



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

JENNIFER COHAN
SECRETARY

October 28, 2020

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

Dear Ms. Tustin:

The enclosed Traffic Impact Study (TIS) review letter for the **Ross Business Park** (Tax Parcel 331-5.00-4.11) 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) 760-2167.

Sincerely,

A handwritten signature in black ink that reads "Troy Brestel".

Troy Brestel
Project Engineer

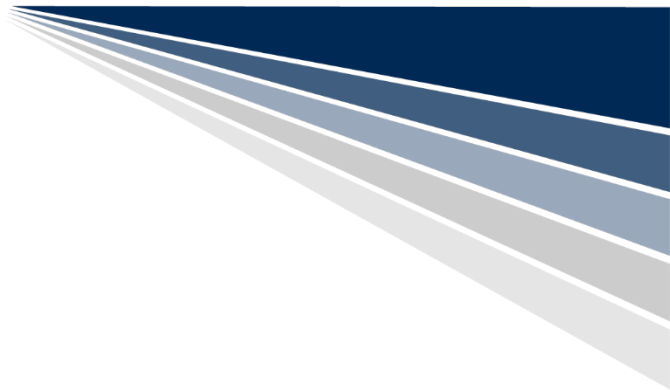
TEB:km

Enclosures

cc with enclosures: Ms. Judy Schwartz, George, Miles & Buhr, L.L.C.
Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Charles Anderson, City of Seaford
Ms. Trisha Newcomer, City of Seaford
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
J. Marc Coté, Director, Planning
Shanté Hastings, Director, Transportation Solutions (DOTS)
Mark Luszczyk, Deputy Director, Traffic, DOTS
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Todd Sammons, Assistant Director, Development Coordination
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Chris Sylvester, Traffic Studies Manager, Traffic, DOTS
Alistair Probert, South District Engineer, South District
Gomez Norwood, South District Public Works Manager, South District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Wendy Polasko, Subdivision Engineer, Development Coordination
Susanne Laws, Sussex Review Coordinator, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
John Andrescavage, Subdivision Manager, Development Coordination
Claudy Joinville, Project Engineer, Development Coordination



October 27, 2020

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 15A-Ross Business Park TIS

Dear Mr. Brestel:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for Ross Business Park, prepared by The Traffic Group, Inc. dated August 13, 2020. This task was assigned as Task Number 15A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed 488,766 square foot business park in the City of Seaford, Sussex County, Delaware. The site is located on the southeast corner of the intersection of Ross Station Road (Sussex Road 543) and Herring Run Road (Sussex Road 534). The subject property is on an approximately 121.49-acre assemblage of parcels that is zoned as M-1 (Light Industrial) and the developer does not plan to rezone the land.

The business park will be developed in two phases: Phase I will consist of 278,175 square feet with access on Herring Run Road, and Phase II will consist of an additional 210,591 square feet with access on Herring Run Road, Ross Station Road, and Virginia Avenue (Sussex Road 639) by way of N. Market Street extended. Construction of Phase I is projected to be complete in 2024 and Phase II is projected to be complete in 2030.

Per the TIS, two of the site entrances (Site Entrance B/Ross Station Road and Site Entrance C/Virginia Avenue) could not be evaluated due to lack of available count data. Based on an April 15, 2020, correspondence within the TIS these two intersections will be evaluated as an addendum for Phase II when count data can be collected. As such, consistent with the TIS, JMT has conducted this TIS review on five of the seven study intersections, omitting the Site Entrance B and C intersections.

DelDOT does not have any relevant or ongoing improvement projects within the study area.

