



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

NICOLE MAJESKI  
SECRETARY

November 18, 2022

Ms. Teresa Lord, PE, PTOE  
Pennoni Associates, Inc.  
Christiana Executive Campus  
121 Continental Drive, Suite 207  
Newark, DE 19713

Dear Ms. Lord:

The enclosed Traffic Impact Study (TIS) review letter for the **Four Winds Farm** (Tax Parcel: 235-25.00-39.00) residential 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) 760-2124.

Sincerely,

Claudy Joinville  
Project Engineer

CJ:sf

Enclosures

cc with enclosures: Mr. John Stamato, Ribera Development, LLC  
Mr. Mark Davidson, Pennoni Associates, Inc.  
Mr. Alan Decktor, Pennoni Associates, Inc.  
Mr. Jamie Whitehouse, Sussex County Planning & Zoning  
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  
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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  
Sarah Coakley, Principal Planner, Regional Systems Planning  
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Jennifer Cinelli-Miller, Transportation Planner, Regional Systems Planning Section  
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Kevin Hickman, Acting Sussex Review Coordinator, Development Coordination  
Derek Sapp, Sussex County Subdivision Manager, Development Coordination  
Mark Galipo, Traffic Engineer, Traffic, DOTS  
Annamaria Furfato, Project Engineer, Development Coordination



November 18, 2022

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

RE: Agreement No. 1945F  
Project Number T202069012  
Traffic Impact Study Services  
Task 5-6A –Four Winds Farm TIS

Dear Mr. Joinville:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the Four Winds Farm development, which was prepared by Pennoni Associates, Inc., dated February 2022. This review was assigned as Task Number 5-6A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed 336 single-family detached house development in Sussex County, Delaware. The site is located on the east side of Shingle Point Road (Sussex Road 249), approximately 1/3 of a mile north of Webb Road (Sussex Road 248A). The subject property is on an approximately 169.00-acre parcel that is currently zoned as AR-1 (Agricultural Residential). The developer does not plan to rezone the land. Construction for the development is anticipated to be completed in 2030 and one full access point is proposed on Shingle Point Road.

The subject site falls within the *Coastal Corridors Study Area*. The effort aims to study the east-west travel patterns in Sussex County including, but not limited to, Delaware Route 404, US Route 9 and Delaware Route 16. Initial efforts will identify the east-west routes/corridors in northwestern Sussex County that are currently congested or are at risk for congestion based on anticipated growth in the area. The study will focus on several factors including longer trips from the Chesapeake Bay Bridge to the Delaware beaches and Ocean City, Maryland, regional traffic between Maryland's Eastern Shore and Sussex County, and local east/west traffic within the northwestern part of Sussex County. The study will contain recommendations for short term (completed within 1 to 3 years), medium term (completed within 4 to 8 years), and long term (takes 9 or more years to complete) projects. The study is currently in the data collection and public outreach phase. Preliminary data collection has focused study efforts on the area between US Route 113 and Delaware Route 1, where the proposed development is located. More information can be found at the site below.

<https://deldot.gov/projects/Studies/404/>

The *Park Avenue Relocation* project (DelDOT Contract No. T202004601 and T201904601) aims to improve traffic and safety operations along Park Avenue. Park Avenue, also known as US Route 9 Truck Bypass, is a designated truck route for tractor trailers moving through the Georgetown



area. DelDOT's Capital Transportation Plan for Fiscal Year 2019-2024 recommended that the roads used for the truck bypass be upgraded with appropriate turn lanes, shoulders, and intersection improvements. Geometric and roadside improvements will be made throughout the project limits. The project will be completed in two phases: construction for Phase 1 is underway and expected to end in 2023, and construction of Phase 2 is expected to begin in 2023 and end in 2025. The Phase 2 project will include improvements to the Shingle Point Road intersection with US Route 9 such as providing one left turn lane and one shared through/right turn lane along the eastbound US Route 9 approach, one shared left turn/through lane and one channelized right turn lane along the westbound US Route 9 approach, and one shared left turn/through lane and one right turn lane along the southbound Shingle Point Road approach. More information about this project can be found

at: <https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202004601>  
and <https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201904601>

DelDOT Traffic Studies is currently coordinating with the Town of Milton to address concerns at the intersection of Delaware Route 5/Wharton Street/Mulberry Street. Concerns have been raised about pedestrian safety and traffic control type. Currently DelDOT Traffic Studies is conducting a Measure of Effectiveness effort at the intersection to evaluate a two-way stop control versus an all-way stop control during summer and non-summer timeframes.

The *SR 30 (Gravel Hill Road, S248) and Shingle Point Road (S249) Traffic Engineering Study*, dated June 2018, was prepared by DelDOT and evaluated the existing conditions at the intersection to determine the feasibility of various improvement options. In order to reduce driver confusion and the potential for crashes, implementation of a traffic signal, an all-way stop control, and an intersection re-alignment concept (into two T-intersections) were evaluated for the intersection. The study determined that the traffic signal and all-way stop control warrants were not met at the intersection and recommended the realignment of the intersection into two T-intersections which has been implemented. Delineators and striping improvements have been utilized to install the recommended improvements.

It is noted that the proposed development is located within the boundary of the proposed Milton Transportation Improvement District (TID). A TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projects and future development within the designated district. The Milton TID is under development by DelDOT, the Town of Milton, and Sussex County. If and when DelDOT and the County establish the TID, it may be appropriate for the developer to contribute to the TID. The TID is tentatively scheduled to be fully operational in 2023.



Based on our review of the traffic impact study, 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 intersections in the table below exhibit the results based on the following five cases:

- Case 1 – 2021 Existing
- Case 2 – 2030 without development and without other pending developments
- Case 3 – 2030 without development and with other pending developments
- Case 4 – 2030 with development and without other pending developments
- Case 5 – 2030 with development and with other pending developments

Five committed developments (Hawthorne f.k.a. Paradise Lakes, Azalea Woods f.k.a. Wilson Moore, Heritage Creek 1, Vines at Sand Hill f.k.a. Sand Hill Valley/Sposato Property, and Cypress Grove f.k.a. Clifton Property) were included in all the future 2030 cases. However, Cases 3 and 5 include the committed developments as well as two additional pending developments (Granary at Draper Farm and Prettyman Property).



Intersection	LOS Deficiencies Occur		Case
	AM	PM	
Delaware Route 30/Shingle Point Road		X	Case 3 – 2030 without development and with other pending developments
		X	Case 4 – 2030 with development and without other pending developments
	X	X	Case 5 – 2030 with development and with other pending developments
US Route 9/Shingle Point Road	X		Case 1 – 2021 Existing
	X	X*	Case 2 – 2030 without development and without other pending developments
	X	X*	Case 3 – 2030 without development and with other pending developments
	X	X*	Case 4 – 2030 with development and without other pending developments
	X	X*	Case 5 – 2030 with development and with other pending developments
Delaware Route 5/Shingle Point Road	X		Case 4 – 2030 with development and without other pending developments
	X	X	Case 5 – 2030 with development and with other pending developments
Delaware Route 5/Sand Hill Road (Sussex Road 319)	X	X	Case 3 – 2030 without development and with other pending developments
	X	X	Case 5 – 2030 with development and with other pending developments
Delaware Route 5/Mulberry Street/Wharton Street (Sussex Road 88)		X	Case 1 – 2021 Existing
	X	X	Case 2 – 2030 without development and without other pending developments
	X	X	Case 3 – 2030 without development and with other pending developments
	X	X	Case 4 – 2030 with development and without other pending developments
	X	X	Case 5 – 2030 with development and with other pending developments

\*The Summer Saturday peak hour was analyzed for the US Route 9 and Shingle Point Road intersection. The intersection also exhibits failures during the Summer Saturday peak hour.

The unsignalized Delaware Route 30 intersection with Shingle Point Road exhibits LOS deficiencies during the PM peak hour under future conditions with or without the development (Case 3, 4 and 5) and during the AM peak hour under future conditions with the development



(Case 5). Specifically, the westbound Shingle Point Road approach would operate at LOS F with a delay of 57.3 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 190 feet during the AM peak hour under Case 5 conditions. The eastbound Shingle Point Road approach would operate at LOS F with a delay of 115.5 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 250 feet during the PM peak hour under Case 5 conditions. The LOS and delay results do take into account the improvements at the intersection that were implemented per recommendations from the DelDOT *SR 30 (Gravel Hill Road, S248) and Shingle Point Road (S249) Traffic Engineering Study*. Shingle Point Road intersects Delaware Route 30 at a skewed angle and the intersection was realigned to form two T-intersections approximately 350 feet apart. The realignment does not mitigate the capacity constraints but does reduce driver confusion and the potential for crashes. The installation of a traffic signal or roundabout would mitigate the capacity constraints. Due to the realignment being implemented utilizing striping improvements and delineators (generally considered a temporary improvement) and the existing skewed angle of the intersection, we recommend the developer enter into an agreement regarding the conversion of the intersection to a single lane roundabout.

The unsignalized US Route 9 and Shingle Point Road intersection exhibits LOS deficiencies along the southbound Shingle Point Road approach during the AM peak hour under existing conditions (Case 1), and during the AM and PM peak hours under future conditions with or without the proposed development (Case 2, 3, 4, and 5) with a delay of over 1,000 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 665 feet. Additionally, the intersection exhibits LOS deficiencies along the northbound French Road approach during the AM, PM, and Summer Saturday peak hours under future conditions with or without the proposed development (Case 2, 3, 4, and 5) with a delay of 316.5 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 35 feet.

As part of the *Park Avenue Relocation* project (DelDOT Contract No. T202004601 and T201904601), the intersection would be widened to provide a separate left turn lane along the eastbound US Route 9 approach, a separate right turn lane along the westbound US Route 9 approach, and a separate right turn lane along the southbound Shingle Point Road approach. With these improvements, the intersection delay would reduce to 123.4 seconds per vehicle along the northbound French Road approach, and 324.3 seconds of delay per vehicle along the southbound Shingle Point Road approach under Case 5 conditions.

Although the *Park Avenue Relocation* project (DelDOT Contract No. T202004601 and T201904601) would reduce delay at the intersection, deficiencies would still be exhibited along the northbound French Road and southbound Shingle Point Road approaches under future conditions, with or without the proposed development. These deficiencies could be mitigated by the provision of a traffic signal or a single lane roundabout. However, a traffic signal may not be warranted at the intersection and a roundabout is not recommended due to the unbalanced traffic volumes flows projected at the intersection. A larger study outside the scope of this TIS (including a signal warrant evaluation) should be conducted to determine appropriate improvements for the intersection. As such, we do not recommend the developer implement improvements at this intersection. However, we recommend that the developer be responsible to fund an equitable portion of the *Park Avenue Relocation* project (DelDOT Contract No. T202004601 and T201904601).



