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

NICOLE MAJESKI
SECRETARY

November 15, 2022

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

Dear Ms. Tustin,

The enclosed Traffic Impact Study (TIS) review letter for **The Granary at Draper Farm** (Tax Parcels: 235-20.00-12.00 and 19.00) mixed use 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:km
Enclosures
cc with enclosures: Mr. Spencer Van Schaack, Convergence Investments
Mr. Zach Crouch, Davis, Bowen & Friedel, Inc.
Ms. Kristy Rogers, Town of Milton
Mr. Tom Quass, Town of Milton
Mr. Jamie Whitehouse, Sussex County Planning & Zoning
Mr. Andrew Parker, McCormick & Taylor, Inc.
Mr. Tucker Smith, McCormick & Taylor, Inc.
DelDOT Distribution

DelDOT

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Brad Eaby, Deputy Attorney General
Shanté Hastings, Deputy Secretary / Director of Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, Traffic, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Michael Simmons, Assistant Director, Project Development South, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, DelDOT Traffic
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
Sarah Coakley, Principal Planner, Regional Systems Planning
Sireen Muhtaseb, TIS Section Manager, Development Coordination
Alistair Probert, South District Engineer, South District
Matthew Schlitter, South District Public Works Engineer, South District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
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 Furmato, Project Engineer, Development Coordination

November 15, 2022

Mr. Claudy Joinville
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1946F
Traffic Impact Study Services
Task No. 3A Subtask 06A – The Granary at Draper Farm

Dear Mr. Joinville:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Granary at Draper Farm residential development prepared by The Traffic Group dated March 2022. The Traffic Group prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Granary at Draper Farm residential development, proposed to be located east of Delaware Route 30 (Gravel Hill Road), south of Sand Hill Road (Sussex Road 319) in Sussex County, Delaware. The proposed development would consist of 875 single-family homes, 475 multi-family mid-rise houses, and 60,000 square feet of retail space. Three full-access driveways are proposed: two on Sand Hill Road and one on Delaware Route 30. Construction is expected to be complete by 2041.

The subject land is located on an approximately 450.12-acre assemblage of parcels. The land is currently zoned AR-1 (Agricultural Residential) in Sussex County. The developer is seeking a Large Parcel Development (LPD) overlay annexed into the Town of Milton under R-2 (Residential) zoning.

Currently, there are two active DelDOT capital projects within or very near the area of study. The first project is *HEP SC, SR 30 and SR 16 Intersection Improvements* (State Project No. T202204304). This project involves the implementation of geometric improvements needed at the intersection of Delaware Route 30 and Delaware Route 16, as this intersection was identified as a high crash location in the 2017 Hazard Elimination Program. A roundabout is recommended at this intersection. Design and right of way acquisition are currently underway. Construction is expected to begin in 2024.

The second active DelDOT capital project is *HEP Sussex County, SR 1 and SR 16 Grade Separated Intersection* (State Project No. T201500301). It is located just outside the study area. This project seeks to replace the existing Delaware Route 1 and Delaware Route 16 signalized intersection with a grade-separated intersection to improve safety and reduce the number of crashes at the intersection. Design is complete and utility relocations began in Fall 2021. Construction is expected to begin in the Spring of 2022.

There is also an ongoing DelDOT Study in the area. DelDOT's Coastal Corridors Study aims to study the east-west travel patterns in Sussex County including, but not limited to, the portion of Delaware Route 16 that runs through the study area. 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 a number of 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 latest updates indicate that the study is in the data collection / public outreach phase.

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, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	***Existing Traffic Control***	***Situations for which deficiencies occur***
DE Route 30 and Site Access A	Unsignalized	2041 with development PM (Case 3)
Sand Hill Road and Lavinia Street / Site Access B	Unsignalized	2041 with development AM and PM (Case 3)
DE Route 16 and DE Route 30	Signalized	2041 without development PM (Case 2) 2041 with development PM and Saturday (Case 3)
DE Route 16 and Mulberry Street / Mulberry Street Ext.	Unsignalized	2021 existing PM (Case 1) 2041 without development AM, PM, and SAT (Case 2) 2041 with development AM, PM, and SAT (Case 3)
DE Route 5 and DE Route 16	Signalized	2041 with development PM and SAT (Case 3)
DE Route 5 and Wharton Street / Mulberry Street	Unsignalized	2021 existing PM (Case 1) 2041 without development AM and PM (Case 2) 2041 with development AM and PM (Case 3)
DE Route 5 and Sand Hill Road	Unsignalized	2041 without development PM (Case 2) 2041 with development AM and PM (Case 3)
DE Route 5 and Shingle Point Road	Unsignalized	2041 without development PM (Case 2) 2041 with development AM and PM (Case 3)

Intersection	*Existing Traffic Control*	*Situations for which deficiencies occur*
DE Route 30 and Sand Hill Road	Unsignalized	2041 without development AM and PM (Case 2) 2041 with development AM and PM (Case 3)
DE Route 30 and Huff Road	Unsignalized	2041 with development PM (Case 3)
DE Route 30 and Shingle Point Road	Unsignalized	2041 without development PM (Case 2) 2041 with development AM and PM (Case 3)

Delaware Route 30 and Site Access A:
This proposed stop-controlled intersection is projected to operate with LOS deficiencies for the weekday PM peak hour in Case 3. However, the delay is experienced only on the Site Access approach, with a queue of 3 vehicles. Therefore, no mitigation is recommended.

Sand Hill Road and Lavinia Street / Site Access B:
This stop-controlled intersection is projected to operate with LOS deficiencies for AM and PM peak hour periods in Case 3. However, the delay is experienced only on the proposed Site Access approach with a queue of less than 3 vehicles in both cases. Therefore, no mitigation is recommended at this intersection to address the delay or queue. For improved safety a left-turn lane must be added on eastbound Sand Hill Road to shadow the proposed left-turn lane on the westbound approach.

Delaware Route 16 and Delaware Route 30:
This signalized intersection experiences LOS deficiencies for Case 2, weekday evening peak hour period, and for Case 3, weekday evening and midday summer Saturday peak hours. DelDOT's *HEP SC, SR 30 and SR 16 Intersection Improvements* project is designing a roundabout at this intersection which, when implemented, will provide acceptable levels of service. The developer should contribute towards that project.

Delaware Route 16 and Mulberry Street / Mulberry Street Ext:
This stop-controlled intersection experiences LOS deficiencies for the existing weekday PM peak hour on the northbound Mulberry Street approach. The northbound and southbound Mulberry Street approaches are projected to exhibit LOS deficiencies for all future peak hours in Cases 2 and 3. The Town of Milton has considered alternative improvements, which warrant further evaluation in an effort beyond this TIS. More information on the Town's alternative improvements is available at https://milton.delaware.gov/files/2021/08/TrafficCalmingADHOC-AdvisoryReport_2021_LoRes.pdf. For the purpose of the subject development a signal agreement is appropriate but ultimately a different improvement may be better for this location.

Delaware Route 5 and Delaware Route 16:
This signalized intersection is projected to operate with LOS deficiencies during the weekday PM and Saturday peak hour periods for Case 3. While signal timing modifications may mitigate the LOS deficiencies, operational concerns including lengthy queues would remain. Physical

improvements at this intersection, consisting of adding left-turn lanes on the Delaware Route 16 approaches and a separate right-turn lane on the southbound Delaware Route 5 approach, are planned by another developer. Therefore, we recommend that this developer should not be responsible for improvements at this intersection.

Delaware Route 5 and Wharton Street / Mulberry Street:
This stop-controlled intersection currently experiences LOS deficiencies for the weekday PM peak hour at the westbound approach. Furthermore, the westbound approach is projected to operate with LOS deficiencies for the future AM and PM weekday peak hour periods in Case 2 and Case 3, and the eastbound approach is expected to operate with an LOS deficiency for Case 3. While the developer recommends implementing a traffic signal, DelDOT has not yet determined if a signal would be acceptable here. The Town of Milton has considered alternative improvements such as a roundabout, an all-way stop, or other roadway improvements, which warrant further evaluation in an effort beyond this TIS. More information on the Town's alternative improvements is available at https://milton.delaware.gov/files/2021/08/TrafficCalmingADHOC-AdvisoryReport_2021_LoRes.pdf. As such, the developer should coordinate with DelDOT regarding future improvements at this intersection, which could possibly include a signal, roundabout, or other control measure which will be determined by DelDOT at a later date and which the developer would implement.

Delaware Route 5 and Sand Hill Road:
This stop-controlled intersection is projected to operate with LOS deficiencies at the eastbound approach during weekday PM peak hour for Case 2, and during both AM and PM peak hours for Case 3. While the developer recommends implementing all-way stop control (AWSC), as part of a TIS that type of intersection should not be considered to address poor operations. DelDOT's position is AWSC can be installed on a location-specific basis primarily to address safety concerns, but typically not due to operational deficiencies. Therefore, alternative intersection control options were considered, and a roundabout was identified as the appropriate improvement. The developer should construct a single-lane roundabout at this intersection.

Delaware Route 5 and Shingle Point Road:
This stop-controlled intersection is projected to operate with LOS deficiencies on the eastbound approach during weekday PM peak hour for Case 2, and during both AM and PM peak hours for Case 3. While the developer recommends implementing a traffic signal, a Traffic Signal Justification Study (TSJS) would first be needed to support that. Regardless, DelDOT's preference at this intersection is a roundabout instead of a signal. The developer should construct a single-lane roundabout at this intersection.

