



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

NICOLE MAJESKI
SECRETARY

October 8, 2021

Mr. Ring W. Lardner
Davis, Bowen & Friedel, Inc.
1 Park Avenue
Milford, DE 19963

Dear Mr. Lardner:

The enclosed Traffic Impact Study (TIS) review letter for the **Mitchell Farm (Zwaanendael Farm)** (Tax Parcel 335-8.00-37.00) 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 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) 760-2109.

Sincerely,

T. William Brockenbrough, Jr.
County Coordinator

TWB:km
Enclosure

cc with enclosure: Mr. D.J. Hughes, Davis, Bowen & Friedel, Inc.
Mr. David Edgell, Office of State Planning Coordination
Mr. Jamie Whitehouse, Sussex County Planning and Zoning
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

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October 7, 2021

Mr. Troy Brestel
Project Engineer
Development Coordination
DelDOT Division of Planning
800 Bay Road
P O Box 778
Dover, DE 19903

RE: Agreement No. 1945F
Project Number T202069012
Traffic Impact Study Services
Task 4A-Mitchell Farm (Zwaanendael Farm)

Dear Mr. Brestel:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for Mitchell Farm (Zwaanendael Farm), prepared by Davis, Bowen & Friedel, Inc. dated November 2019 and the TIS Addendum prepared by Davis, Bowen & Friedel, Inc. dated April 2020. This task was assigned as Task Number 4A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed mixed-use development in Sussex County, Delaware. The development would be comprised of 206,500 square feet of medical/office buildings, 60 single-family homes, and 150 multi-family (mid-rise) homes. Construction is anticipated to be complete in 2027.

The site is located on the northeast corner of the intersection of Kings Highway (Sussex Road 268) and Gills Neck Road (Sussex Road 267). Two full access points are proposed: one along Kings Highway directly opposite the proposed site access for the Beebe Medical development and one along Gills Neck Road opposite the site access for the proposed Gills Neck Village Center commercial project.

The site consists of two tax parcels, a 3-acre parcel known as Lot 1 and the remainder of the original parcel consisting of approximately 48 acres. Both parcels are zoned AR-1 (Agricultural Residential). Lot 1 is subject to a conditional use for a 39,000 square foot medical/office building which has been constructed. The remaining parcel (48 acres) is the subject of the following applications pending with Sussex County: a subdivision application, 3 change of zone applications (B-2, C-3, and MR), and a conditional use (MR parcel).

It should be noted that the 39,000 square foot medical/office building on Lot 1 that has been approved and constructed provides a Site Entrance along Gills Neck Road. The Site Entrance is constructed as a two-way stop-controlled intersection with one shared left turn/through lane and one right turn lane along the southbound Site Entrance approach (stop-controlled). One left turn



lane and one through lane are provided along the eastbound Gills Neck Road approach and one through lane and one right turn lane are provided along the westbound Gills Neck Road approach. As part of the Lot 1 construction, sidewalks and bike lanes have been added along the Gills Neck Road site frontage and the Site Entrance along Gills Neck Road contains ADA compliant curb ramps.

DelDOT has several relevant and ongoing improvement projects and plans within the study area including the *Realignment of Old Orchard Road/Savannah Road/Wescoats Road* (DelDOT Contract No. T201609601) project; a signal at the Kings Highway and Clay Road intersection which was recently installed; the *Corridor Management Plan* for the Lewes Scenic and Historic Byway (October 2015); the *Kings Highway and Gills Neck Road Master Plan* dated September 2016; the *US 9, Kings Highway, Dartmouth Drive to Freeman Highway* project; and the Delaware River and Bay Authority (DRBA) *Freeman Highway Rehabilitation* project (DelDOT Contract No. 20191619-00). Detailed information regarding these projects can be found later in this letter.

As part of the DelDOT *US 9, Kings Highway, Dartmouth Drive to Freeman Highway* project, Kings Highway is proposed to be widened to provide two through lanes in each direction. For the purposes of this letter, this DelDOT project will also be referred to as the Kings Highway Dual Lane project. At each intersection within the DelDOT project limits, improvement alternatives to achieve acceptable LOS in addition to dual lanes will be evaluated and subject to the typical DelDOT process, which includes public workshops.

While the specific alternatives to be examined in developing the DelDOT project have not been determined, improvement alternatives have been previously identified in several documents, including the 2007 DelDOT Planning *Kings Highway Corridor Study*, 2008 DelDOT TIS Review Letters, 2009 Letter Agreement, 2009 DelDOT Planning document *Kings Highway/Gills Neck Road Planned Area Improvements*, 2015 Lewes Scenic and Historic Byway *Corridor Management Plan*, and the 2016 DelDOT *Kings Highway/Gills Neck Road Master Plan* completed as part of the Lewes Scenic and Historic Byway.

The TIS evaluates the following future 2027 scenarios:

- Case 2a – Future 2027 without development and without Kings Highway Dual Lane project
- Case 3a – Future 2027 with development and without Kings Highway Dual Lane project
- Case 3b – Future 2027 with development and with Kings Highway Dual Lane project
- Case 3c – Future 2027 with development, with no site entrance along Kings Highway and without the completion of the Kings Highway Dual Lane project

JMT also included a future 2027 without development scenario with the completion of the Kings Highway Dual Lane project (Case 2b). Intersections outside the limits of the Kings Highway Dual Lane project were addressed as part of Case 2a, without development; and 3a with the development.



As part of the TIS Addendum, the following scenarios were evaluated and included in JMT's review:

- Case 2d – Future 2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without Kings Highway Dual Lane project
- Case 3d – Future 2023 with 117,000 square feet of medical/dental office space, including 39,000 square feet medical/dental office space from Lot 1, and without Kings Highway Dual Lane project and a rights-in site entrance along Kings Highway
- Case 3b – Future 2027 with development and with Kings Highway Dual Lane Project and Bay Breeze Drive left turn out restriction

Only intersections impacted by volume modifications during Cases 2d, 3d, and 3b were analyzed as part of the TIS Addendum. Specifically, for Cases 2d and 3d the following intersections were analyzed as part of JMT's review:

- Kings Highway (Sussex Road 268)/Site Entrance
- Gills Neck Road (Sussex Road 267)/Site Entrance
- Kings Highway/Atlantic Drive
- Kings Highway/Gills Neck Road/Cape Henlopen High School Entrance
- Kings Highway/Clay Road (Sussex Road 269)

For Case 3b, the following intersections were analyzed as part of JMT's review:

- Kings Highway/Bay Breeze Drive
- Kings Highway/Freeman Highway (Sussex Road 23)

The TIS Addendum also included an additional scenario for a Future 2021 condition with development of Lot 1 (39,000 square feet of medical/dental office space) and without Kings Highway Dual Lane project. However, per direction from DelDOT this scenario was not included in this review.

In addition to the TIS Addendum, analyses were conducted for the additional "Case 4 – Future 2027 with development and Kings Highway Dual Lane Project with Additional Improvements" scenario at intersections along Kings Highway which operated under constrained conditions despite the widening of the roadway (Case 3b). These Case 4 analyses were conducted for planning purposes only. The actual intersection improvements will be determined as part of the DelDOT project.

Based on our review of the TIS and assuming the DelDOT Kings Highway Dual Lane project will be completed by 2027 per the DelDOT CTP and discussions with DelDOT, we have the following comments and recommendations:

With the Kings Highway Dual Lane Project and individual intersection improvements alternatives to be evaluated as part of the DelDOT Project process that includes public workshops,



improvement alternatives to achieve acceptable LOS will be identified. The following intersections (signalized) or intersection approaches (unsignalized) exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements. Any location and scenario shown with an “X” in the following tables indicates a LOS deficiency. Further details are provided later in this letter.

Intersection	Intersection Control	LOS Deficiencies Occur			Year	Case
		AM	PM	Saturday		
Kings Highway (Sussex Road 268)/Site Entrance/Beebe Medical Entrance	Unsignalized		X	X	2027	2a
					2027	2b
					2023	2d
		X	X	X	2027	3a
		X	X	X	2027	3b
			X	X	2027	3c
				X	2023	3d
	Roundabout				2027	2a
					2027	2b
			X	X	2027	3a
					2027	3b
			X	X	2027	3c
	Signalized				2027	2a
			X	X	2027	3a
					2027	3b
					2027	3c
					2027	3d
Gills Neck Road (Sussex Road 267)/Site Entrance/Gills Neck Village Center Entrance	Unsignalized				2027	2a
					2023	2d
		X*	X*	X*	2027	3a
		X*	X*	X*	2027	3b
		X*	X	X	2027	3c
			X*	X*	2023	3d

*LOS deficiency occurs along the Gills Neck Village Center Entrance approach which is to be built by others.



Intersection	Intersection Control	LOS Deficiencies Occur			Year	Case
		AM	PM	Saturday		
Kings Highway (Sussex Road 268)/Bay Breeze Drive	Unsignalized			X	2018	1
			X	X	2027	2a
			X	X	2027	2b
			X	X	2027	3a
					2027	3b
	Roundabout				2027	2a
					2027	2b
				X	2027	3a
					2027	3b
	Signalized				2027	2a
					2027	2b
					2027	3a
					2027	3b
Kings Highway/Freeman Highway (Sussex Road 23)	Unsignalized				2018	1
			X	X	2027	2a
			X	X	2027	3a
			X	X	2027	3b
	Signalized				2027	2
					2027	3
Kings Highway (Sussex Road 268)/Savannah Road (Sussex Road 18)	Unsignalized			X	2018	1
			X	X	2027	2a
			X	X	2027	3a
	Single Lane Roundabout				2027	2a
					2027	3a
	Signalized				2027	2a
					2027	3a



Intersection	Intersection Control	LOS Deficiencies Occur			Year	Case
		AM	PM	Saturday		
Savannah Road/Gills Neck Road/Front Street (Sussex Road 267)	Signalized			X	2018	1
				X	2027	2a
					2027	2a*
				X	2027	3a
					2027	3a*
	Single Lane Roundabout				2027	2a
					2027	3a
Kings Highway (Sussex Road 268)/Atlantic Drive	Unsignalized				2018	1
			X	X	2027	2a
				X	2027	2b
			X	X	2023	2d
			X	X	2027	3a
					2027	3b*
			X	X	2027	3c
			X	X	2023	3d
	Signalized				2027	2a
					2027	2b
					2023	2d
			X		2027	3a
					2027	3b*
					2027	3c
			2023	3d		

Notes:

¹At the intersection of Savannah Road/Gills Neck Road/Front Street, Case 2a* and 3a* are scenarios which include implementing an additional through lane along northbound and southbound Savannah Road.

²Atlantic Drive would provide only rights-in/rights-out movements along Kings Highway during Case 3b*.



Intersection	Intersection Control	LOS Deficiencies Occur			Year	Case
		AM	PM	Saturday		
Kings Highway/Gills Neck Road/Cape Henlopen High School	Signalized	X	X	X	2018	1
		X	X	X	2027	2a
		X			2027	2b
		X		X	2023	2d
		X	X	X	2027	3a
		X	X	X	2027	3b
		X	X	X	2027	3c
		X		X	2023	3d
Kings Highway/Clay Road (Sussex Road 269)	Unsignalized	X	X	X	2018	1
	Signalized	X	X	X	2027	2a
					2027	2b
			X		2023	2d
		X	X	X	2027	3a
			X		2027	3b
		X	X	X	2027	3c
			X	X	2023	3d
				4		
Kings Highway (Sussex Road 268)/Dartmouth Drive (Sussex Road 268A)	Unsignalized		X	X	2018	1
		X	X	X	2027	2a
		X	X	X	2027	3a
	Single Lane Roundabout				2027	2a
					2027	3a
	Signalized				2027	2a
			X	2027	3a	

As shown in the above table, ten study intersections are identified to exhibit LOS deficiencies. To minimize the impact of the deficiencies without the completion of the Kings Highway Dual Lane Project, interim condition improvements have been identified. The following section separates the analysis results based on the full build out of the site and the interim condition.



Interim Condition

As part of the TIS report, interim improvements without the implementation of the Kings Highway Dual Lane project were recommended at the Gills Neck Road/Cape Henlopen High School Entrance intersection. One scenario of the interim improvements included the modification of the westbound Gills Neck Road approach to provide two left turn lanes and a shared through/right turn lane and providing split phase signal operation along the eastbound and westbound approaches. In addition, the southbound Kings Highway approach would be modified to provide one left turn lane, one through lane, and one shared through/right turn lane.

Per a meeting between DelDOT and the developer on February 26, 2020, the interim improvements were further refined from those mentioned in the TIS and were identified to contain the following:

- Restripe the westbound Gills Neck Road approach to Kings Highway to provide two left turn lanes, and one shared through/right turn lane
- Lengthen the westbound Gills Neck Road shared through/right turn lane to provide 570 feet of storage.
- Restripe the southbound Kings Highway approach to Gills Neck Road to provide one left turn lane, one through lane, and one shared through/right turn lane
- Restripe southbound Kings Highway south of Gills Neck Road to provide two through lanes, the rightmost through lane would become a right-turn only lane onto Clay Road
- Construct a shared-use path along the western side of Kings Highway from the Gills Neck Road/Cape Henlopen High School Entrance intersection to the Clay Road intersection
- Provide a rights-in only entrance along Kings Highway across from the proposed Beebe Medical Center development
- Maintain the full movement entrance along Gills Neck Road across from the proposed Gills Neck Village Center access

The TIS Addendum analyzed these interim conditions based on a partial build of the site (117,000 square feet of medical/office space in 2023) without the Kings Highway Dual Lane project and with a rights-in access along Kings Highway (Case 3d). At the unsignalized Kings Highway/Site Entrance/Beebe Medical Site Entrance intersection, the eastbound Beebe Medical Site Entrance would experience capacity constraints during the Case 3d Saturday peak period (LOS F with 50.6 seconds of delay per vehicle). However, the projected 95th percentile queue length would be approximately 20 feet, which would have minimal impacts to the Beebe Medical Site Entrance.

