



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

NICOLE MAJESKI
SECRETARY

October 15, 2021

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

Dear Ms. Kline-Elsier:

The enclosed Traffic Operational Analysis (TOA) review letter for the **Village of College Park** (Protocol Tax Parcel 135-14.00-31.00) 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 TOA 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) 760-2109.

Sincerely,

T. William Brockenbrough, Jr.
County Coordinator

TWB:km
Enclosure

cc with enclosure: Mr. Shawn Tucker, Barnes & Thornburg, LLP
Mr. Douglas Liberman, Larson Engineering, Inc.
Mr. David Edgell, Office of State Planning Coordination
Ms. Jocelyn Huff, Town of Georgetown
Mr. Jamie Whitehouse, Sussex County Planning and Zoning
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, 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
Chris Sylvester, Traffic Studies Manager, Traffic, DOTS
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
Richard McCabe, Sussex Review Coordinator, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Derek Sapp, Subdivision Manager, Development Coordination
Claudy Joinville, Project Engineer, Development Coordination
Annamaria Furmato, Project Engineer, Development Coordination



October 13, 2021

Mr. Claudy Joinville
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202069012
Traffic Impact Study Services
Task 3-2A – Village of College Park TOA

Dear Mr. Joinville:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Operational Analysis (TOA) for the Village of College Park, which was prepared by McMahon Associates, Inc. dated January 27, 2021. This review was assigned as Task Number 3-2A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TOA evaluates the impacts of a proposed mixed-use development in the Town of Georgetown in Sussex County, Delaware. A Traffic Impact Study (TIS) was performed in 2008 that included this development; while most of the improvements identified in that TIS are complete, those identified at the intersection of Bridgeville Road and Vaughn Road are not. Thus, the purpose of this TOA is to identify what improvements need to be made at that intersection. Outside of this, the developer also included analysis of four other intersections in the nearby area. As a courtesy, we have reviewed the analysis of those intersections as well.

The Village of College Park development would be comprised of 121 single family homes and 288 apartments. In addition to the proposed residential uses, two pad sites within the Shops at College Park are anticipated to be developed with approximately 80,000 square feet of office space. As these lots are controlled by the same applicant, the development of these lots is included in the TOA.

The site is located northwest of the intersection of US 113 (DuPont Boulevard) and Bridgeville Road (Delaware Route 18), along the northwest corner of the intersection of College Park Lane and Carmean Way. The subject property is on an approximately 69.67-acre assemblage of parcels. Per the Record Plan prepared by Larson Engineering Group Inc., last revised June 21, 2019, the subject land is currently zoned as MR-1 (Multi-family Residential) and RPC (Residential Planned Community) and the developer does not plan to rezone the land. Access is proposed via internal connections to University Drive which ultimately provide two full accesses to Bridgeville Road (University Drive and Carmean Way) and a full access to US 113 (College Park Lane). The TOA refers to the unsignalized site access along Bridgeville Road as College Park Lane but for the



purposes of this TOA review letter it is referred to as University Drive, per the Record Plan. Construction for the development is anticipated to be completed in 2025.

DelDOT has relevant and ongoing projects within the study area. The US 113 North/South Study is examining potential improvements throughout the entire length of US 113 in Delaware, from the Maryland state line in Selbyville to SR 1 north of Milford. The study is divided into four geographic areas, and the site falls into the Georgetown area. For each of these areas, environmental studies are required for potential improvements by the Federal Highway Administration (FHWA). The selected On-alignment Alternative consists of widening US 113 to provide one additional lane northbound and southbound, provide controlled access with grade separated interchanges at eight locations, eliminate all traffic signals and unsignalized crossovers along US 113, and widen existing shoulder to 15 feet. Additionally, the study identified the grade separated intersection at US 113 and Bridgeville Road to be the highest priority. The Georgetown Area Environmental Assessment of the On-alignment Alternative was completed in 2012.

The *US 113 @ SR 18/SR 404 (Georgetown) Grade Separated Intersection* project (DelDOT Contract No. T201412701) was identified in the Georgetown Environmental Assessment through the US 113 North/South study. The project aims to preserve mobility for local residents and businesses while providing highway improvements that would reduce congestion, decrease accidents, and accommodate the anticipated traffic growth. The project will convert the study intersection of US 113 and Bridgeville Road (Delaware Route 18) to a grade separated intersection. The grade separation will include Bridgeville Road bridging over US 113 with loop ramps in the northeast and southwest quadrants. Additionally, the project will widen US 113 to provide three lanes in each direction from Bedford Street to Ennis Street. The project is currently in the design and planning phase, and construction is anticipated to begin in 2024 and end in 2026. More information about the project can be found at:
<https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201412701#project-details1>

DelDOT's 2019 Hazard Elimination Program identified Site S-5 which is within the project area. Site S-5 is the intersection of US 113 and College Park Lane. The Site S-5 Task I report included a crash summary and field observations. The study recommended that southbound US 113 be restriped to provide an acceleration lane for the eastbound right turn, as well as signing and striping improvements. Additionally, the report recommended that a study be conducted to evaluate shopping center access improvements along westbound College Park Lane to reduce the potential for angle crashes. Per a site visit, these recommendations have not yet been implemented.

