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

JENNIFER COHAN
SECRETARY

December 21, 2018

Mr. Ted Williams
Landmark Science & Engineering, Inc.
Christiana Executive Campus
200 Continental Drive
Suite 400
Newark, DE 19713

Dear Mr. Williams:

The enclosed Traffic Impact Study (TIS) review letter for the **Copperleaf (f.k.a. Clayton Farm** (Tax Parcels 13-011.00-021 & 166) residential development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this review letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel
Project Engineer

TEB:sf
Enclosures
cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Owen Robatino, New Castle County Department of Land Use
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

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Brad Eaby, Deputy Attorney General
Robert McCleary, Director, Transportation Solutions (DOTS)
Drew Boyce, Director, Planning
Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS
Mark Tudor, Assistant Director, Project Development North, DOTS
J. Marc Coté, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Peter Haag, Traffic Studies Manager, Traffic, DOTS
Kevin Canning, Canal District Engineer, North District
Matthew Lichtenstein, Canal District Public Works Engineer, Canal District
David Dooley, Service Development Planner, Delaware Transit Corporation
Pao Lin, New Castle Subdivision Manager, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Claudy Joinville, Project Engineer, Development Coordination

Engineering A Brighter Future®

December 21, 2018

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

RE: Agreement No. 1774
Project Number T201769002
Traffic Impact Study Services
Task 20A-Copperleaf

Dear Mr. Brestel:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for Copperleaf at Back Creek, prepared by Landmark Science & Engineering dated June 2018. This task was assigned Task Number 20A. Landmark Science & Engineering prepared the report 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 development would be comprised of 153 single family detached homes and the site is located on the south side of Churchtown Road (New Castle Road 432), approximately 1,800 feet southwest of the intersection of Churchtown Road and Choptank Road (New Castle Road 435). One full access point is proposed along Churchtown Road. In addition, an interconnection to the adjacent Fox Hunter Crossing subdivision via Ernest Drive is proposed that would provide access via Choptank Road. The subject property is on an approximately 203.86-acre assemblage of parcels that are zoned as S (Suburban) and no rezoning is proposed. Construction is expected to be complete in 2024.

DelDOT currently has one relevant and ongoing improvement project within the study area, which is the *US 301, Maryland State Line to SR 1* project (Contract #T200511301).

The *US 301, Maryland State Line to SR 1* project is divided into several sections and contains improvements that will 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 Selected Alternative (Green North + Spur Road) provides a four-lane limited access toll road, US Route 301, on a new alignment. The new US Route 301 mainline section would extend from the Maryland State Line, west of Middletown, to the vicinity of Armstrong Corner Road where it would continue northeast, crossing the existing US Route 301 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 would be provided via intersections south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road, and at Jamison Corner Road. Additional

information can be found on the DelDOT project website at http://deldot.gov/information/projects/us301/index.shtml

As part of the US Route 301 project, improvements as part of Section 4 (Contracts #T200911305 and #T200911307) are within the study area of the TIS. Specifically, the improvements include the removal of the existing signal at the Bethel Church Road and Summit Bridge Road (US 301/SR 896) intersection and the modification to be a grade-separated intersection. In addition, the eastbound and westbound Bethel Church Road approaches will be terminated with cul-de-sacs prior to the intersection with Summit Bridge Road. The eastbound Bethel Church Road approach will be realigned, and ramps will be added to connect to the proposed Spur Road.

Improvements are also proposed as part of the US Route 301 Section 4 project at the Choptank Road intersections with Armstrong Corner Road and Bohemia Mill Road. The two intersections (Armstrong Corner Road with Choptank Road and Bohemia Mill Road with Choptank Road) are approximately ¼ mile apart from each other. Armstrong Corner Road will be realigned to be directly across from Bohemia Mill Road to form a four-legged intersection with Choptank Road. The current Armstrong Corner Road intersection with Choptank Road would remain but only serve one existing residence along Armstrong Corner Road and terminate east of the residence. Per DelDOT's Capital Transportation Program (CTP) for Fiscal Year 2018 to Fiscal Year 2023, funding for design of the US Route 301 Section 4 project is allocated during Fiscal Years 2021 to 2023. Right-of-way and construction funding would be allocated in the later years outside of the current CTP.

DelDOT has one ongoing pavement rehabilitation and resurfacing project within the project area. This project is along Churchtown Road, from Choptank Road to Boyd's Corner Road (Contract #T201506104) and involves milling, patching, and overlays. Construction is estimated to be complete by Fall of 2019.

Based on our review of the traffic impact study, we have the following comments and recommendations:

The proposed development will meet the New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) for all the roundabout and signalized intersections analyzed in this study with the exception of the Bethel Church Road/Summit Bridge Road (US 301/SR 896/New Castle Road 16) intersection. However, per the February 1, 2018 DelDOT Scoping Meeting Minutes, the Bethel Church Road/Summit Bridge Road intersection is not required to be evaluated by New Castle County and therefore does not need to meet the county LOS standards.

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

Intersection	*Situations for which LOS deficiencies occur*
Bethel Church Road/Summit Bridge Road	2018 Existing AM (Case 1) 2024 AM and PM without development (Case 2) 2024 AM and PM with development (Case 3)

The signalized intersection of Bethel Church Road/Summit Bridge Road exhibits LOS deficiencies (LOS F) during the 2018 Existing AM peak hour (Case 1) as well as during the AM and PM peak hour for the 2024 build out year condition, with or without the proposed development (Cases 2 and 3). As the intersection operates with atypical signal phasing, JMT conducted an additional analysis using Synchro 9 software. With Synchro, the intersection would exhibit LOS deficiencies (LOS F) during the AM 2024 conditions with or without the proposed development (Cases 2 and 3). However, with the completion of the US Route 301 Mainline project (Maryland State Line to SR 1), traffic is expected to be reduced by at least 20 percent on the local roadways. Therefore, with the expected volume reduction as well as modifying the signal timing splits, the intersection would operate at LOS D or better under Cases 2 and 3 conditions. As such, it is recommended that the developer enter into a signal agreement with DelDOT for the signal timing modifications.

