



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

JENNIFER COHAN  
SECRETARY

August 1, 2019

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

Dear Ms. Tustin,

The Department has completed its review of the traffic impact study (TIS) for the proposed Chase Oaks (formerly known as Charter Oak) residential development. The TIS was prepared by The Traffic Group, Inc. (TTG), and is dated May 10, 2019. TTG prepared the report in a manner generally consistent with DeIDOT's *Development Coordination Manual*.

The TIS evaluates the traffic impacts of the proposed development, proposed to be located on both sides of Webbs Landing Road (Sussex Road 277B) and Robinsonville Road (Sussex Road 277), in Sussex County, Delaware.

The proposed development would consist of 249 single-family detached houses on an approximately 139.13-acre assemblage of parcels (Tax Parcels 234-6.00-96.00, 97.00 & 98.00). Three full access points are proposed: one along Robinsonville Road and two along Webbs Landing Road opposite each other, creating one four-leg intersection with Webbs Landing Road. Construction is anticipated to be complete in 2026.

The subject land is currently zoned AR-1(Agricultural Residential) in Sussex County, and the developer, Charter Oak Investment, LLC, does not plan to rezone the land.

DeIDOT currently has one active project within the study area for the proposed development. DeIDOT's Hazard Elimination Program (HEP), formerly known as the Highway Safety Improvement Program (HSIP), includes improvements at the intersections of Delaware Route 24 and Camp Arrowhead Road (Sussex Road 279) / Fairfield Road, and Delaware Route 24 and Robinsonville Road / Angola Road (Sussex Road 277). This project would make operational improvements to address safety deficiencies and to accommodate future traffic volumes at these two intersections.



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Specifically, the improvements associated with the Delaware Route 24 / Camp Arrowhead Road / Fairfield Road intersection will include extending the existing left-turn and right-turn lanes to increase capacity and providing bicycle lanes and pedestrian facilities.

The improvements associated with the Delaware Route 24 and Robinsonville Road / Angola Road will include the widening of the eastbound Robinsonville Road and westbound Angola Road approaches to provide separate left-turn, through and right-turn lanes; the widening of the northbound and southbound Delaware Route 24 approaches to provide separate left-turn, through and right-turn lanes; and extending the existing left-turn and right-turn lanes on all approaches to meet storage requirements.

The latest updates for this HEP project indicate that design is currently underway and right-of-way acquisition is anticipated to be underway in the fall of 2019. Construction is anticipated to be complete in the spring of 2021.

In addition to the above-mentioned HEP project, the developer of Burton's Pond will be realigning Sloan Road / Pinewater Road (Sussex Road 49) with the intersection of Delaware Route 24 and Hollymount Road (Sussex Road 48) to create a four-leg intersection. This project will also incorporate a separate left-turn lane, one through lane, and a right-turn lane along the northbound and southbound Delaware Route 24 approaches. The eastbound Hollymount Road and westbound Sloan Road / Pinewater Road approaches will include a separate left-turn, one through lane and a right-turn lane.

It is noted that the proposed development is located within the boundary of the proposed Henlopen Transportation Improvement District (TID). A TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projections and future development within the designated district. In this letter, DelDOT has identified the locations in the study area where they have identified improvements to be done as part of the TID. In some locations, the developer should be required to make or contribute toward those improvements. If and when DelDOT and the County establish the TID, it may be appropriate for the developer to contribute to the TID. The Henlopen TID is still under development by DelDOT and Sussex County. DelDOT has completed the 2045 traffic analysis for the TID and is finalizing concept plans and cost estimates for needed improvements. DelDOT plans to discuss those plans and estimates and options for a Capital Transportation Program for the TID (TID CTP) with the County this fall.

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

The review of the Chase Oaks TIS shows that the following intersections exhibit Level of Service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements:

<i>Intersection</i>	<i>Existing Traffic Control</i>	<i>Situation for which deficiencies occur</i>
Robinsonville Road & Kendale Road	Two-way stop control (T-intersection)	2026 AM, PM and Saturday midday without Chase Oaks (Case 2 & 3)
Beaver Dam Road & Kendale Road	Two-way stop control (T-intersection)	2018 PM existing (Case 1); and 2026 AM, PM and Saturday midday with and without Chase Oaks (Case 2 & 3).
Robinsonville Road & Harts Road	Two-way stop control (T-intersection)	2026 PM with Chase Oaks (Case 3)
Delaware Route 24 & Harts Road	Two-way stop control (T-intersection)	2018 AM & PM existing (Case 1); 2026 AM, PM and Saturday midday with and without Chase Oaks (Case 2 & 3)
Delaware Route 24 & Pinewater Road / Sloan Road	Two-way stop control (T-intersection)	2018 PM existing (Case 1); and 2026 AM, PM and Saturday midday with and without Chase Oaks (Case 2 & 3).
Delaware Route 24 & Robinsonville Road / Angola Road	Signalized	2026 AM, PM & Saturday midday with and without Chase Oaks (Case 2 & 3)

The proposed site entrances on Webbs Landing Road and Robinsonville Road exhibit acceptable LOS during future 2026 conditions with the proposed development. DeIDOT Auxiliary Lane Worksheet (ALW) shows the need for left-turn and right-turn lanes on Webbs Landing Road at Site Entrance 1. While DeIDOT's ALW shows no need for a bypass lane or turn lanes at Site Entrance 2 on Robinsonville Road, initial analysis results from the Henlopen TID recommend exclusive northbound left-turn and southbound right-turn lanes in the year 2045.

The unsignalized intersection of Robinsonville Road and Webbs Landing Road exhibits acceptable LOS during future conditions without and with the proposed development. However, left-turn and right-turn lanes are warranted at this location per the DeIDOT Road Design Manual.

The unsignalized intersection of Robinsonville Road and Kendale Road exhibits LOS deficiencies during future conditions without and with the proposed development. With the construction of Chase Oaks, the eastbound Kendale Road approach is expected to operate at LOS F during the AM, PM and Saturday midday peak hours. The future AM, PM and Saturday midday peak hour 95<sup>th</sup> percentile queue lengths would be approximately 23, 15 and 13 vehicles, respectively. Although the Henlopen TID is still under development, a traffic signal has been recommended for this intersection based on initial TID analysis results. A traffic signal would mitigate all LOS deficiencies at this intersection during the future conditions without and with the proposed Chase Oaks development.

The unsignalized intersection of Beaver Dam Road and Kendale Road exhibits LOS deficiencies during existing AM peak hour and future conditions without and with the proposed development. With the construction of Chase Oaks, the westbound Kendale Road approach is expected to operate at LOS F during the AM, PM and Saturday midday peak hours. The future AM, PM and Saturday midday peak hour 95<sup>th</sup> percentile queue lengths would be approximately 24, 42 and 26 vehicles, respectively. Although the Henlopen TID is still under development, a traffic signal has been recommended for this intersection based on initial TID analysis results. A traffic signal would mitigate the LOS deficiencies at this intersection for the future conditions without and with the proposed Chase Oaks development. A traffic signal would be the most appropriate mitigation measure for this intersection.