The unsignalized Delaware Route 5 and Shingle Point Road intersection exhibits LOS deficiencies along the eastbound Shingle Point Road approach during the AM peak hour under future conditions with the proposed development (Case 4 and 5) and during the PM peak hour under future conditions with the proposed development (Case 5). During the AM peak hour under Case 5 conditions, the eastbound Shingle Point Road approach would operate at LOS F with a delay of 59.9 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 170 feet. The deficiencies at the intersection could be mitigated by the provision of a traffic signal or a single lane roundabout. However, Shingle Point Road/Chestnut Street intersects Delaware Route 5 at a skewed angle which may impact the design of a traffic signal. As such, we recommend the developer enter into an agreement regarding the conversion of the intersection to a single lane roundabout.

The Delaware Route 5 and Sand Hill Road intersection exhibits LOS deficiencies along the eastbound Sand Hill Road approach during the AM and PM peak hours under future conditions with or without the proposed development (Case 3 and 5). During the AM peak hour under Case 5 conditions, the eastbound Sand Hill Road approach would operate at LOS F with a delay of 125.6 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 430 feet. The deficiencies at the intersection could be mitigated by the provision of a traffic signal or a single lane roundabout. Furthermore, the Peak Hour Volume warrant for a traffic signal would be met under Case 5 conditions and there are existing auxiliary lanes along each approach to the intersection. We recommend a traffic signal be installed at the intersection but should not be solely the responsibility of the Four Winds Farm developer as the deficiencies occur with or without the proposed development. As such, we recommend that the developer enter into a traffic signal agreement for the intersection of Delaware Route 5 and Sand Hill Road and coordinate with DelDOT on the implementation and equitable cost sharing of a traffic signal installation.

The Delaware Route 5 and Mulberry Street/Wharton Street intersection exhibits LOS deficiencies along the westbound Wharton Street approach during the PM peak hour under existing conditions (Case 1), and during the AM and PM peak hours under future conditions, with or without the proposed development (Case 2, 3, 4, and 5). Additionally, the intersection exhibits LOS deficiencies along the eastbound Mulberry Street approach during the AM and PM peak hours under future conditions with the proposed development (Case 5). During the AM peak hour under Case 5 conditions, the eastbound Mulberry Street approach would operate at LOS F with a delay of 63.3 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 165 feet. During the PM peak hour under Case 5 conditions, the westbound Wharton Street approach would operate at LOS F with a delay of 835.8 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 720 feet.

Additionally, DelDOT Traffic Studies is currently coordinating with the Town of Milton to address concerns at the intersection of Delaware Route 5/Wharton Street/Mulberry Street about pedestrian safety and traffic control type. Currently DelDOT Traffic Studies is conducting a Measure of Effectiveness effort at the intersection to evaluate a two-way stop control versus an all-way stop control during summer and non-summer timeframes. As such, an additional analysis of the intersection was conducted to evaluate the conversion of the intersection to an all-way stop control. With the implementation of an all-way stop control, the intersection would exhibit LOS deficiencies along the northbound Delaware Route 5 approach under future conditions, with or





without the proposed development (Case 3 and 5), and along the southbound Delaware Route 5 approach under future conditions with the proposed development (Case 5). Specifically, during the AM peak hour under Case 5 conditions, the northbound Delaware Route 5 approach would operate at LOS F with a delay of 74.7 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 430 feet. During the PM peak hour under Case 5 conditions, the southbound Delaware Route 5 approach would operate at LOS F with a delay of 70.3 seconds per vehicle and a calculated 95<sup>th</sup> percentile queue length of approximately 355 feet. The deficiencies at the intersection could be mitigated by the provision of a traffic signal or a single lane roundabout, however, the feasibility of those mitigation measures should be evaluated as part of a larger study, outside the scope of this TIS. A larger study outside the scope of this TIS (including a signal warrant evaluation) should be conducted to determine appropriate improvements for the intersection. As such, we do not recommend the developer implement improvements at this intersection. However, it is recommended that the developer enter into an agreement to provide an equitable contribution to a future intersection improvement that will be determined at a later date by DelDOT.

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.

1. The developer shall improve Shingle Point 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 DelDOT Subdivision Review Coordinator in whose area the development is located.
2. The developer should construct an unsignalized full access for the proposed Four Winds Farm development along Shingle Point Road, approximately 4,000 feet north of the intersection with Delaware Route 30. The intersection should be consistent with the lane configurations shown in the table below.



Approach	Current Configuration	Proposed Configuration
Westbound Site Entrance	Approach does not exist	One shared left turn/right turn lane
Northbound Shingle Point Road	One through lane	One through lane and one right turn lane
Southbound Shingle Point Road	One through lane	One left turn lane and one through lane

Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the northbound Shingle Point Road right turn lane is 290 feet. Based on DelDOT’s *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the southbound Shingle Point Road left turn lane is 185 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

3. The developer should enter into an agreement to build a single lane roundabout at the intersection of Shingle Point Road and DE Route 30. The roundabout design should follow *NCHRP: Report 672 2nd Edition – Roundabouts: An Information Guide*, DelDOT’s *Road Design Manual*, and DelDOT’s *Design Guidance Memorandum Number 1-26* for roundabouts. The roundabout should also be designed to accommodate pedestrians and bicyclists. Additionally, lighting at the roundabout should be evaluated per DelDOT’s lighting guidelines. The developer should coordinate with DelDOT’s Development Coordination Section regarding the agreement during the Entrance Plan review process.

As other developments are proposed in the area and meet DelDOT’s current thresholds to make or participate in off-site improvements, DelDOT would require them to contribute toward the cost of the roundabout or reassign responsibility for the design and construction, such that this developer is only participating in those costs. The agreement should specify these terms and identify when the final design and construction of the roundabout should be completed. Alternatively, the Developer may opt to participate in the Milton TID when it is fully operational tentatively scheduled in 2023. If and when the developer participates in the Milton TID then their TID fees will apply towards this improvement.

4. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvement to convert the existing unsignalized Delaware Route 5 and Shingle Point Road/Chestnut Street intersection to a single lane roundabout. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the improvement. Alternatively, the Developer may opt to participate in the Milton TID when it is fully operational tentatively scheduled in 2023. If and when the developer participates in the Milton TID then their TID fees will apply towards this improvement.



5. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Delaware Route 5 and Sand Hill Road for the installation of a traffic signal. The intersection should be consistent with the lane configurations shown in the table below:

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Eastbound Sand Hill Road	One left turn lane and one right turn lane	No change
Northbound Delaware Route 5	One left turn lane and one through lane	No change
Southbound Delaware Route 5	One through lane and one right turn lane	No change

The calculated queue lengths from the HCS analysis can be accommodated within the existing storage lengths for the northbound Delaware Route 5 left turn lane and the southbound Delaware Route 5 right turn lane, and therefore should be maintained. The traffic signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT’s discretion. At DelDOT’s discretion, the developer may contribute to the Traffic Signal Revolving Fund in lieu of a traffic signal agreement. Alternatively, the Developer may opt to participate in the Milton TID when it is fully operational tentatively scheduled in 2023. If and when the developer participates in the Milton TID then their TID fees will apply towards this improvement.

6. The developer should enter into an agreement with DelDOT to fund an equitable portion of improvements to the intersection of US Route 9 and Shingle Point Road as part of the *Park Avenue Relocation* (DelDOT Contract No. T202004601 and T201904601) project. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of the improvements.
7. The developer should enter into an agreement with DelDOT to design and construct future improvements possibly including a signal, roundabout, or other control measure, that will be determined by DelDOT at a later date, to the intersection of Delaware Route 5 and Wharton Street / Mulberry Street. The developer should coordinate with DelDOT on the improvements regardless of any interim improvement completed by the Town. Alternatively, the Developer may opt to participate in the Milton TID when it is fully operational tentatively scheduled in 2023. If and when the developer participates in the Milton TID then their TID fees will apply towards this improvement.
8. The following bicycle, pedestrian, and transit improvements should be included:
  - a. A minimum of fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Shingle Point Road site frontages. Within the easement, the developer should construct a ten-foot wide shared-use path (SUP) with an angled termination into the shoulder where the shoulder/bike lane is at least five feet wide. The SUP should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the SUP. If feasible, the SUP should



be placed behind utility poles and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.

- b. At least one internal connection of a sidewalk or SUP in the vicinity of the site entrance from the SUP along Shingle Point Road is required.
- c. A sidewalk or SUP should be provided at the northern end of the property from the Shingle Point Road SUP to a proposed internal street sidewalk.
- d. ADA compliant curb ramps and marked crosswalks should be provided along the site entrance.
- e. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Shingle Point Road approaches to the site entrance.
- f. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/SUP or should be flush with the pavement.

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](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](mailto: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.

  
Joanne M. Arellano, P.E., PTOE

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

Enclosure

## **General Information**

**Report date:** February 2022

**Prepared by:** Pennoni Associates, Inc.

**Prepared for:** Ribera Development, LLC

**Tax Parcels:** 235-25.00-39.00

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

## **Project Description and Background**

**Description:** The proposed development consists of 336 single-family detached houses.

**Location:** The land is located on the east side of Shingle Point Road (Sussex Road 249), approximately 1/3 of a mile northeast of Webb Road (Sussex Road 248A) in Sussex County, DE.

