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

NICOLE MAJESKI
SECRETARY

September 23, 2022

Ms. Nicole Kline-Elsier, PE, PTOE
McMahon Associates, Inc.
835 Springdale Drive, Suite 200
Exton, PA 19341

Dear Ms. Kline-Elsier,

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Canal Overlook** (Tax Parcel: 12-028.00-010) 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. Paul Lester, Diamond Materials, Inc.
Mr. Chris Castagno, Diamond Materials, Inc.
Mr. Trevor Furr, McBride & Ziegler, Inc.
Mr. Mark Ziegler, McBride & Ziegler, Inc.
Mr. Greg Swift, McBride & Ziegler, Inc.
Mr. David L. Edgell, Office of State Planning Coordination
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Mark Wolanski, New Castle County Department of Land Use
Mr. Owen C. Robatino, New Castle County Department of Land Use
Mr. Andrew J. Parker, McCormick Taylor, Inc.
Mr. Tucker Smith, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT

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

McCORMICK TAYLOR

September 22, 2022

Mr. Claudy Joinville
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1946F
Traffic Impact Study Services
Task No. 3A Subtask 09 – Canal Overlook

Dear Mr. Joinville:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Canal Overlook development prepared by McMahon Associates, Inc. dated May 4, 2022. McMahon Associates prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Canal Overlook residential development, to be located on the south side of Cox Neck Road (New Castle Road 411), approximately 4,700 feet east of Clarks Corner Road (New Castle Road 378), in New Castle County. The proposed development would consist of 108 single-family detached houses. Two full-movement unsignalized access points are proposed for this development, both on Cox Neck Road. Construction is anticipated to be complete by 2026.

The subject land is located on approximately 83 acres. The subject land is currently zoned S (Suburban) in New Castle County. The developer does not plan to rezone the land.

Currently there are no active DelDOT projects within the study area.

The proposed Canal Overlook development would 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 intersections that were required by New Castle County to be analyzed.

However, as shown in the table below, based on the criteria listed in Chapter 2 of DelDOT's Development Coordination Manual, one intersection identified by DelDOT as being required for study may exhibit LOS deficiencies without the implementation of physical roadway and/or traffic control improvements. The potential LOS deficiency is on the stop-controlled minor-street approach at one unsignalized intersection. The deficiency pertains to that approach only, and the intersection is not subject to New Castle County's concurrency requirements.

Intersection	***Existing Traffic Control***	***Situations for which deficiencies occur***
Cox Neck Road and Clarks Corner Road	Unsignalized	2026 with development AM (Case 3)

Cox Neck Road and Clarks Corner Road

This unsignalized intersection would operate at LOS E on the minor street stop-controlled southbound approach of Clarks Corner Road during the future AM peak hour with Canal Overlook traffic added. The addition of a left or right-turn lane on the southbound approach would provide minimal benefit, and a traffic signal is not desired by DelDOT at this location. Given that the subject development would add no more than 11 vehicles to that approach during either peak hour, the delay is only 5 seconds into the LOS E range, and the 95th percentile queue length is less than 100 feet long, we do not recommend any improvements be implemented by the developer to mitigate this minor LOS deficiency.

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

1. The developer shall improve the State-maintained road(s) on which they front (Cox Neck 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 the full-movement Site Access A (eastern access) on Cox Neck Road. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Eastbound Cox Neck Road	One through lane	One through lane and one right-turn lane
Westbound Cox Neck Road	One through lane	One shared through/left-turn lane
Northbound Site Access A	Approach does not exist	One shared left/right-turn lane

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

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Cox Neck Road	N/A	145 feet *
Westbound Cox Neck Road	N/A	N/A
Northbound Site Access A	N/A	N/A

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

3. The developer should construct the full-movement Site Access B (western access) on Cox Neck Road. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Eastbound Cox Neck Road	One through lane	One through lane and one right-turn lane
Westbound Cox Neck Road	One through lane	One shared through/left-turn lane
Northbound Site Access B	Approach does not exist	One shared left/right-turn lane

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

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Cox Neck Road	N/A	190 feet *
Westbound Cox Neck Road	N/A	N/A
Northbound Site Access B	N/A	N/A

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

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

   a. Per the DelDOT Development Coordination Manual section 5.2.9.2, bicycle lanes are required where right turn lanes are being installed.

   b. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.

   c. Utility covers should be made flush with the pavement.

