



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

JENNIFER COHAN
SECRETARY

November 16, 2016

Ms. Betty Tustin
The Traffic Group, Inc.
104 Kenwood Court
Berlin, Maryland 21811

Dear Ms. Tustin,

The Department has completed its review of the Traffic Impact Study (TIS) for the Melanie's Ridge development (formerly known as the Haggerty Property), prepared by The Traffic Group, Inc. (TTG) and dated August 30, 2016. TTG prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of Melanie's Ridge, proposed to be located on the west side of Bridgeville Highway (Sussex Road 13), approximately 1/3 mile south of the intersection of Bridgeville Highway and Herring Run Road (Sussex Road 534), in the City of Seaford. The proposed development would consist of 280 apartment units and 10,000 square feet of retail space to be developed on an approximately 58.43-acre parcel of land (Tax Parcel 331-5.00-11.00). Two access points are proposed: One full access along Bridgeville Highway and another access on Herring Run Road via an interconnection with the adjoining property Mearfield Section 2 development, northwest of the subject site. Construction is anticipated to be complete by 2021.

The land is currently split-zoned as R-3 (High-Density Residential) and C-2 (Highway Commercial) in the City of Seaford, and no rezoning is needed to permit the proposed uses.

During the scoping meeting and subsequent scope of work letter, dated June 17, 2016, DelDOT expressed that it would be preferable for the developer to pursue a cross-access easement through the adjoining parcel (Tax Parcel 331-5.00-11.01) north of the subject site along Bridgeville Highway to place the site entrance opposite Fallon Avenue. A four-way intersection instead of two offset three-way intersections would preserve efficient traffic operation in the area when the above-mentioned parcel and other nearby lands are developed.

DelDOT currently has one relevant project in the study area. It is a Safe Routes to School Project which was advertised for construction on October 6, 2016. This project includes the installation of ADA compliant curb ramps and marked crosswalks across all four approaches of the intersection of Virginia Avenue (Sussex Road 639) and Bridgeville Highway.



In 2014, The Traffic Group, Inc. completed a TIS for Mearfield Apartments, a residential development (Tax Parcel 331-5.00-13.00) consisting of 324 apartment units. That TIS analyzed four intersections in addition to the site entrance. Three of the four intersections analyzed in the Mearfield Apartments TIS are within the study area of the subject development. Per a request from the developer's Consultant, DeIDOT agreed to remove those three intersections from the scope of work and, instead, use the results of the analysis from the Mearfield Apartments TIS.

The future volumes considered in Mearfield Apartments TIS were more conservative due to the higher growth rates used and the list of committed developments, which included 208 condominiums and 147 townhouses on the site where Melanie's Ridge is now proposed. Below are the three intersections that were analyzed in the Mearfield Apartments TIS and were excluded from the scope of work for the subject site:

- 1) Bridgeville Highway / Herring Run Road
- 2) Bridgeville Highway / Virginia Avenue (Sussex Road 639)
- 3) Delaware Route 20 / Bridgeville Highway

The level of service (LOS) information provided herein for the three above-mentioned intersections is taken directly from the Mearfield Apartments TIS review letter DeIDOT issued on March 25, 2015.

During our review of the TIS, we considered one additional case (Case 3a) in addition to the three cases indicated in the scoping letter. For that case, we analyzed the proposed site entrance on Bridgeville Highway as the only entrance to the site, assuming no interconnection with Mearfield Section 2, to address the possibility that Melanie's Ridge might develop before Mearfield Section 2. While the analysis shows a slight degradation in the LOS, the recommended turn-lane lengths remain unchanged.

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

The review of the above-mentioned Mearfield Apartments TIS shows that the unsignalized intersection of Bridgeville Highway and Virginia Avenue exhibits LOS deficiencies without the implementation of physical roadway and/or traffic control improvements during the morning and afternoon peak hour periods for both future scenarios: 2023 without Mearfield Apartments and 2023 with Mearfield Apartments. As mentioned above, due to the nature of the Mearfield Apartments TIS, we would expect the LOS deficiencies at this intersection to be similar under both scenarios for the subject TIS.

The LOS deficiencies exhibited at this intersection occur on the eastbound Virginia Avenue approach. Despite the minor street LOS deficiencies that are anticipated to occur during future conditions, we do not recommend that any improvements be implemented by the developer at this intersection. The worst-case queue length is 185 feet, which occurs during the PM peak hour with the Mearfield Apartments development. Adding a dedicated right-turn lane to the eastbound approach would slightly reduce Case 3 delays and queue lengths, but the approach would still operate at LOS F with queue lengths in excess of 150 feet. The only seemingly feasible option to mitigate the LOS deficiencies at this intersection would be to install a traffic

signal, but that appears unlikely to be warranted. Furthermore, the nearby street network provides other means of access from Virginia Avenue to Bridgeville Highway.