Based on our review of the TIS, we have the following comments and recommendations: The following intersections exhibit level of service (LOS) deficiencies without the implementation of



physical roadway and/or traffic control improvements. The table below does not include any signalized intersections that exhibit LOS deficiencies under Cases 1, 2, 3, or 4 due to the utilization of splits from the DelDOT Timing Plans and can be mitigated with signal timing split optimization while maintaining the existing signal cycle lengths as the developer would not be recommended to do any additional improvements at those locations.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
US Route 13/Herring Run Road (Sussex Road 534)/Tharp Road (Sussex Road 534)		X	Case 1- 2019 Existing
		X	Case 2- 2024 without development
		X	Case 3- 2024 with development of Phase I
	X	X	Case 4- 2030 with development of Phase I and II

The signalized US Route 13 intersection with Herring Run Road/Tharp Road (Sussex Road 534) exhibits LOS deficiencies during the PM peak hours under existing conditions and future conditions with or without the proposed development with delays of up to 71.0 seconds per vehicle. Additionally, the intersection exhibits LOS deficiencies during the AM peak hour under future conditions with the full development with delays of up to 56.4 seconds per vehicle.

The deficiencies can be mitigated by converting the westbound Tharp Road right turn lane to a shared through/right turn lane, while maintaining the existing 150 seconds cycle length. The deficiencies can also be mitigated by decreasing the signal cycle length to 120 seconds and optimizing the green split times. As signal timing modifications would mitigate the capacity constraints, we do not recommend the developer implement any improvements at this intersection. It should be noted that the US Route 13 intersection with Herring Run Road/Tharp Road is part of a coordinated corridor along US Route 13 and altering the signal cycle length would affect the operations at other signals along the corridor.

Should the City of Seaford approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. Only recommendations for Site Entrance A along Herring Run Road are included below. Any recommendations for Site Entrances B and C will be included as part of a future addendum. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer shall improve Herring Run Road within the limits of their frontage to meet DelDOT’s standards for their Functional Classification as found in Section 1.1 of the *Development Coordination Manual* and elsewhere therein. The improvements shall include both directions of travel, regardless of whether the developer’s lands are on one or both sides of the road. Frontage is defined in Section 1 of the *Development Coordination Manual*, which states “This length includes the length of roadway perpendicular to lines



created by the projection of the outside parcel corners to the roadway.” Questions on or appeals of this requirement should be directed to the DeIDOT Subdivision Review Coordinator in whose area the development is located.

2. The developer should construct a full access site entrance (Site Entrance A) for the proposed Ross Business Park development on Herring Run Road, approximately 650 feet east of Ross Station Road to be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Herring Run Road	One through lane	One through lane and one right turn lane
Westbound Herring Run Road	One through lane	One left turn lane and one through lane
Northbound Site Entrance A	Approach does not exist	One shared left turn/right turn lane

Based on DeIDOT’s *Development Coordination Manual*, the recommended minimum storage length is 190 feet (excluding taper) for the eastbound Herring Run Road right turn lane and 185 feet (excluding taper) for the westbound Herring Run Road left turn lane. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage lengths.

3. The following bicycle, pedestrian, and transit improvements should be included:
 - a. DeIDOT will require a sidewalk or shared-use path to the specific facility to be decided during the plan review process. If feasible, the facility should connect to the existing sidewalk along the frontage of Mearfield.
 - b. Internal connection(s) should be provided from the non-motorized facility.
 - 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. ADA compliant curb ramps and marked crosswalks should be provided along the Site Entrance A approach to Herring Run Road. The use of diagonal curb ramps is discouraged.
 - e. A minimum five-foot wide bicycle lane should be incorporated in the right turn lane along the eastbound Herring Run Road approach to Site Entrance A.



- f. 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.
- g. Bike parking racks should be provided near the building entrances. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.

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. Don Weber, Assistant Director for Traffic Operations and Management. Mr. Weber can be reached at (302) 659-4651 or by email at Don.Weber@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
Enclosure

General Information

Report date: August 13, 2020

Prepared by: The Traffic Group, Inc.