   d. If clubhouses or other community facilities are constructed within the site, bicycle parking should be provided near building entrances. Where building architecture provides for an awning, other overhang, or indoor parking, the bicycle parking should be covered.

   e. A minimum 15-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Cox Neck Road.

   f. Within the easement along the Cox Neck Road site frontage, a minimum of a 10-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed. The shared-use path should meet AASHTO and ADA standards and should have a minimum of a five-foot buffer from the roadway. At the property boundaries, the shared-use path should connect to the adjacent property or to the shoulder in accordance with DelDOT's *Shared-Use Path and/or Sidewalk Termination Reference Guide* dated August 1, 2018. The developer shall coordinate with DelDOT's Development Coordination Section through the plan review process to determine the details of the shared-use path design and connections/terminations at or before both boundaries of the property.

   g. As shown on the site plan, the developer should construct a multi-use trail through the site, connecting to Cox Neck Road at the north end and to the Michael N. Castle Trail along the C & D Canal at the south end. Details of this multi-use trail should be coordinated with DelDOT's Development Coordination Section.

   h. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.

   i. The developer should install a crosswalk across Cox Neck Road. Location of the crossing should be determined through coordination with DelDOT's Development Coordination Section and Traffic Section as well as the Delaware Transit Corporation (DTC). The crosswalk may be installed where the proposed trail through the site intersects Cox Neck Road, or it may be installed at a different location. The proposed bus stop pads noted below in Item 4.m. might also be installed at the crosswalk location if determined to be appropriate.

j. The developer should coordinate with DelDOT's Development Coordination Section and Traffic Section regarding design of the crosswalk on Cox Neck Road described in Item 4.i. In doing so, if requested by DelDOT, the developer will need to conduct an analysis to determine what type of crossing treatment would be appropriate and should assume that the minimum pedestrian crossing volume threshold is met. The analysis must be based on guidance and worksheets found in NCHRP Report 562. Preliminarily, it is anticipated that a median refuge island and Rectangular Rapid Flashing Beacon (RRFB) may be feasible and desired by DelDOT.

k. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. Internal sidewalks in the development should connect to the proposed shared-use path along Cox Neck Road and to the proposed multi-use trail through the site.

l. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.

m. The developer should coordinate with the Delaware Transit Corporation (DTC) regarding location, design and construction of a pair of companion 5' by 8' bus stop pads (Type 2) along the Cox Neck Road site frontage.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

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

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

Sincerely,

McCormick Taylor, Inc.