At the unsignalized Gills Neck Road/Site Entrance/Gills Neck Village Center Entrance, the northbound Gills Neck Village Center Entrance would experience capacity constraints during the Case 3d weekday PM and Saturday peak periods (LOS F with 76.3 seconds of delay per vehicle). The projected 95th percentile queue length would be approximately 105 feet. As the design of this entrance would be the responsibility of the Gills Neck Village Center, additional improvements to mitigate the LOS deficiencies at this intersection during the Case 3d conditions would be unreasonable to assign to the Mitchell Farm developer.



At the unsignalized Kings Highway/Atlantic Drive intersection, the eastbound Atlantic Drive approach would experience capacity constraints during the Case 3d weekday PM and Saturday peak periods (LOS F with 164.8 seconds of delay per vehicle). However, the projected 95th percentile queue length would be approximately 80 feet, which could be accommodated within Atlantic Drive and not impact adjacent intersections.

At the signalized Kings Highway/Gills Neck Road/Cape Henlopen High School intersection, LOS deficiencies would continue to occur during the weekday AM, weekday PM, and Saturday peak periods under Case 3d conditions. However, the delays would reduce when compared to 2018 Existing Case 1 conditions during all peak periods. Specifically, during the Saturday peak period, the Case 1 delay is calculated to be 832.0 seconds per vehicle and under Case 3d conditions the delay would decrease to 366.8 seconds per vehicle. For the Saturday peak period, it should be noted that the proposed site entrance along Gills Neck Road is approximately 650 feet east of the Gills Neck Road/Kings Highway intersection. The projected 95th percentile queue length under Case 3d conditions during the Saturday peak period would be approximately 770 feet which would spillback past the Gills Neck Road site entrance. DBF analysis calculated a shorter 95th percentile queue length along westbound Gills Neck Road. However, the DBF analysis incorporated a longer signal cycle length and did not account for the signalization of Clay Road at Kings Highway.

With the future signalization of the Kings Highway/Clay Road intersection and the addition of an access on the easterly leg for the Gills Neck Village Center, the Kings Highway/Clay Road intersection would experience capacity constraints under Case 3d weekday PM and Saturday peak period conditions (LOS F with 165.2 seconds of delay per vehicle). The calculated 95th percentile queue length along the southbound Kings Highway approach to Clay Road would be approximately 2,300 feet during the weekday PM peak period and would impact operations at intersections upstream including the Kings Highway/Gills Neck Road intersection.

As interim improvements would reduce the delay at the Kings Highway and Gills Neck Road intersection prior to the completion of the Kings Highway Dual Lane project and improve operations along Kings Highway between the Beebe Medical Site Entrance and Clay Road compared to existing conditions, it is recommended that the developer implement the interim improvements as part of the partial build of the site (117,000 square feet of medical/office space).

Full Build Out of Site

The unsignalized Site Entrance along Kings Highway is proposed approximately 1,550 feet north of the northeast tangent point of the Gills Neck Road/Cape Henlopen High School Entrance intersection and exhibits LOS deficiencies during the AM, PM, and Saturday peak hours under future conditions with or without the proposed development and without completion of the Kings Highway Dual Lane project. These deficiencies occur along the eastbound Beebe Medical Entrance and the westbound Site Entrance approaches.



The provision of a signal and the completion of the Kings Highway Dual Lane project would improve the intersection to operate at LOS C (25.0 seconds of delay per vehicle) or better during all peak hours under future conditions, with or without the proposed development. However, these improvements should be part of the larger long-term improvement Kings Highway Dual Lane project. Therefore, we do not recommend the developer implement any improvements at this intersection. It is recommended that the developer coordinate with DelDOT on the implementation and equitable cost sharing of the Kings Highway Dual Lane project including the installation of a signal at this intersection.

The unsignalized Atlantic Drive intersection with Kings Highway exhibits LOS deficiencies during the PM and Saturday peak hours under future conditions, with or without the proposed development and without the completion of the Kings Highway Dual Lane project. These deficiencies can be mitigated through the completion of the Kings Highway Dual Lane project or signalization of the intersection. However, due to the proximity of the Atlantic Drive intersection to the proposed Kings Highway Site Entrance intersection and the Kings Highway/Gills Neck Road intersection, it is suggested that the Atlantic Drive approach to Kings Highway be modified to rights-in/rights-out only and remain unsignalized. The intersection will operate at acceptable LOS C (18.1 seconds of delay per vehicle) or better with a rights-in/rights out only restriction.

Additionally, interconnection should be provided between Henlopen Gardens and the proposed Beebe Medical development to minimize the number of U-turn movements at the adjacent signalized intersections. If interconnection is not feasible, U-turn movements could be provided at the adjacent signalized intersections as part of the Kings Highway Dual Lane project. These improvements should be part of the larger long-term improvement Kings Highway Dual Lane project. Therefore, we do not recommend the developer implement any improvements at this intersection. It is recommended that the developer coordinate with DelDOT on the implementation and equitable cost sharing of the Kings Highway Dual Lane project.

The signalized Gills Neck Road/Cape Henlopen High School Entrance intersection with Kings Highway exhibits LOS deficiencies during the AM, PM, and Saturday peak hours under existing and future conditions, with or without the proposed development and without the completion of the Kings Highway Dual Lane project. These deficiencies could be mitigated by the provision of one left turn lane, one shared left turn/through lane, and one right turn lane along westbound Gills Neck Road, the provision of one left turn lane, one through lane, and one right turn lane along the eastbound Cape Henlopen High School Entrance approach, the modification of the signal phasing along the eastbound and westbound approaches to split phase, and the completion of the Kings Highway Dual Lane project. These improvements would improve the intersection to operate at LOS D (54.9 seconds of delay per vehicle). The improvements that require widening of the roadway should be part of the larger long-term improvement Kings Highway Dual Lane project. Therefore, we recommend the developer implement only the interim improvements at this intersection and coordinate with DelDOT on the equitable cost sharing of the Kings Highway Dual Lane project.



The unsignalized Site Entrance along Gills Neck Road is proposed approximately 650 feet east of the northeast tangent point of the Kings Highway intersection and exhibits LOS deficiencies during the AM, PM, and Saturday peak hours under future conditions with the proposed development and with or without the completion of the Kings Highway Dual Lane project. Specifically, these deficiencies are only projected along the northbound Gills Neck Village Center Entrance with delays during the PM peak of 201.4 seconds per vehicle under Cases 3a and 3b conditions, and the calculated 95th percentile queue length would be approximately 113 feet. Although long delays are expected, they would occur at the Gills Neck Village Center Entrance and should not be the responsibility of the Mitchell Farm developer to mitigate as the Site Entrance for the Mitchell Farm (Zwaanendael Farm) site has already been constructed. As such, it is recommended that the Mitchell Farm developer maintain the full access at the Site Entrance.

The formerly unsignalized intersection of Clay Road with Kings Highway exhibited LOS deficiencies during the AM, PM, and Saturday peak hours under existing and future conditions, with or without the proposed development and with or without the completion of the Kings Highway Dual Lane project. DelDOT recently converted the intersection to a signalized intersection consistent with the recommendations from DelDOT's *Signal Justification Study US9 – Kings Highway (S268) & Clay Road (S269)*. The study also recommended a long-term improvement to determine the feasibility of converting the intersection to a roundabout or installing appropriate turn lanes as part of a larger project such as the Kings Highway Dual Lane project. Additionally, the Gills Neck Village Center development will construct a westbound approach to the intersection.

A TIS/TOA has not been completed for the Gills Neck Village Center development as previously contemplated. However, per the January 15, 2008, TIS review letter performed by McCormick Taylor for the original development proposed at the site (the Gills Neck Road Subdivision, Townsend Property), the westbound approach was recommended to provide two left turn lanes, one through lane, and one right turn lane opposite Clay Road. With the signalization of the intersection, the completion of the Kings Highway Dual Lane project, and the addition of auxiliary lanes along all approaches, the intersection would operate at acceptable LOS. Therefore, we recommend the Mitchell Farm developer only implement the interim improvements at the intersection. However, it is recommended that the Mitchell Farm developer coordinate with DelDOT on the implementation and equitable cost sharing of the improvements at this intersection as part of the Gills Neck Village Center development and the Kings Highway Dual Lane project. The improvements should include the provision of two left turn lanes along the westbound Gills Neck Village Center approach.

The unsignalized intersection of Kings Highway and Dartmouth Drive exhibits LOS deficiencies during the AM, PM, and Saturday peak hours under existing and future conditions with or without the development and with or without the Kings Highway Dual Lane project. The deficiencies at this intersection could be mitigated through the provision of a roundabout or a signal.

Per the January 15, 2008, TIS review letter for the Gills Neck Road Subdivision, improvements were recommended to modify the intersection to a single-lane roundabout with a bypass lane for



the southbound Kings Highway right-turn movement and a bypass lane for the northbound Kings Highway through movement. Should a roundabout be determined to be infeasible at this location, the January 15, 2008, TIS review letter also recommended the eastbound Dartmouth Drive approach be modified to provide an exclusive left-turn lane and a shared left turn/right turn lane as well provide a second receiving lane along northbound Kings Highway. However, these improvements are outside the scope of this TIS, as any extensive improvements to this intersection should be part of a larger long-term improvement project (such as the Kings Highway Dual Lane project). Therefore, we do not recommend the developer implement any improvements at this intersection. It is recommended that the developer coordinate with DelDOT on the equitable cost sharing of the Kings Highway Dual Lane project including either the installation of a roundabout or a signal at this intersection.

The unsignalized Bay Breeze Drive intersection with Kings Highway exhibits LOS deficiencies during the PM and Saturday peak hours under existing and future conditions, with or without the proposed development and with or without the completion of the Kings Highway Dual Lane project. These deficiencies could be mitigated through the provision of a signal or by restricting left-out movements from Bay Breeze Drive. However, these improvements are outside the scope of this TIS, as any extensive improvements to this intersection should be part of a larger long-term improvement project (such as the Kings Highway Dual Lane project). Therefore, we do not recommend the developer implement any improvements at this intersection.

The unsignalized Freeman Highway intersection with Kings Highway exhibits LOS deficiencies during the PM and Saturday peak hours under future conditions, with or without the proposed development and with or without the completion of the Kings Highway Dual Lane project. These deficiencies could be mitigated through the provision of a signal. However, these improvements are outside the scope of this TIS, as any extensive improvements to this intersection should be part of a larger long-term improvement project (such as the Kings Highway Dual Lane project). Therefore, we do not recommend the developer implement any improvements at this intersection.

It should be noted that the TIS analyzed the Freeman Highway intersection with Kings Highway with a different methodology from that used by JMT. Based on coordination with DelDOT's Planning and Traffic Studies Sections, it was agreed that JMT's approach to analyzing this intersection was more appropriate. However, the TIS methodology could be deemed the more appropriate approach if a gap study was conducted to further validate this method.

The unsignalized Savannah Road intersection with Kings Highway exhibits LOS deficiencies during the PM and Saturday peak hours under existing and future conditions with or without the proposed development. These deficiencies could be mitigated through the provision of a single lane roundabout or a signal. However, a roundabout is not feasible at this location due to the existing buildings adjacent to the intersection. Additionally, the deficiencies occur along the eastbound 3rd Street approach and the 95th percentile queue length along this approach under Case 3 conditions during the Saturday peak hour is approximately 255 feet which would not extend into the adjacent Chestnut Street intersection. Therefore, we do not recommend the developer implement any improvements at this intersection.



The signalized Front Street/Gills Neck Road intersection with Savannah Road exhibits LOS deficiencies during the Saturday peak hour under existing and future condition with or without the proposed development. These deficiencies could be mitigated through the provision of a single lane roundabout or an additional through lane along northbound and southbound Savannah Road. However, a roundabout is not feasible at this location due to the existing buildings adjacent to the intersection and widening Savannah Road may not be feasible at this location due to the existing draw bridge located along the northerly leg. Therefore, we do not recommend the developer implement any improvements at this intersection.

Should Sussex County 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.

Interim Improvements

The following items should be incorporated as part of the partial build out of the site (117,000 square feet of medical/office space) or any land use not projected to exceed the daily or peak hour site traffic based on the partial build out of the site.

1. The developer should provide a bituminous concrete overlay to the existing travel lanes along the northbound Kings Highway site frontage in the area affected by entrance plan construction, including any auxiliary lanes, at DelDOT’s discretion. DelDOT should analyze the existing lanes’ pavement section and recommend an overlay thickness to the developer’s engineer, if necessary.

