proposed Development's Compatibility with the Sussex County Comprehensive Plan:

The *New Castle County Comprehensive Plan* states that development is encouraged within residential areas where appropriate infrastructure is present. Therefore, the development is consistent with the *New Castle County Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 210 (Single-Family Detached Housing), ITE Land Use Code 220 (Low-Rise Multi-Family Housing), ITE Land Use Code 221 (Mid-Rise Multi-Family Housing), and ITE Land Use Code 251 (Detached Senior Adult Housing). Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

Table 1
Carter Farm Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
255 Units - Single-Family Detached Housing (ITE Land Use Code 210)	2,460	46	140	186	157	93	250
36 Units - Low-Rise Multi-Family Housing (ITE Land Use Code 220)	231	4	14	18	15	9	24
240 Units - Mid-Rise Multi-Family Housing (ITE Land Use Code 221)	1,306	21	60	81	63	40	103
95 Units - Detached Senior Adult Housing (ITE Land Use Code 251)	538	13	26	39	28	18	46
Total	4,535	84	240	324	263	160	423

*Note: The number of proposed units provided in the Final TIS supersedes the information provided in the June 23, 2021, DelDOT Scoping Meeting Memorandum.

Overview of TIS

Intersections examined:

1. Bethel Church Road (New Castle Road 433) / Site Entrance A
2. Choptank Road (New Castle Road 435) / Site Entrance B
3. Bethel Church Road / Millwood Drive
4. Bethel Church Road / Clipper Drive
5. Bethel Church Road / Giller Lane
6. Bethel Church Road / Choptank Road
7. Bethel Church Road / Dillon Circle
8. Summit Bridge Road (New Castle Road 16) / Bethel Church Road
9. Summit Bridge Road / Red Lion Road (New Castle Road 35) / Brennan Boulevard
10. Choptank Road / Clayton Manor Drive

11. Choptank Road / Churchtown Road (New Castle Road 432)
12. Churchtown Road / Colonel Clayton Drive
13. Churchtown Road / Meadow Drive
14. Churchtown Road / Dickerson Lane
15. Summit Bridge Road / Boyds Corner Road (New Castle Road 15) / Churchtown Road
16. Boyds Corner Road / Ratledge Road (New Castle Road 414)
17. Choptank Road / Ernest Drive
18. Choptank Road / Old School House Road (New Castle Road 431)
19. Choptank Road / Armstrong Corner Road (New Castle Road 429)

Conditions examined:

1. Case 1 – 2021 Existing
2. Case 2 – 2028 without Development
3. Case 3 – 2028 with Development

Committed Developments considered:

1. Country Club Estates (288 single-family detached houses, 36 townhomes, 216 apartment units)
2. Summit Campus (40,000 SF early childhood center, a 107,473 SF elementary school, 396,000 SF middle and high school)
3. Highlands at Back Creek (40 single-family detached houses)
4. Bohemia Mill Pond (18 single-family detached houses)
5. Summit Pointe (99 single-family detached houses)
6. Summit Bridge / Silver Wind Estates (3 single-family detached houses)
7. Summit Circle (14 single-family detached houses)
8. Rothwell Village (67 single-family homes)
9. Summit Aviation Additions (Partly built 129,068 SF additions including 80,000 SF warehousing spaces, 50,600 SF hanger, 1,300 SF storage space out of total 289,718 SF
10. Whispering Woods (31 senior adult housing detached, 35 senior adult housing attached)
11. Whitehall
    a. Village 1 (76,317 SF shopping center, 2,750 SF general office, 95 single-family detached housing, 330 low-rise multi-family housing)
    b. Village 2 (65 single-family detached housing, 370 low-rise multi-family housing, 20,800 SF elementary school)
    c. Hamlet 3 (28 single-family detached housing, 185 low-rise multi-family housing, 15,600 SF elementary school)
    d. Hamlet 4 (147 single-family detached housing, 174 low-rise multi-family housing)
    e. Hamlet 5 (500 single-family detached housing)
    f. Hamlet 6 (500 single-family detached housing)
    g. Hamlet 7 (149 single-family detached housing, 80 low-rise multi-family housing)

12. Whitehall Scott Run Business Park (1,835,360 SF industrial park, 75,000 SF shopping center)
13. Bayberry North (98 single-family detached housing, 16 low-rise multi-family housing)
14. Windsor at Hyetts Corner (48 single-family detached housing)
15. Winchelsea (194 senior adult detached housing, 142 senior adult attached housing)
16. Bayberry Town Center (146 low-rise multi-family housing, 31,000 SF general office building, 186,345 SF shopping center, 61,200 SF athletic club)
17. Bayberry South (544 single-family detached housing, 74 low-rise multi-family housing, 143 senior adult detached housing)
18. Boyds Corner Farm / Coburn Farm (94,000 SF shopping center, 17,300 SF general office building, 113 single-family detached housing)
19. MOT Charter High School additions (11,230 SF high school)

*Note: Committed development information provided in the Final TIS supersedes the information provided in the June 23, 2021, DelDOT Scoping Meeting Memorandum.

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

Intersection Descriptions

1. **Bethel Church Road (New Castle Road 433) / Site Entrance A**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Bethel Church Road) Existing one shared left turn/through lane; proposed one shared left turn/through lane and one right turn lane.
   Westbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane; Proposed one left turn lane, one through lane, and one right turn lane.
   Northbound Approach: (Site Entrance A) Proposed one shared left turn/right turn lane, stop-controlled.
   Southbound Approach: (Fairview Avenue) Existing one shared left turn/right turn lane, stop-controlled.

2. **Choptank Road (New Castle Road 435) / Site Entrance B**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Site Entrance B) Proposed one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Choptank Road) Existing one through lane; proposed one left turn lane and one through lane.
   Southbound Approach: (Choptank Road) Existing one through lane; proposed one through lane and one right turn lane.

3. **Bethel Church Road / Millwood Drive**
   Type of Control: Two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Bethel Church Road) Exiting one shared through/right turn lane.

Westbound Approach: (Bethel Church Road) Exiting one shared left turn/through lane and one bypass lane
Northbound Approach: (Millwood Drive) Existing one shared left turn/right turn lane, stop-controlled.

4. **Bethel Church Road / Clipper Drive**
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Bethel Church Road) Existing one shared left turn/through lane.
Westbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane.
Southbound Approach: (Clipper Drive) Existing one shared left turn/right turn lane, stop-controlled.

5. **Bethel Church Road / Giller Lane**
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane.
Westbound Approach: (Bethel Church Road) Existing one shared left turn/through lane.
Northbound Approach: (Giller Lane) Existing one shared left turn/right turn lane, stop-controlled.

6. **Bethel Church Road / Choptank Road**
Type of Control: Roundabout intersection.
Eastbound Approach: (Bethel Church Road) Existing one shared through/right turn lane, yield controlled.
Northbound Approach: (Choptank Road) Existing one shared left turn lane/through lane, yield controlled.
Southbound Approach: (Bethel Church Road) Existing one shared through/right turn lane, yield controlled.

7. **Bethel Church Road / Dillon Circle**
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Bethel Church Road) Existing one left turn lane and one through lane.
Westbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane.
Southbound Approach: (Dillon Circle) Existing one shared left turn/right turn lane, stop-controlled.

8. Summit Bridge Road (New Castle Road 16) / Bethel Church Road

Type of Control: Existing signalized intersection (four-legged).

Eastbound Approach: (Bethel Church Road) Existing two left turn lanes and one channelized right turn lane.

Westbound Approach: (Bethel Church Road) Existing one entrance ramp, signalized.

Northbound Approach: (Summit Bridge Road) Existing one left turn lane and two through lanes.

Southbound Approach: (Summit Bridge Road) Existing two through lanes and one channelized right turn lane.

9. Summit Bridge Road / Red Lion Road (New Castle Road 35) / Brennan Boulevard

Type of Control: Existing signalized intersection (four-legged).

Eastbound Approach: (Brennan Boulevard) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane.

Westbound Approach: (Red Lion Road) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane.

Northbound Approach: (Summit Bridge Road) Existing one left turn lane, two through lanes and one channelized right turn lane.

Southbound Approach: (Summit Bridge Road) Existing one left turn lane, two through lanes, and one channelized right turn lane.

10. Choptank Road / Clayton Manor Drive

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Clayton Manor Drive) Existing one shared left turn/right turn lane, stop-controlled.

Northbound Approach: (Choptank Road) Existing one shared left turn/through lane.

Southbound Approach: (Choptank Road) Existing one through lane and one right turn lane.

11. Choptank Road / Churchtown Road (New Castle Road 432)

Type of Control: Roundabout intersection.

Eastbound Approach: (Churchtown Road) Existing one shared left turn/through/right turn lane, yield controlled.

Westbound Approach: (Churchtown Road) Existing one shared left turn/through/right turn lane, yield controlled.

Northbound Approach: (Choptank Road) Existing one shared left turn/through/right turn lane, yield controlled.

Southbound Approach: (Choptank Road) Existing one shared left turn/through/right turn lane, yield controlled.

12. Churchtown Road / Colonel Clayton Drive

Type of Control: Two-way stop-controlled intersection (T-intersection).

Northbound Approach: (Colonel Clayton Drive) Existing one shared left turn/right turn lane, stop-controlled.

Eastbound Approach: (Churchtown Road) Existing one through lane and one right turn lane.

Westbound Approach: (Churchtown Road) Existing one shared left turn/through.

13. Churchtown Road / Meadow Drive

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Churchtown Road) Existing one shared left turn/through lane.

Westbound Approach: (Churchtown Road) Existing one through lane and one right turn lane.

Southbound Approach: (Meadow Drive) Existing one shared left turn/right turn lane, stop-controlled.

14. Churchtown Road / Dickerson Lane

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Churchtown Road) Exiting one shared left turn/through lane and one bypass lane.

Westbound Approach: (Churchtown Road) Existing one through lane and one right turn lane.

Southbound Approach: (Dickerson Lane) Existing one shared left turn/right turn lane, stop-controlled.

15. Summit Bridge Road / Boyds Corner Road (New Castle Road 15) / Churchtown Road

Type of Control: Existing signalized intersection (Four-legged).

Eastbound Approach: (Churchtown Road) Existing one left turn lane and one shared through/right turn lane.

Westbound Approach: (Boyds Corner Road) Existing two left turn lanes, one through lane and one channelized right turn lane.

Northbound Approach: (Summit Bridge Road) Existing one left turn lane, two through lanes, and one right turn lane.

Southbound Approach: (Summit Bridge Road) Existing two left turn lanes, two through lanes and one right turn lane.

16. Boyds Corner Road / Ratledge Road (New Castle Road 414)

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Boyds Corner Road) Exiting one shared left turn/through lane, and one bypass lane.
Westbound Approach: (Boyds Corner Road) Existing one through lane and one right turn lane.
Southbound Approach: (Ratledge Road) Existing one shared left turn/right turn lane, stop-controlled.

17. Choptank Road / Ernest Drive
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Ernest Drive) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Choptank Road) Existing one shared left turn/ through lane.
Southbound Approach: (Choptank Road) Existing one through lane and one right turn lane.

18. Choptank Road / Old School House Road (New Castle Road 431)
Type of Control: Two-way stop-controlled intersection (T-intersection).
Westbound Approach: (Old School House Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Choptank Road) Existing one through lane and one right turn lane.
Southbound Approach: (Choptank Road) Existing one shared left turn/ through lane.

19. Choptank Road / Armstrong Corner Road (New Castle Road 429)
Type of Control: Two-way stop-controlled intersection (T-intersection).
Westbound Approach: (Armstrong Corner Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Choptank Road) Existing one through lane and one right turn lane.
Southbound Approach: (Choptank Road) Existing one shared left turn/ through lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, DART Route 302 runs parallel to the project area along Summit Bridge Road. There is one DART Route 302 stop at the North Middletown Park & Ride located approximately one mile from the Choptank Road / Armstrong Corner Road intersection. Route 302 provides 6 round trips from 5:45 AM to 6:48 PM on weekdays.

Planned transit service: Per email correspondence on May 6, 2022, with Mr. Jared Kauffman, Planner for DART, the Delaware Transit Corporation does not have any transit specific comments for the project.

Existing bicycle and pedestrian facilities: According to DelDOT's New Castle County Bicycle Map, several study roadways are considered bicycle routes. Choptank Road and Summit Bridge Road (north of the Bethel Church Road intersection) are considered a statewide bicycle route. Bethel Church Road, Summit Bridge Road (south of Bethel Church Road intersection), Churchtown Road, Boyds Corner Road, Red Lion Road, and Armstrong Corner Road are considered connector bike routes. Pedestrian crossings exist at the study intersections of Choptank Road/Churchtown Road, Bethel Church Road/Choptank Road, and Summit Bridge Road/Red Lion Road/Brennan Boulevard. Sidewalks exist at the study intersections of Choptank Road/ Churchtown Road and Bethel Church Road/Choptank Road.