In addition, with the interconnection to Ernest Drive, a significant increase in volume due to the proposed development is expected along the northbound Choptank Road left turn movement onto Ernest Drive. Although the Choptank Road/Ernest Drive intersection would operate at acceptable LOS C or better with the proposed development (Case 3), the left turn lane is warranted per DelDOT's *Development Coordination Manual*. It is recommended that the developer coordinate with DelDOT to determine if adequate right-of-way is available to add an exclusive left turn lane along the northbound approach. If adequate right-of-way is available, the developer should improve the intersection and add the left turn lane to accommodate the increase in traffic as a result of the development.

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 should reconstruct Churchtown Road along the site frontage limits to provide two twelve-foot travel lanes and two eight-foot shoulders. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lane's pavement section and recommend an overlay thickness to the developer's engineer if necessary.

2. The developer should construct a full movement access entrance on the southerly side of Churchtown Road, approximately 2,500 feet west of the Churchtown Road intersection with Choptank Road and provide the lane configurations as shown in the table below:

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

Based on DelDOT's *Development Coordination Manual* and the updated Auxiliary and Bypass Lane Warrants from October 23, 2017, the recommended minimum storage length (excluding taper) is 95 feet for the westbound Churchtown Road left turn lane. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage length.

3. The developer should coordinate with DelDOT's Development Coordination section during the plan review process to determine if adequate right-of-way is available to improve the Choptank Road/Ernest Drive intersection to provide the lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Ernest Drive	One shared left turn/right turn lane	No change
Northbound Choptank Road	One shared through/left turn lane	One left turn lane and one through lane
Southbound Choptank Road	One through lane and one right turn lane	No change

The developer should improve the intersection to accommodate the northbound left turn lane and coordinate with DelDOT's Development Coordination section for the design. Based on DelDOT's *Development Coordination Manual* and the updated Auxiliary and Bypass Lane Warrants from October 23, 2017, the recommended minimum storage length (excluding taper) is 185 feet for the northbound Choptank Road left turn lane. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage length.

4. The developer should enter into a traffic signal agreement with DelDOT for the Bethel Church Road/Summit Bridge Road intersection. The agreement should include any signal timing changes as well as any signal equipment necessary, such as signal heads, signal

controller cabinet, pedestrian signals, crosswalks, interconnection, etc. at DelDOT's discretion.

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

   a. Improvements at proposed sites within an Investment Level 4 area are at DelDOT's discretion. For this development, a minimum fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Churchtown Road site frontage. Within this easement, the developer should construct a ten-foot wide shared-use path that meets current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the shared-use path. If feasible, the shared-use path should be placed behind utility poles and street trees should be provided within the buffer area. Extensions of the path may be required as off-site improvements during the plan review process or may be built later as a DelDOT capital project. The developer should coordinate with DelDOT's Development Coordination section during the plan review process to identify the exact location of the shared-use path and if the path should be extended to Connemarra Court.

   b. As the Back Creek Country Club exists across from the proposed development, pedestrian connectivity with a shared-use path or sidewalk to the club should be considered. The developer should coordinate with DelDOT's Development Coordination section during the plan review process to determine the feasibility of providing pedestrian access from the proposed development to Back Creek Drive. If connectivity is feasible, an evaluation of pedestrian treatments should be conducted using *NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings* to identify any required treatments for pedestrians crossing Churchtown Road.

   c. Sidewalks should be provided on both sides of all internal roads.

   d. Any proposed internal pathways should be ten-feet wide and hot-mix.

   e. ADA compliant curb ramps and a marked crosswalk should be provided along the Site Entrance approach to Churchtown Road. The use of diagonal curb ramps is discouraged.

   f. Minimum five-foot wide bicycle lanes should be incorporated in the shoulder along both directions of Churchtown Road within the site frontage limits.

g. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/shared-use paths or should be flush with the pavement.

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. Mark Buckalew of DelDOT's Traffic Section. Mr. Buckalew can be reached at (302) 894-6353 or by email at Mark.Buckalew@state.de.us.

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.