2. The developer should construct a rights-in only site entrance for the proposed Mitchell Farm/Zwaanendael Farm development on Kings Highway, approximately 1,550 feet north of the northeast tangent point of the Gills Neck Road/Cape Henlopen High School Entrance intersection to be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Beebe Medical Entrance	Approach does not exist	One left turn lane and one right turn lane*
Westbound Site Entrance	Approach does not exist	One receiving lane for the rights-in movements**
Northbound Kings Highway	One through lane	One shared left turn/through lane and one right turn lane**
Southbound Kings Highway	One through lane	One through lane and one right turn lane*

*To be built by others



**To be built by developer by 2023 before the completion of the Mitchell Farm/Zwaanendael Farm medical/office space.

Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage lengths (excluding taper) of the separate left turn and right turn lanes along Kings Highway are listed below. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage length.

Approach	Right Turn Lane
Northbound Kings Highway	290 feet
Southbound Kings Highway	115 feet*

*This storage length is the proposed storage length on the October 4, 2019, plans for the Beebe Medical Center and it should be built by the developer of that project.

The developer should submit a plan to DelDOT’s Development Coordination section depicting the design of the signalized intersection as it could exist in 2027 and show the interim improvements in that context. The final design of the site entrance should be determined during the Entrance Plan review process.

- The developer should maintain the existing site entrance for the proposed Mitchell Farm/Zwaanendael Farm development, approximately 650 feet east of the northeast tangent point of the Kings Highway intersection and directly across from the proposed Gills Neck Village Center Entrance to be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Gills Neck Road	One left turn lane and one through lane	One left turn lane, one through lane, and one right turn lane*
Westbound Gills Neck Road	One through lane and one right turn lane	One left turn lane**, one through lane, and one right turn lane
Northbound Gills Neck Village Center Entrance	Approach does not exist	One left turn/through lane and one right turn lane***
Southbound Site Entrance	One shared left turn/through lane and one right turn lane	No change

*Right turn lane to be built by others

**Left turn lane to be built by others

***Approach to be built by others



Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage lengths (excluding taper) of the separate left turn and right turn lanes along Gills Neck Road are listed below. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage length.

Approach	Left Turn Lane	Right Turn Lane
Eastbound Gills Neck Road	120 feet*	190 feet**
Westbound Gills Neck Road	120 feet**	120 feet*

*This storage length is the existing storage length per the June 2018 Zwaanendael Farm Rezoning Sketch Plan and it should be maintained.

**To be built by others

As a TOA/TIS will be performed for the Gills Neck Village Center, the recommended lane configurations and storage lengths for the Gills Neck Village Center entrance may be modified based on those results.

- The developer should restripe the Kings Highway and Gills Neck Road/Cape Henlopen High School Entrance intersection to be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Cape Henlopen High School	One shared left turn/through lane and one right turn lane	No change
Westbound Gills Neck Road	One left turn lane, one through lane, and one right turn lane	Two left turn lanes and one shared through/right turn lane
Northbound Kings Highway	One left turn lane, one through lane, and one right turn lane	No change
Southbound Kings Highway	One left turn lane, one through lane, and one right turn lane	One left turn lane, one through lane, and one shared through/right turn lane

The recommended minimum storage lengths (excluding taper) of the separate left turn and right turn lanes along Kings Highway and Gills Neck Road are listed below.



Approach	Left Turn Lane	Through/Right Turn Lane	Right Turn Lane
Northbound Kings Highway	250 feet*	-	180 feet*
Southbound Kings Highway	340 feet*	550 feet	-
Westbound Gills Neck Road	420 feet	570 feet**	-

*Storage lengths match the existing storage lengths per field conditions and should be maintained.

**Storage length does not match the existing storage length and requires lengthening.

The developer should restripe Kings Highway south of the Gills Neck Road intersection to provide two through lanes and the rightmost through lane should transition to a right turn only lane at the Clay Road intersection. The SUP should be constructed along Kings Highway to connect to Clay Road and the shoulder along Kings Highway should be eliminated.

The developer should enter into a traffic signal agreement with DelDOT for the intersection of Kings Highway with Gills Neck Road. 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 Development Coordination section depicting the design of Kings Highway from Gills Neck Road to Clay Road. The final design should be determined during the Entrance Plan review process.

Full Build Out Improvements

The following items should be incorporated as part of the full build out of the site.

5. The developer should enter into an agreement with DelDOT to fund an equitable portion of improvements to the intersections of Kings Highway with Dartmouth Drive, Clay Road, Gills Neck Road/Cape Henlopen High School Entrance, Atlantic Drive, Freeman Highway, Bay Breeze Drive, and the Site Entrance/Beebe Medical Center Entrance as part of the *US 9, Kings Highway, Dartmouth Drive to Freeman Highway* project. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the improvements. The amount of right-of-way dedicated by the property owner for the DelDOT Project in excess of 50 feet from the centerline on Kings Highway and 40 feet from the centerline on Gills Neck Road that otherwise would have been purchased as part of the DelDOT project would be considered as part of the contribution towards the DelDOT project.



6. The developer should enter into an agreement with DelDOT to fund an equitable portion of improvements to the intersection of Clay Road and Marsh Road as part of the *Realignment of Old Orchard Road/Savannah Road/Wescoats Road* (DelDOT Contract No. T201609601) project. The project will improve the intersection of Marsh Road and Clay Road to eliminate the existing skewed angle of the intersection. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the Clay Road and Marsh Road intersection improvements.
7. Vehicular interconnections or cross access easements between the on-site lots should be provided. The developer should coordinate with DelDOT's Development Coordination Section to determine the locations and feasibilities of the interconnections.
8. The following bicycle, pedestrian, and transit improvements should be included:
 - a. A minimum fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Kings Highway site frontage. Within the easement, the developer should construct a ten-foot wide shared-use path (SUP) to meet the shared-use path recently constructed for Lot 1. The developer should coordinate with DelDOT's Development Coordination section during the plan review process to identify the exact location of the SUP.
 - b. An accessway should be provided from the SUP into the site for Lots 1 through 5.
 - c. Where internal sidewalks are located alongside of parking spaces, a buffer, physical barrier or signage should be added to eliminate vehicular overhang onto the sidewalk.
 - d. The tie-in installed for Lot 1 should be removed once the SUP is extended along the entire property frontage.
 - e. ADA compliant curb ramps and marked crosswalks should be provided along the Kings Highway Site Entrance approach to Kings Highway. The use of diagonal curb ramps is discouraged.
 - f. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the northbound Kings Highway approach to the Kings Highway Site Entrance.
 - g. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/shared-use paths or should be flush with the pavement.



- h. Bike parking should be provided near the building entrances. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
- i. A Type 2 bus stop should be installed at the Kings Highway Site Entrance intersection. The developer should coordinate with DART and DelDOT on the location, design, as well as the amenities to provide.

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 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 https://www.deldot.gov//Publications/manuals/de_mutcd/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 TIS 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', is written in a cursive style.

Joanne M. Arellano, P.E., PTOE

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

Enclosure

General Information

Report date: November 2019

Prepared by: Davis, Bowen & Friedel, Inc.

Prepared for: The Mitchell Family Ltd. Partnership

Tax Parcel: 335-8.00-37.00

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

Project Description and Background

Description: The developer seeks to develop 206,500 square feet of medical-dental office space, 60 single-family detached houses, and 150 multi-family mid-rise dwelling units.

Location: The subject site is located on the northeast corner of the intersection of Kings Highway (Sussex Road 268) and Gills Neck Road (Sussex Road 267) in Sussex County, Delaware.

Amount of Land to be developed: An approximately 52.71-acre parcel.

Land Use approval(s) needed: Rezoning and Entrance Plan.

Proposed completion date: 2027.

Proposed access location: Two full access points are proposed: one along Kings Highway directly opposite the proposed site access for the Beebe Medical development and one along Gills Neck Road opposite the site access for the proposed Gills Neck Village Center commercial project.

Daily Traffic Volumes:

- 2018 Average Annual Daily Traffic on Kings Highway: 13,019 vehicles per day (non-Summer)
- 2018 Average Annual Daily Traffic on Gills Neck Road: 4,995 vehicles per day (non-Summer)

Site Map



*Graphic is an approximation based on the Rezoning Sketch Plan prepared by Davis, Bowen & Friedel, Inc. dated June 2018.

Relevant and On-going Projects

DelDOT has several relevant and ongoing improvement projects within the study area including the *Realignment of Old Orchard Road/Savannah Road/Wescoats Road* (DelDOT Contract No. T201609601) project. The project will realign Old Orchard Road to intersect Savannah Road at its intersection with Wescoats Road. Additionally, the project will improve the intersection of Marsh Road and Clay Road to eliminate the existing skewed angle of the intersection. Construction is anticipated to begin in 2023.

Per direction from the DelDOT Traffic Section, a signal at the Kings Highway and Clay Road intersection was recently installed. DelDOT completed the *Signal Justification Study US9 – Kings Highway (S268) & Clay Road (S269)* in February 2020. As part of the study, field observations were conducted, existing sight distances were assessed, crashes were reviewed, intersection analyses were performed, and warrant analyses based on the DE MUTCD were evaluated. The

crash evaluation reviewed data from August 7, 2014 to January 23, 2020 which identified one fatal angle crash. Four of the DE MUTCD Traffic Signal Warrants were met which included the eight-hour, four-hour, and peak-hour vehicular warrants as well as the Alternative Crash Experience Warrant (IA-19.3). Various improvement options were evaluated as part of the study, including the implementation of all-way-stop-control and installation of a roundabout or signal. The study recommended the short-term improvement to install a traffic signal. A long-term improvement to determine the feasibility of converting the intersection to a roundabout or installing appropriate turn lanes was recommended.

In October 2015 a collaborative effort by DelDOT, Delaware Greenways, and other groups developed the *Corridor Management Plan* for the Lewes Scenic and Historic Byway. This was done as part of the *Delaware Byways Program*. The *Delaware Byways Program* includes the identification, promotion, preservation, and enhancement of Delaware roadways with at least one of the following qualities: scenic, historic, natural, cultural, recreational, and archaeological. The Lewes Scenic and Historic Byway traverses through the City of Lewes and extends into Sussex County on the following roads: New Road, Pilot Town Road, Savannah Road, Cape Henlopen Drive, Gills Neck Road, and Kings Highway. Recommendations from the plan for Kings Highway include considering options for narrow or wide medians and opportunities for linking together isolated parcels in a gridded circulation network. Additionally, at the Kings Highway/Gills Neck Road intersection, the plan recommends the consideration of options that accommodate planned pedestrian and bicycle pathways and movements. More information about the Corridor Management Plan can be found here: <https://deldot.gov/Programs/byways/index.shtml?dc=cmp>

The *Kings Highway and Gills Neck Road Master Plan* dated September 2016 is an early action project of the Lewes Scenic and Historic Byway Corridor Management Plan. The purpose of the Master Plan is to establish a vision for Kings Highway and Gills Neck Road. The Master Plan recommends two travel lanes per direction and a boulevard design along Kings Highway. From north of Gills Neck Road to Freeman Highway, the Master Plan recommends one travel lane per direction with a center turn lane along Kings Highway. Additionally, a roundabout and a signal are recommended at the Dartmouth Drive and Clay Road intersections, respectively. Along Gills Neck Road, one travel lane per direction with a boulevard design is recommended. More information about the Master Plan can be found here: https://deldot.gov/Programs/byways/pdfs/lewes_cmp/KHGN_MasterPlan_092616finalrx.pdf?cache=1582120567909

The *US 9, Kings Highway, Dartmouth Drive to Freeman Highway* project is planned to implement the improvements recommended by the Master Plan. A DelDOT Contract Number does not exist for the recommended improvements yet. Based on the proposed CTP FY 20 thru FY 26 Spending Plan, design is projected to start Fiscal Year 2022 and construction is projected to start Fiscal Year 2026.

Additionally, the Delaware River and Bay Authority (DRBA) *Freeman Highway Rehabilitation* project (Contract No. 20191619-00) includes the repaving of Freeman Highway from south of the intersection with Bay Breeze Drive to the intersection with Cape Henlopen Drive.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, 2015)

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

The proposed development is located within the Investment Level 1 area.

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 other 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, to promote well-designed and efficient new growth, and to facilitate redevelopment 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. Further, Level 1 areas are the first priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity between neighborhoods and public facilities.

Proposed Development's Compatibility with Livable Delaware:

The proposed development is located in the Investment Level 1 area. According to Livable Delaware, Level 1 areas support and encourage a wide range of uses and enhance community identity and integrity. The proposed project is a mixed-use development that will support the ongoing development in the surrounding area. Therefore, the proposed development is generally consistent with the 2015 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans

(Source: Sussex County March 2019 Comprehensive Plan)

Sussex County Comprehensive Plan:

Per the *Sussex County Comprehensive Plan Future Land Use Map*, the proposed development is in an area designated as Coastal Area.

Proposed Development's Compatibility with the Sussex County Comprehensive Plan:

Per the *Sussex County Comprehensive Plan Future Land Use Map*, the proposed development is in an area designated as Coastal Area. A range of housing types are appropriate in Coastal Areas, including single-family homes and multifamily units, as well as office and mixed-use developments. Therefore, the proposed development is generally consistent with the *Sussex County March 2019 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 Code 210 (Single-Family Detached Housing), Land Use Code 221 (Multifamily Mid-Rise Housing), and Land Use Code 720 (Medical-Dental Office Building). The trip generation was approved by DelDOT during the PTIS review as well as the review of the TIS Addendum.