**Amount of Land to be developed:** An approximately 169.00-acre assemblage of parcels.

**Land Use approval(s) needed:** Entrance Plan.

**Proposed completion date:** 2030.

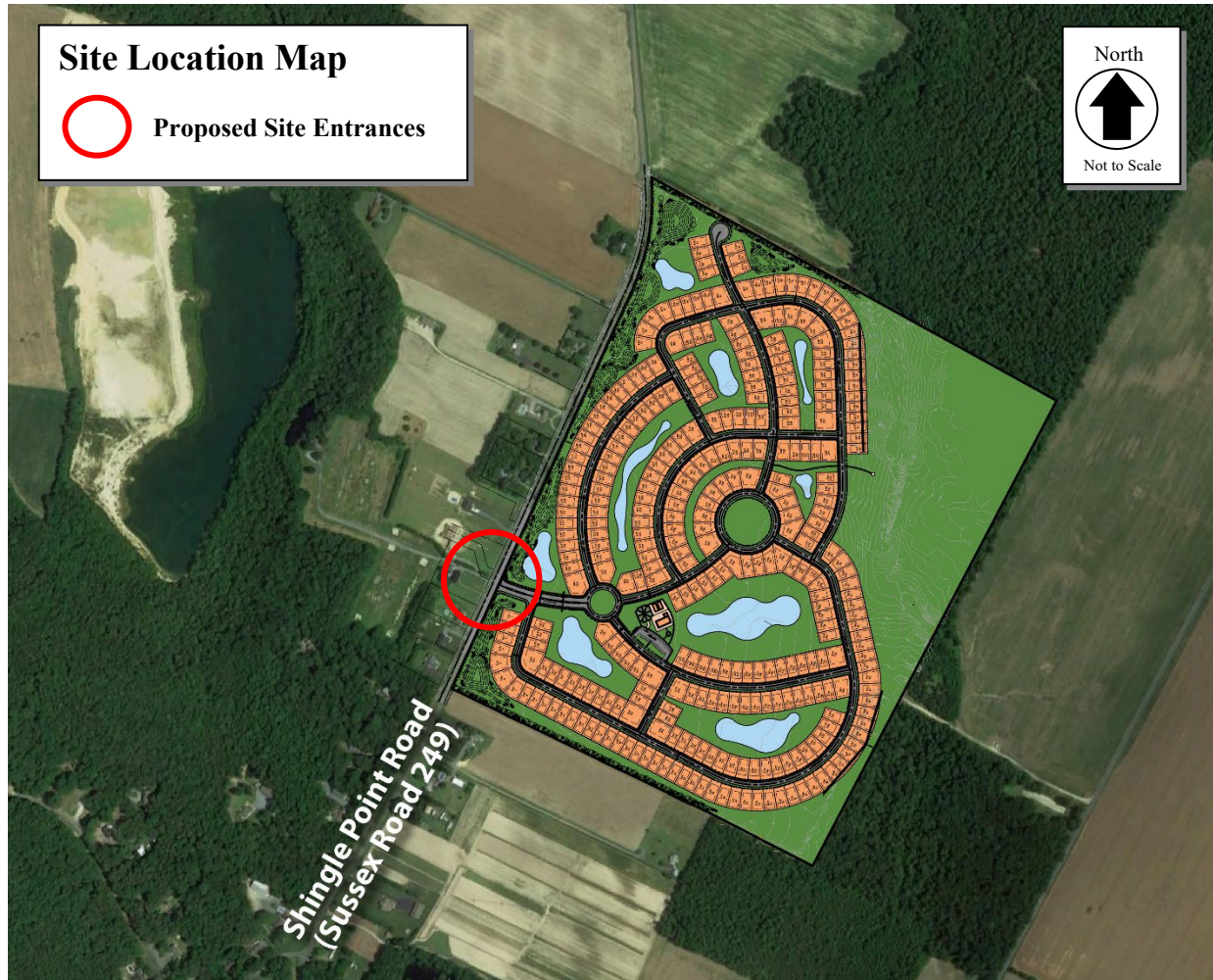
**Proposed access locations:** One full access point on Shingle Point Road.

### **Daily Traffic Volumes:**

- 2021 Average Annual Daily Traffic on Shingle Point Road: 1,439

\*AADT is sourced from ATR data provided by TIS Report. Data taken from seven full days starting 10/01/2021.

## Site Map



*\*Graphic is an approximation based on the Preliminary Plan prepared by Pennoni Associates Inc. dated August 20, 2021.*

## Relevant and On-going Projects

The subject site falls within the *Coastal Corridors Study Area*. The effort aims to study the east-west travel patterns in Sussex County including, but not limited to, Delaware Route 404, US Route 9 and Delaware Route 16. Initial efforts will identify the east-west routes/corridors in northwestern Sussex County that are currently congested or are at risk for congestion based on anticipated growth in the area. The study will focus on several factors including longer trips from the Chesapeake Bay Bridge to the Delaware beaches and Ocean City, Maryland, regional traffic between Maryland's Eastern Shore and Sussex County, and local east/west traffic within the northwestern part of Sussex County. The study will contain recommendations for short term (completed within 1 to 3 years), medium term (completed within 4 to 8 years), and long term (takes 9 or more years to complete). The study is currently in the data collection and public outreach phase. Preliminary data collection has focused study efforts on the area between US Route 113

and Delaware Route 1, where the proposed development is located. More information can be found at the site below.

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at: <https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202004601>

and <https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201904601>.

DelDOT Traffic Studies is currently coordinating with the Town of Milton to address concerns at the intersection of Delaware Route 5/Wharton Street/Mulberry Street. Concerns have been raised about pedestrian safety and traffic control type. Currently DelDOT Traffic Studies is conducting a Measure of Effectiveness effort at the intersection to evaluate a two-way stop control versus an all-way stop control during summer and non-summer timeframes.

The *SR 30 (Gravel Hill Road, S248) and Shingle Point Road (S249) Traffic Engineering Study*, dated June 2018, was prepared by DelDOT and evaluated the existing conditions at the intersection to determine the feasibility of various improvement options. In order to reduce driver confusion and the potential for crashes, implementation of a traffic signal, an all-way stop control, and an intersection re-alignment concept (into two T-intersections) were evaluated for the intersection. The study determined that the traffic signal and all-way stop control warrants were not met at the intersection and recommended the realignment of the intersection into two T-intersections which has been implemented. Delineators and striping improvements have been utilized to install the recommended improvements.

It is noted that the proposed development is located within the boundary of the proposed Milton Transportation Improvement District (TID). A TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projects and future development within the designated district. The Milton TID is under development by DelDOT, the Town of Milton, and Sussex County. The TID is tentatively scheduled to be fully operational in 2023.

## **Livable Delaware**

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

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

The proposed development is located within the Investment Level 4 and Investment Level 3.

#### *Investment Level 3*

Investment Level 3 Areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities where development is not necessary to accommodate expected population growth during a five-year planning period (or longer). In these instances, development in Investment Level 3 may be least appropriate for new growth and development in the near term. The second category includes lands that are adjacent to or intermingled with fast-growing areas within counties or municipalities that are otherwise categorized as Investment Levels 1 or 2. Environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues most often impact these lands. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state agencies and local government with land-use authority. Investment Level 3 is further characterized by areas with new development separated from existing development by a substantial amount of vacant land that is not contiguous with existing infrastructure, areas that are experiencing some development pressure, areas with existing but disconnected development, and possible lack of adequate infrastructure.

The state will consider investing in infrastructure within Investment Level 3 Areas once the Investment Level 1 and 2 Areas are substantially built out, or when the infrastructure or facilities are logical extensions of existing systems and deemed appropriate to serve a particular area. The priorities in the Level 3 Areas are for DelDOT to focus on regional movements between towns and other population centers. DelDOT also supports the development and implementation of Transportation Improvement Districts in Investment Level 3 areas. Local roadway improvements will be made by developers and property owners as development occurs. Lower priority is given to transportation system–capacity improvements and transit-system enhancements.

#### *Investment Level 4*

Delaware's Investment Level 4 Areas are rural in nature and are where the bulk of the state's open space/natural areas and agricultural industry is located. These areas contain agribusiness activities, farm complexes, and small settlements. They typically include historic crossroads or points of trade, often with rich cultural ties. Delaware's Investment Level 4 Areas are also the location of scattered residential uses, featuring almost entirely single-family detached residential structures. Delaware's Investment Level 4 Areas also include many unincorporated communities, typically with their own distinctive character and identity. Investment Level 4 Areas depend on a transportation system primarily of secondary roads linked to roadways used as regional thoroughfares for commuting and trucking.



It is the state's intent to discourage additional urban and suburban development in Investment Level 4 Areas unrelated to agriculture and to the areas' needs. In Investment Level 4 Areas, the state's investments and policies should retain the rural landscape and preserve open spaces and farmlands, support farmland-related industries, and establish defined edges to more concentrated development. The focus for the Level 4 Areas will be to preserve and maintain existing facilities in safe working order, corridor-capacity preservation, and the enhancement of transportation facilities to support agricultural business. The lowest priority is given to transit system enhancements.

**Proposed Development's Compatibility with Livable Delaware:**

The proposed site would be located predominately in Investment Level 4, with a portion of the site to the north being in Investment Level 3. Investment Level 4 areas typically discourage additional suburban development; the aim of Investment Level 4 areas should instead be to preserve the rural landscape. Investment Level 3 can describe areas adjacent to growth with environmentally sensitive areas. Development in these areas can be appropriate if the environmental features are considered and accommodated by the site. Northeast of the subject site is an intermittent stream, and there is no development proposed in the area of the stream. Despite this consideration, most of the subject site is in Investment level 4 and therefore, the proposed development is not consistent with the 2020 update of the Livable Delaware "Strategies for State Policies and Spending."

**Comprehensive Plan**

*(Source: Sussex County 2019 Comprehensive Plan)*

**Sussex County Comprehensive Plan:**

Per the *Sussex County Comprehensive Plan Zoning Map*, the proposed development is currently zoned as AR-1 – Agricultural Residential. Per the *Sussex County Comprehensive Plan Future Land Use Map*, the proposed development is in an area designated as a Low-Density Rural Area.

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

The *Sussex County Comprehensive Plan* states that low density areas zoned as AR-1 can be developed into residential areas such that no more than two single family houses per acre are implemented. The developer is planning to implement 336 single family homes on approximately 169.00 acres of land, which is 2 houses per acre. Therefore, the development is generally consistent with the *Sussex County 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, 10<sup>th</sup> Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 210 (Single-Family Detached Housing). Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

**Table 1**  
Four Wind Farms Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour			Saturday Peak Hours		
		In	Out	Total	In	Out	Total	In	Out	Total
336 single-family detached houses (ITE Code 210)	3,171	60	183	243	205	120	325	162	138	300

**Overview of TIS**

**Intersections examined:**

1. Site Entrance/Shingle Point Road (Sussex Road 249)
2. Delaware Route 30/Shingle Point Road
3. Shingle Point Road/Briarwood Road (Sussex Road 253)
4. US Route 9/Shingle Point Road
5. Delaware Route 30/Prettyman Road (Sussex Road 254)
6. Pettyjohn Road/Prettyman Road
7. Delaware Route 5/Shingle Point Road
8. Delaware Route 5/Sandy Hill Road (Sussex Road 319)
9. Delaware Route 5/Mulberry Street/Wharton Street (Sussex Road 88)

**Conditions examined:**

1. Case 1 – 2021 Existing.
2. Case 2 – 2030 without development and without other pending developments.
3. Case 3 – 2030 without development and with other pending developments.
4. Case 4 – 2030 with development and without other pending developments.
5. Case 5 – 2030 with development and with other pending developments.