Andrew J. Parker, PE, PTOE
Project Manager

Enclosure

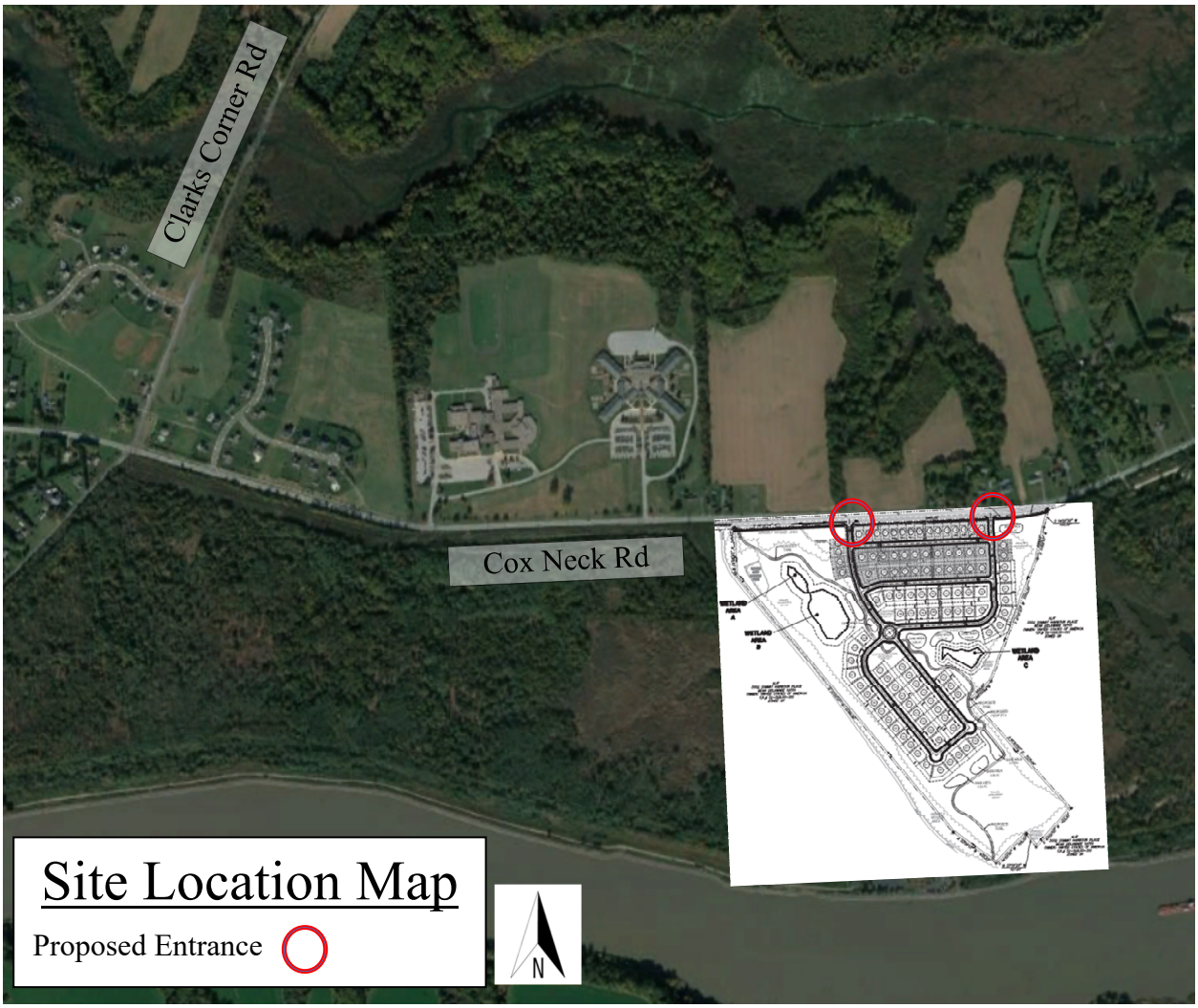
General Information

Report date: May 4, 2022
Prepared by: McMahon Associates, Inc.
Prepared for: Diamond Materials LLC
Tax parcel: 12-028.00-010
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Canal Overlook development would consist of 108 single-family detached houses.
Location: The site is located on the south side of Cox Neck Road (New Castle Road 411), approximately 4,700 feet east of Clarks Corner Road (New Castle Road 378), in New Castle County. A site location map is included on page 7.
Amount of land to be developed: approximately 83 acres of land
Land use approval(s) needed: Subdivision approval. The subject land is currently zoned S (Subarban) in New Castle County. The developer does not plan to rezone the land.
Proposed completion year: 2026
Proposed access locations: Two full-movement unsignalized access points are proposed for this development, both on Cox Neck Road.
Daily Traffic Volumes (per DelDOT Traffic Summary 2019):

- 2019 Average Annual Daily Traffic on Cox Neck Road: 1,276 vehicles/day


Clarks Corner Rd
Cox Neck Rd
Site Location Map
Proposed Entrance
N

2020 Delaware Strategies for State Policies and Spending

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed Canal Overlook development is located mostly within Investment Level 3 and to a small extent within Investment Level 4.

Investment Level 3
Investment Level 3 Areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities where development is not necessary to accommodate expected population growth during this five-year planning period (or longer). In these instances, development in Investment Level 3 may be least appropriate for new growth and development in the near term.

The second category includes lands that are adjacent to or intermingled with fast-growing areas within counties or municipalities that are otherwise categorized as Investment Levels 1 or 2. Environmentally sensitive features, agricultural preservation issues, or other infrastructure issues most often impact these lands. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state agencies and local governments with land-use authority.

Due to the limits of finite financial resources, state infrastructure spending on "hard" or "grey" infrastructure such as roads, sewer, water, and public facilities will generally be directed to Investment Level 1 and 2 Areas during this planning period. The State will consider investing in these types of infrastructure in Investment Level 3 Areas once the Investment Level 1 and 2 Areas are substantially built out, or when the infrastructure or facilities are logical extensions of existing systems and deemed appropriate to serve a particular 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 (for example, unincorporated areas like Clarksville in Sussex County and Port Penn in New Castle County).

Investment Level 4 Areas also boast undeveloped natural areas, such as forestlands, and large recreational uses, such as state and county parks and fish and wildlife preserves. Level 4 Areas may include natural habitats that are important for providing "ecosystem services" such as improving water quality and reducing flood risk. Sometimes, private recreational facilities, such as campgrounds or golf courses (often with associated residential developments), are also situated in Investment Level 4 Areas.