Table 1
Mitchell Farm (Zwaanendael Farm) Trip Generation – Full Build Out

Land Use	ADT	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
60 Single-Family Detached Houses (ITE Code 210)	650	12	35	47	39	23	62	37	31	68
150 Multifamily Mid-Rise Houses (ITE Code 221)	816	13	38	51	40	25	65	34	36	70
206,500 SF Medical-Dental Office Building (ITE Code 720)	7,846	332	94	426	197	505	702	552	417	969
Total Trips	9,312	357	167	524	276	553	829	623	484	1,107
Internal Capture	44	1	1	2	5	5	10	6	6	12
New Trips	9,268	356	166	522	271	548	819	617	478	1,095

Mitchell Farm (Zwaanendael Farm) Trip Generation – Partial Build Out (Case 3d)

Land Use	ADT	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
117,000 SF Medical-Dental Office Building (ITE Code 720)	1,003	200	57	257	112	287	399	300	227	527

Overview of TIS

Intersections examined:

1. Kings Highway (Sussex Road 268)/Site Entrance/Beebe Medical Site Entrance
2. Gills Neck Road (Sussex Road 267)/Site Entrance/Gills Neck Village Center Site Entrance
3. Kings Highway/Bay Breeze Drive
4. Kings Highway/Freeman Highway (Sussex Road 23)
5. Kings Highway/Savannah Road (Sussex Road 18)
6. Savannah Road/Gills Neck Road/Front Street (Sussex Road 267)
7. Kings Highway/Atlantic Drive (*City of Lewes*)
8. Kings Highway/Gills Neck Road/Cape Henlopen High School Entrance
9. Kings Highway/Clay Road (Sussex Road 269)
10. Clay Road/Marsh Road (Sussex Road 269B)
11. Kings Highway/Dartmouth Drive (Sussex Road 268A)

Conditions examined:

TIS

1. Case 1 – Existing (2018)
2. Case 2a – 2027 without development and without the Kings Highway dual lanes project
Case 2b – 2027 without development and with the Kings Highway dual lanes project
3. Case 3a – 2027 with development and without the Kings Highway dual lanes project
Case 3b – 2027 with development and with the Kings Highway dual lanes project
Case 3c – 2027 with development, without the Kings Highway dual lanes project, and without an entrance along Kings Highway
4. Case 4 – 2027 with development and with the Kings Highway dual lanes project with additional improvements

TIS Addendum

1. Case 2d – Future 2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project
2. Case 3d – Future 2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway

Committed Developments considered:

1. Gills Neck Village Center (75,000 square foot shopping center, 213 single family homes on the residual lands)
2. Governors (287 single-family detached houses, 136 multi-family low-rise dwelling units)

3. Beebe Medical (175-unit continuing care retirement, 140 multi-family low-rise dwelling units)
4. Showfield (252 single-family detached houses: 86 units proposed in the City of Lewes, 166 units recorded in Sussex County)
5. White's Pond Meadow-Gills Neck Road (79 single-family detached homes)
6. Admirals Chase (26 semi-detached houses)
7. Cape Henlopen High School Expansion (400 students)
8. The Moorings at Lewes, formerly known as Cadbury, expansion (32-unit Continuing Care Retirement Center)

*Note: Committed development information provided in the TIS supersedes the information provided in the July 3, 2018 DelDOT Scoping Meeting Memorandum. DelDOT provided future year 2027 Case 2 projections based on the DelDOT Travel Demand Model that includes background growth as well as traffic from the eight committed developments.

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

Intersection Descriptions

1. Kings Highway (Sussex Road 268)/Site Entrance/Beebe Medical Site Entrance

Type of Control: Proposed two-way stop-controlled intersection (four-legged intersection)

Eastbound Approach: (Beebe Site Access) Proposed one shared left turn/through lane and one right turn lane, stop-controlled

Westbound Approach: (Site Entrance) Proposed one shared left turn/through lane and one right turn lane, stop-controlled

Northbound Approach: (Kings Highway) Existing one through lane; proposed one left turn lane, one through lane, and one right turn lane

Southbound Approach: (Kings Highway) Existing one through lane; proposed one left turn lane, one through lane, and one right turn lane

2. Gills Neck Road (Sussex Road 267)/Site Entrance/Gills Neck Village Center Site Entrance

Type of Control: Proposed two-way stop-controlled intersection (four-legged intersection)

Eastbound Approach: (Gills Neck Road) Existing one through lane; proposed one left turn lane, one through lane, and one right turn lane

Westbound Approach: (Gills Neck Road) Existing one through lane; proposed one left turn lane, one through lane, and one right turn lane

Northbound Approach: (Gills Neck Village Center Entrance) Proposed one shared left turn/through lane and one right turn lane, stop-controlled

Southbound Approach: (Site Entrance) Proposed one shared left turn/through lane and one right turn lane, stop-controlled

3. Kings Highway/Bay Breeze Drive

Type of Control: Existing stop-controlled intersection

Westbound Approach: (Bay Breeze Drive) Existing one left-turn lane and one right-turn lane, stop-controlled

Northbound Approach: (Kings Highway) Existing one shared through lane/channelized right-turn lane

Southbound Approach: (Kings Highway) Existing two through lanes and one left-turn lane (stop-controlled)

4. Kings Highway/Freeman Highway (Sussex Road 23)

Type of Control: Existing stop-controlled intersection

Northbound Approach: (Kings Highway) Existing one left-turn lane (stop-controlled) and one through lane

Southbound Approach: (Freeman Highway) Existing one through lane and one channelized right-turn lane (stop-controlled)

5. Kings Highway/Savannah Road (Sussex Road 18)

Type of Control: Existing two-way stop-controlled intersection (four-legged intersection)

Eastbound Approach: (3rd Street) Existing one shared through/left-turn lane and one right-turn lane, stop controlled

Westbound Approach: (Kings Highway) Existing one shared through/left-turn lane and one right-turn lane, stop controlled

Northbound Approach: (Savannah Road) Existing one left-tun lane and one shared through/right-turn lane

Southbound Approach: (Savannah Road) Existing one left-tun lane and one shared through/right-turn lane

6. Savannah Road/Gills Neck Road/Front Street (Sussex Road 267)

Type of Control: Existing signalized intersection (four-legged)

Eastbound Approach: (Front Street) Existing one left turn lane and one shared through/right turn lane

Westbound Approach: (Gills Neck Road) Existing one shared left turn/through/right turn lane

Northbound Approach: (Savannah Road) Existing one left turn lane and one shared through/right turn lane

Southbound Approach: (Savannah Road) Existing on left turn lane and one shared through/right turn lane

7. Kings Highway/Atlantic Drive

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

Eastbound Approach: (Atlantic Drive) Existing one shared left-turn/right-turn lane, stop-controlled

Northbound Approach: (Kings Highway) Existing one shared left-turn/through lane

Southbound Approach: (Kings Highway) Existing one shared through/right-turn lane

8. Kings Highway/Gills Neck Road/Cape Henlopen High School Entrance

Type of Control: Existing signalized intersection (four-legged)

Eastbound Approach: (Cape Henlopen High School Entrance) Existing one shared left turn/through lane and one right turn lane

Westbound Approach: (Gills Neck Road) Existing one left turn lane, one through lane, and one right turn lane

Northbound Approach: (Kings Highway) Existing one left turn lane, one through lane, and one right turn lane

Southbound Approach: (Kings Highway) Existing one left turn lane, one through lane, and one right turn lane

9. Kings Highway/Clay Road (Sussex Road 269)

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

Eastbound Approach: (Clay Road) Existing one shared left turn/right turn lane, stop-controlled

Northbound Approach: (Kings Highway) Existing one shared left turn/through lane

Southbound Approach: (Kings Highway) Existing one shared through/right turn lane

10. Clay Road (Sussex Road 269) and Marsh Road (Sussex Road 269B)

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

Eastbound Approach: (Clay Road) Existing one shared through/right turn lane

Westbound Approach: (Clay Road) Existing one shared through/left turn lane

Northbound Approach: (Marsh Road) Existing one left-turn lane and one right-turn lane, stop-controlled.

11. Kings Highway (Sussex Road 268) and Dartmouth Drive (Sussex Road 268A)

Type of Control: Existing two-way stop-controlled intersection

Eastbound Approach: (Dartmouth Drive) Existing one shared left turn/right turn lane, stop-controlled

Northbound Approach: (Kings Highway) One left-turn lane and one through lane

Southbound Approach: (Kings Highway) One through lane and one channelized right-turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, Delaware Transit Corporation (DTC) currently does not provide existing services within the study area.

Planned transit service: Per email correspondence on February 11, 2020 with Mr. Jared Kauffman, Fixed-Route Planner at the DTC, a Type 2 bus stop has been installed at the intersection of Kings Highway and Gills Neck Road/Cape Henlopen High School Entrance. An additional Type 2 bus stop should be installed along northbound Kings Highway at the intersection with the site entrance. Additionally, a sidewalk/SUP interconnection should be provided between the site and the adjacent Bay Breeze Estates.

Existing bicycle and pedestrian facilities: According to DelDOT's *Lewes & Rehoboth Beach Area Bicycle Map*, two Connector Bicycle Routes and one Regional Bicycle Route exist within the study area. One Connector Bicycle Route travels along Gills Neck Road, beginning at the study intersection with Savannah Road, traversing through one study intersection (Site Entrance) intersecting with another Connector Bicycle Route at the study intersection of Kings Highway. The other Connector Bicycle Route exists along Kings Highway and traverses through seven of the study intersections (Freeman Highway, Bay Breeze Drive, Site Entrance, Atlantic Drive, Gills Neck Road/Cape Henlopen High School Entrance, Clay Road, and Dartmouth Drive). The Regional Bicycle Route exists along Savannah Road and traverses through one study intersection (Gills Neck Road/Front Street). Pedestrian facilities currently exist at four of the study intersections: Savannah Road/Gills Neck Road/Front Street, Kings Highway/Savannah Road, Kings Highway/Gills Neck Road/Cape Henlopen High School Entrance, and Gills Neck Road/Site Entrance.

Planned bicycle and pedestrian facilities: Per email correspondence on February 12, 2020 from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- The existing 10-foot wide shared-use path (SUP) should be extended along the Kings Highway site frontage. Once the SUP is extended, the existing tie-in installed for Minor Subdivision Lot 1 shall be removed (including pipe), top soiled, seeding, mulched, and re-graded to assure positive drainage.
- An internal sidewalk/SUP connection is required from the SUP into the site for Lots 1 thru 5.
- Internal bicycle racks should be provided at all Lots.
- Revise design of SUP from Type 2 ramp on the egress side to Type 1 ramp.
- Per the DCM, the site shall dedicate right-of-way per the roadway classification and establish a 15-foot wide permanent easement along the property frontage.
- 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 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 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.

- Kings Highway – LTS: 3 and 4
- Gills Neck Road – LTS: 4

Crash Evaluation

Per the crash data included in the TIS from July 25, 2015 to July 25, 2018 and provided by the Delaware Crash Analysis Reporting System, a total of 166 crashes were reported within the study area. The TIS reports that 89 of these crashes are relevant within the study area and intersections. 19 of these crashes occurred within the functional area of the intersection of Kings Highway and Clay Road, 18 occurred within the functional area of the intersection of Kings Highway and Gills Neck Road/Cape Henlopen High School Access, 17 occurred within the functional area of Savannah Road/Kings Highway/3rd Street, and 11 occurred within the function area of Savannah Road/Front Street/Gills Neck Road. No fatalities occurred within the study area over the 3-year period.

A crash evaluation was also completed as part of DelDOT's *Signal Justification Study US9 – Kings Highway (S268) & Clay Road (S269)* in February 2020. As part of the study, a crash evaluation reviewed data from August 7, 2014 to January 23, 2020 which identified one fatal angle crash at the Kings Highway and Clay Road intersection. The installation of a traffic signal was identified in the study as a short-term improvement which is expected to be implemented prior to Summer of 2021.

Previous Comments

Comments from DelDOT from the Preliminary Traffic Impact Study (PTIS) were addressed in the final TIS.

General HCS Analysis Comments

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

1. For the intersection analyses, the TIS used HCS7 version 7.8, whereas JMT used HCS7 version 7.8.5. The TIS Addendum did utilize HCS7 version 7.8.5.
2. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in the Case 2 and Case 3 future scenario analyses, unless the existing heavy vehicle percentage was greater than 3% and there was no significant increase of vehicles along that movement, in which case the existing heavy vehicle percentage was used for analysis of future scenarios. The TIS utilized various heavy vehicle percentages.
3. Per DelDOT's *Development Coordination Manual* and coordination with DelDOT Planning, JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph along roadways and site entrances, whereas the TIS did in some locations.
4. Per DelDOT's *Development Coordination Manual*, both the TIS and JMT utilized the existing PHF for the Case 1 scenario and a future PHF for Cases 2 and 3 scenarios of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher, unless DelDOT-approved calibrated PHFs were provided by the TIS. JMT did not alter any PHFs for cases without widening, whereas the TIS utilized altered PHFs.
5. Per DelDOT's *Development Coordination Manual*, JMT and the TIS utilized a base saturation flow rate of 1,750 pc/h/ln at all intersections.
6. JMT utilized bicycle and pedestrian counts consistent with the existing turning movement counts whereas the TIS did not.
7. At the signalized intersections, JMT increased right turn on red volumes proportionally with volume increases, whereas the TIS maintained existing right turn on red volumes.
8. At the unsignalized intersections, differences in critical headways and follow-up headways were noticed between the TIS and JMT's analysis. JMT utilized the HCS7 Version 7.8.5 default values.
9. At the unsignalized intersections, the TIS utilized proportion of time spent blocked at the intersections based on field views. The TIS utilized the highest proportion of time spent blocked that would be able to provide an HCS output, which resulted in inconsistent values being used. It is recognized that existing delays may be longer than what is calculated in the JMT analysis due to blocked side streets especially during Cape May-Lewes Ferry arrival/departure times. However, JMT analyzed the intersections with no proportion of

time spent blocked input in order to provide a comparable baseline between cases and peaks.

