



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

NICOLE MAJESKI  
SECRETARY

March 19, 2024

Brian Clarke  
Verdantas  
5400 Limestone Road  
Wilmington, DE 19808

Dear Mr. Brian Clarke:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Convenience Store with Gas - Greenwood** (Tax Parcel: 530-10.13-75.00, 76.00, 77.00, 79.01) commercial 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. The letter has been revised to reflect DelDOT's position on Item 5 in the recommendations and to the paragraph on page 2 discussing E Market Street and Site Entrance A. 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](mailto:Annamaria.Furmato@delaware.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Annamaria Furmat".

Annamaria Furmat  
TIS Group Project Engineer

AF:km  
Enclosures  
cc with enclosures: Fred Wittig, Diamond State Management  
James Taylor, Verdantas  
Dan Tomczak, Verdantas  
Shaun Condron, Verdantas  
David L. Edgell, Office of State Planning Coordination  
Jamie Whitehouse, Sussex County Planning & Zoning  
Andrew J. Parker, McCormick Taylor, Inc.  
Tucker Smith, McCormick Taylor, Inc.  
DelDOT Distribution



## DelDOT Distribution

Brad Eaby, Deputy Attorney General

Shanté Hastings, Deputy Secretary / Director of Transportation Solutions (DOTS)

Mark Luszcz, Deputy Director, DelDOT Traffic, DOTS

Michael Simmons, Assistant Director, Project Development South, DOTS

Peter Haag, Chief Traffic Engineer, DelDOT Traffic, DOTS

Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, DelDOT Traffic, DOTS

Sean Humphrey, Traffic Engineer, DelDOT Traffic, DOTS

Matt Schlitter, South District Public Works Engineer, Maintenance & Operations

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

John Pietrobono, Sussex County Review Coordinator, Development Coordination, Planning

Jose Quixtan, Sussex County Subdivision Reviewer, Development Coordination, Planning

Sireen Muhtaseb, TIS Group Manager, Development Coordination, Planning

Philip Lindsey, TIS Group Project Engineer, Development Coordination, Planning

Anthony Aglio, Planning Supervisor, Statewide & Regional Planning, Planning

Steve Bayer, Regional Transportation Planner, Statewide & Regional Planning



March 19, 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. 5A Subtask 01A – Greenwood Convenience Store with Gas**

Dear Ms. Furmato:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Greenwood Convenience Store with Gas development prepared by Verdantas, dated October 2023. Verdantas prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Greenwood Convenience Store with Gas development to be located on the northwest corner of Sussex Highway (US Route 13) and East Market Street (Delaware Route 16), in the Town of Greenwood, Sussex County, Delaware. The proposed development would consist of a 5,585 square foot convenience store with 16 gas pumps. One full access point is proposed on Delaware Route 16. This TIS also evaluates a potential second access point on US Route 13 which is subject to DelDOT's Corridor Capacity Preservation Program (CCPP). Construction is anticipated to be complete in 2025.

The subject land is located on an approximately 4.19-acre assemblage of parcels. The land is currently zoned as H-C (Highway Commercial) and the developer does not plan to rezone the land.

Currently, there are three DelDOT initiatives within the area of study.

DelDOT's Corridor Capacity Preservation Program (CCPP), a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 13, are able to efficiently carry regional traffic without impedance from the effects of local development. The Greenwood Convenience Store with Gas development proposes direct access to US Route 13 in an area identified as Investment Level 2 in the Strategies for State Policies and Spending. More details on DelDOT's CCPP are available at the following link:

[https://deldot.gov/Programs/corr\\_cap/](https://deldot.gov/Programs/corr_cap/)

DelDOT Planning is working with the towns of Greenwood and Bridgeville to develop a future-looking, long-range transportation plan for Greenwood, Bridgeville, and the areas surrounding the towns, which will help integrate transportation improvements with community goals and visions.



