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

NICOLE MAJESKI
SECRETARY

September 10, 2024

Jon Sabatino, PE
Site Studios, Inc.
P.O. Box 682
North East, MD 21901

Dear Mr. Sabatino:

The enclosed Traffic Impact Study (TIS) review letter for the **John G. Leach** (Tax Parcel: 1201300090) school 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 Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Group Project Engineer

AF:km
Enclosures
cc with enclosures: Steven Hudson, Colonial School District
David L. Edgell, Office of State Planning Coordination
Antoni Sekowski, New Castle County Department of Land Use
Bradford Shockley, New Castle County Department of Land Use
Owen C. Robatino, New Castle County Department of Land Use
Andrew J. Parker, McCormick Taylor, Inc.
Tucker Smith, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT

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Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Deputy Secretary, Transportation Solutions (DOTS)
Mark Luszcz, Deputy Director, Operations and Support, Traffic, DOTS
Matthew Vincent, Assistant Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Sean Humphrey, Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Nathan Draper, Canal District Public Works Engineer, Canal District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Pamela Steinebach, Director, Planning
Todd Sammons, Assistant Director, Development Coordination, Planning
Wendy Polasko, Subdivision Engineer, Development Coordination, Planning
Randhir Sharma, New Castle Review Coordinator, Development Coordination, Planning
Sireen Muhtaseb, TIS Group Manager, Development Coordination, Planning
Ben Fisher, TIS Group Engineer, Development Coordination
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Steve Bayer, Regional Transportation Planner, Statewide & Regional Planning

August 29, 2024

Ms. Annamaria Furmato
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1946F
Traffic Impact Study Services
Task No. 2A Subtask 01A – George Leach School

Dear Ms. Furmato:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the George Leach School development prepared by Duffield Associates, Inc. dated February 2021. Duffield Associates prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed George Leach School development, proposed to be located on the west side of Delaware Route 7 (Bear Corbitt Road / New Castle Road 5), north of the intersection of Delaware Route 72 and US Route 13 in New Castle County, Delaware. The proposed development would consist of a 65,000 square-foot special needs school. One right-in/right-out access driveway is proposed on Bear Corbitt Road/Delaware Route 7. At the time the TIS was prepared, construction was expected to be complete by 2022.

The subject land is located on an approximately 19 acre parcel. The land is currently zoned CR (Commercial Residential), and the developer does not plan to rezone the land.

Currently, DelDOT has one active project near the study area: *SR 72, McCoy Road to SR 71* (State Project No. T200601102). This project entails widening Delaware Route 72 to four lanes and a center-turn lane. The project limits go from just west of Delaware Route 71 to just east of McCoy Road. In addition, this project will incorporate bicycle lanes and sidewalks, enhancing multi-modal transportation, safety, and operational improvements along Delaware Route 72. This project is currently under construction, which is expected to continue until 2025.

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

The proposed George Leach School 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 included in the New Castle County scope of study.

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 deficiencies are on the stop-controlled minor street approach at one unsignalized intersection. Because this unsignalized intersections is controlled by a stop sign on only the minor street approach, the deficiencies pertain 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***
DE Route 72 and School House Road	Unsignalized	2022 without George Leach School PM (Case 2); 2022 with George Leach School PM (Case 3)

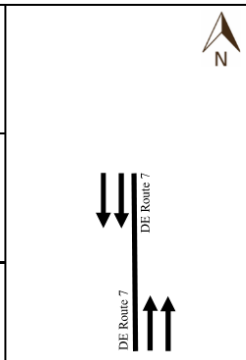
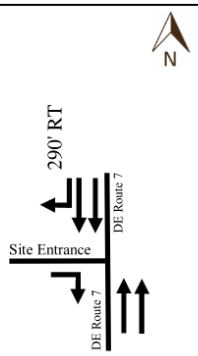
DE Route 72 at School House Road (See Table 6, Page 20)
This unsignalized intersection operates acceptably in existing conditions during the weekday AM and PM peak hours. However, the intersection experiences LOS deficiencies in the PM peak hour for 2022 conditions, both without and with the George Leach School. The southbound Schoolhouse Road approach is projected to operate at LOS F in the 2022 PM peak hour when capacity analysis is based on the existing peak hour factor (PHF) of 0.65 per 2019 traffic count data. If the future PHF is increased to 0.92, which guidance in DelDOT's Development Coordination Manual allows if approved by DelDOT and which appears to be reasonable to do in this case based on the relatively large increase in volumes from existing to future conditions due to other developments, the analysis of future conditions at this intersection indicates no deficiencies. Given the possibility that the intersection would not have any LOS deficiencies and the very low number of vehicles (less than 10) that are projected to be added to this intersection by the George Leach School during the future PM peak hour, we do not recommend any improvements be implemented by the developer at this intersection.