Prepared for: The City of Seaford

Tax Parcel: 331-5.00-4.00 & 4.11

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

Project Description and Background

Description: The developer seeks to develop 488,766 square-foot business park which would be developed in two phases. Phase I is proposed to consist of 278,175 square feet and have access on Herring Run Road. Phase II is proposed to consist of the additional 210,591 square feet and would have access on Herring Run Road, Ross Station Road, and Virginia Avenue (Sussex Road 639) by way of N. Market Street Extended.

Location: The subject site is located on the southeast corner of the intersection of Ross Station Road (Sussex Road 543) and Herring Run Road (Sussex Road 534), in the City of Seaford.

Amount of Land to be developed: An approximately 121.49-acre assemblage of parcels.

Land Use approval(s) needed: Entrance Plan.

Proposed completion date: Phase I by 2024 and Phase II by 2030.

Proposed access location: Three full access points are proposed: one on Herring Run Road, one on Ross Station Road, and one on Virginia Avenue by way of N. Market Street Extended. The TIS only evaluates the access point along Herring Run Road. The access points along Ross Station Road and Virginia Avenue will be evaluated under a future addendum.

Daily Traffic Volumes:

- 2019 Average Annual Daily Traffic on Herring Run Road (Sussex Road 534): 1,534 vehicles per day (non-Summer)
- 2019 Average Annual Daily Traffic on Ross Station Road (Sussex Road 543): 1,782 vehicles per day (non-Summer)

Site Map



**Graphic is an approximation based on the Concept Site Plan prepared by George, Miles & Buhr, LLP dated August 2019. Only the site entrance along Herring Run Road is depicted. The site entrances along Ross Station Road and Virginia Avenue will be evaluated under a future addendum.*

Relevant and On-going Projects

DelDOT does not have any relevant or ongoing improvement projects within the study area.

Livable Delaware

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

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

The proposed development is located in an Out of Play area.

Out of Play

These lands which are not available for development include publicly-owned lands, private conservation lands, lands for which serious legal and/or environmental constraints on development are identified, and lands in some form of permanent open-space protection. These areas are generally not expected to be the location of private development activities such as residential subdivisions or commercial shopping centers. However, government entities, private property owners, and conservation organizations are still expected to invest in these areas for the purposes

in which they were acquired and preserved. There may also be times when private property owners could be able to build or redevelop on these lands in accordance with State and local environmental and land use regulations.

Proposed Development’s Compatibility with Livable Delaware:

This site is located at Out of Play area. Out of Play areas are generally not expected to be the location of private development activities such as residential subdivisions. However, there may be times when government entities or private property owners could be able to build or redevelop on these out of play lands in accordance with State and local environmental and land use regulations. Therefore, the proposed development is not consistent with the 2020 update of the Livable Delaware “Strategies for State Policies and Spending”.

Comprehensive Plans

(Source: City of Seaford, Comprehensive Plan, 2008)

City of Seaford Comprehensive Plan:

The subject property is located within the City of Seaford and per the *City of Seaford Comprehensive Plan Zoning Map*, the proposed development is in an area designated as M-1 (Light Industrial).

Proposed Development’s Compatibility with the City of Seaford Comprehensive Plan:

Per the City of Seaford Comprehensive Plan, the subject property is located in an area zoned for light industrial. The proposed development is an industrial park. As such, the proposed use is generally compatible with the *City of Seaford 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 130 (Industrial Park). The trip generation was approved by DelDOT during the Preliminary Traffic Impact Study (PTIS) review.

Table 1
Ross Business Park

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Phase I - 278,175 SF Industrial Park (ITE Code 130)	1,598	90	21	111	23	88	111
Phase I & II – 488,766 SF Industrial Park (ITE Code 130)	2,143	159	37	196	41	155	196

Overview of TIS

Intersections examined:

1. Site Entrance A / Herring Run Road (Sussex Road 534)
2. Site Entrance B / Ross Station Road (Sussex Road 543)
3. Site Entrance C / Virginia Avenue (Sussex Road 639)
4. Herring Run Road / Ross Station Road
5. Herring Run Road / Bridgeville Highway (Sussex Road 13)
6. Herring Run Road / Lowe's Entrance / Seaford Village Shopping Center Entrance
7. US Route 13 / Herring Run Road / Tharp Road (Sussex Road 534)

Note: Per the TIS, two of the site entrances (Site Entrance B/Ross Station Road and Site Entrance C/Virginia Avenue) included in the February 6, 2020 DelDOT Scoping Meeting Memorandum could not be evaluated due to lack of available count data. Based on correspondence within the TIS, these two intersections will be evaluated as an addendum for Phase II when count data can be collected.