Mir Ale Wahed,
Mir Wahed, P.E., PTOE

cc: Joanne Arellano, P.E., PTOE
Enclosure

General Information

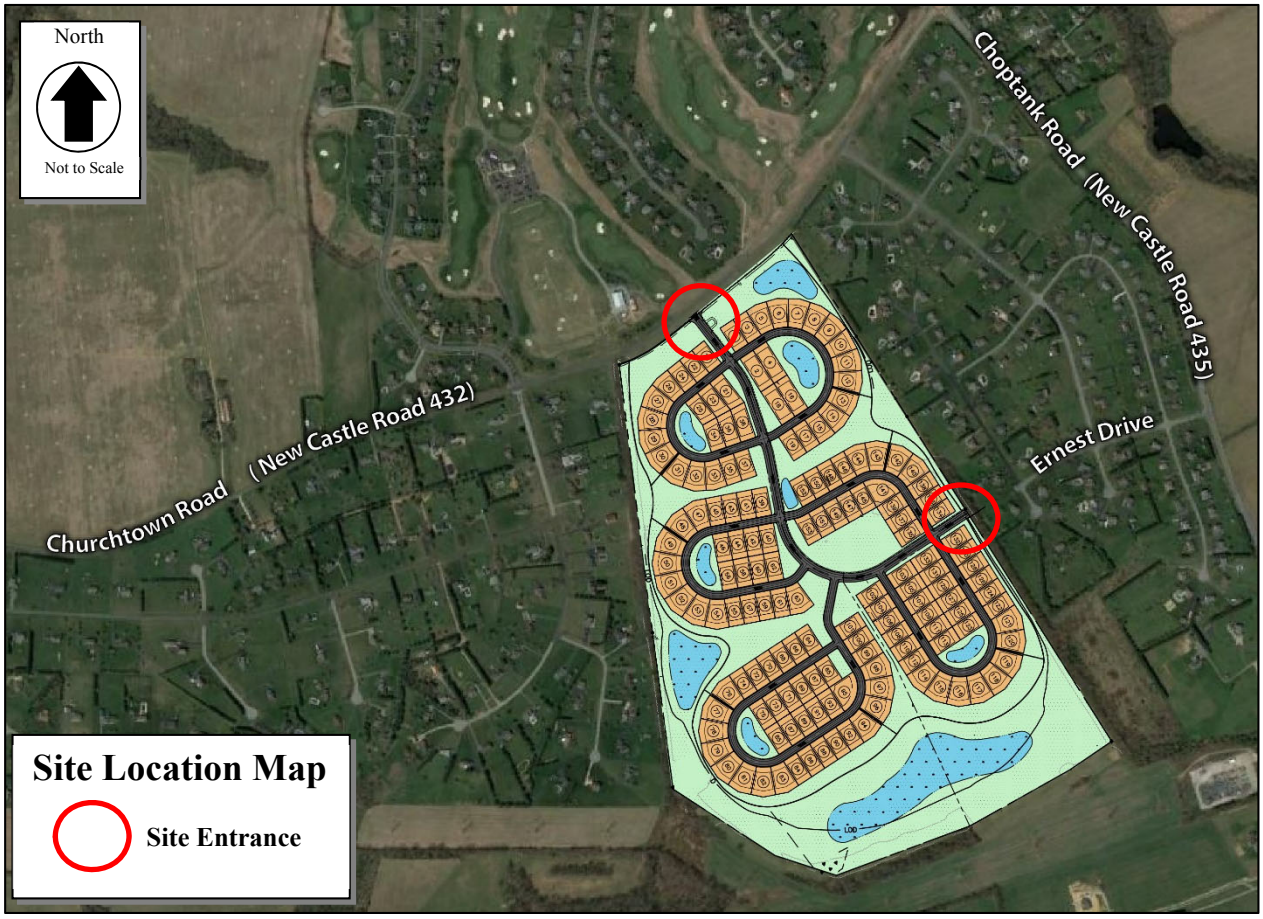
Report date: June 2018
Prepared by: Landmark Science & Engineering
Prepared for: Clayton Farms, L.L.C.
Tax Parcel: 13-011.00-021 and 13-011.00-166
Generally consistent with DelDOT's *Development Coordination Manual*: Yes.

Project Description and Background

Description: The developer seeks to develop 153 single family detached houses.
Location: The subject property is located on the south side of Churchtown Road (New Castle Road 432), approximately 1,800 feet southwest of the intersection of Churchtown Road and Choptank Road (New Castle Road 435), in New Castle County.
Amount of Land to be developed: The subject property is on an approximately 203.86-acre assemblage of parcels.
Land Use approval(s) needed: Entrance Plan approval.
Proposed completion date: 2024
Proposed access locations: One full access point is proposed along Churchtown Road. An interconnection to the adjacent Fox Hunter Crossing subdivision via Ernest Drive is also proposed which would provide access via Choptank Road.

- 2018 Average Annual Daily Traffic on Churchtown Road (New Castle Road 432): 2,665 vehicles per day.
- 2018 Average Annual Daily Traffic on Choptank Road (New Castle Road 435): 4,889 vehicles per day.

Site Map



**Graphic is an approximation based on the Site Plan prepared by Landmark Science & Engineering, dated June 2017.*

Relevant and On-going Projects

DelDOT currently has one relevant and ongoing improvement project within the study area, which is the *US 301, Maryland State Line to SR 1* project (Contract #T200511301).

The *US 301, Maryland State Line to SR 1* project is divided into several sections and contains improvements that will 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 Selected Alternative (Green North + Spur Road) provides a four-lane limited access toll road, US Route 301, on a new alignment. The new US Route 301 mainline section would extend from the Maryland State Line, west of Middletown, to the vicinity of Armstrong Corner Road where it would continue northeast, crossing the existing US Route 301 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 would be provided via intersections south of Middletown (Levels Road), in the vicinity of Armstrong Corner Road, and at Jamison Corner Road. Additional information can be found on the DelDOT project website at http://deldot.gov/information/projects/us301/index.shtml

As part of the US Route 301 project, improvements as part of Section 4 (Contracts #T200911305 and #T200911307) are within the study area of the TIS. Specifically, the improvements include the removal of the existing signal at the Bethel Church Road and Summit Bridge Road (US 301/SR 896) intersection and the modification to be a grade-separated intersection. In addition, the eastbound and westbound Bethel Church Road approaches will be terminated with cul-de-sacs prior to the intersection with Summit Bridge Road. The eastbound Bethel Church Road approach will be realigned, and ramps will be added to connect to the proposed Spur Road.