Delaware Route 30 and Sand Hill Road:
This all-way stop controlled intersection is projected to operate with LOS deficiencies for the future AM and PM peak hours in Cases 2 and 3. While the developer recommends implementing a traffic signal, this intersection was recently nominated for a roundabout in the Safety Roll-up Program. DelDOT's Traffic Studies Section recommended the roundabout in a project nomination provided to DeDOT's Project Development – South Section in March 2022. As such, the developer should coordinate with DelDOT regarding construction of a single-lane roundabout at this intersection. The outcome of that coordination will very likely be one of two scenarios: either the developer will construct the roundabout, or the developer will contribute towards a future DelDOT project to construct the roundabout.

Delaware Route 30 and Huff Road:
This stop-controlled intersection is projected to operate with LOS deficiencies for the westbound approach during the weekday PM peak hour period for Case 3. Implementation of geometric improvements proposed by the developer (i.e., the installation of a left-turn lane on eastbound Huff Road) would not resolve the LOS deficiencies. Instead, the developer should construct a single-lane roundabout at this intersection. Alternatively, the developer may wish to coordinate with DelDOT regarding the possibility of constructing a traffic signal in lieu of a roundabout. If the developer wishes to explore a traffic signal, they will need to complete a Traffic Signal Justification Study (TSJS) to determine if there is adequate support for that type of traffic control.

Delaware Route 30 and Shingle Point Road:
This stop-controlled intersection is projected to operate with LOS deficiencies for the weekday PM peak hour in Case 2, and in the AM and PM peak hour periods in Case 3. While the developer recommends implementing a traffic signal, a Traffic Signal Justification Study (TSJS) would first be needed to support that. Regardless, this intersection was previously evaluated as part of a different TIS, and at that time DelDOT determined the appropriate improvement to be a roundabout instead of a signal. DelDOT has recommended that the other developer construct the roundabout at this intersection. The subject developer should contribute towards the roundabout project being led by the other developer.

Should Sussex County (or the Town of Milton if the property is annexed) choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. 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 the State-maintained road(s) on which they front (Delaware Route 30 and Sand Hill 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 the full-movement Site Access A on Delaware Route 30. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Northbound DE Route 30	One through lane	One through lane and one right-turn lane
Southbound DE Route 30	One through lane	One through lane and one left-turn lane
Westbound Site Access A	Approach does not exist	One left-turn lane and one right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths and other design details during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound DE Route 30	N/A	290 feet *
Southbound DE Route 30	235 feet *	N/A
Westbound Site Access A	N/A	80 feet **

* Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*
** Initial turn-lane length based on queuing analysis

3. The developer should construct the full-movement Site Access B as the fourth leg of the existing intersection of Sand Hill Road and Lavinia Street. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Northbound Site Access B	Approach does not exist	One shared left-turn / through lane and one right-turn lane
Southbound Lavinia Street	Shared left-turn / right-turn lane	One shared left-turn / through / right-turn lane
Eastbound Sand Hill Road	Shared through / left-turn lane	One left-turn lane, one through lane, and one right-turn lane
Westbound Sand Hill Road	Shared through / right-turn lane	One left-turn lane and one shared through / right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths and other design details during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Site Access B	N/A	60 feet *
Southbound Lavinia Street	N/A	N/A
Eastbound Sand Hill Road	210 feet **	290 feet **
Westbound Sand Hill Road	210 feet **	N/A

* Initial turn-lane length based on queuing analysis
** Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*

4. The developer should construct the full-movement Site Access C on both sides of Sand Hill Road. The proposed configuration is shown in the table below. This intersection will also require pedestrian improvements including a two-stage pedestrian crossing of Sand Hill Road. A tunnel for pedestrians and bicyclists, which the developer must maintain, may also be constructed if the developer chooses to build one. Details regarding the potential tunnel would need to be coordinated with and approved by DelDOT. Pedestrian elements for this location are also described in Item 14.i. below.

Approach	Existing Configuration	Proposed Configuration
Northbound Site Access C (south leg)	Approach does not exist	One shared left-turn / through / right-turn lane
Southbound Site Access C (north leg)	Approach does not exist	One shared left-turn / through / right-turn lane
Eastbound Sand Hill Road	One through lane	One left-turn lane, one through lane, and one right-turn lane
Westbound Sand Hill Road	One through lane	One left-turn lane, one through lane, and one right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths and other design details during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Site Access C (south leg)	N/A	N/A
Northbound Site Access C (north leg)	N/A	N/A
Eastbound Sand Hill Road	210 feet *	290 feet *
Westbound Sand Hill Road	210 feet *	290 feet *

* Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*

5. The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT's HEP SC, SR 30 and SR 16 Intersection Improvements Project, which will feature installation of a roundabout at the intersection of Delaware Route 30 and Delaware Route 16. The amount of the contribution, as determined by DelDOT's Development Coordination Section, should not exceed $57,639.90.

6. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Delaware Route 16 and Mulberry Street / Mulberry Street Ext. A signal may be constructed there when warranted as determined by DelDOT, who is currently working with the Town of Milton to decide what improvements will be constructed at this intersection. The signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. A contribution to DelDOT's Traffic Signal Revolving Fund (TSRF) is also an option. If the TSRF is utilized, the amount of the contribution, as determined by DelDOT's Development Coordination Section, should not exceed $25,547.

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 also has the option to prepare and submit to DelDOT a Traffic Signal Justification Study (TSJS) for the intersection of Delaware Route 5 and Wharton Street / Mulberry Street. The study must include evaluation of other forms of intersection control, including but not necessarily limited to a single-lane roundabout. The developer should coordinate with DelDOT on the improvements regardless of any interim improvement completed by the Town. One or more other developers may also be required to contribute towards the improvements. 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 developer should enter into an agreement with DelDOT to design and construct a single-lane roundabout at the intersection of Delaware Route 5 and Sand Hill Road. The roundabout may be designed to minimize impact on existing utility poles near this intersection. The developer should coordinate with DelDOT's Development Coordination Section to determine details regarding design, schedule and construction of the roundabout. The developer also has the option to prepare and submit to DelDOT a Traffic Signal Justification Study (TSJS) for the intersection of Delaware Route 5 and Sand Hill Road. The study must include evaluation of other forms of intersection control, including but not necessarily limited to a single-lane roundabout. One or more other developers may be required to contribute towards the improvements. 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.

9. The developer should enter into an agreement with DelDOT to design and construct a single-lane roundabout at the intersection of Delaware Route 5 and Shingle Point Road. The roundabout may be designed to minimize impact on existing utility poles near this intersection. The developer should coordinate with DelDOT's Development Coordination Section to determine details regarding design, schedule and construction of the roundabout.

The developer also has the option to prepare and submit to DelDOT a Traffic Signal Justification Study (TSJS) for the intersection of Delaware Route 5 and Shingle Point Road. The study must include evaluation of other forms of intersection control, including but not necessarily limited to a single-lane roundabout. One or more other developers may be required to contribute towards the improvements. 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.

10. The developer should enter into an agreement with DelDOT to design and construct a single-lane roundabout at the intersection of Delaware Route 30 and Sand Hill Road. The developer should coordinate with DelDOT's Development Coordination Section to determine details regarding design, schedule and construction of the roundabout. Upon future coordination with DelDOT, the need for the developer to construct the roundabout may potentially turn into having the developer fund an equitable portion of a future DelDOT project to construct a roundabout at this intersection. One or more other developers may be required to contribute towards the improvements. 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.

11. The developer should enter into an agreement with DelDOT to design and construct a single-lane roundabout at the intersection of Delaware Route 30 and Huff Road. The roundabout may be designed to minimize impact on existing utility poles near this intersection. The developer should coordinate with DelDOT's Development Coordination Section to determine details regarding design, schedule and construction of the roundabout. The developer also has the option to prepare and submit to DelDOT a Traffic Signal Justification Study (TSJS) for the intersection of Delaware Route 30 and Huff Road. The study must include evaluation of other forms of intersection control, including but not necessarily limited to a single-lane roundabout. 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.

12. The developer should coordinate with DelDOT regarding an equitable share contribution towards construction of a single-lane roundabout at the intersection of Delaware Route 30 and Shingle Point Road, the construction of which is being led by another developer. The amount of the contribution from the Granary at Draper Farm developer will be determined by DelDOT's Development Coordination Section. 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.

13. If speed limit adjustments are needed or desired on any roadways due to annexation into the Town of Milton, the developer will need to conduct a speed study for each proposed speed limit change and must include physical traffic calming measures in the roadway to support the proposed speed limit change. This requirement may change or be eliminated if the Town of Milton makes a formal request to DelDOT to reduce speed limits on roadways within its boundaries.

14. The following bicycle and pedestrian improvements should be included:

    a. Per the DelDOT Development Coordination Manual section 5.2.9.2, bicycle lanes are required where right turn lanes are being installed.

    b. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.

    c. Utility covers should be made flush with the pavement.

    d. If clubhouses or other community facilities are constructed within the site, bicycle parking should be provided near building entrances. Where building architecture provides for an awning, other overhang, or indoor parking, the bicycle parking should be covered.

    e. A minimum 15-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontages along Sand Hill Road and Delaware Route 30.

    f. Within the easements along the Sand Hill Road and the Delaware Route 30 site frontages, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed. The shared-use path should meet AASHTO and ADA standards and should have a minimum of a five-foot buffer from the roadway. At the property boundaries, the shared-use path should connect to the adjacent property or to the shoulder in accordance with DelDOT's *Shared-Use Path and/or Sidewalk Termination Reference Guide* dated August 1, 2018. The developer shall coordinate with DelDOT's Development Coordination Section through the plan review process to determine the details of the shared-use path design and connections/terminations at or before all boundaries of the property.

    g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.

    h. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards.