The planning process will focus on safety, mobility, economic development, quality of life, and other topics that emerge. This effort is an outgrowth of the Coastal Corridors Study, which focused on the east-west roads from the Maryland State Line to SR 1, between SR 16 and SR 404. Data collected during that study presented the opportunity to proceed with longer-range transportation and community planning approach along the western side of the study area (west of US 113). Public workshops are anticipated in Spring 2024. More information can be found at the following link:

<https://bridgeville.delaware.gov/information-plans-maps/2023-greenwood-and-bridgeville-transportation-plan/>

Additionally, at the intersection of US Route 13 and Delaware Route 16, DelDOT is working on a project under the FY26 Federal Intersection Improvement Program. The project is expected to rebuild the existing traffic signal and upgrade pedestrian facilities to include signalized pedestrian crossings. The project is currently in the design phase and is expected to begin construction no sooner than Summer or Fall 2025. A contract number has not been assigned to this project at this time.

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

The following intersection exhibits level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

<i>Intersection</i>	<i>Existing Traffic Control</i>	<i>Situations for which deficiencies occur</i>
1 – E. Market Street (DE 16) & Site Entrance A	Unsignalized	2025 with development SAT (Case 3) 2025 with development SAT (Case 4)

#### E. Market Street (Delaware Route 16) & Site Entrance A (Table 2, Page 17)

This unsignalized intersection experiences LOS deficiencies during the Summer Saturday peak in Cases 3 and 4. In Case 3 during the Summer Saturday peak hour, the southbound site entrance driveway is expected to operate at LOS F with 58.6 seconds of delay and queues over 187 feet long. The same approach operates at LOS C during the weekday AM and PM peak hours. If the developer were to add a separate left and right turn lane on the southbound approach, the delay in Case 3 during the summer Saturday peak hour could be reduced to LOS E with 45.2 seconds of delay and 150-foot queues.

#### US Route 13 & Site Entrance B (Table 3, Page 18)

As noted earlier in this letter, the TIS evaluates a potential second site entrance with direct access to US Route 13 which is subject to DelDOT's CCPP. The CCPP states that, in an Investment Level 1 or 2 area, no direct access to the corridor (US Route 13) will be permitted if the property has reasonable alternative access to a secondary road. Reasonable alternative access is evaluated based on the proposed development's impact on operations or safety of an adjacent intersection. In this case, the alternative access is Site Entrance A on to Delaware Route 16. Based on the capacity

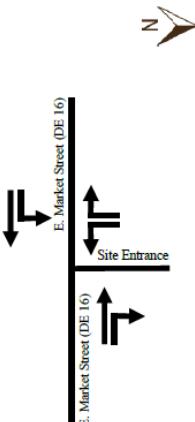


analysis in the TIS and this review, when access is prohibited to US Route 13, the proposed development does add delay to the adjacent intersection of US Route 13 and Delaware Route 16 and drivers would experience failing operations at the proposed Site Entrance A approach to Delaware Route 16. Existing queues on eastbound Delaware Route 16 extend west of Queen Avenue (over 500 feet long). In any scenario, vehicles heading east from proposed Site Entrance A will have difficulty entering the eastbound queue, adding to the operational and safety concerns. The proposed rights-in/rights-out Site Entrance B onto US Route 13 will alleviate some of the pressure on Site Entrance A, eliminate the LOS deficiency, and is expected to have minimal impact to delay and queuing along southbound US Route 13 approaching Delaware Route 16. As such, direct access to US Route 13 from the proposed Greenwood Convenience Store with Gas development is recommended.

Should the Town of Greenwood 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.

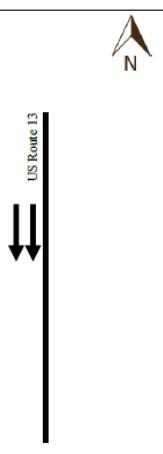
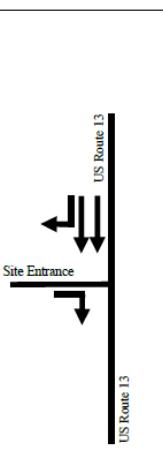
1. The developer shall improve the State-maintained Roads on which they front (US Route 13 and Delaware Route 16), within the limits of their frontage. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. "Frontage" 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 full-movement Site Entrance A on E. Market Street (Delaware Route 16). The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound DE 16	One through lane		Eastbound DE 16	One left turn lane and one thru lane	
Westbound DE 16	One through lane		Westbound DE 16	One thru lane and one right turn lane	
Northbound	Approach does not exist		Northbound	Approach does not exist	
Southbound	Approach does not exist		Southbound Site Entrance	One left turn lane and one tight turn lane. Stop Control.	

