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

NICOLE MAJESKI
SECRETARY

December 23, 2022

Ms. Betty H. 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 **Somerton Chase** (Tax Parcels: 133-20.00-40.00, 41.00, 41.01, and 41.02) 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:km
Enclosures
cc with enclosures: Mr. Nick Hammonds, Jack Lingo Asset Management
Mr. Doug Motley, Jack Lingo Asset Management
Mr. Ring Lardner, Davis, Bowen & Friedel, Inc.
Ms. Carrie Kruger, Town of Millsboro
Mr. Jamie Whitehouse, Sussex County Planning & Zoning
Ms. Joanne M. Arellano, Johnson, Mirmiran, & Thompson, Inc.
Mr. Mir Wahed, Johnson, Mirmiran, & Thompson, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Deputy Secretary / Director of Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, Traffic, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Michael Simmons, Assistant Director, Project Development South, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Mark Galipo, Traffic Engineer, Traffic, DOTS
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
Sireen Muhtaseb, TIS Section Manager, Development Coordination
Kevin Hickman, Acting Sussex Review Coordinator, Development Coordination
Thomas Gagnon, Sussex County Subdivision Manager, Development Coordination
Annamaria Furmato, Project Engineer, Development Coordination
Philip Lindsey, Project Engineer, Development Coordination
Alistair Probert, South District Engineer, South District
Matthew Schlitter, South District Public Works Engineer, South District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning

December 23, 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 5-14A – Somerton Chase TIS

Dear Mr. Joinville:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the Somerton Chase development, which was prepared by The Traffic Group, Inc. dated May 26, 2022. This review was assigned as Task Number 5-14A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed residential development in the Town of Millsboro, Sussex County, Delaware, and would consist of 214 single-family detached houses. The site is located on the north side of Radish Road (Sussex Road 338), approximately 1,700 feet west of Hickory Hill Road/South Delaware Avenue (Sussex Road 82). The subject property is on an approximately 69.00-acre assemblage of parcels. The land is currently split-zoned as MR (Medium-Density Residential), and the developer does not plan to rezone the land. Construction for the development is anticipated to be completed in 2028.

The following two access scenarios were evaluated as part of the TIS:

- Case 3a - One full movement access on Radish Road
- Case 3b - One full movement access on Radish Road and one full movement access on Delaware Route 24 (Millsboro Highway) via Bramble Drive through a future interconnection with Plantation Lakes.

Additionally, a TIS addendum prepared by The Traffic Group, Inc. was submitted to DelDOT on July 6, 2022 to account for updated Summer Saturday peak hour counts collected at the Delaware Route 24/South Delaware Avenue intersection. This TIS review incorporates the addendum and the recommendations contained herein at that intersection are based on the updated counts.

DelDOT has several relevant and ongoing improvement projects within the study area including the *Corridor Capacity Preservation Program* (CCPP), which aims to maintain the regional importance and preserve the intended function and capacity of existing designated transportation routes within the Program. The main objectives of the program are listed below:

• Prevent the need to build an entirely new road
• Minimize the transportation impacts of increased economic growth
• Maintain an existing road's ability to handle traffic efficiently and safely
• Preserve the ability to make future improvements
• Sort local and through traffic

US Route 113 is one of the highways included in the CCPP. More information regarding the CCPP can be found at https://deldot.gov/Programs/corr_cap/index.shtml.

The *US 113 3rd Lane Widening* project includes the addition of a third lane in each direction starting south of Bett's Pond Bridge and ending at the US Route 113/Dagsboro Road intersection. Engineering design is scheduled to begin later this year with construction funded to begin in Fiscal Year (FY) 2029. A DelDOT contract number has not yet been assigned to this project.

The *North Millsboro Bypass, US 113 to SR 24* (DelDOT Contract No. T201912701) project includes the construction of a two-lane connector road between US Route 113 and Delaware Route 24 north of Millsboro. The project will also consist of a grade separated intersection at the US Route 113/Delaware Route 20 intersection. The project has been split into two projects for construction and consists of the grade separation (*US 113 & SR 20 Grade Separated Intersection)* and the connector road (*CM/GC North Millsboro Bypass, US 113 to SR 24).* The *US 113 & SR 20 Grade Separated Intersection* (DelDOT Contract No. T202112702) project is scheduled for PS&E in March 2023 and construction to begin in fall 2023. The *CM/GC North Millsboro Bypass, US 113 to SR 24* (DelDOT Contract No. T202112701) project is scheduled for PS&E in March 2023 and construction to begin in spring 2023. More information regarding the projects can be found at: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201912701.

There are two pavement and rehabilitation projects proposed along Delaware Route 24. There is HSIP intersection work at the US Route 113/ Delaware Route 24 intersection (DelDOT Contract No. T201606301) and the project is substantially complete. There is a pavement rehabilitation resurfacing project on Delaware Route 24 from US Route 113 to Maryland Camp Road (DelDOT Contract No. T201906304) which was completed in late summer 2022.

Additionally, DelDOT is in the process of removing the Delaware Route 30 designation starting at the intersection of John J. Williams Highway (Delaware Route 24) and Gravel Hill Road, just north of Millsboro, westward to US Route 13. The removal is proposed due to the complex nature of its routing amongst Delaware State Routes 24, 26 and 54. More information regarding the project can be found at: https://deldot.gov/projects/Studies/proposed-SR30-declassification-west-of-Millsboro/.

Based on our review of the TIS, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements. Additionally, the table below does not include any signalized intersections that exhibit LOS deficiencies which can be mitigated with signal timing optimization as the developer would not be recommended to implement any additional improvements at those intersections.

Intersection	LOS Deficiencies Occur			Case
	AM	PM	SAT	
Delaware Route 24/Bramble Drive/Plantation Lakes Boulevard*	X	X	-	Case 2 – 2028 without Development
	X	X	-	Case 3a – 2028 with Development
	X	X	-	Case 3b – 2028 with Development
Delaware Route 24/S. Delaware Avenue	X	X		Case 1 – 2022 Existing
	X	X	X	Case 2 – 2028 without Development
	X	X	X	Case 3a – 2028 with Development
	X	X	X	Case 3b – 2028 with Development
Delaware Route 24/Mumford Road/Lewis Road		X		Case 2 – 2028 without Development
		X		Case 3a – 2028 with Development
		X		Case 3b – 2028 with Development

*A Saturday analysis was not required at the Delaware Route 24/Bramble Drive/Plantation Lakes Boulevard intersection.

The unsignalized Delaware Route 24/Bramble Drive/Plantation Lakes Boulevard intersection exhibits LOS deficiencies during the AM and PM peak hour under future conditions with or without the development. Specifically, during the weekday AM peak hour under Case 3b conditions, the northbound Bramble Drive approach would operate at LOS F (64.2 seconds of delay per vehicle) and the southbound Plantation Lakes Boulevard left turn/through movement would operate at LOS F (416.9 seconds of delay per vehicle). Both a roundabout and a traffic signal would mitigate the deficiencies at this intersection. However, on May 27, 2022 DelDOT met with the Town of Millsboro to discuss operations at this intersection. At that time a traffic signal was not justified to be installed based on existing conditions. Furthermore, the Peak Hour Volume warrant for a traffic signal would be met under Case 3a and 3b conditions and there are existing auxiliary turn lanes along Delaware Route 24. As such, we recommend the developer enter into a traffic signal agreement at this location.

The unsignalized Delaware Route 24/S. Delaware Avenue intersection exhibits LOS deficiencies during the AM and PM peak hours under existing conditions and during the AM, PM, and Saturday peak hours under future conditions with or without the development. Specifically, during the weekday PM peak hour under Case 3b conditions, the northbound S. Delaware Avenue approach would operate at LOS F (954.7 seconds of delay per vehicle). Both a roundabout and a traffic signal would mitigate the deficiencies at this intersection. However, on May 27, 2022, DelDOT met with the Town of Millsboro to discuss operations at this intersection. As a result of that meeting, DelDOT is developing a conceptual layout that will be presented at a future Town Council meeting with the intersection signalized and with split phase operation. As such, we recommend the developer enter into a traffic signal agreement at this location.