**Committed Developments considered:**

1. Hawthorne f.k.a. Paradise Lakes and Landlock Acres (254 single-family detached houses with 48 units unbuilt)
2. Azalea Woods f.k.a. Wilson Moore (610 single-family detached houses)
3. Heritage Creek 1 (58 age-restricted detached houses)
4. Vines of Sand Hill f.k.a. The Estates of Sand Hill Valley, Whispering Meadows, Sposato Property (393 single-family detached houses with 301 units unbuilt)
5. Cypress Grove f.k.a. Clifton Property (71 units of low-rise multi-family housing, 168 units of mid-rise multi-family housing, and 20,000 square feet of retail space)
6. Granary at Draper Farm (875 single-family detached houses, 475 units of multi-family mid-rise houses, and 60,000 square feet of retail space)
7. Prettyman Property (100 single-family detached houses)

\*Note: Committed development information provided in the TIS supersedes the information provided in the September 24, 2021, DelDOT Scoping Meeting Memorandum.

\*Note: Granary at Draper Farm and Prettyman Property were requested by DelDOT to be included in an additional future case to be evaluated.

**Peak hours evaluated:** Weekday morning, weekday evening, and Saturday midday peak periods.

\*Note: Saturday midday peak period traffic count was for the intersection of US Route 9 and Shingle Point Road.

## **Intersection Descriptions**

### **1. Site Entrance/Shingle Point Road (Sussex Road 249)**

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

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

**Northbound Approach:** (Shingle Point Road) Existing one through lane; Proposed one through and one right turn lane.

**Southbound Approach:** (Shingle Point Road) Existing one through lane; Proposed one left turn and one through lane.

### **2A. Delaware Route 30/Shingle Point Road**

**Type of Control:** Two-way stop-controlled intersection (T-intersection).

**Eastbound Approach:** (Shingle Point Road) Existing one shared left turn/right turn lane, stop controlled.

**Northbound Approach:** (Delaware Route 30) Existing one shared left turn/through lane.

**Southbound Approach:** (Delaware Route 30) Existing one shared through/right turn lane.

### **2B. Delaware Route 30/Shingle Point Road**

**Type of Control:** Two-way stop-controlled intersection (T-intersection).

**Westbound Approach:** (Shingle Point Road) Existing one shared left turn/right turn lane, stop controlled.

**Northbound Approach:** (Delaware Route 30) Existing one shared through/right turn lane.

**Southbound Approach:** (Delaware Route 30) Existing one shared left turn/through lane.

\*Note: Delaware Route 30 and Shingle Point Road has modified geometry per the *SR 30 (Gravel Hill Road, S248) and Shingle Point Road (S249) Study*, June 2018. The

intersection was reconfigured to operate as two three-legged T-intersections (as opposed to one four-legged intersection) as its existing configuration.

**3. Shingle Point Road/Briarwood Road (Sussex Road 253)**

**Type of Control:** Two-way stop-controlled intersection (T-intersection).

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

**Northbound Approach:** (Shingle Point Road) Existing one shared left turn/through lane.

**Southbound Approach:** (Shingle Point Road) Existing shared one through/right turn lane.

**4. US Route 9/Shingle Point Road/French Road**

**Type of Control:** Two-way stop-controlled intersection (four-legged intersection)

**Eastbound Approach:** (US Route 9) Existing one shared left turn/through lane; proposed one left turn lane and one shared through/right turn lane.

**Westbound Approach:** (US Route 9) Existing one shared left turn/through/right turn lane; proposed one shared left turn/through lane and one right turn lane.

**Northbound Approach:** (French Road) Existing one shared left turn/through/right turn lane, stop controlled.

**Southbound Approach:** (Shingle Point Road) Existing one shared left turn/right turn lane, stop controlled; proposed one shared left turn/through lane and one right turn lane.

\*Note: Shingle Point Road and French Road intersect US Route 9 at offset locations. This intersection will be improved to the proposed lane configurations as part of the DelDOT *Park Avenue Relocation, Phase 2* project (Contract No. T201904601)

**5. Delaware Route 30/Prettyman Road (Sussex Road 254)**

**Type of Control:** Two-way stop-controlled intersection (T-intersection).

**Westbound Approach:** (Prettyman Road) Existing one shared left turn/right turn lane, stop-controlled.

**Northbound Approach:** (Delaware Route 30) Existing one shared through/right turn lane.

**Southbound Approach:** (Delaware Route 30) Existing one shared left turn/through lane.

**6. Pettyjohn Road/Prettyman Road**

**Type of Control:** Two-way stop-controlled intersection.

**Eastbound Approach:** (Pettyjohn Road) Existing one shared left turn/through/right turn lane, stop-controlled.

**Westbound Approach:** (Pettyjohn Road) Existing one shared left turn/through/right turn lane, stop-controlled.

**Northbound Approach:** (Prettyman Road) Existing one shared left turn/through/right turn lane.

**Southbound Approach:** (Prettyman Road) Existing one shared left turn/through/right turn lane.

#### 7. Delaware Route 5/Shingle Point Road

**Type of Control:** Two-way stop-controlled intersection.

**Eastbound Approach:** (Shingle Point Road) Existing one shared left turn/through/right turn lane, stop-controlled.

**Westbound Approach:** (Chestnut Street) Existing one shared left turn/through/right turn lane, stop-controlled.

**Northbound Approach:** (Delaware Route 5) Existing one shared left turn/through lane and one right turn lane.

**Southbound Approach:** (Delaware Route 5) Existing one shared left turn/through lane and one right turn lane.

#### 8. Delaware Route 5/Sand Hill Road (Sussex Road 319)

**Type of Control:** Two-way stop-controlled intersection (T-intersection).

**Eastbound Approach:** (Sand Hill Road) Existing one left turn lane and one channelized right turn lane, stop-controlled.

**Northbound Approach:** (Delaware Route 5) Existing one left turn lane and one through lane.

**Southbound Approach:** (Delaware Route 5) Existing one through lane and one channelized right turn lane.

#### 9. Delaware Route 5/Mulberry Street/Wharton Street (Sussex Road 88)

**Type of Control:** Two-way stop-controlled intersection.

**Eastbound Approach:** (Mulberry Street) Existing one shared left turn/through/right turn lane, stop-controlled.

**Westbound Approach:** (Wharton Street) Existing one shared left turn/through/right turn lane, stop-controlled.

**Northbound Approach:** (Delaware Route 5) Existing one shared left turn/through/right turn lane.

**Southbound Approach:** (Delaware Route 5) Existing one shared left turn/through/right turn lane.

## **Transit, Pedestrian, and Bicycle Facilities**

**Existing transit service:** Per DelDOT Gateway, there are two DART Routes that run through the project area, 206 and 303. DART Route 206 traverse the study area along US Route 9. Route 206 provides 11 round trips from 5:30 AM to 12:11 AM on weekdays, and eight round trips from 6:05 AM to 10:26 PM on weekends. DART Route 303 provides service along US Route 9 up to Delaware Route 5, where the route traverses Delaware Route 5 from US Route 9 to north beyond the study area. Route 303 provides eight round trips from 4:46 AM to 8:57 PM on weekdays.

East of the intersection of US Route 9/Shingle Point Road are two bus stops, on the north and south sides of US Route 9, that service DART Routes 206 and 303. On the northeast corner of the intersection of Delaware Route 5/Mulberry Street/Wharton Street is one bus stop which services DART Route 303.

**Planned transit service:** Per email correspondence on February 24, 2022, with Mr. Jared Kauffman, Planner for DART, the Delaware Transit Corporation does not have any transit specific comments for the project.

**Existing bicycle and pedestrian facilities:** According to DelDOT's Sussex County On-Road Bicycle Map, several study roadways are considered bicycle routes. US Route 9, Delaware Route 5, and Delaware Route 30 are considered regional bicycle routes. Prettyman Road and Sandhill Road are connector bicycle routes.

**Planned bicycle and pedestrian facilities:** Per email correspondence dated March 22, 2022, from Mr. John Fiori, DelDOT's Bicycle Coordinator, Ms. Linda Osiecki, DelDOT's Pedestrian Coordinator, and Maria Andaya, DelDOT's School Coordinator, the following improvements were recommended:

- Per the DelDOT SUP/Sidewalk Policy a non-motorized facility is not required unless an existing facility abuts to the property or the site generates over 2,000-trips per day. Although it appears there are no existing facilities, the site does appear to generate over 2,000-trips. Local Systems will be recommending to install a 10' wide shared-use path along the property frontage with an angled termination into shoulder where shoulder/bike lane is at least 5' wide.
- An internal connection from the SUP at the entrance should be implemented.
- An additional pedestrian access on the northern end of the property from the frontage SUP to a proposed internal street sidewalk should be implemented.
- Local Systems Improvements has no bicycle/pedestrian improvement projects within the area of this project.
- If sufficient right-of-way exists, it is recommended that the SUP along the eastern side of Shingle Point Road be extended to Delaware Route 5 and that the SUP is further extended to the intersection of Delaware Route 5/Sand Hill Road.
- If the SUP is extended and sufficient right-of-way exists, construct sidewalk from the intersection of Delaware Route 5/Sand Hill Road north to the existing sidewalk at the Milton Multi-Use Trail.

- If the SUP is extended, provide pedestrian crossings at Delaware Route 5/Shingle Point Road and Delaware Route 5/Sand Hill Road.
- If the SUP is extended, improve existing DART bus stop locations along Delaware Route 5.
- Per the *Development Coordination Manual* (DCM) the site shall dedicate right-of-way per the roadway classification and establish a 15' wide permanent easement along all property roadway 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 separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).

**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 a map developed by the University of Delaware.

- Shingle Point Road LTS: 4

### **Crash Evaluation**

Per the crash data included in the TIS from January 1, 2017, to September 28, 2021, and provided by the Delaware Department of Transportation (DelDOT), 69 crashes were reported within the study area, 14 included injuries, 54 included property damage, and one reported crash involved a fatality. A total of 22 crashes were reported along Delaware Route 30, six along Delaware Route 9, two along Pettyjohn Road, 18 along Delaware Route 5, 19 along Shingle Point Road, and two along Prettyman Road.