Should the City of Seaford 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 should pursue a cross-access easement through the adjoining parcel (Tax Parcel 331-5.00-11.01) north of the subject site along Bridgeville Highway to place the site entrance opposite Fallon Avenue. A four-way intersection instead of two offset three-way intersections would preserve efficient traffic operation in the area when the above-mentioned parcel and other nearby lands are developed.

Based on the recommended turn-lane lengths detailed in Item 2, it may still be possible to provide access if the site entrance is not placed opposite Fallon Avenue. However, the recommended southbound right-turn lane into the subject site would be close to the existing bypass lane opposite Fallon Avenue. Also, the recommended northbound left-turn lane into the subject site would be located along a curved segment of Bridgeville Highway where sight distance would be limited for vehicles exiting and turning into the site. In either location, the developer's engineer would be responsible for demonstrating in the entrance plan review process that safe access can be provided.

2. The developer should construct the site entrance on Bridgeville Highway. The proposed configuration is shown in the table below.

Approach	Current Configuration	Proposed Configuration
Northbound Bridgeville Highway	One through lane and one right-turn lane	One left-turn lane, one through lane, and one right-turn lane
Southbound Bridgeville Highway	One shared through / left-turn lane	One left-turn lane, one through lane, and right-turn lane
Eastbound Site Entrance	Approach does not exist	One shared left / through / right-turn lane
Fallon Avenue	One shared left / through / right-turn lane	One shared left / through / 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 Subdivision Section to determine final turn-lane lengths.

Approach	Left-Turn Lane(s)	Right-Turn Lane
Northbound Bridgeville Highway	210 feet*	N/A
Southbound Bridgeville Highway	N/A	245 feet*
Eastbound Site Entrance	N/A	N/A

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

3. The developer should provide a bituminous concrete overlay to the existing travel lanes along the Bridgeville Highway site frontage where the roadway is affected by the required improvements, at DelDOT's discretion. DelDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.
4. The developer should construct an interconnection leading to Wheatfields Drive in the adjacent Mearfield Section 2 development to the north. Consideration should be given to dedicating the extension of Wheatfields Drive and the part of Melanie's Ridge Drive between Wheatfields Drive and Bridgeville Highway to public use and to building them for acceptance as City streets. The dedication to public use and acceptance by the City should be reflected on the record plan by note or illustration.
3. The following bicycle, pedestrian, and transit improvements should be included:
 - a. Adjacent to the right-turn lane added to southbound Bridgeville Highway at the site entrance, a minimum of a five foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.
 - b. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane added to southbound Bridgeville Highway at the site entrance.
 - c. Appropriate bicycle symbols, directional arrows, striping (including stop bars), and signing should be included along bicycle facilities and right-turn lanes within the project limits, and should be considered along Melanie's Ridge Drive within the site.
 - d. Utility covers should be made flush with the pavement.
 - e. A fifteen-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Bridgeville Highway.
 - f. A minimum of a five-foot sidewalk (with a minimum of a five-foot buffer from the roadway) that meets current AASHTO and ADA standards is recommended within the easement along the Bridgeville Highway site frontage.
 - g. Along Melanie's Ridge Drive, DelDOT recommends the construction of a buffered sidewalk connecting to Bridgeville Highway at the proposed site entrance.

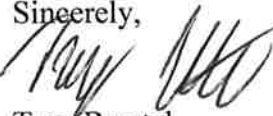
- h. DelDOT recommends the construction of internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative within the development. These sidewalks should each be a minimum of five feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. The proposed sidewalks should connect to the sidewalks along Melanie's Ridge Drive.
- i. Where internal sidewalks are located alongside of parking spaces, DelDOT recommends that a buffer be added to eliminate vehicular overhang onto the sidewalk.
- j. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
- k. Coordinate with the Delaware Transit Corporation regarding the addition of an ADA-compliant bus stop pad at the proposed Community Center with amenities such as a shelter, trash receptacle, and lighting.

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://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DelDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at Adam.Weiser@state.de.us.

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 subdivision review process.

Ms. Betty Tustin, The Traffic Group, Inc.
November 16, 2016
Page 6 of 24

Additional details on our review of this TIS are attached. If you have any questions concerning this review, please contact me at (302) 760-2167 or Mr. Claudy Joinville at (302) 760-2124. My email is Troy.Brestel@state.de.us and Mr. Joinville's email is Claudy.Joinville@state.de.us.