Conditions examined:

1. Existing (2019)
2. 2024 without development
3. 2024 with development of Phase I (278,175 square feet)
4. 2030 with full development (Phases I & II – 488,766 square feet)

Committed Developments considered:

1. Melanie's Ridge (f.k.a. Haggerty Property) (280 units of low-rise apartments and 10,000 square feet of retail space)
2. Mearfield Single-Family (182 single-family detached houses)
3. Mearfield Section 2 (153 low-rise condominiums / townhouses)
4. Wawa – Seaford (f.k.a. Ayers Property) (5,585 square-foot super convenience store with gas pumps)
5. Villages of Stoneybrook (150 low-rise townhouses / condominiums)
6. 7-Eleven (4,950 square-foot super convenience store with gas pumps)

Note: Committed development information listed above is from the TIS report and supersedes the information provided in the February 6, 2020 DelDOT Scoping Meeting Memorandum

Peak hours evaluated: Weekday morning and evening peak hours.

Intersection Descriptions

1. Site Entrance A/ Herring Run Road (Sussex Road 534)

Type of Control: Proposed stop-controlled intersection (T-intersection)

Eastbound Approach: (Herring Run Road) Existing one through lane; proposed one through lane and one right turn lane

Westbound Approach: (Herring Run Road) Existing one through lane; proposed one left turn lane and one through lane

Northbound Approach: (Site Entrance A) Proposed one shared left turn/right turn lane, stop controlled

2. Herring Run Road / Ross Station Road (Sussex Road 543)

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

Westbound Approach: (Herring Run Road) Existing one shared left turn/right turn lane, stop controlled

Northbound Approach: (Ross Station Road) Existing one shared through/right turn lane

Southbound Approach: (Ross Station Road) Existing one shared left turn/through lane

3. Herring Run Road/ Bridgeville Highway (Sussex Road 13)

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

Eastbound Approach: (Herring Run Road) Existing one left turn lane and one shared through/right turn lane

Westbound Approach: (Herring Run Road) Existing one left turn lane and one shared through/right turn lane

Northbound Approach: (Bridgeville Highway) Existing one shared left turn/through lane and one right turn lane

Southbound Approach: (Bridgeville Highway) Existing one shared left turn/through lane and one right turn lane

4. Herring Run Road/ Lowe's Entrance / Seaford Village Shopping Center Entrance

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

Eastbound Approach: (Herring Run Road) Existing one left turn lane, one through lane and one shared through/right turn lane

Westbound Approach: (Herring Run Road) Existing one left turn lane, one through lane and one right turn lane

Northbound Approach: (Seaford Village Shopping Center) Existing one shared left turn/through lane and one right turn lane

Southbound Approach: (Lowe's Entrance) Existing one shared left turn/through lane and one right turn lane

5. US Route 13/ Herring Run Road / Tharp Road (Sussex Road 534)

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

Eastbound Approach: (Herring Run Road) Existing two left turn lanes, one through lane, and one right turn lane

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

Northbound Approach: (US Route 13) Existing two left turn lanes, two through lanes, and one channelized right turn lane

Southbound Approach: (US Route 13) Existing one left turn lane, two through lanes, and one channelized right turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, Delaware Transit Corporation (DTC) currently provides existing services within the study area via DART Routes 903 and 212. DART Route 212 runs along US Route 13 with existing bus stops adjacent to one study intersection (US Route 13 and Herring Run Road/Tharp Road). DART Route 903 runs along Bridgeville Highway with existing bus stops adjacent to one study intersection (Herring Run Road and Bridgeville Highway). DART Route 212 provides 11 round trips on weekdays from 5:13 AM to 11:29 PM and 7 round trips on Saturday from 10:10 AM to 10:55 PM. DART Route 903 provides 14 round trips on weekdays from 5:45 AM to 7:43 PM.