Of the 22 crashes reported on Delaware Route 30, two were rear-end, three were head-on, nine were angle, four involved hitting a fixed object, three were a non-collision/other classification, and one was with an animal. Of the six crashes reported on Delaware Route 9, one was a rear end collision, one was an angle collision, one was a sideswipe, two involved hitting a fixed object, and one involved an animal. Both crashes reported on Pettyjohn Road were angle collisions. Of the 18 crashes reported on Delaware Route 5, one was head on, nine were angle collisions, four involved a fixed object, two were non-collisions/other, one involved a bike/pedestrian, and one involved an animal. Of the 19 reported crashes on Shingle Point Road, one was a rear end collision, one was an angle collision, two involved a fixed object, three are considered non-collisions/other, and 12

involved animals. Both crashes reported along Prettyman Road were rear end crashes. One fatality occurred at the intersection of Delaware Route 30 and Shingle Point Road, when a vehicle heading eastbound failed to remain stopped at the stop sign. The intersection has been reconfigured since then to create a more defined offset intersection.

**Previous Comments**

All comments from the PTIS have been addressed in the Final TIS.

**Sight Distance Evaluation**

No sight distance constraints were noted at the site entrances per a field visit conducted on March 5, 2022.



**General HCS Analysis Comments**

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

- 1) Both the TIS and JMT used version 7.9.6 of HCS7 to complete the analysis.
- 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, Case 3, Case 4, and Case 5 future scenario analysis, 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 did not.
- 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 in the analyses, whereas the TIS did not.
- 4) Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for the Existing 2021 scenario and a future PHF for Cases 2, 3, 4, and 5 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 existing PHF for all cases.
- 5) Two different build scenarios were analyzed:
  - Case 4 – Includes trips from committed developments, but not other pending developments
  - Case 5 – Includes trips from both committed developments and other pending developments

Table 2  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Site Entrance / Shingle Point Road (Sussex Road 249)</b>				
2030 with development and without other pending developments (Case 4)				
Westbound Site Entrance Approach	B (12.6)	B (10.7)	B (12.6)	B (10.7)
Southbound Shingle Point Road Left Turn	A (7.7)	A (7.8)	A (7.7)	A (7.8)
2030 with development and with other pending developments (Case 5)				
Westbound Site Entrance Approach	B (13.6)	B (11.5)	B (12.7)	B (11.5)
Southbound Shingle Point Road Left Turn	A (7.8)	A (8.0)	A (7.7)	A (8.0)

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

Table 3  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 30 / Shingle Point Road</b>				
2021 Existing (Case 1)				
(N) Westbound Shingle Point Road Approach	C (15.0)	B (14.3)	C (15.1)	B (14.3)
(N) Southbound Delaware Route 30 Left Turn	A (7.8)	A (7.9)	A (7.8)	A (7.9)
(S) Eastbound Shingle Point Road Approach	C (15.3)	C (15.4)	C (15.3)	C (15.6)
(S) Northbound Delaware Route 30 Left Turn	A (8.2)	A (7.9)	A (8.2)	A (7.9)
(E) Eastbound Shingle Point Road Left Turn	A (8.9)	A (8.8)	A (9.0)	A (8.9)
(W) Westbound Shingle Point Road Left Turn	A (9.2)	A (8.9)	A (9.1)	A (9.0)
2030 without development and without other pending developments (Case 2)				
(N) Westbound Shingle Point Road Approach	C (20.8)	C (21.5)	C (19.8)	C (21.5)
(N) Southbound Delaware Route 30 Left Turn	A (8.0)	A (8.2)	A (8.1)	A (8.3)
(S) Eastbound Shingle Point Road Approach	D (25.5)	C (24.3)	C (23.5)	C (24.6)
(S) Northbound Delaware Route 30 Left Turn	A (8.5)	A (8.1)	A (8.5)	A (8.2)
(E) Eastbound Shingle Point Road Left Turn	A (9.2)	A (9.0)	A (9.2)	A (9.0)
(W) Westbound Shingle Point Road Left Turn	A (9.4)	A (9.3)	A (9.2)	A (9.4)

Table 3 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 30 / Shingle Point Road</b>				
2030 without development and with other pending developments (Case 3)				
(N) Westbound Shingle Point Road Approach	D (30.7)	D (30.4)	D (25.1)	D (27.7)
(N) Southbound Delaware Route 30 Left Turn	A (8.1)	A (8.4)	A (8.1)	A (8.4)
(S) Eastbound Shingle Point Road Approach	E (37.2)	E (41.3)	D (28.6)	E (36.7)
(S) Northbound Delaware Route 30 Left Turn	A (8.8)	A (8.3)	A (8.5)	A (8.3)
(E) Eastbound Shingle Point Road Left Turn	A (9.3)	A (9.2)	A (9.3)	A (9.3)
(W) Westbound Shingle Point Road Left Turn	A (9.6)	A (9.4)	A (9.4)	A (9.4)
2030 with development and without other pending developments (Case 4)				
(N) Westbound Shingle Point Road Approach	E (41.5)	D (32.1)	D (30.6)	D (28.9)
(N) Southbound Delaware Route 30 Left Turn	A (8.0)	A (8.2)	A (8.0)	A (8.2)
(S) Eastbound Shingle Point Road Approach	D (33.7)	F (55.5)	C (24.8)	E (47.5)
(S) Northbound Delaware Route 30 Left Turn	A (8.6)	A (8.3)	A (8.3)	A (8.3)
(E) Eastbound Shingle Point Road Left Turn	A (9.4)	A (9.9)	A (9.4)	A (9.9)
(W) Westbound Shingle Point Road Left Turn	A (9.8)	A (9.5)	A (9.6)	A (9.6)

Table 3 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

<b>Unsignalized Intersection Two-Way Stop Control<sup>1</sup></b>	<b>LOS per TIS</b>		<b>LOS per JMT</b>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 30 / Shingle Point Road</b>				
2030 with development and with other pending developments (Case 5)				
(N) Westbound Shingle Point Road Approach	F (107.2)	F (58.8)	F (57.3)	E (48.7)
(N) Southbound Delaware Route 30 Left Turn	A (8.2)	A (8.4)	A (8.1)	A (8.4)
(S) Eastbound Shingle Point Road Approach	F (62.3)	F (143.7)	E (41.1)	F (115.5)
(S) Northbound Delaware Route 30 Left Turn	A (9.0)	A (8.4)	A (8.7)	A (8.5)
(E) Eastbound Shingle Point Road Left Turn	A (9.5)	B (10.2)	A (9.5)	A (9.8)
(W) Westbound Shingle Point Road Left Turn	B (10.0)	A (9.7)	A (9.8)	A (9.7)

Table 3 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 30 / Shingle Point Road</b> <sup>2</sup>				
2030 without development and with other pending developments (Case 3)	--	--	B (10.2)	B (10.1)
2030 with development and without other pending developments (Case 4)	--	--	B (12.5)	B (11.7)
2030 with development and with other pending developments (Case 5)				
(Northern Leg) Overall LOS	C (20.5)	B (15.7)	B (15.0)	B (13.6)
(Southern Leg) Overall LOS	B (16.5)	B (19.5)		

<sup>2</sup> The TIS analyzed the intersection as a clustered location with two intersections, with a cycle length of 100 seconds. JMT analyzed this location as one signal with a two-phase operation and a cycle length of 60 seconds.

Table 3 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 30 / Shingle Point Road <sup>3</sup></b>				
2030 without development and with other pending developments (Case 3)				
Eastbound Shingle Point Road Approach	--	--	A (7.1)	A (6.5)
Westbound Shingle Point Road Approach	--	--	A (6.2)	A (6.8)
Northbound Delaware Route 30 Approach	--	--	A (7.4)	A (8.4)
Southbound Delaware Route 30 Approach	--	--	A (8.8)	A (7.4)
Overall LOS	--	--	A (7.8)	A (7.6)
2030 with development and without other pending developments (Case 4)				
Eastbound Shingle Point Road Approach	--	--	A (7.1)	A (6.8)
Westbound Shingle Point Road Approach	--	--	A (7.1)	A (7.1)
Northbound Delaware Route 30 Approach	--	--	A (7.2)	A (8.8)
Southbound Delaware Route 30 Approach	--	--	A (9.2)	A (7.5)
Overall LOS	--	--	A (7.8)	A (7.8)
2030 with development and with other pending developments (Case 5)				
Eastbound Shingle Point Road Approach	--	--	A (8.1)	A (7.9)
Westbound Shingle Point Road Approach	--	--	A (8.1)	A (8.3)
Northbound Delaware Route 30 Approach	--	--	A (8.0)	B (10.9)
Southbound Delaware Route 30 Approach	--	--	B (11.2)	A (8.5)
Overall LOS	--	--	A (9.1)	A (9.3)

<sup>3</sup> JMT conducted an additional analysis of the intersection as a single lane roundabout.

Table 4  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Shingle Point Road / Briarwood Road (Sussex Road 253)</b>				
2021 Existing (Case 1)				
Eastbound Briarwood Road Approach	A (9.5)	A (9.2)	A (9.5)	A (9.3)
Northbound Shingle Point Road Left Turn	A (7.6)	A (7.4)	A (7.5)	A (7.4)
2030 without development and without other pending developments (Case 2)				
Eastbound Briarwood Road Approach	B (10.1)	A (9.7)	B (10.2)	A (9.8)
Northbound Shingle Point Road Left Turn	A (7.8)	A (7.5)	A (7.7)	A (7.6)
2030 without development and with other pending developments (Case 3)				
Eastbound Briarwood Road Approach	B (10.4)	A (9.9)	B (10.5)	A (10.0)
Northbound Shingle Point Road Left Turn	A (7.9)	A (7.6)	A (7.7)	A (7.6)
2030 with development and without other pending developments (Case 4)				
Eastbound Briarwood Road Approach	B (10.9)	B (10.7)	B (11.0)	B (10.7)
Northbound Shingle Point Road Left Turn	A (8.0)	A (7.6)	A (7.8)	A (7.7)
2030 with development and with other pending developments (Case 5)				
Eastbound Briarwood Road Approach	B (11.2)	B (10.9)	B (11.3)	B (11.0)
Northbound Shingle Point Road Left Turn	A (8.1)	A (7.7)	A (7.9)	A (7.7)