Based on our review of the TOA, 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.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
Bridgeville Road (Delaware Route 18)/University Drive (Site Access)	X		Case 3 – 2025 with Development
US 113 (DuPont Boulevard)/Bridgeville Road (Delaware Route 18)		X	Case 1 – Existing
		X	Case 2 – 2025 without Development
	X	X	Case 3 – 2025 with Development

The existing unsignalized Bridgeville Road intersection with University Drive would exhibit LOS deficiencies during the AM peak hour under future conditions with the proposed development. These deficiencies occur along the southbound Site Entrance approach and with delays of 35.6 seconds per vehicle during the AM peak hour under Case 3 conditions. These LOS deficiencies could be mitigated by signalization of the intersection while maintaining the existing intersection footprint. The projected LOS failures only exist along the southbound University Drive (Site Entrance) approach to the intersection and the calculated 95th percentile queue length along the southbound left turn lane is approximately 35 feet. However, DelDOT previously identified the need for the Georgetown Commercial development to enter into a traffic signal agreement for the intersection when a signal is warranted. Therefore, we recommend that the Village of College Park enter into a traffic signal agreement for the intersection of Bridgeville Road and University Drive, and coordinate with DelDOT on the implementation and equitable cost sharing of a traffic signal installation when a signal is warranted.

The existing signalized US 113 intersection with Bridgeville Road exhibits LOS deficiencies during the PM peak hour under existing and future conditions, with or without the proposed development and during the AM peak hour under future conditions with the development. However, as part of the *US 113 @ SR 18/SR 404 (Georgetown) Grade Separated Intersection* project, the intersection will be converted to a grade-separated interchange. Therefore, we do not recommend that the developer implement any improvements at this intersection. However, the developer has made an equitable contribution to the improvements planned at the intersection as part of the *US 113 @ SR 18/SR 404 (Georgetown) Grade Separated Intersection* (DelDOT Contract No. T201412701) project.

Should the Town of Georgetown approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. 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 enter into a traffic signal agreement with DelDOT to fund an equitable portion of the improvements planned for the full access site entrance for the proposed Village of College Park development on Bridgeville Road at the intersection with University Drive. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound Bridgeville Road	One left turn lane, one through lane, and one right turn lane	No change
Westbound Bridgeville Road	One left turn lane, one through lane, and one right turn lane	No change
Northbound University Drive	One shared left turn/through lane and one right turn lane	No change
Southbound University Drive	One shared left turn/through lane and one right turn lane	No change

Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage lengths (excluding taper) of the separate left turn and right turn lanes along Bridgeville Road are listed below.

Approach	Left Turn Lane	Right Turn Lane
Eastbound Bridgeville Road	120 feet	190 feet
Westbound Bridgeville Road	120 feet	190 feet

The existing eastbound Bridgeville Road left turn lane should be lengthened to provide the recommended storage length. The other auxiliary lane storage lengths should be maintained and the calculated queue lengths from the HCS analysis can be accommodated within the recommended storage lengths.

DelDOT previously identified the need for the Georgetown Commercial development to enter into a traffic signal agreement for the intersection when a signal is warranted. The traffic signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT’s discretion. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of these improvements. Prior to Entrance Plan approval, the developer should submit a signal warrant analysis to DelDOT to confirm when a signal should be installed and the signal phasing operation.



- The developer previously entered into a traffic signal agreement for the construction of a traffic signal at the intersection of Bridgeville Road and Carmean Way. This traffic signal agreement has been executed, and so the developer should enter into a new traffic signal agreement for the intersection to modify the signal phasing along the northbound and southbound approaches and provide a pedestrian crossing along the easterly leg. The intersection should be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Bridgeville Road	One left turn lane, one through lane, and one right turn lane	No change
Westbound Bridgeville Road	One left turn lane, two through lanes, and one right turn lane	No change
Northbound Carmean Way	One shared left turn/through lane and one right turn lane	No change
Southbound Carmean Way	One shared left turn/through lane and one right turn lane	No change

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage lengths (excluding taper) of the separate left turn and right turn lanes along Bridgeville Road are listed below.

Approach	Left Turn Lane	Right Turn Lane
Eastbound Bridgeville Road	145 feet	190 feet
Westbound Bridgeville Road	190 feet	190 feet

Based on a recent site visit, the auxiliary lane storage lengths are consistent with the recommended minimum lengths and should be maintained. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage lengths.

The signal phasing along the northbound and southbound Carmean Way approaches should be modified to split phase and the developer should install a pedestrian crossing along the easterly leg of the intersection. The traffic signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. Prior to Entrance Plan approval, the developer should submit a plan to DelDOT to confirm the design of the intersection and the signal phasing operation.