Sincerely,

Troy Brestel
Project Engineer

TEB:cjm
Enclosures

cc with enclosures: Ms. Betty Tustin, The Traffic Group, Inc.
Ms. Dolores J. Slatcher, City Manager, City of Seaford
Mr. Joshua Littleton, Building Official, City of Seaford
Mr. Lawrence Lank, Sussex County Planning and Zoning
Ms. Janelle Cornwell, Sussex County Planning & Zoning
Mr. Robert McCleary, Director, Transportation Solutions (DOTS)
Mr. Drew Boyce, Director, Planning
Mr. Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS
Mr. Michael Simmons, Assistant Director, Project Development South,
DOTS
Mr. Alastair Probert, South District Engineer, DOTS
Mr. J. Marc Coté, Assistant Director, Development Coordination
Mr. T. William Brockenbrough, Jr., County Coordinator, Development
Coordination
Mr. Peter Haag, Traffic Studies Manager, Traffic, DOTS
Ms. Lisa Collins, Service Development Planner, Delaware Transit
Corporation
Mr. Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Mr. Todd Sammons, Subdivision Engineer, Development Coordination
Mr. Steven Sisson, Sussex County Subdivision Coordinator, Development
Coordination
Mr. Scott Neidert, Traffic Safety Engineer, DelDOT Traffic, DOTS
Mr. Scott Johnson, Subdivision Manager, Development Coordination
Mr. Claudy Joinville, Project Engineer, Development Coordination

General Information

Report date: August 30, 2016

Prepared by: The Traffic Group, Inc. (TTG)

Prepared for: Melanie's Ridge (f.k.a. Haggerty Property)

Tax parcels: 331-5.00-11.00

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

Project Description and Background

Description: The proposed Melanie's Ridge (f.k.a. Haggerty Property) development would 280 apartment units and 10,000 square feet of retail space.

Location: Melanie's Ridge is proposed to be located on the west side of Bridgeville Highway, approximately 1/3 of a mile south of the intersection of Bridgeville Highway and Herring Run Road, in the City of Seaford. A site location map is included on Page 8.

Amount of land to be developed: approximately 58.43-acre parcel of land

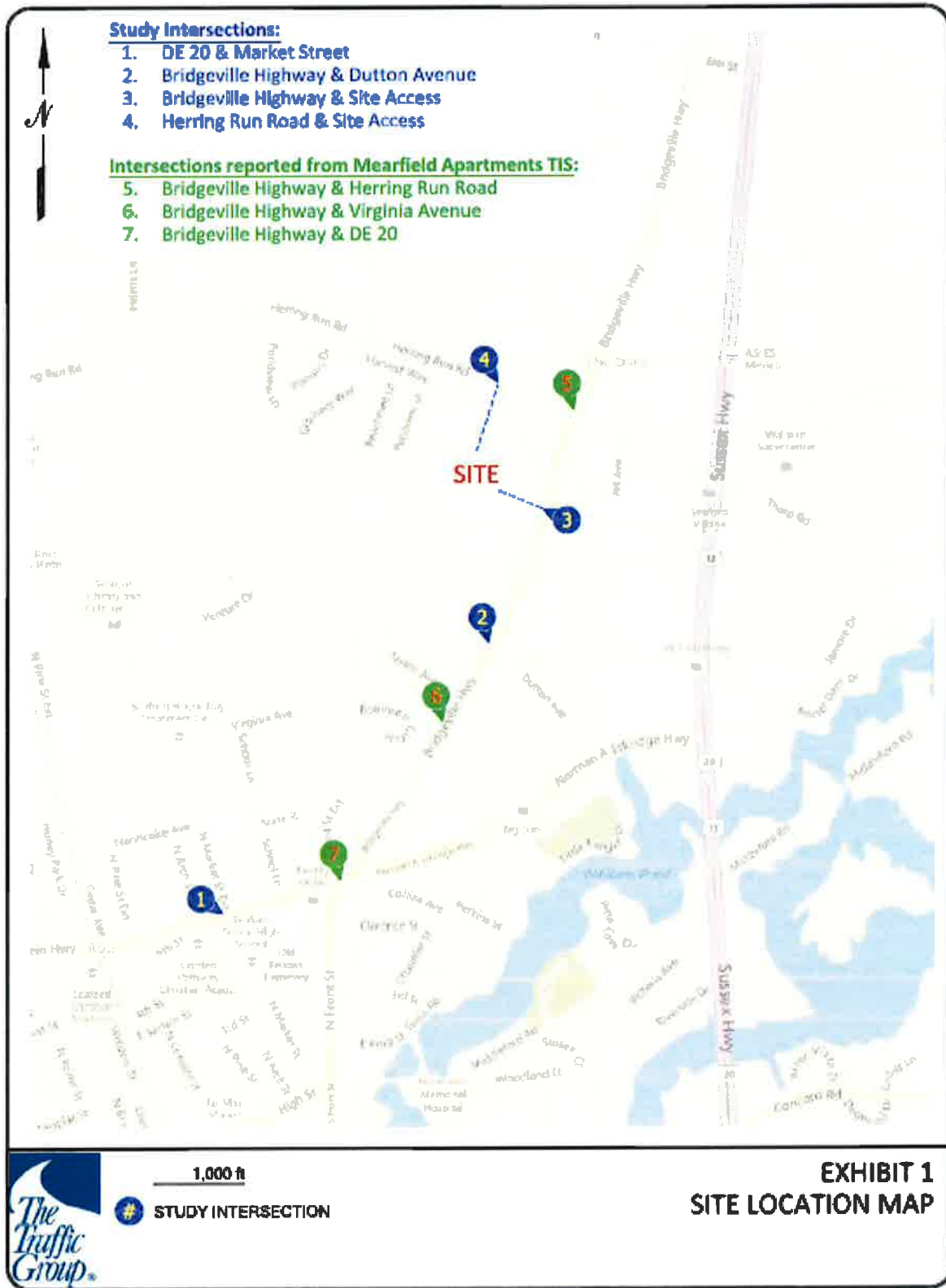
Land use approval(s) needed: Subdivision approval and City of Seaford land use approval. The land is currently split-zoned as R-3 (High-Density Residential) and C-2 (Highway Commercial) in the City of Seaford, and no rezoning is needed to permit the proposed uses.