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, unless a Design Deviation is requested and approved by the Department. 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. The following items should be implemented at the same time as site construction once all agency approvals and permits are secured and completed in accordance with DelDOT's Standards and Specifications.

1. The developer shall improve the State-maintained Roads on which they front (Delaware Route 7 and Delaware Route 72), within the limits of their frontage. 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" means the length along the state right-of-way of a single property tract where an entrance is proposed or required. If a single property tract has frontage along multiple roadways, any segment of roadway including an entrance shall be improved to meet DelDOT's Functional Classification criteria as found in Section 1.1 of the Development Coordination Manual and elsewhere therein, and/or improvements established in the Traffic Operational Analysis and/or Traffic Impact Study. "Secondary Frontage" means the length along the state right-of-way of a single property tract where no entrance is proposed or required. The segment of roadway may be upgraded by improving

the pavement condition of the existing roadway width. The Pavement Management Section and Subdivision Section will determine the requirements to improve the pavement condition.

2. The developer should construct the right-in/right-out site access on southbound Delaware Route 7. The site access should be located approximately 500 feet south of the existing median crossover on Delaware Route 7 just north of the site. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Northbound DE Route 7	Two through lanes		Northbound DE Route 7	Two through lanes	
Southbound DE Route 7	Two through lanes		Southbound DE Route 7	Two through lanes and one right turn lane	
Eastbound	Approach does not exist		Eastbound Site Entrance	One right-turn only lane. Stop control.	
Westbound	Approach does not exist		Westbound	Approach does not exist	

At the proposed Site Entrance intersection, a separate right-turn lane is warranted on southbound Delaware Route 7 based on DelDOT's Auxiliary Lane Worksheet. The initial recommended minimum turn lane length (excluding taper) is a 290-foot right-turn lane. 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.

3. The following bicycle and pedestrian 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. Bicycle parking should be provided near school 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 frontages along Delaware Route 7 and Delaware Route 72. Within the easements along the Delaware Route 7 and Delaware Route 72 site frontages, a minimum of a ten-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 Development Coordination Manual. The developer should coordinate with DelDOT's Development Coordination Section to determine the details of the shared-use path connections at the property boundaries.

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

g. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the school site. 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 on the school site should connect to the proposed shared-use path along Delaware Route 7.

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


Scope of Improvements Figure
George Leach School TIS
Proposed Site Entrance – frontage improvements and turn lanes as described in the review letter
Study Intersection – No Improvements
Emerald Ridge
Roger Corp
Lower Twin
George Leach School Site
DE 1
DE 7
DE 72
School House Rd
River Rd
DE 72
DE 72
Mid County
DE 1
US 13
Clarks Corner Rd
Mullins Dr