At the proposed Site Entrance A intersection, separate left-turn and right-turn lanes are warranted on the Delaware Route 16 approaches based on DelDOT's Auxiliary Lane Worksheet. Initial recommended minimum turn lane lengths (excluding tapers) include a 75-foot left-turn lane on eastbound Delaware Route 16 and a 110-foot right-turn lane on westbound Delaware Route 16. The developer should also construct separate left and right-turn lanes on the southbound Site Entrance approach. 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 developer should construct the rights-in/rights-out Site Entrance B on US Route 13. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound	Approach does not exist		Eastbound Site Entrance B	One right turn lane. Stop Control.	
Westbound	Approach does not exist		Westbound	Approach does not exist	
Northbound	Approach does not exist		Northbound	Approach does not exist	
Southbound US Route 13	Two through lanes		Southbound US Route 13	Two through lanes and a right turn lane	

At the proposed Site Entrance B intersection, a separate right-turn lane is warranted on the US Route 13 approach based on DelDOT's Auxiliary Lane Worksheet. Initial recommended minimum turn lane lengths (excluding tapers) include a 190-foot right-turn lane on southbound US Route 13. 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.

4. The developer should contribute to the Traffic Signal Revolving Fund (TSRF) for future signal improvements at the intersection of US Route 13 and Delaware Route 16. The amount of the TSRF contribution, as determined by DelDOT's Development Coordination Section, is \$11,669.00.

5. The developer should secure a perpetual cross-access easement with adjacent parcels 530-10.13-79.00 and 530-10.00-100.00. Within this easement, the developer should design and construct a road that would connect the proposed development with Duck Creek Lane. The developer should coordinate with the Town of Greenwood regarding the connection to Duck Creek Lane.



6. 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. 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 16 and US Route 13. Within the US Route 13 easement, a minimum of a 10-foot wide shared-use path should be constructed. Within the Delaware Route 16 easement, a minimum of a 5-foot wide sidewalk should be constructed. The shared-use path and sidewalks 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 and sidewalk 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 and sidewalk design and connections/terminations at or before both boundaries of the property.
  - e. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
  - f. 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 and sidewalk along the site frontages.
  - g. The developer should construct a Type 2 (17' x 8') shelter pad with bus pull-off along the US Route 13 site frontage. The developer should coordinate with DelDOT's Subdivision Group and the Delaware Transit Corporation (DTC) regarding the exact location, design, and construction of this bus stop.

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



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

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

Sincerely,

**McCormick Taylor, Inc.**

A handwritten signature in black ink that reads "Andrew J. Parker".

Andrew J. Parker, PE, PTOE  
Project Manager

Enclosure



## Scope of Improvements Figure

### Greenwood Convenience Store with Gas TIS

- Yellow circle: Proposed Site Entrance - Frontage improvements and turn lanes as described in the review letter.
- Red circle with 'S': Study Intersection - TSRF Contribution
- Blue circle: Study Intersection - No Improvements



## **General Information**

**Report date:** October 2023

**Prepared by:** Verdantas, LLC.

**Prepared for:** Greenwood Associates, LLC.

**Tax parcels:** 53-10.13-75.00, 76.00, 77.00, and 79.01.

**Generally consistent with DelDOT's Development Coordination Manual:** Yes

## **Project Description and Background**

**Description:** the Greenwood Convenience Store with Gas development would consist of a 5,585 square foot convenience store with 16 gas pumps.