The unsignalized intersection of Robinsonville Road and Harts Road exhibits LOS deficiencies during the PM peak hour in the future condition with the proposed development. With the construction of Chase Oaks, the westbound Harts Road approach is expected to operate at LOS E in the weekday PM peak hour. The future PM peak hour 95<sup>th</sup> percentile queue length would be approximately 6 vehicles. The initial analysis for the Henlopen TID recommends that Harts Road be closed at Delaware Route 24. With that closure, the TID recommends adding exclusive northbound right-turn and southbound left-turn lanes at the intersection of Robinsonville Road and Harts Road. Absent that closure, adding a westbound right-turn lane would solve the LOS deficiencies at this intersection.

The unsignalized intersection of Delaware Route 24 and Harts Road exhibits LOS deficiencies during the existing AM and PM peak hour and future conditions without and with the proposed development. With the construction of Chase Oaks, the southbound Harts Road approach is expected to operate at LOS F during the AM, PM and Saturday midday peak hours. The future AM, PM, and Saturday midday peak hour 95<sup>th</sup> percentile queue lengths would be approximately 23, 19, and 16 vehicles, respectively. The queues are mainly associated with the southbound left-turn movement. As mentioned above, the initial analysis for the Henlopen TID recommends that Harts Road be closed at Delaware Route 24. To replace it, the analysis recommends extending Jolyns Way, located just south of the subject intersection, to intersect Robinsonville Road creating a one-lane roundabout and providing a traffic signal at the intersection of Delaware Route 24 and Jolyns Way.

The unsignalized intersection of Delaware Route 24 and Pinewater Road / Sloan Road exhibits LOS deficiencies during the existing PM peak hour and future conditions without and with the proposed development. With the construction of Chase Oaks, the westbound Pinewater Road / Sloan Road approach is expected to operate at LOS E in the existing weekday PM peak hour,

and at LOS F during the future AM, PM, and Saturday midday peak hours. As mentioned above, there is a planned improvement by the developer of Burton’s Pond to realign Pinewater Road / Sloan Road with the intersection of Delaware Route 24 and Hollymount Road. As part of the realignment project, a traffic signal will be installed at the intersection to address those LOS deficiencies.

Should the County 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 should improve Robinsonville Road and Webbs Landing Road along the site frontages in order to meet DelDOT’s local road standards. The standards include, but are not limited to, eleven-foot travel lanes and five-foot shoulders. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT’s discretion. DelDOT should analyze the existing lane’s pavement section and recommend an overlay thickness to the developer’s engineer if necessary.
2. The developer should construct exclusive northbound right-turn and southbound left-turn lanes at the intersection of Robinsonville Road and Webbs Landing Road. The proposed configuration is shown on the table below.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Northbound Robinsonville Road	One shared through / right-turn lane	One through lane and one right-turn lane
Southbound Robinsonville Road	One shared left-turn / through lane	One left-turn lane and one through lane
Eastbound Webbs Landing Road	Does not exist	Does not exist
Westbound Webbs Landing Road	One shared left-turn / right-turn lane	One shared left-turn / 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 Subdivision Section to determine final turn-lane lengths.

<b>Approach</b>	<b>Left-Turn Lane(s)</b>	<b>Right-Turn Lane</b>
Northbound Robinsonville Road	N/A	100 feet*
Southbound Robinsonville Road	100 feet*	N/A
Eastbound Webbs Landing Road	N/A	N/A
Westbound Webbs Landing Road	N/A	N/A

\* Proposed turn-lane length based on DelDOT’s *Road Design Manual*.

3. The developer should enter into a traffic signal agreement with DelDOT for the design and construction of a future traffic signal for the intersection of Robinsonville Road and Kendale Road. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. Entering into a Traffic Signal Revolving Fund (TSRF) agreement for this intersection is one option for meeting this requirement.
4. The developer should enter into a traffic signal agreement with DelDOT for the design and construction of a future traffic signal for the intersection of Beaver Dam Road and Kendale Road. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. Entering into a Traffic Signal Revolving Fund (TSRF) agreement for this intersection is one option for meeting this requirement.
5. The developer should coordinate with DelDOT regarding an equitable share contribution toward the potential improvements at the intersection of Robinsonville Road and Harts Road proposed by the Henlopen TID. The improvements include adding exclusive northbound right-turn and southbound left-turn lanes at the intersection. Otherwise, the developer should enter into an agreement with DelDOT to construct an exclusive westbound right-turn lane at the intersection of Robinsonville Road and Harts Road. The length of the westbound right-turn lane should be a minimum of 50 feet, in addition to a 50-foot taper. The developer should coordinate with DelDOT's Development Coordination Section to determine the final design details of this improvement.
6. The developer should construct Site Access 1 on Webbs Landing Road. As the proposed Chase Oaks would be located on both sides of Webbs Landing Road, Site Access 1 will form a four-leg intersection with Webbs Landing Road. The proposed configuration is shown on the table below.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Northbound Site Entrance	Does not exist	One shared left-turn / through / right-turn lane
Southbound Site Entrance	Does not exist	One shared left-turn / through / right-turn lane
Eastbound Webbs Landing Road	One through lane	One left-turn lane, one through lane, and one right turn lane
Westbound Webbs Landing Road	One through lane	One shared left-turn / 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 Subdivision Section to determine final turn-lane lengths.

<b>Approach</b>	<b>Left-Turn Lane(s)</b>	<b>Right-Turn Lane</b>
Northbound Site Entrance	N/A	N/A
Southbound Site Entrance	N/A	N/A
Eastbound Webbs Landing Road	85 feet*	70 feet*
Westbound Webbs Landing Road	N/A	N/A

\* Proposed turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet*.

- The developer should construct Site Access 2 on Robinsonville Road. The proposed configuration is shown in the table below.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration*</b>
Northbound Robinsonville Road	One through lane	One shared left-turn / through lane
Southbound Robinsonville Road	One through lane	One shared through / right-turn lane
Eastbound Site Entrance	Does not exist	One shared left-turn / right-turn lane

\*Per DelDOT’s *Auxiliary Lane Worksheet*, no turn lanes or bypass lanes are required at this entrance.

- The developer should coordinate with DelDOT regarding an equitable share contribution toward the planned improvements by the developer of Burton’s Pond to realign Pinewater Road / Sloan Road with the intersection of Delaware Route 24 and Hollymount Road. The amount of the contribution should be determined through coordination with DelDOT’s Development Coordination Section.
- The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT’s HEP projects at the intersections of Delaware Route 24 and Camp Arrowhead Road / Fairfield Road, and Delaware Route 24 and Robinsonville Road / Angola Road. The amount of the contribution should be determined through coordination with DelDOT’s Development Coordination Section.