Internal sidewalks in the development should connect to the proposed shared-use paths along Sand Hill Road and Delaware Route 30. The internal sidewalks for the portion of the development north of Sand Hill Road should also connect to the pedestrian rail-trail that runs east to west along the northern boundary of that portion of the site.

i. Any proposed pedestrian crossings across Sand Hill Road, Lavinia Street, or Delaware Route 30 must be evaluated using NCHRP 562. From a design standpoint, each crossing should be designed and constructed as a two-stage crossing with a concrete median refuge. In addition, the developer may construct a pedestrian tunnel(s) if desired as long as the design is coordinated with and approved by DelDOT and the developer agrees to maintain the tunnel including pumps as needed to manage flooding. The developer should coordinate with DelDOT regarding pedestrian crossing needs, locations, and facility designs.

j. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.

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 http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

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 site plan review process.

Additional details on our review of this TIS are attached. Please contact me at (610) 640-3500 or through e-mail at ajparker@mccormicktaylor.com if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.

Andrew J. Parker, PE, PTOE
Project Manager

Enclosure

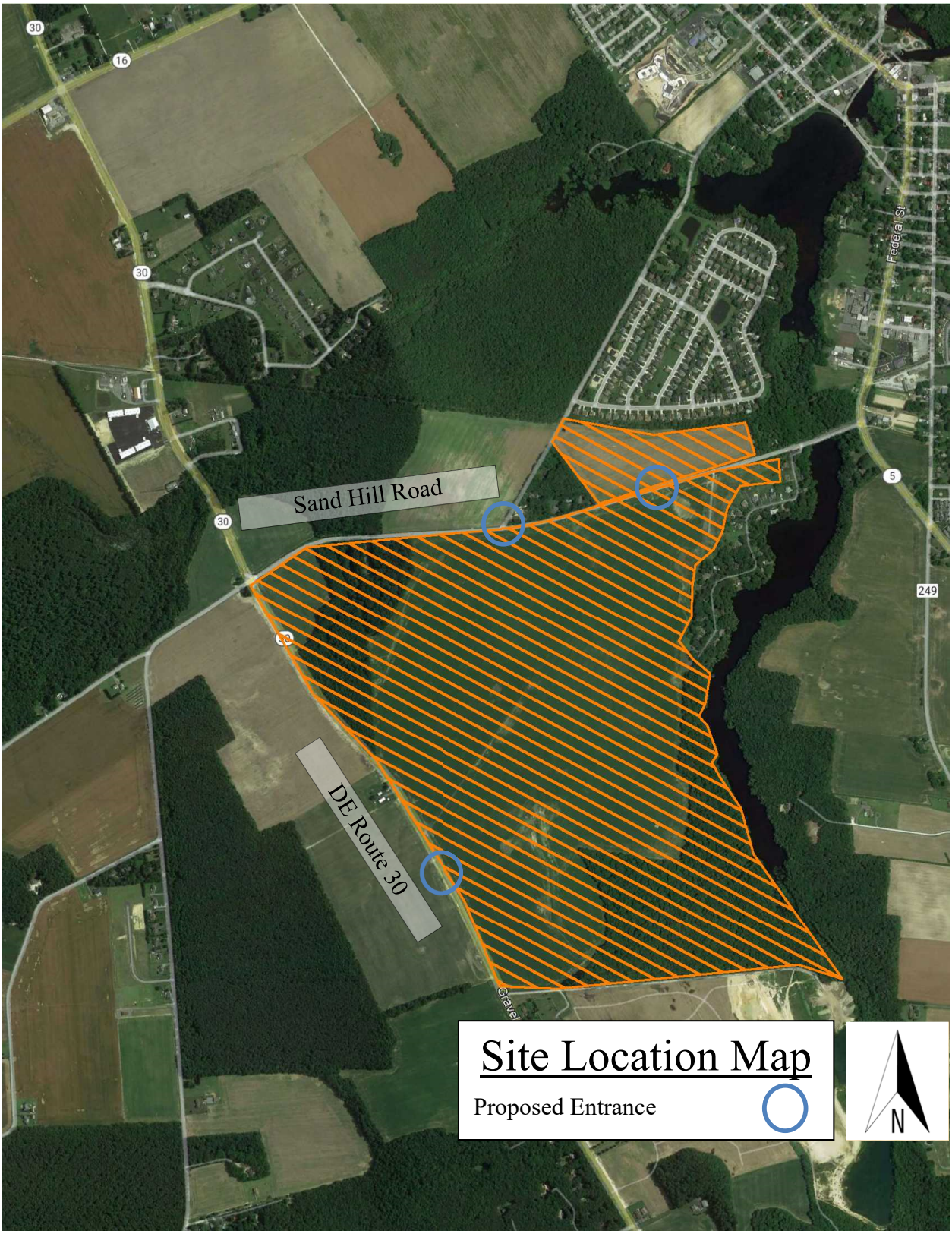
General Information

Report date: March 2022
Prepared by: The Traffic Group, Inc.
Prepared for: Convergence Investments
Tax parcels: 235-20.00-12.00, 235-20.00-19.00
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Granary at Draper Farms development consists of 875 single-family homes, 475 multi-family mid-rise houses, and 60,000 sq ft of retail space.
Location: The land is located east of Delaware Route 30 (Gravel Hill Road), south of Sand Hill Road (Sussex Road 319) in Sussex County, Delaware. A site location map is included on page 14.
Amount of land to be developed: approximately 450.12-acre assemblage of parcels
Land use approval(s) needed: Subdivision approval. The land is currently zoned AR-1 (Agricultural Residential) in Sussex County. The developer is seeking a Large Parcel Development (LPD) overlay annexed into the Town of Milton under R-2 (Residential) zoning.
Proposed completion year: 2041
Proposed access locations: Three full-access driveways are proposed: two on Sand Hill Road and one on Delaware Route 30 (Gravel Hill Road).
Daily Traffic Volumes (per DelDOT Traffic Summary 2019):

- 2019 Average Annual Daily Traffic on Delaware Route 30: 3,912 vehicles/day
- 2019 Average Annual Daily Traffic on Sand Hill Road: 3,911 vehicles/day


Sand Hill Road
DE Route 30
Site Location Map
Proposed Entrance
N
Federal St
30
16
5
249

2020 Delaware Strategies for State Policies and Spending

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The majority of the proposed Granary at Draper Farm development is located within Investment Levels 2. A small portion of the property is located within Investment Level 3 area.

Investment Level 2
This investment level has many diverse characteristics. These areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. These areas have been shown to be the most active portion of Delaware's developed landscape. They serve as transition areas between Level 1 and the more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity.

Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, and provides essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community. Investment Level 2 areas are prime locations for designating "pre-permitted areas."

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed Granary at Draper Farms Development project consists of 875 single-family homes, 475 multi-family mid-rise houses, and 60,000 sq ft of retail space developed in an Investment Level 2 area. Investment Level 2 supports the development of residential growth with infrastructure and essential neighborhood services. Investment level 2 encourage a broad mix of housing options. However, a small part of the property is in Investment Level 3 area where this type of use may not be as appropriate. Further discussion may be required to determine if the proposed development complies with the Strategies.

Comprehensive Plan

Sussex County Comprehensive Plan:
(Source: Sussex County Comprehensive Plan, March 2019)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed Granary at Draper Farms development is proposed on land designated as a "Developing Area" per the Future Land Use Map. The Developing Areas are newer, emerging growth areas that demonstrate the characteristics of developmental pressures. Most of the proposed Developing

Areas are adjacent to municipalities, within or adjacent to potential future annexation areas of a municipality, or adjacent to Town Centers. A range of housing types are appropriate in Developing Areas, including single family homes, townhouses, and multi-family units. In selected areas and at appropriate intersections, commercial uses should be allowed. It would appear that the proposed Granary at Draper Farms development fits within the intended land use for this location.

Town of Milton Comprehensive Plan
(Source: Town of Milton Comprehensive Plan, adopted 2018)

While not within the Town Boundary, the area of the proposed development is within the Growth Area Boundary of the Future Land Use Map, and the property is identified for a Residential use. Given that the proposed development is indeed primarily residential, it would appear to fit within the vision of the Town of Milton if annexed, however given the retail component additional discussion may be required.

Proposed Development's Compatibility with Comprehensive Plan:

The proposed Granary at Draper Farms residential development project includes 875 single-family homes, 475 multi-family mid-rise houses, and 60,000 sq ft of retail space on an approximately 450.12-acre assemblage of parcels. The land is currently zoned AR-1 (Agricultural Residential). The developer is seeking a Large Parcel Development (LPD) overlay annexed into the Town of Milton under R-2 (Residential) zoning. Milton's R-2 zoning seems to comply with the Future Land Use Category "Developing Area" as defined above. It would appear that the proposed Granary at Draper Farms residential development fits within the intended land use for this location.

