



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

NICOLE MAJESKI  
SECRETARY

March 4, 2022

Ms. Dawn Riggi  
Davis Bowen & Friedel, Inc.  
1 Park Avenue  
Milford, DE 19963

Dear Ms. Riggi:

The enclosed Traffic Impact Study (TIS) review letter for the **V&M, LLC** (Tax Parcels: 334-12.00-108.00, 108.01, 109.00, 109.01, 110.00, 111.00, 111.01, 112.00, 112.01) 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. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2124.

Sincerely,

Claudy Joinville  
Project Engineer

CJ:km

Enclosures

cc with enclosures: Mr. Zac Crouch, Davis Bowen & Friedel, Inc.  
Mr. Eric Sugrue, V&M, LLC  
Mr. David Edgell, Office of State Planning Coordination  
Mr. Jamie Whitehouse, Sussex County Planning and Zoning  
Mr. Andrew Parker, McCormick & Taylor, Inc.  
DelDOT Distribution

## DelDOT Distribution

Brad Eaby, Deputy Attorney General  
Shanté Hastings, Deputy Secretary / Director of Transportation Solutions (DOTS)  
Pamela Steinebach, Director, Planning  
Mark Luszczyk, Deputy Director, Traffic, DOTS  
Peter Haag, Chief Traffic Engineer, Traffic, DOTS  
Michael Simmons, Assistant Director, Project Development South, DOTS  
Todd Sammons, Assistant Director, Development Coordination  
T. William Brockenbrough, Jr., County Coordinator, Development Coordination  
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, DelDOT Traffic  
Alistair Probert, South District Engineer, South District  
Matthew Schlitter, South District Public Works Engineer, South District  
Jared Kauffman, Service Development Planner, Delaware Transit Corporation  
Tremica Cherry, Service Development Planner, Delaware Transit Corporation  
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Wendy Polasko, Subdivision Engineer, Development Coordination  
Steve McCabe, Sussex Review Coordinator, Development Coordination  
Mark Galipo, Traffic Engineer, Traffic, DOTS  
Brian Yates, Subdivision Manager, Development Coordination  
Annamaria Furmato, Project Engineer, Development Coordination



March 2, 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. 2A Subtask 07A – V&M LLC**

Dear Mr. Joinville:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the V&M LLC development prepared by Davis, Bowen & Friedel, Inc. dated November 2021. Davis, Bowen & Friedel prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed V&M LLC development, along the south side of Delaware Route 24 (Sussex Road 24) and the west side of Mulberry Knoll Road (Sussex Road 284), in Sussex County, Delaware. The proposed development would consist of a 5,000 square-foot convenience store with gas pumps and a 12,000 square-foot office building. Two unsignalized access points are proposed: one right-in/right-out on Delaware Route 24 and one full-movement access on Mulberry Knoll Road. Construction is anticipated to be completed in 2023.

The subject land is located on an approximately 3.31-acre assemblage of parcels. The subject land is currently zoned AR-1 (Agricultural Residential), and the developer seeks a conditional use zoning to develop this commercial use.

There are currently two active DelDOT projects within the study area. The *SR 24, Mulberry Knoll to SR 1* (State Contract No. T200411209) project will widen Delaware Route 24 to provide dual lanes from just east of Mulberry Knoll Road to Delaware Route 1. The typical section of Delaware Route 24 will consist of a 16-foot center-left-turn lane along with two 11-foot travel lanes in each direction, an 8-foot shoulder eastbound and a 5-foot shoulder/bike lane westbound. Improvements at the intersection of Delaware Route 24 and Plantation Road / Warrington Road (Sussex Road 275) will include changing the Delaware Route 24 approaches so they each have one left-turn lane, two through lanes, and one right-turn lane, along with widening the Plantation Road and Warrington Road approaches so they each consist of one exclusive left-turn lane, one shared through/left-turn lane, one exclusive through lane, and one right-turn lane. Construction has begun and is scheduled for completion in Spring 2022.