10. The following bicycle, pedestrian, and transit improvements should be included:
- a. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane on eastbound Webbs Landing Road at the proposed site entrance along that road.
  - b. Adjacent to the right-turn lane added to eastbound Webbs Landing Road at the site entrance, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.
  - c. Appropriate bicycle symbols, directional arrows, striping (including stop bars), and signing should be included along bicycle facilities and right-turn lanes within the project limit.
  - d. Utility covers should be made flush with the pavement.
  - e. A minimum of fifteen-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Robinsonville Road and Webbs Landing Road.
  - f. Within the easements along Robinsonville Road and Webbs Landing Road, a minimum of a ten-foot wide Shared-Use Path (SUP) that meets current AASHTO and ADA standards should be constructed along each site frontage. Each SUP should connect to the shoulder improvements in accordance with DelDOT's *Shared Use Path and/or Sidewalk Termination Policy* dated June 19, 2014. The SUP should have a minimum of a five-foot buffer from the roadway. The developer should coordinate with DelDOT's Development Coordination Section to determine exact locations and details of the SUP connections at the property boundaries.
  - g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings within the development, including all site entrances. Type 3 curb ramps are discouraged.
  - h. DelDOT recommends the construction of internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative 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. These internal sidewalks should connect to the frontage shared-use paths.
  - i. Where internal sidewalks are located alongside of parking spaces, DelDOT recommends that a buffer be added to eliminate 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://www.deldot.gov/information/pubs\\_forms/manuals/de\\_mutcd/index.shtml](http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml). For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Mark Buckalew of DelDOT's Traffic Section. Mr. Buckalew can be reached at (302) 894-6353 or by email at [Mark.Buckalew@state.de.us](mailto:Mark.Buckalew@state.de.us).

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 subdivision review process.

Ms. Betty Tustin, The Traffic Group, Inc.

August 1, 2019

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Additional details on our review of this TIS are attached. If you have any questions concerning this review, please contact me at (302) 760-2109 or Mr. Claudy Joinville at (302) 760-2124. My email is [Thomas.Brockenbrough@delaware.gov](mailto:Thomas.Brockenbrough@delaware.gov) and Mr. Joinville's email is [Claudy.Joinville@delaware.gov](mailto:Claudy.Joinville@delaware.gov).

Sincerely,



T. William Brockenbrough, Jr.  
County Coordinator

TWB:cjm

Enclosures

cc with enclosures: Ms. Janelle Cornwell, Sussex County Planning & Zoning  
Ms. Constance C. Holland, Office of State Planning Coordination  
Mr. Brad Eaby, Deputy Attorney General  
Ms. Shanté Hastings, Director, Transportation Solutions (DOTS)  
Mr. Drew Boyce, Director, Planning  
Mr. Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS  
Mr. Michael Simmons, Assistant Director, Project Development South,  
DOTS  
Mr. Alastair Probert, South District Engineer, DOTS  
Mr. J. Marc Coté, Assistant Director, Development Coordination  
Mr. Don Weber, Assistant Director, Traffic, DOTS  
Mr. Peter Haag, Traffic Studies Manager, Traffic, DOTS  
Mr. David Dooley, Service Development Planner, Delaware Transit  
Corporation  
Mr. Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Mr. Todd Sammons, Subdivision Engineer, Development Coordination  
Ms. Susanne Laws, Sussex County Subdivision Coordinator, Development  
Coordination  
Mr. Mark Buckalew, Traffic Safety Engineer, DelDOT Traffic, DOTS  
Mr. John Andrescavage, Subdivision Manager, Development  
Coordination  
Mr. Brian Yates, Subdivision Manager, Development Coordination  
Mr. Troy Brestel, Project Engineer, Development Coordination  
Mr. Claudy Joinville, Project Engineer, Development Coordination

## **General Information**

**Report date:** May 10, 2019

**Prepared by:** The Traffic Group, Inc. (TTG)

**Prepared for:** Chase Oaks (f.k.a. Charter Oak)

**Tax parcels:** 234-6.00-96.00, 97.00 & 98.00

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

## **Project Description and Background**

**Description:** The proposed Chase Oaks residential development would consist of 249 single-family detached houses.

**Location:** proposed to be located on both sides of Webbs Landing Road (Sussex Road 277B) and Robinsonville Road (Sussex Road 277), in Sussex County, Delaware. A site location map is included on Page 11.

**Amount of land to be developed:** approximately 139.13-acre assemble of parcels of land

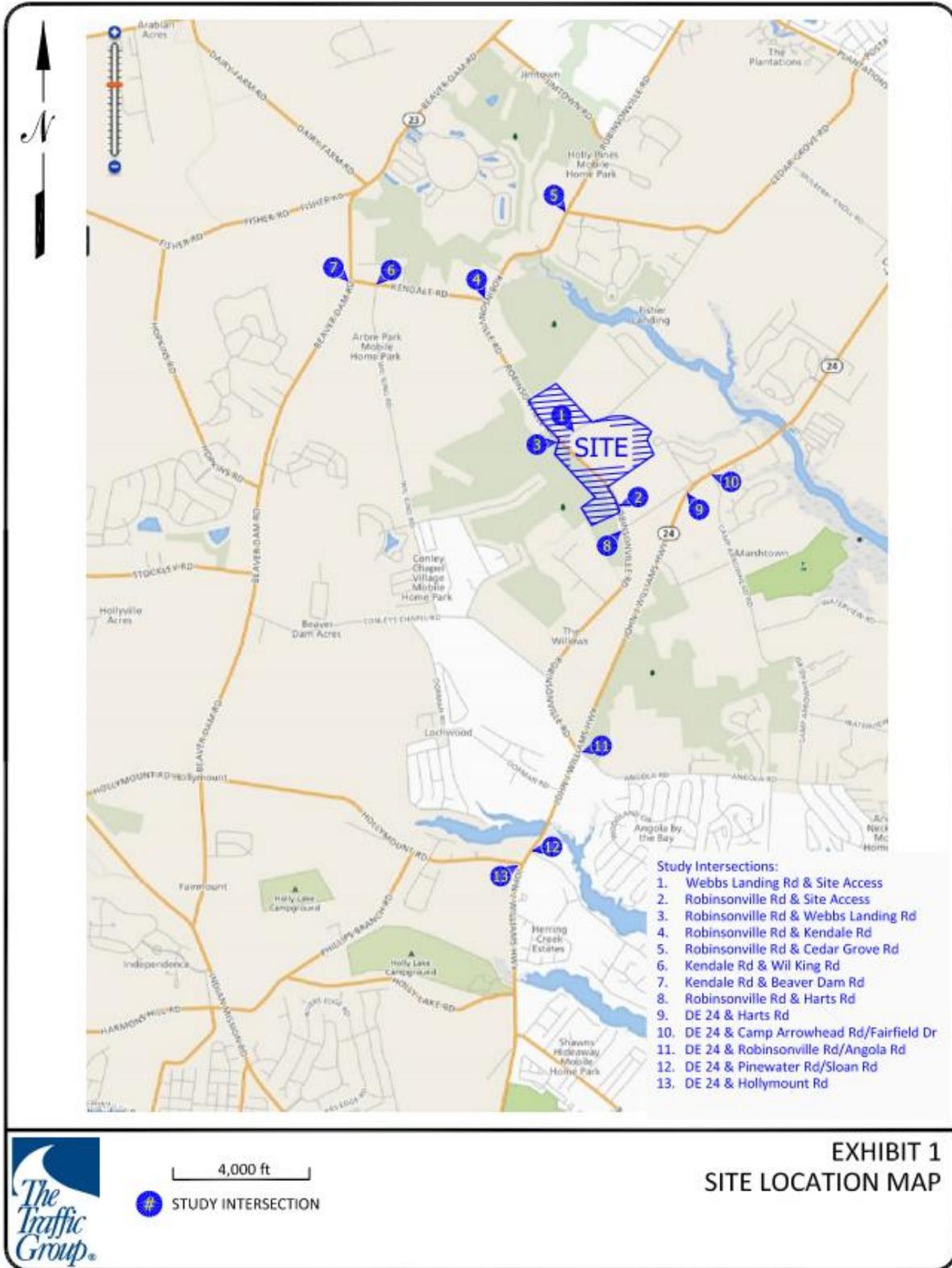
**Land use approval(s) needed:** DelDOT Subdivision approval and Sussex County land use approval. The subject land is currently zoned AR-1(Agricultural Residential) in the Sussex County, and the developer, Charter Oak Investment, LLC, does not plan to rezone the land.