Proposed completion date: 2021

Proposed access locations: Two full access points are proposed: one along Bridgeville Highway and another along Herring Run Road via an interconnection with Mearfield Section 2 to the north.

Daily Traffic Volumes (per DelDOT Traffic Summary 2015):

- 2015 Average Annual Daily Traffic on Bridgeville Highway: 12,879 vpd
- 2015 Average Annual Daily Traffic on Herring Run Road: 1,342 vpd



2015 Delaware Strategies for State Policies and Spending

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

The proposed Melanie's Ridge development is located within Investment Level 1 area.

Investment Level 1

Investment Level 1 Areas are areas of the state that are most prepared for growth and where the state can make cost-effective infrastructure investments for schools, roads, and public safety. In these areas, 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. Investment Level 1 Areas are often municipalities, towns, or urban / urbanizing places in counties. Density is generally higher than in the surrounding areas. Overall, it is the state's intent to use its spending and management tools to maintain and enhance community character, to promote well-designed and efficient new growth, and to facilitate redevelopment in Investment Level 1 Areas.

Proposed Development's Compatibility with Strategies for State Policies and Spending:

The proposed Melanie's Ridge development is located within Investment Level 1 area, and is to be developed as 280 apartment units and 10,000 square feet of retail space. This type of development is consistent with the character of Investment Level 1 areas. The proposed development is located adjacent to the commercial corridor of US Route 13. The *Strategies* document generally encourages efficient new growth and redevelopment in Investment Level 1 areas, and the proposed development is consistent with those goals. It is therefore concluded that the proposed development generally complies with the policies stated in the "2015 Strategies for State Policies and Spending."

Comprehensive Plan

City of Seaford Comprehensive Plan:

(Source: City of Seaford Comprehensive Plan, 2008)

The City of Seaford Comprehensive Plan Land Use Plan indicates that the proposed development parcel is in both residential and commercial zone. The parcel is split-zoned as R-3 (High-Density Residential) and C-2 (Highway Commercial) according to the current City of Seaford Zoning Map.

The City of Seaford Comprehensive Plan recognizes the growth that the City of Seaford has experienced over the years, and affirms that the City is in a position to accept future growth generated by the *Livable Delaware* strategy aimed at planning new growth near existing communities and town centers. Two of the goals of the Comprehensive Plan are to provide housing opportunities for all income ranges and to revitalize Seaford's downtown area. The Comprehensive Plan highlights that hundreds of low-income and/or government subsidized dwellings were found to be substandard

Sussex County Comprehensive Plan:

(Source: Sussex County Comprehensive Plan Update, June 2008)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed Melanie's Ridge development is in the City of Seaford, 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 that municipality's zoning ordinance, its public water and sewer capacities, and its comprehensive planning policies.

Proposed Development's Compatibility with Comprehensive Plan: The proposed Melanie's Ridge development is planned as a high-density residential apartment complex and a retail use. The proposed development appears to comply with the City of Seaford Comprehensive Plan, as two of the main goals of the plan are to provide housing opportunities for all income ranges and to revitalize Seaford's downtown area.

The site is currently split-zoned as R-3 (High-Density Residential) and C-2 (Highway Commercial) within the City of Seaford, and no rezoning is needed to permit the proposed uses. The City has already designated the parcel for high-density residential and commercial developments; therefore the proposed Melanie's Ridge mixed-use development is consistent with the City of Seaford Comprehensive Plan.

Relevant Projects in the DelDOT Capital Transportation Program

DelDOT currently has one relevant project in the study area. It is the Safe Routes to School Project which was advertised for construction on October 6, 2016. This project includes the installation of ADA compliant curb ramps and marked crosswalk across all four approaches of the intersection of Virginia Avenue (Sussex Road 639) and Bridgeville Highway.