10. The analysis includes scenarios with or without the *US 9, Kings Highway, Dartmouth Drive to Freeman Highway* DeIDOT project. As part of the project, Kings Highway is proposed to be widened to provide two through lanes in each direction.
11. Three separate Case 3 scenarios were included in the analysis:
 - Case 3a – Future 2027 with development and without the Kings Highway Dual Lane project.
 - Case 3b – Future 2027 with development and with the Kings Highway Dual Lane project. As part of this scenario, Atlantic Drive is assumed to only provide rights-in/rights-out movements along Kings Highway and an interconnection would exist between Atlantic Drive and the Beebe Medical Center.
 - Case 3c – Future 2027 with development and without the Kings Highway Dual Lane project and without a site entrance along Kings Highway.
12. The analysis also includes the TIS Addendum which reviewed the following scenarios:
 - Case 2d – Future 2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project
 - Case 3d – Future 2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway
13. The analyses highlighted in gray represent the JMT interim recommendations as part of the TIS Review letter.
14. The analyses highlighted in blue represent the JMT suggested improvements with the full build of the proposed development.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ²						
Northbound Kings Highway Left Turn	A (8.7)	F (90.3)	F (58.2)	A (8.7)	B (12.0)	B (11.1)
Eastbound Beebe Medical Entrance	B (14.9)	F (*)	F (*)	B (14.2)	E (42.9)	E (45.0)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ³						
Northbound Kings Highway Left Turn	-	-	-	A (8.7)	B (12.1)	B (11.2)
Eastbound Beebe Medical Entrance	-	-	-	B (11.5)	D (25.8)	C (23.7)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d) ²						
Northbound Kings Highway Left Turn	A (8.6)	F (136.9)	F (74.3)	A (8.6)	B (10.3)	B (10.6)
Eastbound Beebe Medical Entrance	B (14.4)	F (*)	F (*)	B (13.8)	D (26.5)	D (32.0)

*HCS reported delay greater than 1000 seconds per vehicle

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

² For the PM and Saturday peak periods, the TIS utilized various values for proportion of time blocked whereas JMT utilized the default value of 0.

³ For this scenario, JMT incorporated two through lanes in each direction along Kings Highway.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance						
2027 with Development and without Kings Highway Dual Lane Project (Case 3a) ²						
Northbound Kings Highway Left Turn	A (8.7)	F (259.0)	F (162.7)	A (8.7)	B (12.0)	B (11.1)
Southbound Kings Highway Left Turn	B (10.3)	B (10.9)	C (16.5)	B (10.3)	B (10.9)	C (16.5)
Eastbound Beebe Medical Entrance	C (19.5)	F (*)	F (*)	C (17.9)	F (130.8)	F (358.0)
Westbound Site Entrance	F (78.6)	F (*)	F (*)	F (59.4)	F (*)	F (*)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ³						
Northbound Kings Highway Left Turn	A (8.9)	B (12.6)	B (11.4)	A (8.9)	B (12.6)	B (11.4)
Southbound Kings Highway Left Turn	B (10.3)	B (10.9)	C (16.5)	B (10.3)	B (10.9)	C (16.5)
Eastbound Beebe Medical Entrance	C (20.8)	F (144.8)	F (468.9)	C (19.1)	F (78.9)	F (340.4)
Westbound Site Entrance	F (55.5)	F (*)	F (*)	E (44.7)	F (*)	F (*)
2027 with Development, without Kings Highway Dual Lane Project and no site entrance on Kings Highway (Case 3c) ²						
Northbound Kings Highway Left Turn	A (8.9)	F (90.3)	E (48.1)	A (8.9)	B (12.4)	B (11.9)
Eastbound Beebe Medical Site Entrance	C (16.3)	F (*)	F (*)	C (15.4)	F (53.3)	F (67.4)

*HCS reported delay greater than 1000 seconds per vehicle

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance						
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d) ²						
Northbound Kings Highway Left Turn	A (8.7)	B (10.4)	B (10.8)	A (8.7)	B (10.4)	B (10.8)
Eastbound Beebe Medical Site Entrance	C (16.1)	E (40.9)	F (64.4)	C (15.2)	D (34.7)	F (50.6)

*HCS reported delay greater than 1000 seconds per vehicle

Note: Analysis highlighted in gray represents the JMT interim recommendations

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ⁴						
Eastbound Beebe Medical Entrance	-	-	-	A (5.3)	B (11.5)	A (10.0)
Northbound Kings Highway	-	-	-	A (8.9)	B (12.5)	D (32.7)
Southbound Kings Highway	-	-	-	A (7.0)	E (39.2)	C (21.5)
Overall Intersection	-	-	-	A (8.0)	D (27.7)	D (27.2)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ^{3,5}						
Eastbound Beebe Medical Entrance	-	-	-	A (4.6)	A (8.8)	A (7.8)
Northbound Kings Highway	-	-	-	A (5.1)	A (5.9)	A (7.5)
Southbound Kings Highway	-	-	-	A (4.5)	A (7.8)	A (7.0)
Overall Intersection	-	-	-	A (4.9)	A (7.0)	A (7.2)

*HCS reported delay greater than 1000 seconds per vehicle

⁴ JMT modeled the intersection as a single-lane roundabout.

⁵ JMT modeled the intersection as a dual-lane roundabout.

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance						
2027 with Development and without Kings Highway Dual Lane Project (Case 3a) ⁴						
Eastbound Beebe Medical Entrance	-	-	-	A (6.1)	C (15.0)	B (14.0)
Westbound Site Entrance	-	-	-	A (7.7)	C (20.5)	E (37.8)
Northbound Kings Highway	-	-	-	B (13.9)	C (20.1)	F (163.0)
Southbound Kings Highway	-	-	-	A (8.6)	F (131.9)	F (90.8)
Overall Intersection	-	-	-	B (11.4)	F (75.5)	F (121.1)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ^{3,5}						
Eastbound Beebe Medical Entrance	-	-	-	A (5.3)	B (11.2)	B (11.0)
Westbound Site Entrance	-	-	-	A (6.7)	B (14.8)	C (21.8)
Northbound Kings Highway	-	-	-	A (6.5)	A (7.1)	B (12.1)
Southbound Kings Highway	-	-	-	A (5.4)	B (11.7)	B (10.1)
Overall Intersection	-	-	-	A (6.1)	B (10.2)	B (12.1)

*HCS reported delay greater than 1000 seconds per vehicle

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance						
2027 with Development, without Kings Highway Dual Lane Project and no site entrance on Kings Highway (Case 3c) ⁴						
Eastbound Beebe Medical Entrance	-	-	-	A (5.7)	B (12.3)	B (11.7)
Northbound Kings Highway	-	-	-	A (9.5)	C (16.3)	F (51.5)
Southbound Kings Highway	-	-	-	A (7.8)	F (51.2)	E (36.3)
Overall Intersection	-	-	-	A (8.7)	E (35.6)	E (43.8)

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance⁶						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ⁷	-	-	-	A (4.7)	A (10.0)	B (13.8)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ^{3,7}	-	-	-	A (3.3)	A (3.2)	A (4.2)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d) ⁷	-	-	-	A (4.7)	A (5.6)	A (8.9)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a) ^{8,9}	A (9.5)	D (51.5)	F (105.4)	B (18.7)	F (81.3)	F (114.0)

⁶ JMT used a signal cycle length of 100 seconds during the AM and Saturday peak periods, and a cycle length of 130 seconds during the PM peak period for all Cases. The TIS used various signal cycle lengths for each period and case analyzed.

⁷ JMT modeled the intersection as split phase with one shared left turn/through lane along the northbound Kings Highway approach, one through lane and one right turn lane along the southbound Kings Highway approach, and one left turn lane and one right turn lane along the eastbound Beebe Medical Center approach. The signal would operate with two phases.

⁸ Both the TIS and JMT modeled the intersection with one left turn lane, one through lane, and one right turn lane along northbound and southbound Kings Highway, and one shared left turn/through lane and one right turn lane along eastbound Beebe Medical Center and the westbound Site Entrance.

⁹ Both the TIS and JMT modeled the northbound and southbound approaches with protected and permissive left turn phasing. The TIS modeled the eastbound and westbound approaches as concurrent phases with permitted left turns, whereas JMT modeled as split phase operation.

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/Site Entrance⁶						
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ^{9,10}	B (12.1)	B (16.2)	B (16.2)	B (13.3)	C (23.7)	C (23.0)
2027 with Development, without Kings Highway Dual Lane Project and no site entrance on Kings Highway (Case 3c) ¹¹	-	-	-	A (5.0)	B (15.0)	D (49.7)
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d) ¹¹	-	-	-	A (4.6)	A (5.7)	A (9.4)

Note: Analysis highlighted in blue represents JMT suggested improvements with the full build of the proposed development

¹⁰ Both the TIS and JMT modeled the intersection with one shared left turn/through lane and one right turn lane along eastbound Beebe Medical Center and the westbound Site Entrance. The TIS modeled the northbound and southbound Kings Highway approaches with one left turn lane, one through lane, and one shared through/right turn lane. JMT modeled the northbound and southbound Kings Highway approaches with one left turn lane, two through lanes, and one right turn lane.

¹¹ Reduction in delay when compared to Case 3a is due to the removal of the easterly leg Site Entrance on Kings Highway from this intersection.

¹¹ JMT modeled the northbound Kings Highway approach with a shared left turn/through lane and a separate right turn lane, the southbound Kings Highway approach with a through lane and a right turn lane, and the eastbound Beebe Medical Center approach with a separate left turn lane and a right turn lane.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Gills Neck Road (Sussex Road 267)/Site Entrance						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ^{2, 12}						
Westbound Gills Neck Road Left Turn	F (434.6)	A (8.9)	A (8.5)	A (8.1)	A (8.9)	A (8.4)
Northbound Gills Neck Village Center Entrance	F (*)	F (*)	F (*)	C (16.4)	C (22.5)	C (16.5)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d) ^{2, 13}						
Eastbound Gills Neck Road Left Turn	F (130.7)	D (34.2)	F (102.7)	A (8.4)	A (8.1)	A (8.1)
Westbound Gills Neck Road Left Turn	E (47.0)	D (30.9)	F (55.2)	A (7.9)	A (8.5)	A (8.2)
Northbound Gills Neck Village Center Entrance	F (*)	F (*)	F (*)	C (20.6)	D (28.5)	C (24.0)
Southbound Site Entrance	F (95.3)	F (133.4)	F (166.8)	B (11.3)	B (11.8)	B (10.9)

*HCS reported delay greater than 1000 seconds per vehicle

¹² Both the TIS and JMT modeled the intersection with one through lane and one right turn lane along eastbound Gills Neck Road, one left turn lane and one through lane along westbound Gills Neck Road, and one left turn lane and one through lane along the northbound Gills Neck Village Center entrance.

¹³ Both the TIS and JMT modeled the intersection with one left turn lane, one through lane, and one right turn lane along the eastbound and westbound Gills Neck Road approaches, and one shared left turn/through lane and one right turn lane along the northbound Gills Neck Village Center entrance and the southbound Site Entrance.

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Gills Neck Road (Sussex Road 267)/Site Entrance						
2027 with Development and without Kings Highway Dual Lane Project (Case 3a) ^{2,13}						
Eastbound Gills Neck Road Left Turn	F (104.1)	C (16.6)	D (27.7)	A (9.1)	A (8.7)	A (9.0)
Westbound Gills Neck Road Left Turn	A (8.1)	B (14.1)	A (8.4)	A (8.1)	A (8.9)	A (8.4)
Northbound Gills Neck Village Center Entrance	F (*)	F (*)	F (*)	E (44.7)	F (201.4)	F (261.6)
Southbound Site Entrance	F (120.2)	F (88.1)	F (120.9)	B (14.2)	C (18.6)	C (17.8)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ^{13,14}						
Eastbound Gills Neck Road Left Turn	A (9.1)	A (8.7)	A (9.0)	A (9.1)	A (8.7)	A (9.0)
Westbound Gills Neck Road Left Turn	A (8.1)	A (8.9)	A (8.4)	A (8.1)	A (8.9)	A (8.4)
Northbound Gills Neck Village Center Entrance	F (54.9)	F (280.9)	F (351.9)	E (44.7)	F (201.4)	F (266.1)
Southbound Site Access	B (14.8)	C (19.8)	C (19.3)	B (14.2)	C (18.6)	C (17.8)

*HCS reported delay greater than 1000 seconds per vehicle

Note: Analysis highlighted in blue represents JMT suggested improvements with the full build of the proposed development

¹⁴ The Gills Neck Village Center Entrance improvements will be determined as part of the Gills Neck Village Center TOA.