Table 5  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2021 Existing (Case 1)						
Northbound French Road Approach	C (21.9)	D (25.3)	C (17.9)	C (22.2)	D (25.8)	C (18.2)
Southbound Shingle Point Road Approach	D (34.7)	D (32.5)	B (12.9)	E (35.7)	D (32.5)	B (13.0)
Eastbound US Route 9 Left Turn	A (9.6)	A (9.7)	A (8.2)	A (9.6)	A (9.8)	A (8.3)
Westbound US Route 9 Left Turn	A (8.9)	A (8.9)	A (8.2)	A (9.0)	A (9.0)	A (8.3)
2030 without development and without other pending developments (Case 2)						
Northbound French Road Approach	E (45.9)	F (89.9)	D (34.9)	E (44.4)	F (93.6)	E (36.0)
Southbound Shingle Point Road Approach	F (213.3)	F (372.5)	D (26.1)	F (714.7)	F (*)	E (39.6)
Eastbound US Route 9 Left Turn	B (10.8)	B (11.8)	A (8.9)	B (10.7)	B (12.1)	A (9.0)
Westbound US Route 9 Left Turn	A (9.3)	A (9.5)	A (8.5)	A (9.4)	A (9.6)	A (8.6)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 without development and without other pending developments (Case 2) <i>with Improvements</i> <sup>4</sup>						
Northbound French Road Approach	--	--	--	E (39.8)	F (65.6)	D (34.9)
Southbound Shingle Point Road Approach	--	--	--	F (165.6)	F (241.3)	D (25.1)
Eastbound US Route 9 Left Turn	--	--	--	B (10.7)	B (12.1)	A (9.0)
Westbound US Route 9 Left Turn	--	--	--	A (9.4)	A (9.6)	A (8.6)
2030 without development and with other pending developments (Case 3)						
Northbound French Road Approach	F (55.9)	F (129.8)	E (41.8)	F (53.6)	F (136.0)	E (43.1)
Southbound Shingle Point Road Approach	F (218.9)	F (446.9)	D (27.5)	F (813.6)	F (*)	E (48.5)
Eastbound US Route 9 Left Turn	B (10.9)	B (12.3)	A (9.0)	B (10.8)	B (12.5)	A (9.1)
Westbound US Route 9 Left Turn	A (9.3)	A (9.5)	A (8.5)	A (9.4)	A (9.6)	A (8.6)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

<sup>4</sup> Consistent with the improvements proposed as part of the DelDOT Park Avenue Relocation project (Contract No. T201904601), JMT modeled the intersection to include the provision of one left turn lane and one shared through/right turn lane along the eastbound US Route 9 approach, one shared left turn/through lane and one right turn lane along the westbound US Route 9 approach, one shared left turn/through lane and one right turn lane along the southbound Shingle Point Road approach, and one shared left turn/through/right turn lane along the northbound French Road approach.

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 without development and with other pending developments (Case 3) <i>with Improvements</i> <sup>4</sup>						
Northbound French Road Approach	--	--	--	E (46.2)	F (81.7)	E (41.2)
Southbound Shingle Point Road Approach	--	--	--	F (164.0)	F (268.6)	D (26.1)
Eastbound US Route 9 Left Turn	--	--	--	B (10.8)	B (12.5)	A (9.1)
Westbound US Route 9 Left Turn	--	--	--	A (9.4)	A (9.6)	A (8.6)
2030 with development and without other pending developments (Case 4)						
Northbound French Road Approach	F (61.5)	F (168.6)	E (44.2)	F (58.7)	F (177.3)	E (45.7)
Southbound Shingle Point Road Approach	F (212.9)	F (509.9)	D (28.3)	F (836.1)	F (*)	F (52.3)
Eastbound US Route 9 Left Turn	B (10.9)	B (12.5)	A (9.1)	B (10.8)	B (12.8)	A (9.1)
Westbound US Route 9 Left Turn	A (9.3)	A (9.5)	A (8.5)	A (9.4)	A (9.6)	A (8.6)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 with development and without other pending developments (Case 4) <i>with Improvements</i> <sup>4</sup>						
Northbound French Road Approach	--	--	--	F (50.4)	F (93.9)	E (43.5)
Southbound Shingle Point Road Approach	--	--	--	F (162.9)	F (289.7)	D (26.7)
Eastbound US Route 9 Left Turn	--	--	--	B (10.8)	B (12.8)	A (9.1)
Westbound US Route 9 Left Turn	--	--	--	A (9.4)	A (9.6)	A (8.6)
2030 with development and with other pending developments (Case 5)						
Northbound French Road Approach	F (83.2)	F (299.3)	F (54.1)	F (77.8)	F (316.5)	F (56.0)
Southbound Shingle Point Road Approach	F (223.0)	F (641.2)	D (30.6)	F (943.6)	F (*)	F (69.7)
Eastbound US Route 9 Left Turn	B (11.0)	B (13.0)	A (9.2)	B (11.0)	B (13.3)	A (9.3)
Westbound US Route 9 Left Turn	A (9.3)	A (9.5)	A (8.5)	A (9.4)	A (9.6)	A (8.6)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 with development and with other pending developments (Case 5) with Improvements <sup>4</sup>						
Northbound French Road Approach	--	--	--	F (63.7)	F (123.4)	F (52.5)
Southbound Shingle Point Road Approach	--	--	--	F (167.9)	F (324.3)	D (28.5)
Eastbound US Route 9 Left Turn	--	--	--	B (10.9)	B (13.3)	A (9.3)
Westbound US Route 9 Left Turn	--	--	--	A (9.4)	A (9.6)	A (8.6)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS <sup>5</sup>			LOS per JMT <sup>6</sup>		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 without development and without other pending developments (Case 2)	C (21.9)	B (19.7)	B (12.1)	B (29.1)	B (27.8)	B (18.0)
2030 without development and with other pending developments (Case 3)	C (24.6)	C (22.1)	C (13.2)	C (30.1)	C (25.1)	B (18.6)
2030 with development and without other pending developments (Case 4)	C (26.2)	C (28.1)	B (13.4)	C (30.9)	C (28.0)	B (18.5)
2030 with development and with other pending developments (Case 5)	C (29.7)	C (33.8)	B (14.7)	C (34.2)	C (29.4)	C (21.1)

<sup>5</sup> The TIS analyzed this intersection with improvements, including the provision of one left turn lane and one shared through/right turn lane along the eastbound US Route 9 approach, one shared left turn/through/right turn along the westbound US Route 9 approach and northbound French Road approach, and one shared left-turn/through lane and one right turn lane along the southbound Shingle Point Rd approach. The TIS modeled the signal phasing with an eastbound left protected and permitted phase and permitted phasing along the northbound and southbound approaches, and with a cycle length of 120 seconds.

<sup>6</sup> JMT modeled the intersection to include the provision of one left turn lane, one through lane, and one right turn lane along the westbound US Route 9 approach, one left turn lane and one shared through/right turn lane along the eastbound US Route 9 approach, one shared left turn/through lane and one right turn lane along the southbound Shingle Point Rd approach, and one shared left turn/through/right turn along the northbound French Road approach. JMT modeled the intersection with protected and permissive left turn phasing along the eastbound and westbound US Route 9 approaches, with split phases for the northbound and southbound approaches, and with a cycle length of 120 seconds.

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1,3</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 without development and without other pending developments (Case 2)						
Northbound French Road Approach	-	-		A (8.4)	A (8.8)	A (5.4)
Southbound Shingle Point Road Approach	-	-		C (15.2)	B (12.4)	A (7.5)
Eastbound US Route 9 Approach	-	-		C (16.6)	C (18.8)	A (8.1)
Westbound US Route 9 Approach	-	-		C (16.4)	D (30.2)	A (8.6)
Overall LOS	-	-		C (16.3)	C (23.4)	A (8.3)
2030 without development and with other pending developments (Case 3)						
Eastbound Shingle Point Road Approach	-	-		A (8.5)	A (9.1)	A (5.4)
Westbound Shingle Point Road Approach	-	-		C (15.2)	B (13.3)	A (7.5)
Northbound Delaware Route 5 Approach	-	-		C (17.2)	C (20.7)	A (8.1)
Southbound Delaware Route 5 Approach	-	-		C (17.1)	E (35.7)	A (8.6)
Overall LOS	-	-		C (16.9)	D (26.6)	A (8.3)
2030 with development and without other pending developments (Case 4)						
Eastbound Shingle Point Road Approach	-	-		A (8.5)	A (9.3)	A (5.6)
Westbound Shingle Point Road Approach	-	-		C (17.8)	B (13.7)	A (8.0)
Northbound Delaware Route 5 Approach	-	-		C (17.2)	C (22.0)	A (8.7)
Southbound Delaware Route 5 Approach	-	-		C (17.1)	E (39.6)	A (9.3)
Overall LOS	-	-		C (17.2)	D (28.8)	A (8.8)

Table 5 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1,3</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Summer SAT	Weekday AM	Weekday PM	Summer SAT
<b>US Route 9 / Shingle Point Road</b>						
2030 with development and with other pending developments (Case 5)						
Northbound French Road Approach	-	-		A (8.6)	A (9.6)	A (5.8)
Southbound Shingle Point Road Approach	-	-		C (19.3)	B (14.7)	A (8.5)
Eastbound US Route 9 Approach	-	-		C (17.8)	C (24.5)	A (9.1)
Westbound US Route 9 Approach	-	-		C (17.9)	E (47.4)	A (9.8)
Overall LOS	-	-		C (18.0)	D (33.2)	A (9.3)



Table 6  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 30 / Prettyman Road (Sussex Road 254)</b>				
2021 Existing (Case 1)				
Westbound Prettyman Road Approach	B (10.2)	B (10.4)	B (10.2)	B (10.4)
Southbound Delaware Route 30 Left Turn	A (7.9)	A (7.8)	A (8.0)	A (7.8)
2030 without development and without other pending developments (Case 2)				
Westbound Prettyman Road Approach	B (11.0)	B (11.6)	B (10.8)	B (11.3)
Southbound Delaware Route 30 Left Turn	A (8.2)	A (8.1)	A (8.2)	A (8.1)
2030 without development and with other pending developments (Case 3)				
Westbound Prettyman Road Approach	B (11.5)	B (12.9)	B (11.2)	B (12.4)
Southbound Delaware Route 30 Left Turn	A (8.3)	A (8.4)	A (8.3)	A (8.3)
2030 with development and without other pending developments (Case 4)				
Westbound Prettyman Road Approach	B (11.3)	B (14.6)	B (11.0)	B (12.3)
Southbound Delaware Route 30 Left Turn	A (8.5)	A (8.5)	A (8.3)	A (8.2)
2030 with development and with other pending developments (Case 5)				
Westbound Prettyman Road Approach	B (11.3)	B (14.6)	B (11.5)	B (13.8)
Southbound Delaware Route 30 Left Turn	A (8.5)	A (8.5)	A (8.5)	A (8.5)

