



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

NICOLE MAJESKI
SECRETARY

April 22, 2022

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

Dear Ms. Tustin,

The enclosed Traffic Impact Study (TIS) Addendum review letter for the **Western Sussex Business Campus (f.k.a Ross Business Park)** (Tax Parcels: 331-5.00-4.00 & 4.11) commercial development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS Addendum to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2124.

Sincerely,

Claudy Joinville
Project Engineer

CJ:svf

Enclosures

cc with enclosures: Ms. Trisha Newcomer, City of Seaford
Mr. Benjamin Hearn, George, Miles & Buhr, LLC
Ms. Cheri Hochstedler, George, Miles & Buhr, LLC
Mr. David Edgell, Coordinator, Office of State Planning Coordination
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

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



Last Revised April 22, 2022

October 27, 2020

Mr. Claudy Joinville
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-Western Sussex Business Campus (f.k.a Ross Business Park) TIS

Dear Mr. Joinville:

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 and the Western Sussex Business Campus f.k.a. Ross Business Park TIS Addendum prepared by The Traffic Group, Inc. dated January 24, 2022. This task was assigned as Task Number 15A. The TIS and the TIS Addendum have been 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 were to be evaluated as an addendum for Phase II when count data could be collected. Traffic counts for the two remaining intersections were collected in November 2021 when schools were in session. The TIS Addendum was then prepared by The Traffic Group to summarize the traffic analysis results at the two remaining intersections.



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

Based on our review of the TIS and TIS Addendum, 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. 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.

- The developer should construct a full access site entrance (Site Entrance A) for the proposed 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.

- The developer should maintain a full access site entrance (Site Entrance B) for the proposed development at the existing T-intersection of Ross Station and Site Entrance B / Market Street Extension, and be consistent with the lane configuration shown in the table below:

| Approach | Current Configuration | Proposed Configuration |
|------------------------------|--|------------------------|
| Northbound Ross Station Road | One through lane and one right turn lane | No Change |
| Southbound Ross Station Road | One bypass lane and one through lane | No Change |
| Westbound Site Entrance B | One left turn lane and one right turn lane | No Change |

Based on DeIDOT’s *Development Coordination Manual*, a left turn lane would be warranted along southbound Ross Station Road. However, due to the existing lane drop located to the north of the intersection, the existing bypass lane should be maintained. In



addition, the existing storage for the right turn lane along northbound Ross Station Road should also be maintained.

4. The developer should maintain a full access site entrance (Site Entrance C) for the proposed development at the existing intersection of Virginia Avenue and Site Entrance C / Market Street Extension, to be consistent with the lane configuration shown in the table below:

| Approach | Current Configuration | Proposed Configuration |
|------------------------------------|--|------------------------|
| Eastbound Virginia Avenue | One shared left turn/through/right turn lane | No Change |
| Westbound Virginia Avenue | One shared left turn/through/right turn lane | No Change |
| Northbound Market Street Extension | One shared left turn/through/right turn lane | No Change |
| Southbound Site Entrance C | One shared left turn/through/right turn lane | No Change |

Based on DelDOT’s *Development Coordination Manual*, a left turn lane would be warranted along westbound Virginia Avenue and a right turn lane would be warranted along both eastbound and westbound Virginia Avenue. However, due to geometric constraints, auxiliary turn lanes should not be installed by the developer.

5. The following bicycle, pedestrian, and transit improvements should be included:
 - a. DelDOT 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. ADA compliant curb ramps and marked crosswalks should be provided along the Site Entrance B approach to Ross Station Road. The use of diagonal curb ramps is discouraged.



- f. ADA compliant curb ramps and marked crosswalks should be provided at the intersection of Site Entrance C and Virginia Avenue, due to the proximity of Seaford Senior High School. The design of the ADA facilities should be determined during the Entrance Plan review process. The use of diagonal curb ramps is discouraged. An NCHRP 572 pedestrian crossing analysis should be conducted to determine the recommended pedestrian crossing treatments.
- g. 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.
- h. 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.
- i. 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.
- j. A Type 2 bus stop should be installed at the Site Entrance A intersection with Herring Run Road. A pedestrian pathway should be constructed to connect the bus stop to the internal pedestrian sidewalk. The developer should coordinate with DART and DelDOT on the location, design, and 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
Enclosure

General Information

Report date: August 13, 2020, TIS Report; January 24, 2022 TIS Addendum

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. A TIS was submitted on August 13, 2020 which evaluated conditions at 5 of the 7 study intersections. A TIS Addendum was submitted on January 24, 2022 which evaluates the operating conditions at the two remaining study locations.

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.