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Gills Neck Road (Sussex Road 267)/Site Access						
2027 with Development, without Kings Highway Dual Lane Project and no site entrance on Kings Highway (Case 3c) ^{2,14}						
Eastbound Gills Neck Road Left Turn	F (77.7)	B (11.2)	D (31.8)	B (10.4)	A (9.5)	B (11.9)
Westbound Gills Neck Road Left Turn	A (8.1)	A (8.9)	A (8.4)	A (8.1)	A (8.9)	A (8.4)
Northbound Gills Neck Village Center Entrance	F (*)	F (*)	F (*)	F (344.7)	F (*)	F (*)
Southbound Site Entrance	F (871.5)	F (90.5)	F (*)	C (17.1)	F (54.4)	F (56.5)
2027 with Development, without Kings Highway Dual Lane Project and a rights- in only entrance on Kings Highway (Case 3c)						
Eastbound Gills Neck Road Left Turn	-	-	-	A (9.5)	A (8.9)	A (9.7)
Westbound Gills Neck Road Left Turn	-	-	-	A (8.1)	A (8.9)	A (8.4)
Northbound Gills Neck Village Center Entrance	-	-	-	F (117.5)	F (*)	F (*)
Southbound Site Entrance	-	-	-	C (15.5)	F (52.0)	D (28.7)

*HCS reported excessive delay greater than 1000 seconds per vehicle

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Gills Neck Road (Sussex Road 267)/Site Entrance						
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d) ¹⁵						
Eastbound Gills Neck Road Left Turn	A (8.5)	A (8.2)	A (8.4)	A (8.5)	A (8.2)	A (8.4)
Westbound Gills Neck Road Left Turn	A (7.9)	A (8.5)	A (8.2)	A (7.9)	A (8.5)	A (8.2)
Northbound Gills Neck Village Center Entrance	D (27.9)	F (97.4)	F (101.2)	C (24.9)	F (75.5)	F (76.3)
Southbound Site Access	B (11.9)	C (15.4)	B (13.2)	B (11.6)	B (14.9)	B (12.8)

Note: Analysis highlighted in gray represents the JMT interim recommendations

Table 4
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive ^{2, 15}						
2018 Existing (Case 1)						
Southbound Kings Highway Left Turn	A (8.6)	F (289.8)	F (458.6)	-	-	-
Westbound Bay Breeze Drive Approach	C (19.8)	F (*)	F (*)	-	-	-
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)						
Southbound Kings Highway Left Turn	A (9.1)	F (286.0)	B (12.0)	-	-	-
Westbound Bay Breeze Drive Approach	D (25.7)	F (*)	F (144.1)	-	-	-
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ^{3, 16}						
Southbound Kings Highway Left Turn	-	A (9.9)	B (12.0)	A (9.2)	B (10.2)	B (12.3)
Westbound Bay Breeze Drive Approach	-	F (128.2)	F (144.1)	C (18.9)	E (39.3)	F (52.0)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)						
Southbound Kings Highway Left Turn	A (9.2)	F (286.0)	F (447.6)	-	-	-
Westbound Bay Breeze Drive Approach	D (30.2)	F (*)	F (*)	-	-	-

*HCS reported excessive delay greater than 1000 seconds per vehicle

¹⁵ Due to the unique configuration of the Kings Highway/Bay Breeze Drive intersection, JMT analyzed the intersection as two separate intersections. The TIS analyzed it as a single T-intersection.

¹⁶ JMT assumed the intersection would be modified to a traditional T-intersection as part of the Kings Highway Dual Lane project.

Table 4 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive ^{2,17}						
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ¹⁸						
Southbound Kings Highway Left Turn	A (9.2)	B (10.5)	B (12.8)	A (9.4)	A (10.8)	B (13.1)
Westbound Bay Breeze Drive Approach	C (22.5)	F (65.6)	F (93.7)	C (20.8)	F (52.6)	F (72.3)
2027 with Development and with Kings Highway Dual Lane Project and Bay Breeze Drive left turn out restriction (Case 3b)						
Southbound Kings Highway Left Turn	A (9.2)	B (10.5)	B (12.8)	A (9.4)	B (10.8)	B (13.1)
Westbound Bay Breeze Drive Right Turn	B (11.4)	B (13.0)	C (15.9)	B (11.3)	B (12.9)	C (15.6)

*HCS reported excessive delay greater than 1000 seconds per vehicle

Table 4 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive ^{2,17}						
2018 Existing (Case 1)						
Westbound Bay Breeze Drive Left Turn	-	-	-	C (19.6)	D (25.8)	E (45.5)
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)						
Westbound Bay Breeze Drive Left Turn	-	-	-	D (25.2)	F (106.4)	F (153.2)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)						
Westbound Bay Breeze Drive Left Turn	-	-	-	D (29.6)	F (164.0)	F (261.0)

¹⁷ Due to the unique configuration of the Kings Highway/Bay Breeze Drive intersection, JMT analyzed the intersection as two separate intersections. This table summarized the results of the analysis conducted at the location where the westbound Bay Breeze Drive approach is a stop-controlled left-turn lane, the northbound Kings Highway approach is a through lane and a right turn lane, and the southbound Kings Highway approach is a through lane.

Table 4 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive ^{2,18,19}						
2018 Existing (Case 1)						
Southbound Kings Highway Left Turn	-	-	-	B (13.5)	B (14.0)	C (21.7)
Westbound Bay Breeze Drive Right Turn	-	-	-	B (12.1)	B (12.2)	C (18.8)
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)						
Southbound Kings Highway Left Turn	-	-	-	C (15.3)	C (19.1)	D (29.6)
Westbound Bay Breeze Drive Right Turn	-	-	-	B (13.5)	C (16.1)	D (25.2)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)						
Southbound Kings Highway Left Turn	-	-	-	C (15.8)	C (21.9)	D (33.8)
Westbound Bay Breeze Drive Right Turn	-	-	-	B (13.9)	C (18.1)	D (28.6)

¹⁸ JMT analyzed the southbound left-turn movement as an eastbound through movement as the movement is stop-controlled.

¹⁹ Due to the unique configuration of the Kings Highway/Bay Breeze Drive intersection, JMT analyzed the intersection as two separate intersections. This table summarizes the results of the analysis conducted at the location where the westbound Bay Breeze Drive approach is a yield-controlled channelized right-turn lane, the northbound Kings Highway approach is a through lane, and the southbound Kings Highway approach is a left-turn lane.

Table 4 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive²						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ⁴						
Westbound Bay Breeze Drive Approach	-	-	-	A (6.7)	A (8.2)	B (12.4)
Northbound Kings Highway Approach	-	-	-	A (8.9)	B (12.5)	E (42.9)
Southbound Kings Highway Approach	-	-	-	A (6.4)	C (22.1)	C (15.7)
Overall Intersection	-	-	-	A (7.9)	C (17.6)	C (30.8)
2027 with Development and with Kings Highway Dual Lane Project (Case 2b) ^{3, 5}						
Westbound Bay Breeze Drive Approach	-	-	-	A (5.7)	A (6.7)	A (9.4)
Northbound Kings Highway Approach	-	-	-	A (5.2)	A (6.0)	A (7.9)
Southbound Kings Highway Approach	-	-	-	A (4.4)	A (7.0)	A (6.4)
Overall Intersection	-	-	-	A (4.9)	A (6.5)	A (7.2)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a) ⁴						
Westbound Bay Breeze Drive Approach	-	-	-	A (7.0)	A (9.4)	B (14.1)
Northbound Kings Highway Approach	-	-	-	A (9.5)	C (16.4)	F (66.6)
Southbound Kings Highway Approach	-	-	-	A (7.2)	D (27.4)	C (23.3)
Overall Intersection				A (8.5)	C (22.0)	E (46.8)

Table 4 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive²						
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ^{3, 5}						
Westbound Bay Breeze Drive Approach	-	-	-	A (5.9)	A (7.5)	B (10.4)
Northbound Kings Highway Approach	-	-	-	A (5.4)	A (6.5)	A (8.5)
Southbound Kings Highway Approach	-	-	-	A (4.7)	A (7.3)	A (7.1)
Overall Intersection	-	-	-	A (5.1)	A (6.9)	A (7.9)

Table 4 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Bay Breeze Drive ^{20,21}						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)	-	-	-	A (8.3)	A (9.3)	D (38.0)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ³	-	-	-	A (6.0)	A (4.9)	A (6.2)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)	-	-	-	A (8.5)	B (10.9)	D (52.6)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ³	-	-	-	A (5.9)	A (5.0)	A (6.6)

²⁰ JMT used a signal cycle length of 100 seconds during the AM and Saturday peak periods, and a cycle length of 130 seconds during the PM peak period.

²¹ JMT modeled the signal as a three-phase signal with protected-permissive left turn phasing along the southbound Kings Highway approach.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Freeman Highway (Sussex Road 23) ²²						
2018 Existing (Case 1) ²³						
Northbound Kings Highway Left Turn	A (8.4)	B (12.4)	A (9.1)	C (15.0)	C (18.4)	C (19.6)
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ²³						
Northbound Kings Highway Left Turn	A (8.7)	C (17.6)	B (11.0)	C (17.2)	F (109.6)	F (68.4)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a) ²³						
Northbound Kings Highway Left Turn	A (8.9)	C (23.5)	B (12.2)	C (19.1)	F (199.4)	F (140.6)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b)						
Northbound Kings Highway Left Turn	-	B (13.4)	-	C (19.1)	F (199.4)	F (140.6)
2027 with Development and with Kings Highway Dual Lane Project and Bay Breeze Drive left turn out restriction (Case 3b) ²⁴						
Northbound Kings Highway Left Turn	A (9.0)	B (14.1)	B (12.5)	C (17.2)	F (231.7)	F (151.3)

²² The TIS modeled the northbound movement as a left-turn lane and a through lane. JMT did not include the through movement in the analysis, because it is a free-flow movement with no conflicts. JMT modeled the northbound left-turn movement as a westbound through as it is stop-controlled.

²³ For the PM peak period, the TIS utilized various values for proportion of time blocked whereas JMT utilized the default value of 0.

²⁴ For this scenario, Bay Breeze Drive left turn outs would be restricted and those movements would be U-turns at the Kings Highway/Freeman Highway intersection.

Table 5 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268) / Freeman Highway (Sussex Road 23) ²⁵						
2027 without Development (Case 2)	-	-	-	B (14.9)	D (36.9)	C (25.0)
2027 with Development (Case 3)	-	-	-	B (17.6)	D (38.0)	C (27.5)

²⁵ JMT analyzed the intersection as signalized. The AM and Saturday signal cycle lengths are 100 seconds and the PM signal cycle length is 130 seconds.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268) / Savannah Road (Sussex Road 18) ²⁶						
2018 Existing (Case 1)						
Eastbound 3 rd Street Approach	B (11.5)	B (14.8)	D (28.5)	B (11.6)	C (16.5)	E (35.1)
Westbound Kings Highway Approach	B (10.4)	B (12.7)	C (16.2)	B (10.3)	B (13.3)	C (16.9)
Northbound Savannah Road Left Turn	A (7.5)	A (7.8)	A (7.8)	A (7.5)	A (7.9)	A (7.9)
Southbound Savannah Road Left Turn	A (7.7)	A (7.9)	A (8.7)	A (7.7)	A (8.0)	A (8.9)
2027 without Development (Case 2)						
Eastbound 3 rd Street Approach	B (13.8)	F (55.7)	F (99.6)	B (14.7)	F (165.4)	F (171.0)
Westbound Kings Highway Approach	B (11.5)	E (35.3)	C (21.8)	B (11.5)	E (46.5)	C (23.6)
Northbound Savannah Road Left Turn	A (7.6)	A (7.9)	A (7.8)	A (7.6)	A (8.0)	A (8.0)
Southbound Savannah Road Left Turn	A (7.8)	A (8.5)	A (9.1)	A (7.8)	A (8.6)	A (9.3)
2027 with Development (Case 3) ²⁷						
Eastbound 3 rd Street Approach	C (15.5)	F (96.7)	F (277.0)	C (17.2)	F (357.6)	F (565.9)
Westbound Kings Highway Approach	B (12.1)	F (56.7)	D (30.6)	B (12.0)	F (89.8)	E (39.5)
Northbound Savannah Road Left Turn	A (7.6)	A (8.0)	A (7.8)	A (7.6)	A (8.0)	A (8.0)
Southbound Savannah Road Left Turn	A (7.9)	A (8.6)	A (9.3)	A (7.9)	A (8.7)	A (9.5)

²⁶ For the analysis, the TIS used HCS7 version 7.8, whereas JMT used HCS7 version 7.8.5 resulting in delay differences.

²⁷ During the weekday AM, the TIS used a westbound through volume of 24, and JMT used a volume of 23 consistent with the volume diagrams.

Table 6 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268) / Savannah Road (Sussex Road 18)²⁸						
2027 without Development (Case 2)						
Eastbound 3 rd Street	-	-	-	A (4.3)	A (7.4)	A (5.6)
Westbound Kings Highway	-	-	-	A (4.9)	A (7.6)	B (10.0)
Northbound Savannah Road	-	-	-	A (5.1)	A (7.5)	B (10.0)
Southbound Savannah Road	-	-	-	A (4.8)	A (7.7)	A (5.8)
Overall Intersection	-	-	-	A (4.9)	A (7.6)	A (8.4)
2027 with Development (Case 3)						
Eastbound 3 rd Street	-	-	-	A (4.5)	A (7.8)	A (6.2)
Westbound Kings Highway	-	-	-	A (5.1)	A (8.5)	B (11.4)
Northbound Savannah Road	-	-	-	A (5.3)	A (7.8)	B (11.4)
Southbound Savannah Road	-	-	-	A (5.0)	A (8.3)	A (6.4)
Overall Intersection	-	-	-	A (5.1)	A (8.2)	A (9.4)

²⁸ JMT modeled the intersection as a single-lane roundabout.