Proposed Development's Compatibility with Strategies for State Policies and Spending: The proposed Canal Overlook development falls within Investment Levels 3 and 4, and is to be developed with 108 single family detached houses. The proposed development is mostly consistent with the character of Investment Level 3, especially considering that any relatively nearby Level 1 and 2 areas are substantially built out. However, Investment Level 4 should emphasize only

development that is compatible with and enhances agriculture, agribusiness, appropriate visitor activities, and similar economic activities. New housing developments are generally discouraged in such areas. Based on the *2020 Delaware Strategies for State Polices and Spending* document, the proposed development does not appear to be compatible with Investment Level 4 and its compatibility with Investment Level 3 is at least questionable. As such, additional discussion is required.

Comprehensive Plan

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

The New Castle County Comprehensive Plan 2012 Future Land Use Map indicates that the proposed development is located within the Low Density Residential Area (1-3 du/acre).

Proposed Development's Compatibility with Comprehensive Plan: The proposed Canal Overlook project includes 108 dwelling units on an approximately 83-acre parcel (1.3 du/acre). The land is currently zoned S (Suburban) in New Castle County. The developer does not plan to rezone the land. According to Section 40.02.200 of the New Castle County Unified Development Code (UDC), characteristics of the S (Suburban) zoning district are as follows:

- Permits a wide range of residential uses.
- Permits moderate to high-density development and a full range of residential uses in a manner consistent with providing a high quality suburban character. Significant areas of open space and/or landscaping shall be provided to maintain the balance between green space and buildings that characterize suburban character.
- Used to in-fill tracts containing at last five acres or where New Castle County seeks to redevelop the area to suburban character.

The proposed development appears to fit within the above characteristics of S zoning, and is within the desired density range for a Low Density Residential Area. As such, the proposed development appears to comply with New Castle County's Comprehensive Plan 2012 as well as the S zoning.

Relevant Projects in the DelDOT Capital Transportation Program

Currently there are no active DelDOT projects within the study area.

Trip Generation

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

- 108 single-family detached houses (ITE Land Use Code 210)

Table 1
Canal Overlook Peak Hour Trip Generation

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
108 single-family detached houses	20	61	81	69	40	109
TOTAL TRIPS	**20**	**61**	**81**	**69**	**40**	**109**

Overview of TIS

Intersections examined:

1) Cox Neck Road & Site Access A (east access)
2) Cox Neck Road & Site Access B (west access)
3) US Route 13 & Cox Neck Road
4) Cox Neck Road & Wagonwheel Drive / Hybridge Avenue
5) Cox Neck Road & Cobblestone Drive
6) Cox Neck Road & Clarks Corner Road
7) Cox Neck Road & Nicholas Court
8) Cox Neck Road & Gunning Bedford Middle School Access
9) Cox Neck Road & Southern Elementary School Access
10) Cox Neck Road & Nowland Lane
11) Cox Neck Road & 7th Street
12) Clinton Street & 5th Street

Conditions examined:

1) 2021 Existing (Case 1)
2) 2026 without development (Case 2)
3) 2026 with development (Case 3)

Peak hours evaluated: Weekday morning and evening peak hours

Committed developments considered:

1) Fort Dupont Redevelopment: 35 single family homes, 75 townhomes, 100 stacked townhomes, 25 apartments, 75,000 square feet of office, a 4,720 square foot state law enforcement office, 50,000 square feet of retail, and a 9,800 square foot restaurant
2) Delaware Logistics Park: 255,395 square foot industrial building
3) Peoples Park: 2,885,110 square foot industrial park
4) Whitehall: 64,350 square feet of commercial space, 14,950 square foot office, 2,994 residential units, and a 299-student middle/junior high school
5) Whitehall Scott Run Business Park: 1,720,000 square feet of office and 104,000 square feet of commercial space
6) Bayberry North: 527 single-family homes, 67 townhomes, and 60 twin homes
7) Windsor at Hyetts Corner: 149 single-family detached homes
8) Winchelsea: 181 single family homes, 44 twin homes, 134 townhomes, and 154 apartments
9) Bayberry Town Center: 150 single family homes, 150 townhomes, 300 apartments, 178,960 square feet of office space, a 61,650 square foot athletic club, 381,594 square feet of commercial space and 38,500 square feet of restaurant space
10) Bayberry South: 580 single family homes, 100 townhomes, 389 age-restricted single-family homes, and 120 age-restricted apartments
11) Boyds Corner Farm: 116 single family homes, 98,980 square feet of commercial space, and 48,000 square feet of office space
12) Shannon Cove: 39 single family homes remaining to be built
13) Windsor Commons: 316 low-rise multi-family homes
14) Hubers Crossing: 119,385 square foot shopping center with a 11,943 square foot paramedic substation