Planned bicycle and pedestrian facilities: Per email correspondence dated June 15, 2022 from Mr. John Fiori, DelDOT Bicycle Coordinator, and Linda Osiecki, DelDOT Pedestrian Coordinator, the following improvements were recommended:

- Per the DelDOT SUP/Sidewalk Policy, a non-motorized facility is required since it appears the site will generate over 2,000-trips per day. Install a 10’ wide SUP along the property frontage on the south side of Bethel Church Road and connect to Giller Lane; then extend the SUP from Giller Lane to the existing roundabout. Install a 10’ wide SUP along the property frontage on the northwest side of Choptank Road
- Improve all legs of roundabout by improving the existing pathway to a 10’ wide SUP, detectable warning truncated domes at curb ramps and median refuge, as well as curb openings at least as wide as the 10' SUP.
- Sidewalk required along the internal subdivision streets.
- An internal connection from the SUP at the entrances will be required.
- Add pedestrian crossings of Bethel Church Road at Fairview Ave intersection.
- At this time Local Systems Improvements has no bicycle/pedestrian improvement projects within the area of this project.
- Per the Development Coordination Manual (DCM) the site shall dedicate right-of-way per the roadway classification and establish a 15’ wide permanent easement along all property roadway frontages.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if the right turn lane is warranted, then a separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).
- There could be additional and/or revised comments once project is discussed at a pre-submittal meeting and/or plans are submitted for LONO/ENT review/approval.

Bicycle Level of Traffic Stress in Delaware: Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout

the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the Bicycle On-Road Network Level of Traffic Stress map from the April 2018 Blueprint for a Bicycle-Friendly Delaware document which can be found on the following website:
https://deldot.gov/Publications/plans/bikeandped/pdfs/DelDOTBikePlan043018FINAL.pdf

- Bethel Church Road LTS: 3
- Choptank Road LTS: 2

Crash Evaluation

Per the crash data included in the TIS from January 20, 2018, to January 20, 2021, and provided by the Delaware Department of Transportation (DelDOT), 9 crashes were reported along Choptank Road within the study area. Of the 9 crashes reported, 6 involved property damage, 3 involved personal injuries, and there were no fatalities. The crashes reported were classified as follows: 3 front to front, 1 sideswipe in the opposite direction, and 5 not a collision between two vehicles. No crashes were reported at the existing Fairview Avenue intersection with Bethel Church Road. Information on the number of crashes at each intersection was not provided.

Previous Comments

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

Sight Distance Evaluation

No sight distance constraints were noted at the site entrances per a field visit conducted on May 18, 2022.

General HCS Analysis Comments

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

1) JMT used version 7.9.5 of HCS7 to complete the analysis, whereas the TIS utilized version 7.8.5.

2) As all the intersections within the study area experience some increase in volumes, per DelDOT's *Development Coordination Manual,* JMT utilized the future intersection PHF of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph, or used the existing PHF if higher.

3) Per DelDOT's *Development Coordination Manual*, JMT used a minimum heavy vehicle percentage of 3% for each movement greater than 100 vph in the Case 2 and Case 3 future scenario analysis, unless the existing heavy vehicle percentage was greater than 3% and there was no significant increase of vehicles along that movement, in which case the existing heavy vehicle percentage was used for the analysis of future scenarios, whereas the TIS did not.

4) Per DelDOT's *Development Coordination Manual* and coordination with DelDOT Planning, JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph along roadways in the existing and future condition analyses, whereas the TIS did not.

5) JMT incorporated pedestrians in the analysis, whereas the TIS did not.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T intersection in Cases 1 & 2)[1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road (New Castle Road 433) / Site Entrance A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions (Case 1)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.8)	A (7.4)	A (7.9)
Southbound Fairview Avenue Approach	A (9.8)	A (9.5)	B (10.9)	B (10.7)
2028 without Development (Case 2)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.8)	A (7.5)	A (8.0)
Southbound Fairview Avenue Approach	B (10.5)	A (9.7)	B (12.3)	B (11.1)
2028 with Development (Case 3)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.8)	A (7.5)	A (7.9)
Westbound Bethel Church Road Left Turn	A (7.8)	A (7.6)	A (7.9)	A (7.6)
Northbound Site Entrance A Approach	B (10.7)	A (9.9)	B (10.9)	A (10.0)
Southbound Fairview Avenue Approach	B (14.4)	B (13.9)	B (15.0)	B (14.4)

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

Table 3
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road (New Castle Road 435) / Site Entrance B	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)				
Eastbound Site Entrance B Approach	C (19.5)	D (31.7)	C (19.4)	D (31.7)
Northbound Choptank Road Left Turn	A (8.3)	B (10.3)	A (8.3)	B (10.3)

Table 4
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Millwood Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Bethel Church Road Left Turn	A (7.5)	A (7.4)	A (7.6)	A (7.4)
Northbound Millwood Drive Approach	A (8.8)	A (8.5)	A (9.4)	A (8.8)
2024 without Development (Case 2)				
Westbound Bethel Church Road Left Turn	A (7.7)	A (7.5)	A (7.8)	A (7.5)
Northbound Millwood Drive Approach	A (9.2)	A (8.6)	A (9.8)	A (8.9)
2024 with Development (Case 3)				
Westbound Bethel Church Road Left Turn	A (7.8)	A (7.5)	A (7.8)	A (7.5)
Northbound Millwood Drive Approach	A (9.3)	A (8.7)	A (9.9)	A (9.0)

[2] TIS modeled with flared minor street approach whereas JMT did not.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Clipper Drive[3]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Bethel Church Road Left Turn	A (7.3)	A (7.4)	A (7.3)	A (7.4)
Southbound Clipper Drive Approach	A (8.6)	A (9.0)	A (9.4)	A (9.3)
2028 without Development (Case 2)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.5)	A (7.4)	A (7.5)
Southbound Clipper Drive Approach	A (9.2)	A (9.3)	B (10.0)	A (9.5)
2028 with Development (Case 3)				
Eastbound Bethel Church Road Left Turn	A (7.4	A (7.5)	A (7.4)	A (7.5)
Southbound Clipper Drive Approach	A (9.3)	A (9.4)	B (10.2)	A (9.7)

[3] JMT modeled the eastbound Bethel Church Road approach with a shared through/left turn lane per existing conditions, whereas the TIS modeled the approach with a separate through and left turn lane.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Giller Lane	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Bethel Church Road Left Turn	A (7.7)	A (7.5)	A (7.7)	A (7.5)
Northbound Giller Lane Approach	A (9.5)	A (8.3)	A (9.6)	A (9.3)
2028 without Development (Case 2)				
Westbound Bethel Church Road Left Turn	A (7.9)	A (7.5)	A (7.9)	A (7.6)
Northbound Giller Lane Approach	B (10.0)	A (9.5)	B (10.0)	A (9.4)
2028 with Development (Case 3)				
Westbound Bethel Church Road Left Turn	A (8.1)	A (7.7)	A (8.1)	A (7.7)
Northbound Giller Lane Approach	B (10.5)	A (10.0)	B (10.5)	A (9.9)

Table 7
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Choptank Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Bethel Church Road Approach	A (5.6)	A (6.4)	A (5.7)	A (6.6)
Northbound Choptank Road Approach	A (7.7)	A (5.1)	A (7.7)	A (5.2)
Southbound Bethel Church Road Approach[4]	A (4.5)	A (8.1)	A (4.5)	A (8.1)
Overall	A (6.3)	A (7.1)	A (6.4)	A (7.1)
2028 without Development (Case 2)				
Eastbound Bethel Church Road Approach	A (7.3)	A (8.8)	A (7.4)	A (8.9)
Northbound Choptank Road Approach	B (11.8)	A (6.5)	B (11.8)	A (6.5)
Southbound Bethel Church Road Approach[4]	A (5.5)	B (11.8)	A (5.4)	B (11.8)
Overall	A (8.9)	A (9.8)	A (8.9)	A (9.9)
2028 with Development (Case 3)				
Eastbound Bethel Church Road Approach	A (8.7)	B (10.7)	A (8.8)	B (10.8)
Northbound Choptank Road Approach	C (16.1)	A (7.3)	C (16.1)	A (7.3)
Southbound Bethel Church Road Approach[4]	A (5.9)	C (15.5)	A (5.8)	C (15.6)
Overall	B (11.3)	B (12.6)	B (11.2)	B (12.6)

[4] Although Bethel Church Road is generally an east-west roadway throughout the study area, it intersects Choptank Road from the north in this location. As such, it was denoted Southbound Bethel Church Road.

Table 8
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Dillon Circle[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions				
Eastbound Dillon Circle Approach	B (14.9)	C (17.4)	C (16.2)	C (15.8)
Northbound Bethel Church Road Left Turn	A (8.7)	A (8.3)	A (8.1)	A (8.4)
2028 without Development (Case 2)				
Eastbound Dillon Circle Approach	D (33.3)	C (19.7)	D (32.3)	C (22.4)
Northbound Bethel Church Road Left Turn	A (9.2)	A (9.1)	A (8.5)	A (9.1)
2028 with Development (Case 3)				
Eastbound Dillon Circle Approach	E (45.8)	D (25.6)	E (44.1)	D (29.0)
Northbound Bethel Church Road Left Turn	A (9.3)	A (9.6)	A (8.6)	A (9.6)

Table 8 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Dillon Circle[5]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)				
Eastbound Dillon Circle Approach	-	-	A (5.3)	A (6.8)
Northbound Bethel Church Road Approach	-	-	C (15.9)	A (7.0)
Southbound Bethel Church Road Approach	-	-	A (6.6)	A (9.8)
Overall	-	-	B (12.4)	A (8.6)

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Dillon Circle[6]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)	-	-	A (5.8)	A (4.2)

[5] JMT conducted an additional analysis of the intersection as a single lane roundabout.
[6] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the eastbound approach was modeled with one left turn lane and one right-turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled with utilizing a 60 second cycle length. The northbound and southbound approaches were modeled with concurrent phasing and protected/permitted northbound left turns.

Table 9
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Signalized Intersection [1]	**LOS per TIS**[7]		**LOS per JMT**	
Summit Bridge Road (New Castle Road 16) / Bethel Church Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions (Case 1)	-	-	D (36.9)	E (59.0)
2021 Existing Conditions (Case 1) *with optimization* [8]	C (23.6)	B (13.9)	C (33.7)	B (19.2)
2028 without Development (Case 2) *with optimization* [8]	F (90.9)	C (28.6)	F (171.6)	F (88.2)
2028 with Development (Case 3) *with optimization* [8]	F (99.8)	D (36.7)	F (189.6)	F (105.3)

[7] The TIS modeled the intersection utilizing Synchro.

[8] Signal Optimization scenario includes optimizing splits while maintaining cycle lengths consistent with the DelDOT Timing Plans.

Table 10
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Summit Bridge Road / Red Lion Road (New Castle Road 35) / Brennan Boulevard [9,]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions (Case 1) [10]	-	-	C (33.6)	D (41.1)
2021 Existing Conditions (Case 1) *with optimization* [8]	B (16.2)	B (19.4)	C (28.0)	C (31.1)
2028 without Development (Case 2) *with optimization* [11]	D (37.4)	D (44.4)	D (48.1)	D (45.4)
2028 with Development (Case 3) *with optimization* [11]	D (48.1)	E (59.1)	D (54.9)	D (52.6)

[9] JMT analyzed the intersection assuming 40% left turns in the shared lanes along the eastbound and westbound approaches, whereas the TIS assumed various values.
[10] JMT analyzed this scenario using the existing DelDOT Timings Plan for this intersection.
[11] JMT modeled the intersection utilizing the m60 Timesheet associated with DelDOT Project No. T202104001, whereas the TIS modeled the intersection utilizing existing timings.

Table 11
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Clayton Manor Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions				
Eastbound Clayton Manor Drive Approach	B (13.4)	B (12.6)	C (18.8)	C (18.2)
Northbound Choptank Road Left Turn	A (8.1)	A (9.1)	A (8.1)	A (9.1)
2028 without Development (Case 2)				
Eastbound Clayton Manor Drive Approach	C (19.7)	C (18.1)	D (25.1)	D (26.7)
Northbound Choptank Road Left Turn	A (8.2)	A (9.8)	A (8.3)	A (9.8)
2028 with Development (Case 3)				
Eastbound Clayton Manor Drive Approach	D (27.6)	D (25.6)	E (37.2)	E (38.0)
Northbound Choptank Road Left Turn	A (8.6)	B (10.2)	A (8.6)	B (10.2)

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Clayton Manor Drive[5]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)				
Eastbound Clayton Manor Drive Approach	-	-	A (7.2)	A (7.5)
Northbound Choptank Road Approach	-	-	A (8.9)	A (7.8)
Southbound Choptank Road Approach	-	-	A (6.7)	B (12.3)
Overall			A (7.8)	B (10.2)

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Clayton Manor Drive[12]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3) *with signal timing optimization*	-	-	A (6.6)	A (5.2)

[12] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the northbound approach was modeled with one left turn lane and one right-turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled with utilizing a 60 second cycle length. The eastbound and westbound approaches were modeled with concurrent phasing and protected/permitted westbound left turns.