Planned transit service: Per email correspondence on September 10, 2020 with Mr. Jared Kauffman, Fixed-Route Planner, the DTC does not have any transit specific comments for the project.

Existing bicycle and pedestrian facilities: According to DelDOT's *Sussex County Bicycle Map*, Statewide Bicycle Route and Connector Bicycle Routes exist within the study area. The Statewide Bicycle Route travels along Ross Station Road and beginning at a study intersection (Herring Run Road) and traveling south. One of the Connector Bicycle Routes travels along Ross Station Road and traverses through one study intersection (Herring Run Road). The route then travels east along Herring Run Road/Tharp Road and traverses three study intersections (Site Entrance A, Bridgeville Highway, and US Route 13). Another Connector Bicycle Route travels along US Route 13 and traverses one study intersection (Herring Run Road/Tharp Road). Pedestrian facilities exist at three of the study intersections along Herring Run Road (Bridgeville Highway, Lowe's Entrance/Seaford Village Shopping Center, and US Route 13).

Planned bicycle and pedestrian facilities: Per email correspondence on September 11, 2020 from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- A 10' wide sidewalk or shared-use path should be constructed along the property frontage of Ross Station Road and Herring Run Road. Since the site is within the City of Seaford, the City would determine if it should be a SUP or sidewalk. There is an existing sidewalk along the south side of Herring Run Road along the Mearfield development. This network could be extended to Ross Station Road but there is tax parcel 331-5.00-4.09 (lands n/f of the City of Seaford) the facility would need to cross. There is an existing sidewalk along the south side of North Market Street Ext. This network could be extended to Herring Run Road.
- Internal connection(s) from the non-motorized facility is required.

- Per the *Development Coordination Manual* (DCM) the site shall dedicate right-of-way per the roadway classification and establish a 15-foot wide permanent easement along the property frontages.
- 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 functional classification or existing conditions.

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

- Herring Run Road (Sussex Road 534) – LTS: 4
- Ross Station Road (Sussex Road 543) – LTS: 2, 3, and 4

Crash Evaluation

Per the crash data included in the TIS from April 18, 2017 to April 18, 2020 and provided by the Delaware Crash Analysis Reporting System, a total of 158 crashes were reported within the study area. Of the 158 crashes reported:

- 94 crashes occurred at the signalized intersection of Delaware Route 13 and Herring Run Road/Tharp Road
 - Of those 94 crashes, 54 were rear end crashes, 18 were angle crashes, 10 were sideswipe crashes, four were crashes with fixed objects, four were front to front crashes, three were unknown/other, and one was a rear to rear crash. 18 of these crashes resulted in injuries.
- 24 crashes occurred at the signalized intersection of Herring Run Road/Lowe's Entrance/Seaford Village Shopping Center Entrance
 - Of those 24 crashes, 13 were rear end crashes, four were angle crashes, four were sideswipe crashes, one was rear to rear, and two were unknown/other. Two of these crashes resulted in injuries.
- 20 crashes occurred at the signalized intersection Herring Run Road/Bridgeville Highway

- Of those 20 crashes, nine were rear-end crashes, seven were angle crashes, three were front to front crashes, and one was a sideswipe crash. Six of these crashes resulted in injuries.
- Nine crashes occurred at the unsignalized intersection Herring Run Road/Ross Station Road
 - Of those nine crashes, three were rear end incidents, two were angle incidents, two were crashes with fixed objects, one was a sideswipe crash, and one was unknown/other. One of these accidents resulted in injuries.
- 11 crashes occurred at the unsignalized intersection Site Entrance C/ Virginia Avenue
 - Of those 11 crashes, seven were angle crashes, two were unknown/other, one was a rear end crash, and one was sideswipe crash. One of these accidents resulted in injuries.
- No fatalities were reported within the study area during the 3-year study period.