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



- a. Where internal sidewalks are located alongside of parking spaces, a buffer, physical barrier, or signage should be added to eliminate vehicular overhand onto the sidewalk.
 - b. A minimum five-foot wide bicycle lane should be incorporated in the right turn lane along the southbound US 113 approach to College Park Lane/Site Entrance. Widening along the right turn lane and modifications to the existing channelized island on the northwest corner of the intersection may be needed to accommodate the bicycle lane. The developer should coordinate with DelDOT Development Coordination Section regarding the design during Entrance Plan review.
 - c. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/SUP or should be flush with the pavement.
 - d. The developer should provide bus pads along University Drive. The developer should coordinate with DART on the exact locations, the design, and the amenities to provide, during the Entrance Plan review.
4. Due to the proximity of the proposed development to the Delaware Coastal Airport, we recommend that deed restrictions be required similar to the attached Avigation Nuisance Easement and Non-Suit Covenant (pages 24 and 25). The applicant should contact Mr. Joshua Thomas at (302) 760-4834 at DelDOT's Statewide and Regional Planning Section to determine whether the proposed development is within the Runway Protection Zone. If so, restrictions may apply.

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 Plan Review process.

Improvements in this TOA may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at https://www.deldot.gov/Publications/manuals/de_muted/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction, please contact Mr. Jeff VanHorn, Assistant Director for Traffic Operations and Management. Mr. VanHorn can be reached at (302) 659-4606 or by email at Jeffrey.VanHorn@delaware.gov.

Additional details on our review of the TOA are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.



Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

A handwritten signature in black ink, appearing to read 'Joanne M. Arellano'. The signature is fluid and cursive, with the first name 'Joanne' being the most prominent.

Joanne M. Arellano, P.E., PTOE

cc: Mir Wahed, P.E., PTOE
Janna Brown, E.I.T.

Enclosure

General Information

Report date: January 27, 2021

Prepared by: McMahon Associates, Inc.

Prepared for: Sussex Entertainment Enterprises, LLC

Tax Parcels: 135-14.00-35.00, 135-14.00-31.00, 135-14.00-31.01

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

Project Description and Background

Description: The proposed development consists of 121 detached single-family houses and 288 mid-rise multi-family apartments. Note: in addition to the proposed residential uses, two pad sites remain within the Shops at College Park which are anticipated to be developed with approximately 80,000 square feet of office space. As these lots are controlled by the same applicant, the development of these lots is included in the TOA.

Location: The subject site is located northwest of the intersection of US 113 and Bridgeville Road (Delaware Route 18), along the northwest corner of the intersection of College Park Lane and Carmean Way, in the Town of Georgetown, Sussex County.

Amount of Land to be developed: An approximately 70-acre assemblage of parcels.

Land Use approval(s) needed: Entrance Plan.

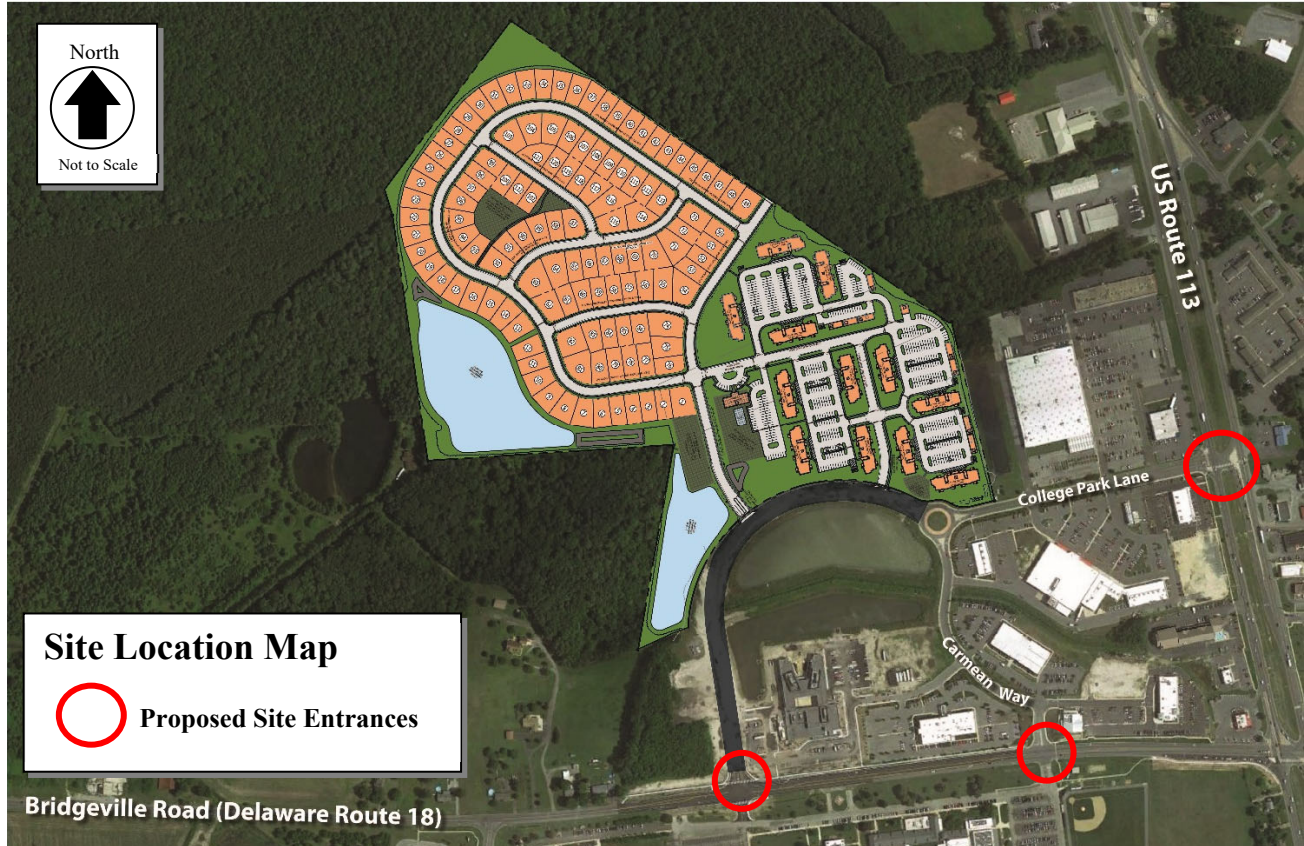
Proposed completion date: 2025.