Relevant Projects in the DelDOT Capital Transportation Program

Currently, there are two active DelDOT capital projects within or very near the area of study. The first project is *HEP SC, SR 30 and SR 16 Intersection Improvements* (State Project No. T202204304). This project involves the implementation of geometric improvements needed at the intersection of Delaware Route 30 and Delaware Route 16, as this intersection was identified as a high crash location in the 2017 Hazard Elimination Program. A roundabout is recommended at this intersection. Design and right of way acquisition are currently underway. Construction is expected to begin in 2024.

The second active DelDOT capital project is *HEP Sussex County, SR 1 and SR 16 Grade Separated Intersection* (State Project No. T201500301). It is located just outside the study area. This project seeks to replace the existing Delaware Route 1 and Delaware Route 16 signalized intersection with a grade-separated intersection to improve safety and reduce the number of crashes at the intersection. Design is complete and utility relocations began in Fall 2021. Construction is expected to begin in the Spring of 2022.

There is also an ongoing DelDOT Study in the area. DelDOT's Coastal Corridors Study aims to study the east-west travel patterns in Sussex County including, but not limited to, the portion of Delaware Route 16 that runs through the study area. 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 a number of 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 latest updates indicate that the study is in the data collection / public outreach phase.

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.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Tenth Edition, published by the Institute of Transportation Engineers (ITE). The following land use was utilized to estimate the amount of new traffic generated for this development:

- 875 Single-family Detached Housing Units (ITE Land Use Code 210)
- 475 Multi-family Housing (Low-Rise) Units (ITE Land Use Code 220)
- 60,000 SF Shopping Center (ITE Land Use Code 820)

Table 1
GRANARY AT DRAPER FARMS PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
LUC 210: 875 Single Family Detached Housing	157	473	630	517	303	820	409	348	757
LUC 220: 475 Multi-Family Housing (Low-Rise)	48	159	207	147	87	234	256	218	474
Internal Trips	-4	-6	-10	-50	-18	-68	-51	-22	-73
LUC 820: Shopping Center	113	69	182	179	193	372	215	198	413
Internal Trips	-6	-4	-10	-18	-50	-68	-22	-51	-73
TOTAL TRIPS	**308**	**691**	**999**	**775**	**515**	**1290**	**807**	**691**	**1498**

Overview of TIS

Intersections examined:

1) Delaware Route 30/ Site Access A
2) Sand Hill Road (Sussex Road 319) / Lavinia Street (Sussex Road 250)/Site Access B
3) Sand Hill Road/Site Access C

4) Delaware Route 30 / Reynolds Pond Rd (Sussex Road 241)
5) Delaware Route 16 / Saw Mill Road (Sussex Road 239)
6) Delaware Route 30 / Delaware Route 16
7) Delaware Route 16 / Mulberry Street (Sussex Road 197) / Mulberry Street Ext. (Sussex Road 212)
8) Delaware Route 5 / Delaware Route 16
9) Mulberry Street / Lavinia Street
10) Delaware Route 5 / Magnolia Street
11) Delaware Route 5 / Front Street
12) Delaware Route 5 / Mulberry Street / Wharton Street (Sussex Road 88)
13) Delaware Route 5 / Sand Hill Road
14) Delaware Route 5 / Shingle Point Road (Sussex Road 249)
15) Delaware Route 5 / Heritage Boulevard
16) Delaware Route 5 / Pettyjohn Road (Sussex Road 255)
17) Delaware Route 30 / Sand Hill Road
18) Delaware Route 30 / Neptune Road (Sussex Road 251)
19) Delaware Route 30 / Huff Road (Sussex Road 252)
20) Delaware Route 30 / Shingle Point Road
21) Sand Hill Road / Burton Road (Sussex Road 241)
22) Sand Hill Road / Donovan Road (Sussex Road 242)
23) Sand Hill Road / Huff Road
24) Burton Road / E. Redden Road (Sussex Road 565)

Conditions examined:

1) 2021 Existing (Case 1)
2) 2041 No-Build (Case 2)
3) 2041 Build (Case 3)

Peak hours evaluated: Weekday morning and evening peak hours, and Saturday mid-day peak hour for select intersections

Committed developments considered:

1) Heritage Creek 1 (58 Senior Adult Housing – detached)
2) Captains Way (240 Mobile Home units, 1,500 sq. ft. Shopping Center)
3) Hawthorne (f.k.a. Paradise Lakes) (254 Single-Family Detached Housing)
4) Azalea Woods (f.k.a. Wilson Moore) (610 Single-Family Detached Housing)
5) Vines at Sand Hill (f.k.a. Sand Hill Valley/Sposato Property) (393 Single-Family Detached Housing)
6) Royal Farm #428 – Milton (5,154 sq. ft. Super Convenience Market w/ Gas)
7) Cyprus Grove (f.k.a. Clifton Property) (71 Multifamily Low-Rise units, 168 Multifamily Mid-Rise units, 20,000 sq. ft. Shopping Center)
8) Four Winds Farm (336 Single-Family Detached Housing)

Intersection Descriptions

1) **Delaware Route 30 & Site Access A**
   Type of Control: proposed minor stop-controlled T-intersection
   Northbound Approach: (DE Route 30) proposed through lane and left-turn lane
   Southbound Approach: (DE Route 30) proposed through lane and right-turn lane
   Westbound Approach: (Site Access A) proposed right-turn lane and left-turn lane

2) **Sand Hill Road / Lavinia Street & Site Access B**
   Type of Control: proposed minor stop-controlled intersection
   Northbound Approach: (Site Access B) shared left-turn / through lane and a right-turn lane
   Southbound Approach: (Lavinia St) shared left-turn / through / right-turn lane
   Eastbound Approach: (Sand Hill Rd) left-turn lane and a shared through / right-turn lane
   Westbound Approach: (Sand Hill Rd) shared left-turn / through lane and a right-turn lane

3) **Sand Hill Road & Site Access C**
   Type of Control: proposed minor stop-controlled intersection
   Northbound Approach: (Site Access C) shared left-turn / through / right-turn lane
   Southbound Approach: (Site Access C) shared left-turn / through / right-turn lane
   Eastbound Approach: (Sand Hill Rd) left-turn lane, through lane, and a right-turn lane
   Westbound Approach: (Sand Hill Rd) left-turn lane, through lane, and a right-turn lane

4) **Delaware Route 30 & Reynolds Pond Rd**
   Type of Control: minor stop-controlled intersection
   Northbound Approach: (DE Route 30) shared left-turn / through / right-turn lane
   Southbound Approach: (DE Route 30) shared left-turn / through / right-turn lane
   Eastbound Approach: (Reynolds Pond Rd) shared left-turn / through / right-turn lane
   Westbound Approach: (Reynolds Pond Rd) shared left-turn / through / right-turn lane

5) **Delaware Route 16 & Saw Mill Road**
   Type of Control: minor stop-controlled T-intersection
   Northbound Approach: (Saw Mill Rd) shared right-turn / left-turn lane
   Eastbound Approach: (DE Route 16) shared through / right-turn lane
   Westbound Approach: (DE Route 16) shared through / left-turn lane

6) **Delaware Route 30 & Delaware Route 16**
   Type of Control: signalized intersection
   Northbound Approach: (DE Route 30) shared through / left-turn lane and a right-turn lane
   Southbound Approach: (DE Route 30) shared left-turn / through / right-turn lane
   Eastbound Approach: (DE Route 16) shared left-turn / through / right-turn lane
   Westbound Approach: (DE Route 16) shared left-turn / through / right-turn lane

7) **Delaware Route 16 & Mulberry Street / Mulberry Street Ext.**
Type of Control: minor stop-controlled intersection
Northbound Approach: (Mulberry St) shared left-turn / through / right-turn lane
Southbound Approach: (Mulberry St Ext) shared left-turn / through / right-turn lane
Eastbound Approach: (DE Route 16) shared left-turn / through / right-turn lane
Westbound Approach: (DE Route 16) shared left-turn / through / right-turn lane

8) **Delaware Route 5 & Delaware Route 16**
Type of Control: signalized intersection
Northbound Approach: (DE Route 5) shared left-turn / through / right-turn lane
Southbound Approach: (DE Route 5) shared left-turn / through / right-turn lane
Eastbound Approach: (DE Route 16) shared left-turn / through / right-turn lane
Westbound Approach: (DE Route 16) shared left-turn / through / right-turn lane

9) **Mulberry Street & Lavinia Street**
Type of Control: minor stop-controlled intersection
Northbound Approach: (Mulberry St) shared through / left-turn lane
Southbound Approach: (Mulberry St) shared through / right-turn lane
Eastbound Approach: (Lavinia St) shared right-turn / left-turn lane

10) **Delaware Route 5 & Magnolia Street**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (DE Route 5) shared through / left-turn lane
Southbound Approach: (DE Route 5) shared through / right-turn lane
Eastbound Approach: (Magnolia St) shared right-turn / left-turn lane

11) **Delaware Route 5 & Front Street**
Type of Control: stop-controlled intersection
Northbound Approach: (Federal St) shared left-turn / through / right-turn lane
Southbound Approach: (Federal St) shared left-turn / through / right-turn lane
Eastbound Approach: (DE Route 5) shared left-turn / through lane and a channelized right-turn lane
Westbound Approach: (Front St) shared left-turn / through / right-turn lane