Intersection Descriptions

1) **Cox Neck Road & Site Access A (east access)**
   Type of Control: proposed one-way stop (T-intersection)
   Eastbound Approach: (Cox Neck Road) one through lane and one right-turn lane
   Westbound Approach: (Cox Neck Road) one shared through/left-turn lane
   Northbound Approach: (Site Access A) one shared left/right-turn lane, stop controlled

2) **Cox Neck Road & Site Access B (west access)**
   Type of Control: proposed one-way stop (T-intersection)
   Eastbound Approach: (Cox Neck Road) one through lane and one right-turn lane
   Westbound Approach: (Cox Neck Road) one shared through/left-turn lane
   Northbound Approach: (Site Access B) one shared left/right-turn lane, stop controlled

3) **US Route 13 & Cox Neck Road**
   Type of Control: signalized
   Westbound Approach: (Cox Neck Road) one left-turn lane and one right-turn lane
   Northbound Approach: (US Route 13) one u-turn lane, two through lanes, and one right-turn lane
   Southbound Approach: (US Route 13) one left-turn lane and two through lanes

4) **Cox Neck Road & Wagonwheel Drive / Hybridge Avenue**
Type of Control: two-way stop controlled
Eastbound Approach: (Cox Neck Road) one shared left/through/right-turn lane
Westbound Approach: (Cox Neck Road) one shared through/left-turn lane and one right-turn lane
Northbound Approach: (Hybridge Avenue) one shared left/through/right-turn lane, stop controlled
Southbound Approach: (Wagonwheel Drive) one shared left/through/right-turn lane, stop controlled

5) **Cox Neck Road & Cobblestone Drive**
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Cox Neck Road) one through lane and one right-turn lane
Westbound Approach: (Cox Neck Road) one shared through/left-turn lane
Northbound Approach: (Cobblestown Drive) one shared left/right-turn lane, stop controlled

6) **Cox Neck Road & Clarks Corner Road**
Type of Control: two-way stop controlled
Eastbound Approach: (Cox Neck Road) one shared left/through/right-turn lane
Westbound Approach: (Cox Neck Road) one shared left/through/right-turn lane
Northbound Approach: (Clarks Corner Road) one shared left/through/right-turn lane, stop controlled
Southbound Approach: (Clarks Corner Road) one shared left/through/right-turn lane, stop controlled

7) **Cox Neck Road & Nicholas Court**
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Cox Neck Road) one shared through/left-turn lane
Westbound Approach: (Cox Neck Road) one through lane and one right-turn lane
Southbound Approach: (Nicholas Court) one shared left/right-turn lane, stop controlled

8) **Cox Neck Road & Gunning Bedford Middle School Access**
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Cox Neck Road) one shared through/left-turn lane
Westbound Approach: (Cox Neck Road) one shared through/right-turn lane
Southbound Approach: (Middle School Access) one shared left/right-turn lane, stop controlled
Note: there is also a yellow/red flasher signal at this intersection

9) **Cox Neck Road & Southern Elementary School Access**
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Cox Neck Road) one shared through/left-turn lane and one bypass lane
Westbound Approach: (Cox Neck Road) one through lane and one right-turn lane
Southbound Approach: (Elementary School Access) one shared left/right-turn lane, stop controlled

10) Cox Neck Road & Nowland Lane
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Cox Neck Road) one shared through/right-turn lane
Westbound Approach: (Cox Neck Road) one shared through/left-turn lane
Northbound Approach: (Nowland Lane) one shared left/right-turn lane, stop controlled

11) Cox Neck Road & 7th Street
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Cox Neck Road) one shared through/right-turn lane
Westbound Approach: (Cox Neck Road) one shared through/left-turn lane
Northbound Approach: (7th Street) one shared left/right-turn lane, stop controlled

12) Clinton Street & 5th Street
Type of Control: signalized
Eastbound Approach: (Clinton Street) one shared left/through/right-turn lane
Westbound Approach: (Clinton Street) one shared left/through/right-turn lane
Northbound Approach: (5th Street) one shared left/through/right-turn lane
Southbound Approach: (5th Street) one shared left/through/right-turn lane

Safety Evaluation

Crash Data: Delaware Crash Analysis Reporting System (CARS) data was provided in the TIS for the three-year period from November 4, 2018, through December 4, 2021. For the entire study area there was a total of 22 reportable crashes, 9 of which were at intersections. Of those 22 crashes, 18 resulted in property damage only while 4 crashes resulted in injuries. There were no fatal crashes. None of the crashes involved a bicyclist or pedestrian. Ten crashes were not a collision between two vehicles, and many of those were a single vehicle hitting a deer. Five of the crashes were at the intersection of Clinton Street & 5th Street.