The unsignalized Delaware Route 24/Mumford Road/Lewis Road intersection exhibits LOS deficiencies during the weekday PM peak hour under future conditions with or without the development. Specifically, during the weekday PM peak hour under Case 3a conditions, the northbound Mumford Road approach would operate at LOS E (44.6 seconds of delay per vehicle) with a calculated 95th percentile queue length of approximately 100 feet. Providing a separate left turn lane and a shared through/right turn lane along the northbound approach would mitigate the LOS deficiency and reduce the northbound Mumford Road approach delay to LOS D (31.4 seconds of delay per vehicle) with a calculated 95th percentile queue length of approximately 60 feet. Although the provision of a separate left turn lane and a shared through/right turn lane would reduce delay at the intersection, operations would be impacted. Specifically, if a vehicle executing a left turn movement and a vehicle executing a through movement arrive simultaneously at the intersection, those vehicles may obstruct each other's sight distances as they wait for the same gap in traffic to execute the movements.

A roundabout and a traffic signal would also mitigate the LOS deficiency at the Delaware Route 24/Mumford Road/Lewis Road intersection. However, per coordination with DelDOT, it is not recommended that the developer implement any improvements at this intersection.

Should the Town of Millsboro 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 Radish 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 provide an interconnection to the Plantation Lakes development through Bramble Drive. The developer should submit a plan to DelDOT during the Plan review process depicting the location of the interconnection.

3. The developer should construct a full access for the proposed Somerton Chase development along Radish Road, approximately 2,500 feet west of the intersection with Hickory Hill Road/S. Delaware Avenue. The design of this access should include physical traffic calming measures to address speeding concerns along Radish Road. The intersection should be consistent with the lane configurations shown in the table below.

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

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the eastbound Radish Road left turn lane and the westbound Radish Road right turn lane is 185 feet and 190 feet, respectively. The projected queue lengths from the HCS analysis can be accommodated within the recommended storage lengths. The developer should coordinate with DelDOT's Development Coordination section during the Entrance Plan review process to determine the feasibility of including physical traffic calming measures along Radish Road.

4. The developer should enter into a traffic signal agreement with DelDOT for the Delaware Route 24/Bramble Drive/Plantation Lakes Boulevard intersection. 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. The Traffic Signal Revolving Fund contribution is $17,924.

5. The developer should enter into a traffic signal agreement with DelDOT for the Delaware Route 24/South Delaware Avenue intersection. The traffic signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. A Signal Justification Study should be performed and the scope of the study will be identified at a later date 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. The Traffic Signal Revolving Fund contribution is $13,700.

6. 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 Radish Road site frontage. Within the easement, the developer should construct a new ten-foot wide shared-use path (SUP). 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 Radish Road should be provided.

c. ADA compliant curb ramps and marked crosswalks should be provided along the site entrances.

d. Minimum five-foot wide bicycle lanes should be incorporated in the shoulder along the Radish Road site frontage.

e. 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. For any additional information regarding the work zone impact and mitigation procedures during construction, please contact Mr. Jeff VanHorn, Assistant Director for Traffic Operations and Management. Mr. VanHorn can be reached at (302) 659-4606 or by email at Jeffrey.VanHorn@delaware.gov. Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

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

Enclosure

General Information

Report date: May 26, 2022
Prepared by: The Traffic Group
Prepared for: Jack Lingo Asset Management
Tax Parcels: 133-20.00-40.00, 133-20.00-41.00, 133-20.00-41.01, 133-20.00-41.02
Generally consistent with DelDOT's *Development Coordination Manual (DCM)*: Yes

Project Description and Background

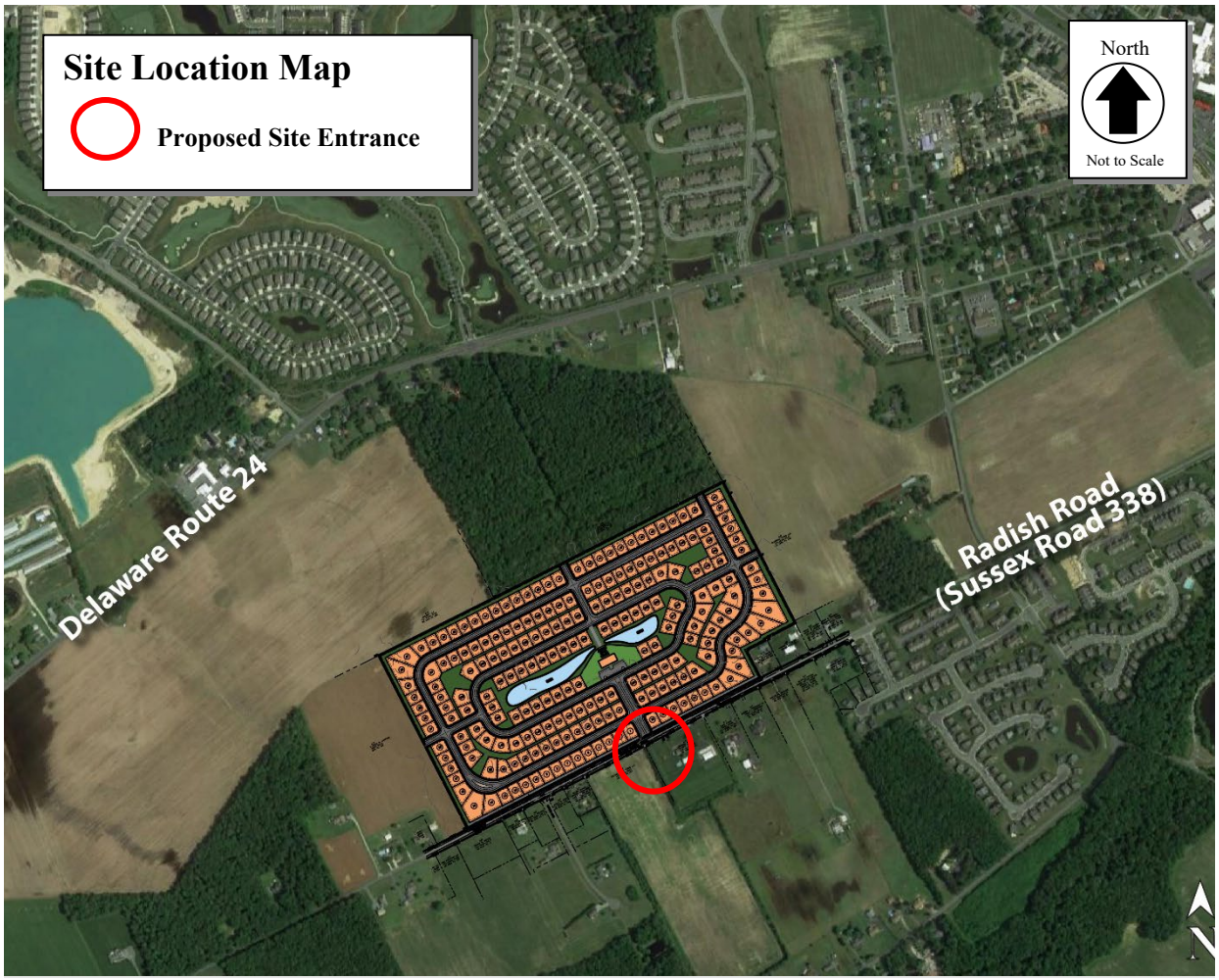
Description: The proposed residential development consists of up to 214 single-family detached homes.
Location: The land is located on the north side of Radish Road (Sussex Road 338), approximately 1,700 feet west of Hickory Hill Road/S. Delaware Avenue (Sussex Road 82), in the Town of Millsboro, Sussex County, Delaware.
Amount of Land to be developed: An approximately 69.00-acre assemblage of parcels.
Land Use approval(s) needed: Entrance Plan.
Proposed completion date: 2028.
Proposed access locations: One full access point is proposed on Radish Road. Additionally, another full access scenario is proposed with a full access point on Radish Road and a full access point on Delaware Route 24 via Bramble Drive through Plantation Lakes.