12) **Delaware Route 5 & Mulberry Street / Wharton Street**
Type of Control: minor stop-controlled intersection
Northbound Approach: (DE Route 5) shared left-turn / through / right-turn lane
Southbound Approach: (DE Route 5) shared left-turn / through / right-turn lane
Eastbound Approach: (Mulberry St) shared left-turn / through / right-turn lane
Westbound Approach: (Wharton St) shared left-turn / through / right-turn lane

13) **Delaware Route 5 & Sand Hill Road**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (DE Route 5) left-turn lane and a through lane
Southbound Approach: (DE Route 5) channelized right-turn lane and a through lane
Eastbound Approach: (Sand Hill Rd) left-turn lane and a channelized right-turn lane

14) **Delaware Route 5 & Shingle Point Road**
Type of Control: minor stop-controlled intersection
Northbound Approach: (DE Route 5) shared left-turn / through lane and a right-turn lane
Southbound Approach: (DE Route 5) shared left-turn / through lane and a right-turn lane
Eastbound Approach: (Shingle Point Rd) shared left-turn / through / right-turn lane
Westbound Approach: (Chestnut St) shared left-turn / through / right-turn lane

15) **Delaware Route 5 & Heritage Boulevard**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (DE Route 5) through lane and a right-turn lane
Southbound Approach: (DE Route 5) left-turn lane and a bypass lane
Eastbound Approach: (Heritage Blvd) shared left-turn / right-turn lane

16) **Delaware Route 5 & Pettyjohn Road**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (Pettyjohn Rd) shared left-turn / right-turn lane
Eastbound Approach: (DE Route 5) through lane and a right-turn lane
Westbound Approach: (DE Route 5) shared left-turn / through lane

17) **Delaware Route 30 & Sand Hill Road**
Type of Control: all-way stop-controlled intersection
Northbound Approach: (DE Route 30) shared left-turn / through lane and a right-turn lane
Southbound Approach: (DE Route 30) shared left-turn / through lane and a right-turn lane
Eastbound Approach: (Sand Hill Rd) shared left-turn / through / right-turn lane
Westbound Approach: (Sand Hill Rd)) shared left-turn / through lane and a channelized right-turn lane

18) **Delaware Route 30 & Neptune Road**
Type of Control: minor stop-controlled intersection
Northbound Approach: (DE Route 30) shared left-turn / through / right-turn lane
Southbound Approach: (DE Route 30) shared left-turn / through / right-turn lane
Eastbound Approach: (Neptune Rd) shared left-turn / through / right-turn lane
Westbound Approach: (Neptune Rd) shared left-turn / through / right-turn lane

19) **Delaware Route 30 & Huff Road**
Type of Control: minor stop-controlled intersection
Northbound Approach: (Huff Rd) shared left-turn / through / right-turn lane
Southbound Approach: (Huff Rd) shared left-turn / through / right-turn lane
Eastbound Approach: (DE Route 30) shared left-turn / through / right-turn lane
Westbound Approach: (DE Route 30) shared left-turn / through / right-turn lane

20) **Delaware Route 30 & Shingle Point Road**
Type of Control: minor stop-controlled t-intersection
Northbound Approach: (Shingle Point Rd) shared left-turn / right-turn lane
Eastbound Approach: (DE Route 30) through lane and a channelized right-turn lane
Westbound Approach: (DE Route 30) shared through / left-turn / right-turn lane

21) **Sand Hill Road & Burton Road**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (Sand Hill Road) shared left-turn / through lane
Southbound Approach: (Sand Hill Road) shared right-turn / through lane
Eastbound Approach: (Burton Rd) shared left-turn / right-turn lane

22) **Sand Hill Road & Donovan Road**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (Sand Hill Road) shared left-turn / through lane
Southbound Approach: (Sand Hill Road) shared right-turn / through lane
Eastbound Approach: (Donovan Rd) shared left-turn / right-turn lane

23) **Sand Hill Road & Huff Road**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (Sand Hill Road) shared right-turn / through lane
Southbound Approach: (Sand Hill Road) shared left-turn / through lane
Westbound Approach: (Huff Rd) shared left-turn / right-turn lane

24) **Burton Road & E. Redden Road**
Type of Control: minor stop-controlled T-intersection
Northbound Approach: (Burton Rd) shared left-turn / right-turn lane
Eastbound Approach: (Redden Rd) shared left-turn / through lane
Westbound Approach: (Redden Rd) shared right-turn / through lane

Safety Evaluation

Crash Data: Delaware Crash Analysis Reporting System (CARS) data was provided in Appendix B of the TIS for the period from January 28, 2019 through January 28, 2022. The crash data shows that a significant number of crashes occurred at the intersection of Delaware Route 16 & Delaware Route 30 (37 crashes), Delaware Route 16 & Mulberry St. (19 crashes), Delaware Route 16 & Delaware Route 5 (13 crashes), Delaware Route 30 & Sand Hill Rd. (20 crashes), and Delaware Route 30 & Shingle Point Rd. (12 crashes). It is noted that the DelDOT Project *"HEP SC, SR 30 and SR 16 Intersection Improvements"* is set to address deficiencies at the intersection of Delaware Route 16 and Delaware Route 30.

Sight Distance: The proposed site accesses on both Sand Hill Road and Delaware Route 30 were observed to have an unobstructed view looking from the proposed driveway approaches with no apparent visual obstructions in either direction. As always adequacy of available sight distance must be confirmed during the site plan review process for all proposed movements at the site access.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates one bus route that travels through the study area (Intercounty Bus Route 303, located approximately 1,100 feet north of the intersection of Delaware Route 5 & Sand Hill Road and runs along Delaware Route 5).

Planned transit service: Based on coordination with DTC representatives, no additional transit service is anticipated, but bicycle parking is requested through the site with covered bicycle parking at the apartment buildings to encourage non-motorized travel.

Existing bicycle and pedestrian facilities: There are numerous existing bicycle lanes and trails throughout the study area. According to the Sussex County Bicycle Map: Sand Hill Road, Lavinia St, Delaware Route 5, Delaware Route 16, Delaware Route 30, E Redden Road and Prettyman Road are all officially recognized bicycle routes. Regional routes include Delaware Route 16, Delaware Route 5, Delaware Route 30 and Federal St. Connector routes include E Redden, Sand Hill Road and Lavinia St.

Planned bicycle and pedestrian facilities: Through coordination with DelDOT, the following bicycle and pedestrian facilities are being recommended: a Shared Use Path (SUP) along all frontages to property limits with appropriate internal connections, a connection to the existing Rails to Trail path, and a safe crossing of Sand Hill Road.

Previous Comments

In a review letter dated January 4, 2022, comments were given on the Granary at Draper Farms development TIS including: updates to the 2019 Saturday Traffic counts, updates to the northbound volumes at the intersection of Front Street and Delaware Route 5, application of the appropriate seasonal adjustment factor at the intersection of Donovan Road / Sand Hill Road and Delaware Route 5 and Wharton St., and the inclusion of private driveways' turning movement counts at the intersection of Neptune Road / Delaware Route 30 and Huff Road / Delaware Route 30. Those concerns appear to have been addressed and accepted per a response letter dated January 19, 2022, with minor additional traffic count and committed development comments. In a review letter dated February 16, 2022, the traffic counts were found to be acceptable and the developer was directed to proceed with the Final TIS.

It appears that all substantive comments from DelDOT's TIS Scoping Memorandum, Traffic Count Review, Preliminary TIS Review, and other correspondence were addressed in the Final TIS submission.

General HCS Analysis Comments
(see table footnotes on the following pages for specific comments)

1) For two-way stop control intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized and all-way stop control intersections, the TIS and McCormick Taylor applied HV by lane group using existing data. The TIS and McCormick Taylor generally assumed future HV to be the same as existing HV at all intersections. Both the TIS and McCormick Taylor assumed 3% HV for future movements to and from the proposed site access points (as per DelDOT's Development Coordination Manual section 2.2.8.11.6.H).

2) For existing conditions, the TIS and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts that were available. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F where applicable.

3) For analyses of all intersections, McCormick Taylor and the TIS assumed 0% grade for all movements.

Table 2
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [1] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Site Access A	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition (Case 3)						
Westbound Site Access A – Lefts	C (23.4)	F (55.2)	-	C (23.5)	F (55.3)	-
Westbound Site Access A – Rights	B (11.8)	B (12.1)	-	B (11.9)	B (12.1)	
Southbound DE Route 30 – Lefts	A (8.3)	A (9.4)	-	A (8.3)	A (9.3)	

[1] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 3
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [2] **One-Way Stop (T-Intersection)**	**LOS per TIS**			**LOS per McCormick Taylor**		
Sand Hill Rd & **Lavinia St / Site Access B**	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Sand Hill Rd – Lefts	A (7.9)	A (7.9)	-	A (9.2)	A (9.4)	-
Southbound Lavinia St	B (10.3)	B (10.5)	-	A (9.5)	A (9.6)	-
2041 No Build Condition (Case 2)						
Eastbound Sand Hill Rd – Lefts	A (8.1)	A (8.0)	-	A (9.4)	A (9.6)	-
Southbound Lavinia St	B (10.8)	B (11.0)	-	A (9.9)	B (10.0)	-
2041 Build Condition (Case 3)						
Eastbound Redden Rd – Lefts	A (8.3)	A (8.2)	-	A (9.6)	A (9.9)	-
Westbound Redden Rd – Lefts	A (8.2)	A (8.5)		B (11.4)	B (12.4)	
Northbound Site Access B – Left/Thrus	E (35.6)	E (44.5)		C (24.9)	E (41.5)	
Northbound Site Access B – Rights	B (11.2)	B (10.5)		B (11.4)	B (10.9)	
Southbound Burton	C (16.6)	C (29.8)	-	B (12.0)	C (19.3)	-