Trip Generation

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

- 280 Apartment Units (ITE Land Use Code 220)
- 10,000 Square-Feet of Retail Space (ITE Land Use Code 826)

Table 1
 MELANIE'S RIDGE PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
280 Apartment Units	28	113	141	112	60	172
10,000 S.F. of Retail	5	2	7	12	15	27
TOTAL TRIPS	33	115	148	124	75	199

Table 2
 MELANIE'S RIDGE DAILY TRIP GENERATION

Land Use	Weekday ADT		
	In	Out	Total
280 Apartment Units	910	910	1,820
10,000 S.F. of Retail	222	221	443
TOTAL TRIPS	1,132	1,131	2,263

Overview of TIS

Intersections examined:

- 1) Site Entrance / Herring Run Road (Sussex Road 534)
- 2) Site Entrance / Bridgeville Highway (Sussex Road 13)
- 3) Bridgeville Highway / Dutton Avenue
- 4) Delaware Route 20 / Market Street

From Mearfield Apartment TIS:

- 5) Bridgeville Highway / Herring Run Road
- 6) Bridgeville Highway / Virginia Avenue (Sussex Road 639)
- 7) Delaware Route 20 / Bridgeville Highway

Conditions examined in Melanie's Ridge TIS:

- 1) 2016 existing conditions (Case 1)
- 2) 2021 without Melanie's Ridge (Case 2)
- 3) 2021 with Melanie's Ridge (Case 3)
- 4) 2021 with Melanie's Ridge and one full access on Bridgeville Highway (Case 3a)*
**Case 3a was not originally included the scope of work. We added and analyzed this additional case during our review of the TIS, assuming no interconnection with Mearfield Section 2.*

Conditions examined in Mearfield Apartments TIS:

- 1) 2014 existing conditions (Case 1)
- 2) 2023 without Mearfield Apartments (Case 2)
- 3) 2023 with Mearfield Apartments (Case 3)

Peak hours evaluated: Weekday morning and afternoon peak hours

Committed development considered:

- 1) Mearfield Single Family (182 single-family detached houses)
- 2) Mearfield Section 2 (153 condominiums / townhouses)

Intersection Descriptions

1) Herring Run Road / Site Entrance

Type of Control: proposed two-way stop-controlled (T-intersection)

Northbound approach: (Mearfield Apartments Site Entrance) one shared left / right-turn lane, stop-controlled

Eastbound approach: (Herring Run Road) one through lane and one right-turn lane

Westbound approach: (Herring Run Road) one left-turn lane and one through lane

2) Bridgeville Highway / Site Entrance / Fallon Avenue

Type of Control: proposed two-way stop-controlled (four-leg intersection)

Northbound approach: (Bridgeville Highway) one left-turn lane, one through lane, and one right-turn lane

Southbound approach: (Bridgeville Highway) one left-turn lane, one through lane, and one right-turn lane

Eastbound approach: (Site Entrance) one shared left / through / right-turn lane

Westbound approach: (Fallon Avenue) one shared left / through / right-turn lane

3) Bridgeville Highway / Dutton Avenue

Type of Control: existing two-way stop-controlled (T-intersection)

Northbound approach: (Bridgeville Highway) one through lane and one right-turn lane

Southbound approach: (Bridgeville Highway) one shared through / left-turn lane

Westbound approach: (Dutton Avenue) one shared left / right-turn lane

4) Delaware Route 20 / Market Street

Type of Control: existing four-leg intersection

Northbound approach: (Market Street) one left-turn lane and one shared through / right-turn lane

Southbound approach: (Market Street) one left-turn lane and one shared through / right-turn lane

Eastbound approach: (Delaware Route 20) one left-turn lane, one through lane, and one shared through / right-turn lane

Westbound approach: (Delaware Route 20) one left-turn lane, one through lane, and one shared through / right-turn lane

- 5) **Bridgeville Highway & Herring Run Road**
Type of Control: signalized four-leg intersection
Northbound approach: (Bridgeville Highway) one shared through / left-turn lane and one right-turn lane
Southbound approach: (Bridgeville Highway) one shared through / left-turn lane and one right-turn lane
Eastbound approach: (Herring Run Road) one left-turn lane and one shared through / right-turn lane
Westbound approach: (Herring Run Road) one left-turn lane and one shared through / right-turn lane

- 6) **Bridgeville Highway & Virginia Avenue / Woodland Mills Drive**
Type of Control: two-way stop-controlled (four-leg intersection)
Northbound approach: (Bridgeville Highway) one shared through / left-turn lane and one right-turn lane
Southbound approach: (Bridgeville Highway) one shared left / through / right-turn lane
Eastbound approach: (Virginia Avenue) one shared left / through / right-turn lane, stop-controlled
Westbound approach: (Woodland Mills Drive) one shared left / through / right-turn lane, stop-controlled