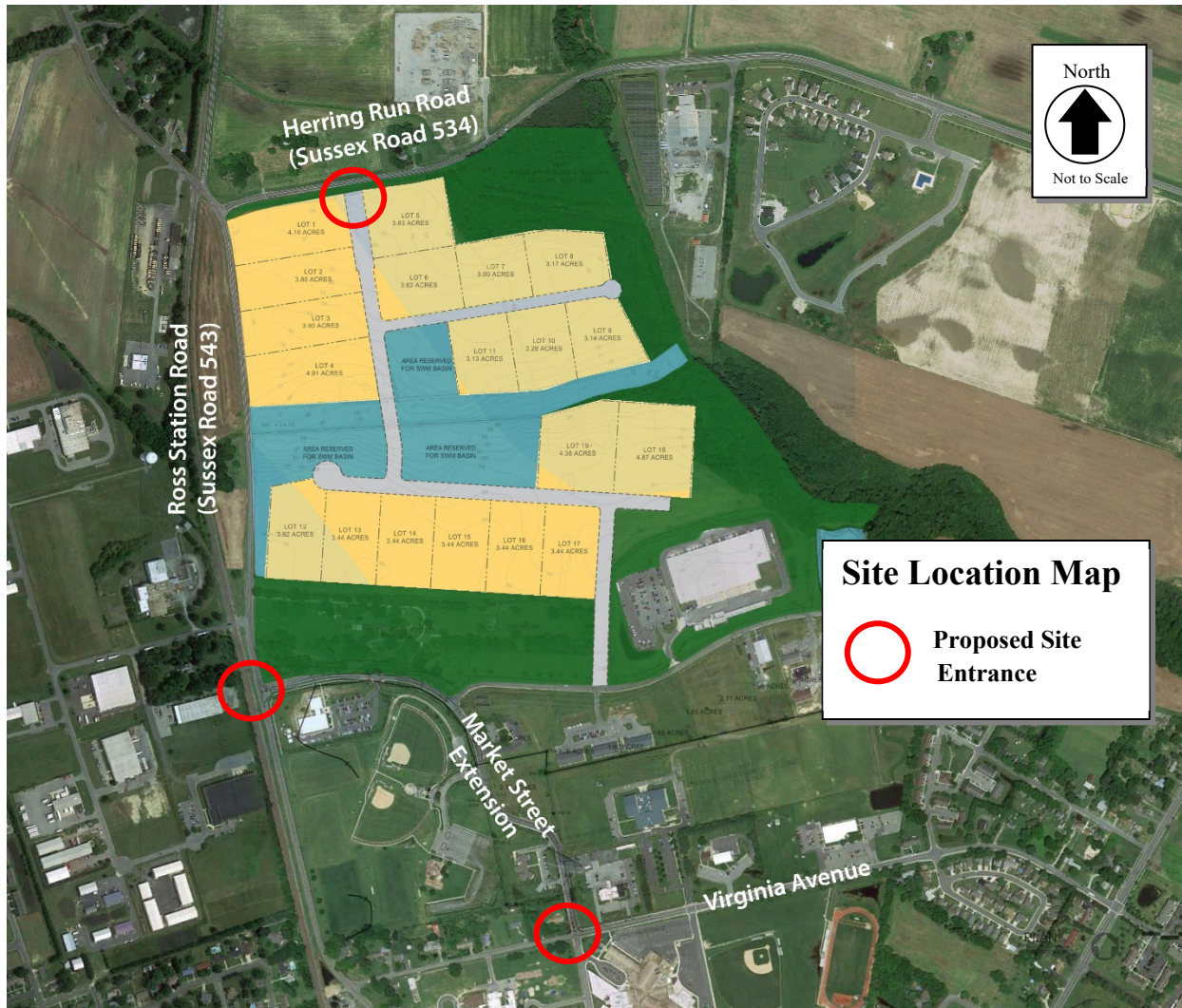
Proposed completion date: Phase I by 2024 and Phase II by 2030.

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 are evaluated in the TIS 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.*

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
Western Sussex Business Campus (f.k.a. 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. Herring Run Road / Ross Station Road
3. Herring Run Road / Bridgeville Highway (Sussex Road 13)
4. Herring Run Road / Lowe’s Entrance / Seaford Village Shopping Center Entrance
5. US Route 13 / Herring Run Road / Tharp Road (Sussex Road 534)
6. Site Entrance B / Ross Station Road (Sussex Road 543)
7. Site Entrance C / Virginia Avenue (Sussex Road 639)

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

6. Site Entrance B / Ross Station Road (Sussex Road 543)

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

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

Southbound Approach: (Ross Station Road) Existing one through lane and one bypass lane

Westbound Approach: (Site Entrance B) Existing one left turn lane and one right turn lane, stop controlled

7. Site Entrance C / Virginia Avenue (Sussex Road 639)

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

Eastbound Approach: (Virginia Avenue) Existing one shared left turn/through/right turn lane

Westbound Approach: (Virginia Avenue) Existing one shared left turn/through/right turn lane

Northbound Approach: (Market Street Extension) Existing one shared left turn/through/right turn lane, stop controlled

Southbound Approach: (Site Entrance A / Market Street Extension) Existing one shared left turn/through/right turn lane, stop controlled

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: In a February 10, 2022 email correspondence from Mr. Kauffman, the DTC requests a Type 2 5x8 bus stop at the entrance with Herring Run Road.