**Proposed completion date:** 2026

**Proposed access location:** Three full access points are proposed: one along Robinsonville Road and two along Webbs Landing Road opposite each other, creating one four-leg intersection with Webbs Landing Road.

### **Daily Traffic Volumes (per DelDOT Traffic Summary 2018):**

- 2018 Average Annual Daily Traffic on Robinsonville Road 3,537 vpd
- 2018 Average Annual Daily Traffic on Webbs Landing Road: 423 vpd



**EXHIBIT 1**  
**SITE LOCATION MAP**

## **2015 Delaware Strategies for State Policies and Spending**

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

The proposed Chase Oaks development is located within three investment level areas, Investment Level 2, Level 3 and Level 4.

#### *Investment Level 2*

Investment Level 2 Areas are areas of the state that are the most active portion of Delaware's developed landscape. Investment Level 2 Areas consist of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water or 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 serve as a transition between Investment Level 1 Areas and the state's more open, less populated areas.

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. In addition, investments should encourage a 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, it is the State's intent to use its spending and management tools to promote well-designed development in Investment Level 2 Areas.

#### *Investment Level 3*

Investment Level 3 Areas fall into two categories. The first category covers land that is in long-term growth plans of counties and municipalities but where development is not necessary to accommodate expected short-term population growth. The second category includes lands that are adjacent to fast growing Investment Level 1 and Level 2 areas but are often impacted by environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues. From a housing perspective, Investment Level 3 areas are characterized by low density and rural homes.

#### *Investment Level 4*

Investment Level 4 Areas are predominantly rural or agricultural and contain much of Delaware's open space and natural areas. These areas are home to agribusiness activities, farm complexes, and small settlements / unincorporated communities. Investment Level 4 Areas may also have scattered single-family detached residential homes. Existing transportation facilities and services will be maintained by the state while it continues to manage the transportation system in a manner that will support the preservation of the natural environment and agricultural business. Construction of new homes, and development unrelated to the areas' needs is discouraged; housing policies will focus on maintenance and rehabilitation of existing homes and communities. In addition, the Department of Education does not support the construction of new

educational facilities in Investment Level 4 Areas. The educational needs of Investment Level 4 Areas would likely need to be met through facilities located in Investment Level 1, Level 2 and Level 3 Areas.

In general, the state will limit its investments in public infrastructure systems. Investments should address existing public health, safety, or environmental risks, preserve rural character and natural resources, and discourage further development that is unrelated to the areas' needs.

**Proposed Development's Compatibility with Strategies for State Policies and Spending:**

The proposed Chase Oaks development is located within Investment Level 2, Level 3 and Level 4 Areas, and is to consist of a 249 single-family detached houses. This type of development is consistent with the character of Investment Level 2, Level 3 and, to a lesser extent, Level 4 areas. It is noted that only a small portion of the proposed development is within the Level 4 Area. New housing developments are discouraged in Investment Level 4 areas and should meet significant qualifications regarding timing, phasing, site characteristics, and agency programs in Investment Level 2 and Level 3 areas. In general, the state would be responsible for providing many public services to the residents of the proposed development, such as school construction and transportation, police and fire / EMS services, and additional maintenance of the transportation system.

However, given that only a small portion of the development is within Level 4, state policies provide that some of the needs of developments located within Level 4 areas would need to be met through facilities located in Level 1, Level 2 and Level 3 areas. It also noted that the majority of the proposed development is located within Level 2 and Level 3 areas. While a portion of the proposed development is located within Level 4, because the majority of the development is located within Level 2 and Level 3 areas, the development appears to generally comply with the policies stated in the *2015 Strategies for State Policies and Spending* document. Nonetheless, additional discussion may be required to address the portion of the development located within the Level 4.

**Comprehensive Plan**

**Sussex County Comprehensive Plan:**

*(Source: Sussex County Comprehensive Plan Update, June 2008)*

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed Chase Oaks development is located in Sussex County, within a "low-density area." Low density areas are categorized as rural areas. In these areas, Sussex County expects farming to co-exist with certain types of residential uses. Similar to all other lands designated as low density areas in Sussex County, the site of the proposed development is zoned AR-1 (Agricultural Residential). This zoning designation allows for single-family detached homes at two homes per acre on lots containing a minimum of ½ acre if the development connect to central sewers. Otherwise, single-family detached homes are permitted on minimum ¾ acre lots. Two homes per acre are also allowed where a cluster-style plan is used and 30% of the tract is preserved in permanent open space.

Based on the Sussex County Comprehensive Plan, the following major guidelines should apply to future growth in the low density areas.

**Permitted Uses** – The primary land uses within low-density areas should be agricultural activities and single-family detached homes. Business or industrial uses should only be permitted to support or address the needs for these two uses.

**Densities** – The minimum lot size should be ½ acre for lots with central sewer service and ¾ acre for lots with on-site septic systems. A cluster-style plan should permit overall site densities of two homes per acre, provided significant open space is preserved and the development connects to a central sewer.

**Infrastructure** – Developments where lots are smaller than ¾ acre should require connection to a central sewer.

**Proposed Development's Compatibility with Comprehensive Plan:** The Chase Oaks residential development would consist of 249 single-family detached houses on a 139.13-acre assemblage of parcels. It appears that a cluster-style development is proposed, considerable open space is preserved, and the tract connects to a central community sewer system. Therefore, the comprehensive plan allows for a maximum overall site density of two homes per acre. The construction of 249 single-family houses on 139.13 acres results in an overall site density of just under two homes per acre.

The proposed site is currently zoned AR-1 within Sussex County, and no rezoning is proposed. The purpose of the AR-1 zoning district is to protect agricultural lands and activities and other valuable natural resources. Low-density housing is permitted along with churches, recreational facilities, and accessory uses as may be necessary or is normally compatible with residential surroundings. While there are issues relating to the use and size of the proposed development in this rural area that require further discussion, based on the elements described above it appears the proposed development may be compatible with the current version of the Sussex County Comprehensive Plan.

### **Relevant Projects in the DelDOT Capital Transportation Program**

DelDOT currently has one active project within the study area for the proposed development. DelDOT's Hazard Elimination Program (HEP), formerly known as the Highway Safety Improvement Program (HSIP) includes improvements at the intersections of Delaware Route 24 and Camp Arrowhead Road (Sussex Road 279) / Fairfield Road, and Delaware Route 24 and Robinsonville Road / Angola Road (Sussex Road 277). This project would make operational improvements to address safety deficiencies and to accommodate future traffic volumes at these intersections.

Specifically, the improvements associated with the Delaware Route 24 / Camp Arrowhead Road intersection will include extending the existing left-turn and right-turn lanes to increase capacity and providing bicycle lanes and pedestrian facilities.