The *SR 24, Love Creek to Mulberry Knoll* (State Contract No. T201212201) project will improve safety and increase capacity on Delaware Route 24 from Love Creek to Mulberry Knoll Road. Dual lanes along Delaware Route 24 will extend from east of Mulberry Knoll Road to west of the



school entrances located west of Mulberry Knoll Road. The dualized portion of the project will include a 12-foot center-left-turn lane along with two 11-foot travel lanes in each direction, an 8-foot shoulder eastbound and a 5-foot shoulder/bike lane westbound. Improvements at the intersection of Delaware Route 24 and Mulberry Knoll Road will include signalization, changing the Delaware Route 24 approaches so they each have one left-turn lane, two through lanes, and one right-turn lane, along with widening the Mulberry Knoll Road approaches so they each have one left-turn lane and one shared through/right turn lane. Construction is scheduled to begin in 2022 and be completed in 2023.

It is noted that DelDOT and V&M LLC (the developer) entered into a Letter Agreement executed on August 12, 2021 to have DelDOT incorporate certain access and frontage improvements needed for the V&M LLC commercial project into the construction of DelDOT’s *SR 24, Love Creek to Mulberry Knoll* project. The developer would pay for certain construction costs as specified in the agreement.

The proposed development is located within the boundary of the Henlopen Transportation Improvement District (TID) as presently contemplated by Sussex County and DelDOT. The TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projections and future development within the designated district. This development is not consistent with the approved TID future land use plan and therefore does not qualify for TID participation.

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

The following intersections exhibit 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>
Delaware Route 24 and Mulberry Knoll Road	Unsignalized	2019 Existing PM and Saturday (Case 1); 2023 without development AM, PM and SAT (Case 2); 2023 with development AM, PM and SAT (Case 3)
Delaware Route 24 and Plantation Road / Warrington Road	Signalized	2023 without development PM and Saturday (Case 2); 2023 with development PM and Saturday (Case 3)

Both intersections listed in the table above exhibit LOS deficiencies if unimproved, but improvements at both intersections are scheduled for construction in the near future as part of DelDOT’s aforementioned SR 24 projects. The improvements to be implemented by those projects will completely mitigate the LOS deficiencies for the scenarios evaluated in this TIS. These two DelDOT projects are fully funded and scheduled for construction within the next 2-3 years. As such, we do not recommend any additional improvements be implemented at these intersections by the V&M LLC developer other than the northbound Mulberry Knoll Road left-turn lane extension described below in Item No. 5, nor should this developer contribute towards the DelDOT

projects other than by satisfying requirements of compensation as specified in the Letter Agreement between DelDOT and the developer executed on August 12, 2021.

Should Sussex 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 and DelDOT must comply with all requirements specified in the Letter Agreement by and between DelDOT and the developer executed on August 12, 2021, many of which are associated with roadway, access, and site frontage improvements along Delaware Route 24 and within the V&M LLC site frontage of that roadway.

Responsibilities of DelDOT per that Letter Agreement include, but are not limited to, construction of the V&M LLC development's right-in/right-out site access on the south side of Delaware Route 24 west of Mulberry Knoll Road, along with a separate right-turn deceleration lane along eastbound Delaware Route 24 for that site access. DelDOT will also be responsible for constructing sidewalk along the entire Delaware Route 24 site frontage.

Design details of the Delaware Route 24 site access and site frontage improvements should be coordinated between the developer and DelDOT's Development Coordination and Project Development – South sections.

2. The developer shall improve the State-maintained roads on which they front (Delaware Route 24 and Mulberry Knoll Road, with exceptions noted in the second paragraph of this item), 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.

It is noted that the above paragraph may not be entirely applicable to improvements within the Delaware Route 24 frontage, as most if not all such improvements are to be implemented by DelDOT as part of the *SR 24, Love Creek to Mulberry Knoll* project. The Letter Agreement between DelDOT and the developer executed on August 12, 2021 describes responsibilities for improvements along the Delaware Route 24 site frontage by both parties, and should be followed accordingly.