Table 7  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Prettyjohn Road / Prettyman Road</b>				
2021 Existing (Case 1)				
Eastbound Prettyman Road Approach	A (7.4)	A (7.5)	A (7.5)	A (7.6)
Westbound Prettyman Road Approach	A (7.5)	A (7.4)	A (7.5)	A (7.4)
Northbound Prettyjohn Left Turn	B (10.5)	B (10.0)	B (10.6)	B (10.1)
Southbound Prettyjohn Road Left Turn	B (10.0)	A (9.8)	A (9.9)	A (9.9)
2030 without development and without other pending developments (Case 2)				
Eastbound Prettyman Road Approach	A (7.4)	A (7.5)	A (7.5)	A (7.6)
Westbound Prettyman Road Approach	A (7.5)	A (7.4)	A (7.5)	A (7.5)
Northbound Prettyjohn Left Turn	B (10.2)	B (10.0)	B (10.3)	B (10.1)
Southbound Prettyjohn Road Left Turn	B (10.4)	B (10.8)	B (10.3)	B (10.9)
2030 without development and with other pending developments (Case 3)				
Eastbound Prettyman Road Approach	A (7.5)	A (7.6)	A (7.5)	A (7.6)
Westbound Prettyman Road Approach	A (7.5)	A (7.5)	A (7.6)	A (7.5)
Northbound Prettyjohn Left Turn	B (10.4)	B (10.0)	B (10.5)	B (10.1)
Southbound Prettyjohn Road Left Turn	B (10.8)	B (11.4)	B (10.7)	B (11.5)

Table 7 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

<b>Unsignalized Intersection Two-Way Stop Control<sup>1</sup></b>	<b>LOS per TIS</b>		<b>LOS per JMT</b>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Prettyjohn Road / Prettyman Road</b>				
2030 with development and without other pending developments (Case 4)				
Eastbound Prettyman Road Approach	A (7.5)	A (7.7)	A (7.5)	A (7.7)
Westbound Prettyman Road Approach	A (7.6)	A (7.5)	A (7.7)	A (7.6)
Northbound Prettyjohn Left Turn	B (10.7)	B (10.5)	B (10.8)	B (10.6)
Southbound Prettyjohn Road Left Turn	B (10.8)	B (11.4)	B (10.7)	B (11.6)
2030 with development and with other pending developments (Case 5)				
Eastbound Prettyman Road Approach	A (7.5)	A (7.7)	A (7.5)	A (7.7)
Westbound Prettyman Road Approach	A (7.6)	A (7.5)	A (7.7)	A (7.6)
Northbound Prettyjohn Left Turn	B (10.9)	B (10.5)	B (11.0)	B (10.6)
Southbound Prettyjohn Road Left Turn	B (11.3)	B (12.2)	B (11.2)	B (12.2)

Table 8  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Shingle Point Road</b>				
2021 Existing (Case 1)				
Eastbound Shingle Point Approach	C (21.0)	C (18.6)	C (20.9)	C (18.8)
Westbound Shingle Point Approach	C (19.4)	C (17.7)	C (19.7)	C (17.9)
Northbound Delaware Route 5 Left Turn	A (8.5)	A (8.2)	A (8.4)	A (8.1)
Southbound Delaware Route 5 Left Turn	A (8.4)	A (8.2)	A (8.1)	A (8.1)
2030 without development and without other pending developments (Case 2)				
Eastbound Shingle Point Approach	E (37.1)	D (25.4)	D (28.2)	C (24.6)
Westbound Shingle Point Approach	C (23.4)	C (21.0)	C (20.9)	C (20.5)
Northbound Delaware Route 5 Left Turn	A (8.7)	A (8.4)	A (8.5)	A (8.4)
Southbound Delaware Route 5 Left Turn	A (8.5)	A (8.3)	A (8.2)	A (8.2)
2030 without development and without other pending developments (Case 2) <i>with improvement</i> <sup>7</sup>				
Eastbound Shingle Point Approach	C (24.9)	C (22.6)	C (22.1)	C (22.1)
Westbound Shingle Point Approach	C (23.4)	C (21.0)	C (16.4)	C (20.5)
Northbound Delaware Route 5 Left Turn	A (8.7)	A (8.4)	A (8.5)	A (8.4)
Southbound Delaware Route 5 Left Turn	A (8.5)	A (8.3)	A (8.2)	A (8.2)

<sup>7</sup> Improvement scenario includes the provision of a separate left turn lane along the eastbound Shingle Point Road approach.

Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Shingle Point Road</b>				
2030 without development and with other pending developments (Case 3)				
Eastbound Shingle Point Approach	F (61.2)	E (43.6)	D (33.5)	D (34.1)
Westbound Shingle Point Approach	D (27.4)	C (24.4)	C (22.1)	C (21.9)
Northbound Delaware Route 5 Left Turn	A (9.0)	A (8.6)	A (8.6)	A (8.5)
Southbound Delaware Route 5 Left Turn	A (8.6)	A (8.5)	A (8.2)	A (8.3)
2030 without development and with other pending developments (Case 3) <i>with improvement</i> <sup>7</sup>				
Eastbound Shingle Point Approach	-	-	C (24.0)	C (29.5)
Westbound Shingle Point Approach	-	-	C (22.1)	C (21.9)
Northbound Delaware Route 5 Left Turn	-	-	A (8.6)	A (8.5)
Southbound Delaware Route 5 Left Turn	-	-	A (8.2)	A (8.3)
2030 with development and without other pending developments (Case 4)				
Eastbound Shingle Point Approach	F (82.2)	D (33.3)	E (38.6)	D (27.6)
Westbound Shingle Point Approach	C (24.0)	C (22.5)	C (20.0)	C (20.5)
Northbound Delaware Route 5 Left Turn	A (8.8)	A (8.7)	A (8.4)	A (8.5)
Southbound Delaware Route 5 Left Turn	A (8.5)	A (8.3)	A (8.1)	A (8.2)

Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Shingle Point Road</b>				
2030 with development and without other pending developments (Case 4) <i>with improvement</i> <sup>7</sup>				
Eastbound Shingle Point Approach	E (41.4)	D (28.6)	D (26.2)	D (24.5)
Westbound Shingle Point Approach	C (24.0)	C (22.5)	C (20.0)	C (20.5)
Northbound Delaware Route 5 Left Turn	A (8.8)	A (8.7)	A (8.4)	A (8.5)
Southbound Delaware Route 5 Left Turn	A (8.5)	A (8.3)	A (8.1)	A (8.2)
2030 with development and with other pending developments (Case 5)				
Eastbound Shingle Point Approach	F (155.5)	F (69.2)	F (59.9)	E (47.7)
Westbound Shingle Point Approach	C (28.2)	C (26.4)	C (22.6)	C (23.5)
Northbound Delaware Route 5 Left Turn	A (9.1)	A (8.9)	A (8.7)	A (8.7)
Southbound Delaware Route 5 Left Turn	A (8.6)	A (8.5)	A (8.2)	A (8.3)
2030 with development and with other pending developments (Case 5) <i>with improvement</i> <sup>7</sup>				
Eastbound Shingle Point Approach	-	-	E (35.4)	E (39.7)
Westbound Shingle Point Approach	-	-	C (22.6)	C (23.5)
Northbound Delaware Route 5 Left Turn	-	-	A (8.7)	A (8.7)
Southbound Delaware Route 5 Left Turn	-	-	A (8.2)	A (8.3)

Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS <sup>8</sup>		LOS per JMT <sup>9</sup>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Shingle Point Road</b>				
2030 without development and without other pending developments (Case 2)	-	-	A (9.9)	A (9.4)
2030 without development and with other pending developments (Case 3)	B (12.0)	B (11.7)	B (10.1)	B (10.1)
2030 with development and without other pending developments (Case 4)	-	-	B (11.4)	B (10.0)
2030 with development and with other pending developments (Case 5)	B (14.4)	B (12.9)	B (11.5)	B (11.0)

<sup>8</sup> The TIS analysis includes an eastbound left-turn lane on the Shingle Point Road approach to Delaware Route 5, and a northbound right turn lane on the Delaware Route 5 approach to Shingle Point Road. The TIS modeled the signal as a two-phase signal with a 90 second cycle length.

<sup>9</sup> The JMT analysis includes separate left turn, through, and right turn lanes at all four approaches to the intersection. JMT modeled the signal as a two-phase signal with a 90 second cycle length.

Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1, 10</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Shingle Point Road</b>				
2030 without development and without other pending developments (Case 2)				
Eastbound Shingle Point Road Approach	-	-	A (6.5)	A (5.3)
Westbound Shingle Point Road Approach	-	-	A (5.0)	A (5.5)
Northbound Delaware Route 5 Approach	-	-	A (6.7)	A (6.9)
Southbound Delaware Route 5 Approach	-	-	A (7.8)	A (6.7)
Overall LOS	-	-	A (7.1)	A (6.6)
2030 without development and with other pending developments (Case 3)				
Eastbound Shingle Point Road Approach	-	-	A (6.9)	A (5.8)
Westbound Shingle Point Road Approach	-	-	A (5.4)	A (5.9)
Northbound Delaware Route 5 Approach	-	-	A (6.9)	A (7.6)
Southbound Delaware Route 5 Approach	-	-	A (8.5)	A (7.0)
Overall LOS	-	-	A (7.6)	A (7.1)

<sup>10</sup> JMT conducted an additional analysis intersection as a single lane roundabout.