Table 6 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268) / Savannah Road (Sussex Road 18)²⁹						
2027 without Development (Case 2)	-	-	-	C (26.6)	C (33.7)	C (31.3)
2027 with Development (Case 3)	-	-	-	C (29.3)	D (37.5)	D (36.3)

²⁹ JMT modeled the intersection as a signalized with split phases along the 3rd Street and Kings Highway approaches. A cycle length of 120 seconds was utilized for all peak periods.

Table 7
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Savannah Road/Gills Neck Road/Front Street (Sussex Road 267) ³⁰						
2018 Existing (Case 1) ³¹	B (15.9)	B (19.1)	F (136.7)	C (29.8)	C (31.3)	F (166.2)
2027 without Development (Case 2) ³¹				C (32.1)	D (36.3)	F (240.1)
2027 without Development (Case 2) with signal timing optimization ³⁴	B (14.1)	B (17.7)	F (154.6)	B (15.2)	B (19.7)	F (160.5)
2027 without Development (Case 2) with improvement ³³				B (14.2)	B (17.2)	D (44.6)
2027 with Development (Case 3) ³³				C (32.4)	D (36.9)	F (263.7)
2027 with Development (Case 3) with signal timing optimization ³²	B (14.5)	B (17.8)	F (158.2)	B (18.3)	C (22.0)	F (176.7)
2027 with Development (Case 3) with improvement ³³				B (16.8)	B (17.8)	D (48.2)

³⁰ JMT did not incorporate RTOR because the movement is restricted, whereas the TIS did.

³¹ JMT used MAX 1 Timers, whereas the TIS utilized observed signal timing splits for existing cases and optimized signal timing splits for future cases.

³² For optimized signal timing scenarios, JMT utilized cycle lengths of 60, 90, and 120 seconds for the AM, PM, and Saturday peak hours, respectively.

³³ JMT improvement scenario includes providing an additional through lane along northbound and southbound Savannah Road with signal timing optimization. Cycle lengths of 60, 90, and 120 seconds were utilized for the AM, PM, and Saturday peak hours, respectively.

Table 7 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Roundabout ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Savannah Road/Gills Neck Road/Front Street (Sussex Road 267)						
2027 without Development (Case 2) ³⁴						
Eastbound Front Street Approach	-	-	-	A (4.1)	A (5.7)	C (15.0)
Westbound Gills Neck Road Approach	-	-	-	A (4.7)	A (5.2)	B (14.8)
Northbound Savannah Road Approach	-	-	-	A (5.2)	A (5.7)	E (39.8)
Southbound Savannah Road Approach	-	-	-	A (4.7)	A (7.8)	C (16.9)
Overall				A (4.8)	A (6.6)	C (24.4)
2027 with Development (Case 3) ³⁴						
Eastbound Front Street Approach	-	-	-	A (4.2)	A (5.9)	B (15.9)
Westbound Gills Neck Road Approach	-	-	-	A (4.7)	A (5.4)	C (16.1)
Northbound Savannah Road Approach	-	-	-	A (5.3)	A (6.1)	F (54.1)
Southbound Savannah Road Approach	-	-	-	A (4.8)	A (8.2)	C (20.8)
Overall				A (4.9)	A (6.9)	D (31.3)

³⁴ JMT modeled the intersection as a single-lane roundabout with a right turn bypass lane along the eastbound Front Street and the northbound Savannah Road approaches.

Table 8
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Atlantic Drive ²						
2018 Existing (Case 1)						
Northbound Kings Highway Left Turn	A (8.3)	F (112.3)	F (126.5)	A (8.3)	B (10.4)	A (9.7)
Eastbound Atlantic Drive Approach	B (13.7)	F (*)	F (*)	B (13.2)	C (24.7)	D (31.1)
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)						
Northbound Kings Highway Left Turn	A (8.8)	F (78.2)	F (84.5)	A (8.9)	B (12.4)	B (10.9)
Eastbound Atlantic Drive Approach	C (17.7)	F (*)	F (*)	C (16.6)	F (57.1)	F (93.4)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ³						
Northbound Kings Highway Left Turn	-	-	-	A (8.9)	B (12.5)	B (11.0)
Eastbound Atlantic Drive Approach	-	-	-	B (12.9)	C (24.1)	E (38.0)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d)						
Northbound Kings Highway Left Turn	A (8.6)	F (110.0)	F (125.1)	A (8.7)	B (11.3)	B (10.4)
Eastbound Atlantic Drive Approach	C (15.8)	F (*)	F (*)	C (15.0)	E (35.8)	F (52.4)

*HCS reported excessive delay greater than 1000 seconds per vehicle

Table 8 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Atlantic Drive ²						
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)						
Northbound Kings Highway Left Turn	A (9.0)	F (73.4)	E (43.7)	A (9.1)	B (13.7)	B (11.7)
Eastbound Atlantic Drive Approach	C (20.7)	F (*)	F (*)	C (19.0)	F (107.4)	F (261.9)
2027 with Development and with Kings Highway Dual Lane Project and Atlantic Drive as Rights-In/Rights-Out Only (Case 3b) ³						
Eastbound Atlantic Drive Right Turn	B (10.7)	C (17.8)	B (14.1)	B (10.6)	C (17.7)	B (14.3)
2027 with Development, only access along Gills Neck Road and without Kings Highway Dual Lane Project (Case 3c)						
Northbound Kings Highway Left Turn	A (9.1)	F (60.7)	F (64.0)	A (9.2)	B (12.8)	B (11.6)
Eastbound Atlantic Drive Approach	C (19.9)	F (*)	F (*)	C (18.4)	F (76.5)	F (168.9)

*HCS reported excessive delay greater than 1000 seconds per vehicle

Note:

Analysis highlighted in blue represents JMT suggested improvements with the full build of the proposed development

Table 8 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Atlantic Drive²						
2027 with Development, without Kings Highway Dual Lane Project and rights-in only along Kings Highway (Case 3c) ³⁵						
Northbound Kings Highway Left Turn	-	-	-	A (9.2)	B (12.8)	B (11.6)
Eastbound Atlantic Drive Approach	-	-	-	C (20.1)	F (89.6)	F (351.4)
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d)						
Northbound Kings Highway Left Turn	A (8.7)	B (11.3)	B (11.6)	A (8.7)	B (11.4)	B (11.2)
Eastbound Atlantic Drive Approach	C (17.1)	E (44.9)	F (397.7)	C (16.1)	E (39.0)	F (164.8)

Note: Analysis highlighted in gray represents the JMT interim recommendations

³⁵ The additional northbound Kings Highway through traffic as a result of a rights-in only site access along Kings Highway increases the delay for vehicles exiting Atlantic Drive.

Table 8 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268)/ Atlantic Drive ^{36,37}						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)	-	-	-	A (8.1)	C (32.3)	B (19.8)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b)	-	-	-	A (5.6)	B (14.2)	A (6.6)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d)	-	-	-	A (7.5)	C (22.9)	B (13.8)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)	-	-	-	A (8.9)	E (56.7)	D (45.6)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ³⁸	-	-	-	A (5.6)	B (13.8)	A (7.1)
2027 with Development, only access along Gills Neck Road, and without Kings Highway Dual Lane Project (Case 3c)	-	-	-	A (8.7)	D (40.2)	C (34.1)
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d)	-	-	-	A (7.9)	C (22.9)	C (30.4)

³⁶ JMT modeled the intersection as signalized with a cycle length of 100 seconds during the AM and Saturday peak periods, and 130 seconds during the PM peak period. The signal would operate with protected-permissive left turn phasing along the northbound Kings Highway approach.

³⁷ JMT modeled the intersection with one left turn lane and one through lane along northbound Kings Highway, one through lane and one right turn lane along southbound Kings Highway, and one left turn lane and one right turn lane along Atlantic Drive. For the scenarios with the Kings Highway Dual Lane Project, the number of through lanes along Kings Highway would increase to two.

³⁸ JMT assumed Atlantic Drive would not have turning restrictions with the provision of a traffic signal and the Kings Highway Dual Lane Project.

Table 9
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Gills Neck Road/Cape Henlopen High School ^{39,40,41}						
2018 Existing (Case 1) ⁴²	F (160.3)	F (343.7)	F (412.7)	F (226.2)	F (359.7)	F (832.0)
2027 without Development and without Kings Highway Dual Lane Project (Case 2a) ⁴³	F (202.3)	F (112.9)	F (433.5)	F (436.3)	F (160.6)	F (574.0)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ⁴⁴	D (46.2)	C (32.2)	C (26.4)	E (78.7)	D (50.5)	D (51.0)
2027 without Development, with Kings Highway Dual Lane Project (Case 2b) with improvements ⁴⁵	D (48.0)	D (53.2)	C (28.7)	C (31.8)	D (45.2)	C (33.2)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d) ⁴⁶	F (209.3)	F (111.4)	F (314.9)	F (152.8)	D (46.6)	F (307.5)

³⁹ For future Cases, JMT analyzed the intersection as a coordinated intersection with Clay Road, whereas the TIS analyzed the intersection as an uncoordinated intersection.

⁴⁰ For future Cases with the Kings Highway Dual Lane Project (Cases 2b and 3b), both the TIS and JMT increased the peak hour factor to 0.92 and set all initial queue lengths to zero.

⁴¹ For future Cases, JMT utilized signal cycle lengths consistent with the DelDOT Timing Plan whereas the TIS utilized various cycle lengths.

⁴² JMT utilized timing splits provided on the DelDOT Timing Plan, whereas the TIS did not. Both the TIS and JMT utilized signal cycle lengths consistent with the DelDOT Timing Plan.

⁴³ For the AM, PM, and Saturday peak hours, JMT maintained the calibrated peak hour factor, whereas the TIS increased the peak hour factor to various values.

⁴⁴ Both the TIS and JMT modeled the intersection with two through lanes along Kings Highway and the Gills Neck Road and Cape Henlopen High School Entrance approaches maintained the existing lane configurations.

⁴⁵ Both the TIS and JMT modeled the intersection with two through lanes along Kings Highway, one left turn lane, one left turn/through lane, and one right turn lane along Gills Neck Road, and the Cape Henlopen High School Entrance approach would maintain the existing lane configurations. The signal phasing along Gills Neck Road and the Cape Henlopen High School would be modified to split phase.

⁴⁶ Both the TIS and JMT utilized weighted peak hour factors to conduct the analysis.

Table 9 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Gills Neck Road/Cape Henlopen High School ^{41,42,43}						
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)	F (248.5)	F (202.4)	F (448.3)	F (443.4)	F (251.2)	F (754.6)
2027 with Development and with Kings Highway Dual Lane Project (Case 3b) ⁴⁴	D (51.9)	E (67.5)	D (51.4)	F (87.8)	F (117.2)	F (111.5)
2027 with Development and with Kings Highway Dual Lane Project (Case 4) ⁴⁷	D (47.7)	E (61.2)	D (39.1)	D (54.5)	D (54.1)	D (54.9)

Note: Analysis highlighted in blue represents JMT suggested improvements with the full build of the proposed development

⁴⁷ Both the TIS and JMT modeled the intersection with two through lanes along Kings Highway, one left turn lane, one shared left turn/through lane, and one right turn lane along Gills Neck Road and one left turn lane, one through lane, and one right turn lane along the Cape Henlopen High School Entrance approach. The signal phasing along Gills Neck Road and the Cape Henlopen High School would be modified to split phase.

Table 9 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Gills Neck Road/Cape Henlopen High School ^{41,42,43}						
2027 with Development without Kings Highway Dual Lane Project (Case 3c)	F (230.0)	F (197.4)	F (425.1)	F (451.9)	F (279.7)	F (686.7)
2027 with Development and without Kings Highway Dual Lane Project (Case 3c) <i>with TIS improvements</i> ⁴⁸	F (200.2)	F (143.4)	F (363.1)	F (356.2)	F (167.6)	F (571.2)
2027 with Development without Kings Highway Dual Lane Project and with rights-in only entrance along Kings Highway (Case 3c) ⁴⁹	-	-	-	F (327.8)	F (135.0)	F (582.6)
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d) ^{50,51}	F (139.6)	E (62.6)	F (317.3)	F (161.2)	D (54.7)	F (366.8)

Note: Analysis highlighted in gray represents the JMT interim recommendations

⁴⁸ TIS improvements scenario incorporates two left turn lanes and a shared through/right turn lane along the westbound Gills Neck Road approach and split phase operation along the eastbound and westbound approaches.

⁴⁹ This scenario models the westbound Gills Neck Road approach with one left turn lane, one shared left turn/through lane, and one right turn lane and the southbound approach with one left turn lane, one through lane, and one shared through/right turn lane.

⁵⁰ Both the TIS and JMT modeled the intersection with one left turn lane, one through lane, and one right turn lane along northbound Kings Highway, one left turn lane, one through lane, and one shared through/right turn lane along southbound Kings Highway, and two left turn lanes, and one shared through/right turn lane along Gills Neck Road. The TIS and JMT maintained the existing lane configurations along the Cape Henlopen High School Entrance approach. The signal phasing along Gills Neck Road and the Cape Henlopen High School would be modified to split phase.

⁵¹ During the PM peak hour, JMT optimized the signal timing splits and modified the signal cycle length to 150 seconds.