3. The developer should construct the full-movement site access on Mulberry Knoll Road. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Eastbound Site Access	Approach does not exist	One shared left/right-turn lane
Northbound Mulberry Knoll Road	One through lane	One shared through/left-turn lane
Southbound Mulberry Knoll Road	One through lane	One through lane and one 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 Site Access	N/A	N/A
Northbound Mulberry Knoll Road	N/A	N/A
Southbound Mulberry Knoll Road	N/A	60 feet *

\* Initial turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet* and assuming an effective entrance radius of greater than 50 feet as indicated in the TIS. The length of this right-turn lane assumes a reduction of the posted speed limit on Mulberry Knoll Road down to 35 mph, as proposed by the developer to achieve acceptable sight distance at the site access. Additional discussion is required during site plan review, and the turn lane length would need to be longer if the posted speed limit is not reduced and/or if the entrance radius is less than 50 feet.

Sight distance limitations at the proposed site access location on Mulberry Knoll Road have been identified. Sight distance for drivers exiting this driveway is limited by horizontal curves in both directions on Mulberry Knoll Road, and sight distance requirements are not met at the current posted speed limit of 50 mph. The developer proposes to reduce the posted speed limit on Mulberry Knoll Road to 35 mph, which would allow sight distance requirements to be satisfied.

The developer’s recommendation to reduce the posted speed limit on Mulberry Knoll Road will need to be evaluated by DelDOT and further coordinated with the developer. There may also be a need to consider changes to the site access location and design, as well as the possibility of a design deviation. As always, adequacy of available sight distance must be confirmed during the site plan review process.

4. As described immediately above, the developer should coordinate with DelDOT regarding the possibility of reducing the posted speed limit on Mulberry Knoll Road south of Delaware Route 24.
5. The developer should improve the intersection of Delaware Route 24 and Mulberry Knoll Road beyond the scope of improvements being implemented by DelDOT under the *SR 24, Love Creek to Mulberry Knoll* project by extending the length of the planned northbound Mulberry Knoll Road left-turn lane by an additional 40 feet to better accommodate projected queues due to increased vehicle demands for that movement which are directly attributed to the proposed development. The developer should coordinate DelDOT's Development Coordination Section to determine final turn-lane length and design details, as well as responsibilities for implementation especially as they relate to the possibility of incorporating this modification into DelDOT's SR 24 project.
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 within the project limits.
  - c. Utility covers should be made flush with the pavement.
  - d. A minimum 15-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Mulberry Knoll Road.
  - e. Within the easement along the Mulberry Knoll Road site frontage, 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 southern property boundary, the shared-use path should connect to the adjacent property or to the roadway in accordance with DelDOT's *Shared-Use Path and/or Sidewalk Termination Reference Guide* dated August 1, 2018. At the northern property boundary / Delaware Route 24, the shared-use path should connect to the sidewalk being constructed along the Delaware Route 24 frontage as part of DelDOT's *SR 24, Love Creek to Mulberry Knoll* project. The developer should coordinate with DelDOT's Development Coordination Section to determine the details of the shared-use path connection 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 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 Mulberry Knoll Road, the proposed sidewalk (to be constructed as part of the DelDOT project) along Delaware Route 24, and to the to-be-signalized intersection of Delaware Route 24 & Mulberry Knoll Road.
- h. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.
- i. The developer should coordinate with the Delaware Transit Corporation (DTC) regarding design and construction of a 5'x8' Type 2 bus stop pad to be located on eastbound Delaware Route 24 before the beginning of the right-turn lane onto Mulberry Knoll Road. This bus stop pad may be incorporated into the improvements being made by DelDOT as part of the *SR 24, Love Creek to Mulberry Knoll* project. The developer should coordinate with DTC and DelDOT to ensure the bus stop pad is designed and installed to the satisfaction of all parties.

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, appearing to read "Andrew J. Parker".

Andrew J. Parker, PE, PTOE  
Project Manager

Enclosure



## **General Information**

**Report date:** November 2021

**Prepared by:** Davis, Bowen & Friedel, Inc

**Prepared for:** V&M LLC

**Tax parcel:** 3-34-12.00-108.00, 108.01, 109.00, 109.01, 110.00, 111.00, 111.01, 112.00, 112.01

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

## **Project Description and Background**

**Description:** The proposed V&M LLC development consists of a of a 5,000 square-foot convenience store with gas pumps and a 12,000 square-foot office building.