Improvements are also proposed as part of the US Route 301 Section 4 project at the Choptank Road intersections with Armstrong Corner Road and Bohemia Mill Road. The two intersections (Armstrong Corner Road with Choptank Road and Bohemia Mill Road with Choptank Road) are approximately ¼ mile apart from each other. Armstrong Corner Road will be realigned to be directly across from Bohemia Mill Road to form a four-legged intersection with Choptank Road. The current Armstrong Corner Road intersection with Choptank Road would remain but only serve one existing residence along Armstrong Corner Road and terminate east of the residence. Per DelDOT's Capital Transportation Program (CTP) for Fiscal Year 2018 to Fiscal Year 2023, funding for design of the US Route 301 Section 4 project is allocated during Fiscal Years 2021 to 2023. Right-of-way and construction funding would be allocated in the later years outside of the current CTP.

DelDOT has one ongoing pavement rehabilitation and resurfacing project within the project area. This project is along Churchtown Road, from Choptank Road to Boyd's Corner Road (Contract #T201506104) and involves milling, patching, and overlays. Construction is estimated to be complete by Fall of 2019.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, 2015)

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

The proposed development is located within the Investment Level 4 area.

Investment Level 4

Delaware's Investment Level 4 Areas are rural in nature and are where the bulk of the state's open space/natural areas and agricultural industry is located. These areas contain agribusiness activities, farm complexes, and small settlements. They typically include historic crossroads or points of trade, often with rich cultural ties. Delaware's Investment Level 4 Areas are also the location of scattered residential uses, featuring almost entirely single-family detached residential structures. Delaware's Investment Level 4 Areas also include many unincorporated communities, typically with their own distinctive character and identity. Investment Level 4 Areas depend on a transportation system primarily of secondary roads linked to roadways used as regional thoroughfares for commuting and trucking.

It is the state's intent to discourage additional urban and suburban development in Investment Level 4 Areas unrelated to agriculture and to the areas' needs. In Investment Level 4 Areas, the state's investments and policies should retain the rural landscape and preserve open spaces and

farmlands, support farmland-related industries, and establish defined edges to more concentrated development. The focus for the Level 4 Areas will be to preserve and maintain existing facilities in safe working order, corridor-capacity preservation, and the enhancement of transportation facilities to support agricultural business.

Proposed Development's Compatibility with Livable Delaware:

The proposed development is located in Investment Level 4 Areas. According to Livable Delaware, Level 4 areas contain single-family detached residential houses for those who value quiet settings. Therefore, the proposed development is generally consistent with the 2015 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans
(Source: New Castle County, June 2012 Comprehensive Plan Update)

New Castle County Comprehensive Plan:
The subject property is zoned as S (Suburban). Rezoning is not necessary to permit the proposed land use.

Proposed Development's Compatibility with the New Castle County Comprehensive Plan:
Per the *New Castle County Comprehensive Plan,* the future land use plan depicts this area as Low Density which is classified as 1 to 3 dwelling units per acre. As such, the proposed use appears to be generally compatible 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).

The peak period trip generation utilized in the TIS for the proposed development is included in Table 1.

Table 1
Copperleaf Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
153 Units Single-Family Detached Housing	1,538	28	85	113	96	57	153

Intersections examined:

1. Churchtown Road (New Castle Road 432)/Site Entrance A
2. Choptank Road (New Castle Road 435)/Ernest Drive/Site Entrance B
3. Churchtown Road/Colonel Clayton Drive
4. Churchtown Road/Choptank Road
5. Choptank Road/Clayton Manor Drive
6. Choptank Road/Bethel Church Road (New Castle Road 433)
7. Bethel Church Road/Summit Bridge Road (US 301/SR 896/New Castle Road 16)
8. Churchtown Road/Meadow Drive
9. Churchtown Road/Connemara Court/Back Creek Drive
10. Churchtown Road/Brady Lane
11. Choptank Road/Old School House Road (New Castle Road 431)
12. Choptank Road/Westside Lane
13. Choptank Road/Armstrong Corner Road (New Castle Road 429)

Conditions examined:

1. Case 1 – 2018 Existing
2. Case 2 – 2024 without development
3. Case 3 – 2024 with development

Peak hours evaluated: Weekday morning and evening peak hours.

Committed Developments considered:

1. Highlands at Back Creek (Unbuilt 42 single-family detached houses)
2. Summit Bridge Estates (Unbuilt 36 single-family detached houses)
3. Rothwell Estates (Unbuilt 143 single-family detached house)
4. Bohemia Mill Pond (Unbuilt 20 single-family detached houses)
5. Connection Church (Unbuilt 24,747 SF church facility with 544 seats and 10,000 SF public assembly space)
6. Country Club Estates (Unbuilt 115 single-family detached dwellings)
7. Summit Pointe (Unbuilt 99 single-family detached houses)
8. Summit Circle (Unbuilt 14 single-family detached houses)
9. Carter Farm (Unbuilt 321 single-family detached houses and 257 townhouses)
10. Whispering Woods (Unbuilt 67 age-restricted single-family detached houses, 32 single-family attached houses, and 79 townhouses)
11. Bayberry – North (Unbuilt 263 single-family detached houses, 33 single-family attached houses, and 87 townhouses)
12. Bayberry – South (Unbuilt 580 single-family detached houses, 100 townhouses, 258 age-restricted single-family detached houses, and 122 age-restricted townhouses)
13. Bayberry Town Center (318,594 square feet of retail, 175,000 square-feet of office space, a 61,650 square-foot athletic club, and a 3,960 square-foot bank with drive-through window)

14. Winchelsea (Unbuilt 166 single-family detached houses, 30 single-family attached houses, 163 townhouses, and 154 apartments)
15. Cedar Lane Housing (Unbuilt 31 single-family detached houses)

Intersection Descriptions

1. **Churchtown Road (New Castle Road 432)/Site Entrance A**
   Type of Control: Proposed two-way stop controlled intersection (T-intersection)
   Eastbound Approach: (Churchtown Road (New Castle Road 432)) Existing one through lane; Proposed one shared through/right turn lane
   Westbound Approach: (Churchtown Road (New Castle Road 432)) Existing one through lane; Proposed one left turn lane and one through lane
   Northbound Approach: (Site Entrance A) Proposed one shared left turn/right turn lane, stop controlled