Proposed access locations: Internal connections to University Drive which ultimately provide two full accesses to Bridgeville Road (University Drive and Carmean Way) and a full access to US 113 (College Park Lane). The TOA refers to the unsignalized site access along Bridgeville Road as College Park Lane but for the purposes of this TOA review letter it is referred to as University Drive, per the Record Plan.

Daily Traffic Volumes:

- 2019 Average Annual Daily Traffic on US 113: 28,066
- 2019 Average Annual Daily Traffic on Bridgeville Road (Delaware Route 18): 16,611

Site Map



**Graphic is an approximation based on the Record Plan prepared by Larson Engineering Group, Inc. last revised June 21, 2019.*

Relevant and On-going Projects

DelDOT has relevant and ongoing projects within the study area. The US 113 North/South Study is examining potential improvements throughout the entire length of US 113 in Delaware, from the Maryland state line in Selbyville to SR 1 north of Milford. The study is divided into four geographic areas, and the site falls into the Georgetown area. For each of these areas, environmental studies are required for potential improvements by the Federal Highway Administration (FHWA). The selected On-alignment Alternative consists of widening US 113 to provide one additional lane northbound and southbound, provide controlled access with grade separated interchanges at eight locations, eliminate all traffic signals and unsignalized crossovers along US 113, and widen existing shoulder to 15 feet. Additionally, the study identified the grade separated intersection at US 113 and Bridgeville Road to be the highest priority. The Georgetown Area Environmental Assessment of the On-alignment Alternative was completed in 2012.

The *US 113 @ SR 18/SR 404 (Georgetown) Grade Separated Intersection* project (DelDOT Contract No. T201412701) was identified in the Georgetown Environmental Assessment through the US 113 North/South study. The project aims to preserve mobility for local residents and businesses while providing highway improvements that would reduce congestion, decrease

accidents, and accommodate the anticipated traffic growth. The project will convert the study intersection of US 113 and Bridgeville Road (Delaware Route 18) to a grade separated intersection. The grade separation will include Bridgeville Road bridging over US 113 with loop ramps in the northeast and southwest quadrants. Additionally, the project will widen US 113 to provide three lanes in each direction from Bedford Street to Ennis Street. The project is currently in the design and planning phase, and construction is anticipated to begin in 2024 and end in 2026. More information about the project can be found at:

<https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201412701#project-details1>

DelDOT's 2019 Hazard Elimination Program identified Site S-5 which is within the project area. Site S-5 is the intersection of US 113 and College Park Lane. The Site S-5 Task I report included a crash summary and field observations. The study recommended that southbound US 113 be restriped to provide an acceleration lane for the eastbound right turn, as well as signing and striping improvements. Additionally, the report recommended that a study be conducted to evaluate shopping center access improvements along westbound College Park Lane to reduce the potential for angle crashes. Per a site visit, these recommendations have not yet been implemented.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, 2020)

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

The proposed development is located within the Investment Level 1 and Level 2. The majority of the site exists in Level 2.

Investment Level 1

These areas are often municipalities, towns, or urban/urbanizing places in counties where density is generally higher than in surrounding areas. In Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote a variety of transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Overall, it is the state's intent to use its spending and management tools to maintain and enhance community character, and to promote well-designed and efficient new growth in Investment Level 1 Areas.

In Level 1 Areas the state's first priority will be for preserving existing facilities and making safety improvements. Level 1 areas will also be the highest priority for context sensitive transportation system capacity enhancements, transit-system enhancements, ADA accessibility, and for closing gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 1 Areas are ideal locations for Transportation Improvement Districts as well as Complete Community Enterprise Districts. Further, Level 1 areas are the first priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity of neighborhoods and public facilities.