**Location:** The site is located along the south side of Delaware Route 24 (Sussex Road 24) and the west side of Mulberry Knoll Road (Sussex Road 284), in Sussex County, Delaware. A site location map is included on page 8.

**Amount of land to be developed:** approximately 3.31 acre assemblage of parcels

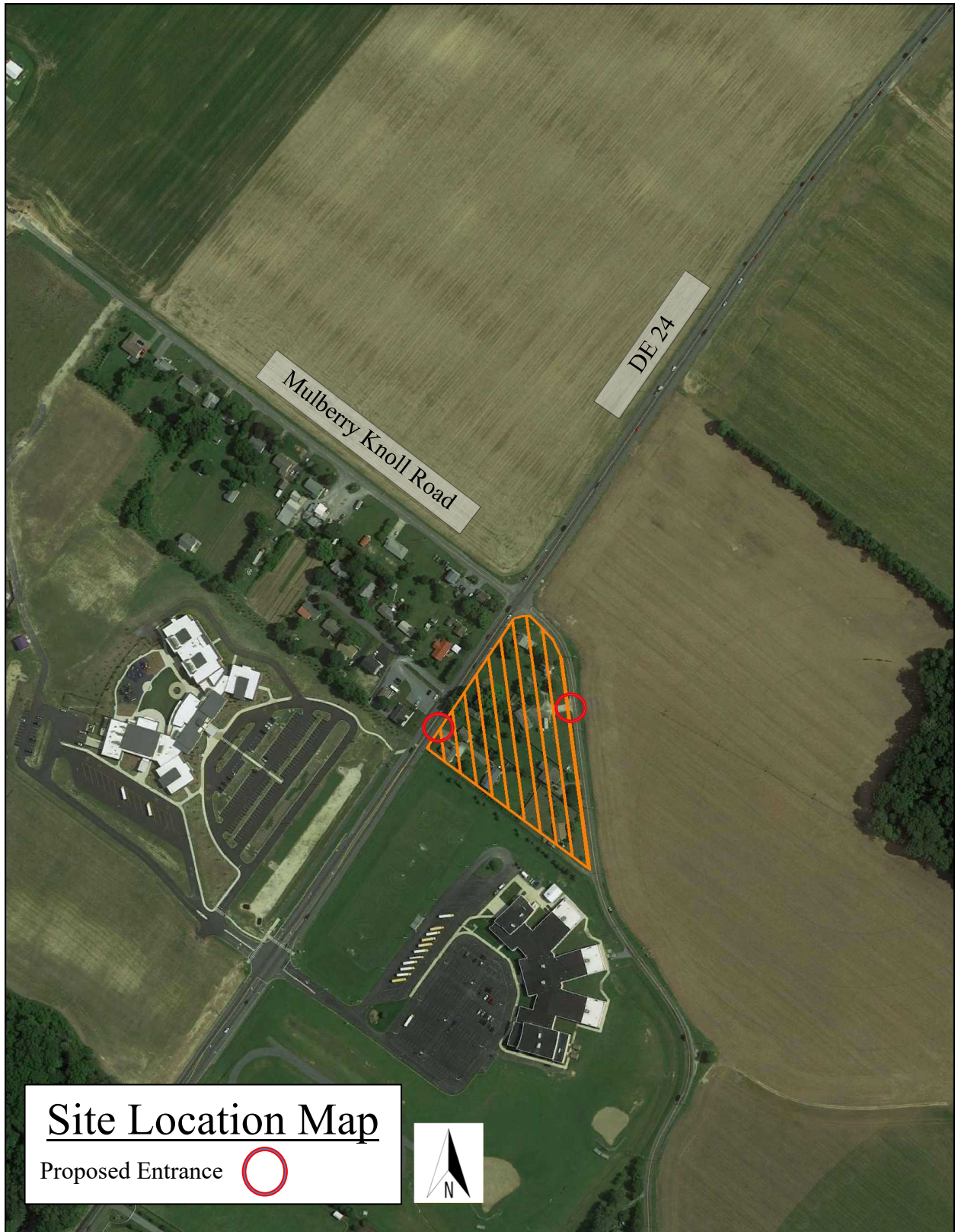
**Land use approval(s) needed:** Subdivision approval. The subject land is currently zoned AR-1 (Agricultural Residential), and the developer seeks a conditional use zoning to develop this commercial use.