Table 8 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1, 10</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Shingle Point Road</b>				
2030 with development and without other pending developments (Case 4)				
Eastbound Shingle Point Road Approach	-	-	A (6.5)	A (5.5)
Westbound Shingle Point Road Approach	-	-	A (5.5)	A (5.5)
Northbound Delaware Route 5 Approach	-	-	A (7.1)	A (7.0)
Southbound Delaware Route 5 Approach	-	-	A (6.6)	A (7.1)
Overall LOS	-	-	A (6.7)	A (6.8)
2030 with development and with other pending developments (Case 5)				
Eastbound Shingle Point Road Approach	-	-	A (7.8)	A (6.3)
Westbound Shingle Point Road Approach	-	-	A (5.5)	A (6.1)
Northbound Delaware Route 5 Approach	-	-	A (7.6)	A (8.1)
Southbound Delaware Route 5 Approach	-	-	A (8.7)	A (7.9)
Overall LOS	-	-	A (8.1)	A (7.7)

Table 9  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-Intersection) <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Sand Hill Road (Sussex Road 319)</b>				
2021 Existing (Case 1)				
Eastbound Sand Hill Road Approach	C (15.3)	B (13.2)	C (15.3)	B (13.3)
Northbound Delaware Route 5 Left Turn	A (8.2)	A (8.8)	A (8.2)	A (8.7)
2030 without development and without other pending developments (Case 2)				
Eastbound Sand Hill Road Approach	C (20.9)	C (16.6)	C (19.0)	C (15.8)
Northbound Delaware Route 5 Left Turn	A (8.4)	A (9.2)	A (8.4)	A (9.1)
2030 without development and with other pending developments (Case 3)				
Eastbound Sand Hill Road Approach	F (157.3)	F (142.1)	F (85.0)	F (72.6)
Northbound Delaware Route 5 Left Turn	A (8.9)	B (11.2)	A (8.7)	B (10.5)
2030 with development and without other pending developments (Case 4)				
Eastbound Sand Hill Road Approach	D (25.7)	C (18.8)	C (20.1)	C (16.4)
Northbound Delaware Route 5 Left Turn	A (8.5)	A (9.6)	A (8.4)	A (9.2)
2030 with development and with other pending developments (Case 5)				
Eastbound Sand Hill Road Approach	F (220.4)	F (203.7)	F (125.6)	F (107.7)
Northbound Delaware Route 5 Left Turn	A (9.0)	B (11.8)	A (8.8)	B (10.9)

Table 9 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1, 11</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Sand Hill Road (Sussex Road 319)</b>				
2030 without development and with other pending developments (Case 3) <i>with improvement</i>				
Eastbound Sand Hill Road Approach	C (18.4)	A (9.3)	B (13.9)	A (8.3)
Northbound Delaware Route 5 Approach	B (11.4)	A (9.9)	A (9.8)	A (8.8)
Southbound Delaware Route 5 Approach	A (7.6)	C (15.7)	A (7.0)	C (12.6)
Overall LOS	B (13.2)	B (12.2)	B (10.7)	B (10.3)
2030 with development and with other pending developments (Case 5) <i>with improvement</i>				
Eastbound Sand Hill Road Approach	C (19.8)	B (10.7)	B (14.8)	A (9.4)
Northbound Delaware Route 5 Approach	B (13.4)	B (10.8)	B (11.2)	A (9.5)
Southbound Delaware Route 5 Approach	A (8.1)	C (19.3)	A (7.4)	B (14.8)
Overall LOS	B (14.5)	B (14.3)	B (11.5)	B (11.7)

<sup>11</sup> JMT conducted an additional analysis intersection as a single lane roundabout.

Table 9 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

<b>Signalized Intersection<sup>1</sup></b>	<b>LOS per TIS</b>		<b>LOS per JMT<sup>12</sup></b>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Sand Hill Road (Sussex Road 319)</b>				
2030 without development and without other pending developments (Case 2)	-	-	-	-
2030 without development and with other pending developments (Case 3)	-	-	B (17.8)	B (11.6)
2030 with development and without other pending developments (Case 4)	-	-	-	-
2030 with development and with other pending developments (Case 5)	-	-	B (18.0)	B (12.0)

<sup>12</sup> JMT conducted an additional analysis of the existing unsignalized two-way stop control intersection as a signalized intersection with a 60 second cycle length.

Table 10  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2021 Existing (Case 1)				
Eastbound Mulberry Street Approach	C (17.3)	C (19.2)	C (17.5)	C (19.4)
Westbound Wharton Street (SR 88) Approach	C (21.7)	F (53.7)	C (22.1)	F (55.1)
Northbound Delaware Route 5 Left Turn	A (7.6)	A (7.8)	A (7.7)	A (7.9)
Southbound Delaware Route 5 Left Turn	A (7.8)	A (7.8)	A (7.8)	A (7.8)
2030 without development and without other pending developments (Case 2)				
Eastbound Mulberry Street Approach	C (23.3)	D (30.3)	C (23.7)	C (20.8)
Westbound Wharton Street (SR 88) Approach	E (35.1)	F (199.5)	E (36.0)	F (60.8)
Northbound Delaware Route 5 Left Turn	A (7.8)	A (8.1)	A (7.9)	A (8.0)
Southbound Delaware Route 5 Left Turn	A (8.1)	A (8.0)	A (8.1)	A (7.9)
2030 without development and with other pending developments (Case 3)				
Eastbound Mulberry Street Approach	F (51.1)	F (103.6)	E (49.4)	D (31.2)
Westbound Wharton Street (SR 88) Approach	F (432.8)	F (*)	F (407.0)	F (603.9)
Northbound Delaware Route 5 Left Turn	A (8.0)	A (8.6)	A (8.1)	A (8.3)
Southbound Delaware Route 5 Left Turn	A (8.4)	A (8.3)	A (8.4)	A (8.1)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection Two-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2030 with development and without other pending developments (Case 4)				
Eastbound Mulberry Street Approach	D (26.7)	E (41.0)	D (26.8)	C (22.0)
Westbound Wharton Street (SR 88) Approach	E (44.9)	F (338.0)	E (45.7)	F (69.1)
Northbound Delaware Route 5 Left Turn	A (7.8)	A (8.3)	A (7.9)	A (8.1)
Southbound Delaware Route 5 Left Turn	A (8.2)	A (8.1)	A (8.2)	A (8.0)
2030 with development and with other pending developments (Case 5)				
Eastbound Mulberry Street Approach	F (65.9)	F (229.1)	F (63.3)	E (39.2)
Westbound Wharton Street (SR 88) Approach	F (636.8)	F (*)	F (596.1)	F (835.8)
Northbound Delaware Route 5 Left Turn	A (8.1)	A (8.8)	A (8.1)	A (8.5)
Southbound Delaware Route 5 Left Turn	A (8.5)	A (8.4)	A (8.5)	A (8.2)

\* HCS calculated delay exceeds 1,000 seconds/vehicle.

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection All-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2030 without development and without other pending developments (Case 2)				
Eastbound Mulberry Street Approach	B (12.0)	B (14.7)	B (12.0)	B (11.8)
Westbound Wharton Street (SR 88) Approach	B (11.4)	C (16.5)	B (11.4)	B (12.9)
Northbound Delaware Route 5 Approach	C (16.5)	D (26.7)	C (16.4)	C (16.5)
Southbound Delaware Route 5 Approach	B (12.9)	C (20.3)	B (12.9)	B (14.3)
Overall LOS	B (13.9)	C (20.8)	B (13.9)	B (14.4)
2030 without development and with other pending developments (Case 3)				
Eastbound Mulberry Street Approach	--	--	C (14.8)	C (15.3)
Westbound Wharton Street (SR 88) Approach	--	--	C (15.0)	C (23.6)
Northbound Delaware Route 5 Approach	--	--	F (52.6)	E (44.1)
Southbound Delaware Route 5 Approach	--	--	C (17.2)	D (25.7)
Overall LOS	--	--	D (32.7)	D (30.4)
2030 with development and without other pending developments (Case 4)				
Eastbound Mulberry Street Approach	--	--	B (12.4)	B (11.8)
Westbound Wharton Street (SR 88) Approach	--	--	B (11.7)	B (12.9)
Northbound Delaware Route 5 Approach	--	--	C (19.1)	C (16.5)
Southbound Delaware Route 5 Approach	--	--	B (13.5)	C (14.3)
Overall LOS	--	--	C (15.4)	B (14.4)

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Unsignalized Intersection All-Way Stop Control <sup>1</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2030 with development and with other pending developments (Case 5)				
Eastbound Mulberry Street Approach	--	--	B (14.8)	C (16.7)
Westbound Wharton Street (SR 88) Approach	--	--	B (15.0)	D (26.5)
Northbound Delaware Route 5 Approach	--	--	F (74.7)	F (70.3)
Southbound Delaware Route 5 Approach	--	--	C (17.8)	E (36.8)
Overall LOS	--	--	E (43.8)	E (43.9)



Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1, 10</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2030 without development and without other pending developments (Case 2)				
Eastbound Mulberry Street Approach	-	-	A (6.1)	A (6.1)
Westbound Wharton Street (SR 88) Approach	-	-	A (5.2)	A (6.1)
Northbound Delaware Route 5 Approach	-	-	A (6.8)	A (6.1)
Southbound Delaware Route 5 Approach	-	-	A (5.6)	A (6.5)
Overall LOS	-	-	A (6.1)	A (6.2)
2030 without development and with other pending developments (Case 3)				
Eastbound Mulberry Street Approach	-	-	A (6.9)	A (7.4)
Westbound Wharton Street (SR 88) Approach	-	-	A (7.2)	A (8.7)
Northbound Delaware Route 5 Approach	-	-	A (9.4)	A (7.1)
Southbound Delaware Route 5 Approach	-	-	A (7.1)	A (9.2)
Overall LOS	-	-	A (8.1)	A (8.1)
2030 with development and without other pending developments (Case 4)				
Eastbound Mulberry Street Approach	-	-	A (6.1)	A (6.3)
Westbound Wharton Street (SR 88) Approach	-	-	A (5.4)	A (6.1)
Northbound Delaware Route 5 Approach	-	-	A (7.3)	A (6.2)
Southbound Delaware Route 5 Approach	-	-	A (5.7)	A (6.9)
Overall LOS	-	-	A (6.4)	A (6.4)

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

Roundabout <sup>1, 10</sup>	LOS per TIS		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2030 with development and with other pending developments (Case 5)				
Eastbound Mulberry Street Approach	-	-	A (7.0)	A (8.0)
Westbound Wharton Street (SR 88) Approach	-	-	A (7.5)	A (9.1)
Northbound Delaware Route 5 Approach	-	-	A (10.0)	A (7.5)
Southbound Delaware Route 5 Approach	-	-	A (7.3)	B (10.1)
Overall LOS			A (8.5)	A (8.7)

Table 10 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Final Traffic Impact Study for Four Winds Farm  
Report Dated: February 2022  
Prepared by: Pennoni Associates, Inc.

<b>Signalized Intersection<sup>1</sup></b>	<b>LOS per TIS<sup>13</sup></b>		<b>LOS per JMT<sup>14</sup></b>	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Delaware Route 5 / Mulberry Street / Wharton Street (SR 88)</b>				
2030 without development and without other pending developments (Case 2)	-	-	B (11.6)	B (12.4)
2030 without development and with other pending developments (Case 3)	B (17.8)	C (25.8)	B (12.1)	B (18.2)
2030 with development and without other pending developments (Case 4)	-	-	B (11.4)	B (11.7)
2030 with development and with other pending developments (Case 5)	B (18.0)	C (21.5)	B (12.0)	B (18.3)

<sup>13</sup> The TIS analyzed the intersection with a shared left turn/through/right turn lane for all four approaches. The TIS modeled the signal as a two-phase signal with a 90 second cycle length.

<sup>14</sup> JMT analyzed the intersection with a shared left turn/through/right turn lane for all four approaches. JMT modeled the signal as a two-phase signal with a 60 second cycle length.