Investment Level 2

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. They serve as transition areas between Level 1 and the state's more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like Investment Level 1 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. 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 its 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, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

Level 2 Areas share similar priorities as with the Level 1 Areas where the aim remains to: make context sensitive transportation system capacity enhancements, preserve existing facilities, make safety enhancements, make transportation system capacity improvements, create transit system enhancements, ensure ADA accessibility, and close gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 2 Areas are ideal locations for Transportation Improvement Districts and Complete Community Enterprise Districts. Other priorities for Level 2 Areas include: Corridor Capacity Preservation, off-alignment multi-use paths, interconnectivity of neighborhoods and public facilities, and signal-system enhancements.

Proposed Development's Compatibility with Livable Delaware:

The majority of the proposed site would be located in Investment Level 2. Investment Level 2 encompasses a wide variety of usages and densities and encourages diversified housing beyond single family detached homes. Both Investment Levels 1 and 2 promote efforts to improve interconnectivity between neighborhoods, improvements to existing transportation, and mixed-use development. The site's plan to develop both single-family detached homes and midrise multi-family apartments will diversify housing and the intent to provide commercial development adjacent to the site creates a mixed-use development area. Therefore, the proposed development is generally consistent with the 2020 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plan

(Source: Town of Georgetown 2010 Comprehensive Plan)

Georgetown Comprehensive Plan:

Per the Record Plan last revised June 21, 2019, the subject land is currently zoned as MR-1 (Multi-family Residential) and RPC (Residential Planned Community) and the developer does not plan to rezone the land. Per the *Town of Georgetown Comprehensive Plan Map* (adopted February 2019) the proposed development is in an area designated Medium High Density Residential (with some neighborhood business allowed).

Proposed Development’s Compatibility with the Georgetown Comprehensive Plan:

Per the *Town of Georgetown Comprehensive Plan Map* (adopted February 2019) the proposed development is in an area designated Medium High Density Residential (with some neighborhood business allowed). This land use encourages a mix of single family detached houses and multi-family apartments. Therefore, the proposed development is generally consistent with the *Town of Georgetown Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Codes: 210 (Single Family Detached Houses), 221 (Mid-Rise Multi-Family Townhouses), and 720 (Medical-Dental Office). Note, the trip generation in Table 1 which was used in the TOA review differs from what was included in the TOA. Specifically, JMT has updated the 80,000 square foot office use to be based on medical-dental office per DelDOT.

Table 1
Village of College Park Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
121 Single Family Detached Houses (ITE Code 210)	1,239	22	68	90	75	45	120
288 Mid-Rise Multi-Family Apartments (ITE Code 221)	1,568	27	77	104	77	50	127
80,000 SF Medical-Dental Office (ITE Code 720)	2,986	143	40	183	78	199	277
Total Trips	5,793	192	185	377	230	294	524

Overview of TOA

Intersections examined:

1. Bridgeville Road (Delaware Route 18) and Vaughn Road (Sussex Road 520)
2. Bridgeville Road and University Drive (Site Access)
3. Bridgeville Road and Carmean Way (Site Access)
4. Bridgeville Road and US 113 (Dupont Boulevard)
5. US 113 and College Park Lane (Site Access)

Conditions examined:

1. Case 1 – Existing
2. Case 2 – 2025 without development
3. Case 3 – 2025 with development

Committed Developments considered:

1. Shipbuilders Square: 159 townhouses.

Peak hours evaluated: Weekday morning and evening peak hours.

Intersection Descriptions

- 1. Bridgeville Road (Delaware Route 18) and Vaughn Road (Sussex Road 520)**
Type of Control: Existing two-way stop controlled intersection (T-intersection)
Eastbound Approach: (Bridgeville Road) Existing one through lane and one right-turn lane.
Westbound Approach: (Bridgeville Road) Existing one shared left-turn/through lane and one bypass lane.
Northbound Approach: (Vaughn Road) Existing one left-turn lane, stop controlled and one channelized right-turn lane, yield controlled.
- 2. Bridgeville Road (Delaware Route 18) and University Drive (Site Access)**
Type of Control: Existing two-way stop controlled intersection
Eastbound Approach: (Bridgeville Road) Existing one left turn-lane, one through lane, and one right-turn lane.
Westbound Approach: (Bridgeville Road) Existing one left turn-lane, one through lane, and one right-turn lane.
Northbound Approach: (University Drive) Existing one shared left-turn/through lane and one right-turn lane, stop controlled.
Southbound Approach: (University Drive (Site Access)) Existing one shared left-turn/through lane and one right-turn lane, stop controlled.

3. Bridgeville Road (Delaware Route 18) at Carmean Way (Site Access)

Type of Control: Existing signalized intersection

Eastbound Approach: (Bridgeville Road) Existing one left-turn lane, one through lane, and one right-turn lane.