**Proposed completion year:** 2023

**Proposed access locations:** Two access points are proposed: full site access along Mulberry Knoll Road and right-in/right-out access along Delaware Route 24.

### **Daily Traffic Volumes (per DelDOT Traffic Summary 2019):**

- 2019 Average Annual Daily Traffic on Delaware Route 24: 19,793 vehicles/day
- 2019 Average Annual Daily Traffic on Mulberry Knoll Road: 517 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 proposed V&M LLC 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 V&M LLC development falls within Investment Level 2 and is to be developed as a super-convenience store with gas. 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 V&M LLC site is planned for "Commercial" land use. It would appear that the proposed V&M LLC building fits within the intended land use for this location.

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

The proposed development appears to comply with the Sussex County Comprehensive Plan. The V&M LLC store is proposed on land that is planned for Commercial use. The land is zoned as AR-1 (Agricultural Residential); and the developers are seeking a conditional use zoning of C-2

(Medium – Commercial). The proposed facility generally aligns with both the Future Land Use Map and the proposed zoning.

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

There are currently two active DelDOT projects within the study area. The *SR 24, Mulberry Knoll to SR 1* (State Contract No. T200411209) project will widen Delaware Route 24 to provide dual lanes from just east of Mulberry Knoll Road to Delaware Route 1. The typical section of Delaware Route 24 will consist of a 16-foot center-left-turn lane along with two 11-foot travel lanes in each direction, an 8-foot shoulder eastbound and a 5-foot shoulder/bike lane westbound. Improvements at the intersection of Delaware Route 24 and Plantation Road / Warrington Road (Sussex Road 275) will include changing the Delaware Route 24 approaches so they each have one left-turn lane, two through lanes, and one right-turn lane, along with widening the Plantation Road and Warrington Road approaches so they each consist of one exclusive left-turn lane, one shared through/left-turn lane, one exclusive through lane, and one right-turn lane. Construction has begun and is scheduled for completion in Spring 2022.

The *SR 24, Love Creek to Mulberry Knoll* (State Contract No. T201212201) project will improve safety and increase capacity on Delaware Route 24 from Love Creek to Mulberry Knoll Road. Dual lanes along Delaware Route 24 will extend from east of Mulberry Knoll Road to west of the school entrances located west of Mulberry Knoll Road. The dualized portion of the project will include a 12-foot center-left-turn lane along with two 11-foot travel lanes in each direction, an 8-foot shoulder eastbound and a 5-foot shoulder/bike lane westbound. Improvements at the intersection of Delaware Route 24 and Mulberry Knoll Road will include signalization, changing the Delaware Route 24 approaches so they each have one left-turn lane, two through lanes, and one right-turn lane, along with widening the Mulberry Knoll Road approaches so they each have one left-turn lane and one shared through/right turn lane. Construction is scheduled to begin in 2022 and be completed in 2023.

It is noted that DelDOT and V&M LLC (the developer) entered into a Letter Agreement executed on August 12, 2021 to have DelDOT incorporate certain access and frontage improvements needed for the V&M LLC commercial project into the construction of DelDOT's *SR 24, Love Creek to Mulberry Knoll* project. The developer would pay for certain construction costs as specified in the agreement.

The proposed development is located within the boundary of the Henlopen Transportation Improvement District (TID) as presently contemplated by Sussex County and DelDOT. The TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projections and future development within the designated district. This development is not consistent with the approved TID future land use plan and therefore does not qualify for TID participation.