Daily Traffic Volumes:

- 2021 Average Annual Daily Traffic on Radish Road: 1,202

*AADT is sourced from ATR data provided by the TIS report. Data taken from six full days starting February 3, 2022.

Site Map



**Graphic is an approximation based on the Preliminary Sketch Plan prepared by Davis, Bowen & Friedel, Inc. dated February 2022.*

Relevant and On-going Projects

DelDOT has several relevant and ongoing improvement projects within the study area including the *Corridor Capacity Preservation Program* (CCPP), which aims to maintain the regional importance and preserve the intended function and capacity of existing designated transportation routes within the Program. The main objectives of the program are listed below:

- Prevent the need to build an entirely new road
- Minimize the transportation impacts of increased economic growth
- Maintain an existing road's ability to handle traffic efficiently and safely
- Preserve the ability to make future improvements
- Sort local and through traffic

US Route 113 is one of the highways included in the CCPP. More information regarding the CCPP can be found at https://deldot.gov/Programs/corr_cap/index.shtml.

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The *North Millsboro Bypass, US 113 to SR 24* (DelDOT Contract No. T201912701) project includes the construction of a two-lane connector road between US Route 113 and Delaware Route 24 north of Millsboro. The project will also consist of a grade separated intersection at the US Route 113/Delaware Route 20 intersection. The project has been split into two projects for construction and consists of the grade separation (*US 113 & SR 20 Grade Separated Intersection)* and the connector road (*CM/GC North Millsboro Bypass, US 113 to SR 24).* The *US 113 & SR 20 Grade Separated Intersection* (DelDOT Contract No. T202112702) project is scheduled for PS&E in March 2023 and construction to begin in fall 2023. The *CM/GC North Millsboro Bypass, US 113 to SR 24* (DelDOT Contract No. T202112701) project is scheduled for PS&E in March 2023 and construction to begin in spring 2023. More information regarding the projects can be found at: https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T201912701.

There are two pavement and rehabilitation projects proposed along Delaware Route 24. There is HSIP intersection work at the US Route 113/ Delaware Route 24 intersection (DelDOT Contract No. T201606301) and the project is substantially complete. There is a pavement rehabilitation resurfacing project on Delaware Route 24 from US Route 113 to Maryland Camp Road (DelDOT Contract No. T201906304) which was completed in late summer 2022.

Additionally, DelDOT is in the process of removing the Delaware Route 30 designation starting at the intersection of John J. Williams Highway (Delaware Route 24) and Gravel Hill Road, just north of Millsboro, westward to US Route 13. The removal is proposed due to the complex nature of its routing amongst Delaware State Routes 24, 26 and 54. More information regarding the project can be found at: https://deldot.gov/projects/Studies/proposed-SR30-declassification-west-of-Millsboro/.

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

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

The proposed development is located within Investment Level 2 and a four-acre portion of the proposed development along Radish Road is located within Investment Level 1.

Investment Level 1

These areas are often municipalities, towns, or urban/urbanizing places in counties where density is generally higher than in surrounding areas. In Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote a variety of transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Overall, it is the state's intent to use its spending and

management tools to maintain and enhance community character, and to promote well-designed and efficient new growth in Investment Level 1 Areas.

In Level 1 Areas the state's first priority will be for preserving existing facilities and making safety improvements. Level 1 areas will also be the highest priority for context sensitive transportation system capacity enhancements, transit-system enhancements, ADA accessibility, and for closing gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 1 Areas are ideal locations for Transportation Improvement Districts as well as Complete Community Enterprise Districts. Further, Level 1 areas are the priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity of neighborhoods and public facilities.

Investment Level 2

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. They serve as transition areas between Level 1 and the state's more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. 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 its 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, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

Level 2 Areas share similar priorities as with the Level 1 Areas where the aim remains to: make context sensitive transportation system capacity enhancements, preserve existing facilities, make safety enhancements, make transportation system capacity improvements, create transit system enhancements, ensure ADA accessibility, and close gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 2 Areas are ideal locations for Transportation Improvement Districts and Complete Community Enterprise Districts. Other priorities for Level 2 Areas include: Corridor Capacity Preservation, off-alignment multi-use paths, interconnectivity of neighborhoods and public facilities, and signal-system enhancements.

Proposed Development's Compatibility with Livable Delaware:

The proposed site is located within Investment Level 2 and a four-acre portion along Radish Road is located within Investment Level 1. Programs within Investment Levels 1 and 2 aim to create

new housing opportunities through new construction and redevelopment. Additionally, Investment Levels 1 and 2 aim to provide essential open spaces, recreational facilities/services to promote a sense of community. The proposed development has planned space dedicated specifically to open space. Therefore, the proposed development is consistent with the *2020 Delaware Strategies for State Policies and Spending*.

Comprehensive Plan

(Source: Millsboro 2020 Comprehensive Plan Update)

Millsboro Comprehensive Plan:

Per the Millsboro 2020 *Official Zoning Map,* the proposed development appears to be currently zoned as Medium Density Residential (MR). Per the *Millsboro 2021 Comprehensive Plan Future Land Use and Annexation Map,* the proposed development is in an area designated as Mixed-Use and Residential.

Proposed Development's Compatibility with the Millsboro Comprehensive Plan:

The *Millsboro 2020 Comprehensive Plan* encourages residential development on undeveloped parcels. Therefore, the proposed development is generally consistent with the *Millsboro 2020 Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 210 (Single Family Detached Housing). Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

Table 1
Somerton Chase Trip Generation

Entrance	Land Use	ADT	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
Single Family Detached Housing	214 Units	2,094	39	118	157	133	78	211	107	91	198

Overview of TIS

Intersections examined:

1. Site Entrance / Radish Road (Sussex Road 338)
2. Delaware Route 24 / Bramble Drive/Plantation Lakes Boulevard
3. Radish Road (Sussex Road 338) / Hickory Hill Road / S. Delaware Avenue (Sussex Road 82)
4. Hickory Hill Road / Handy Road (Sussex Road 337)
5. Hickory Hill Road / West Bourne Way
6. Handy Road / Towne Center Boulevard
7. US Route 113 / Delaware Route 20 / Handy Road (Sussex Road 337)
8. S. Delaware Avenue (Sussex Road 82) / Old Landing Road (Sussex Road 339)
9. S. Delaware Avenue / Irons Way
10. Delaware Route 24 / S. Delaware Avenue (Sussex Road 339)
11. Radish Road / Mumford Road (Sussex Road 409)
12. Delaware Route 24 / Mumford Road / Lewis Road (Sussex Road 409)

Conditions examined:

1. Case 1 – 2021 existing
2. Case 2 – 2028 without development
3. Case 3 – 2028 with development
    a. Without future interconnection to Plantation Lakes
    b. With future interconnection to Plantation Lake via Bramble Drive

Committed Developments considered:

1. Plantation Lakes
    a. Residential - North of Betts Pond
        i. 353 single family detached homes; 306 units remain unbuilt
        ii. 485 mid-rise multifamily homes; 360 units remain unbuilt
    b. Residential – South of DE 24 (Parcels L & Q)
        i. 459 mid-rise multifamily homes
        ii. 307 single family detached homes
    c. Commercial (478,000 SF shopping center)
2. Alderleaf Meadows (f.k.a. Homestead Phase 2) (163 single family detached homes)
3. Foster Commons (60 low-rise multifamily homes)
4. Westtown Village (f.k.a. Millwood Phase 2) (92 single family detached homes)

*Note: Committed development information provided in the Final TIS supersedes the information provided in the November 15, 2021, DelDOT Scoping Meeting Memorandum.