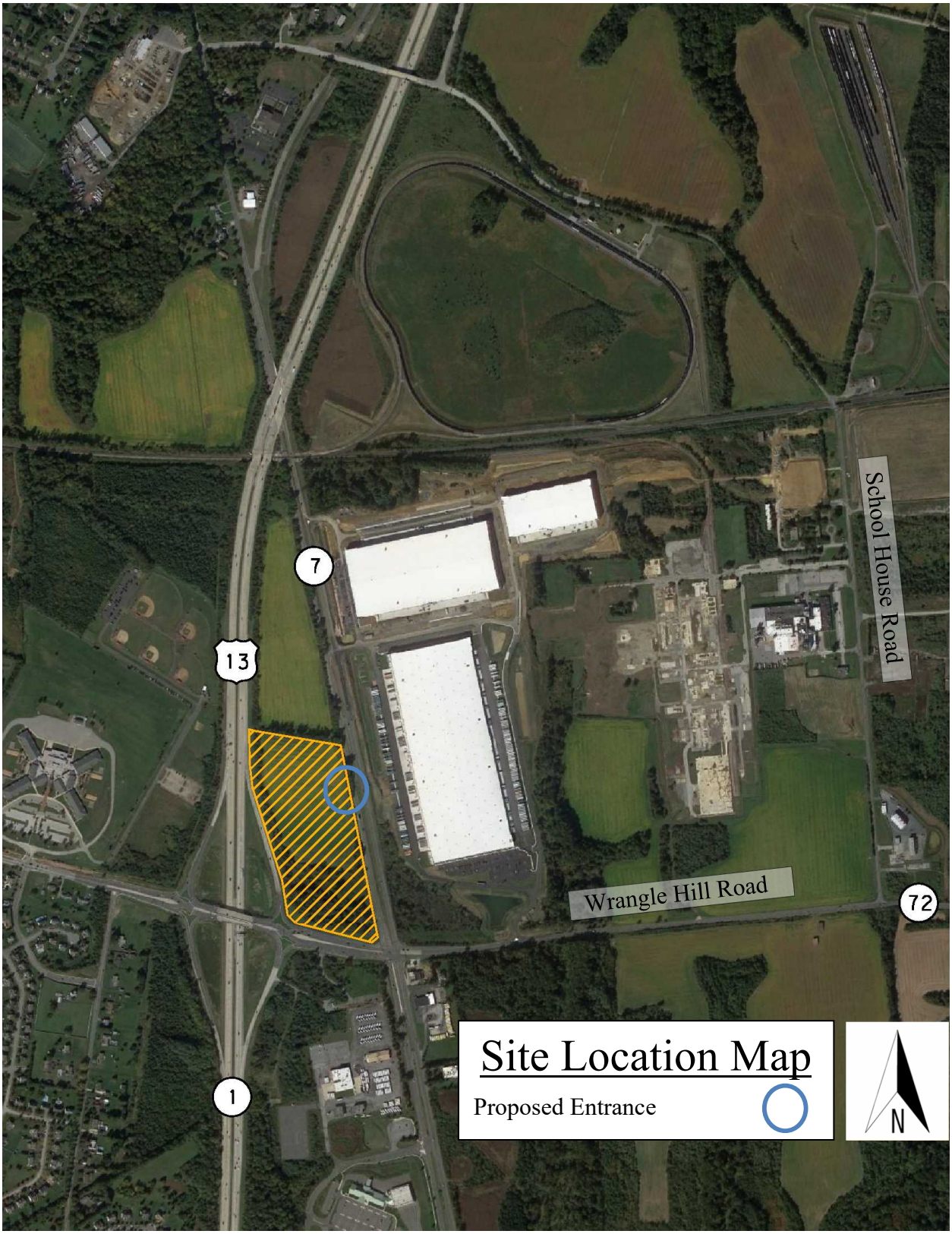
General Information

Report date: February 2021
Prepared by: Duffield Associates, Inc
Prepared for: George Leach School
Tax parcel: 12-013.00-090
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed George Leach School project consists of a 65,000 square-foot special needs school.
Location: The land is located on the northwest corner of the intersection of Delaware Route 72 and US Route 13 / Bear Corbitt Road (Delaware Route 7 / New Castle Road 5), east of Delaware Route 1, in New Castle County. A site location map is included on page 7.
Amount of land to be developed: Approximately 19 acres
Land use approval(s) needed: Subdivision approval. The land is zoned CR (Commercial Residential), and the developer does not plan to rezone the land.
Proposed completion year: At the time the TIS was prepared, construction was expected to be complete by 2022.
Proposed access locations: One rights-in/rights-out access point is proposed on Bear Corbitt Road/Delaware Route 7.
Daily Traffic Volumes (per DelDOT Traffic Summary 2019):

- 2019 Average Annual Daily Traffic on Delaware Route 7: 5,947 vehicles/day


School House Road
7
13
Wrangle Hill Road
72
1
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 George Leach School development is located within Investment Level 2.

Investment Level 2
This investment level has many diverse characteristics. These areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. These areas have been shown to be the most active portion of Delaware's developed landscape. They serve as transition areas between Level 1 and the more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity.

Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, and provides essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community. Investment Level 2 areas are prime locations for designating "pre-permitted areas."

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed George Leach School project consists of a 65,000 square-foot educational development located in an Investment Level 2 area. In Investment Level 2, the DOE will offer expedited approval for educational facilities and co-location of services in campus settings to the extent possible. In this Investment Level there is unqualified consideration of certificates of necessity and state participation in projects in accordance with established statutes, regulations, and procedures. As such, the proposed development appears to comply with the guidelines set forth in the 2020 "Strategies for State Policies and Spending".

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 entirely within the Office/Commercial/Industrial Development Area (OCI) including all areas where the school is planned to be built according to the site plan provided in the TIS.

The New Castle County Comprehensive Plan indicates that a combination of Centralized Southern Growth and Northern New Castle County Redevelopment (which calls for directing more of the future growth into the infill and Office/Commercial/Industrial (OCI) Development Areas north of the canal) is the most cost-effective, environmentally prudent and infrastructurally efficient manner to meet the County's future growth needs.

Proposed Development's Compatibility with Comprehensive Plan: The proposed George Leach School project includes a 65,000 square-foot development on an approximately 19 acre lot. The land is currently zoned as CR (Commercial Residential). The developer does not plan to rezone the land. The purpose of CR zoning districts is to provide for community and regional commercial services, with a suburban transition character. The New Castle County Comprehensive Plan 2012 Future Land Use Map indicates that the proposed development parcel is within the Office/Commercial/Industrial Development Area (OCI) Area. The proposed development appears to comply with the New Castle County's Comprehensive Plan 2012 as well as the CR zoning.