2. **Choptank Road (New Castle Road 435)/Ernest Drive/Site Entrance B**
   Type of Control: Existing 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 (New Castle Road 435)) Existing one shared through/left turn lane
   Southbound Approach: (Choptank Road (New Castle Road 435)) Existing one through lane and one right turn lane

3. **Churchtown Road/Colonel Clayton Drive**
   Type of Control: Existing two-way stop controlled intersection (T-intersection)
   Eastbound Approach: (Churchtown Road) Existing one shared through/right turn lane
   Westbound Approach: (Churchtown Road) Existing one shared through/left turn lane
   Northbound Approach: (Colonel Clayton Drive) Existing one shared left turn/right turn lane, stop controlled

4. **Churchtown Road/Choptank Road**
   Type of Control: Existing four-leg Roundabout
   Eastbound Approach: (Churchtown Road) Existing one shared through/left turn/right turn lane
   Westbound Approach: (Churchtown Road) Existing one shared through/left turn/right turn lane
   Northbound Approach: (Choptank Road) Existing one shared through/left turn/right turn lane
   Southbound Approach: (Choptank Road) Existing one shared through/left turn/right turn lane

5. **Choptank Road/Clayton Manor Drive**
   Type of Control: Existing 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 through/left turn lane
   Southbound Approach: (Choptank Road) Existing one through lane and one right turn lane

6. **Choptank Road/Bethel Church Road (New Castle Road 433)**
   Type of Control: Existing three-leg Roundabout
   Eastbound Approach: (Bethel Church Road) Existing one shared left turn/right turn lane
   Northbound Approach: (Choptank Road) Existing one shared through/left turn lane
   Southbound Approach: (Bethel Church Road) Existing one shared through/right turn lane

7. **Bethel Church Road/Summit Bridge Road (US 301/SR 896/New Castle Road 16)**
   Type of Control: Existing signalized intersection (four-leg intersection); proposed to be converted to a grade-separated intersection without signal control as part of the *US 301 DelDOT Project (Contract #T200911305)*
   Eastbound Approach: (Bethel Church Road) Existing two left turn lanes and one channelized right turn lane
   Westbound Approach: (Bethel Church Road) Existing one channelized right turn lane
   Northbound Approach: (Summit Bridge Road) Existing one left turn lane and two through lanes
   Southbound Approach: (Summit Bridge Road) Existing one channelized right turn lane and two through lanes

8. **Churchtown Road/Meadow Drive**
   Type of Control: Existing two-way stop controlled intersection (T-intersection)
   Eastbound Approach: (Churchtown Road) Existing one shared through/left turn 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

9. **Churchtown Road/Connemara Court/Back Creek Drive**
   Type of Control: Existing two-way stop controlled intersection (four-leg intersection)

Eastbound Approach: (Churchtown Road) Existing one shared through/left turn/right turn lane
Westbound Approach: (Churchtown Road) Existing one shared through/left turn lane and one right turn lane
Northbound Approach: (Connemara Court) Existing one shared through/left turn/right turn lane, stop controlled.
Southbound Approach: (Back Creek Drive) Existing one shared through/left turn/right turn lane, stop controlled

10. **Churchtown Road/Brady Lane**
Type of Control: Existing two-way stop controlled intersection (T-intersection)
Eastbound Approach: (Churchtown Road) Existing one shared through/right turn lane
Westbound Approach: (Churchtown Road) Existing one shared through/left turn lane
Northbound Approach: (Brady Lane) Existing one shared left turn/right turn lane, stop controlled

11. **Choptank Road/Old School House Road (New Castle Road 431)**
Type of Control: Existing 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 through/left turn lane

12. **Choptank Road/Westside Lane**
Type of Control: Existing two-way stop controlled intersection (T-intersection)
Eastbound Approach: (Westside Lane) Existing one shared left turn/right turn lane, stop controlled.
Northbound Approach: (Choptank Road) Existing one shared through/left turn lane
Southbound Approach: (Choptank Road) Existing one through lane and one right turn lane

13. **Choptank Road/Armstrong Corner Road (New Castle Road 429)**
Type of Control: Existing two-way 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) One shared through/left turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Delaware Transit Corporation (DTC) currently does not provide any service in the study area.

Planned transit service: JMT contacted Mr. David Dooley, Transit Planner at the DTC. Per email correspondence on June 26, 2018 from Mr. Dooley, the DTC does not have any future plans to extend bus service to the area but recommends sidewalks along frontage roads with pedestrian access to the interior of the development.

Existing bicycle and pedestrian facilities: According to DelDOT's *New Castle County Bicycle Map,* the Statewide Bicycle Route (Bicycle Route 1) and Regional Bicycle routes exist within the study area. The Statewide Bicycle Route exists along Summit Bridge Road, Choptank Road and Bethel Church Road and traverses through eight of the project's study intersections (the Summit Bridge Road intersection with Bethel Church Road, the Bethel Church Road intersection with Choptank Road, and the Choptank Road intersections with Clayton Manor Drive, Churchtown Road, Ernest Drive (Site Entrance B), Old School House Road, Westside Lane and Armstrong Corner Road). The Regional Bicycle route exists along Summit Bridge Road, Bethel Church Road and Churchtown Road and traverses through eight of the project's study intersections (the Summit Bridge Road intersection with Bethel Church Road, the Bethel Church Road intersection with Choptank Road, and the Churchtown Road intersections with Brady Lane, Connemara Court, proposed Site Entrance A, Colonel Clayton Drive, Choptank Road, and Meadow Drive). Pedestrian facilities exist at the Choptank Road intersection with Bethel Church Road and Churchtown Road.