[2] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 4
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [3] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Sand Hill Rd & Site Access C	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition (Case 3)						
Eastbound Sand Hill Rd – Lefts	A (7.9)	A (8.4)	-	A (9.4)	B (10.1)	-
Westbound Sand Hill Rd – Lefts	A (8.5)	A (8.3)	-	B (12.4)	B (11.9)	
Northbound Site Access C	C (20.5)	C (20.9)	-	C (17.0)	C (17.8)	-
Southbound Site Access C	C (23.7)	D (27.9)	-	B (11.5)	B (12.7)	

[3] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 5
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [4] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Reynolds Pond Road	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Reynolds Pond Rd	B (12.0)	B (12.6)	-	B (12.0)	B (12.6)	-
Westbound Reynolds Pond Rd	B (12.2)	B (12.2)	-	B (12.2)	B (12.2)	-
Northbound DE Route 30 – Lefts	A (7.8)	A (7.7)	-	A (7.8)	A (7.7)	-
Southbound DE Route 30 – Lefts	A (7.6)	A (7.8)	-	A (7.6)	A (7.8)	-
2041 No Build Condition (Case 2)						
Eastbound Reynolds Pond Rd	B (12.8)	B (14.2)	-	B (12.8)	B (14.2)	-
Westbound Reynolds Pond Rd	B (13.2)	B (13.6)	-	B (13.2)	B (13.6)	-
Northbound DE Route 30 – Lefts	A (7.9)	A (7.9)	-	A (7.9)	A (7.9)	-
Southbound DE Route 30 – Lefts	A (7.7)	A (7.9)	-	A (7.7)	A (7.9)	-
2041 Build Condition (Case 3)						
Eastbound Reynolds Pond Rd	B (13.5)	C (15.2)	-	B (13.5)	C (15.2)	-
Westbound Reynolds Pond Rd	B (14.0)	B (14.4)	-	B (14.0)	B (14.4)	-
Northbound DE Route 30 – Lefts	A (8.0)	A (8.0)	-	A (8.0)	A (8.0)	-
Southbound DE Route 30 – Lefts	A (7.8)	A (8.0)	-	A (7.8)	A (8.0)	-

[4] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 6
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [5] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 16 & Saw Mill Road	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Westbound DE Route 16 – Lefts	A (8.4)	A (8.2)	A (8.2)	A (8.4)	A (8.2)	A (8.2)
Northbound Saw Mill Rd	B (11.5)	B (12.2)	B (11.5)	B (11.5)	B (12.2)	B (11.5)
2041 No Build Condition (Case 2)						
Westbound DE Route 16 – Lefts	A (8.8)	A (8.8)	A (8.7)	A (8.8)	A (8.8)	A (8.7)
Northbound Saw Mill Rd	B (12.8)	B (15.0)	B (13.0)	B (12.8)	B (15.0)	B (13.0)
2041 Build Condition (Case 3)						
Westbound DE Route 16 – Lefts	A (8.9)	A (9.2)	A (9.1)	A (8.9)	A (9.2)	A (9.1)
Northbound Saw Mill Rd	B (13.6)	C (17.4)	B (14.6)	B (13.6)	C (17.4)	B (14.6)

[5] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 7
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Signalized Intersection [6]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 16 & Delaware Route 30	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)	B (14.0)	B (15.6)	B (15.8)	B (14.0)	B (15.6)	B (15.8)
2041 No Build Condition (Case 2)	B (18.3)	E (58.7)	D (38.6)	B (17.8)	E (55.9)	D (35.3)
2041 Build Condition (Case 3)	D (51.8)	F (130.4)	F (123.9)	D (48.7)	F (128.3)	F (126.8)
Roundabout Intersection [6]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 16 & Delaware Route 30	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition w/ DelDOT Improvements (Case 4)	C (22.2)	D (26.0)	D (27.2)	C (22.2)	D (26.0)	D (27.2)

[6] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 8
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [7] **Two-Way Stop**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 16 & Mulberry St / Mulberry St Ext	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound DE Route 16 – Lefts	A (7.9)	A (8.3)	A (8.1)	A (9.3)	A (9.9)	A (9.6)
Westbound DE Route 16 – Lefts	A (8.3)	A (8.2)	A (8.7)	A (8.3)	A (8.2)	A (8.7)
Northbound Mulberry St	D (26.0)	F (56.6)	E (40.5)	C (23.0)	E (45.7)	D (33.0)
Southbound Mulberry St Ext	D (25.8)	D (28.2)	C (24.5)	D (26.0)	D (28.9)	C (24.6)
2041 No Build Condition (Case 2)						
Eastbound DE Route 16 – Lefts	A (8.1)	A (8.6)	A (8.3)	A (9.5)	B (10.3)	A (9.9)
Westbound DE Route 16 – Lefts	A (8.7)	A (8.5)	A (9.1)	A (8.7)	A (8.5)	A (9.1)
Northbound Mulberry St	F (67.2)	F (253.4)	F (148.5)	F (57.8)	F (216.4)	F (113.8)
Southbound Mulberry St Ext	F (52.0)	F (60.4)	E (48.0)	F (53.0)	F (66.7)	E (49.3)
2041 Build Condition (Case 3)						
Eastbound DE Route 16 – Lefts	A (8.1)	A (8.7)	A (8.4)	A (9.5)	B (10.4)	B (10.0)
Westbound DE Route 16 – Lefts	A (8.8)	A (8.7)	A (9.3)	A (8.8)	A (8.7)	A (9.3)
Northbound Mulberry St	F (144.9)	F (535.4)	F (400.7)	F (135.7)	F (537.9)	F (363.9)
Southbound Mulberry St Ext	F (80.2)	F (144.3)	F (131.5)	F (84.0)	F (202.2)	F (153.5)
Signalized Intersection [7]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 16 & Mulberry St / Mulberry St Ext	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition	B (11.7)	B (13.5)	B (11.9)	B (11.7)	B (13.6)	B (11.9)

[7] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 9
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Signalized Intersection [8]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Delaware Route 16	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)	B (10.2)	B (12.6)	B (11.8)	A (10.0)	B (12.6)	B (11.8)
2041 No Build Condition (Case 2)	B (14.3)	D (41.2)	C (25.9)	B (14.1)	D (42.0)	C (26.7)
2041 Build Condition (Case 3)	B (17.7)	F (81.2)	D (54.1)	B (17.2)	F (83.1)	E (56.1)
2041 Build Condition (Case 3) *w/ Signal Timing Changes*	B (16.7)	D (49.3)	D (45.1)	B (16.9)	D (54.8)	D (50.3)
2041 Build Condition (Case 3) *w/ Planned Improvements by Others* [9]	N/A	N/A	N/A	B (15.6)	C (25.6)	C (22.4)

[8] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[9] Planned Improvements by Others includes the addition of left-turn lanes on the eastbound and westbound approaches of Delaware Route 16 and a right-turn lane on the southbound approach of Delaware Route 5.

Table 10
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [10] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Mulberry St & Lavinia St	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Lavinia St	B (11.9)	B (13.2)	-	B (11.9)	B (13.2)	-
Northbound Mulberry St – Lefts	A (7.9)	A (7.9)	-	A (7.9)	A (7.9)	-
2041 No Build Condition (Case 2)						
Eastbound Lavinia St	B (12.9)	B (13.5)	-	B (12.9)	B (13.5)	-
Northbound Mulberry St – Lefts	A (8.0)	A (8.0)	-	A (7.9)	A (8.0)	-
2041 Build Condition (Case 3)						
Eastbound Lavinia St	B (14.3)	B (14.9)	-	B (14.3)	B (14.9)	-
Northbound Mulberry St – Lefts	A (8.0)	A (8.1)	-	A (8.0)	A (8.1)	-

[10] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 11
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [11] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Magnolia St	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Magnolia St	B (10.5)	B (11.6)	-	B (10.5)	B (11.6)	-
Northbound DE Route 5 – Lefts	A (7.8)	A (7.9)	-	A (7.8)	A (7.9)	-
2041 No Build Condition (Case 2)						
Eastbound Magnolia St	B (12.3)	B (14.1)	-	B (12.3)	B (14.1)	-
Northbound DE Route 5 – Lefts	A (8.1)	A (8.3)	-	A (8.1)	A (8.3)	-
2041 Build Condition (Case 3)						
Eastbound Magnolia St	B (13.1)	C (15.5)	-	B (13.0)	C (15.5)	-
Northbound DE Route 5 – Lefts	A (8.2)	A (8.5)	-	A (8.2)	A (8.5)	-

[11] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 12
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [12] **Two-Way Stop, One-Way Yield**	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & **Front St/Federal St**	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound DE Route 5	A (2.1)	A (2.7)	-	A (2.5)	A (3.1)	-
Westbound Front St	A (5.7)	A (7.1)	-	A (5.7)	A (7.1)	-
Southbound Federal St	A (4.3)	A (5.3)	-	A (3.9)	A (5.1)	-
2041 No Build Condition (Case 2)						
Eastbound DE Route 5	A (2.7)	A (3.9)	-	A (3.0)	A (4.6)	-
Westbound Front St	A (6.8)	A (8.4)	-	A (6.5)	B (10.7)	-
Southbound Federal St	A (5.7)	A (6.7)	-	A (3.8)	A (6.3)	-
2041 Build Condition (Case 3)						
Eastbound DE Route 5	A (3.1)	A (4.5)	-	A (3.1)	A (4.6)	-
Westbound Front St	A (7.4)	A (9.1)	-	A (7.3)	B (10.1)	-
Southbound Federal St	A (5.9)	A (7.4)	-	A (4.6)	A (6.0)	-