Relevant Projects in the DelDOT Capital Transportation Program

Currently, DelDOT has one active project near the study area: *SR 72, McCoy Road to SR 71* (State Project No. T200601102). This project entails widening Delaware Route 72 to four lanes and a center-turn lane. The project limits go from just west of Delaware Route 71 to just east of McCoy Road. In addition, this project will incorporate bicycle lanes and sidewalks, enhancing multi-modal transportation, safety, and operational improvements along Delaware Route 72. This project is currently under construction, which is expected to continue until 2025.

Trip Generation

Trip generation for the proposed development was obtained through specific demographic and operational data for students and staff (number of students and staff, bus transportation vs parent drop-off, arrival, and departure times) that was provided to Duffield Associates by the Colonial School District. Volumes were reviewed and approved by DelDOT. Trip generation data is summarized below:

Table 1
GEORGE LEACH SCHOOL PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Weekday ADT		
	In	Out	Total	In	Out	Total	In	Out	Total
65,000 sf school	45	45	90	0	72	72	167	167	334
TOTAL TRIPS	**45**	**45**	**90**	**0**	**72**	**72**	**167**	**167**	**334**

Overview of TIS

Intersections examined:

1) Site Entrance / Delaware Route 7
2) US Route 13 / Delaware Route 7 / Delaware Route 72
3) Northbound Delaware Route 1 Ramps / Delaware Route 72
    a. Signalized intersection
    b. Merge of Westbound right and Eastbound Left
    c. Merge onto Northbound Delaware Route 1
4) Southbound Delaware Route 1 Ramps / Delaware Route 72
    a. Signalized intersection
    b. Merge of Westbound left and Eastbound right
    c. Merge onto Southbound Delaware Route 1
5) Delaware Route 72 / School House Road (New Castle Road 406)
6) Delaware Route 72 / River Road / Clarks Corner Road (New Castle Road 378)
7) US Route 13 / Mid County Drive
8) US Route 13 / Mullins Drive
9) Delaware Route 7 / Lower Twin Lane (New Castle Road 406) / Julian Lane
10) Delaware Route 7 / Roger Corporation (a.k.a Arlon, Inc.) Entrance
11) Delaware Route 7 / Emerald Ridge Road

Conditions examined:

1) 2020 existing (Case 1)
2) 2022 without school (Case 2)
3) 2022 with school (Case 3)

Peak hours evaluated: Weekday morning and evening peak hours

Committed developments considered (when TIS was prepared):

1) New Castle Logistics Park (northeast corner of the intersection of Delaware Route 72 and US Route 13 / Delaware Route 7): 2,008,760 square feet (1,346 employees) of industrial space.
2) Fort DuPont Redevelopment (Delaware City, recent TIS): 50 single-family detached houses, 105 townhouses, 100 condominiums, 161 low-rise apartments, 85-bed assisted living facility, 25-room hotel, 13,000 SF museum, 141,000 SF office space, 4,720 SF government office building, 75,572 SF retail, and 9,800 SF quality restaurant.
3) Peoples Park (Route 72 north side, east of Route 72): Unbuilt 67,732 SF industrial space + 18,000 SF mini-warehouse space w. 180 SF office + several other unbuilt parcels.
4) DOT Foods/Peoples Park* (Route 72 north side, east of Route 72): Unbuilt 401,907 SF facility.
5) Highpointe at St. Georges (US 13 west side & Kirkwood-St. Georges Road north side): 15 unbuilt single-family detached houses out of a total of 175.
6) Arlon Expansion (a.k.a. Roger Corporation) (Route 7 east side & Governor Lea Road south side): Unbuilt 130,000 square feet manufacturing space. Built portion is 130,872 square feet of manufacturing space.

Intersection Descriptions

1) **Delaware Route 7 & Site Access**
   Type of Control: proposed minor yield-controlled intersection
   Eastbound Approach: (Site Access) proposed yield-controlled right-turn-only lane
   Northbound Approach: (DE Route 7) existing two through lanes separated from southbound lanes by grass median; proposed unchanged
   Southbound Approach: (DE Route 7) existing two through lanes; proposed two through lanes and one right-turn lane

2) **US Route 13/DE Route 7 & DE Route 72**
   Type of Control: signalized
   Eastbound Approach: (DE Route 72) one left-turn lane, two through lanes, and one channelized right-turn lane
   Westbound Approach: (DE Route 72) one left-turn lane, two through lanes, and one channelized right-turn lane
   Northbound Approach: (DE Route 13) two left-turn lanes, two through lanes, and one channelized right-turn lane
   Southbound Approach: (DE Route 7) one left-turn lane, one through lane, and one channelized right-turn lane