Table 12
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Churchtown Road (New Castle Road 432)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Churchman Road Approach	A (7.4)	A (6.6)	A (8.0)	A (7.0)
Westbound Churchman Road Approach	A (5.9)	A (6.1)	A (6.3)	A (6.6)
Northbound Choptank Road Approach	A (7.7)	A (6.8)	A (8.1)	A (7.2)
Southbound Choptank Road Approach	A (6.7)	A (9.8)	A (6.9)	B (10.1)
Overall	A (7.1)	A (7.9)	A (7.5)	A (8.2)
2028 without Development (Case 2)				
Eastbound Churchman Road Approach	C (15.2)	B (12.0)	C (15.2)	B (12.1)
Westbound Churchman Road Approach	A (8.5)	B (11.1)	A (8.7)	B (11.3)
Northbound Choptank Road Approach	B (12.6)	B (12.1)	B (12.7)	B (12.3)
Southbound Choptank Road Approach	A (8.7)	D (28.3)	A (8.4)	C (20.5)
Overall	B (11.8)	C (17.7)	B (11.8)	C (15.0)
2028 with Development (Case 3)				
Eastbound Churchman Road Approach	C (20.6)	B (14.2)	C (20.7)	B (14.3)
Westbound Churchman Road Approach	A (9.1)	B (14.80	A (9.4)	B (15.0)
Northbound Choptank Road Approach	B (14.8)	C (16.2)	C (15.1)	C (16.4)
Southbound Choptank Road Approach	B (11.0)	E (43.1)	B (11.2)	E (43.3)
Overall	B (14.5)	D (25.3)	B (14.7)	D (25.5)

Table 13
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road / Colonel Clayton Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Churchtown Road Left Turn	A (7.7)	A (7.6)	A (7.8)	A (7.6)
Northbound Colonel Clayton Drive Approach	A (8.9)	A (8.5)	B (10.0)	A (9.6)
2028 without Development (Case 2)				
Westbound Churchtown Road Left Turn	A (8.5)	A (8.0)	A (8.5)	A (8.1)
Northbound Colonel Clayton Drive Approach	B (10.6)	A (9.4)	B (12.4)	B (11.5)
2028 with Development (Case 3)				
Westbound Churchtown Road Left Turn	A (8.5)	A (8.1)	A (8.5)	A (8.1)
Northbound Colonel Clayton Drive Approach	B (10.7)	A (9.5)	B (12.4)	B (11.6)

Table 14
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road / Meadow Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Churchtown Road Eastbound Left Turn	A (7.4)	A (7.7)	A (7.4)	A (7.7)
Meadow Drive Southbound Approach	B (10.2)	A (8.0)	B (10.1)	B (10.4)
2028 without Development (Case 2)				
Churchtown Road Eastbound Left Turn	A (7.6)	A (8.1)	A (7.6)	A (8.0)
Meadow Drive Southbound Approach	B (12.8)	B (10.1)	B (12.7)	B (12.4)
2028 with Development (Case 3)				
Churchtown Road Eastbound Left Turn	A (7.7)	A (8.2)	A (7.7)	A (8.2)
Meadow Drive Southbound Approach	B (13.1)	B (10.7)	B (13.5)	B (13.2)

Table 15
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road / Dickerson Lane[13]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Churchtown Road Left Turn	A (7.3)	A (7.6)	A (7.4)	A (7.7)
Westbound Churchtown Road Left Turn	A (7.7)	A (7.5)	A (7.7)	A (7.5)
Southbound Dickerson Lane Approach	B (10.5)	B (10.7)	B (10.5)	B (10.8)
2028 without Development (Case 2)				
Eastbound Churchtown Road Left Turn	A (7.7)	A (8.0)	A (7.7)	A (8.0)
Westbound Churchtown Road Left Turn	A (8.2)	A (7.7)	A (8.2)	A (7.7)
Southbound Dickerson Lane Approach	C (15.1)	B (13.2)	C (15.0)	B (13.3)
2028 with Development (Case 3)				
Eastbound Churchtown Road Left Turn	A (7.7)	A (8.1)	A (7.7)	A (8.1)
Westbound Churchtown Road Left Turn	A (8.3)	A (7.8)	A (8.3)	A (7.8)
Southbound Dickerson Lane Approach	C (15.7)	B (13.1)	C (16.1)	B (14.2)

[13] Southerly leg of the intersection is a private residential driveway. No northbound traffic was recorded during turning movement count data collection and so results have not been included.

Table 16
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Summit Bridge Road / Boyds Corner Road (New Castle Road 15) / Churchtown Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)	C (24.4)	D (36.4)	C (26.9)	C (26.6)
2021 Existing (Case 1) *with optimized timings* [8]	-	-	C (22.5)	C (24.9)
2028 without Development (Case 2) *with optimized timings* [8, 14]	F (100.3)	F (120.7)	E (64.2)	D (41.0)
2028 without Development (Case 2) *with improvement* [15]	-	-	C (34.9)	C (34.4)
2028 with Development (Case 3) *with optimized timings* [8, 16]	D (46.3)	D (43.1)	E (69.2)	D (48.0)
2028 with Development (Case 3) *with improvement* [15]	-	-	D (38.4)	D (40.4)

[14] The TIS did not provide an optimized timing scenario.
[15] Improvement scenario includes providing an additional northbound through lane and optimizing splits while maintaining cycle lengths consistent with the DelDOT Timing Plans.
[16] JMT modeled the intersection utilizing the existing cycle length, whereas the TIS did not.

Table 17
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Boyds Corner Road / Ratledge Road (New Castle Road 414)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Boyds Corner Road Left Turn	A (9.7)	A (9.1)	A (9.7)	A (9.2)
Southbound Ratledge Road Approach	D (27.6)	C (19.2)	D (28.3)	C (19.0)
2028 without Development (Case 2)				
Eastbound Boyds Corner Road Left Turn	B (14.1)	B (13.6)	B (14.0)	B (13.6)
Southbound Ratledge Road Approach	F (*)	F (*)	F (*)	F (964.7)
2028 without Development (Case 2) *with improvement by others* [17]				
Eastbound Boyds Corner Road Left Turn	-	-	B (14.0)	B (13.6)
Southbound Ratledge Road Approach	-	-	F (489.1)	F (179.4)
2028 with Development (Case 3)				
Eastbound Boyds Corner Road Left Turn	B (14.5)	B (14.1)	B (14.3)	B (14.1)
Southbound Ratledge Road Approach	F (*)	F (*)	F (*)	F (*)
2028 with Development (Case 3) *with improvement by others* [17]				
Eastbound Boyds Corner Road Left Turn	-	-	B (14.3)	B (14.1)
Southbound Ratledge Road Approach	-	-	F (538.3)	F (215.7)

* Delay greater than 1,000 seconds per vehicle

[17] Improvement scenario includes modifying the southbound Ratledge Road approach to provide one left turn lane and one right turn lane.

Table 17 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**[18]	
Boyds Corner Road / Ratledge Road (New Castle Road 414	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 without Development (Case 2)	-	-	D (46.5)	C (24.0)
2028 with Development (Case 3)	-	-	D (47.7)	C (27.3)

[18] Improvement scenario is in accordance with the Southern New Castle County TID improvement to signalize the intersection. A 120 second cycle length was utilized with a protected-permissive left turn phasing along eastbound Boyds Corner Road. One left turn lane and one through lane are provided along the eastbound Boyds Corner Road approach, one through lane and one right turn lane are provided along the westbound Boyds Corner Road approach, and one left turn lane and one right turn lane are provided along the southbound Ratledge Road approach.

Table 18
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Ernest Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Ernest Drive Approach	A (8.9)	B (10.7)	B (12.6)	B (13.8)
Northbound Choptank Road Left Turn	A (8.1)	A (10.6)	A (8.2)	A (8.7)
2028 without Development (Case 2)				
Eastbound Ernest Drive Approach	A (9.7)	B (11.8)	B (14.8)	C (16.6)
Northbound Choptank Road Left Turn	A (8.5)	A (9.0)	A (8.6)	A (9.1)
2028 with Development (Case 3)				
Eastbound Ernest Drive Approach	B (10.1)	B (12.0)	C (15.6)	C (18.1)
Northbound Choptank Road Left Turn	A (8.7)	A (9.1)	A (8.7)	A (9.3)

Table 19
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Old School House Road (New Castle Road 431)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Old Schoolhouse Road Approach	B (13.6)	C (19.4)	B (13.8)	C (19.8)
Southbound Choptank Road Left Turn	A (8.3)	A (8.3)	A (8.1)	A (8.4)
2028 without Development (Case 2)				
Westbound Old Schoolhouse Road Approach	C (16.6)	D (27.5)	C (16.7)	D (27.8)
Southbound Choptank Road Left Turn	A (8.6)	A (8.9)	A (8.3)	A (8.9)
2028 with Development (Case 3)				
Westbound Old Schoolhouse Road Approach	C (18.2)	D (32.9)	C (18.3)	D (33.2)
Southbound Choptank Road Left Turn	A (8.7)	A (9.1)	A (8.4)	A (9.2)

Table 20
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Armstrong Corner Road (New Castle Road 429)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Armstrong Corner Road Approach	B (14.8)	C (18.0)	B (14.8)	C (18.4)
Southbound Choptank Road Left Turn	A (8.2)	A (8.5)	A (8.2)	A (8.6)
2028 without Development (Case 2)				
Westbound Armstrong Corner Road Approach	C (19.2)	D (31.2)	C (19.3)	D (31.7)
Southbound Choptank Road Left Turn	A (8.6)	A (9.0)	A (8.6)	A (9.0)
2028 with Development (Case 3)				
Westbound Armstrong Corner Road Approach	C (20.9)	E (45.2)	C (20.9)	E (46.3)
Southbound Choptank Road Left Turn	A (8.7)	A (9.3)	A (8.7)	A (9.3)
2028 with Development (Case 3) *with improvements*[19]				
Westbound Armstrong Corner Road Left Turn	D (29.9)	F (55.7)	D (29.9)	F (56.7)
Westbound Armstrong Corner Road Right Turn	B (11.2)	B (14.9)	B (11.2)	C (15.0)
Overall Westbound Armstrong Road Approach	C (18.3)	C (24.4)	C (18.3)	C (24.8)
Southbound Choptank Road Left Turn	A (8.7)	A (9.3)	A (8.7)	A (9.3)

[19] The Armstrong Corner Road approach was modeled with separate left turn and right turn lanes .

Table 20 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Roundabout Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Armstrong Corner Road (New Castle Road 429)[20]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with development (Case 3)				
Westbound Armstrong Corner Road Approach	-	-	A (5.4)	A (8.3)
Northbound Choptank Road Left Turn	-	-	A (7.0)	A (8.7)
Southbound Choptank Road Left Turn	-	-	A (7.8)	A (9.4)
Overall	-	-	A (7.3)	A (9.0)

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Armstrong Corner Road (New Castle Road 429)[21]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with development (Case 3)	-	-	A (6.4)	A (8.5)

[20] JMT conducted an additional analysis of the intersection as a single lane roundabout.

[21] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the westbound approach was modeled with one left turn lane and one right turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled with utilizing a 60 second cycle length. The northbound and southbound approaches were modeled with concurrent phasing and protected/permitted southbound left turns.

Avigation Nuisance Easement & Non-Suit Covenant

This indenture made this _____ day of _____, 20_____, by and between _____, hereinafter referred to as Grantor, and _____ hereinafter referred to as Grantee, witnesseth:

WHEREAS the Grantor is the owner in fee of a certain parcel of land ("the Property") in the County of _____, State of Delaware; and

WHEREAS said parcel of land is near or adjacent to _____, an operating airport ("Airport"); and

WHEREAS the Grantee is the owner of said airport; and

WHEREAS the Grantor proposes to make a use of said Property and to develop thereon the following:

_____
_____

_____
_____
, which use and development require approval by Municipal and County authorities subject to the applicable provisions of law; and

WHEREAS the Grantor has been advised that the subject Property is located adjacent to the Airport; that the present and future impacts of Airport operations might be considered annoying to users of the Property for its stated purpose and might interfere with the unrestricted use and enjoyment of the Property in its intended use; that these Airport impacts might change over time, for example and not by way of limitation by an increase in the number of aircraft using the Airport, louder aircraft, seasonal variations, and time-of-day variations; that changes in Airport, air traffic control operating procedures or in Airport layout could result in increased noise impacts; and that the Grantor's and users' own personal perceptions of the noise exposure could change and that his or her sensitivity to aircraft noise could increase;

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements and conditions contained herein, the parties hereto agree as follows:

Grantor does hereby grant a permanent nuisance and avigation easement ("Easement") to Grantee over all of the following described real estate:

By virtue of this agreement, the Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to Grantee or any successor agency legally authorized to operate said airport, any and all claims for damage of any kind whatsoever incurred as a result of aircraft using the Easement granted herein regardless of any future changes in volume or character of aircraft overflights, or changes in airport design and operating policies, or changes in air traffic control procedures.

The Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, does further hereby covenant and agree with the Grantee, its successors and assigns, that it will not, from and after the effective date hereof, sue, prosecute, molest, or trouble the Grantee, its successors and assigns, in

These covenants and agreements shall run with the land of the Grantor, as hereinabove described, for the benefit of the Grantee, and its successors and assigns in the ownership, use and operation of the aforesaid Airport.

Grantee, its successors and assigns, shall have and hold said Easement and all rights appertaining thereto until said Airport shall be abandoned and shall cease to be used for airport purposes.

If any provision of this Easement or any amendments hereto, or the application thereof to any person, thing or circumstances is held invalid, such invalidity shall not affect the provisions or application of this Easement or such amendments that can be given effect without the invalid provisions or application, and to this end the provisions of this Easement and such amendments are declared to be severable.

IN WITNESS WHEREOF, the Grantor has hereunto set its hand and seal the day and year first above written.

_____(SEAL)

_____(SEAL)

NOTARY ACKNOWLEDGEMENT

STATE OF DELAWARE

ss.

COUNTY OF KENT

BE IT REMEMBERED that on this _____ day of _____, 20_____ personally, came before me, the subscriber, a Notary Public for the State and County aforesaid, _____, party(ies) to this Indenture, known to me personally to be such, and acknowledged this Indenture, to his/her (their) act or deed.

GIVEN under my Hand and Seal of office the day and year first above written.

_____

Notary Public, State of Delaware

My Commission Expires _____

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

NICOLE MAJESKI
SECRETARY

August 12, 2022

Christopher Duke, P.E.
Becker Morgan Group, Inc.
100 Discovery Blvd, Suite 102
Newark, DE 19713

Dear Mr. Duke:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Carter Farm** (Tax Parcels: 11-061.00-001, 11-061.00-005, and 11-061.00-008) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2124.

Sincerely,

Claudy Joinville
Project Engineer

CJ:svf
Enclosures
cc with enclosures:
Mr. Bill Krapf, Carter Farm, LLC
Mr. David L. Edgell, Office of State Planning Coordination
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Bradford Shockley, New Castle County Department of Land Use
Mr. Owen C. Robatino, New Castle County Department of Land Use
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Deputy Secretary, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Matthew Vincent, Chief of Project Development North, DOTS
Todd Sammons, Assistant Director, Development Coordination
Sireen Muhtaseb, TIS Group Manager, Development Coordination
Jared Kauffmann, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Wendy Polasko, Subdivision Engineer, Development Coordination
John Pietrobono, New Castle Review Coordinator, Development Coordination
Pao Lin, Subdivision Manager, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Annamaria Furmato, Project Engineer, Development Coordination

August 11, 2022

Mr. Claudy Joinville
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202069012
Traffic Impact Study Services
Task 5-12A –Carter Farm TIS

Dear Mr. Joinville:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the Carter Farm development, which was prepared by Becker Morgan Group, Inc, dated April 2022. This review was assigned as Task Number 5-12A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed residential development in New Castle County, Delaware. The proposed development would consist of 240 units of mid-rise multi-family housing (apartments), 36 units of low-rise multi-family housing (townhouses), 95 age-restricted detached houses, and 255 single-family detached houses. The site is located on the south side of Bethel Church Road (New Castle Road 433) and west of Choptank Road (New Castle Road 435). The subject property is on an approximately 411.90-acre assemblage of parcels. The land is currently zoned as S (Suburban) and the developer does not plan to rezone the land.

Two access points are proposed: one full access on Bethel Church Road opposite Fairview Avenue and one full access on Choptank Road. The Millwood subdivision has a paper street that would connect to the Carter Farm development. Construction for the Carter Farm development is anticipated to be completed in 2028.

The site is located near the Southern New Castle County TID which was established in August 2014 for the area bounded by Lorewood Grove Road and the Chesapeake and Delaware (C&D) Canal to the north, Marl Pit Road to the south, Delaware Route 1 and US Route 13 to the east, and US Route 301, Delaware Route 72, and Delaware Route 896 to the west. Recommendations for study intersections within the TID are summarized in the *Traffic Analysis for the Southern New Castle County TID Technical Report,* dated November 2013. The TID is currently in operation, however updated analysis is being conducted to determine if the recommended improvements from the November 2013 report are sufficient or if additional improvements are necessary. The updated analysis and study are scheduled to be completed in 2022.

DelDOT has several ongoing and recently completed projects within the study area. The *US 301 Corridor Improvements* project (including DelDOT Contract No. T200811301, T200911301,

T200911302, T200911302, T200911308, T201011301, and T201011302) was divided into several sections which were recently constructed within the study area. The aim of the project was to reduce traffic congestion in the project area and improve highway safety by removing through traffic, especially heavy vehicle truck traffic, from the local roads. The project constructed a four-lane limited access toll road, US Route 301, on a new alignment which extends from the Maryland State Line, west of Middletown, to the vicinity of Armstrong Corner Road. The new US Route 301 continues northeast, crossing Summit Bridge Road and Boyds Corner Road before curving east and tying into Delaware Route 1 south of the Chesapeake and Delaware (C&D) Canal. Access to the new US Route 301 is provided via intersections south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road, and at Jamison Corner Road. Construction of the above-mentioned contracts was completed and the new US Route 301 opened to traffic in January 2019. Additional information can be found on the DelDOT project website at: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200511301#project-details1.

The *SR 896 and Bethel Church Road Interchange* project (DelDOT Contract No. T200911305) will be implemented independently from the *US 301 Corridor Improvements* project and is intended to improve the safety and operation of the intersection of Summit Bridge Road and Bethel Church Road. The project is anticipated to include the removal of the existing signal at the Bethel Church Road and Summit Bridge Road intersection and the conversion to a grade-separated intersection. Additionally, the eastbound and westbound Bethel Church Road approaches are anticipated to be terminated with cul-de-sacs prior to the intersection with Summit Bridge Road. Design work is scheduled to begin in FY 2023. Construction is tentatively anticipated to begin in 2027. More information can be found at DelDOT's website: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200911305.

In conjunction with the *SR 896 and Bethel Church Road Interchange* project, the *US 301 Spur Road* project is planned to include a 4.5-mile, limited-access highway that will start from the US 301 Mainline at approximately 2/3 of a mile south of Armstrong Corner Road and connect to Summit Bridge Road at the proposed Summit Bridge Road/Bethel Church Road interchange. The eastbound Bethel Church Road approach would be realigned, and ramps would be added to connect to the proposed Spur Road. Additionally, DelDOT is undergoing monitoring efforts for the US 301 Spur Road. Specifically, DelDOT is monitoring traffic volumes, crash data, and land use information along the corridor with the goal of determining when to construct the Spur Road.

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

The New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) apply to all signalized, all-way-stop, and roundabout intersections. The proposed development would meet the UDC LOS Standards for all intersections that were required by New Castle County to be analyzed.

However, separate from the UDC but based on the LOS evaluation criteria as stated in DelDOT's *Development Coordination Manual*, the following study intersections exhibit LOS deficiencies and would require the implementation of physical roadway and/or traffic control improvements.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
Bethel Church Road/Dillon Circle	X		Case 3 – 2028 with Development
Summit Bridge Road (New Castle Road 16)/Bethel Church Road	X	X	Case 2– 2028 without Development
	X	X	Case 3 – 2028 with Development
Choptank Road/Clayton Manor Drive	X	X	Case 3 – 2028 with Development
Summit Bridge Road/Boyds Corner Road (New Castle Road 15)/Churchtown Road	X		Case 2– 2028 without Development
	X		Case 3 – 2028 with Development
Boyds Corner Road/Ratledge Road (New Castle Road 414)	X	X	Case 2– 2028 without Development
	X	X	Case 3 – 2028 with Development
Choptank Road/Armstrong Corner Road (New Castle Road 429)		X	Case 3 – 2028 with Development

The existing unsignalized Bethel Church Road intersection with Dillon Circle exhibits LOS deficiencies during the AM peak hour under future conditions with the proposed development. Specifically, the eastbound Dillon Circle approach would operate at LOS E with a delay of 44.1 seconds per vehicle and a calculated 95th percentile queue length of approximately 50 feet. The deficiencies at the intersection could be mitigated with the installation of a traffic signal or a single lane roundabout. However, the volumes executing turning movements from Dillon Circle onto Bethel Church Road would not meet the volume-based traffic signal warrants (a maximum of 48 left turning vehicles from Dillon Circle during the PM peak hour under Case 3 conditions). As such, due to the extensive scope of the improvements it would be unreasonable to require the developer to improve the intersection. Additionally, based on correspondence with DelDOT Project Development section, this intersection may be impacted by the *Summit Bridge Road / Bethel Church Road Interchange* project (DelDOT Contract No. T200911305). Therefore, we do not recommend that the developer implement any improvements at this intersection.

The existing signalized Summit Bridge Road intersection with Bethel Church Road exhibits LOS deficiencies during the AM and PM peak hours under future conditions, with or without the proposed development. However, as part of the *SR 896 and Bethel Church Road Interchange* project, the intersection will be converted to a grade-separated interchange. Therefore, we do not recommend that the developer implement any improvements at this intersection. However, it is recommended that the developer be responsible to fund an equitable portion of the improvements made to the intersection as part of the *SR 896 and Bethel Church Road Interchange* (DelDOT Contract No. T200911305) project.

The existing unsignalized Choptank Road intersection with Clayton Manor Drive exhibits LOS deficiencies during the AM and PM peak hours under future conditions with the proposed development. Specifically, these deficiencies occur along the eastbound Clayton Manor Drive approach with delays of 38.0 seconds of delay per vehicle and a projected 95th percentile queue of approximately 50 feet during the PM peak hour under Case 3 conditions. The deficiencies at the intersection could be mitigated with the installation of a traffic signal or a single lane roundabout. However, due to the short queue length and minimal delay projected at the intersection, as well as the nature of Clayton Manor Drive, and the extensive scope of the improvements, we do not recommend that the developer implement any improvements at this intersection.

The existing signalized Summit Bridge Road intersection with Boyds Corner Road/Churchtown Road exhibits LOS deficiencies during the AM peak hour under future conditions with or without the proposed development. These deficiencies could be mitigated by providing an additional through lane along the northbound Summit Bridge Road approach. Additionally, widening along northbound Summit Bridge Road, north of the intersection with Boyds Corner Road, would be needed to maintain the westbound right turn acceleration lane. With the provision of an additional through lane along northbound Summit Bridge Road and widening north of the intersection, the intersection would improve to operate at LOS D (40.4 seconds of delay per vehicle) or better under Case 3 conditions. However, due to the extensive scope of these improvements, it would be unreasonable to require the developer to construct these improvements. Additionally, the intersection is part of the Southern New Castle County TID study area and volumes at this intersection may be reduced in the future due to the anticipated Spur Road construction. Therefore, we do not recommend the developer implement any improvements at this intersection.

The existing unsignalized Boyds Corner Road intersection with Ratledge Road exhibits LOS deficiencies during the AM and PM peak hours under future conditions, with or without the proposed development. These deficiencies occur along the southbound Ratledge Road approach, with delays of 1,000 seconds per vehicle or more and 95th percentile queues up to approximately 1,140 feet during the AM peak hour under Case 3 conditions. These LOS deficiencies could be mitigated by signalization of the intersection and widening the southbound Ratledge Road approach to provide one left turn lane and one right turn lane. With the implementation of a signal, the intersection would operate at LOS D (47.7 seconds of delay per vehicle) or better under Case 3 conditions. As this intersection is part of the Southern New Castle County TID study area, we do not recommend the developer implement any improvements at this intersection. However, it is recommended that the developer enter into a traffic signal agreement for the Boys Corner Road intersection with Ratledge Road.

The existing unsignalized Choptank Road intersection with Armstrong Corner Road exhibits LOS deficiencies during the PM peak hour under future conditions with the proposed development. These deficiencies occur along the westbound Armstrong Corner Road approach, with delays of 46.3 seconds per vehicle and projected 95th percentile queue of approximately 140 feet during the PM peak hour under Case 3 conditions. These LOS deficiencies could be mitigated with the installation of a traffic signal or a single lane roundabout. Although a signal would mitigate the LOS deficiencies at the intersection, the provision of a single lane roundabout would be aligned with the character of the roadway, as there are single lane roundabouts along Choptank Road north

and south of the Armstrong Corner Road intersection. Therefore, we recommend that the developer coordinate with DelDOT on the implementation of a roundabout installation.