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

Intersection Descriptions

1. **Site Entrance / Radish Road (Sussex Road 338)**
   Type of Control: Two-way stop-controlled intersection.
   Eastbound Approach: (Radish Road) Existing one through lane; Proposed one shared left turn/through lane.
   Westbound Approach: (Radish Road) Existing one through lane; Proposed one shared through/right turn lane.
   Southbound Approach: (Site Entrance) Proposed one left turn lane and one right turn lane, stop-controlled.

2. **Delaware Route 24 / Bramble Drive / Plantation Lakes Boulevard**
   Type of Control: Two-way stop-controlled intersection.
   Eastbound Approach: (Delaware Route 24) Existing one left turn lane, one through lane and one right turn lane.
   Westbound Approach: (Delaware Route 24) Existing one left turn lane, one through lane and one right turn lane.
   Northbound Approach: (Partially built entrance) Existing one shared left turn/through/right turn lane, stop-controlled.
   Southbound Approach: (Plantation Lakes Blvd.) Existing one left turn lane and one right turn lane, stop-controlled.

3. **Radish Road (Sussex Road 338) / Hickory Hill Road / S. Delaware Avenue (Sussex Road 82)**
   Type of Control: All-way stop-controlled intersection.
   Eastbound Approach: (Radish Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Westbound Approach: (Radish Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Northbound Approach: (Hickory Hill Road) Existing one shared left turn/through/right turn lane*
   Southbound Approach: (S. Delaware Avenue) Existing one shared left turn/through/right turn lane, stop-controlled.

   *The northbound approach is a partially built entrance that terminates immediately south of the intersection.

4. **Hickory Hill Road / Handy Road (Sussex Road 337)**
   Type of Control: Two-way stop-controlled intersection.
   Eastbound Approach: (Hickory Hill Road) Existing one shared through/right turn lane.

Northbound Approach: (Handy Road) Existing one shared left turn/right turn lane, stop-controlled.
Southbound Approach: (Hickory Hill Road) Existing one shared left turn/through lane.

5. **Hickory Hill Road / West Bourne Way**
Type of Control: Two-way stop-controlled intersection.
Eastbound Approach: (West Bourne Way) Existing one shared left turn/through/right turn lane, stop-controlled.
Westbound Approach: (West Bourne Way) Existing one shared left turn/through/right turn lane, stop-controlled.
Northbound Approach: (Hickory Hill Road) Existing one shared left turn/through/right turn lane.
Southbound Approach: (Hickory Hill Road) Existing one shared left turn/through lane and one right turn lane.

6. **Handy Road (Sussex Road 337) / Towne Center Boulevard**
Type of Control: Two-way stop-controlled intersection.
Eastbound Approach: (Partially built entrance) Existing one shared left turn/through/right turn lane.
Westbound Approach: (Towne Center Boulevard) Existing one left turn lane and one right turn lane, stop-controlled.
Northbound Approach: (Handy Road) Existing one left turn lane, one through lane and one right turn lane.
Southbound Approach: (Handy Road) Existing one left turn lane, one through lane and one right turn lane.

7. **US Route 113 / Delaware Route 20 / Handy Road (Sussex Road 337)**
Type of Control: Existing signalized intersection (four-legged).
Eastbound Approach: (Handy Road) Existing one left turn lane, one through lane and one right turn lane.
Westbound Approach: (Delaware Route 20) Existing one left turn lane, one through lane and one channelized right turn lane.
Northbound Approach: (US Route 113) Existing one left turn lane, two through lanes and one right turn lane.
Southbound Approach: (US Route 113) Existing two left turn lanes, two through lanes and one right turn lane.

8. **S. Delaware Avenue / Old Landing Road (Sussex Road 339)**
Type of Control: Two-way stop-controlled intersection.

Westbound Approach: (Old Landing Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (S. Delaware Avenue) Existing one shared through/right turn lane.
Southbound Approach: (S. Delaware Avenue) Existing one shared left turn/through lane.

* A private driveway is located at the eastbound leg of the intersection.

9. S. Delaware Avenue (Sussex Road 82) / Irons Avenue
Type of Control: Two-way stop-controlled intersection.
Eastbound Approach: (Irons Avenue) Existing one shared left turn/through/right turn lane, stop-controlled.
Westbound Approach: (Irons Avenue) Existing one shared left turn/through/right turn lane, stop-controlled.
Northbound Approach: (S. Delaware Avenue) Existing one shared left turn/through/right turn lane.
Southbound Approach: (S. Delaware Avenue) Existing one shared left turn/through/right turn lane.

10. Delaware Route 24 / S. Delaware Avenue (Sussex Road 339)
Type of Control: Two-way stop-controlled intersection.
Eastbound Approach: (Delaware Route 24) Existing one shared left turn/through/right turn lane.
Westbound Approach: (Delaware Route 24) Existing one shared left turn/through/right turn lane.
Northbound Approach: (S. Delaware Avenue) Existing one shared left turn/through/right turn lane, stop-controlled.
Southbound Approach: (S. Delaware Avenue) Existing one shared left turn/through/right turn lane, stop-controlled.

11. Radish Road (Sussex Road 338) / Mumford Road (Sussex Road 409)
Type of Control: Two-way stop-controlled intersection.
Westbound Approach: (Radish Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Mumford Road) Existing one shared through/right turn lane.
Southbound Approach: (Mumford Road) Existing one shared left turn/through lane.

12. Delaware Route 24 / Mumford Road (Sussex Road 409) / Lewis Road (Sussex Road 409)
Type of Control: Two-way stop-controlled intersection.

Eastbound Approach: (Delaware Route 24) Existing one shared left turn/through/right turn lane.
Westbound Approach: (Delaware Route 24) Existing one shared left turn/through/right turn lane.
Northbound Approach: (Mumford Road) Existing one shared left turn/through/right turn lane, stop-controlled.
Southbound Approach: (Lewis Road) Existing one shared left turn/through/right turn lane, stop-controlled.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, there are no bus routes that run through the study area.

Planned transit service: Per email correspondence on June 3, 2022, with Mr. Jared Kauffman, Planner for DART, the Delaware Transit Corporation (DTC) does not have any transit specific comments for the project.

Existing bicycle and pedestrian facilities: According to DelDOT's Sussex County Bicycle Map, several study roadways are considered bicycle routes. Philips Hill Road, S. Delaware Avenue, and Handy Road are considered connector bicycle routes. Delaware Route 24 is considered a regional bicycle route. Crosswalks are located at the intersections of Delaware Route 24/Plantation Lakes Boulevard, Hickory Hill Road/West Bourne Way, Handy Road/Towne Center Boulevard, and US Route 113/Delaware Route 20/Handy Road.

Planned bicycle and pedestrian facilities: Within the TIS report, per email correspondence on April 20, 2022 with Mr. Anthony Aglio, DelDOT Bicycle Coordinator, a multi-use path is requested along the property frontage with a bicycle lane if shoulders are being added.

Bicycle Level of Traffic Stress in Delaware: Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the Bicycle On-Road Network Level of Traffic Stress map from the April 2018 Blueprint for a Bicycle-Friendly Delaware document which can be found on the following website:
https://deldot.gov/Publications/plans/bikeandped/pdfs/DelDOTBikePlan043018FINAL.pdf

- Radish Road: 4

Crash Evaluation

Per the crash data included in the TIS from April 25, 2019, to April 25, 2022, and provided by the Delaware Department of Transportation (DelDOT), a total of 130 crashes were reported within the study area. Of the 130 crashes reported, no fatalities occurred.

55 crashes were reported at the US Route 113/Delaware Route 20/Handy Road intersection. Of the 55 incidents, 28 were front to rear, 10 were sideswipe, 10 were angle, one was front to front, and the remaining six were not collisions between two vehicles.

19 crashes were reported at the Delaware Route 24/S. Delaware Avenue (Sussex Road 82). Of the 19 incidents, eight were angle crashes, six were front to rear, two were front to front, and the remaining three were not collisions between two vehicles.