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) and two of the study intersections along Market Street Extension (Site Entrances B and C).

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 ¹ | 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 ¹ | 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) <i>with signal optimization</i> 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) <i>with signal optimization</i> ⁵ | - | - | D (40.9) | D (49.0) |
| 2024 without Development (Case 2) <i>with Improvement</i> 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) <i>with signal optimization</i> ⁵ | D (44.0) | D (52.7) | D (42.0) | D (51.2) |
| 2024 with Development of Phase I (Case 3) <i>with Improvement</i> 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) <i>with signal optimization</i> ⁵ | D (45.6) | D (54.7) | D (42.5) | D (52.9) |
| 2030 with Development of Phases I & II (Case 4) <i>with Improvement</i> 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.

Table 7
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study Addendum for Western Sussex Business Campus
f.k.a. Ross Business Park
Report Dated: January 24, 2022
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 B/Ross Station Road (Sussex Road 543) | | | | |
| 2019 Existing (Case 1) | | | | |
| Southbound Ross Station Road Left Turn | A (7.9) | A (8.2) | A (7.8) | A (7.6) |
| Westbound Site Entrance B Approach | B (10.0) | A (9.5) | A (9.8) | A (9.4) |
| | | | | |
| 2024 without Development (Case 2) | | | | |
| Southbound Ross Station Road Left Turn | A (7.9) | A (8.2) | A (7.8) | A (7.6) |
| Westbound Site Entrance B Approach | B (10.1) | A (9.5) | A (9.8) | A (9.5) |
| | | | | |
| 2024 with Development of Phase I (Case 3) | | | | |
| Southbound Ross Station Road Left Turn | A (7.9) | A (8.2) | A (7.9) | A (7.7) |
| Westbound Site Entrance B Approach | B (10.1) | A (9.6) | A (9.9) | A (9.6) |
| | | | | |
| 2030 with Development of Phases I & II (Case 4) | | | | |
| Southbound Ross Station Road Left Turn | A (8.0) | A (8.2) | A (7.9) | A (7.7) |
| Westbound Site Entrance B Approach | B (10.3) | A (9.7) | A (10.0) | A (9.6) |

Table 8
Peak Hour Levels Of Service (LOS)
Based Based on Traffic Impact Study Addendum for Western Sussex Business Campus
f.k.a. Ross Business Park
Report Dated: January 24, 2022
Prepared By: The Traffic Group, Inc.

| Unsignalized Intersection Two-Way Stop Control ¹ | LOS per TIS | | LOS per JMT | |
|--|---------------|---------------|---------------|---------------|
| | Weekday AM | Weekday PM | Weekday AM | Weekday PM |
| Site Entrance C/Virginia Avenue (Sussex Road 639) | | | | |
| 2019 Existing (Case 1) | | | | |
| Eastbound Virginia Avenue Left Turn | A (8.3) | A (7.3) | A (7.4) | A (7.3) |
| Westbound Virginia Avenue Left Turn | A (7.6) | A (7.4) | A (7.6) | A (7.5) |
| Northbound Market Street Extension Approach | B (14.1) | B (10.6) | B (13.5) | B (10.4) |
| Southbound Site Entrance C Approach | C (16.4) | B (12.1) | C (15.4) | B (12.1) |
| | | | | |
| 2024 without Development (Case 2) | | | | |
| Eastbound Virginia Avenue Left Turn | A (8.4) | A (7.3) | A (7.4) | A (7.3) |
| Westbound Virginia Avenue Left Turn | A (7.6) | A (7.4) | A (7.6) | A (7.5) |
| Northbound Market Street Extension Approach | B (14.2) | B (10.6) | B (13.6) | B (10.4) |
| Southbound Site Entrance C Approach | C (16.5) | B (12.1) | C (15.5) | B (12.1) |
| | | | | |
| 2024 with Development of Phase I (Case 3) | | | | |
| Eastbound Virginia Avenue Left Turn | A (8.4) | A (7.3) | A (7.4) | A (7.3) |
| Westbound Virginia Avenue Left Turn | A (7.6) | A (7.4) | A (7.6) | A (7.5) |
| Northbound Market Street Extension Approach | B (14.9) | B (10.7) | B (14.2) | B (10.5) |
| Southbound Site Entrance C Approach | B (16.9) | B (12.3) | B (15.7) | B (12.3) |
| | | | | |
| 2030 with Development of Phases I & II (Case 4) | | | | |
| Eastbound Virginia Avenue Left Turn | A (8.4) | A (7.3) | A (7.4) | A (7.3) |
| Westbound Virginia Avenue Left Turn | A (7.6) | A (7.4) | A (7.6) | A (7.5) |
| Northbound Market Street Extension Approach | C (16.4) | B (10.9) | B (15.5) | B (10.7) |
| Southbound Site Entrance C Approach | C (18.4) | B (12.9) | C (16.9) | B (12.9) |