- 7) **Delaware Route 20 & Bridgeville Highway**
Type of Control: signalized four-leg intersection
Northbound approach: (Bridgeville Highway) one left-turn lane, one shared through/right-turn lane and one right-turn lane
Southbound approach: (Bridgeville Highway) one left-turn lane, one through lane and one right-turn lane (right-turn-on-red prohibited)
Eastbound approach: (Delaware Route 20) one left-turn lane, two through lanes and one right-turn lane
Westbound approach: (Delaware Route 20) one left-turn lane, two through lanes and one right-turn lane

Safety Evaluation

Crash Data: Crash data was obtained for July 21, 2013 to July 21, 2016 for each of four study intersections for the proposed development, and for October 10, 2011 to October 10, 2014 for each of the three intersections analyzed in the Mearfield Apartments TIS. The crash data requests returned a total of 61 reportable crashes, which includes 13 personal injury crashes and no fatalities. There was one crash involving a pedestrian injury at the intersection of Delaware Route 20 and Bridgeville Highway, and 6 of the 61 crashes were alcohol-related. The data indicates that the most common types of crashes were rear-end crashes and angle crashes, mostly caused by driver distraction/inattention, following too close, or failure to yield the right-of-way. Most of the crashes occurred during daylight hours, and the surface, lighting, or weather conditions were contributing factors in relatively few crashes. The data does not indicate any major crash trends and no additional safety improvements are recommended at this time as a result of the crash data analysis.

- Delaware Route 20 / Market Street
 - 15 crashes reported (14 property damage, 1 personal injury)
- Bridgeville Highway / Dutton Avenue
 - 8 crashes report (7 property damage, 1 personal injury)
- Bridgeville Highway and Herring Run Road
 - 15 crashes reported (9 property damage, 6 injury)
- Bridgeville Highway and Virginia Avenue
 - 6 crashes reported (6 property damage, 0 injury)
- Delaware Route 20 & Bridgeville Highway
 - 17 crashes reported (12 property damage, 5 injury, 1 pedestrian crash)

Sight Distance: The proposed entrance on Bridgeville Highway would be located on the inside of a horizontal curve, which presents potential sight distance and safety concerns especially for left-turning vehicles to and from the site. The proposed location of the Bridgeville Highway site entrance, as well as the lane configurations and allowed movements at that intersection, may require a closer evaluation from a safety perspective. The potential sight distance and safety concerns would be minimized if the proposed site entrance is placed opposite Fallon Avenue.

With generally straight and flat roadways, and few potential visual obstructions throughout the rest of the study area including the proposed site entrance for the Mearfield Apartments, sight distance appears adequate. No problematic sight distance issues have been reported or indicated by crash data, and no major problems were observed during field observations in the area.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: The Delaware Transit Corporation (DTC) currently operates DART Bus Route 212 in the project area. Route 212 serves Georgetown, Bridgeville, Seaford, Blades, Laurel and Delmar, with stops in the Seaford Village Shopping Center located at the southwest corner of the intersection of US Route 13 and Herring Run Road/Tharp Road. DART also operates a new flex route - Route 903F (Seaford Loop), which is a local loop through downtown Seaford. The route originates and ends in the Seaford Village Shopping Center and also travels through the study intersection of Bridgeville Highway and Virginia Avenue.

Planned transit service: At the time of the Mearfield Apartment TIS, The Traffic Group contacted the DTC to determine requested transit facilities for the proposed development. It was requested that an ADA compliant bus stop waiting pad be provided at the proposed Community Center. It is still unknown whether transit service would be extended to Melanie's Ridge at this time. The developer should coordinate with DTC to determine any planned transit service near the proposed site entrance on Bridgeville Highway.

Existing bicycle and pedestrian facilities: According to DelDOT's Sussex County Bicycle Map (dated 2012), Bridgeville Highway is classified as a High Traffic Bicycle Route along the proposed site frontage. Bridgeville Highway has ten-foot wide shoulders in both directions with no bicycle symbols, directional arrows or striping. Herring Run Road is classified as a Connector Bicycle Route without a bikeway along the proposed Mearfield Apartments site frontage. Herring Run Road has six-foot wide shoulders in both directions with bicycle symbols, directional arrows and striping.

According to the bicycle level of service (BLOS) calculator developed by the *League of Illinois Bicyclists* Bridgeville Highway operates at BLOS A. While the annual average daily traffic volume is relatively high on that road segment where the site entrance is proposed to be located, which is from Delaware Route 20 to the north Seaford limits, the adequate BLOS is largely due to the low posted speed limit of 45 mph and wide shoulders. There are currently no sidewalk or multi-use paths along the proposed site frontage.