13 crashes were reported at the Delaware Route 24/Plantation Lakes Boulevard intersection. Of the 13 incidents, five were angle crashes, two were front to front, one was front to rear, and the remaining five were not collisions between two vehicles.

The remaining intersections had a total of 10 crashes or less reported.

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 June 15, 2022.

General HCS Analysis Comments

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

1) The TIS used the HCS2022 version of HCS, whereas 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 and Case 3 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. JMT utilized the existing heavy vehicle percentage for each movement greater than 100 vph in the Case 1 Existing scenario.

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 in the analyses, whereas the TIS did not.

4) JMT included bicycles and pedestrians counted during the traffic data collection in the analysis, whereas the TIS did not.

5) A TIS addendum prepared by The Traffic Group, Inc. was submitted to DelDOT on July 6, 2022 to account for updated Summer Saturday peak hour counts collected at the Delaware Route 24/South Delaware Avenue intersection. This TIS review incorporates the updated analysis based on those counts.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
Site Entrance / Radish Road (Sussex Road 338)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 With Development (Case 3a)				
Eastbound Radish Road Left Turn	A (7.4)	A (7.9)	A (7.4)	A (7.9)
Southbound Site Entrance Approach	B (10.2)	B (10.7)	B (10.3)	B (10.8)
2028 With Development (Case 3b)				
Eastbound Radish Road Left Turn	A (7.4)	A (7.7)	A (7.4)	A (7.8)
Southbound Site Entrance Approach	A (9.8)	B (10.1)	A (9.9)	B (10.2)

[1] 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 Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Delaware Route 24/ Bramble Drive/Plantation Lakes Boulevard	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Eastbound Delaware Route 24 Left Turn	A (8.5)	A (9.1)	A (8.2)	A (9.2)
Southbound Plantation Lakes Boulevard Left Turn/Through	D (29.1)	C (20.7)	D (29.8)	C (21.2)
Southbound Plantation Lakes Right Turn	B (10.2)	B (12.0)	B (10.4)	B (11.7)
2028 Without Development (Case 2)				
Eastbound Delaware Route 24 Left Turn	A (8.8)	A (9.9)	A (8.5)	B (10.0)
Westbound Delaware Route 24 Left Turn	A (9.4)	A (8.8)	A (9.4)	A (8.8)
Northbound Bramble Drive Approach	E (35.6)	D (33.8)	E (38.5)	E (39.8)
Southbound Plantation Lakes Boulevard Left Turn/Through	F (244.5)	F (100.5)	F (293.9)	F (117.1)
Southbound Plantation Lakes Right Turn	B (11.0)	B (14.1)	B (11.2)	B (13.7)
2028 With Development (Case 3a)				
Eastbound Delaware Route 24 Left Turn	A (8.8)	A (9.9)	A (8.5)	B (10.0)
Westbound Delaware Route 24 Left Turn	A (9.4)	A (8.8)	A (9.4)	A (8.8)
Northbound Bramble Drive Approach	E (35.6)	D (33.8)	E (38.5)	E (39.8)
Southbound Plantation Lakes Boulevard Left Turn/Through	F (244.5)	F (100.5)	F (293.9)	F (117.1)
Southbound Plantation Lakes Right Turn	B (11.0)	B (14.1)	B (11.2)	B (13.7)

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Delaware Route 24/ Bramble Drive/Plantation Lakes Boulevard	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 With Development (Case 3b)				
Eastbound Delaware Route 24 Left Turn	A (8.8)	A (9.9)	A (8.5)	B (10.0)
Westbound Delaware Route 24 Left Turn	A (9.5)	A (9.0)	A (9.5)	A (9.1)
Northbound Bramble Drive Approach	F (57.0)	F (52.4)	F (64.2)	F (66.3)
Southbound Plantation Lakes Boulevard Left Turn/Through	F (333.7)	F (141.0)	F (416.9)	F (174.9)
Southbound Plantation Lakes Right Turn	B (11.0)	B (14.1)	B (11.2)	B (13.7)

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Roundabout [1]	**LOS per TIS**		**LOS per JMT**	
Delaware Route 24/ Bramble Drive/Plantation Lakes Boulevard[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 Without Development (Case 2)				
Eastbound Delaware Route 24 Approach	-	-	C (15.4)	A (9.1)
Westbound Delaware Route 24 Approach	-	-	A (7.3)	C (17.9)
Northbound Bramble Drive Approach	-	-	B (11.0)	A (6.4)
Southbound Plantation Lakes Boulevard Approach	-	-	A (6.0)	A (7.0)
Intersection	-	-	B (11.3)	B (14.0)
2028 With Development (Case 3a)				
Eastbound Delaware Route 24 Approach	-	-	C (15.4)	A (9.1)
Westbound Delaware Route 24 Approach	-	-	A (7.3)	C (17.9)
Northbound Bramble Drive Approach	-	-	B (11.0)	A (6.4)
Southbound Plantation Lakes Boulevard Approach	-	-	A (6.0)	A (7.0)
Intersection	-	-	B (11.3)	B (14.0)
2028 With Development (Case 3b)				
Eastbound Delaware Route 24 Approach	-	-	C (16.0)	A (10.0)
Westbound Delaware Route 24 Approach	-	-	A (7.6)	C (20.7)
Northbound Bramble Drive Approach	-	-	B (13.1)	A (7.0)
Southbound Plantation Lakes Boulevard Approach	-	-	A (6.2)	A (7.3)
Intersection	-	-	B (12.0)	C (15.7)

[2] JMT conducted an additional analysis of the intersection as a single lane roundabout.

Table 3 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
Delaware Route 24/ Bramble Drive/Plantation Lakes Boulevard[3]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2028 Without Development (Case 2)	-	-	C (31.9)	C (24.9)
2028 With Development (Case 3a)	-	-	C (31.9)	C (25.6)
2028 With Development (Case 3b)	-	-	C (32.7)	C (26.0)

[3] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, the northbound approach (Bramble Dr.) and the southbound approach (Plantation Lakes Blvd.) were modeled with one shared left turn/through lane and one right turn lane. Other approaches were modeled with existing lane configurations. The intersection was modeled utilizing a 120 second cycle length with split phase operation.

Table 4
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection All-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Radish Road/Hickory Hill Road/S. Delaware Avenue (Sussex Road 82)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)[4]				
Eastbound Radish Road Approach	A (8.8)	A (8.5)	A (8.7)	A (8.4)
Westbound Radish Road Approach	A (8.5)	A (9.5)	A (8.4)	A (9.4)
Northbound Hickory Hill Road Approach	A (8.6)	A (9.9)	A (8.5)	A (9.7)
Southbound Hickory Hill Road Approach	A (10.0)	A (9.4)	A (9.8)	A (9.3)
2028 Without Development (Case 2)[5]				
Eastbound Radish Road Approach	A (9.2)	A (8.8)	A (9.2)	A (8.9)
Westbound Radish Road Approach	A (8.8)	A (9.9)	A (8.8)	A (10.0)
Northbound Hickory Hill Road Approach	A (9.0)	B (10.7)	A (9.0)	B (10.8)
Southbound Hickory Hill Road Approach	B (11.2)	A (10.0)	B (11.1)	B (10.1)
2028 With Development (Case 3a)[5]				
Eastbound Radish Road Approach	B (10.8)	B (10.1)	B (10.7)	B (10.2)
Westbound Radish Road Approach	A (9.3)	B (10.9)	A (9.3)	B (11.1)
Northbound Hickory Hill Road Approach	A (9.9)	B (13.1)	A (9.8)	B (13.2)
Southbound Hickory Hill Road Approach	B (12.6)	B (11.5)	B (12.4)	B (11.6)
2028 With Development (Case 3b)[5]				
Eastbound Radish Road Approach	A (9.9)	A (9.5)	A (9.9)	A (9.6)
Westbound Radish Road Approach	A (9.1)	B (10.6)	A (9.1)	B (10.7)
Northbound Hickory Hill Road Approach	A (9.6)	B (12.6)	A (9.5)	B (12.7)
Southbound Hickory Hill Road Approach	B (11.9)	B (10.9)	B (11.8)	B (10.9)

[4] The TIS utilized a PHF of 0.86 for the AM peak hour and 0.83 for the PM peak hour, whereas JMT utilized a PHF of 0.89 and 0.86, respectively.