Planned bicycle and pedestrian facilities: Per email correspondence on July 9, 2018 from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- Install a 10-foot wide shared use path along the Churchtown Road site frontage if a pedestrian facility is required.
- If an internal path is proposed around the site, it should be 10-feet wide and hot-mix.
- The site shall dedicate right-of-way per the roadway classification and establish a 15-foot wide permanent easement along the Churchtown Road property frontage.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. If a right turn lane is warranted, then a 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 classification or existing conditions.

Bicycle Level of Service and Bicycle Compatibility Index: According to the League of Illinois Bicyclists (LIB), Bicycle Level of Service (BLOS) is an emerging national standard for quantifying the bike-friendliness of a roadway by measuring on-road bicyclist comfort levels for specific roadway geometries and traffic conditions. Utilizing the 10-year projected AADT along the Churchtown Road site frontage with a 40 miles per hour speed limit and the provision of a 5-foot wide bike lane, the BLOS with the full build out construction of the proposed development is

summarized below. The BLOS was determined utilizing the calculators published on the LIB website:
http://rideillinois.org/blos/blosform.htm

- Churchtown Road – BLOS: B (1.51-2.50)

Previous Comments
The comments from the Preliminary TIS have been addressed in the TIS.

General HCS Analysis Comments

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

1. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement in the Case 2 and Case 3 future scenario analyses, 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 analysis of future scenarios. The TIS utilized existing heavy vehicle percentages for the future scenario analyses.

2. Per DelDOT's *Development Coordination Manual,* JMT utilized the existing PHF for Case 1 and a future PHF for Cases 2 and 3 of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher. The TIS assumed 0.92 for all future scenarios.

3. JMT utilized updated Cases 2 and 3 volumes. As discussed with DelDOT, the updated volumes were created to address some volume development inconsistencies identified in the TIS report.

4. JMT included pedestrian volumes in the analysis whereas the TIS did not.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road (New Castle Road 432)/Site Entrance A [2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 With Development (Case 3)				
Westbound Churchtown Road Left Turn	-	-	A (7.9)	A (7.9)
Northbound Site Entrance A Approach	-	-	B (10.5)	B (10.1)
2024 With Development (Case 3) *with Improvement* [3]				
Westbound Churchtown Road Left Turn	-	-	A (7.9)	A (7.9)
Northbound Site Entrance A Approach	-	-	B (10.5)	B (10.1)

[1] For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] TIS did not provide any analysis results for proposed Site Entrance A.
[3] Improvement scenario includes the provision of a left turn lane along the westbound Churchtown Road approach.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road (New Castle Road 435)/Ernest Drive/Site Entrance B	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Ernest Drive Approach	B (13.1)	B (12.2)	B (13.1)	B (12.2)
Northbound Choptank Road Left Turn	A (8.3)	A (8.4)	A (8.3)	A (8.4)
2024 Without Development (Case 2)				
Eastbound Ernest Drive Approach	B (14.3)	B (14.0)	B (15.0)	B (14.1)
Northbound Choptank Road Left Turn	A (8.6)	A (8.8)	A (8.6)	A (8.8)
2024 With Development (Case 3)				
Eastbound Ernest Drive Approach	C (15.3)	C (16.4)	C (16.1)	C (16.6)
Northbound Choptank Road Left Turn	A (8.6)	A (9.0)	A (8.7)	A (9.0)
2024 With Development (Case 3) *with Improvement* [4]				
Eastbound Ernest Drive Approach	-	-	C (16.1)	C (16.6)
Northbound Choptank Road Left Turn	-	-	A (8.7)	A (9.0)

[4] Improvement scenario includes the provision of a left turn lane along the northbound Choptank Road approach.

Table 4
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road/Colonel Clayton Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Westbound Churchtown Road Left Turn	A (7.6)	A (7.5)	A (7.6)	A (7.5)
Northbound Colonel Clayton Drive Approach	A (9.6)	A (9.5)	A (9.6)	A (9.5)
2024 Without Development (Case 2)				
Westbound Churchtown Road Left Turn	A (7.8)	A (7.8)	A (7.8)	A (7.7)
Northbound Colonel Clayton Drive Approach	B (10.4)	B (10.5)	B (10.3)	B (10.4)
2024 With Development (Case 3)				
Westbound Churchtown Road Left Turn	A (7.9)	A (7.8)	A (7.9)	A (7.8)
Northbound Colonel Clayton Drive Approach	B (10.7)	B (10.9)	B (10.7)	B (10.8)

Table 5
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Roundabout [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road/Choptank Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Churchtown Approach	A (6.8)	A (5.9)	A (6.8)	A (5.9)
Westbound Churchtown Approach	A (5.9)	A (5.5)	A (6.0)	A (5.5)
Northbound Choptank Road Approach	A (7.1)	A (5.9)	A (7.2)	A (5.9)
Southbound Choptank Road Approach	A (6.0)	A (7.8)	A (6.0)	A (7.8)
Overall Intersection	A (6.5)	A (6.6)	A (6.6)	A (6.6)
2024 Without Development (Case 2)				
Eastbound Churchtown Approach	A (9.8)	A (9.2)	A (9.7)	A (9.2)
Westbound Churchtown Approach	A (7.2)	A (9.0)	A (7.2)	A (9.4)
Northbound Choptank Road Approach	A (9.2)	A (9.5)	A (9.1)	A (9.6)
Southbound Choptank Road Approach	A (8.0)	B (12.7)	A (8.1)	B (13.6)
Overall Intersection	A (8.7)	B (10.6)	A (8.6)	B (11.0)