The improvements associated with the Delaware Route 24 and Robinsonville Road / Angola Road will include the widening of the eastbound Robinsonville Road and westbound Angola

Road approaches to provide separate left-turn, through and right-turn lanes; the widening of the northbound and southbound Delaware Route 24 approaches to provide separate left-turn, through and right-turn lanes; and extending the existing left-turn and right-turn lanes on all approaches to meet storage requirements.

The latest updates for this HEP project indicate that design is currently underway and right-of-way acquisition is anticipated to be underway in the fall of 2019. Construction is anticipated to be complete in the spring of 2021.

In addition to the above-mentioned HEP project, the developer of Burton's Pond will be realigning Sloan Road / Pinewater Road (Sussex Road 49) with the intersection of Delaware Route 24 and Hollymount Road (Sussex Road 48) to create a four-leg intersection. This project will also incorporate a separate left-turn lane, one through lane, and a right-turn lane along the northbound and southbound Delaware Route 24 approaches. The eastbound Hollymount Road and westbound Sloan Road / Pinewater Road approaches will include a separate left-turn, one through lane and a right-turn lane.

It is noted that the proposed development is located within the boundary of the Henlopen Transportation Improvement District (TID). The TID is a planning concept that seeks to proactively align transportation infrastructure spending and improvements with land use projections and future development within the designated district. When intersection improvements are identified as part of the Henlopen TID, contributions would be required from the developer of Chase Oaks. Presently, DelDOT and the County are still working toward establishing the TID but when and if that is done, it may be appropriate for the developer to exchange some of the obligations addressed in this letter for an obligation to contribute to the TID. The TID is still under development by DelDOT and Sussex County. DelDOT has completed the 2045 traffic analysis for the TID and is finalizing concept plans and cost estimates for needed improvements. DelDOT plans to discuss them and develop options for a Capital Transportation Program for the TID (TID CTP) for review with the County this fall.

### **Trip Generation**

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

- 249 single-family detached houses (ITE Land Use Code 210)

Table 1  
CHASE OAKS PEAK HOUR TRIP GENERATION

Land Use 249 Single-Family Detached Houses	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Site Entrance 1	41	125	166	140	82	222	112	95	207
Site Entrance 2	4	12	16	14	8	22	11	9	20
<b>TOTAL TRIPS</b>	<b>45</b>	<b>137</b>	<b>182</b>	<b>154</b>	<b>90</b>	<b>244</b>	<b>123</b>	<b>104</b>	<b>227</b>

Table 2  
CHASE OAKS DAILY TRIP GENERATION

Land Use 249 Single-Family Detached Houses	Weekday ADT			Saturday ADT		
	In	Out	Total	In	Out	Total
Site Entrance 1	1,095	1,095	2,190	1,052	1053	2,105
Site Entrance 2	108	109	217	104	104	208
<b>TOTAL TRIPS</b>	<b>1,203</b>	<b>1,204</b>	<b>2,407</b>	<b>1,156</b>	<b>1,157</b>	<b>2,313</b>

**Overview of TIS**

**Intersections examined:**

- 1) Webbs Landing Road (Sussex Road 277B) / Site Entrance 1
- 2) Robinsonville Road (Sussex Road 277) / Site Entrance 2
- 3) Robinsonville Road / Webbs Landing Road (Sussex Road 277B)
- 4) Robinsonville Road / Kendale Road (Sussex Road 287)
- 5) Robinsonville Road / Cedar Grove Road (Sussex Road 283)
- 6) Kendale Road / Wil King Road (Sussex Road 288)
- 7) Kendale Road / Beaver Dam Road (Sussex Road 285)
- 8) Robinsonville Road / Harts Road (Sussex Road 277A)
- 9) Delaware Route 24 / Harts Road
- 10) Delaware Route 24 / Camp Arrowhead Road (Sussex Road 279) / Fairfield Drive
- 11) Delaware Route 24 / Robinsonville Road / Angola Road (Sussex Road 277)
- 12) Delaware Route 24 / Pinewater Road / Sloan (Sussex Road 49)
- 13) Delaware Route 24 / Hollymount Road (Sussex Road 48)\*

*\*Due to the proposed realignment of Pinewater Road / Sloan Road at the intersection of Delaware Route 24 and Hollymount Road (Sussex Road 48), DelDOT required the Consultant to conduct a traffic count at the intersection of Delaware Route 24 and Hollymount Road as Cases 2 and 3 should assume the completion of the realignment project.*

**Conditions examined:**

- 1) 2018 existing conditions (Case 1)
- 2) 2026 without Chase Oaks (Case 2)
- 3) 2026 with Chase Oaks (Case 3)

**Peak hours evaluated:** Weekday morning, afternoon, and Saturday midday peak hours

**Committed developments considered:**

- 1) Tidewater Landing (213 single-family detached houses - 20 unbuilt)
- 2) Dellwood a.k.a. Ocean Meadows (100 single-family detached houses)
- 3) Acadia a.k.a. Insight at Lewes Point (238 single-family detached houses)
- 4) Coastal Club (412 single-family detached houses – 260 unbuilt, 280 residential condominiums / townhouses – 163 unbuilt)
- 5) Anchors Run a.k.a. Insight at Lewes Run (263 single-family detached houses)
- 6) Kindleton (90 single-family detached houses)
- 7) Outer Banks (49 single-family detached houses)
- 8) The Woods at Burton Pond (165 single-family detached houses)
- 9) Pelican Landing (88,000 square-foot shopping center)
- 10) Marsh Island (152 single-family detached houses)
- 11) Marsh Farm Estates (104 single-family detached houses with 103 *unbuilt* units)
- 12) Saddle Ridge (f.k.a. Windswept) (81 single-family detached houses)
- 13) Rehoboth Point Yacht Club (f.k.a. Love Creek Marina) (188 condominiums and 5,000 square-foot quality restaurant)
- 14) Middle Creek Preserve (313 single-family detached houses)
- 15) Dorman Farm Property (200 single-family detached houses, 178 townhouses)
- 16) Headwater Cove (137 single-family detached houses)
- 17) Kielbasa (68 single-family detached houses)
- 18) Novosel Subdivision (160 single-family detached houses)
- 19) Street Property (173 single-family detached houses)

**Intersection Descriptions**

- 1) **Webbs Landing Road / Site Entrance 1**  
**Type of Control:** no existing intersection; proposed two-way stop (four-leg intersection)  
**Northbound approach:** (Proposed Site Entrance 1) proposed shared left-turn / through / right-turn lane, stop-controlled  
**Southbound approach:** (Proposed Site Entrance 1) proposed shared left-turn / through / right-turn lane, stop-controlled  
**Eastbound approach:** (Webbs Landing Road) one shared left / through / right-turn lane  
**Westbound approach:** (Webbs Landing Road) one shared left / through / right-turn lane