3) **Northbound DE Route 1 Ramps & DE Route 72 (Diverging Diamond Interchange)**
   Type of Control: signalized
   Eastbound Approach: (DE Route 72) two through lanes and one channelized left-turn lane
   Westbound Approach: (DE Route 72) two through lanes and one channelized right-turn lane
   Northbound Approach: (DE Route 1) two left-turn lanes and one channelized right-turn lane

4) **Southbound DE Route 1 Ramp & DE Route 72 (Diverging Diamond Interchange)**
   Type of Control: signalized
   Eastbound Approach: (DE Route 72) two through lanes and one channelized right-turn lane
   Westbound Approach: (DE Route 72) two through lanes and one channelized left-turn lane
   Southbound Approach: (DE Route 1) two left-turn lanes and one channelized right-turn lane

5) **DE Route 72 & School House Road**
   Type of Control: one-way stop (T-intersection)
   Eastbound Approach: (DE Route 72) one shared through/left-turn lane
   Westbound Approach: (DE Route 72) one shared through/right-turn
   Southbound Approach: (School House Road) one shared left/right-turn lane, stop control

6) **DE Route 72 & River Road/Clarks Corner Road**
   Type of Control: signalized
   Eastbound Approach: (DE Route 72) one shared through/left-turn lane and one channelized right turn lane
   Westbound Approach: (DE Route 72) one shared through/left-turn lane and one channelized right turn lane
   Northbound Approach: (Clarks Corner Road) one shared left/through/right-turn lane
   Southbound Approach: (River Road) one shared through/left-turn lane and one channelized right-turn lane

7) **US Route 13 & Mid County Drive**
   Type of Control: signalized
   Eastbound Approach: (Mid County Drive) two left-turn lanes and one channelized right-turn lane
   Northbound Approach: (US Route 13) one left-turn lane and two through lanes
   Southbound Approach: (US Route 13) one u-turn lane, two through lanes, and one channelized right-turn lane

8) **US Route 13 & Mullins Drive**
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Mullins Drive) one shared left/right-turn lane, stop-controlled
Northbound Approach: (US Route 13) one left-turn lane and two through lanes
Southbound Approach: (US Route 13) one u-turn lane, two through lanes, and one right-turn lane

9) **DE Route 7 & Lower Twin Lane / Julian Lane**
Type of Control: two-way stop controlled
Eastbound Approach: (Julian Lane) one shared left/through/right-turn lane, stop controlled
Westbound Approach: (Lower Twin Lane) one shared left/through/right-turn lane, stop controlled
Northbound Approach: (DE Route 7) one shared left/through/right-turn lane
Southbound Approach: (DE Route 7) one shared through/left-turn lane and one right-turn lane

10) **DE Route 7 & Rogers Corporation**
Type of Control: one-way stop (T-intersection)
Westbound Approach: (Rogers Corporation) one shared left/right-turn lane, stop controlled
Northbound Approach: (DE Route 7) one through lane and one right-turn lane
Southbound Approach: (DE Route 7) one shared through/left-turn lane

11) **DE Route 7 & Emerald Ridge Road**
Type of Control: one-way stop (T-intersection)
Eastbound Approach: (Emerald Ridge) one shared left/right-turn lane, stop controlled
Northbound Approach: (DE Route 7) one shared through/left-turn lane and a bypass lane
Southbound Approach: (DE Route 7) one through lane and one right-turn lane

Safety Evaluation

Crash Data: Delaware Crash Analysis Reporting System (CARS) data was provided in Appendix E of the TIS. However, per current DelDOT policy McCormick Taylor did not conduct a review of the provided crash data at this time.

Sight Distance: The proposed site access on Bear Corbitt Road (DE Route 7) is located on a divided highway and consists of one right-in/right-out movement, so there is ample sight distance for drivers looking north (left) when exiting the proposed development. As always adequacy of available sight distance should be confirmed during the site plan review process for all proposed movements at the site access. Aside from the site access, the study area generally consists of relatively flat roadways and there are few visual obstructions. Sight distance appears adequate throughout the study area.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates multiple fixed-route transit bus services in the area of the proposed George Leach School development. Bus stops for Routes 25, 44, 47, and 53 can be found at the Wrangle Hill @ Park & Ride bus stop on DE Route 13 just south of the DE Route 7/DE-Route 72 intersection. The New Castle County Logistics Center (located across DE Route 7 from the George Leach School) supports a bus stop for Route 25 as well. Neither of these bus stops are accessible by pedestrians from the proposed George Leach School.

Planned transit service: Based on coordination with DTC representatives, there are no requests for transit-related improvements associated with the proposed school.