According to the BLOS calculator, the Herring Run Road corridor operates at BLOS B. A buffered sidewalk exists along the entire frontage of the Mearfield Single Family and Mearfield Section 2 developments, which extends west from the entrance to the Nanticoke Mears Health Campus to the City of Seaford Electric Department facility.

Planned bicycle and pedestrian facilities: DelDOT's Statewide & Regional Planning Section provided comments regarding planned or requested bicycle and pedestrian facilities in the study area of this proposed development. The following requests were provided:

- Install five-foot sidewalk, with a minimum of three-foot buffer along the Bridgeville Highway site frontage, and tie it into the shoulder just before the existing traffic guardrail.
- Install bike lanes along the Bridgeville Highway site frontage.

From Mearfield Apartments TIS:

- Complete sidewalk on Herring Run Road to the intersection of Bridgeville Highway.
- Need a buffered public sidewalk along Sassafras Drive (the proposed site entrance/main access road for the proposed development) connecting from Herring Run Road through to the southern parcel boundary.
- Consider bike lane striping and bike symbol markings on Sassafras Drive.
- Need a sidewalk connection from Sassafras Drive along Harvest Way to western parcel boundary.
- Need extended bike lane to flow across Sassafras Drive highway entrance.

Previous Comments

All comments from DelDOT's Scoping Letter, Traffic Count Review, and Preliminary TIS (PTIS) Review were addressed in the Final TIS submission.

General HCS Analysis Comments

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

- 1) For signalized intersections, DelDOT applied Heavy Vehicle (HV) percentages by lane group using existing data. The HCS worksheets provided in the TIS do not specify how HV percentages were applied.
- 2) For signalized intersections, DelDOT used a base saturation flow rate of 1,750 pcphpl provided in the Development Coordination Manual. The TIS did not note the base saturation flow rates used in their analysis, either in the letter or the capacity analysis appendix.
- 3) For the intersection of Delaware Route 20 and Market Street, DelDOT included right-turn-on-red (RTOR) volumes for existing and future conditions analyses. From the Mearfield Apartments TIS, McCormick Taylor input no right-turn-on-red (RTOR) volumes for existing and future conditions analyses. The TIS did not note whether RTOR volumes were used in their analysis, either in the letter or the capacity analysis appendix.
- 4) For unsignalized intersections, the TIS and DelDOT applied heavy vehicle (HV) percentages by movement. For future conditions, the TIS and DelDOT generally assumed future HV percentages to be the same as existing HV percentages.
- 5) For existing conditions at unsignalized intersections, the TIS and DelDOT determined and applied, for each intersection, the peak hour factor (PHF) by movements. For future conditions, the TIS assumed future PHF for some movements that were generally different from the PHF DelDOT applied. DelDOT used future PHF of 0.92 for movements that had significant increase in trips for future conditions.

Table 3
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Melanie's Ridge
Report dated August 30, 2016
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection ¹ Two-Way Stop Control (T-intersection)	LOS per TIS		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Highway & Site Entrance				
2021 with Melanie's Ridge (Case 3)				
Eastbound Site Entrance	C (18.5)	D (26.8)	C (18.5)	D (26.8)
Northbound Bridgeville Highway – Left	A (8.3)	A (9.3)	A (8.3)	A (9.3)

¹ For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds.

Table 4
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Melanie's Ridge
Report dated August 30, 2016
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection ² Two-Way Stop Control (T-intersection)	LOS per TIS		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Highway & Site Entrance³				
2021 with Melanie's Ridge (Case 3)				
Eastbound Site Entrance	N/A	N/A	C (21.4)	D (33.5)
Northbound Bridgeville Highway – Left	N/A	N/A	A (8.3)	A (9.3)

² For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds.

³ The site entrance is analyzed as the only access for the proposed Melanie's Ridge development. Therefore, this analysis assumed no interconnection with the Mearfield Section 2 residential development.

Table 5
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Melanie's Ridge
Report dated August 30, 2016
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection ⁴ Two-Way Stop Control (T-intersection)	LOS per TIS		LOS per DeIDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Herring Run Road & Site Entrance				
2021 with Melanie's Ridge (Case 3)				
Northbound Site Entrance	B (10.6)	B (11.0)	B (11.0)	B (11.1)
Westbound Herring Run Road – Left	A (7.8)	A (8.0)	A (7.9)	A (8.0)

⁴ For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds.