Westbound Approach: (Bridgeville Road) Existing one left-turn lane, two through lanes, and one right-turn lane.

Northbound Approach: (Carmean Way) Existing one shared through/left-turn lane and one right-turn lane.

Southbound Approach: (Carmean Way (Site Access)) Existing one shared left-turn/through lane and one right-turn lane.

4. US 113 (DuPont Boulevard) at Bridgeville Road (Delaware Route 18)

Type of Control: Existing signalized intersection

Eastbound Approach: (Bridgeville Road) Existing one left turn-lane, one through lane, and two channelized right-turn lanes.

Westbound Approach: (Bridgeville Road) Existing one left turn-lane, two through lanes, and one channelized right-turn lane.

Northbound Approach: (US 113) Existing two left turn-lanes, two through lanes, and one channelized right-turn lane.

Southbound Approach: (US 113) Existing one left turn-lane, two through lanes, and one channelized right-turn lane.

5. US 113 at College Park Drive (Site Access)

Type of Control: Existing signalized intersection

Eastbound Approach: (College Park Drive) Existing two left turn-lanes and one channelized right-turn lane.

Northbound Approach: (US 113) Existing two left turn-lanes and two through lanes.

Southbound Approach: (US 113) Existing two through lanes and one channelized right-turn lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, Delaware Transit Corporation (DTC) currently provides existing services through the study area via DART Routes 212, 303, and 901. DART Route 212 travels along US 113 and Bridgeville Road within the study area, with two bus stops on the southeast and northwest corners of the Bridgeville Road intersection with Carmean Way. DART Route 303 travels along US 113 with no bus stops within the study area. DART Route 901 is a flex route which can provide service along US 113, College Park Lane, Carmean Way, and Bridgeville Road within the study area, with two bus stops along Carmean Way and College Park Lane. DART Route 212 provides 11 round trips from 5:13 AM to 11:29 PM on weekdays, and 7 round trips from 10:10 AM to 10:55 PM on Saturdays. DART Route 303 provides 8 round trips from 4:46 AM to 8:56 PM on weekdays. DART Route 901 provides 14 round trips from 6:00 AM to 7:49 PM on weekdays.

Planned transit service: Per email correspondence on March 17, 2021 with Mr. Jared Kauffman, Fixed-Route Planner for DART, transit improvements would be provided after their March 25, 2021 meeting.

Existing bicycle and pedestrian facilities: According to DelDOT's Sussex County Bicycle Map, a Regional Route exists within the study area. The Regional Route exists along Delaware Route 18 and transverses four study intersections (Vaughn Road, University Drive, Carmean Way, and US 113). Additionally, pedestrian facilities exist at three study intersections along Bridgeville Road (University Drive, Carmean Way, and US 113), and the US 113 and College Park Lane intersection.

Planned bicycle and pedestrian facilities: Per email correspondence dated March 4, 2021, from Mr. John Fiori, DelDOT's Bicycle Coordinator and Ms. Linda Osiecki, DelDOT's Pedestrian Coordinator, the following improvements were recommended:

- Provide a pedestrian crossing at the western leg of the roundabout, if not already constructed.
- Provide angled terminations into the shoulder where sidewalk is missing at undeveloped properties.
- Provide a pedestrian crossing on Vaughn Road at the Bridgeville Road intersection.
- Provide pedestrian crossing on Carmean Way at the Bridgeville Road intersection.
- If existing right turn lane is improved at the intersection of College Park Lane/US 113, then separate bike lane is required along turn lane. If that is not feasible then install bicycle treatment as per the DE MUTCD, Figure 9C-4C.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if the right turn lane is warranted, then a separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions.

Bicycle Level of Traffic Stress in Delaware: Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate

and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the map on the DelDOT Gateway.

- US 113 LTS: 4
- Bridgeville Road (Delaware Route 18) LTS: 3 and 4

Crash Evaluation

A crash evaluation was not included in the TOA.

Previous Comments

JMT identified volume inconsistencies between the volumes included in the TOA and an October 30, 2020 email from DelDOT. As such, JMT performed volume updates for Cases 1, 2, and 3 to utilize during the TOA review.