Table 5 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Roundabout [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road/Choptank Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 With Development (Case 3)				
Eastbound Churchtown Approach	B (10.8)	B (10.2)	B (10.8)	B (10.1)
Westbound Churchtown Approach	A (7.6)	A (9.9)	A (7.7)	B (10.3)
Northbound Choptank Road Approach	B (10.1)	B (10.2)	B (10.0)	B (10.3)
Southbound Choptank Road Approach	A (8.2)	B (14.9)	A (8.4)	C (16.1)
Overall Intersection	A (9.3)	B (11.9)	A (9.3)	B (12.4)

Table 6
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road/Clayton Manor Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Clayton Manor Drive Approach	C (16.5)	C (15.4)	C (16.5)	C (15.4)
Northbound Choptank Road Left Turn	A (8.2)	A (8.7)	A (8.2)	A (8.7)
2024 Without Development (Case 2)				
Eastbound Clayton Manor Drive Approach	C (19.8)	C (23.1)	C (21.3)	C (22.3)
Northbound Choptank Road Left Turn	A (8.5)	A (9.4)	A (8.6)	A (9.3)
2024 With Development (Case 3)				
Eastbound Clayton Manor Drive Approach	C (21.1)	D (25.3)	C (20.9)	C (24.4)
Northbound Choptank Road Left Turn	A (8.6)	A (9.5)	A (8.5)	A (9.5)

Table 7
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Roundabout [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road/Bethel Church Road (New Castle Road 433)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Bethel Church Road Approach	A (6.0)	A (6.2)	A (5.8)	A (6.2)
Northbound Choptank Road Approach	A (8.8)	A (5.1)	A (8.2)	A (5.0)
Southbound Bethel Church Road Approach	A (4.5)	A (8.3)	A (4.5)	A (8.3)
Overall Intersection	A (6.9)	A (7.1)	A (6.6)	A (7.1)
2024 Without Development (Case 2)				
Eastbound Bethel Church Road Approach	A (7.9)	A (9.1)	A (7.9)	A (9.6)
Northbound Choptank Road Approach	B (13.9)	A (6.7)	B (13.4)	A (6.8)
Southbound Bethel Church Road Approach	A (5.2)	B (13.5)	A (5.3)	B (14.4)
Overall Intersection	A (9.9)	B (11.0)	A (9.7)	B (11.6)
2024 With Development (Case 3)				
Eastbound Bethel Church Road Approach	A (8.0)	A (9.7)	A (8.1)	B (10.2)
Northbound Choptank Road Approach	C (15.2)	A (6.9)	B (14.6)	A (7.1)
Southbound Bethel Church Road Approach	A (5.3)	B (14.8)	A (5.4)	C (15.9)
Overall Intersection	B (10.6)	B (11.9)	B (10.4)	B (12.6)

Table 8a
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Bethel Church Road/Summit Bridge Road (US 301/SR 896/New Castle Road 16) [5, 6]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (27.4)	C (25.0)	F (105.5)	C (27.4)
2024 Without Development (Case 2)	D (42.3)	E (55.6)	F (212.9)	E (76.1)
2024 With Development (Case 3)	D (45.1)	E (59.3)	F (227.6)	F (80.4)
2024 Without Development (Case 2) *with 20% Reduction and Signal Optimization* [7, 8]	-	-	F (135.3)	D (48.9)
2024 Without Development (Case 2) *with 20% Reduction, Signal Optimization, and Improvement* [7, 8, 9]	-	-	D (52.2)	C (27.1)
2024 With Development (Case 3) *with 20% Reduction and Signal Optimization* [11, 12]	-	-	F (143.3)	D (51.7)
2024 With Development (Case 3) *with 20% Reduction, Signal Optimization, and Improvement* [7, 8, 9]	-	-	D (52.4)	C (28.4)

[5] JMT utilized signal timing splits and cycle lengths consistent with the DelDOT Timing Plan whereas the TIS did not.
[6] JMT utilized signal phasing consistent with existing field conditions but the TIS did not.
[7] Reduction scenario includes a 20 percent volume reduction along Summit Bridge Road as a result of the US 301 DelDOT improvement project.
[8] Signal Optimization scenario includes optimizing splits while maintaining cycle lengths consistent with the DelDOT Timing Plans.
[9] Improvement scenario includes the provision of three left turn lanes and one channelized right turn lane for the eastbound Bethel Church Road approach.

Table 8b
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Signalized Intersection [10]	**LOS per TIS**		**LOS per JMT (Synchro)**	
Bethel Church Road/Summit Bridge Road (US 301/SR 896/New Castle Road 16) [11]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	-	-	C (33.0)	B (17.9)
2024 Without Development (Case 2)	-	-	F (93.2)	D (38.7)
2024 With Development (Case 3)	-	-	F (98.9)	D (45.1)
2024 Without Development (Case 2) *with 20% Reduction and Signal Optimization* [7, 8]	-	-	D (44.9)	C (22.9)
2024 With Development (Case 3) *with 20% Reduction and Signal Optimization* [7, 8]	-	-	D (48.0)	C (23.6)

[10] The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds based on Synchro methodology.
[11] Due to an atypical signal operation that is not consistent with NEMA methodology, JMT conducted an additional analysis in Synchro 9 to be consistent with the existing signal phasing.