Should New Castle County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. 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 shall improve Bethel Church Road and Choptank Road within the limits of their frontage to meet DelDOT's standards for their Functional Classification as found in Section 1.1 of the *Development Coordination Manual* and elsewhere therein. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. Frontage is defined in Section 1 of the *Development Coordination Manual*, which states "This length includes the length of roadway perpendicular to lines created by the projection of the outside parcel corners to the roadway." Questions on or appeals of this requirement should be directed to the DelDOT Subdivision Review Coordinator in whose area the development is located.

2. The developer should construct an unsignalized full access for the proposed Carter Farm development along Bethel Church Road, opposite Fairview Avenue. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound Bethel Church Road	One shared left turn/through lane	One left turn lane, one through lane, and one right turn lane
Westbound Bethel Church Road	One through lane and one right turn lane	One left turn lane, one through lane, and one right turn lane
Northbound Site Entrance A	Approach does not exist	One shared left turn/right turn lane
Southbound Fairview Avenue	One shared left turn/ right turn lane	No change

Pedestrian facilities should be provided, including a crosswalk across Bethel Church Road. The developer should conduct a pedestrian crossing analysis per NCHRP 562 to determine the pedestrian treatments. Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the separate left turn and right turn lanes along Bethel Church Road are summarized in the table below. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

Approach	Left Turn Lane	Right Turn Lane
Eastbound Bethel Church Road	135 feet	145 feet
Westbound Bethel Church Road	135 feet	240 feet*

*The existing right turn lane storage length (excluding taper) along Westbound Bethel Church Road is approximately 115 feet.

3. The developer should construct an unsignalized full access for the proposed Carter Farm development along Choptank Road, approximately 3,000 feet north of the intersection with Clayton Manor Drive. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound Site Entrance B	Approach does not exist	One shared left turn/right turn lane
Northbound Choptank Road	One through lane	One left turn lane and one through lane
Southbound Choptank Road	One through lane	One through lane and one right turn lane

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the northbound Choptank Road left turn lane is 145 feet. Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the southbound Choptank Road right turn lane is 190 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

4. The developer should construct an interconnection to the adjacent Millwood subdivision. The site should also be redesigned to discourage cut through traffic between the Millwood subdivision and Choptank Road. The developer should coordinate with DelDOT's Development Coordination Section regarding the location of the interconnection.

5. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements to the intersection of Summit Bridge Road and Bethel Church Road as part of the *SR 896 and Bethel Church Road Interchange* (DelDOT Contract No. T200911305) project. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the improvements.

6. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Boyds Corner Road and Ratledge Road. The agreement should include pedestrian

signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. At DelDOT's discretion, the developer may contribute to the Traffic Signal Revolving Fund in lieu of a traffic signal agreement.

7. The developer should enter into an agreement to build or participate in the construction of a single lane roundabout at the intersection of Choptank Road and Armstrong Corner Road. The roundabout design should follow *NCHRP: Report 672 2nd Edition – Roundabouts: An Information Guide*, DelDOT's *Road Design Manual*, and DelDOT's *Design Guidance Memorandum Number 1-26* for roundabouts. The roundabout should also be designed to accommodate pedestrians and bicyclists. Additionally, lighting at the roundabout should be evaluated per DelDOT's lighting guidelines. The developer should coordinate with DelDOT's Development Coordination Section regarding the agreement during the Entrance Plan review process. The agreement should identify when the final design and construction of the roundabout should be completed.

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

    a. A minimum of fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Bethel Church Road and Choptank Road site frontages. Within the easements, the developer should construct a ten-foot wide shared-use path (SUP) with connections to the adjacent pedestrian facilities. The SUP should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the SUP. If feasible, the SUP should be placed behind utility poles and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.

    b. The SUP along the Bethel Church Road site frontage should connect to Giller Lane and continue to the roundabout at the Bethel Church Road/Choptank Road intersection.

    c. At least one internal connection of a sidewalk or SUP at the site entrances from the SUP along Bethel Church Road and Choptank Road should be provided.

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

    e. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Bethel Church Road approaches to Site Entrance A and the Choptank Road approaches to Site Entrance B.

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

9. Due to the proximity of the proposed development to the Summit Aviation Airport, we recommend that deed restrictions be required similar to the attached Avigation Nuisance Easement and Non-Suit Covenant. The applicant should contact Mr. Steve Bayer at (302) 760-4834 from DelDOT's Office of Aeronautics to determine whether the proposed development is within the Runway Protection Zone. If so, restrictions may apply.

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 Plan Review process.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at https://www.deldot.gov//Publications/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction, please contact Mr. Jeff VanHorn, Assistant Director for Traffic Operations and Management. Mr. VanHorn can be reached at (302) 659-4606 or by email at Jeffrey.VanHorn@delaware.gov.

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

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

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

Enclosure

General Information

Report date: April 2022
Prepared by: Becker Morgan Group, Inc.
Prepared for: Carter Farm, LLC
Tax Parcels: 11-061.00-001, 11-061.00-005, and 11-061.00-008
Generally consistent with DelDOT's *Development Coordination Manual (DCM)*: Yes

Project Description and Background

Description: The proposed development consists of 240 units of low-rise multi-family housing (apartments), 36 units of low-rise multi-family housing (townhouses), 95 age-restricted detached houses, and 255 single-family detached houses.
Location: The land is located on the south side of Bethel Church Road (New Castle Road 433) and west of Choptank Road (New Castle Road 435), in New Castle County, Delaware.
Amount of Land to be developed: An approximately 411.90-acre assemblage of parcels.
Land Use approval(s) needed: Entrance Plan.
Proposed completion date: 2028.
Proposed access locations: Two full access points are proposed: one on Bethel Church Road opposite Fairview Avenue and one on Choptank Road.

Daily Traffic Volumes:

- 2021 Average Annual Daily Traffic on Bethel Church Road: 4,500
- 2021 Average Annual Daily Traffic on Choptank Road: 7,262

*AADT is sourced from data provided by DelDOT Gateway

Site Map

**Graphic is an approximation based on the Overall Site Plan prepared by Becker Morgan Group dated October 25, 2021.*

Relevant and On-going Projects

The site is located near the Southern New Castle County TID which was established in August 2014 for the area bounded by Lorewood Grove Road and the Chesapeake and Delaware (C&D) Canal to the north, Marl Pit Road to the south, Delaware Route 1 and US Route 13 to the east, and US Route 301, Delaware Route 72, and Delaware Route 896 to the west. Recommendations for study intersections within the TID are summarized in the *Traffic Analysis for the Southern New Castle County TID Technical Report,* dated November 2013. The TID is currently in operation, however updated analysis is being conducted to determine if the recommended improvements from the November 2013 report are sufficient or if additional improvements are necessary. The updated analysis and study are scheduled to be completed in 2022.

DelDOT has several ongoing and recently completed projects within the study area. The *US 301 Corridor Improvements* project (including DelDOT Contract No. T200811301, T200911301, T200911302, T200911302, T200911308, T201011301, and T201011302) was divided into several sections which were recently constructed within the study area. The aim of the project was to

reduce traffic congestion in the project area and improve highway safety by removing through traffic, especially heavy vehicle truck traffic, from the local roads. The project constructed a four-lane limited access toll road, US Route 301, on a new alignment which extends from the Maryland State Line, west of Middletown, to the vicinity of Armstrong Corner Road. The new US Route 301 continues northeast, crossing Summit Bridge Road and Boyds Corner Road before curving east and tying into Delaware Route 1 south of the Chesapeake and Delaware (C&D) Canal. Access to the new US Route 301 is provided via intersections south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road, and at Jamison Corner Road. Construction of the above-mentioned contracts was completed and the new US Route 301 opened to traffic in January 2019. Additional information can be found on the DelDOT project website at: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200511301#project-details1.

The *SR 896 and Bethel Church Road Interchange* project (DelDOT Contract No. T200911305) will be implemented independently from the *US 301 Corridor Improvements* project and is intended to improve the safety and operation of the intersection of Summit Bridge Road and Bethel Church Road. The project is anticipated to include the removal of the existing signal at the Bethel Church Road and Summit Bridge Road intersection and the conversion to a grade-separated intersection. Additionally, the eastbound and westbound Bethel Church Road approaches are anticipated to be terminated with cul-de-sacs prior to the intersection with Summit Bridge Road. Design work is scheduled to begin in FY 2023. Construction is tentatively anticipated to begin in 2027. More information can be found at DelDOT's website: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T200911305.

In conjunction with the *SR 896 and Bethel Church Road Interchange* project, the *US 301 Spur Road* project is planned to include a 4.5-mile, limited-access highway that will start from the US 301 Mainline at approximately 2/3 of a mile south of Armstrong Corner Road and connect to Summit Bridge Road at the proposed Summit Bridge Road/Bethel Church Road interchange. The eastbound Bethel Church Road approach would be realigned, and ramps would be added to connect to the proposed Spur Road. Additionally, DelDOT is undergoing monitoring efforts for the US 301 Spur Road. Specifically, DelDOT is monitoring traffic volumes, crash data, and land use information along the corridor with the goal of determining when to construct the Spur Road.

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

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

The proposed development is located within Investment Level 2.

Investment Level 2

These areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. They serve as transition areas between Level 1 and the state's

more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use its spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

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

Proposed Development's Compatibility with Livable Delaware:

The proposed site is located in Investment Level 2. Investment Level 2 areas should promote a full range of housing types. As the site proposes multi-family apartments and townhouses, age-restricted housing, and single-family homes, it is generally consistent with the 2020 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plan

(Sources: New Castle County 2050 Comprehensive Plan)

New Castle County Comprehensive Plan:

Per the *New Castle County Comprehensive Plan Zoning Map,* the proposed development is currently zoned as Suburban. Per the *New Castle County Comprehensive Plan Future Land Use Map,* the proposed development is in an area designated as Residential.

Proposed Development's Compatibility with the Sussex County Comprehensive Plan:

The *New Castle County Comprehensive Plan* states that development is encouraged within residential areas where appropriate infrastructure is present. Therefore, the development is consistent with the *New Castle County Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 210 (Single-Family Detached Housing), ITE Land Use Code 220 (Low-Rise Multi-Family Housing), ITE Land Use Code 221 (Mid-Rise Multi-Family Housing), and ITE Land Use Code 251 (Detached Senior Adult Housing). Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

Table 1
Carter Farm Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
255 Units - Single-Family Detached Housing (ITE Land Use Code 210)	2,460	46	140	186	157	93	250
36 Units - Low-Rise Multi-Family Housing (ITE Land Use Code 220)	231	4	14	18	15	9	24
240 Units - Mid-Rise Multi-Family Housing (ITE Land Use Code 221)	1,306	21	60	81	63	40	103
95 Units - Detached Senior Adult Housing (ITE Land Use Code 251)	538	13	26	39	28	18	46
Total	4,535	84	240	324	263	160	423

*Note: The number of proposed units provided in the Final TIS supersedes the information provided in the June 23, 2021, DelDOT Scoping Meeting Memorandum.