General HCS Analysis Comments

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

1. Due to the lack of existing heavy vehicle information and per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph and 5% for each movement less than 100 vph for all cases. The TOA utilized 3% for each movement along all major approaches and 0% for each movement along all minor approaches.
2. Due to the lack of existing peak hour factor data and per DelDOT's *Development Coordination Manual*, JMT and utilized a PHF of 0.80 for intersections with less than 500 vph, 0.88 for intersections between 500 and 1,000 vph, and 0.92 for intersections with more than 1,000 vph for all cases, whereas the TOA utilized various PHFs.
3. JMT utilized a saturation flow rate of 1,750 pc/h/ln, whereas the TOA utilized a saturation flow rate of 1,900 pc/h/ln for the signalized analyses.
4. For the signalized intersection HCS analysis, JMT utilized the green times consistent with DelDOT's timing sheet and checked on "field measured phase timing" in HCS, whereas the TOA did not.
5. Due to volume discrepancies, JMT incorporated updated peak hour volumes for Case 1, 2, and 3 scenarios.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Operation Analysis for Village at College Park
Report Dated: January 27, 2021
Prepared by: McMahon Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Road (Delaware Route 18)/Vaughn Road				
Existing (Case 1) ²				
Westbound Bridgeville Road Left Turn	A (9.0)	A (8.2)	A (8.8)	A (8.0)
Northbound Vaughn Road Approach	C (16.6)	C (21.2)	C (15.4)	C (20.7)
2025 Without Development (Case 2) ²				
Westbound Bridgeville Road Left Turn	A (9.1)	A (8.2)	A (8.9)	A (8.1)
Northbound Vaughn Road Approach	C (17.8)	C (24.3)	C (16.5)	C (23.4)
2025 With Development (Case 3) ²				
Westbound Bridgeville Road Left Turn	A (9.3)	A (8.4)	A (9.1)	A (8.3)
Northbound Vaughn Road Approach	C (19.5)	D (30.1)	C (18.4)	D (32.6)

¹ For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

² JMT utilized updated volumes in the analysis.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Operation Analysis for Village at College Park
Report Dated: January 27, 2021
Prepared by: McMahon Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Road (Delaware Route 18)/University Drive (Site Access) ³				
Existing (Case 1)				
Eastbound Bridgeville Road Left Turn	A (8.1)	A (8.7)	A (8.1)	A (8.7)
Westbound Bridgeville Road Left Turn	A (9.2)	A (8.1)	A (9.2)	A (8.1)
Northbound University Drive Approach	B (14.5)	C (15.9)	B (14.3)	C (15.6)
Southbound University Drive Approach ⁴	-	B (14.5)	C (16.8)	B (14.3)
2025 Without Development (Case 2)				
Eastbound Bridgeville Road Left Turn	A (8.1)	A (8.8)	A (8.2)	A (8.8)
Westbound Bridgeville Road Left Turn	A (9.3)	A (8.2)	A (9.3)	A (8.2)
Northbound University Drive Approach	C (15.1)	C (16.7)	B (14.9)	C (16.3)
Southbound University Drive Approach ⁴	-	C (15.1)	C (17.6)	B (14.9)
2025 With Development (Case 3) ²				
Eastbound Bridgeville Road Left Turn	A (8.3)	A (9.2)	A (8.3)	A (9.5)
Westbound Bridgeville Road Left Turn	A (9.5)	A (8.3)	A (9.5)	A (8.3)
Northbound University Drive Approach	C (16.5)	C (20.3)	C (16.7)	C (21.2)
Southbound University Drive Approach	D (32.1)	C (21.8)	E (35.6)	D (27.2)

³ The TOA refers to the site access along Bridgeville Road as College Park Lane but for the purposes of this TOA review letter it is referred to as University Drive, per the Record Plan.

⁴ JMT included one southbound left vehicle to generate delay results for the approach, whereas the TOA did not.

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Operation Analysis for Village at College Park
Report Dated: January 27, 2021
Prepared by: McMahon Associates, Inc.

Signalized Intersection ¹	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Road (Delaware Route 18)/University Drive (Site Access) ³				
2025 With Development (Case 3) ^{2, 5}	-	-	B (17.2)	B (18.5)

⁵ JMT modeled the intersection as an uncoordinated signalized intersection with a 90 second cycle length during the AM and PM peak hours. The eastbound and westbound Bridgeville Road approaches were modeled with protected-only left turn phasing, and the northbound and southbound approaches were modeled as concurrent phases with permitted left turn phasing.

Table 4
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Operation Analysis for Village at College Park
Report Dated: January 27, 2021
Prepared by: McMahon Associates, Inc.

Signalized Intersection ¹	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Bridgeville Road (Delaware Route 18)/Carmean Way (Site Access) ^{6,7}				
Existing (Case 1)	B (19.1)	C (23.0)	D (43.9)	C (32.8)
2025 Without Development (Case 2)	B (19.5)	C (23.6)	D (45.0)	C (34.3)
2025 With Development (Case 3) ²	C (22.6)	C (27.8)	D (44.6)	D (36.8)
2025 With Development (Case 3) <i>with signal optimization</i> ^{2,5}	-	-	C (23.6)	C (32.8)
2025 With Development (Case 3) <i>with improvement</i> ^{2,8}	-	-	D (35.5)	D (45.7)

⁶ Per direction from DelDOT, JMT modeled the intersection as 24-hour free with MAX 1 timers.

⁷ JMT modeled the intersection with two through lanes along the westbound approach and concurrent northbound and southbound approaches per existing conditions. The TOA modeled the westbound approach with one through lane and the northbound and southbound approaches as split phase.

⁸ For the improvement scenario, JMT modeled the intersection with a 120 second cycle length and split phasing along the northbound and southbound approaches. This improvement was considered due to the lane configuration and increase in volumes along the side street approaches.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Operation Analysis for Village at College Park
Report Dated: January 27, 2021
Prepared by: McMahon Associates, Inc.