- 2) **Robinsonville Road / Site Entrance 2**  
**Type of Control:** no existing intersection; proposed one-way stop (T-intersection)  
**Northbound approach:** (Robinsonville Road) proposed shared left-turn / through lane  
**Southbound approach:** (Robinsonville Road) proposed shared through / right-turn lane  
**Eastbound approach:** (Proposed Site Access 2) proposed shared left-turn / right-turn lane, stop-controlled
- 3) **Robinsonville Road / Webbs Landing Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Robinsonville Road) one shared through / right-turn lane  
**Southbound approach:** (Robinsonville Road) one shared left-turn / through lane  
**Westbound Approach:** (Webbs Landing Road) one shared left-turn / right-turn lane
- 4) **Robinsonville Road / Kendale Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Robinsonville Road) one shared left-turn / through lane  
**Southbound approach:** (Robinsonville Road) one shared through / right-turn lane  
**Eastbound Approach:** (Kendale Road) one shared left-turn / right-turn lane
- 5) **Robinsonville Road / Cedar Grove Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Robinsonville Road) one shared through / right-turn lane  
**Southbound approach:** (Robinsonville Road) one shared left-turn / through lane  
**Westbound Approach:** (Cedar Grove Road) one shared left-turn / right-turn lane
- 6) **Wil King Road / Kendale Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Wil King Road) one shared left-turn / right-turn lane  
**Eastbound Approach:** (Kendale Road) one shared through / right-turn lane  
**Westbound approach:** (Kendale Road) one shared left-turn / through lane
- 7) **Beaver Dam Road / Kendale Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Beaver Dam Road) one shared through / right-turn lane  
**Southbound approach:** (Beaver Dam Road) one shared left-turn / through lane  
**Westbound Approach:** (Kendale Road) one shared left-turn / right-turn lane
- 8) **Robinsonville Road / Harts Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Robinsonville Road) one shared through / right-turn lane  
**Southbound approach:** (Robinsonville Road) one shared left-turn / through lane  
**Westbound Approach:** (Harts Road) one shared left-turn / right-turn lane

- 9) **Delaware Route 24 / Harts Road**  
**Type of Control:** one-way stop (T-intersection)  
**Southbound approach:** (Harts Road) one left-turn lane and one right-turn lane  
**Eastbound approach:** (Delaware Route 24) one left-turn lane and one through lane  
**Westbound Approach:** (Delaware Route 24) one through lane and one right-turn lane
  
- 10) **Delaware Route 24 / Camp Arrowhead Road / Fairfield Drive**  
**Type of Control:** four-way signalized intersection  
**Northbound approach:** (Camp Arrowhead Road) one left-turn lane, one through lane, and one right-turn lane  
**Southbound approach:** (Fairfield Drive) one left-turn lane and one shared through / right-turn lane  
**Eastbound approach:** (Delaware Route 24) one left-turn lane, one through lane, and one right-turn lane  
**Westbound Approach:** (Delaware Route 24) one left-turn lane, one through lane, and one right-turn lane
  
- 11) **Delaware Route 24 / Robinsonville Road / Angola Road**  
**Type of Control:** four-way signalized intersection  
**Northbound approach:** (Delaware Route 24) one left-turn lane and one shared through / right-turn lane  
**Southbound approach:** (Delaware Route 24) one left-turn lane and one shared through / right-turn lane  
**Eastbound approach:** (Robinsonville Road) one shared left-turn / through lane and one right-turn lane  
**Westbound Approach:** (Angola Road) one shared left-turn / through lane and one right-turn lane
  
- 12) **Delaware Route 24 / Pinewater Road / Sloan Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Delaware Route 24) one through lane and one right-turn lane  
**Southbound approach:** (Delaware Route 24) one shared left-turn / through lane  
**Westbound Approach:** (Pinewater Road/Sloan Road) one shared left-turn / right-turn lane
  
- 13) **Delaware Route 24 / Hollymount Road**  
**Type of Control:** one-way stop (T-intersection)  
**Northbound approach:** (Delaware Route 24) one shared left-turn / through lane  
**Southbound approach:** (Delaware Route 24) one through lane and one right-turn lane  
**Eastbound Approach:** (Hollymount Road) one shared left-turn / right-turn lane

## **Safety Evaluation**

**Crash Data:** Per current DelDOT policy, a review of crash data is not included in this letter.

**Sight Distance:** The proposed access on Webbs Landing Road would be located on a relatively straight section of roadway. However, the location of the proposed access appears to be in the trough of a vertical curve, which could limit sight distance. In addition, east of the proposed site entrance, there is a horizontal curve which has the potential to impact sight distance or create safety concerns for left-turning vehicles in and out of the site entrance on Webbs Landing Road. Due to the vertical and horizontal curves mentioned above, sight distance and safety should be analyzed as part of the site plan review process to confirm that adequate sight distance will be available for all proposed movements at the site entrance.

The proposed entrance on Robinsonville Road would be located on a slightly curved and relatively flat section of roadway and appears to have adequate sight distance. The proposed entrance on Robinsonville Road would be located on the inside of a horizontal curve and approximately ½ mile north of another horizontal curve near the intersection of Robinsonville Road and Fox Run Road. While there appears to be no immediate sight distance or safety concerns to left-turning vehicles in and out of the site entrance on Robinsonville Road due to the slight horizontal curve at the entrance location, sight distance should be analyzed as part of the site plan review process to confirm that adequate sight distance will be available for all proposed movements at the site entrance.

There appears to be a slight sight distance deficiency at the intersection of Robinsonville Road and Kendale Road for vehicles turning left from Kendale Road, although it appears there is room for left-turning vehicles to move up closer to Robinsonville Road to improve their sight distance.

While there are horizontal curves along Robinsonville Road, the study area generally consists of straight and flat roadways and there are few potential visual obstructions. Sight distance appears to be adequate throughout the study area, other than the issues described above. No problematic sight distance deficiencies have been reported or indicated by crash data.

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

**Existing transit service:** The Traffic Group, Inc. contacted representatives of the Delaware Transit Corporation (DTC) to determine existing and planned transit services near the proposed development. DART currently operates Route 215 along Delaware Route 24. DTC currently has no plans to extend service along Robinsonville Road.

**Planned transit service:** At the time of the Chase Oaks TIS, it was determined that there are no plans to extend transit service along Robinsonville to serve the proposed development.

**Existing bicycle and pedestrian facilities:** According to DelDOT's Sussex County Bicycle Map (dated March 2018), Beaver Dam Road is classified a "high traffic connector bicycle route with bikeway." Delaware Route 24 is classified as a "high traffic regional bicycle route with bikeway." A portion of Robinsonville Road, from Delaware Route 24 to Conley Chapel Road, is classified is classified as a "connector bicycle route without bikeway."

There are few existing pedestrian facilities throughout the study area. There no marked crosswalks or pedestrian signals at the study intersections. Only the intersection of Delaware Route 24 and Camp Arrowhead Road / Fairfield Drive has curb ramps along the north side.

**Planned bicycle and pedestrian facilities:** The Traffic Group, Inc. contacted representatives of the DelDOT's Local Systems Planning Section to determine existing and planned bicycle and pedestrian facilities for the proposed development. DelDOT's Local Systems Planning Section provided comments regarding planned or requested bicycle and pedestrian facilities in the study area of this proposed development. The following comments were provided:

- Install a ten-foot wide shared-use path along the site frontages on Robinsonville Road and Webbs Landing Road.

### **Previous Comments**

All comments from DelDOT's Scoping Letter, Traffic Count Review, and Preliminary TIS (PTIS) Review were addressed in the Final TIS submission.

### **General HCS Analysis Comments**

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

- 1) The TIS used cycle lengths of 120 seconds, whereas DelDOT used cycle lengths of 150 seconds in the analyses of the signalized intersections of Delaware Route 24 and Camp Arrowhead Road / Fairfield Road, and Delaware Route 24 and Robinsonville Road / Angola Road.
- 2) Neither the TIS nor DelDOT included percent grade in their analyses.