**Location:** to be located on the northwest corner of Sussex Highway (US Route 13) and East Market Street (Delaware Route 16), in the Town of Greenwood, Sussex County, Delaware. A site location map is included on page 10.

**Amount of land to be developed:** approximately 4.19-acre assemblage of parcels.

**Land use approval(s) needed:** The land is currently zoned as H-C (Highway Commercial) and the developer does not plan to rezone the land.

**Proposed completion year:** 2025

**Proposed access locations:** Two full access points are proposed, one full access on Delaware Route 16 and one on US Route 13.

**Average Daily Traffic Volumes (per DelDOT Traffic Summary 2022):**

- US Route 13: 23,189 vehicles/day
- Delaware Route 16: 7,041 vehicles/day





## **2020 Delaware Strategies for State Policies and Spending**

**Location with respect to the Strategies for State Policies and Spending Map of Delaware:** The Greenwood Convenience Store with Gas development is located mostly within Investment Level 2, as described below.

### *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 Greenwood Convenience Store with Gas development would consist of a 5,585 square foot convenience store with 16 gas pumps in an Investment Level 2 area. The proposed development is consistent with the character of Investment Level 2. It is therefore concluded that the proposed development appears to generally comply with the policies stated in the 2020 "Strategies for State Policies and Spending."

## **Comprehensive Plan**

### **Sussex County Comprehensive Plan:**

*(Source: Sussex County Comprehensive Plan, March 2019)*

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed development is in the Town of Greenwood, a municipality. Sussex County strongly favors directing development to municipalities that desire it. The specific permitted uses and densities governing new construction within an incorporated municipality will continue to be governed by the zoning ordinance for that municipality, its public water and sewer capacities, and its comprehensive planning policies.

**Town of Greenwood Comprehensive Plan:**

(Source: *Comprehensive Land Use Plan and Comprehensive Re-Zoning for the Town of Greenwood, 2009*)

The Town of Greenwood's Future Land Use Map, dated August 2009, indicates that the land included in the proposed Greenwood Convenience Store with Gas development is within the Town Limits and classified as "Highway Commercial".

**Proposed Development's Compatibility with Comprehensive Plan:**

The proposed development meets the intended land use in this area of the Town of Greenwood.

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

Currently, there are three DelDOT initiatives within the area of study.

DelDOT's Corridor Capacity Preservation Program (CCPP), a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 13, are able to efficiently carry regional traffic without impedance from the effects of local development. The Greenwood Convenience Store with Gas development proposes direct access to US Route 13 in an area identified as Investment Level 2 in the Strategies for State Policies and Spending. However, as noted earlier in this letter, direct access to US Route 13 is not recommended. More details on DelDOT's CCPP are available at the following link:

[https://deldot.gov/Programs/corr\\_cap/](https://deldot.gov/Programs/corr_cap/)

DelDOT Planning is working with the towns of Greenwood and Bridgeville to develop a future-looking, long-range transportation plan for Greenwood, Bridgeville, and the areas surrounding the towns, which will help integrate transportation improvements with community goals and visions. The planning process will focus on safety, mobility, economic development, quality of life, and other topics that emerge. This effort is an outgrowth of the Coastal Corridors Study, which focused on the east-west roads from the Maryland State Line to SR 1, between SR 16 and SR 404. Data collected during that study presented the opportunity to proceed with longer-range transportation and community planning approach along the western side of the study area (west of US 113). Public workshops are anticipated in Spring 2024. More information can be found at the following link:

<https://bridgeville.delaware.gov/information-plans-maps/2023-greenwood-and-bridgeville-transportation-plan/>

Additionally, at the intersection of US Route 13 and Delaware Route 16, DelDOT is working on a project under the FY26 Federal Intersection Improvement Program. The project is expected to rebuild the existing traffic signal and upgrade pedestrian facilities to include signalized pedestrian crossings. The project is currently in the design phase and is expected to begin construction no sooner than Summer or Fall 2025. A contract number has not been assigned to this project at this time.

## Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Eleventh 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:

- 16 Pump Convenience Store with Gas (Land Use Code 945)

### **Greenwood Convenience Store with Gas Peak Hour Trip Generation**

Land Use	Total Size	Phase	Weekday AM Peak Hour			Weekday PM Peak Hour			Summer Saturday Peak Hour			Average Daily Trips (ADT)		
			In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
LUC 945: Convenience Store with Gas	16 Pumps	Gross	253	253	506	215	215	430	233	243	476	2766	2766	5532
		Pass-by	-192	-192	-384	-161	-161	-322	-175	-182	-357	0	0	0
<b>TOTAL TRIPS</b>			<b>61</b>	<b>61</b>	<b>122</b>	<b>54</b>	<b>54</b>	<b>108</b>	<b>58</b>	<b>61</b>	<b>119</b>	<b>2766</b>	<b>2766</b>	<b>5532</b>

## Overview of TIS

### **Intersections examined:**

- 1) E. Market Street (Delaware Route 16) / Site Entrance A
- 2) US Route 13 / Site Entrance B
- 3) E. Market Street (Delaware Route 16) / US Route 13
  - a. Delaware Route 16 / US Route 13 Southbound
  - b. Delaware Route 16 / US Route 13 Northbound

### **Conditions examined:**

- 1) 2023 Existing (Case 1)
- 2) 2025 without development (Case 2)
- 3) 2025 with development – Rt 16 full access, Rt 13 no access (Case 3)
- 4) 2025 with development – Rt 16 full access, Rt 13 rights-in access (Case 4)
- 5) 2025 with development – Rt 16 full access, Rt 13 rights-in/rights-out access (Case 5)
- 6) 2025 with development – Rt 16 rights-in/rights-out/lefts-in, Rt 13 rights-in/rights-out access (Case 6)

**Peak hours evaluated:** Weekday morning, weekday evening, and Summer Saturday peak hours.



### Committed developments considered:

DelDOT did not identify any substantive committed developments near the proposed development.

### Intersection Descriptions

#### 1) E. Market Street (Delaware Route 16) / Site Entrance A

**Type of Control:** proposed two-way stop controlled.

**Eastbound Approach:** (DE Route 16) existing through lane and proposed left-turn lane.

**Westbound Approach:** (DE Route 16) existing through lane and proposed right-turn lane.

**Southbound Approach:** (Site Entrance A) proposed shared left/right-turn lane. Stop controlled.

#### 2) US Route 13 / Site Entrance B

**Type of Control:** proposed two-way stop controlled.

**Eastbound Approach:** (Site Entrance B) proposed right-turn lane. Stop controlled.

**Southbound Approach:** (US Route 13) two through lanes, and one proposed right-turn lane.

#### 3) E. Market Street (Delaware Route 16) / US Route 13 Southbound

**Type of Control:** Signalized Intersection

**Eastbound Approach:** (DE Route 16) one shared through/right-turn lane.

**Westbound Approach:** (DE Route 16) one left-turn lane and one through lane.

**Southbound Approach:** (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.

#### 4) E. Market Street (Delaware Route 16) / US Route 13 Northbound

**Type of Control:** Signalized Intersection

**Eastbound Approach:** (DE Route 16) one left-turn lane and one through lane.

**Westbound Approach:** (DE Route 16) one left-turn lane, one through lane, and one channelized right-turn lane.

**Northbound Approach:** (US Route 13) one left-turn lane, two through lanes, and one channelized 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 April 24, 2020, to April 24, 2023. A total of 32 crashes occurred within the study area during the three-year period. Of those 32 collisions, 5 resulted in personal injury. The highest frequency of crashes occurred at the signalized intersections of US Route 13 northbound and Delaware Route 16 (20 crashes). The most common type of collision was front to rear (53 percent).

**Sight Distance:** The study area generally consists of relatively flat roadways and there are few visual obstructions. Sight distance appears adequate throughout the study area. No problematic sight distance issues have been reported or indicated by crash data. As always, the 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 DART Bus Stop Map (accessed November 2023), the Delaware Transit Corporation (DTC) does not operate any bus routes through the study area. The nearest bus service is in Bridgeville.