[5] The TIS utilized a PHF of 0.88 for the AM peak hour, whereas JMT utilized a PHF of 0.89.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
Hickory Hill Road/Handy Road (Sussex Road 337)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Westbound Handy Road Approach	A (9.9)	A (9.3)	B (12.1)	B (12.4)
Southbound Hickory Hill Road Approach	A (8.0)	A (7.5)	A (8.0)	A (7.5)
2028 Without Development (Case 2)				
Westbound Handy Road Approach	B (10.7)	A (9.9)	B (13.5)	B (13.7)
Southbound Hickory Hill Road Approach	A (8.2)	A (7.6)	A (8.2)	A (7.6)
2028 With Development (Case 3a)				
Westbound Handy Road Approach	B (11.3)	B (10.5)	B (14.5)	C (15.5)
Southbound Hickory Hill Road Approach	A (8.3)	A (7.7)	A (8.3)	A (7.7)
2028 With Development (Case 3b)				
Westbound Handy Road Approach	B (11.3)	B (10.5)	B (14.5)	C (15.5)
Southbound Hickory Hill Road Approach	A (8.3)	A (7.7)	A (8.3)	A (7.7)

Table 6
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Hickory Hill Road/West Bourne Way	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Eastbound Bourne Way Approach	B (10.7)	B (10.8)	B (10.8)	B (10.7)
Westbound Bourne Way Approach[6]	A (0.0)	B (10.7)	B (11.2)	B (10.9)
Northbound Hickory Hill Road Left Turn	A (7.7)	A (7.6)	A (7.8)	A (7.7)
Southbound Hickory Hill Road Left Turn	A (7.4)	A (7.6)	A (7.4)	A (7.7)
2028 Without Development (Case 2)				
Eastbound Bourne Way Approach	B (11.5)	B (11.6)	B (11.6)	B (11.6)
Westbound Bourne Way Approach[6]	A (0.0)	B (11.6)	B (12.2)	B (11.8)
Northbound Hickory Hill Road Left Turn	A (7.9)	A (7.7)	A (7.9)	A (7.8)
Southbound Hickory Hill Road Left Turn	A (7.4)	A (7.8)	A (7.5)	A (7.9)
2028 With Development (Case 3a)				
Eastbound Bourne Way Approach	B (12.1)	B (11.9)	B (12.2)	B (11.8)
Westbound Bourne Way Approach[6]	A (0.0)	B (11.9)	B (12.9)	B (12.2)
Northbound Hickory Hill Road Left Turn	A (8.0)	A (7.8)	A (8.0)	A (7.8)
Southbound Hickory Hill Road Left Turn	A (7.5)	A (7.9)	A (7.5)	A (7.9)
2028 With Development (Case 3b)				
Eastbound Bourne Way Approach	B (12.1)	B (11.9)	B (12.2)	B (11.8)
Westbound Bourne Way Approach[6]	A (0.0)	B (11.9)	B (12.9)	B (12.2)
Northbound Hickory Hill Road Left Turn	A (8.0)	A (7.8)	A (8.0)	A (7.8)
Southbound Hickory Hill Road Left	A (7.5)	A (7.9)	A (7.5)	A (7.9)

[6] TIS utilized the westbound approach AM volume of 0 vehicles, based on collected data, whereas JMT utilized a volume of 1 to enable calculation of an LOS value.

Table 7
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Handy Road/Towne Center Boulevard	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Eastbound Handy Road Left Turn	A (7.6)	A (7.7)	A (7.6)	A (7.8)
Southbound Towne Center Boulevard Left Turn	B (13.6)	B (11.7)	B (13.4)	B (11.8)
Southbound Towne Center Boulevard Right Turn	A (8.8)	A (9.8)	A (8.8)	A (9.8)
2028 Without Development (Case 2)				
Eastbound Handy Road Left Turn	A (7.7)	A (7.9)	A (7.7)	A (7.9)
Southbound Towne Center Boulevard Left Turn	C (15.0)	B (12.7)	B (14.8)	B (12.8)
Southbound Towne Center Boulevard Right Turn	A (8.8)	B (10.1)	A (8.9)	B (10.2)
2028 With Development (Case 3a)				
Eastbound Handy Road Left Turn	A (7.8)	A (8.0)	A (7.8)	A (8.0)
Southbound Towne Center Boulevard Left Turn	C (16.1)	B (13.7)	C (15.9)	B (13.9)
Southbound Towne Center Boulevard Right Turn	A (8.9)	B (10.6)	A (8.9)	B (10.6)
2028 With Development (Case 3b)				
Eastbound Handy Road Left Turn	A (7.8)	A (8.0)	A (7.8)	A (8.0)
Southbound Towne Center Boulevard Left Turn	C (16.1)	B (13.7)	C (15.9)	B (13.9)
Southbound Towne Center Boulevard Right Turn	A (8.9)	B (10.6)	A (8.9)	B (10.6)

Table 8
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Signalized Intersection[1]	**LOS per TIS**			**LOS per JMT**		
US Route 113/Delaware Route 20/Handy Road[7, 8, 9, 10]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing (Case 1) *with DelDOT timings*	C (21.4)	C (21.6)	C (23.2)	D (35.7)	C (34.8)	E (66.0)
2022 Existing (Case 1) *with signal optimization*[11]	-	-	-	C (31.5)	C (30.2)	C (29.4)
2028 Without Development (Case 2)[12]	C (24.6)	C (25.0)	D (36.0)	C (34.9)	C (33.4)	D (40.3)
2028 With Development (Case 3a)[12]	C (26.0)	C (26.8)	D (40.3)	D (35.6)	C (34.1)	D (40.8)
2028 With Development (Case 3b)[12]	C (26.0)	C (26.8)	D (40.3)	D (35.6)	C (34.1)	D (40.8)

[7] JMT applied the Field Measured Phase Times option within HCS, consistent with DelDOT methodology, whereas the TIS did not.
[8] TIS utilized a Saturday PHF of 0.91 for Case 1 and 0.92 for all future cases, whereas JMT used 0.99 for all cases.
[9] As peak hour right turn on red information was not provided for the Saturday peak hour, JMT assumed right-turn overlap phasing.
[10] JMT used lane widths and turn bay lengths measured in the field, whereas the TIS did not.
[11] JMT modeled the intersection utilizing the existing cycle length of 150 seconds.
[12] TIS used signal timing from the DelDOT provided timing plan for future cases, whereas JMT used optimized signal timing. JMT modeled the intersection using the existing cycle length of 150 seconds.

Table 9
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
S. Delaware Avenue/Old Landing Road (Sussex Road 339)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Westbound Old Landing Road Approach	A (9.8)	A (9.0)	B (10.9)	B (10.6)
Southbound Delaware Ave Left Turn	A (7.6)	A (7.7)	A (7.6)	A (7.7)
2028 Without Development (Case 2)				
Westbound Old Landing Road Approach	A (9.3)	A (9.6)	B (11.0)	B (11.8)
Southbound Delaware Ave Left Turn	A (7.7)	A (7.9)	A (7.7)	A (8.0)
2028 With Development (Case 3a)[13]				
Westbound Old Landing Road Approach	A (9.9)	B (10.4)	B (11.7)	B (12.6)
Southbound Delaware Ave Left Turn	A (7.8)	A (7.9)	A (7.8)	A (8.0)
2028 With Development (Case 3b)[14]				
Westbound Old Landing Road Approach	-	-	B (11.3)	B (12.0)
Southbound Delaware Ave Left Turn	-	-	A (7.7)	A (7.9)

[13] JMT utilized a PM northbound through volume of 234, whereas the TIS used 237.
[14] The TIS did not include Case 3b model results for this intersection.