[12] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 13
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [13] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Wharton St/Mulberry St	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Mulberry St	C (18.5)	C (20.4)	-	C (18.5)	C (20.5)	-
Westbound Wharton St	C (21.3)	E (35.6)	-	C (21.9)	E (36.3)	-
Northbound DE Route 5 – Lefts	A (7.6)	A (7.8)	-	A (7.6)	A (7.8)	-
Southbound DE Route 5 – Lefts	A (8.0)	A (7.7)	-	A (8.0)	A (7.7)	-
2041 No Build Condition (Case 2)						
Eastbound Mulberry St	D (33.6)	D (33.3)	-	D (33.5)	D (33.9)	-
Westbound Wharton St	E (49.3)	F (100.7)	-	F (57.4)	F (108.5)	-
Northbound DE Route 5 – Lefts	A (7.8)	A (8.1)	-	A (7.8)	A (8.1)	-
Southbound DE Route 5 – Lefts	A (8.3)	A (7.9)	-	A (8.3)	A (7.9)	-
2041 Build Condition (Case 3)						
Eastbound Mulberry St	F (69.6)	F (64.3)	-	F (68.9)	F (66.1)	-
Westbound Wharton St	F (474.1)	F (927.6)	-	F (711.3)	F (1058.3)	-
Northbound DE Route 5 – Lefts	A (7.9)	A (8.3)	-	A (7.9)	A (8.3)	-
Southbound DE Route 5 – Lefts	A (8.9)	A (8.2)	-	A (8.9)	A (8.2)	-
Signalized Intersection [13]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Wharton St/Mulberry St	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition	C (30.0)	C (31.2)	-	C (30.0)	C (31.2)	-

[13] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 14
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [14] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Sand Hill Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Sand Hill Rd – Lefts	C (21.0)	C (20.5)	-	C (20.9)	C (20.4)	-
Eastbound Sand Hill Rd – Rights	B (10.8)	B (10.7)	-	B (10.8)	B (10.7)	-
Northbound DE Route 5 – Lefts	A (8.1)	A (8.6)	-	A (8.0)	A (8.4)	-
2041 No Build Condition (Case 2)						
Eastbound Sand Hill Rd – Lefts	D (29.7)	E (37.0)	-	D (29.5)	E (36.4)	-
Eastbound Sand Hill Rd – Rights	B (11.5)	B (12.7)	-	B (11.5)	B (12.7)	-
Northbound DE Route 5 – Lefts	A (8.3)	A (9.3)	-	A (8.2)	A (9.0)	-
2041 Build Condition (Case 3)						
Eastbound Sand Hill Rd – Lefts	F (226.4)	F (391.0)	-	F (222.9)	F (374.5)	-
Eastbound Sand Hill Rd – Rights	B (12.3)	B (13.8)	-	B (12.6)	B (13.8)	-
Northbound DE Route 5 – Lefts	A (8.7)	B (11.1)	-	A (8.6)	B (10.7)	-
Unsignalized Intersection [14] All-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Sand Hill Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition w/ Improvements (Case 4)						
Eastbound Sand Hill Rd – Lefts	C (24.1)	C (18.2)	-	C (24.1)	C (18.2)	-
Eastbound Sand Hill Rd – Rights	C (16.2)	C (17.5)	-	C (16.2)	C (17.5)	-
Northbound DE Route 5 – Lefts	C (15.4)	C (23.0)	-	C (15.4)	C (23.0)	-
Northbound DE Route 5 – Thrus	D (26.4)	D (28.4)	-	D (26.4)	D (28.4)	-
Southbound DE Route 5 – Thrus	C (17.7)	D (27.5)	-	C (17.7)	D (27.5)	-
Southbound DE Route 5 – Rights	B (11.5)	C (17.4)	-	B (11.5)	C (17.4)	-

[14] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 15
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [15] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Shingle Point Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Shingle Point Rd	C (15.7)	C (19.8)	-	C (19.4)	C (22.1)	-
Westbound Shingle Point Rd	C (16.5)	C (16.5)	-	C (17.3)	C (17.1)	-
Northbound DE Route 5 – Lefts	A (8.1)	A (8.0)	-	A (8.1)	A (8.1)	-
Southbound DE Route 5 – Lefts	A (8.4)	A (8.2)	-	A (8.1)	A (8.1)	-
2041 No Build Condition (Case 2)						
Eastbound Shingle Point Rd	D (34.2)	E (49.9)	-	E (41.4)	F (70.6)	-
Westbound Shingle Point Rd	C (17.7)	C (22.9)	-	C (18.2)	C (22.5)	-
Northbound DE Route 5 – Lefts	A (8.3)	A (8.5)	-	A (8.3)	A (8.6)	-
Southbound DE Route 5 – Lefts	A (8.4)	A (8.4)	-	A (8.2)	A (8.3)	-
2041 Build Condition (Case 3)						
Eastbound Shingle Point Rd	F (51.7)	F (122.0)	-	F (69.9)	F (190.8)	-
Westbound Shingle Point Rd	C (19.8)	D (26.2)	-	C (19.9)	D (25.4)	-
Northbound DE Route 5 – Lefts	A (8.5)	A (8.7)	-	A (8.5)	A (8.8)	-
Southbound DE Route 5 – Lefts	A (8.4)	A (8.5)	-	A (8.2)	A (8.4)	-
Signalized Intersection [15]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Shingle Point Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition	B (14.4)	B (14.7)	-	B (14.4)	B (14.7)	-

[15] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 16
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [16] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Heritage Blvd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Westbound Heritage Blvd – Lefts	B (14.2)	B (14.2)	-	B (14.1)	B (14.4)	-
Westbound Heritage Blvd – Rights	B (10.3)	B (10.3)	-	B (10.2)	B (10.3)	-
Southbound DE Route 5 – Lefts	A (8.2)	A (8.0)	-	A (8.0)	A (8.0)	-
2041 No Build Condition (Case 2)						
Westbound Heritage Blvd – Lefts	C (16.1)	C (16.2)	-	C (16.1)	C (16.4)	-
Westbound Heritage Blvd – Rights	B (10.8)	B (10.7)	-	B (10.8)	B (10.7)	-
Southbound DE Route 5 – Lefts	A (8.4)	A (8.2)	-	A (8.2)	A (8.2)	-
2041 Build Condition (Case 3)						
Westbound Heritage Blvd – Lefts	C (17.1)	C (17.2)	-	C (17.0)	C (17.4)	-
Westbound Heritage Blvd – Rights	B (10.9)	B (11.0)	-	B (10.9)	B (11.0)	-
Southbound DE Route 5 – Lefts	A (8.5)	A (8.3)	-	A (8.2)	A (8.3)	-

[16] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 17
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [17] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 5 & Pettyjohn Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Westbound Pettyjohn Rd	A (8.8)	A (9.3)	-	B (11.9)	B (11.0)	-
Northbound DE Route 5 – Lefts	A (8.0)	A (8.0)	-	A (8.0)	A (8.0)	-
2041 No Build Condition (Case 2)						
Westbound Pettyjohn Rd	B (12.0)	A (9.9)	-	B (14.3)	B (13.3)	-
Northbound DE Route 5 – Lefts	A (8.2)	A (8.2)	-	A (8.2)	A (8.2)	-
2041 Build Condition (Case 3)						
Westbound Pettyjohn Rd	B (12.6)	B (10.4)	-	C (15.1)	B (13.9)	-
Northbound DE Route 5 – Lefts	A (8.3)	A (8.3)	-	A (8.3)	A (8.3)	-

[17] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 18
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [18] All-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Sand Hill Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Overall	C (19.2)	C (15.8)	-	C (19.2)	C (15.8)	-
Eastbound Sand Hill Rd	C (16.3)	C (15.9)	-	C (16.3)	C (15.9)	-
Westbound Sand Hill Rd	B (11.7)	B (12.0)	-	B (11.7)	B (12.0)	-
Northbound DE Route 30	B (13.6)	B (15.0)	-	B (13.6)	B (15.0)	-
Southbound DE Route 30	D (25.5)	C (18.5)	-	D (25.5)	C (18.5)	-
2041 No Build Condition (Case 2)						
Overall	E (39.8)	F (54.6)	-	E (39.8)	F (54.6)	-
Eastbound Sand Hill Rd	C (22.6)	D (25.6)	-	C (22.6)	D (25.6)	-
Westbound Sand Hill Rd	B (14.3)	C (15.7)	-	B (14.3)	C (15.7)	-
Northbound DE Route 30	D (25.4)	D (30.4)	-	D (25.4)	D (30.4)	-
Southbound DE Route 30	F (65.2)	F (99.0)	-	F (65.2)	F (99.0)	-
2041 Build Condition (Case 3)						
Overall	F (113.6)	F (174.0)	-	F (113.6)	F (174.0)	-
Eastbound Sand Hill Rd	E (45.0)	F (82.2)	-	E (45.0)	F (82.2)	-
Westbound Sand Hill Rd	D (26.9)	D (26.7)	-	D (26.9)	D (26.7)	-
Northbound DE Route 30	F (117.7)	F (99.9)	-	F (117.7)	F (99.9)	-
Southbound DE Route 30	F (197.2)	F (343.3)	-	F (197.2)	F (343.3)	-
Signalized Intersection [18]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Sand Hill Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition	C (21.9)	C (33.2)	-	C (21.9)	C (33.2)	-