Existing bicycle and pedestrian facilities: The following study area roadways are identified as "Bicycling Routes" on the *New Castle County Bicycle Map* published by DelDOT:

- DE Route 7:
  - Connector Bicycle Route with bikeway
  - Over 10,000 vehicles daily south of DE 72
- DE Route 72
  - Regional Bicycle Route with bikeway
  - Over 10,000 vehicles daily west of DE 7/DE 13
- DE Route 9
  - Statewide Bicycle Route with bikeway

There are no existing sidewalks or exclusive pedestrian facilities in the immediate area of the proposed site entrance on DE Route 7.

Planned bicycle and pedestrian facilities: There is no site plan provided in this TIS; therefore, McCormick Taylor is unable to ascertain whether or not proposed bicycle and pedestrian facilities are included in this development.

Based on coordination with Anthony Aglio with DelDOT's Statewide and Regional Planning Section, a shared-use path with proper setbacks is requested along the DE Route 7 site frontage.

Previous Comments

In a review letter dated January 29, 2021, DelDOT indicated that the revised Preliminary TIS was acceptable as submitted.

It appears that all substantive comments from DelDOT's TIS Scoping Memorandum, Traffic Count Review, Preliminary TIS Review, and other correspondence were addressed in the Final TIS submission.

General HCS Analysis Comments
(see table footnotes on the following pages for specific comments)

1) Both Duffield Associates and McCormick Taylor utilized Highway Capacity Software (HCS) version 7.8 to complete the traffic analyses.

2) For two-way stop control intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized and all-way stop control 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. There are some minor discrepancies between the TIS and McCormick Taylor's heavy vehicle factor calculations.

3) For existing conditions, the TIS determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts and if it was greater than 0.92 they used the calculated PHF in the existing and future analysis for that intersection. If it was less than 0.92, they used 0.92 in the existing and future analysis for that intersection. McCormick Taylor also determined overall intersection PHF for each intersection based on the turning movement counts, but we used the calculated PHF in all analyses. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F, which states that, "Generally existing PHFs shall be applied to future conditions as well." For one intersection (DE Route 72 & School House Road), because the existing PHF was so low (0.65) in the PM peak hour, we also conducted future analyses using a PHF of 0.92 per guidance in that section of the Development Coordination Manual.

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

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

6) For analyses of all intersections, the TIS assumed 0% grade for all movements. McCormick Taylor utilized field data for existing grades and assumed future grades to be the same.

Table 2
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Unsignalized Intersection [1] **Minor Yield-Controlled (Right-in/Right-out)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Delaware Route 7 & **Site Access**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Build Condition				
Eastbound Site Egress – Right	A (9.6)	B (11.0)	A (9.6)	B (11.0)

[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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 3
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Signalized Intersection [2]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13/DE Route 7 & DE Route 72	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)	C (30.4)	C (31.2)	C (34.4)	C (34.7)
2022 No Build Condition (Case 2)	D (36.5)	D (33.6)	D (39.8)	D (38.9)
2022 Build Condition (Case 3)	D (37.5)	C (33.8)	D (40.6)	D (39.3)

[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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 4
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Signalized Intersection and Ramp Merges [3]	**LOS per TIS**		**LOS per McCormick Taylor**	
Northbound DE Route 1 Ramp & DE Route 72 (Diverging Diamond Interchange)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)				
Northbound DE Route 1 at DE Route 72	B (14.7)	B (16.7)	B (19.2)	C (20.2)
WB DE Route 72 / EB DE Route 72 at Northbound DE Route 1 on-ramp Merge	A (6.8)	A (4.4)	A (6.8)	A (4.4)
Northbound DE Route 1 On-ramp Merge	D (29.2)	C (20.2)	D (29.2)	C (20.2)
2022 No Build Condition (Case 2)				
Northbound DE Route 1 at DE Route 72	B (17.7)	B (19.6)	C (20.9)	C (23.8)
WB DE Route 72 / EB DE Route 72 at Northbound DE Route 1 on-ramp Merge	A (7.6)	A (7.5)	A (7.6)	A (7.6)
Northbound DE Route 1 On-ramp Merge	D (30.8)	C (23.7)	D (30.8)	C (23.8)
2022 Build Condition (Case 3)				
Northbound DE Route 1 at DE Route 72	B (17.9)	B (19.6)	C (20.9)	C (24.4)
WB DE Route 72 / EB DE Route 72 at Northbound DE Route 1 on-ramp Merge	A (7.7)	A (7.6)	A (7.7)	A (7.6)
Northbound DE Route 1 On-ramp Merge	D (30.8)	C (23.8)	D (30.8)	C (23.8)