Table 9
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

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
2018 Existing (Case 1)				
Eastbound Churchtown Road Left Turn	A (7.4)	A (7.7)	A (7.4)	A (7.7)
Southbound Meadow Approach	B (10.1)	B (10.4)	B (10.1)	B (10.4)
2024 Without Development (Case 2)				
Eastbound Churchtown Road Left Turn	A (7.5)	A (8.0)	A (7.6)	A (8.1)
Southbound Meadow Approach	B (10.9)	B (12.6)	B (11.3)	B (12.7)
2024 With Development (Case 3)				
Eastbound Churchtown Road Left Turn	A (7.5)	A (8.0)	A (7.6)	A (8.1)
Southbound Meadow Approach	B (11.1)	B (13.0)	B (11.6)	B (13.1)

Table 10
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road/Connemara Court/Back Creek Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Churchtown Road Left Turn	A (7.4)	A (7.5)	A (7.4)	A (7.5)
Westbound Churchtown Road Left Turn	A (7.6)	A (7.5)	A (7.6)	A (7.5)
Northbound Connemara Court [12]	A (9.3)	A (9.5)	A (9.3)	A (9.5)
Southbound Back Creek Drive	B (10.3)	B (11.1)	B (10.3)	B (11.1)
2024 Without Development (Case 2)				
Eastbound Churchtown Road Left Turn	A (7.5)	A (7.8)	A (7.6)	A (7.8)
Westbound Churchtown Road Left Turn	A (7.8)	A (7.7)	A (7.9)	A (7.7)
Northbound Connemara Court [12]	A (9.8)	B (10.5)	A (9.8)	B (10.6)
Southbound Back Creek Drive	B (11.2)	B (13.3)	B (11.4)	B (13.6)

[12] During the AM peak hour, the TIS used a northbound right-turn heavy vehicle percentage of 5% whereas JMT used 6% consistent with the existing traffic count data.

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road/Connemara Court/Back Creek Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 With Development (Case 3)				
Eastbound Churchtown Road Left Turn	A (7.5)	A (7.8)	A (7.6)	A (7.8)
Westbound Churchtown Road Left Turn	A (7.8)	A (7.8)	A (7.9)	A (7.7)
Northbound Connemara Court [12]	A (9.8)	B (10.5)	A (9.8)	B (10.6)
Southbound Back Creek Drive	B (11.3)	B (13.4)	B (11.5)	B (13.5)

Table 12
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Churchtown Road/Brady Lane	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Westbound Churchtown Road Left Turn	A (7.5)	A (7.4)	A (7.5)	A (7.4)
Northbound Brady Lane Approach	A (9.4)	A (9.0)	A (9.4)	A (9.0)
2024 Without Development (Case 2) [13]				
Eastbound Churchtown Road Left Turn	-	-	A (7.6)	A (7.7)
Westbound Churchtown Road Left Turn	A (7.5)	A (7.6)	A (7.6)	A (7.6)
Northbound Brady Lane Approach	A (9.5)	A (9.5)	A (9.8)	A (9.5)
Southbound Brady Lane Approach	-	-	B (11.6)	B (12.2)
2024 With Development (Case 3) [13]				
Eastbound Churchtown Road Left Turn	-	-	A (7.6)	A (7.7)
Westbound Churchtown Road Left Turn	A (7.5)	A (7.6)	A (7.6)	A (7.6)
Northbound Brady Lane Approach	A (9.5)	A (9.6)	A (9.8)	A (9.6)
Southbound Brady Lane Approach	-	-	B (11.7)	B (12.3)

[13] JMT included a southbound approach with a shared through/left turn/right turn lane as part of the future Country Club Estates committed development access during Cases 2 and 3 whereas the TIS did not.

Table 13
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

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
2018 Existing (Case 1)				
Westbound Old School House Road Approach	C (15.2)	C (17.6)	C (15.2)	C (17.6)
Southbound Choptank Road Left Turn	A (8.0)	A (8.0)	A (8.0)	A (8.0)
2024 Without Development (Case 2)				
Westbound Old School House Road Approach	C (16.6)	C (24.4)	C (17.4)	C (24.7)
Southbound Choptank Road Left Turn	A (8.1)	A (8.4)	A (8.2)	A (8.5)
2024 With Development (Case 3)				
Westbound Old School House Road Approach	C (17.4)	D (26.6)	C (18.3)	D (27.0)
Southbound Choptank Road Left Turn	A (8.1)	A (8.6)	A (8.2)	A (8.6)

Table 14
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Choptank Road/Westside Lane	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Westside Lane Approach	B (14.1)	C (15.7)	B (14.1)	C (15.7)
Northbound Choptank Road Left Turn	A (8.7)	A (8.4)	A (8.7)	A (8.4)
2024 Without Development (Case 2)				
Eastbound Westside Lane Approach	C (15.4)	C (20.0)	C (16.2)	C (20.3)
Northbound Choptank Road Left Turn	A (8.9)	A (8.8)	A (9.0)	A (8.8)
2024 With Development (Case 3)				
Eastbound Westside Lane Approach	C (16.1)	C (21.3)	C (16.9)	C (21.6)
Northbound Choptank Road Left Turn	A (9.1)	A (8.8)	A (9.2)	A (8.9)

Table 15
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Copperleaf at Back Creek
Report Dated: June 2018
Prepared by Landmark Science & Engineering

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
2018 Existing (Case 1)				
Westbound Armstrong Corner Road Approach	B (14.2)	B (13.6)	B (14.2)	B (13.6)
Southbound Choptank Road Left Turn	A (8.2)	A (8.0)	A (8.2)	A (8.0)
2024 Without Development (Case 2)				
Westbound Armstrong Corner Road Approach	C (21.9)	D (29.4)	C (24.1)	D (29.6)
Southbound Choptank Road Left Turn	A (8.5)	A (8.6)	A (8.6)	A (8.7)
2024 With Development (Case 3)				
Westbound Armstrong Corner Road Approach	C (23.8)	D (33.8)	C (23.8)	D (34.1)
Southbound Choptank Road Left Turn	A (8.5)	A (8.7)	A (8.5)	A (8.8)