Overview of TIS

Intersections examined:

1. Bethel Church Road (New Castle Road 433) / Site Entrance A
2. Choptank Road (New Castle Road 435) / Site Entrance B
3. Bethel Church Road / Millwood Drive
4. Bethel Church Road / Clipper Drive
5. Bethel Church Road / Giller Lane
6. Bethel Church Road / Choptank Road
7. Bethel Church Road / Dillon Circle
8. Summit Bridge Road (New Castle Road 16) / Bethel Church Road
9. Summit Bridge Road / Red Lion Road (New Castle Road 35) / Brennan Boulevard
10. Choptank Road / Clayton Manor Drive

11. Choptank Road / Churchtown Road (New Castle Road 432)
12. Churchtown Road / Colonel Clayton Drive
13. Churchtown Road / Meadow Drive
14. Churchtown Road / Dickerson Lane
15. Summit Bridge Road / Boyds Corner Road (New Castle Road 15) / Churchtown Road
16. Boyds Corner Road / Ratledge Road (New Castle Road 414)
17. Choptank Road / Ernest Drive
18. Choptank Road / Old School House Road (New Castle Road 431)
19. Choptank Road / Armstrong Corner Road (New Castle Road 429)

Conditions examined:

1. Case 1 – 2021 Existing
2. Case 2 – 2028 without Development
3. Case 3 – 2028 with Development

Committed Developments considered:

1. Country Club Estates (288 single-family detached houses, 36 townhomes, 216 apartment units)
2. Summit Campus (40,000 SF early childhood center, a 107,473 SF elementary school, 396,000 SF middle and high school)
3. Highlands at Back Creek (40 single-family detached houses)
4. Bohemia Mill Pond (18 single-family detached houses)
5. Summit Pointe (99 single-family detached houses)
6. Summit Bridge / Silver Wind Estates (3 single-family detached houses)
7. Summit Circle (14 single-family detached houses)
8. Rothwell Village (67 single-family homes)
9. Summit Aviation Additions (Partly built 129,068 SF additions including 80,000 SF warehousing spaces, 50,600 SF hanger, 1,300 SF storage space out of total 289,718 SF
10. Whispering Woods (31 senior adult housing detached, 35 senior adult housing attached)
11. Whitehall
    a. Village 1 (76,317 SF shopping center, 2,750 SF general office, 95 single-family detached housing, 330 low-rise multi-family housing)
    b. Village 2 (65 single-family detached housing, 370 low-rise multi-family housing, 20,800 SF elementary school)
    c. Hamlet 3 (28 single-family detached housing, 185 low-rise multi-family housing, 15,600 SF elementary school)
    d. Hamlet 4 (147 single-family detached housing, 174 low-rise multi-family housing)
    e. Hamlet 5 (500 single-family detached housing)
    f. Hamlet 6 (500 single-family detached housing)
    g. Hamlet 7 (149 single-family detached housing, 80 low-rise multi-family housing)

12. Whitehall Scott Run Business Park (1,835,360 SF industrial park, 75,000 SF shopping center)
13. Bayberry North (98 single-family detached housing, 16 low-rise multi-family housing)
14. Windsor at Hyetts Corner (48 single-family detached housing)
15. Winchelsea (194 senior adult detached housing, 142 senior adult attached housing)
16. Bayberry Town Center (146 low-rise multi-family housing, 31,000 SF general office building, 186,345 SF shopping center, 61,200 SF athletic club)
17. Bayberry South (544 single-family detached housing, 74 low-rise multi-family housing, 143 senior adult detached housing)
18. Boyds Corner Farm / Coburn Farm (94,000 SF shopping center, 17,300 SF general office building, 113 single-family detached housing)
19. MOT Charter High School additions (11,230 SF high school)

*Note: Committed development information provided in the Final TIS supersedes the information provided in the June 23, 2021, DelDOT Scoping Meeting Memorandum.

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

Intersection Descriptions

1. **Bethel Church Road (New Castle Road 433) / Site Entrance A**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Bethel Church Road) Existing one shared left turn/through lane; proposed one shared left turn/through lane and one right turn lane.
   Westbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane; Proposed one left turn lane, one through lane, and one right turn lane.
   Northbound Approach: (Site Entrance A) Proposed one shared left turn/right turn lane, stop-controlled.
   Southbound Approach: (Fairview Avenue) Existing one shared left turn/right turn lane, stop-controlled.

2. **Choptank Road (New Castle Road 435) / Site Entrance B**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Site Entrance B) Proposed one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Choptank Road) Existing one through lane; proposed one left turn lane and one through lane.
   Southbound Approach: (Choptank Road) Existing one through lane; proposed one through lane and one right turn lane.

3. **Bethel Church Road / Millwood Drive**
   Type of Control: Two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Bethel Church Road) Exiting one shared through/right turn lane.

Westbound Approach: (Bethel Church Road) Exiting one shared left turn/through lane and one bypass lane
Northbound Approach: (Millwood Drive) Existing one shared left turn/right turn lane, stop-controlled.

4. **Bethel Church Road / Clipper Drive**
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Bethel Church Road) Existing one shared left turn/through lane.
Westbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane.
Southbound Approach: (Clipper Drive) Existing one shared left turn/right turn lane, stop-controlled.

5. **Bethel Church Road / Giller Lane**
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane.
Westbound Approach: (Bethel Church Road) Existing one shared left turn/through lane.
Northbound Approach: (Giller Lane) Existing one shared left turn/right turn lane, stop-controlled.

6. **Bethel Church Road / Choptank Road**
Type of Control: Roundabout intersection.
Eastbound Approach: (Bethel Church Road) Existing one shared through/right turn lane, yield controlled.
Northbound Approach: (Choptank Road) Existing one shared left turn lane/through lane, yield controlled.
Southbound Approach: (Bethel Church Road) Existing one shared through/right turn lane, yield controlled.

7. **Bethel Church Road / Dillon Circle**
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Bethel Church Road) Existing one left turn lane and one through lane.
Westbound Approach: (Bethel Church Road) Existing one through lane and one right turn lane.
Southbound Approach: (Dillon Circle) Existing one shared left turn/right turn lane, stop-controlled.

8. Summit Bridge Road (New Castle Road 16) / Bethel Church Road

Type of Control: Existing signalized intersection (four-legged).

Eastbound Approach: (Bethel Church Road) Existing two left turn lanes and one channelized right turn lane.

Westbound Approach: (Bethel Church Road) Existing one entrance ramp, signalized.

Northbound Approach: (Summit Bridge Road) Existing one left turn lane and two through lanes.

Southbound Approach: (Summit Bridge Road) Existing two through lanes and one channelized right turn lane.

9. Summit Bridge Road / Red Lion Road (New Castle Road 35) / Brennan Boulevard

Type of Control: Existing signalized intersection (four-legged).

Eastbound Approach: (Brennan Boulevard) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane.

Westbound Approach: (Red Lion Road) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane.

Northbound Approach: (Summit Bridge Road) Existing one left turn lane, two through lanes and one channelized right turn lane.

Southbound Approach: (Summit Bridge Road) Existing one left turn lane, two through lanes, and one channelized right turn lane.

10. Choptank Road / Clayton Manor Drive

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Clayton Manor Drive) Existing one shared left turn/right turn lane, stop-controlled.

Northbound Approach: (Choptank Road) Existing one shared left turn/through lane.

Southbound Approach: (Choptank Road) Existing one through lane and one right turn lane.

11. Choptank Road / Churchtown Road (New Castle Road 432)

Type of Control: Roundabout intersection.

Eastbound Approach: (Churchtown Road) Existing one shared left turn/through/right turn lane, yield controlled.

Westbound Approach: (Churchtown Road) Existing one shared left turn/through/right turn lane, yield controlled.

Northbound Approach: (Choptank Road) Existing one shared left turn/through/right turn lane, yield controlled.

Southbound Approach: (Choptank Road) Existing one shared left turn/through/right turn lane, yield controlled.

12. Churchtown Road / Colonel Clayton Drive

Type of Control: Two-way stop-controlled intersection (T-intersection).

Northbound Approach: (Colonel Clayton Drive) Existing one shared left turn/right turn lane, stop-controlled.

Eastbound Approach: (Churchtown Road) Existing one through lane and one right turn lane.

Westbound Approach: (Churchtown Road) Existing one shared left turn/through.

13. Churchtown Road / Meadow Drive

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Churchtown Road) Existing one shared left turn/through lane.

Westbound Approach: (Churchtown Road) Existing one through lane and one right turn lane.

Southbound Approach: (Meadow Drive) Existing one shared left turn/right turn lane, stop-controlled.

14. Churchtown Road / Dickerson Lane

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Churchtown Road) Exiting one shared left turn/through lane and one bypass lane.

Westbound Approach: (Churchtown Road) Existing one through lane and one right turn lane.

Southbound Approach: (Dickerson Lane) Existing one shared left turn/right turn lane, stop-controlled.

15. Summit Bridge Road / Boyds Corner Road (New Castle Road 15) / Churchtown Road

Type of Control: Existing signalized intersection (Four-legged).

Eastbound Approach: (Churchtown Road) Existing one left turn lane and one shared through/right turn lane.

Westbound Approach: (Boyds Corner Road) Existing two left turn lanes, one through lane and one channelized right turn lane.

Northbound Approach: (Summit Bridge Road) Existing one left turn lane, two through lanes, and one right turn lane.

Southbound Approach: (Summit Bridge Road) Existing two left turn lanes, two through lanes and one right turn lane.

16. Boyds Corner Road / Ratledge Road (New Castle Road 414)

Type of Control: Two-way stop-controlled intersection (T-intersection).

Eastbound Approach: (Boyds Corner Road) Exiting one shared left turn/through lane, and one bypass lane.
Westbound Approach: (Boyds Corner Road) Existing one through lane and one right turn lane.
Southbound Approach: (Ratledge Road) Existing one shared left turn/right turn lane, stop-controlled.

17. Choptank Road / Ernest Drive
Type of Control: Two-way stop-controlled intersection (T-intersection).
Eastbound Approach: (Ernest Drive) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Choptank Road) Existing one shared left turn/ through lane.
Southbound Approach: (Choptank Road) Existing one through lane and one right turn lane.

18. Choptank Road / Old School House Road (New Castle Road 431)
Type of Control: Two-way stop-controlled intersection (T-intersection).
Westbound Approach: (Old School House Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Choptank Road) Existing one through lane and one right turn lane.
Southbound Approach: (Choptank Road) Existing one shared left turn/ through lane.

19. Choptank Road / Armstrong Corner Road (New Castle Road 429)
Type of Control: Two-way stop-controlled intersection (T-intersection).
Westbound Approach: (Armstrong Corner Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Choptank Road) Existing one through lane and one right turn lane.
Southbound Approach: (Choptank Road) Existing one shared left turn/ through lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, DART Route 302 runs parallel to the project area along Summit Bridge Road. There is one DART Route 302 stop at the North Middletown Park & Ride located approximately one mile from the Choptank Road / Armstrong Corner Road intersection. Route 302 provides 6 round trips from 5:45 AM to 6:48 PM on weekdays.

Planned transit service: Per email correspondence on May 6, 2022, with Mr. Jared Kauffman, Planner for DART, the Delaware Transit Corporation does not have any transit specific comments for the project.

Existing bicycle and pedestrian facilities: According to DelDOT's New Castle County Bicycle Map, several study roadways are considered bicycle routes. Choptank Road and Summit Bridge Road (north of the Bethel Church Road intersection) are considered a statewide bicycle route. Bethel Church Road, Summit Bridge Road (south of Bethel Church Road intersection), Churchtown Road, Boyds Corner Road, Red Lion Road, and Armstrong Corner Road are considered connector bike routes. Pedestrian crossings exist at the study intersections of Choptank Road/Churchtown Road, Bethel Church Road/Choptank Road, and Summit Bridge Road/Red Lion Road/Brennan Boulevard. Sidewalks exist at the study intersections of Choptank Road/ Churchtown Road and Bethel Church Road/Choptank Road.

Planned bicycle and pedestrian facilities: Per email correspondence dated June 15, 2022 from Mr. John Fiori, DelDOT Bicycle Coordinator, and Linda Osiecki, DelDOT Pedestrian Coordinator, the following improvements were recommended:

- Per the DelDOT SUP/Sidewalk Policy, a non-motorized facility is required since it appears the site will generate over 2,000-trips per day. Install a 10’ wide SUP along the property frontage on the south side of Bethel Church Road and connect to Giller Lane; then extend the SUP from Giller Lane to the existing roundabout. Install a 10’ wide SUP along the property frontage on the northwest side of Choptank Road
- Improve all legs of roundabout by improving the existing pathway to a 10’ wide SUP, detectable warning truncated domes at curb ramps and median refuge, as well as curb openings at least as wide as the 10' SUP.
- Sidewalk required along the internal subdivision streets.
- An internal connection from the SUP at the entrances will be required.
- Add pedestrian crossings of Bethel Church Road at Fairview Ave intersection.
- At this time Local Systems Improvements has no bicycle/pedestrian improvement projects within the area of this project.
- Per the Development Coordination Manual (DCM) the site shall dedicate right-of-way per the roadway classification and establish a 15’ wide permanent easement along all property roadway frontages.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if the right turn lane is warranted, then a separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).
- There could be additional and/or revised comments once project is discussed at a pre-submittal meeting and/or plans are submitted for LONO/ENT review/approval.

Bicycle Level of Traffic Stress in Delaware: Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout

the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the Bicycle On-Road Network Level of Traffic Stress map from the April 2018 Blueprint for a Bicycle-Friendly Delaware document which can be found on the following website:
https://deldot.gov/Publications/plans/bikeandped/pdfs/DelDOTBikePlan043018FINAL.pdf

- Bethel Church Road LTS: 3
- Choptank Road LTS: 2

Crash Evaluation

Per the crash data included in the TIS from January 20, 2018, to January 20, 2021, and provided by the Delaware Department of Transportation (DelDOT), 9 crashes were reported along Choptank Road within the study area. Of the 9 crashes reported, 6 involved property damage, 3 involved personal injuries, and there were no fatalities. The crashes reported were classified as follows: 3 front to front, 1 sideswipe in the opposite direction, and 5 not a collision between two vehicles. No crashes were reported at the existing Fairview Avenue intersection with Bethel Church Road. Information on the number of crashes at each intersection was not provided.