[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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 5
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Signalized Intersection and Ramp Merges [4]	**LOS per TIS**		**LOS per McCormick Taylor**	
Southbound DE Route 1 Ramp & DE Route 72 (Diverging Diamond Interchange)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)				
Southbound DE Route 1 at DE Route 72	B (19.9)	B (15.4)	C (23.7)	C (23.7)
WB DE Route 72 / EB DE Route 72 at Southbound DE Route 1 On-ramp Merge	A (2.3)	A (2.8)	A (2.3)	A (2.8)
Southbound DE Route 1 On-ramp Merge	B (17.7)	C (22.6)	B (17.7)	C (22.6)
2022 No Build Condition (Case 2)				
Southbound DE Route 1 at DE Route 72	C (22.0)	C (20.8)	C (28.6)	D (35.4)
WB DE Route 72 / EB DE Route 72 at Southbound DE Route 1 On-ramp Merge	A (2.8)	A (4.9)	A (2.8)	A (4.9)
Southbound DE Route 1 On-ramp Merge	B (18.8)	C (25.5)	B (18.8)	C (25.5)
2022 Build Condition (Case 3)				
Southbound DE Route 1 at DE Route 72	C (22.7)	C (20.9)	C (28.9)	D (35.4)
WB DE Route 72 / EB DE Route 72 at Southbound DE Route 1 On-ramp Merge	A (2.8)	A (5.0)	A (2.8)	A (5.0)
Southbound DE Route 1 On-ramp Merge	B (18.8)	C (25.5)	B (18.8)	C (25.5)

[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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 6
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Unsignalized Intersection [5] **One-Way Stop (T-Intersection)**	**LOS per TIS [6]**		**LOS per** **McCormick Taylor**	
DE Route 72 & **School House Road**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing (Case 1)				
Eastbound DE Route 72 – Left	A (7.6)	A (8.0)	A (7.7)	A (8.4)
Southbound Schoolhouse Road	B (10.3)	B (14.9)	B (10.4)	D (33.5) [7]
2022 No Build Condition (Case 2)				
Eastbound DE Route 72 – Left	A (8.3)	A (8.4)	A (8.3)	A (9.1)
Southbound Schoolhouse Road	B (13.6)	D (26.5)	B (14.0)	F (215.0) [8]
2022 No Build Condition (Case 2) (MT analysis using PM PHF of 0.92)				
Eastbound DE Route 72 – Left	N/A	N/A	N/A	A (8.4)
Southbound Schoolhouse Road	N/A	N/A	N/A	D (26.5) [9]
2022 Build Condition (Case 3)				
Eastbound DE Route 72 – Left	A (9.3)	A (8.4)	A (8.3)	A (9.1)
Southbound Schoolhouse Road	B (13.7)	D (26.6)	B (14.1)	F (216.9) [8]
2022 Build Condition (Case 3) (MT analysis using PM PHF of 0.92)				
Eastbound DE Route 72 – Left	N/A	N/A	N/A	A (8.4)
Southbound Schoolhouse Road	N/A	N/A	N/A	D (26.7) [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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

[6] TIS analysis applied peak hour factor (PHF) of 0.92 to all cases for both peak hours, even though count data indicated actual existing PHF was not 0.92.

[7] McCormick Taylor analysis result based on existing peak hour factor (from count data) of 0.65 for PM peak hour. For the Case 1 PM scenario, the 95th percentile queue length on the southbound Schoolhouse Road approach is approximately 8 vehicles.

[8] McCormick Taylor analysis result based on existing peak hour factor (from count data) of 0.65 for PM peak hour. For the Case 2 and Case 3 PM scenarios with a PHF of 0.65, the 95th percentile queue length on the southbound Schoolhouse Road approach is approximately 26 vehicles.

[9] McCormick Taylor analysis result based on assumed future peak hour factor of 0.92 for PM peak hour. For the Case 2 and Case 3 PM scenarios with a PHF of 0.92, the 95th percentile queue length on the southbound Schoolhouse Road approach is approximately 6 vehicles.

Table 7
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Signalized Intersection	**LOS per TIS**		**LOS per McCormick Taylor**	
DE Route 72 & River Road/Clarks Corner Road [10]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)	B (15.9)	B (18.9)	A (8.6)	B (10.8)
2022 No Build Condition (Case 2)	B (17.7)	B (18.0)	A (9.9)	B (11.3)
2022 Build Condition (Case 3)	B (17.7)	B (18.2)	A (10.0-)	B (11.3)

[10] TIS analyzed as a coordinated intersection. Based on DelDOT signal timings information, McCormick Taylor analyzed as an uncoordinated intersection.