**Planned transit service:** Bill Williamson, representing DTC, was contacted regarding existing and planned transit service in the area. He stated that DTC plans to provide bus service along US Route 13 between Seaford and Dover within the very near future. DTC requests that the developer construct a Type 2 (17' x 8') shelter pad with bus pull-off along the US Route 13 site frontage and provide pedestrian access into the site via sidewalk. DTC also requests that the developer design and construct signalized pedestrian crossings at the signalized intersection of Delaware Route 16 / US Route 13 to facilitate access to the proposed DART stop on US Route 13.

**Existing bicycle and pedestrian facilities:** According to DelDOT's Sussex County Bicycle Map, US Route 13 and Delaware Route 16 are Suggested Connector Bicycle Routes with Bikeway and traffic volumes over 5, 000 vehicles per day. We are not aware of any proposals for additional bicycle or pedestrian facilities in this area.

**Planned bicycle and pedestrian facilities:** A 10-foot shared-use path is requested along the US Route 13 property frontage and a 5-foot sidewalk along the Delaware Route 16 property frontage with a bicycle lane to be included between the through lane and right-turn lane into the site.

### **Previous Comments**

The initial scoping memorandum between the developer and DelDOT was dated February 12, 2023.

In a review letter dated July 11, 2023, DelDOT commented on the use of seasonal adjustment factors, labeling peak hour volumes, and requested justification or adjustments to intersection volumes that were outside of the 10 percent variance. The developer was asked to address the comments and resubmit the traffic counts.

In a second review dated August 1, 2023, DelDOT accepted the traffic counts and directed the developer to proceed with the Preliminary TIS.

In a third review letter dated August 25, 2023, DelDOT provided review comments of the Preliminary TIS that requested revisions to the pass-by distributions and other minor revisions noted in an enclosure. DelDOT requested that the developer address these comments and proceed with the Final TIS.

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) The TIS and McCormick Taylor used Highway Capacity Software (HCS) version 2023 to complete the traffic analyses.
- 2) The TIS and McCormick Taylor generally used heavy vehicle percentages (HV%) from turning movement counts for existing and future conditions (as per DelDOT's Development Coordination Manual section 2.2.8.11.6.H). McCormick Taylor and the TIS assumed 3% HV at proposed site entrances in future conditions.
- 3) McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F where applicable. The TIS used a PHF of 0.92 in all analyses.
- 4) McCormick Taylor utilized a base saturation flow rate of 1,750 pcphgpl for signalized intersections (as per DelDOT's Development Coordination Manual section 2.2.8.11.6.I). The TIS appears to have used a base saturation flow rate of 1,900 pcphgpl.
- 5) For analyses of all intersections, McCormick Taylor and the TIS assumed 0% grade for all movements.
- 6) At signalized intersections, the TIS used a 120 second cycle length for all peak hours. Based on the signal timing submitted with the TIS, there appears to be a 150 second cycle length in the weekday PM and Saturday mid-day peak hours. Additionally, the TIS used 0 seconds for the red clearance interval for the southbound approach of US Route 13 at Delaware Route 16.



Table 2  
 Peak Hour Levels of Service (LOS)  
*Based on the Greenwood Convenience Store with Gas  
 Traffic Impact Study – November 8, 2023  
 Prepared by McCormick Taylor.*