Signalized Intersection ¹	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US 113 (DuPont Boulevard)/Bridgeville Road (Delaware Route 18)				
Existing (Case 1)	D (38.3)	D (48.9)	F (144.6)	F (167.4)
Existing (Case 1) with signal optimization ⁹	-	-	D (45.6)	E (64.7)
2025 Without Development (Case 2)	D (39.9)	D (50.5)	F (150.5)	F (185.1)
2025 Without Development (Case 2) with signal optimization ⁹	-	-	D (53.8)	E (75.8)
2025 With Development (Case 3) ²	D (42.9)	D (53.0)	F (168.5)	F (192.8)
2025 With Development (Case 3) with signal optimization ^{2,9}	-	-	E (61.3)	E (76.6)

⁹ Signal optimization scenario included optimizing green split times while maintaining the existing signal cycle lengths and offsets.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Operation Analysis for Village at College Park
Report Dated: January 27, 2021
Prepared by: McMahon Associates, Inc.

Signalized Intersection ¹	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US 113 (DuPont Boulevard)/College Park Drive (Site Access)				
Existing (Case 1)	B (10.7)	C (21.6)	E (67.8)	F (137.1)
Existing (Case 1) with signal optimization ⁹	-	-	B (16.1)	C (25.1)
2025 Without Development (Case 2) ²	B (11.7)	C (21.8)-	F (81.3)	F (155.0)
2025 Without Development (Case 2) with signal optimization ^{2,9}	-	-	B (13.5)	C (26.0)
2025 With Development (Case 3)	B (13.1)	C (23.1)	F (80.4)	F (151.2)
2025 With Development (Case 3) with signal optimization ⁹	-	-	B (14.9)	C (29.4)

Avigation Nuisance Easement & Non-Suit Covenant

This indenture made this _____ day of _____, 20____, by and between _____, hereinafter referred to as Grantor, and _____ hereinafter referred to as Grantee, witnesseth:

WHEREAS the Grantor is the owner in fee of a certain parcel of land (“the Property”) in the County of _____, State of Delaware; and

WHEREAS said parcel of land is near or adjacent to _____, an operating airport (“Airport”); and

WHEREAS the Grantee is the owner of said airport; and

WHEREAS the Grantor proposes to make a use of said Property and to develop thereon the following:

, which use and development require approval by Municipal and County authorities subject to the applicable provisions of law; and

WHEREAS the Grantor has been advised that the subject Property is located adjacent to the Airport; that the present and future impacts of Airport operations might be considered annoying to users of the Property for its stated purpose and might interfere with the unrestricted use and enjoyment of the Property in its intended use; that these Airport impacts might change over time, for example and not by way of limitation by an increase in the number of aircraft using the Airport, louder aircraft, seasonal variations, and time-of-day variations; that changes in Airport, air traffic control operating procedures or in Airport layout could result in increased noise impacts; and that the Grantor’s and users’ own personal perceptions of the noise exposure could change and that his or her sensitivity to aircraft noise could increase;

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements and conditions contained herein, the parties hereto agree as follows:

Grantor does hereby grant a permanent nuisance and avigation easement (“Easement”) to Grantee over all of the following described real estate:

By virtue of this agreement, the Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to Grantee or any successor agency legally authorized to operate said airport, any and all claims for damage of any kind whatsoever incurred as a result of aircraft using the Easement granted herein regardless of any future changes in volume or character of aircraft overflights, or changes in airport design and operating policies, or changes in air traffic control procedures.

The Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, does further hereby covenant and agree with the Grantee, its successors and assigns, that it will not, from and after the effective date hereof, sue, prosecute, molest, or trouble the Grantee, its successors and assigns, in

These covenants and agreements shall run with the land of the Grantor, as hereinabove described, for the benefit of the Grantee, and its successors and assigns in the ownership, use and operation of the aforesaid Airport.

Grantee, its successors and assigns, shall have and hold said Easement and all rights appertaining thereto until said Airport shall be abandoned and shall cease to be used for airport purposes.

If any provision of this Easement or any amendments hereto, or the application thereof to any person, thing or circumstances is held invalid, such invalidity shall not affect the provisions or application of this Easement or such amendments that can be given effect without the invalid provisions or application, and to this end the provisions of this Easement and such amendments are declared to be severable.

IN WITNESS WHEREOF, the Grantor has hereunto set its hand and seal the day and year first above written.

_____(SEAL)

_____(SEAL)

NOTARY ACKNOWLEDGEMENT

STATE OF DELAWARE

ss.

COUNTY OF KENT

BE IT REMEMBERED that on this ____ day of _____, 20____ personally, came before me, the subscriber, a Notary Public for the State and County aforesaid, _____, party(ies) to this Indenture, known to me personally to be such, and acknowledged this Indenture, to his/her (their) act or deed.

GIVEN under my Hand and Seal of office the day and year first above written.

Notary Public, State of Delaware

My Commission Expires _____