Table 6
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Melanie's Ridge
Report dated August 30, 2016
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection ⁵ Two-Way Stop Control (four-leg intersection) ⁶	LOS per TIS		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Highway & Dutton Avenue				
2016 Existing (Case 1)				
Southbound Bridgeville Highway	A (8.3)	A (8.4)	A (8.3)	A (8.4)
Westbound Dutton Avenue	C (16.5)	C (19.3)	C (16.3)	C (19.1)
2021 without Melanie's Ridge (Case 2)				
Southbound Bridgeville Highway	A (8.4)	A (8.7)	A (8.4)	A (8.7)
Westbound Dutton Avenue	C (19.0)	C (23.7)	C (18.6)	C (23.6)
2021 without Melanie's Ridge (Case 3)				
Southbound Bridgeville Highway	A (8.5)	A (8.8)	A (8.4)	A (8.9)
Westbound Dutton Avenue	C (20.7)	D (27.0)	C (19.6)	D (26.8)

⁵ For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds.

⁶ The TIS and DelDOT analyze this intersection utilizing a westbound through volume of one (1) for the unnamed street as input in order for HCS to report a delay for this approach.

Table 7
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Melanie's Ridge
Report dated August 30, 2016
 Prepared by The Traffic Group, Inc.

Signalized Intersection ⁷	LOS per TIS		LOS per DeIDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Delaware Route 20 & Market Street				
2016 Existing (Case 1)	B (19.0)	B (17.3)	B (18.3)	B (17.2)
2021 without Melanie's Ridge (Case 2)	B (18.9)	B (17.3)	B (18.3)	B (17.3)
2021 with Melanie's Ridge (Case 3)	B (18.9)	B (17.3)	B (18.4)	B (17.3)

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

Table 8
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Mearfield Apartments
Report dated December 2014
Prepared by The Traffic Group, Inc.

Signalized Intersection ⁸	LOS per TIS		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Highway & Herring Run Road				
2014 Existing (Case 1)	B (14.1)	B (14.8)	B (13.1)	B (14.0)
2023 without Mearfield Apartments (Case 2)	B (16.4)	B (18.0)	B (15.2)	B (16.7)
2023 with Mearfield Apartments (Case 3)	B (18.2)	B (19.5)	B (16.7)	B (17.7)

⁸ The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 9
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Mearfield Apartments
Report dated December 2014
Prepared by The Traffic Group, Inc.

Unsignalized Intersection ⁹ Two-Way Stop Control	LOS per TIS		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Highway & Virginia Avenue / Woodland Mills Drive				
2014 Existing (Case 1)				
Northbound Bridgeville Hwy – Left	A (8.2)	A (8.6)	A (8.2)	A (8.6)
Southbound Bridgeville Hwy - Left	A (7.9)	A (8.2)	A (7.9)	A (8.2)
Eastbound Virginia Avenue	C (22.7)	D (34.9)	C (22.6)	D (34.9)
Westbound Woodland Mills Drive	B (14.1)	C (17.3)	B (14.1)	C (17.3)
2023 without Mearfield Apartments (Case 2)				
Northbound Bridgeville Hwy – Left	A (8.7)	A (9.0)	A (8.7)	A (9.0)
Southbound Bridgeville Hwy - Left	A (8.2)	A (8.6)	A (8.2)	A (8.6)
Eastbound Virginia Avenue	E (45.9)	F (104.6)	E (45.5) ¹⁰	F (104.6) ¹¹
Westbound Woodland Mills Drive	C (17.3)	C (23.8)	C (17.3)	C (23.8)
2023 with Mearfield Apartments (Case 3)				
Northbound Bridgeville Hwy – Left	A (8.9)	A (9.1)	A (8.9)	A (9.1)
Southbound Bridgeville Hwy - Left	A (8.2)	A (8.7)	A (8.2)	A (8.7)
Eastbound Virginia Avenue	F (59.4)	F (142.9)	F (58.7) ¹²	F (142.9) ¹³
Westbound Woodland Mills Drive	C (18.5)	D (26.2)	C (18.5)	D (26.2)

⁹ The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

¹⁰ The 95th percentile queue length for the eastbound Virginia Avenue approach during the Case 2 AM peak hour is approximately 5 vehicles.

¹¹ The 95th percentile queue length for the eastbound Virginia Avenue approach during the Case 2 PM peak hour is approximately 6 vehicles.

¹² The 95th percentile queue length for the eastbound Virginia Avenue approach during the Case 3 AM peak hour is approximately 6 vehicles.

¹³ The 95th percentile queue length for the eastbound Virginia Avenue approach during the Case 3 PM peak hour is approximately 7 vehicles.

Table 10
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Mearfield Apartments
Report dated December 2014
 Prepared by The Traffic Group, Inc.

Signalized Intersection ¹⁴	LOS per TIS		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
DE Route 20 & Bridgeville Highway				
2014 Existing (Case 1)	C (26.6)	C (30.1)	C (25.6)	C (29.4)
2023 without Mearfield Apartments (Case 2)	C (29.2)	C (33.4)	C (28.2)	C (33.3)
2023 with Mearfield Apartments (Case 3)	C (30.0)	C (34.7)	C (28.8)	D (35.1)

¹⁴ The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.