General HCS Analysis Comments

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

1. 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, Case 3, and Case 4 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 the analysis of future scenarios, whereas the TIS used a HV% which matches the existing count data.
2. 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 for Case 1 conditions, whereas the TIS did not.
3. Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for the Case 1 scenario and a future PHF for Cases 2, 3, and 4 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. The TIS utilized the existing PHF for all cases.
4. Per DelDOT's *Development Coordination Manual*, both JMT and the TIS utilized a saturation flow rate of 1,750 pc/ph/pl for all signalized analyses as the intersections are located south of the C&D Canal.
5. For the analyses at signalized intersections, JMT utilized the green times consistent with DelDOT's timing sheet and checked on "field measured phase timing" in HCS whereas the TIS did not.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Ross Business Park
Report Dated: August 2020
Prepared By: The Traffic Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Site Entrance A/Herring Run Road (Sussex Road 534) ²				
2024 with Development of Phase I (Case 3)				
Westbound Herring Run Road Left Turn	A (7.9)	A (7.9)	A (8.0)	A (7.9)
Northbound Site Entrance A Approach	B (11.0)	B (12.0)	B (11.4)	B (12.1)
2030 with Development of Phases I & II (Case 4)				
Westbound Herring Run Road Left Turn	A (8.0)	A (7.9)	A (8.0)	A (7.9)
Northbound Site Entrance A Approach	B (10.9)	B (12.0)	B (11.0)	B (12.2)

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

² Per the auxiliary lane spreadsheet, both JMT and the TIS configured the intersection with separate left and right turn lanes along Herring Run Road.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Ross Business Park
Report Dated: August 2020
Prepared By: The Traffic Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Herring Run Road (Sussex Road 534)/Ross Station Road (Sussex Road 543)				
2019 Existing (Case 1)				
Westbound Herring Run Road Approach	B (11.9)	B (11.3)	B (12.0)	B (11.3)
Southbound Ross Station Road Left Turn	A (7.7)	A (7.8)	A (7.7)	A (7.8)
2024 without Development (Case 2)				
Westbound Herring Run Road Approach	B (12.9)	B (12.5)	B (13.0)	B (12.6)
Southbound Ross Station Road Left Turn	A (7.8)	A (8.0)	A (7.8)	A (8.0)
2024 with Development of Phase I (Case 3)				
Westbound Herring Run Road Approach	B (13.9)	B (14.0)	B (13.9)	B (14.0)
Southbound Ross Station Road Left Turn	A (7.9)	A (8.0)	A (7.9)	A (8.0)
2030 with Development of Phases I & II (Case 4)				
Westbound Herring Run Road Approach	B (14.1)	B (13.8)	B (14.1)	B (13.9)
Southbound Ross Station Road Left Turn	A (8.0)	A (8.0)	A (8.0)	A (8.0)

Table 4
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Ross Business Park
Report Dated: August 2020
Prepared By: The Traffic Group, Inc.

Signalized Intersection ¹	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Herring Run Road (Sussex Road 534)/Bridgeville Highway (Sussex Road 13) ³				
2019 Existing (Case 1)	-	-	C (26.0)	C (29.1)
2019 Existing (Case 1) <i>with signal optimization</i> ⁴	B (14.7)	B (17.2)	B (15.7)	B (17.7)
2024 without Development (Case 2)	-	-	C (29.6)	D (35.3)
2024 without Development (Case 2) <i>with signal optimization</i> ⁴	B (18.0)	C (22.0)	B (18.3)	C (23.1)
2024 with Development of Phase I (Case 3)	-	-	C (30.0)	D (37.9)
2024 with Development of Phase I (Case 3) <i>with signal optimization</i> ⁴	B (18.3)	C (23.1)	B (18.5)	C (23.3)
2030 with Development of Phases I & II (Case 4)	-	-	C (30.5)	D (40.5)
2030 with Development of Phases I & II (Case 4) <i>with signal optimization</i> ⁴	B (18.6)	C (24.5)	B (19.4)	C (23.7)