Sight Distance: The study area generally consists of relatively flat roadways. Along Cox Neck Road near the proposed site accesses there are few visual obstructions. However, there is horizontal curve located just to the east of the proposed eastern site access. Other than that, sight distance generally appears adequate throughout the study area. No problematic sight distance issues have been reported or indicated by crash data. As always adequacy of available sight distance should be confirmed during the site plan review process for all proposed movements at the site accesses.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates one bus route in the study area along Cox Neck Road (Bus Route 44, connecting Delaware City to St. Georges and Christiana); however, there are currently no bus stops within 1.5 miles of the proposed development.

Planned transit service: It is unknown if DTC will provide additional transit service in the immediate area of the development, but they have requested a crosswalk across Cox Neck Road to support a pair of companion Type 2 5’ by 8’ bus stop pads along Cox Neck Road.

Existing bicycle and pedestrian facilities: According to DelDOT's New Castle County Bicycle Map, Cox Neck Road is classified as a Regional Bicycle Route with Bikeway (east of Clarks Corner Road) and as a Statewide Bicycle Route with Bikeway (west of Clarks Corner Road). Clarks Corner Road north of Cox Neck Road is classified as a Statewide Bicycle Route without Bikeway. US Route 13 is classified as a High-Traffic Statewide Bicycle Route with Bikeway. Just to the south of the site along the Chesapeake and Delaware Canal is the off-road Michael N. Castle Trail. There are no bike lanes but there are shoulders along Cox Neck Road near the proposed site. Sidewalks are limited to the following locations:

- On the south side of Cox Neck Road (Clinton Street) to the east of Nowland Lane
- On the north side of Cox Neck Road between Center Street and Cobblestone Drive and in the vicinity of Nicholas Court
- On both sides of 5th Street, Wagonwheel Drive, Nicholas Court, Dane Court, and Cobblestone Drive
- Crosswalks across Nicholas Court and on all four legs of Clinton Street & 5th Street

Planned bicycle and pedestrian facilities: There are no known plans to add bike lanes, sidewalks or crosswalks at any off-site intersections, other than DTC's request for a crosswalk across Cox Neck Road. There is a trail proposed to run through the site, connecting Cox Neck Road to the Michael N. Castle Trail along the C & D Canal. A shared-use path should also be provided along the Cox Neck Road site frontage.

Previous Comments

In a review letter dated February 23, 2022, DelDOT indicated that the Preliminary TIS was acceptable as submitted.

It appears that all substantive comments from DelDOT's TIS Scoping Memorandum, Traffic Count Review, Revised Traffic County Review, Preliminary TIS Review, and other correspondence were addressed in the Final TIS submission. One exception to this is that there is no evidence that the developer contacted DelDOT Staff as requested in the Scoping Memo to obtain input on Bicycle/Pedestrian/Transit facilities.

General HCS Analysis Comments

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

1) For two-way stop control intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized intersections, the TIS and McCormick Taylor applied HV by lane group using existing data. The TIS and McCormick Taylor generally assumed future HV to be the same as existing HV at all intersections other than site access. For site accesses, 3% was assumed as per the DelDOT Development Coordination Manual section 2.2.8.11.6.H.

2) For existing conditions, the TIS and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts that were available. Future PHFs were assumed to be the same as existing.

3) For analyses of signalized intersections, McMahon and McCormick Taylor used a base saturation flow rate of 1,900 pc/hr/ln per DelDOT's Development Coordination Manual.

4) For analyses of all intersections, McCormick Taylor and the TIS assumed 0% grade for all movements.