**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:

- 5,000 square-foot Super C-Store with Gas (ITE Land Use Code 960)
- 12,000 square-foot Office (ITE Land Use Code 710)

**Table 1  
V&M, LLC Peak Hour Trip Generation**

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
5,000 SF Super C-Store w/ Gas	211	211	422	173	173	346	159	160	319
12,000 SF General Office	33	5	38	2	13	15	3	3	6
Internal Capture	-2	-2	-4	-4	-4	-8	-2	-2	-4
External Trips	242	214	456	171	182	353	160	161	321
Pass-By Trips	159	160	319	130	130	260	120	121	241
<b>TOTAL TRIPS</b>	<b>83</b>	<b>54</b>	<b>137</b>	<b>41</b>	<b>52</b>	<b>93</b>	<b>40</b>	<b>40</b>	<b>80</b>

**Overview of TIS**

**Intersections examined:**

- 1) Site Entrance & DE Route 24
- 2) Site Entrance & Mulberry Knoll Road
- 3) DE Route 24 & Mulberry Knoll Road
- 4) DE Route 24 & Plantation Road / Warrington Road

**Conditions examined:**

- 1) 2019 Existing (Case 1)
- 2) 2023 without development (Case 2)
- 3) 2023 with development (Case 3)

**Peak hours evaluated:** Weekday morning and evening and Saturday mid-day peak hours

**Committed developments considered:**

- 1) Belle Terre (269 single-family detached houses)
- 2) Arbor-Lyn (142 single-family detached houses)
- 3) Beebe Health Care (100-employee hospital)
- 4) Osprey Point (217 single-family detached houses)
- 5) Delaware State Police Troop 7 (25,270 sf admin facility and 10,115 sf maintenance facility)
- 6) Saddle Ridge (f.k.a. Windswept) (81 single-family detached homes)

- 7) Wellesley (132 single-family detached houses)
- 8) Welches Pond (f.k.a. Fieldstone) (247 single-family detached houses)
- 9) Pelican Landing (84,576 square-foot shopping center)
- 10) Rehoboth Point Yacht Club (f.k.a. Love Creek Marina) (180 units of three-story apartments, 5,000 square-foot quality restaurant, and a 500 square-foot retail facility)
- 11) Acadia Landing (f.k.a. Insight at Lewes Point) (238 single-family detached houses)
- 12) Marsh Island (139 single-family detached houses)
- 13) Marsh Farm Estates (134 single-family detached houses)
- 14) Windswept at Lewes (201 single-family detached houses, 178 townhouses)
- 15) Middle Creek Preserve (313 single-family detached houses)
- 16) Hailey's Glen (f.k.a. Kielbasa Property) (68 single-family detached houses)
- 17) Beachtree Preserve (155 single-family detached houses)

### **Intersection Descriptions**

#### **1) Site Entrance & Delaware Route 24**

**Type of Control:** proposed unsignalized right-in/right-out intersection

**Eastbound Approach:** (DE 24) existing one through lane; proposed one left-turn lane for downstream intersection, two through lanes, and one right-turn lane

**Westbound Approach:** (DE 24) existing one through lane; proposed two through lanes

**Northbound Approach:** (Site Entrance) proposed one right-turn-only lane, stop-controlled

#### **2) Site Entrance & Mulberry Knoll Road**

**Type of Control:** proposed unsignalized T-intersection

**Eastbound Approach:** (Site Entrance) proposed one shared left/right-turn lane, stop-controlled

**Southbound Approach:** (Mulberry Knoll Road) existing one through lane; proposed one through lane and one right-turn lane

**Northbound Approach:** (Mulberry Knoll Road) existing one through lane, proposed one shared through/left-turn lane

#### **3) Delaware Route 24 & Mulberry Knoll Road**

**Type of Control:** existing two-way stop-controlled intersection (to be signalized as part of DelDOT Project "SR 24 Love Creek to Mulberry Knoll")

**Eastbound Approach:** (DE 24) existing one shared through/left-turn lane and one channelized right turn lane; proposed one left-turn lane, two through lanes, and one right-turn lane

**Westbound Approach:** (DE 24) existing one shared through/left-turn lane and one channelized right turn lane; proposed one left-turn lane, two through lanes, and one right-turn lane