Table 10
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
S. Delaware Avenue / Irons Way	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Eastbound Irons Way Approach	B (11.7)	B (11.7)	B (11.9)	B (11.9)
Westbound Irons Way Approach	A (9.1)	A (10.0)	A (9.2)	B (10.1)
Northbound Delaware Ave Left Turn	A (7.8)	A (7.5)	A (7.8)	A (7.6)
Southbound Delaware Ave Left Turn	A (7.5)	A (7.9)	A (7.5)	A (7.7)
2028 Without Development (Case 2)				
Eastbound Irons Way Approach	B (12.9)	B (13.3)	B (13.1)	B (13.5)
Westbound Irons Way Approach	A (9.4)	B (10.8)	A (9.5)	B (10.9)
Northbound Delaware Ave Left Turn	A (7.9)	A (7.7)	A (8.0)	A (7.8)
Southbound Delaware Ave Left Turn	A (7.6)	A (8.1)	A (7.6)	A (7.9)
2028 With Development (Case 3a)[15]				
Eastbound Irons Way Approach	B (13.0)	B (13.0)	B (13.2)	B (13.2)
Westbound Irons Way Approach	A (9.5)	B (10.6)	A (9.6)	B (10.7)
Northbound Delaware Ave Left Turn	A (7.9)	A (7.7)	A (8.0)	A (7.7)
Southbound Delaware Ave Left Turn	A (7.7)	A (8.0)	A (7.7)	A (7.9)
2028 With Development (Case 3b)				
Eastbound Irons Way Approach	B (13.0)	B (13.0)	B (13.2)	B (13.2)
Westbound Irons Way Approach	A (9.5)	B (10.6)	A (9.6)	B (10.7)
Northbound Delaware Ave Left Turn	A (7.9)	A (7.7)	A (8.0)	A (7.7)
Southbound Delaware Ave Left Turn	A (7.7)	A (8.0)	A (7.7)	A (7.9)

[15] JMT utilized a PM northbound through volume of 249, whereas the TIS used 223.

Table 11
Peak Hour Levels Of Service (LOS)
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Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control [1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24/S. Delaware Avenue	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing (Case 1)[16]						
Eastbound Delaware Route 24 Left Turn	A (7.9)	A (8.5)	A (7.8)	A (8.0)	A (8.6)	A (7.9)
Westbound Delaware Route 24 Left Turn	A (9.6)	A (8.2)	A (8.5)	A (9.5)	A (8.3)	A (8.5)
Northbound Delaware Ave Approach	E (38.8)	F (67.3)	F (300.5)	E (39.9)	F (68.2)	F (208.3)
Southbound Delaware Ave Approach	B (13.3)	C (16.3)	D (34.5)	B (13.3)	C (16.5)	E (36.5)
2028 Without Development (Case 2)						
Eastbound Delaware Route 24 Left Turn	A (8.1)	A (9.0)	A (8.2)	A (8.2)	A (9.1)	A (8.2)
Westbound Delaware Route 24 Left Turn	B (10.8)	A (8.8)	A (9.3)	B (10.7)	A (8.9)	A (9.3)
Northbound Delaware Ave Approach	F (248.9)	F (660.2)	F (10802.4)	F (260.0)	F (708.1)	F (5403.0)
Southbound Delaware Ave Approach	C (15.5)	C (22.5)	F (139.1)	C (15.5)	C (22.8)	F (155.8)
2028 With Development (Case 3a)						
Eastbound Delaware Route 24 Left Turn	A (8.1)	A (9.0)	A (8.2)	A (8.2)	A (9.1)	A (8.2)
Westbound Delaware Route 24 Left Turn	B (10.9)	A (8.8)	A (9.3)	B (10.8)	A (8.9)	A (9.4)
Northbound Delaware Ave Approach	F (331.9)	F (1,037)	F (*)	F (337.9)	F (1,029)	F (*)
Southbound Delaware Ave Approach	C (20.2)	D (34.8)	F (201.1)	C (20.4)	E (35.8)	F (223.5)
2028 With Development (Case 3b)						
Eastbound Delaware Route 24 Left Turn	A (8.1)	A (9.0)	A (8.2)	A (8.2)	A (9.2)	A (8.2)
Westbound Delaware Route 24 Left Turn	B (11.0)	A (8.9)	A (9.4)	B (10.9)	A (9.0)	A (9.5)
Northbound Delaware Ave Approach	F (315.0)	F (899.0)	F (*)	F (327.3)	F (954.7)	F (*)
Southbound Delaware Ave Approach	C (17.0)	D (27.1)	F (183.7)	C (17.1)	D (27.6)	F (204.2)

*The analysis did not calculate a delay due to the high vehicle volume and low capacity.

[16] Saturday analysis is based on traffic counts performed on 6/18/2022 for this intersection.

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Roundabout [1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24/S. Delaware Avenue[17]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2028 Without Development (Case 2)						
Eastbound Delaware Route 24 Approach	-	-	-	C (23.0)	A (8.4)	B (13.4)
Westbound Delaware Route 24 Approach	-	-	-	A (6.9)	B (14.9)	A (8.1)
Northbound Delaware Ave Approach	-	-	-	A (9.2)	A (7.8)	B (10.2)
Southbound Delaware Ave Approach	-	-	-	A (5.7)	B (11.3)	A (9.9)
Intersection	-	-	-	C (17.5)	B (11.3)	B (11.0)
2028 With Development (Case 3a)						
Eastbound Delaware Route 24 Approach	-	-	-	C (24.2)	A (9.0)	B (14.5)
Westbound Delaware Route 24 Approach	-	-	-	A (6.9)	C (15.6)	A (8.2)
Northbound Delaware Ave Approach	-	-	-	B (10.4)	A (8.3)	B (11.1)
Southbound Delaware Ave Approach	-	-	-	A (5.8)	B (12.3)	B (10.5)
Intersection	-	-	-	C (18.1)	B (11.9)	B (11.7)
2028 With Development (Case 3b)						
Eastbound Delaware Route 24 Approach	-	-	-	D (26.4)	A (8.9)	B (14.6)
Westbound Delaware Route 24 Approach	-	-	-	A (6.9)	C (15.4)	A (8.3)
Northbound Delaware Ave Approach	-	-	-	A (9.9)	A (8.1)	B (10.8)
Southbound Delaware Ave Approach	-	-	-	A (5.9)	B (11.8)	B (10.6)
Intersection	-	-	-	C (19.7)	B (11.8)	B (11.7)

[17] JMT conducted an additional analysis of the intersection as a single-lane roundabout.

Table 11 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Signalized Intersection[1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24/S. Delaware Avenue[18]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2028 Without Development (Case 2)	-	-	-	B (16.5)	C (20.5)	C (22.7)
2028 With Development (Case 3a)	-	-	-	B (17.9)	C (20.8)	C (26.3)
2028 With Development (Case 3b)	-	-	-	B (19.4)	C (20.9)	C (24.6)

[18] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, all approaches were modeled with existing lane configurations. The intersection was modeled using a 75 second cycle time.