Unsignalized Intersection <sup>1</sup> Two-Way Stop-Controlled	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
<b>1 – E. Market Street (DE 16) &amp; Site Entrance A</b>						
2025 Build Condition (Case 3)						
Eastbound DE 16 – Left	A (1.8)	A (1.2)	A (0.9)	A (1.8)	A (1.2)	A (0.9)
Southbound Site Entrance	B (14.6)	C (15.8)	F (58.7)	C (15.3)	C (16.8)	F (58.6)
2025 Build Condition (Case 4)						
Eastbound DE 16 – Left	A (1.7)	A (1.2)	A (0.9)	A (1.7)	A (1.2)	A (0.9)
Southbound Site Entrance	B (14.6)	C (15.8)	F (58.1)	C (15.2)	C (16.7)	F (58.0)
2025 Build Condition (Case 5)						
Eastbound DE 16 – Left	A (1.7)	A (1.2)	A (0.9)	A (1.7)	A (1.2)	A (0.9)
Southbound Site Entrance	B (12.3)	B (13.1)	D (29.5)	B (12.6)	B (13.6)	D (29.5)
2025 Build Condition (Case 6)						
Eastbound DE 16 – Left	A (1.7)	A (1.2)	A (0.9)	A (1.7)	A (1.2)	A (0.9)
Southbound Site Entrance	A (9.0)	A (9.3)	A (10.8)	A (9.1)	A (9.4)	A (11.0)
2025 Build Condition with Improvements (Case 3) <sup>2</sup>						
Eastbound DE 16 – Left	--	--	--	--	--	A (0.9)
Southbound Site Entrance	--	--	--	--	--	E (45.2)

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

<sup>2</sup> Improvements include separate left and right turn lanes on the southbound Site Entrance A driveway.



Table 3  
 Peak Hour Levels of Service (LOS)  
*Based on the Greenwood Convenience Store with Gas  
 Traffic Impact Study – November 8, 2023  
 Prepared by McCormick Taylor.*

Unsignalized Intersection <sup>3</sup> Two-Way Stop-Controlled	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
2 – US Route 13 & Site Entrance B						
2025 Build Condition (Case 5)						
Eastbound Site Entrance	B (11.0)	B (12.2)	B (12.1)	B (11.2)	B (12.5)	B (12.4)
2025 Build Condition (Case 6)						
Eastbound Site Entrance	B (12.8)	B (14.2)	B (14.6)	B (13.2)	B (14.2)	B (14.6)

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



Table 4  
 Peak Hour Levels of Service (LOS)  
*Based on the Greenwood Convenience Store with Gas  
 Traffic Impact Study – November 8, 2023  
 Prepared by McCormick Taylor.*

Signalized Intersection <sup>4</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
<b>3 – E. Market Street (DE 16) &amp; US Route 13 Southbound</b>						
2023 Existing Condition (Case 1)						
Overall	C (24.1)	C (24.0)	C (27.4)	C (27.1)	D (35.8)	C (34.6)
2025 No Build Condition (Case 2)						
Overall	C (24.2)	C (24.2)	C (27.7)	C (27.3)	D (36.1)	C (34.9)
2025 Build Condition (Case 3)						
Overall	C (27.9)	C (27.3)	C (31.2)	C (28.4)	C (34.7)	D (41.8)
2025 Build Condition (Case 4)						
Overall	C (28.5)	C (27.8)	C (31.4)	C (28.5)	C (34.6)	D (42.1)
2025 Build Condition (Case 5)						
Overall	C (26.9)	C (26.3)	C (29.8)	C (27.4)	D (35.5)	D (37.1)
2025 Build Condition (Case 6)						
Overall	C (23.2)	C (23.3)	C (27.1)	C (27.4)	D (35.9)	D (35.2)

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



Table 5  
 Peak Hour Levels of Service (LOS)  
*Based on the Greenwood Convenience Store with Gas  
 Traffic Impact Study – November 8, 2023  
 Prepared by McCormick Taylor.*

Signalized Intersection <sup>5</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
<b>4 – E. Market Street (DE 16) &amp; US Route 13 Northbound</b>						
2023 Existing Condition (Case 1)						
Overall	C (32.6)	C (33.5)	D (54.8)	C (28.0)	C (34.3)	C (33.6)
2025 No Build Condition (Case 2)						
Overall	C (32.8)	C (33.8)	E (59.9)	C (28.1)	C (34.5)	C (33.9)
2025 Build Condition (Cases 3,4,5,6)						
Overall	C (34.1)	C (34.5)	E (60.1)	C (26.9)	C (32.9)	C (33.0)

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