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

Table 2
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [1] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Site Access A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2026 Build Condition (Case 3)				
Westbound Cox Neck Road – Left	A (7.4)	A (7.5)	A (7.4)	A (7.5)
Northbound Site Access A	A (9.4)	A (9.8)	A (9.4)	A (9.8)

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

Table 3
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [2] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Site Access B	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2026 Build Condition (Case 3)				
Westbound Cox Neck Road – Left	A (7.4)	A (7.6)	A (7.4)	A (7.6)
Northbound Site Access B	A (9.8)	B (10.2)	A (9.8)	B (10.2)

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

Table 4
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Signalized Intersection [3]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Cox Neck Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)	B (18.9)	B (16.7)	C (20.1)	B (17.4)
2026 No Build Condition (Case 2)	C (22.0)	B (17.7)	C (23.6)	B (18.5)
2026 Build Condition (Case 3)	C (24.1)	B (18.3)	C (26.1)	B (19.2)

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

Table 5
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [4] **Two-Way Stop**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Wagonwheel Drive / Hybridge Avenue	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Cox Neck Road – Left	A (7.9)	A (8.4)	A (7.9)	A (8.4)
Westbound Cox Neck Road – Left	A (9.5)	A (7.6)	A (9.5)	A (7.6)
Northbound Hybridge Avenue	C (16.5)	C (19.9)	C (16.5)	C (19.9)
Southbound Wagonwheel Drive	B (11.2)	B (11.9)	B (11.2)	B (11.9)
2026 No-Build Condition (Case 2)				
Eastbound Cox Neck Road – Left	A (8.0)	A (8.5)	A (8.0)	A (8.5)
Westbound Cox Neck Road – Left	A (9.7)	A (7.6)	A (9.7)	A (7.6)
Northbound Hybridge Avenue	C (16.2)	C (15.6)	C (16.2)	C (15.6)
Southbound Wagonwheel Drive	B (12.1)	B (12.6)	B (12.1)	B (12.6)
2026 Build Condition (Case 3)				
Eastbound Cox Neck Road – Left	A (8.2)	A (8.6)	A (8.2)	A (8.6)
Westbound Cox Neck Road – Left	A (9.8)	A (7.8)	A (9.8)	A (7.8)
Northbound Hybridge Avenue	C (17.3)	C (17.3)	C (17.3)	C (17.3)
Southbound Wagonwheel Drive	B (12.7)	B (13.3)	B (12.7)	B (13.3)

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

Table 6
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [5] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Cobblestone Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Cox Neck Road – Left	A (8.1)	A (7.7)	A (8.1)	A (7.7)
Northbound Cobblestone Drive	B (14.9)	B (13.0)	B (14.9)	B (12.9)
2026 No-Build Condition (Case 2)				
Westbound Cox Neck Road – Left	A (8.2)	A (7.8)	A (8.2)	A (7.8)
Northbound Cobblestone Drive	C (16.2)	B (13.6)	C (16.1)	B (13.6)
2026 Build Condition (Case 3)				
Westbound Cox Neck Road – Left	A (8.3)	A (7.9)	A (8.3)	A (7.9)
Northbound Cobblestone Drive	C (17.4)	B (15.0-)	C (17.4)	B (14.9)

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

Table 7
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [6] **Two-Way Stop**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Clarks Corner Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Cox Neck Road – Left	A (7.9)	A (7.9)	A (7.9)	A (7.9)
Westbound Cox Neck Road – Left	A (8.2)	A (7.5)	A (8.2)	A (7.5)
Northbound Clarks Corner Road	B (14.0)	B (10.9)	B (14.0)	B (10.9)
Southbound Clarks Corner Road	C (23.1)	B (14.3)	C (23.1)	B (14.3)
2026 No-Build Condition (Case 2)				
Eastbound Cox Neck Road – Left	A (8.0)	A (8.0)	A (8.0)	A (8.0)
Westbound Cox Neck Road – Left	A (8.3)	A (7.6)	A (8.3)	A (7.6)
Northbound Clarks Corner Road	C (15.2)	B (11.4)	C (15.2)	B (11.4)
Southbound Clarks Corner Road	D (30.6)	C (16.1)	D (30.6)	C (16.1)
2026 Build Condition (Case 3)				
Eastbound Cox Neck Road – Left	A (8.2)	A (8.1)	A (8.2)	A (8.1)
Westbound Cox Neck Road – Left	A (8.4)	A (7.7)	A (8.4)	A (7.7)
Northbound Clarks Corner Road	C (16.2)	B (12.2)	C (16.2)	B (12.2)
Southbound Clarks Corner Road	E (40.6)	C (20.1)	E (40.6)	C (20.1)