Table 12
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
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Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control (T-Intersection)[1]	**LOS per TIS**		**LOS per JMT**	
Radish Road/Mumford Road (Sussex Road 409)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2022 Existing (Case 1)				
Westbound Radish Road Approach	A (8.9)	A (8.9)	A (8.9)	A (9.0)
Southbound Mumford Road Left Turn	A (7.3)	A (7.4)	A (7.4)	A (7.4)
2028 Without Development (Case 2)				
Westbound Radish Road Approach	A (8.9)	A (8.9)	A (8.9)	A (9.0)
Southbound Mumford Road Left Turn	A (7.4)	A (7.4)	A (7.4)	A (7.4)
2028 With Development (Case 3a)				
Westbound Radish Road Approach	A (9.0)	A (9.1)	A (9.0)	A (9.2)
Southbound Mumford Road Left Turn	A (7.4)	A (7.4)	A (7.4)	A (7.5)
2028 With Development (Case 3b)[14]				
Westbound Radish Road Approach	-	-	A (8.9)	A (9.1)
Southbound Mumford Road Left Turn	-	-	A (7.4)	A (7.4)

Table 13
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
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Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24 / Mumford Road / Lewis Road	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2022 Existing (Case 1)						
Eastbound Delaware Route 24 Left Turn	A (8.0)	A (8.3)	A (8.0)	A (7.9)	A (8.2)	A (8.0)
Westbound Delaware Route 24 Left Turn	A (9.1)	A (8.1)	A (8.1)	A (8.6)	A (8.2)	A (8.2)
Northbound Mumford Approach	C (20.5)	D (25.3)	C (19.6)	C (20.3)	D (25.8)	C (19.9)
Southbound Lewis Approach	C (17.2)	C (15.9)	C (16.2)	C (17.3)	C (16.1)	C (16.5)
2028 Without Development (Case 2)						
Eastbound Delaware Route 24 Left Turn	A (8.3)	A (8.5)	A (8.2)	A (8.1)	A (8.3)	A (8.2)
Westbound Delaware Route 24 Left Turn	A (9.3)	A (8.4)	A (8.3)	A (8.8)	A (8.4)	A (8.4)
Northbound Mumford Approach	C (25.0)	D (34.3)	D (25.8)	C (24.8)	E (35.1)	D (26.4)
Southbound Lewis Approach	C (20.0)	C (18.1)	C (19.2)	C (20.1)	C (18.4)	C (19.6)
2028 Without Development (Case 2) *with northbound left-turn lane*						
Eastbound Delaware Route 24 Left Turn	-	-	-	A (8.1)	A (8.3)	A (8.3)
Westbound Delaware Route 24 Left Turn	-	-	-	A (8.8)	A (8.4)	A (8.4)
Northbound Mumford Left Turn	-	-	-	D (25.1)	D (30.1)	D (25.9)
Northbound Mumford Right Turn	-	-	-	C (19.0)	C (20.0)	C (17.7)
Northbound Mumford Approach	-	-	-	C (22.5)	D (26.8)	C (23.6)
Southbound Lewis Approach	-	-	-	C (20.1)	C (18.4)	C (19.8)
2028 With Development (Case 3a)						
Eastbound Delaware Route 24 Left Turn	A (8.3)	A (8.5)	A (8.2)	A (8.1)	A (8.3)	A (8.2)
Westbound Delaware Route 24 Left Turn	A (9.4)	A (8.5)	A (8.4)	A (8.8)	A (8.5)	A (8.5)
Northbound Mumford Approach	D (31.2)	E (43.7)	D (30.9)	D (30.8)	E (44.6)	D (31.7)
Southbound Lewis Approach	C (20.3)	C (19.4)	C (19.8)	C (20.5)	C (19.7)	C (20.3)

Table 13 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
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Prepared by: The Traffic Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24 / Mumford Road / Lewis Road	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2028 With Development (Case 3a) *with northbound left-turn lane*						
Eastbound Delaware Route 24 Left Turn	-	-	-	A (8.1)	A (8.3)	A (8.3)
Westbound Delaware Route 24 Left Turn	-	-	-	A (8.8)	A (8.5)	A (8.5)
Northbound Mumford Left Turn	-	-	-	D (29.4)	E (35.9)	D (30.1)
Northbound Mumford Right Turn	-	-	-	C (19.4)	C (20.7)	C (18.2)
Northbound Mumford Approach	-	-	-	D (26.5)	D (31.4)	D (27.3)
Southbound Lewis Approach	-	-	-	C (20.5)	C (19.7)	C (20.5)
2028 With Development (Case 3b)						
Eastbound Delaware Route 24 Left Turn	A (8.3)	A (8.5)	A (8.2)	A (8.2)	A (8.4)	A (8.3)
Westbound Delaware Route 24 Left Turn	A (9.4)	A (8.5)	A (8.4)	A (8.8)	A (8.5)	A (8.5)
Northbound Mumford Approach	D (28.5)	E (40.5)	D (29.2)	D (28.2)	E (41.5)	D (29.9)
Southbound Lewis Approach	C (20.6)	C (18.9)	C (20.0)	C (20.7)	C (19.2)	C (20.4)
2028 With Development (Case 3b) *with northbound left-turn lane*						
Eastbound Delaware Route 24 Left Turn	-	-	-	A (8.2)	A (8.4)	A (8.3)
Westbound Delaware Route 24 Left Turn	-	-	-	A (8.8)	A (8.5)	A (8.5)
Northbound Mumford Left Turn	-	-	-	D (27.8)	D (34.3)	D (29.0)
Northbound Mumford Right Turn	-	-	-	C (19.4)	C (20.9)	C (18.3)
Northbound Mumford Approach				C (24.9)	D (30.2)	D (26.3)
Southbound Lewis Approach	-	-	-	C (20.7)	C (19.2)	C (20.7)

Table 13 (continued)
Peak Hour Levels Of Service (LOS)
Based on Final Traffic Study for Somerton Chase
Report Dated: May 26, 2022
Prepared by: The Traffic Group

Roundabout [1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24 / Mumford Road / Lewis Road[19]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2028 Without Development (Case 2)						
Eastbound Delaware Route 24 Approach	-	-	-	A (8.2)	A (6.5)	A (6.2)
Westbound Delaware Route 24 Approach	-	-	-	A (5.8)	A (7.4)	A (6.4)
Northbound Mumford Approach	-	-	-	A (5.6)	A (6.0)	A (5.4)
Southbound Lewis Approach	-	-	-	A (4.6)	A (5.0)	A (4.8)
Intersection	-	-	-	A (7.1)	A (6.8)	A (6.2)
2028 With Development (Case 3a)						
Eastbound Delaware Route 24 Approach	-	-	-	A (8.3)	A (6.8)	A (6.5)
Westbound Delaware Route 24 Approach	-	-	-	A (6.0)	A (7.6)	A (7.0)
Northbound Mumford Approach	-	-	-	A (6.1)	A (6.3)	A (5.8)
Southbound Lewis Approach	-	-	-	A (4.7)	A (5.1)	A (5.1)
Intersection	-	-	-	A (7.2)	A (7.1)	A (6.6)
2028 With Development (Case 3b)						
Eastbound Delaware Route 24 Approach	-	-	-	A (8.3)	A (6.8)	A (6.5)
Westbound Delaware Route 24 Approach	-	-	-	A (6.0)	A (7.6)	A (7.0)
Northbound Mumford Approach	-	-	-	A (5.8)	A (6.3)	A (5.6)
Southbound Lewis Approach	-	-	-	A (4.7)	A (5.1)	A (5.0)
Intersection	-	-	-	A (7.2)	A (7.1)	A (6.6)

[19] JMT conducted an additional analysis of the intersection as a single lane roundabout.

Table 13 (continued)
Peak Hour Levels Of Service (LOS)
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Report Dated: May 26, 2022
Prepared by: The Traffic Group

Signalized Intersection [1]	**LOS per TIS**			**LOS per JMT**		
Delaware Route 24 / Mumford Road / Lewis Road[20]	Weekday AM	Weekday PM	Saturday	Weekday AM	Weekday PM	Saturday
2028 Without Development (Case 2)	-	-	-	B (15.4)	B (14.6)	B (13.8)
2028 With Development (Case 3a)	-	-	-	B (16.1)	B (15.2)	B (14.5)
2028 With Development (Case 3b)	-	-	-	B (15.8)	B (15.0)	B (14.2)

[20] JMT conducted an additional analysis of the intersection as a signalized intersection. For this analysis, all approached were modeled with a dedicated left-turn lane and a shared through/right-turn lane. The intersection was modeled utilizing a 75 second cycle length with concurrent phasing and permitted left turns.