Table 3  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
*based on Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>1</sup> Two-Way Stop Control (T- intersection)	LOS per TIS			LOS per DelDOT		
	Weekda y AM	Weekda y PM	Saturday Midday	Weekda y AM	Weekda y PM	Saturda y Midday
Webbs Landing Road & Site Entrance 1						
2026 with Chase Oaks (Case 3)						
Northbound Site Entrance	A (9.9)	B (10.4)	B (10.3)	A (9.9)	B (10.3)	B (10.2)
Southbound Site Entrance	A (8.6)	A (8.5)	A (8.5)	A (8.6)	A (8.5)	A (8.5)
Eastbound Webbs Landing Road - Left	A (8.6)	A (8.8)	A (8.7)	A (8.6)	A (7.3)	A (7.3)
Westbound Webbs Landing Road - Left	A (7.3)	A (7.5)	A (7.4)	A (7.3)	A (7.5)	A (7.4)

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<sup>1</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>2</sup> Two-Way Stop Control (T- intersection)	LOS per TIS			LOS per DelDOT		
	Weekda y AM	Weekda y PM	Saturday Midday	Weekda y AM	Weekda y PM	Saturda y Midday
<b>Robinsonville Road &amp; Site Entrance 2</b>						
2026 with Chase Oaks (Case 3)						
Northbound Robinsonville Road - Left	A (8.1)	A (8.5)	A (8.3)	A (8.1)	A (8.5)	A (8.3)
Eastbound Site Entrance	B (12.8)	B (14.8)	B (14.5)	B (12.8)	B (14.8)	B (14.5)

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<sup>2</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>3</sup> Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Robinsonville Road &amp; Webbs Landing Road</b>						
2018 Existing (Case 1)						
Southbound Robinsonville Road - Left	A (7.7)	A (7.5)	A (7.6)	A (7.7)	A (7.5)	A (7.6)
Westbound Webbs Landing Road	A (9.9)	A (9.3)	B (10.1)	A (9.9)	A (9.3)	B (10.1)
2026 without Chase Oaks (Case 2)						
Southbound Robinsonville Road - Left	A (8.0)	A (8.2)	A (8.2)	A (8.0)	A (8.2)	A (8.2)
Westbound Webbs Landing Road	B (11.9)	B (11.8)	B (13.6)	B (11.9)	B (11.8)	B (13.6)
2026 with Chase Oaks (Case 3)						
Southbound Robinsonville Road - Left	A (8.2)	A (8.7)	A (8.6)	A (8.2)	A (8.7)	A (8.6)
Westbound Webbs Landing Road	C (16.1)	C (22.9)	C (21.2)	C (16.1)	C (22.9)	C (21.2)

<sup>3</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>4</sup> Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Robinsonville Road &amp; Kendale Road</b>						
2018 Existing (Case 1)						
Northbound Robinsonville Road - Left	A (7.6)	A (8.2)	A (8.0)	A (7.6)	A (8.2)	A (8.0)
Eastbound Kendale Road	C (16.3)	B (10.9)	B (12.9)	C (17.7)	B (14.1)	B (13.7)
2026 without Chase Oaks (Case 2)						
Northbound Robinsonville Road - Left	A (8.3)	A (9.2)	A (9.2)	A (8.3)	A (9.2)	A (9.2)
Eastbound Kendale Road	F (249.9)	F (53.3)	F (67.4)	F (254.9)	F (101.0)	F (90.1)
2026 with Chase Oaks (Case 3)						
Northbound Robinsonville Road - Left	A (8.5)	A (9.4)	A (9.2)	A (8.5)	A (9.4)	A (9.2)
Eastbound Kendale Road	F (420.6)	F (136.2)	F (149.7)	F (424.9)	F (190.8)	F (176.1)

<sup>4</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>5</sup>	LOS per TIS			LOS per DeIDOT <sup>6</sup>		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Robinsonville Road &amp; Kendale Road</b>						
2026 without Chase Oaks (Case 2)	N/A	N/A	N/A	B (19.9)	B (18.9)	B (17.8)
2026 with Chase Oaks (Case 3)	N/A	N/A	N/A	B (19.2)	B (19.4)	B (17.8)

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

<sup>6</sup> The improvements at this intersection are based on recommendation from the Henlopen TID. The improvements entail a traffic signal and exclusive turn lanes on all three approaches.

Table 8  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
*based on Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>7</sup> Two-Way Stop Control (T- intersection)	LOS per TIS			LOS per DelDOT		
	Weekda y AM	Weekda y PM	Saturday Midday	Weekda y AM	Weekda y PM	Saturda y Midday
<b>Robinsonville Road &amp; Cedar Grove Road</b>						
2018 Existing (Case 1)						
Southbound Robinsonville Road - Left	A (8.7)	A (7.6)	A (8.0)	A (8.7)	A (7.6)	A (8.0)
Westbound Cedar Grove Road	B (12.1)	B (13.7)	B (13.2)	B (12.1)	B (13.7)	B (13.2)
2026 without Chase Oaks (Case 2)						
Southbound Robinsonville Road - Left	A (9.3)	A (8.0)	A (8.4)	A (9.3)	A (8.0)	A (8.4)
Westbound Cedar Grove Road	C (16.1)	C (24.6)	C (20.7)	C (16.1)	C (24.6)	C (20.7)
2026 with Chase Oaks (Case 3)						
Southbound Robinsonville Road - Left	A (9.5)	A (8.0)	A (8.5)	A (9.5)	A (8.0)	A (8.5)
Westbound Cedar Grove Road	C (17.2)	D (29.4)	C (23.3)	C (17.2)	D (29.4)	C (23.3)

<sup>7</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>8</sup> Two-Way Stop Control (T- intersection)	LOS per TIS			LOS per DeIDOT		
	Weekda y AM	Weekda y PM	Saturday Midday	Weekda y AM	Weekda y PM	Saturda y Midday
<b>Kendale Road &amp; Wil King Road</b>						
2018 Existing (Case 1)						
Northbound Wil King Road	B (11.5)	B (11.5)	B (10.3)	B (11.5)	B (11.5)	B (10.3)
Westbound Kendale Road – Left	A (7.8)	A (7.7)	A (7.6)	A (7.8)	A (7.7)	A (7.6)
2026 without Chase Oaks (Case 2)						
Northbound Wil King Road	B (14.4)	C (16.1)	B (13.5)	B (14.4)	C (16.1)	B (13.5)
Westbound Kendale Road – Left	A (8.0)	A (8.3)	A (8.0)	A (8.0)	A (8.3)	A (8.0)
2026 with Chase Oaks (Case 3)						
Northbound Wil King Road	C (15.1)	C (17.3)	B (14.3)	C (15.1)	C (17.3)	B (14.3)
Westbound Kendale Road – Left	A (8.0)	A (8.4)	A (8.1)	A (8.0)	A (8.4)	A (8.1)