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

Table 8
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [7] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Nicholas Court	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Cox Neck Road – Left	A (7.9)	A (8.0)	A (7.9)	A (8.0)
Southbound Nicholas Court	B (11.3)	B (11.3)	B (11.3)	B (11.3)
2026 No-Build Condition (Case 2)				
Eastbound Cox Neck Road – Left	A (8.0)	A (8.1)	A (8.0)	A (8.1)
Southbound Nicholas Court	B (11.8)	B (12.0)	B (11.8)	B (12.0)
2026 Build Condition (Case 3)				
Eastbound Cox Neck Road – Left	A (8.2)	A (8.3)	A (8.2)	A (8.3)
Southbound Nicholas Court	B (12.6)	B (13.1)	B (12.6)	B (13.1)

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

Table 9
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [8] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Gunning Bedford Middle School Access	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Cox Neck Road – Left	A (8.3)	A (7.9)	A (8.3)	A (7.9)
Southbound Middle School Access	B (11.7)	B (10.5)	B (11.7)	B (10.5)
2026 No-Build Condition (Case 2)				
Eastbound Cox Neck Road – Left	A (8.4)	A (8.0)	A (8.4)	A (8.0)
Southbound Middle School Access	B (12.5)	B (10.9)	B (12.5)	B (10.9)
2026 Build Condition (Case 3)				
Eastbound Cox Neck Road – Left	A (8.8)	A (8.1)	A (8.8)	A (8.1)
Southbound Middle School Access	B (14.0)	B (11.5)	B (14.0)	B (11.5)

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

Table 10
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [9] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Southern Elementary School Access	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Eastbound Cox Neck Road – Left	A (7.9)	A (7.4)	A (7.9)	A (7.4)
Southbound Elementary School Access	A (9.8)	B (10.0+)	A (9.8)	B (10.0+)
2026 No-Build Condition (Case 2)				
Eastbound Cox Neck Road – Left	A (8.0)	A (7.5)	A (8.0)	A (7.5)
Southbound Elementary School Access	B (10.0+)	B (10.4)	B (10.0+)	B (10.4)
2026 Build Condition (Case 3)				
Eastbound Cox Neck Road – Left	A (8.2)	A (7.7)	A (8.2)	A (7.7)
Southbound Elementary School Access	B (10.5)	B (11.1)	B (10.5)	B (11.1)

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

Table 11
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [10] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & Nowland Lane	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Cox Neck Road – Left	A (7.5)	A (7.4)	A (7.5)	A (7.4)
Northbound Nowland Lane	A (9.1)	A (9.2)	A (9.0)	A (9.2)
2026 No-Build Condition (Case 2)				
Westbound Cox Neck Road – Left	A (7.6)	A (7.4)	A (7.6)	A (7.4)
Northbound Nowland Lane	A (9.4)	A (9.4)	A (9.4)	A (9.4)
2026 Build Condition (Case 3)				
Westbound Cox Neck Road – Left	A (7.6)	A (7.4)	A (7.6)	A (7.4)
Northbound Nowland Lane	A (9.5)	A (9.5)	A (9.5)	A (9.5)

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

Table 12
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Unsignalized Intersection [11] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Cox Neck Road & 7th Street	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)				
Westbound Cox Neck Road – Left	A (7.7)	A (7.4)	A (7.7)	A (7.4)
Northbound 7th Street	A (9.0)	A (9.1)	A (9.0)	A (9.1)
2026 No-Build Condition (Case 2)				
Westbound Cox Neck Road – Left	A (7.8)	A (7.5)	A (7.8)	A (7.5)
Northbound 7th Street	A (9.3)	A (9.3)	A (9.3)	A (9.3)
2026 Build Condition (Case 3)				
Westbound Cox Neck Road – Left	A (7.8)	A (7.5)	A (7.8)	A (7.5)
Northbound 7th Street	A (9.3)	A (9.4)	A (9.3)	A (9.4)

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

Table 13
Peak Hour Levels of Service (LOS)
Based on Canal Overlook Traffic Impact Study – May 2022
Prepared by McMahon Associates, Inc.

Signalized Intersection [12]	**LOS per TIS**		**LOS per McCormick Taylor**	
Clinton Street & 5th Street	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 Existing (Case 1)	B (12.3)	B (12.5)	B (10.5)	A (6.9)
2026 No Build Condition (Case 2)	B (13.2)	B (13.7)	A (8.6)	A (6.8)
2026 Build Condition (Case 3)	B (13.7)	B (14.1)	A (9.1)	A (7.0)

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