Table 8
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Signalized Intersection [11]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Mid County Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)	B (14.3)	B (16.2)	A (3.9)	A (7.4)
2022 No Build Condition (Case 2)	B (16.0)	B (17.3)	A (4.4)	A (8.6)
2022 Build Condition (Case 3)	B (16.1)	B (17.3)	A (4.5)	A (8.8)

[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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 9
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Unsignalized Intersection [12] **One-Way Stop (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Mullins Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)				
Eastbound Mullins Drive Approach	C (21.3)	C (20.2)	C (24.1)	C (24.8)
Northbound US Route 13 – Left	A (8.2)	A (9.5)	A (8.1)	B (10.6)
Southbound US Route 13 U-Turn	C (21.4)	B (10.0)	C (22.8)	A (9.9)
2022 No Build Condition (Case 2)				
Eastbound Mullins Drive Approach	D (26.4)	D (26.5)	D (31.0)	D (34.5)
Northbound US Route 13 – Left	A (8.3)	B (10.4)	A (8.3)	B (11.9)
Southbound US Route 13 U-Turn	D (28.4)	B (10.5)	D (30.8)	B (10.4)
2022 Build Condition (Case 3)				
Eastbound Mullins Drive Approach	D (26.8)	D (26.8)	D (31.5)	D (35.0)
Northbound US Route 13 – Left	A (8.3)	B (10.4)	A (8.3)	B (11.9)
Southbound US Route 13 U-Turn	D (28.6)	B (10.5)	D (31.1)	B (10.4)

[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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 10
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Unsignalized Intersection [13] Two-Way Stop Control	**LOS per TIS**		**LOS per McCormick Taylor**	
DE Route 7 & Lower Twin Lane / Julian Lane	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing Condition (Case 1)				
Eastbound Julian Lane Approach	A (9.3)	B (12.9)	B (10.1)	B (12.4)
Westbound Lower Twin Lane Approach	B (11.3)	B (11.9)	B (11.2)	B (11.9)
Northbound DE Route 7 – Left	A (7.7)	A (8.0)	A (7.6)	A (8.6)
Southbound DE Route 7 – Left	A (8.1)	A (7.8)	A (8.1)	A (8.0)
2022 No Build Condition (Case 2)				
Eastbound Julian Lane Approach	B (11.0)	C (18.0)	B (12.2)	C (16.5)
Westbound Lower Twin Lane Approach	B (13.5)	C (16.5)	B (13.4)	C (16.4)
Northbound DE Route 7 – Left	A (8.3)	A (8.3)	A (8.3)	A (9.1)
Southbound DE Route 7 – Left	A (8.4)	A (8.4)	A (8.4)	A (8.7)
2022 Build Condition (Case 3)				
Eastbound Julian Lane Approach	B (11.1)	C (18.0)	B (12.3)	C (16.8)
Westbound Lower Twin Lane Approach	B (13.7)	C (16.5)	B (13.6)	C (16.8)
Northbound DE Route 7 – Left	A (8.4)	A (8.3)	A (8.3)	A (9.1)
Southbound DE Route 7 – Left	A (8.4)	A (8.4)	A (8.4)	A (8.8)

[13] 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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 11
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Unsignalized Intersection [14] **One-Way Stop (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
DE Route 7 & **Rogers Corporation**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing (Case 1)				
Westbound Rogers Corporation Approach	B (13.6)	B (13.3)	B (14.1)	B (14.4)
Southbound DE Route 7 – Left	A (8.1)	A (7.8)	A (8.1)	A (7.9)
2022 No Build Condition (Case 2)				
Westbound Rogers Corporation Approach	C (20.4)	C (21.2)	C (21.8)	D (25.7)
Southbound DE Route 7 – Left	A (8.5)	A (8.4)	A (8.5)	A (8.5)
2022 Build Condition (Case 3)				
Westbound Rogers Corporation Approach	C (21.1)	C (21.8)	C (22.6)	D (26.7)
Southbound DE Route 7 – Left	A (8.5)	A (8.5)	A (8.5)	A (8.6)

[14] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.

Table 12
Peak Hour Levels of Service (LOS)
Based on George Leach School Traffic Impact Study – February 2021
Prepared by Duffield Associates.

Unsignalized Intersection [15] **One-Way Stop (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
DE Route 7 & **Emerald Ridge Road**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2020 Existing (Case 1)				
Eastbound Emerald Ridge Road Approach	B (12.5)	B (12.9)	B (12.5)	B (12.7)
Northbound DE Route 7 – Left	A (7.7)	A (8.2)	A (7.7)	A (8.2)
2022 No Build Condition (Case 2)				
Eastbound Emerald Ridge Road Approach	C (17.7)	C (17.3)	C (17.3)	C (16.6)
Northbound DE Route 7 – Left	A (8.4)	A (8.4)	A (8.4)	A (8.4)
2022 Build Condition (Case 3)				
Eastbound Emerald Ridge Road Approach	C (18.3)	C (17.6)	C (17.8)	C (16.9)
Northbound DE Route 7 – Left	A (8.5)	A (8.4)	A (8.5)	A (8.4)

[15] 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. For ramp merge condition analyses, the numbers in parentheses following levels of service are the average density, measured in passenger cars per mile per lane.