Previous Comments

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

Sight Distance Evaluation

No sight distance constraints were noted at the site entrances per a field visit conducted on May 18, 2022.

General HCS Analysis Comments

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

1) JMT used version 7.9.5 of HCS7 to complete the analysis, whereas the TIS utilized version 7.8.5.

2) As all the intersections within the study area experience some increase in volumes, per DelDOT's *Development Coordination Manual,* JMT utilized the future intersection PHF of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph, or used the existing PHF if higher.

3) Per DelDOT's *Development Coordination Manual*, JMT used a minimum heavy vehicle percentage of 3% for each movement greater than 100 vph in the Case 2 and Case 3 future scenario analysis, unless the existing heavy vehicle percentage was greater than 3% and there was no significant increase of vehicles along that movement, in which case the existing heavy vehicle percentage was used for the analysis of future scenarios, whereas the TIS did not.

4) Per DelDOT's *Development Coordination Manual* and coordination with DelDOT Planning, JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph along roadways in the existing and future condition analyses, whereas the TIS did not.

5) JMT incorporated pedestrians in the analysis, whereas the TIS did not.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T intersection in Cases 1 & 2)[1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road (New Castle Road 433) / Site Entrance A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions (Case 1)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.8)	A (7.4)	A (7.9)
Southbound Fairview Avenue Approach	A (9.8)	A (9.5)	B (10.9)	B (10.7)
2028 without Development (Case 2)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.8)	A (7.5)	A (8.0)
Southbound Fairview Avenue Approach	B (10.5)	A (9.7)	B (12.3)	B (11.1)
2028 with Development (Case 3)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.8)	A (7.5)	A (7.9)
Westbound Bethel Church Road Left Turn	A (7.8)	A (7.6)	A (7.9)	A (7.6)
Northbound Site Entrance A Approach	B (10.7)	A (9.9)	B (10.9)	A (10.0)
Southbound Fairview Avenue Approach	B (14.4)	B (13.9)	B (15.0)	B (14.4)

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

Table 3
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road (New Castle Road 435) / Site Entrance B	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)				
Eastbound Site Entrance B Approach	C (19.5)	D (31.7)	C (19.4)	D (31.7)
Northbound Choptank Road Left Turn	A (8.3)	B (10.3)	A (8.3)	B (10.3)

Table 4
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Millwood Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Bethel Church Road Left Turn	A (7.5)	A (7.4)	A (7.6)	A (7.4)
Northbound Millwood Drive Approach	A (8.8)	A (8.5)	A (9.4)	A (8.8)
2024 without Development (Case 2)				
Westbound Bethel Church Road Left Turn	A (7.7)	A (7.5)	A (7.8)	A (7.5)
Northbound Millwood Drive Approach	A (9.2)	A (8.6)	A (9.8)	A (8.9)
2024 with Development (Case 3)				
Westbound Bethel Church Road Left Turn	A (7.8)	A (7.5)	A (7.8)	A (7.5)
Northbound Millwood Drive Approach	A (9.3)	A (8.7)	A (9.9)	A (9.0)

[2] TIS modeled with flared minor street approach whereas JMT did not.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Clipper Drive[3]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Bethel Church Road Left Turn	A (7.3)	A (7.4)	A (7.3)	A (7.4)
Southbound Clipper Drive Approach	A (8.6)	A (9.0)	A (9.4)	A (9.3)
2028 without Development (Case 2)				
Eastbound Bethel Church Road Left Turn	A (7.4)	A (7.5)	A (7.4)	A (7.5)
Southbound Clipper Drive Approach	A (9.2)	A (9.3)	B (10.0)	A (9.5)
2028 with Development (Case 3)				
Eastbound Bethel Church Road Left Turn	A (7.4	A (7.5)	A (7.4)	A (7.5)
Southbound Clipper Drive Approach	A (9.3)	A (9.4)	B (10.2)	A (9.7)

[3] JMT modeled the eastbound Bethel Church Road approach with a shared through/left turn lane per existing conditions, whereas the TIS modeled the approach with a separate through and left turn lane.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Giller Lane	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Bethel Church Road Left Turn	A (7.7)	A (7.5)	A (7.7)	A (7.5)
Northbound Giller Lane Approach	A (9.5)	A (8.3)	A (9.6)	A (9.3)
2028 without Development (Case 2)				
Westbound Bethel Church Road Left Turn	A (7.9)	A (7.5)	A (7.9)	A (7.6)
Northbound Giller Lane Approach	B (10.0)	A (9.5)	B (10.0)	A (9.4)
2028 with Development (Case 3)				
Westbound Bethel Church Road Left Turn	A (8.1)	A (7.7)	A (8.1)	A (7.7)
Northbound Giller Lane Approach	B (10.5)	A (10.0)	B (10.5)	A (9.9)

Table 7
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Choptank Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Bethel Church Road Approach	A (5.6)	A (6.4)	A (5.7)	A (6.6)
Northbound Choptank Road Approach	A (7.7)	A (5.1)	A (7.7)	A (5.2)
Southbound Bethel Church Road Approach[4]	A (4.5)	A (8.1)	A (4.5)	A (8.1)
Overall	A (6.3)	A (7.1)	A (6.4)	A (7.1)
2028 without Development (Case 2)				
Eastbound Bethel Church Road Approach	A (7.3)	A (8.8)	A (7.4)	A (8.9)
Northbound Choptank Road Approach	B (11.8)	A (6.5)	B (11.8)	A (6.5)
Southbound Bethel Church Road Approach[4]	A (5.5)	B (11.8)	A (5.4)	B (11.8)
Overall	A (8.9)	A (9.8)	A (8.9)	A (9.9)
2028 with Development (Case 3)				
Eastbound Bethel Church Road Approach	A (8.7)	B (10.7)	A (8.8)	B (10.8)
Northbound Choptank Road Approach	C (16.1)	A (7.3)	C (16.1)	A (7.3)
Southbound Bethel Church Road Approach[4]	A (5.9)	C (15.5)	A (5.8)	C (15.6)
Overall	B (11.3)	B (12.6)	B (11.2)	B (12.6)

[4] Although Bethel Church Road is generally an east-west roadway throughout the study area, it intersects Choptank Road from the north in this location. As such, it was denoted Southbound Bethel Church Road.

Table 8
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Dillon Circle[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions				
Eastbound Dillon Circle Approach	B (14.9)	C (17.4)	C (16.2)	C (15.8)
Northbound Bethel Church Road Left Turn	A (8.7)	A (8.3)	A (8.1)	A (8.4)
2028 without Development (Case 2)				
Eastbound Dillon Circle Approach	D (33.3)	C (19.7)	D (32.3)	C (22.4)
Northbound Bethel Church Road Left Turn	A (9.2)	A (9.1)	A (8.5)	A (9.1)
2028 with Development (Case 3)				
Eastbound Dillon Circle Approach	E (45.8)	D (25.6)	E (44.1)	D (29.0)
Northbound Bethel Church Road Left Turn	A (9.3)	A (9.6)	A (8.6)	A (9.6)

Table 8 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Dillon Circle[5]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)				
Eastbound Dillon Circle Approach	-	-	A (5.3)	A (6.8)
Northbound Bethel Church Road Approach	-	-	C (15.9)	A (7.0)
Southbound Bethel Church Road Approach	-	-	A (6.6)	A (9.8)
Overall	-	-	B (12.4)	A (8.6)

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road / Dillon Circle[6]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)	-	-	A (5.8)	A (4.2)

[5] JMT conducted an additional analysis of the intersection as a single lane roundabout.
[6] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the eastbound approach was modeled with one left turn lane and one right-turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled with utilizing a 60 second cycle length. The northbound and southbound approaches were modeled with concurrent phasing and protected/permitted northbound left turns.

Table 9
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Signalized Intersection [1]	**LOS per TIS**[7]		**LOS per JMT**	
Summit Bridge Road (New Castle Road 16) / Bethel Church Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions (Case 1)	-	-	D (36.9)	E (59.0)
2021 Existing Conditions (Case 1) *with optimization* [8]	C (23.6)	B (13.9)	C (33.7)	B (19.2)
2028 without Development (Case 2) *with optimization* [8]	F (90.9)	C (28.6)	F (171.6)	F (88.2)
2028 with Development (Case 3) *with optimization* [8]	F (99.8)	D (36.7)	F (189.6)	F (105.3)

[7] The TIS modeled the intersection utilizing Synchro.

[8] Signal Optimization scenario includes optimizing splits while maintaining cycle lengths consistent with the DelDOT Timing Plans.

Table 10
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Summit Bridge Road / Red Lion Road (New Castle Road 35) / Brennan Boulevard [9,]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions (Case 1) [10]	-	-	C (33.6)	D (41.1)
2021 Existing Conditions (Case 1) *with optimization* [8]	B (16.2)	B (19.4)	C (28.0)	C (31.1)
2028 without Development (Case 2) *with optimization* [11]	D (37.4)	D (44.4)	D (48.1)	D (45.4)
2028 with Development (Case 3) *with optimization* [11]	D (48.1)	E (59.1)	D (54.9)	D (52.6)

[9] JMT analyzed the intersection assuming 40% left turns in the shared lanes along the eastbound and westbound approaches, whereas the TIS assumed various values.
[10] JMT analyzed this scenario using the existing DelDOT Timings Plan for this intersection.
[11] JMT modeled the intersection utilizing the m60 Timesheet associated with DelDOT Project No. T202104001, whereas the TIS modeled the intersection utilizing existing timings.

Table 11
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Clayton Manor Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing Conditions				
Eastbound Clayton Manor Drive Approach	B (13.4)	B (12.6)	C (18.8)	C (18.2)
Northbound Choptank Road Left Turn	A (8.1)	A (9.1)	A (8.1)	A (9.1)
2028 without Development (Case 2)				
Eastbound Clayton Manor Drive Approach	C (19.7)	C (18.1)	D (25.1)	D (26.7)
Northbound Choptank Road Left Turn	A (8.2)	A (9.8)	A (8.3)	A (9.8)
2028 with Development (Case 3)				
Eastbound Clayton Manor Drive Approach	D (27.6)	D (25.6)	E (37.2)	E (38.0)
Northbound Choptank Road Left Turn	A (8.6)	B (10.2)	A (8.6)	B (10.2)

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Clayton Manor Drive[5]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3)				
Eastbound Clayton Manor Drive Approach	-	-	A (7.2)	A (7.5)
Northbound Choptank Road Approach	-	-	A (8.9)	A (7.8)
Southbound Choptank Road Approach	-	-	A (6.7)	B (12.3)
Overall			A (7.8)	B (10.2)

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Clayton Manor Drive[12]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with Development (Case 3) *with signal timing optimization*	-	-	A (6.6)	A (5.2)

[12] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the northbound approach was modeled with one left turn lane and one right-turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled with utilizing a 60 second cycle length. The eastbound and westbound approaches were modeled with concurrent phasing and protected/permitted westbound left turns.

Table 12
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc.