**Northbound Approach:** (Mulberry Knoll Road) existing one shared left/through/right-turn lane; proposed one left-turn lane and one shared through/right-turn lane

**Southbound Approach:** (Mulberry Knoll Road) existing one shared left/through/right-turn lane; proposed one left-turn lane and one shared through/right-turn lane

**4) Delaware Route 24 & Plantation Road / Warrington Road**

**Type of Control:** signalized four-leg intersection (proposed improvements to approaches as part of DelDOT Project “SR 24 Mulberry Knoll Road to SR 1”)

**Eastbound Approach:** (DE 24) existing one left-turn lane, one through lane, and one channelized right-turn lane; proposed one left-turn lane, two through lanes, and one channelized right-turn lane

**Westbound Approach:** (DE 24) existing one left-turn lane, one through lane, and one channelized right-turn lane; proposed one left-turn lane, two through lanes, and one right-turn lane

**Northbound Approach:** (Warrington Road) existing one left-turn lane, one through lane, and one channelized right-turn lane; proposed one exclusive left-turn lane, one shared through/left-turn lane, one exclusive through lane, and one right-turn lane

**Southbound Approach:** (Plantation Road) existing one left-turn lane, one through lane, and one channelized right-turn lane; proposed one exclusive left-turn lane, one shared through/left-turn lane, one exclusive through lane, and one 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 September 13, 2018, through September 13, 2021. A total of 70 crashes occurred within the study area during the three-year period, with 46 of those occurring at/near the intersection of Delaware Route 24 & Plantation Road/Warrington Road. The other 24 occurred at near the intersection of Delaware Route 24 & Mulberry Knoll Road. Of the 70 crashes, 40 were rear-end crashes, 11 were angle collisions, 4 were sideswipes, and 4 were head on. Zero fatalities occurred, while 12 crashes resulted in injuries. Three of the crashes were alcohol related. None of the crashes involved pedestrians or bicyclists.

**Sight Distance:** The study area generally consists of relatively flat roadways and there are few visual obstructions. However due to a horizontal curve, sight distance at the intersection of the proposed site access and Mulberry Knoll Road fails to meet the required distance of 530’ to the left and 610’ to the right (exiting the site). A reduced speed limit from 50 mph to 35mph would allow for acceptable sight distance given the geometry of the existing roadway. 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 fixed-route transit bus route in the area of the proposed V&M, LLC development. Route 215 Millsboro/Rehoboth runs along DE 24 with the nearest stops located west of the site at the Love Creek Marina and east of the site at Beebe Medical Center.

**Planned transit service:** DBF contacted a representative from DART regarding existing and planned service in the area. DBF was notified by Jared Kauffman that a Type 2, 5’x8’ bus stop pad is to be located before the beginning of the right turn lane onto Mulberry Knoll Road. Based

on coordination with DART, a Type 2, 5'x8' bus stop pad is to be located before the beginning of the right turn lane onto Mulberry Knoll Road.

**Existing bicycle and pedestrian facilities:** According to DelDOT's Sussex County Bicycle Map, Delaware Route 24 is designated as a High-Traffic Regional Bicycle Route with a Bikeway. Delaware Route 24 has 10' shoulders in both directions, but no designated bike lanes along the site frontage, nor are there pedestrian crosswalks at the existing intersections within the study area. There are currently no Shared-Use-Paths (SUPs) or sidewalks within the study area.

**Planned bicycle and pedestrian facilities:** Based on coordination with DelDOT Bicycle Coordinator, John T. Fiori; the developer plans to implement 10' wide SUP along the site frontage of Mulberry Knoll Road. The SUP will connect into the proposed sidewalk at the site's frontage along DE 24 as part of the capital improvement project "SR 24, Love Creek to Mulberry Knoll". In addition, a 4'-5' bicycle lane is to be constructed along the DE 24 site frontage.