[18] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 19
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [19] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Neptune Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Neptune Rd	B (10.6)	B (11.5)	-	B (10.6)	B (11.5)	-
Westbound Neptune Rd	B (14.0)	A (9.7)	-	B (11.9)	A (9.7)	-
Northbound DE Route 30 – Lefts	A (7.7)	A (7.8)	-	A (7.7)	A (7.8)	-
Southbound DE Route 30 – Lefts	A (7.6)	A (7.8)	-	A (7.6)	A (7.8)	-
2041 No Build Condition (Case 2)						
Eastbound Neptune Rd	B (12.1)	B (14.6)	-	B (12.1)	B (14.6)	-
Westbound Neptune Rd	C (17.8)	B (10.4)	-	B (14.2)	B (10.4)	-
Northbound DE Route 30 – Lefts	A (7.9)	A (8.2)	-	A (7.9)	A (8.3)	-
Southbound DE Route 30 – Lefts	A (7.9)	A (8.0)	-	A (7.9)	A (8.0)	-
2041 Build Condition (Case 3)						
Eastbound Neptune Rd	B (14.4)	C (17.5)	-	B (14.3)	C (17.5)	-
Westbound Neptune Rd	C (23.0)	B (11.4)	-	C (17.3)	B (11.5)	-
Northbound DE Route 30 – Lefts	A (8.3)	A (8.5)	-	A (8.3)	A (8.6)	-
Southbound DE Route 30 – Lefts	A (8.0)	A (8.4)	-	A (8.0)	A (8.4)	-

[19] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 20
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [20] Two-Way Stop	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Huff Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Huff Rd	B (11.2)	B (13.6)	-	B (11.0)	B (13.8)	-
Westbound Huff Rd	A (0.0)	C (17.0)	-	A (0.0)	C (15.0)	-
Northbound DE Route 30 – Lefts	A (8.0)	A (7.9)	-	A (8.0)	A (7.9)	-
Southbound DE Route 30 – Lefts	A (7.6)	A (7.8)	-	A (7.6)	A (7.8)	-
2041 No Build Condition (Case 2)						
Eastbound Huff Rd	C (17.7)	D (25.7)	-	C (17.6)	D (27.0)	-
Westbound Huff Rd	A (0.0)	D (33.7)	-	A (0.0)	D (25.6)	-
Northbound DE Route 30 – Lefts	A (8.3)	A (8.6)	-	A (8.3)	A (8.7)	-
Southbound DE Route 30 – Lefts	A (7.8)	A (8.0)	-	A (7.8)	A (8.0)	-
2041 Build Condition (Case 3)						
Eastbound Huff Rd	D (31.3)	F (139.3)	-	D (31.9)	F (157.5)	-
Westbound Huff Rd	A (0.0)	E (38.7)	-	A (0.0)	D (28.5)	-
Northbound DE Route 30 – Lefts	A (8.8)	A (8.9)	-	A (8.7)	A (9.0)	-
Southbound DE Route 30 – Lefts	A (7.8)	A (8.1)	-	A (7.8)	A (8.1)	-
2041 Build Condition (Case 3) *w/ Improvements (add EB Left-Turn Lane)*						
Eastbound Huff Road – Lefts	D (29.8)	F (111.2)	-	D (31.1)	F (126.3)	-
Eastbound Huff Road – Thru/Rights	B (13.3)	B (12.4)	-	B (13.0)	B (12.5)	-

[20] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 21
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [21] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Shingle Point Road East	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Westbound Shingle Point Rd East	B (13.3)	B (14.2)	-	B (13.3)	B (14.3)	-
Southbound DE Route 30 – Lefts	A (8.3)	A (7.9)	-	A (7.7)	A (7.9)	-
2041 No Build Condition (Case 2)						
Westbound Shingle Point Rd East	D (27.4)	D (34.9)	-	D (27.4)	E (36.1)	-
Southbound DE Route 30 – Lefts	A (8.7)	A (8.3)	-	A (7.9)	A (8.3)	-
2041 Build Condition (Case 3)						
Westbound Shingle Point Rd East	E (45.9)	F (62.3)	-	E (45.7)	F (65.5)	-
Southbound DE Route 30 – Lefts	A (8.7)	A (8.5)	-	A (8.0)	A (8.5)	-
Delaware Route 30 & Shingle Point Road West	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Shingle Point Rd West	B (13.7)	C (16.2)	-	B (13.6)	C (16.3)	-
Northbound DE Route 30 – Lefts	A (8.1)	A (7.9)	-	A (8.0)	A (8.0)	-
2041 No Build Condition (Case 2)						
Eastbound Shingle Point Rd West	D (27.2)	F (78.4)	-	D (26.8)	F (79.0)	-
Northbound DE Route 30 – Lefts	A (8.6)	A (8.4)	-	A (8.5)	A (8.4)	-
2041 Build Condition (Case 3)						
Eastbound Shingle Point Rd West	E (38.1)	F (188.3)	-	E (37.4)	F (189.6)	-
Northbound DE Route 30 – Lefts	A (8.9)	A (8.6)	-	A (8.7)	A (8.6)	-
Signalized Intersection [21]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 30 & Shingle Point Road	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2041 Build Condition	B (12.2)	B (13.4)	-	B (12.2)	B (13.4)	-

[21] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 22
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [22] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Sand Hill Rd & Burton Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Burton Rd	B (11.0)	B (11.2)	-	B (11.6)	B (12.0)	-
Northbound Sand Hill Rd – Lefts	A (8.1)	A (8.2)	-	A (7.9)	A (7.9)	-
2041 No Build Condition (Case 2)						
Eastbound Burton Rd	B (12.0)	B (11.5)	-	B (12.5)	B (12.2)	-
Northbound Sand Hill Rd – Lefts	A (8.3)	A (8.2)	-	A (8.0)	A (8.0)	-
2041 Build Condition (Case 3)						
Eastbound Burton Rd	B (14.1)	B (14.9)	-	B (14.5)	B (15.3)	-
Northbound Sand Hill Rd – Lefts	A (8.6)	A (8.5)	-	A (8.3)	A (8.2)	-

[22] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 23
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [23] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Sand Hill Rd & Donovan Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Donovan Rd	B (11.3)	B (10.3)	-	B (11.9)	B (11.3)	-
Northbound Sand Hill Rd – Lefts	A (8.0)	A (7.7)	-	A (7.9)	A (7.8)	-
2041 No Build Condition (Case 2)						
Eastbound Donovan Rd	B (12.0)	B (11.1)	-	B (12.6)	B (12.1)	-
Northbound Sand Hill Rd – Lefts	A (8.1)	A (7.8)	-	A (8.0)	A (7.9)	-
2041 Build Condition (Case 3)						
Eastbound Donovan Rd	B (13.2)	B (12.3)	-	B (13.9)	B (13.4)	-
Northbound Sand Hill Rd – Lefts	A (8.3)	A (7.9)	-	A (8.2)	A (8.0)	-

[23] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 24
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [24] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Sand Hill Rd & Huff Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Westbound Huff Rd	B (11.3)	B (11.5)	-	B (11.5)	B (11.9)	-
Southbound Sand Hill Rd – Lefts	A (7.6)	A (7.8)	-	A (7.6)	A (7.8)	-
2041 No Build Condition (Case 2)						
Westbound Huff Rd	B (14.6)	C (15.9)	-	B (14.8)	C (16.4)	-
Southbound Sand Hill Rd – Lefts	A (7.7)	A (8.2)	-	A (7.7)	A (8.2)	-
2041 Build Condition (Case 3)						
Westbound Huff Rd	C (23.2)	D (26.6)	-	C (23.4)	D (27.3)	-
Southbound Sand Hill Rd – Lefts	A (7.9)	A (8.7)	-	A (7.9)	A (8.7)	-

[24] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 25
Peak Hour Levels of Service (LOS)
Based on Granary at Draper Farm Traffic Impact Study – March 2022
Prepared by The Traffic Group

Unsignalized Intersection [25] One-Way Stop (T-Intersection)	**LOS per TIS**			**LOS per McCormick Taylor**		
Redden Rd & Burton Rd	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing Condition (Case 1)						
Eastbound Redden Rd – Lefts	A (7.4)	A (7.4)	-	A (8.7)	A (8.8)	-
Southbound Burton Rd	A (8.1)	A (8.1)	-	A (8.5)	A (8.8)	-
2041 No Build Condition (Case 2)						
Eastbound Redden Rd – Lefts	A (7.5)	A (7.4)	-	A (8.8)	A (8.8)	-
Southbound Burton Rd	A (8.2)	A (8.7)	-	A (8.5)	A (8.8)	-
2041 Build Condition (Case 3)						
Eastbound Redden Rd – Lefts	A (7.5)	A (7.5)	-	A (8.8)	A (9.0)	-
Southbound Burton Rd	A (8.7)	A (8.9)	-	A (8.8)	A (9.0)	-

[25] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.