Unsignalized Intersection Roundabout Control [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Churchtown Road (New Castle Road 432)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Churchman Road Approach	A (7.4)	A (6.6)	A (8.0)	A (7.0)
Westbound Churchman Road Approach	A (5.9)	A (6.1)	A (6.3)	A (6.6)
Northbound Choptank Road Approach	A (7.7)	A (6.8)	A (8.1)	A (7.2)
Southbound Choptank Road Approach	A (6.7)	A (9.8)	A (6.9)	B (10.1)
Overall	A (7.1)	A (7.9)	A (7.5)	A (8.2)
2028 without Development (Case 2)				
Eastbound Churchman Road Approach	C (15.2)	B (12.0)	C (15.2)	B (12.1)
Westbound Churchman Road Approach	A (8.5)	B (11.1)	A (8.7)	B (11.3)
Northbound Choptank Road Approach	B (12.6)	B (12.1)	B (12.7)	B (12.3)
Southbound Choptank Road Approach	A (8.7)	D (28.3)	A (8.4)	C (20.5)
Overall	B (11.8)	C (17.7)	B (11.8)	C (15.0)
2028 with Development (Case 3)				
Eastbound Churchman Road Approach	C (20.6)	B (14.2)	C (20.7)	B (14.3)
Westbound Churchman Road Approach	A (9.1)	B (14.80	A (9.4)	B (15.0)
Northbound Choptank Road Approach	B (14.8)	C (16.2)	C (15.1)	C (16.4)
Southbound Choptank Road Approach	B (11.0)	E (43.1)	B (11.2)	E (43.3)
Overall	B (14.5)	D (25.3)	B (14.7)	D (25.5)

Table 13
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road / Colonel Clayton Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Churchtown Road Left Turn	A (7.7)	A (7.6)	A (7.8)	A (7.6)
Northbound Colonel Clayton Drive Approach	A (8.9)	A (8.5)	B (10.0)	A (9.6)
2028 without Development (Case 2)				
Westbound Churchtown Road Left Turn	A (8.5)	A (8.0)	A (8.5)	A (8.1)
Northbound Colonel Clayton Drive Approach	B (10.6)	A (9.4)	B (12.4)	B (11.5)
2028 with Development (Case 3)				
Westbound Churchtown Road Left Turn	A (8.5)	A (8.1)	A (8.5)	A (8.1)
Northbound Colonel Clayton Drive Approach	B (10.7)	A (9.5)	B (12.4)	B (11.6)

Table 14
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road / Meadow Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Churchtown Road Eastbound Left Turn	A (7.4)	A (7.7)	A (7.4)	A (7.7)
Meadow Drive Southbound Approach	B (10.2)	A (8.0)	B (10.1)	B (10.4)
2028 without Development (Case 2)				
Churchtown Road Eastbound Left Turn	A (7.6)	A (8.1)	A (7.6)	A (8.0)
Meadow Drive Southbound Approach	B (12.8)	B (10.1)	B (12.7)	B (12.4)
2028 with Development (Case 3)				
Churchtown Road Eastbound Left Turn	A (7.7)	A (8.2)	A (7.7)	A (8.2)
Meadow Drive Southbound Approach	B (13.1)	B (10.7)	B (13.5)	B (13.2)

Table 15
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road / Dickerson Lane[13]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Churchtown Road Left Turn	A (7.3)	A (7.6)	A (7.4)	A (7.7)
Westbound Churchtown Road Left Turn	A (7.7)	A (7.5)	A (7.7)	A (7.5)
Southbound Dickerson Lane Approach	B (10.5)	B (10.7)	B (10.5)	B (10.8)
2028 without Development (Case 2)				
Eastbound Churchtown Road Left Turn	A (7.7)	A (8.0)	A (7.7)	A (8.0)
Westbound Churchtown Road Left Turn	A (8.2)	A (7.7)	A (8.2)	A (7.7)
Southbound Dickerson Lane Approach	C (15.1)	B (13.2)	C (15.0)	B (13.3)
2028 with Development (Case 3)				
Eastbound Churchtown Road Left Turn	A (7.7)	A (8.1)	A (7.7)	A (8.1)
Westbound Churchtown Road Left Turn	A (8.3)	A (7.8)	A (8.3)	A (7.8)
Southbound Dickerson Lane Approach	C (15.7)	B (13.1)	C (16.1)	B (14.2)

[13] Southerly leg of the intersection is a private residential driveway. No northbound traffic was recorded during turning movement count data collection and so results have not been included.

Table 16
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Summit Bridge Road / Boyds Corner Road (New Castle Road 15) / Churchtown Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)	C (24.4)	D (36.4)	C (26.9)	C (26.6)
2021 Existing (Case 1) *with optimized timings* [8]	-	-	C (22.5)	C (24.9)
2028 without Development (Case 2) *with optimized timings* [8, 14]	F (100.3)	F (120.7)	E (64.2)	D (41.0)
2028 without Development (Case 2) *with improvement* [15]	-	-	C (34.9)	C (34.4)
2028 with Development (Case 3) *with optimized timings* [8, 16]	D (46.3)	D (43.1)	E (69.2)	D (48.0)
2028 with Development (Case 3) *with improvement* [15]	-	-	D (38.4)	D (40.4)

[14] The TIS did not provide an optimized timing scenario.
[15] Improvement scenario includes providing an additional northbound through lane and optimizing splits while maintaining cycle lengths consistent with the DelDOT Timing Plans.
[16] JMT modeled the intersection utilizing the existing cycle length, whereas the TIS did not.

Table 17
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Boyds Corner Road / Ratledge Road (New Castle Road 414)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Boyds Corner Road Left Turn	A (9.7)	A (9.1)	A (9.7)	A (9.2)
Southbound Ratledge Road Approach	D (27.6)	C (19.2)	D (28.3)	C (19.0)
2028 without Development (Case 2)				
Eastbound Boyds Corner Road Left Turn	B (14.1)	B (13.6)	B (14.0)	B (13.6)
Southbound Ratledge Road Approach	F (*)	F (*)	F (*)	F (964.7)
2028 without Development (Case 2) *with improvement by others* [17]				
Eastbound Boyds Corner Road Left Turn	-	-	B (14.0)	B (13.6)
Southbound Ratledge Road Approach	-	-	F (489.1)	F (179.4)
2028 with Development (Case 3)				
Eastbound Boyds Corner Road Left Turn	B (14.5)	B (14.1)	B (14.3)	B (14.1)
Southbound Ratledge Road Approach	F (*)	F (*)	F (*)	F (*)
2028 with Development (Case 3) *with improvement by others* [17]				
Eastbound Boyds Corner Road Left Turn	-	-	B (14.3)	B (14.1)
Southbound Ratledge Road Approach	-	-	F (538.3)	F (215.7)

* Delay greater than 1,000 seconds per vehicle

[17] Improvement scenario includes modifying the southbound Ratledge Road approach to provide one left turn lane and one right turn lane.

Table 17 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**[18]	
Boyds Corner Road / Ratledge Road (New Castle Road 414	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 without Development (Case 2)	-	-	D (46.5)	C (24.0)
2028 with Development (Case 3)	-	-	D (47.7)	C (27.3)

[18] Improvement scenario is in accordance with the Southern New Castle County TID improvement to signalize the intersection. A 120 second cycle length was utilized with a protected-permissive left turn phasing along eastbound Boyds Corner Road. One left turn lane and one through lane are provided along the eastbound Boyds Corner Road approach, one through lane and one right turn lane are provided along the westbound Boyds Corner Road approach, and one left turn lane and one right turn lane are provided along the southbound Ratledge Road approach.

Table 18
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Ernest Drive[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Ernest Drive Approach	A (8.9)	B (10.7)	B (12.6)	B (13.8)
Northbound Choptank Road Left Turn	A (8.1)	A (10.6)	A (8.2)	A (8.7)
2028 without Development (Case 2)				
Eastbound Ernest Drive Approach	A (9.7)	B (11.8)	B (14.8)	C (16.6)
Northbound Choptank Road Left Turn	A (8.5)	A (9.0)	A (8.6)	A (9.1)
2028 with Development (Case 3)				
Eastbound Ernest Drive Approach	B (10.1)	B (12.0)	C (15.6)	C (18.1)
Northbound Choptank Road Left Turn	A (8.7)	A (9.1)	A (8.7)	A (9.3)

Table 19
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Old School House Road (New Castle Road 431)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Old Schoolhouse Road Approach	B (13.6)	C (19.4)	B (13.8)	C (19.8)
Southbound Choptank Road Left Turn	A (8.3)	A (8.3)	A (8.1)	A (8.4)
2028 without Development (Case 2)				
Westbound Old Schoolhouse Road Approach	C (16.6)	D (27.5)	C (16.7)	D (27.8)
Southbound Choptank Road Left Turn	A (8.6)	A (8.9)	A (8.3)	A (8.9)
2028 with Development (Case 3)				
Westbound Old Schoolhouse Road Approach	C (18.2)	D (32.9)	C (18.3)	D (33.2)
Southbound Choptank Road Left Turn	A (8.7)	A (9.1)	A (8.4)	A (9.2)

Table 20
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Armstrong Corner Road (New Castle Road 429)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Armstrong Corner Road Approach	B (14.8)	C (18.0)	B (14.8)	C (18.4)
Southbound Choptank Road Left Turn	A (8.2)	A (8.5)	A (8.2)	A (8.6)
2028 without Development (Case 2)				
Westbound Armstrong Corner Road Approach	C (19.2)	D (31.2)	C (19.3)	D (31.7)
Southbound Choptank Road Left Turn	A (8.6)	A (9.0)	A (8.6)	A (9.0)
2028 with Development (Case 3)				
Westbound Armstrong Corner Road Approach	C (20.9)	E (45.2)	C (20.9)	E (46.3)
Southbound Choptank Road Left Turn	A (8.7)	A (9.3)	A (8.7)	A (9.3)
2028 with Development (Case 3) *with improvements*[19]				
Westbound Armstrong Corner Road Left Turn	D (29.9)	F (55.7)	D (29.9)	F (56.7)
Westbound Armstrong Corner Road Right Turn	B (11.2)	B (14.9)	B (11.2)	C (15.0)
Overall Westbound Armstrong Road Approach	C (18.3)	C (24.4)	C (18.3)	C (24.8)
Southbound Choptank Road Left Turn	A (8.7)	A (9.3)	A (8.7)	A (9.3)

[19] The Armstrong Corner Road approach was modeled with separate left turn and right turn lanes .

Table 20 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Impact Study for Carter Farm
Report Dated: April 2022
Prepared by: Becker Morgan Group, Inc

Unsignalized Intersection Roundabout Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Armstrong Corner Road (New Castle Road 429)[20]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with development (Case 3)				
Westbound Armstrong Corner Road Approach	-	-	A (5.4)	A (8.3)
Northbound Choptank Road Left Turn	-	-	A (7.0)	A (8.7)
Southbound Choptank Road Left Turn	-	-	A (7.8)	A (9.4)
Overall	-	-	A (7.3)	A (9.0)

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road / Armstrong Corner Road (New Castle Road 429)[21]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 with development (Case 3)	-	-	A (6.4)	A (8.5)

[20] JMT conducted an additional analysis of the intersection as a single lane roundabout.

[21] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the westbound approach was modeled with one left turn lane and one right turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled with utilizing a 60 second cycle length. The northbound and southbound approaches were modeled with concurrent phasing and protected/permitted southbound left turns.

Avigation Nuisance Easement & Non-Suit Covenant

This indenture made this _____ day of _____, 20_____, by and between _____, hereinafter referred to as Grantor, and _____ hereinafter referred to as Grantee, witnesseth:

WHEREAS the Grantor is the owner in fee of a certain parcel of land ("the Property") in the County of _____, State of Delaware; and

WHEREAS said parcel of land is near or adjacent to _____, an operating airport ("Airport"); and

WHEREAS the Grantee is the owner of said airport; and

WHEREAS the Grantor proposes to make a use of said Property and to develop thereon the following:

_____
_____

_____
_____
, which use and development require approval by Municipal and County authorities subject to the applicable provisions of law; and

WHEREAS the Grantor has been advised that the subject Property is located adjacent to the Airport; that the present and future impacts of Airport operations might be considered annoying to users of the Property for its stated purpose and might interfere with the unrestricted use and enjoyment of the Property in its intended use; that these Airport impacts might change over time, for example and not by way of limitation by an increase in the number of aircraft using the Airport, louder aircraft, seasonal variations, and time-of-day variations; that changes in Airport, air traffic control operating procedures or in Airport layout could result in increased noise impacts; and that the Grantor's and users' own personal perceptions of the noise exposure could change and that his or her sensitivity to aircraft noise could increase;

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements and conditions contained herein, the parties hereto agree as follows:

Grantor does hereby grant a permanent nuisance and avigation easement ("Easement") to Grantee over all of the following described real estate:

By virtue of this agreement, the Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to Grantee or any successor agency legally authorized to operate said airport, any and all claims for damage of any kind whatsoever incurred as a result of aircraft using the Easement granted herein regardless of any future changes in volume or character of aircraft overflights, or changes in airport design and operating policies, or changes in air traffic control procedures.

The Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, does further hereby covenant and agree with the Grantee, its successors and assigns, that it will not, from and after the effective date hereof, sue, prosecute, molest, or trouble the Grantee, its successors and assigns, in

These covenants and agreements shall run with the land of the Grantor, as hereinabove described, for the benefit of the Grantee, and its successors and assigns in the ownership, use and operation of the aforesaid Airport.

Grantee, its successors and assigns, shall have and hold said Easement and all rights appertaining thereto until said Airport shall be abandoned and shall cease to be used for airport purposes.

If any provision of this Easement or any amendments hereto, or the application thereof to any person, thing or circumstances is held invalid, such invalidity shall not affect the provisions or application of this Easement or such amendments that can be given effect without the invalid provisions or application, and to this end the provisions of this Easement and such amendments are declared to be severable.

IN WITNESS WHEREOF, the Grantor has hereunto set its hand and seal the day and year first above written.

_____(SEAL)

_____(SEAL)

NOTARY ACKNOWLEDGEMENT

STATE OF DELAWARE

ss.

COUNTY OF KENT

BE IT REMEMBERED that on this _____ day of _____, 20_____ personally, came before me, the subscriber, a Notary Public for the State and County aforesaid, _____, party(ies) to this Indenture, known to me personally to be such, and acknowledged this Indenture, to his/her (their) act or deed.

GIVEN under my Hand and Seal of office the day and year first above written.

_____

Notary Public, State of Delaware

My Commission Expires _____