Table 10
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Clay Road (Sussex Road 269) ^{2, 52}						
2018 Existing (Case 1)						
Northbound Kings Highway Left Turn	F (168.4)	B (13.4)	F (64.3)	A (9.0)	B (14.1)	A (9.7)
Eastbound Clay Road Approach	F (*)	F (*)	F (*)	F (160.1)	F (*)	F (400.9)
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)						
Northbound Kings Highway Left Turn	F (110.1)	C (16.1)	F (69.4)	-	-	-
Southbound Kings Highway Left Turn	F (177.7)	B (13.0)	F (152.6)	-	-	-
Eastbound Clay Road Approach	F (*)	F (103.4)	F (735.5)	-	-	-
Westbound Gills Neck Village Center Access	F (*)	D (25.4)	F (863.8)	-	-	-
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)						
Northbound Kings Highway Left Turn	F (110.1)	C (22.8)	D (29.5)	-	-	-
Southbound Kings Highway Left Turn	F (177.7)	B (14.4)	F (163.9)	-	-	-
Eastbound Clay Road Approach	F (*)	F (319.8)	F (430.2)	-	-	-
Westbound Gills Neck Village Center Access	F (*)	E (37.3)	F (*)	-	-	-

⁵² For all future Cases, JMT modeled the intersection as a signalized intersection per direction from DelDOT, whereas the TIS only modeled the intersection as signalized for Cases that only incorporated the widening project.

Table 10 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Clay Road (Sussex Road 269) ^{53, 54}						
2027 without Development and without Kings Highway Dual Lane Project (Case 2a)	-	-	-	E (55.8)	F (107.9)	E (71.1)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) ⁵⁵	C (26.9)	C (30.1)	C (23.4)	D (36.9)	C (28.3)	C (23.5)
2027 without Development and with Kings Highway Dual Lane Project (Case 2b) <i>with improvements</i> ⁵⁶	-	-	-	D (37.0)	C (28.6)	C (23.3)
2023 with development of Lot 1 (39,000 square feet of medical/dental office space) and without the Kings Highway Dual Lane Project (Case 2d)	-	-	-	C (34.2)	F (94.9)	D (46.5)
2027 with Development and without Kings Highway Dual Lane Project (Case 3a)	-	-	-	F (103.0)	F (191.3)	F (151.1)

⁵³ For future Cases, JMT analyzed the intersection as a signalized intersection coordinated with Gills Neck Road, whereas the TIS analyzed the intersection as an uncoordinated signalized intersection. JMT utilized signal cycle lengths consistent with the signal cycle lengths at the Kings Highway/Gills Neck Road intersection whereas the TIS utilized various signal cycle lengths.

⁵⁴ JMT modeled the intersection with one left turn lane, one through lane, and one right turn lane along the northbound and southbound Kings Highway approaches, one left turn lane, one through lane, and one right turn lane along the eastbound Clay Road approach, and two left turn lanes, one through lane and one right turn lane along the Gills Neck Village Center Entrance. Protected-permissive left turn phasing was utilized along the northbound and southbound approaches, and split phase was utilized along the eastbound and westbound approaches.

⁵⁵ JMT and the TIS modeled the intersection with two through lanes along Kings Highway. The TIS modeled the side street approaches with one left turn lane, one through lane, and one right turn lane.

⁵⁶ JMT incorporated a scenario with improvements proposed at the Kings Highway/Gills Neck Road intersection. Specifically, the improvements include the intersection with two through lanes along Kings Highway, one left turn lane, one left turn/through lane, and one right turn lane along Gills Neck Road, and the Cape Henlopen High School Entrance approach would maintain the existing lane configurations. The signal phasing along Gills Neck Road and the Cape Henlopen High School would be modified to split phase.

Table 10 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Clay Road (Sussex Road 269) ^{57, 58}						
2027 with Development and with Kings Highway Dual Lane Project (Case 3b)	-	-	-	D (50.8)	E (58.0)	D (36.6)
2027 with Development and with Kings Highway Dual Lane Project (Case 4) ^{57,58}	C (30.1)	D (37.0)	C (33.3)	D (39.4)	D (46.5)	D (43.0)

Note: Analysis highlighted in blue represents JMT suggested improvements with the full build of the proposed development

⁵⁷ Both the TIS and JMT modeled the intersection with two through lanes along Kings Highway, one left turn lane, one through lane, and one right turn lane along Clay Road.

⁵⁸ Along the westbound Gills Neck Village Center Entrance approach, JMT provided two left turn lanes, one through lanes, and one right turn lane whereas the TIS provided one left turn lane, one through lane, and one right turn lane. The TIS used protected and permissive phasing along the eastbound and westbound approaches whereas JMT utilized split phase operation.

Table 10 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway/Clay Road (Sussex Road 269) ^{57, 58}						
2027 with Development, without Kings Highway Dual Lane Project and no site entrance on Kings Highway (Case 3c)	-	-	-	F (87.0)	F (196.3)	F (158.6)
2027 with Development, without Kings Highway Dual Lane Project and no site entrance on Kings Highway (Case 3c) with TIS improvements ⁵⁹	-	-	-	F (131.9)	F (193.6)	F (168.3)
2027 with Development, without Kings Highway Dual Lane Project and rights-in only entrance on Kings Highway (Case 3c) ⁶⁰	-	-	-	F (95.6)	F (189.3)	F (156.6)
2023 with 117,000 square feet of medical/dental office space, without the Kings Highway Dual Lane Project, and rights-in site entrance on Kings Highway (Case 3d) ⁵⁵	-	-	-	D (40.7)	F (165.2)	E (69.7)

Note: Analysis highlighted in gray represents the JMT interim recommendations

⁵⁹ The TIS improvements scenario incorporates two left turn lanes and a shared through/right turn lane along the westbound Gills Neck Road approach to Kings Highway and split phase operation along the eastbound and westbound approaches at the Gills Neck Road/Kings Highway intersection.

⁶⁰ JMT modeled the southbound Kings Highway approach with one right turn lane and one through lane.

Table 11
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
Clay Road (Sussex Road 269) / Marsh Road (Sussex Road 269A)						
2018 Existing (Case 1) ⁶¹						
Westbound Clay Road Left	A (7.5)	A (7.6)	A (7.6)	-	-	-
Northbound Marsh Road Approach	A (9.3)	A (9.5)	A (9.4)	-	-	-

⁶¹ Due to the unique configuration of the Clay Road/Marsh Road intersection in Case 1, JMT analyzed the intersection as three separate intersections. The TIS analyzed it as a single standard T-intersection and the results are summarized in this table.

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
Clay Road (Sussex Road 269) / Marsh Road (Sussex Road 269A) ⁶²						
2018 Existing (Case 1) – a ⁶³						
Eastbound Clay Road Right Turn	-	-	-	A (8.5)	A (8.9)	A (8.5)
Northbound Marsh Road Left Turn	-	-	-	A (7.3)	A (7.6)	A (7.3)
2018 Existing (Case 1) – b ⁶⁴						
Eastbound U-turn ⁶⁵	-	-	-	-	A (7.5)	-
Northbound Marsh Road Left Turn	-	-	-	A (9.4)	B (10.1)	B (10.4)
2018 Existing (Case 1) – c ⁶⁶						
Westbound Clay Road Left Turn	-	-	-	A (7.5)	A (7.5)	A (7.6)
Northbound Marsh Road Right Turn	-	-	-	A (9.1)	A (8.8)	A (9.3)

⁶² Due to the unique configuration of the Clay Road/Marsh Road intersection, JMT analyzed the intersection as three separate intersections.

⁶³ Intersection ‘a’ depicts the analysis conducted at the location where the eastbound Clay Road approach is a stop-controlled right turn lane, the northbound Marsh Road approach is a shared through/left turn lane, and the southbound Marsh Road approach is a through lane.

⁶⁴ Intersection ‘b’ depicts the analysis conducted at the location where the eastbound Clay Road approach is a shared through/right turn lane, the westbound Clay Road approach is a through lane, and the northbound Marsh Road approach is a stop-controlled left turn lane.

⁶⁵ JMT modeled the U-turn as a left turn due to limitations of the HCS software.

⁶⁶ Intersection ‘c’ depicts the analysis conducted at the location where the eastbound Clay Road approach is a through lane, the westbound Clay Road approach is a shared through/left turn lane and the northbound Marsh Road approach is a stop-controlled right turn lane.

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
Clay Road (Sussex Road 269) / Marsh Road (Sussex Road 269A) ⁶⁷						
2027 without Development and without Kings Highway Dual Lane project (Case 2a)						
Eastbound Clay Road Approach	B (13.3)	B (13.1)	B (13.5)	B (13.3)	B (12.8)	B (13.0)
Northbound Marsh Road Left Turn	A (8.1)	A (8.2)	A (8.1)	A (8.1)	A (8.2)	A (8.0)
2027 with Development (Case 3)						
Eastbound Clay Road Approach	C (15.2)	C (16.5)	C (18.3)	B (14.4)	C (15.5)	C (15.9)
Northbound Marsh Road Left Turn	A (8.2)	A (8.6)	A (8.4)	A (8.3)	A (8.6)	A (8.3)

⁶⁷ The intersection will be reconfigured as part of the *Realignment of Old Orchard Road/Savannah Road/Wescoats Road* (DelDOT Contract No. T201609601) project. The existing westbound Clay Road left-turn onto Marsh Road will be a major street through movement. The existing right-turn from Marsh Road onto Clay Road will be a major street through movement. The existing eastbound through movement on Clay Road will be a stop-controlled minor street left-turn onto Clay Road.

Table 12
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, INC.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268) / Dartmouth Drive (Sussex Road 268A) ^{2,68,69}						
2018 Existing (Case 1)						
Northbound Kings Highway Left Turn	A (9.7)	A (7.7)	F (133.7)	A (7.4)	A (7.7)	A (7.5)
Eastbound Dartmouth Drive Approach	D (28.7)	F (145.0)	F (*)	D (29.5)	F (86.3)	F (180.7)
2027 without Development (Case 2)						
Northbound Kings Highway Left Turn	A (9.7)	A (7.8)	F (142.5)	A (7.4)	A (7.8)	A (7.6)
Eastbound Dartmouth Drive Approach	F (330.2)	F (*)	F (*)	F (199.0)	F (840.3)	F (831.0)
2027 with Development (Case 3)						
Northbound Kings Highway Left Turn	A (9.7)	A (7.8)	F (142.5)	A (7.4)	A (7.8)	A (7.6)
Eastbound Dartmouth Drive Approach	F (944.9)	F (*)	F (*)	F (477.8)	F (*)	F (*)

*HCS reported excessive delay greater than 1000 seconds per vehicle

⁶⁸ The TIS utilized various values for proportion of time blocked whereas JMT utilized the default value of 0.

⁶⁹ Results represent the eastbound Dartmouth Drive Approach to have one shared left turn/right turn lane. JMT also incorporated the right turn lane to have a flared right turn with a 5-vehicle storage.

Table 12 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
Kings Highway (Sussex Road 268) / Dartmouth Drive (Sussex Road 268A) ⁷⁰						
2027 without Development and with or without Kings Highway Dual Lane Project (Case 2a) ⁷¹						
Eastbound Dartmouth Drive Approach	A (5.7)	A (6.3)	A (5.9)	A (5.7)	A (6.4)	A (6.0)
Northbound Kings Highway Approach	A (0.2)	A (0.9)	A (0.6)	A (0.2)	A (0.9)	A (0.6)
Southbound Kings Highway Approach	A (0.2)	A (0.4)	A (0.2)	A (0.2)	A (0.4)	A (0.2)
Overall Intersection	A (1.1)	A (1.5)	A (1.2)	A (1.1)	A (1.5)	A (1.3)
2027 with Development and with or without Kings Highway Dual Lane Project (Case 3) ⁷¹						
Eastbound Dartmouth Drive Approach	A (6.3)	A (6.9)	A (7.0)	A (6.2)	A (6.9)	A (7.2)
Northbound Kings Highway Approach	A (0.2)	A (0.9)	A (0.5)	A (0.2)	A (0.9)	A (0.5)
Southbound Kings Highway Approach	A (0.2)	A (0.3)	A (0.2)	A (0.2)	A (0.3)	A (0.2)
Overall Intersection	A (1.2)	A (1.5)	A (1.4)	A (1.2)	A (1.5)	A (1.5)

Note: Analysis highlighted in blue represents JMT suggested improvements with the full build of the proposed development

⁷⁰ Both the TIS and JMT modeled the northbound approach with a right turn bypass lane to represent a northbound bypass lane.

⁷¹ Both the TIS and JMT modeled the intersection as a single-lane roundabout.

Table 12 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Mitchell Farm
Report Dated: September 2019
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Kings Highway (Sussex Road 268) / Dartmouth Drive (Sussex Road 268A) ⁷²						
2027 without Development and with or without Kings Highway Dual Lane Project (Case 2a)	-	-	-	C (27.3)	C (26.3)	D (41.4)
2027 with Development and with or without Kings Highway Dual Lane Project (Case 3)	-	-	-	D (54.1)	D (41.9)	F (112.1)

⁷² JMT analyzed the intersection as a signalized intersection with a 60 second cycle length during all peak periods. The eastbound Dartmouth Drive approach would provide one left turn lane and one shared left turn/right turn lane, the northbound Kings Highway approach would provide one left turn lane and one through lane, and the southbound Kings Highway approach would provide one through lane.