### **Previous Comments**

In a review letter dated October 20, 2021, DelDOT indicated that the Preliminary TIS was acceptable as submitted with minor revisions for 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) Both the TIS and McCormick Taylor utilized Highway Capacity Software (HCS) version 7.8.5 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 intersections, the TIS and McCormick Taylor applied HV by lane group using existing data. The TIS adjusted future HV assuming 2% HV in the added volume, while McCormick Taylor generally assumed future HV to be the same as existing HV at all intersections. Both the TIS and McCormick Taylor assumed 3% HV for future movements to and from the proposed site access points (as per DelDOT's Development Coordination Manual section 2.2.8.11.6.H).
- 3) 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 determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F where applicable.
- 4) 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 V&M, LLC Traffic Impact Study – November 2021  
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection <sup>1</sup> One-Way Stop (Right-in/Right-out)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Delaware Route 24 &amp; Site Access</b>						
2023 Build Condition (Case 3)						
Northbound Site Access – Right	C (17.6)	B (14.3)	C (18.6)	C (17.6)	B (14.3)	C (18.6)

<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.

Table 3  
Peak Hour Levels of Service (LOS)  
Based on V&M, LLC Traffic Impact Study – November 2021  
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection <sup>2</sup> One-Way Stop (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Mulberry Knoll Road &amp; Site Access</b>						
2023 Build Condition (Case 3)						
Eastbound Site Access	A (9.6)	A (9.6)	A (9.4)	A (9.2)	A (9.2)	A (9.2)
Northbound Mulberry Knoll Road – Left	A (7.5)	A (7.5)	A (7.4)	A (7.5)	A (7.5)	A (7.4)

<sup>2</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 V&M, LLC Traffic Impact Study – November 2021  
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection <sup>3</sup> Two-Way Stop	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Delaware Route 24 &amp; Mulberry Knoll Road</b>						
2019 Existing Condition (Case 1)						
Eastbound DE 24 – Lefts	A (8.7)	A (9.9)	A (8.8)	A (8.7)	A (9.9)	A (8.8)
Westbound DE 24 – Lefts	B (10.5)	A (9.2)	B (10.3)	B (10.5)	A (9.2)	B (10.3)
Northbound Mulberry Knoll Road	D (29.8)	E (47.4)	D (33.8)	D (29.7)	E (47.3)	D (33.8)
Southbound Mulberry Knoll Road	B (14.8)	C (23.8)	F (695.7)	B (14.8)	C (23.7)	F (693.2)

<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 5  
Peak Hour Levels of Service (LOS)  
Based on V&M, LLC Traffic Impact Study – November 2021  
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection <sup>4</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Delaware Route 24 &amp; Mulberry Knoll Road</b> <sup>5</sup>						
2023 No Build Condition (Case 2)	C (25.8)	C (20.3)	C (25.4)	B (19.0)	B (18.4)	C (21.6)
2023 Build Condition (Case 3)	C (31.0)	C (28.4)	C (27.5)	C (27.1)	C (25.0)	C (24.1)

<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.

<sup>5</sup> Future cases reflect improvements to be implemented as part of DelDOT's *SR 24 Love Creek to Mulberry Knoll* project. Improvements consist of adding a separate left-turn lane and a second through lane on both approaches of DE 24, adding a separate left-turn lane on both approaches of Mulberry Knoll Road, and signaling the intersection.

Table 6  
Peak Hour Levels of Service (LOS)  
Based on V&M, LLC Traffic Impact Study – November 2021  
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection <sup>6</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Delaware Route 24 &amp; Plantation Road / Warrington Road <sup>7</sup></b>						
2019 Existing Condition (Case 1)	D (35.7)	D (39.9)	D (43.1)	D (35.3)	D (40.8)	D (41.9)
2023 No Build Condition (Case 2)	C (33.5)	D (35.7)	D (43.6)	C (33.3)	D (37.9)	D (40.1)
2023 Build Condition (Case 3)	C (32.6)	D (43.2)	D (44.2)	C (33.6)	D (38.0)	D (40.3)

<sup>6</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>7</sup> Future cases reflect improvements to be implemented as part of DelDOT's SR 24 Mulberry Knoll to SR 1 project. Improvements consist of adding a second through lane on both approaches of DE 24 and adding a shared through/left-turn lane on both side street approaches.