³ For the AM peak hour models, the TIS utilized a HV% of 6% and 4% along the northbound through/left turn and right turn movements, respectively, whereas JMT utilized HV% of 4% and 6%, respectively, consistent with the existing count data.

⁴ This scenario includes optimizing the green splits while maintaining the existing cycle length.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Ross Business Park
Report Dated: August 2020
Prepared By: The Traffic Group, Inc.

Signalized Intersection	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Herring Run Road (Sussex Road 534)/Lowe's Entrance/Seaford Village Shopping Center Entrance				
2019 Existing (Case 1)	-	-	D (42.3)	D (49.9)
2019 Existing (Case 1) <i>with signal optimization</i> ⁴	B (12.6)	C (21.1)	B (16.1)	C (25.7)
2024 without Development (Case 2)	-	-	D (46.7)	E (65.1)
2024 without Development (Case 2) <i>with signal optimization</i> ⁴	B (13.7)	C (23.7)	B (17.2)	C (27.1)
2024 with Development of Phase I (Case 3)	-	-	D (47.6)	E (71.3)
2024 with Development of Phase I (Case 3) <i>with signal optimization</i> ⁴	B (13.7)	C (24.4)	B (17.7)	C (28.6)
2030 with Development of Phases I & II (Case 4)	-	-	D (47.7)	E (79.5)
2030 with Development of Phases I & II (Case 4) <i>with signal optimization</i> ⁴	B (13.8)	C (25.3)	B (18.1)	C (30.0)

Table 6
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Ross Business Park
Report Dated: August 2020
Prepared By: The Traffic Group, Inc.

Signalized Intersection	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US Route 13/Herring Run Road (Sussex Road 534)/Tharp Road (Sussex Road 534)				
2019 Existing (Case 1)	C (32.9)	D (44.2)	D (48.9)	E (55.6)
2019 Existing (Case 1) with signal optimization ⁵	-	-	D (37.7)	D (47.8)
2024 without Development (Case 2)	D (42.7)	E (58.2)	D (53.5)	E (67.7)
2024 without Development (Case 2) with signal optimization ⁵	-	-	D (40.9)	D (49.0)
2024 without Development (Case 2) with Improvement ⁶	-	-	D (46.7)	D (53.4)
2024 with Development of Phase I (Case 3)	-	E (58.9)	D (54.4)	E (68.1)
2024 with Development of Phase I (Case 3) with signal optimization ⁵	D (44.0)	D (52.7)	D (42.0)	D (51.2)
2024 with Development of Phase I (Case 3) with Improvement ⁶	-	-	D (47.9)	D (54.2)
2030 with Development of Phases I & II (Case 4)	-	E (61.0)	E (56.4)	E (71.0)
2030 with Development of Phases I & II (Case 4) with signal optimization ⁵	D (45.6)	D (54.7)	D (42.5)	D (52.9)
2030 with Development of Phases I & II (Case 4) with Improvement ⁶	-	-	D (48.9)	D (54.9)

⁵ This scenario includes utilizing a cycle length of 120 seconds during the AM and PM peak hours and optimizing the green splits. For the Case 1 models, a cycle length of 150 seconds was utilized to match the existing cycle length.

⁶ Improvement scenario includes optimizing the green splits, maintaining the existing 150 seconds cycle lengths during the AM and PM peak hours, and modifying westbound Tharp Road (Sussex Road 534) right turn lane to a shared through/right turn lane.