<sup>8</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 10  
**PEAK HOUR LEVELS OF SERVICE (LOS)**  
*based on Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>9</sup> Two-Way Stop Control (T- intersection)	LOS per TIS			LOS per DeIDOT		
	Weekda y AM	Weekday PM	Saturda y Midday	Weekda y AM	Weekday PM	Saturday Midday
<b>Beaver Dam Road &amp; Kendale Road</b>						
2018 Existing (Case 1)						
Southbound Beaver Dam Road - Left	A (9.6)	A (8.4)	A (8.4)	A (9.6)	A (8.4)	A (8.4)
Westbound Kendale Road	C (22.3)	F (50.0)	C (18.3)	C (22.3)	F (50.0)	C (18.4)
2026 without Chase Oaks (Case 2)						
Southbound Beaver Dam Road - Left	B (11.1)	B (10.0)	A (9.8)	B (11.1)	B (10.0)	A (9.8)
Westbound Kendale Road	F (242.4)	F (1,448.9)	F (324.4)	F (242.4)	F (1,448.9)	F (327.2)
2026 with Chase Oaks (Case 3)						
Southbound Beaver Dam Road - Left	B (11.2)	B (10.3)	B (10.0)	B (11.2)	B (10.3)	B (10.0)
Westbound Kendale Road	F (298.7)	F (1,952.6)	F (434.6)	F (298.7)	F (1,952.6)	F (438.0)

<sup>9</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>10</sup>	LOS per TIS			LOS per DeIDOT <sup>11</sup>		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Beaver Dam Road &amp; Kendale Road</b>						
2026 without Chase Oaks (Case 2)	N/A	N/A	N/A	C (25.1)	B (16.6)	B (17.1)
2026 with Chase Oaks (Case 3)	N/A	N/A	N/A	D (38.8)	B (18.4)	B (18.9)

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

<sup>11</sup> The improvements at this intersection are based on recommendation from the Henlopen TID. The improvements entail a traffic signal and exclusive turn lanes on all three approaches.

Table 12  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
*based on Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>12</sup> Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per DeIDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Robinsonville Road &amp; Harts Road</b>						
2018 Existing (Case 1)						
Southbound Robinsonville Road - Left	A (7.8)	A (7.6)	A (7.7)	A (7.8)	A (7.6)	A (7.7)
Westbound Harts Road	B (10.4)	B (11.2)	B (11.4)	B (10.4)	B (11.2)	B (11.4)
2026 without Chase Oaks (Case 2)						
Southbound Robinsonville Road - Left	A (8.3)	A (8.3)	A (8.5)	A (8.3)	A (8.3)	A (8.5)
Westbound Harts Road	B (14.0)	C (23.4)	C (23.6)	B (14.0)	C (23.4)	C (23.6)
2026 with Chase Oaks (Case 3)						
Southbound Robinsonville Road - Left	A (8.5)	A (8.5)	A (8.8)	A (8.5)	A (8.5)	A (8.8)
Westbound Harts Road	C (15.5)	E (35.6)	D (33.9)	C (15.5)	E (35.6)	D (33.9)
2026 with Chase Oaks (Case 3) – <i>with addition of westbound right-turn lane</i>						
Southbound Robinsonville Road - Left	N/A	N/A	N/A	A (8.5)	A (8.5)	A (8.8)
Westbound Harts Road	N/A	N/A	N/A	B (13.7)	C (19.2)	C (20.1)

<sup>12</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>13</sup> Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per DeIDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 24 &amp; Harts Road</b>						
2018 Existing (Case 1)						
Northbound Delaware Route 24 - Left	A (8.4)	B (11.2)	A (8.5)	A (8.4)	B (11.2)	A (8.5)
Eastbound Harts Road	F (61.3)	F (75.1)	D (26.6)	F (61.0)	F (75.3)	D (26.7)
2026 without Chase Oaks (Case 2)						
Northbound Delaware Route 24 - Left	A (9.0)	B (13.9)	A (9.9)	A (9.0)	B (13.9)	A (9.9)
Eastbound Harts Road	F (833.7)	F (1,279.1)	F (434.7)	F (831.3)	F (1,282.1)	F (436.8)
2026 with Chase Oaks (Case 3)						
Northbound Delaware Route 24 - Left	A (9.1)	B (14.2)	B (10.0)	A (9.1)	B (14.2)	B (10.0)
Eastbound Harts Road	F (1,061.0)	F (1,522.9)	F (553.4)	F (1,058.2)	F (1,526.4)	F (555.8)

<sup>13</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>14</sup>	LOS per TIS			LOS per DeIDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 24 &amp; Camp Arrowhead Road</b>						
2018 Existing (Case 1)	B (11.3)	B (10.5)	C (24.2)	A (7.4)	A (6.5)	B (14.2)
2026 without Chase Oaks (Case 2)	B (14.3)	D (43.7)	D (43.9)	C (20.9)	B (15.2)	C (34.8)
2026 without Chase Oaks (Case 2) – <i>with HEP improvements</i>	N/A	N/A	N/A	C (20.9)	B (15.2)	C (31.3)
2026 with Chase Oaks (Case 3)	B (14.2)	D (50.9)	D (44.2)	C (26.2)	B (17.5)	D (32.2)
2026 with Chase Oaks (Case 3) – <i>with HEP Improvements</i>	N/A	N/A	N/A	C (26.2)	B (17.5)	D (32.2)

<sup>14</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>15</sup>	LOS per TIS			LOS per DeIDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 24 &amp; Robinsonville Road / Angola Road</b>						
2018 Existing (Case 1)	D (38.3)	D (35.8)	C (44.2)	B (16.6)	B (15.1)	C (21.1)
2026 without Chase Oaks (Case 2)	F (159.3)	F (212.2)	F (210.7)	E (76.7)	F (116.1)	F (118.7)
2026 without Chase Oaks (Case 2) – <i>with HEP improvements</i>	N/A	N/A	N/A	E (68.1)	E (68.0)	D (38.7)
2026 with Chase Oaks (Case 3)	F (158.5)	F (224.7)	F (219.4)	E (76.2)	F (135.6)	F (123.3)
2026 with Chase Oaks (Case 3) – <i>with HEP improvements</i>	N/A	N/A	N/A	D (35.6)	E (73.8)	D (39.2)

<sup>15</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>16</sup> Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per DeDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 24 &amp; Pinewater Road / Sloan Road</b>						
2018 Existing (Case 1)						
Southbound Delaware Route 24 - Left	B (11.0)	A (9.8)	B (10.1)	B (10.9)	A (9.8)	B (10.1)
Westbound Pinewater Road / Sloan Road	D (32.9)	E (43.5)	D (33.0)	D (32.9)	E (43.5)	D (33.0)
2026 without Chase Oaks (Case 2)						
Southbound Delaware Route 24 - Left	B (12.3)	B (12.5)	B (12.5)	B (12.2)	B (12.5)	B (12.5)
Westbound Pinewater Road / Sloan Road	F (89.4)	F (185.1)	F (119.3)	F (89.3)	F (185.1)	F (119.3)
2026 with Chase Oaks (Case 3)						
Southbound Delaware Route 24 - Left	B (12.4)	B (12.9)	B (12.8)	B (12.3)	B (12.8)	B (12.8)
Westbound Pinewater Road / Sloan Road	F (101.2)	F (218.1)	F (137.5)	F (101.1)	F (218.1)	F (137.5)

<sup>16</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Unsignalized Intersection <sup>17</sup> Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 24 &amp; Hollymount Road</b>						
2018 Existing (Case 1)						
Northbound Delaware Route 24 - Left	A (8.8)	B (11.4)	A (9.3)	A (8.8)	B (11.3)	A (9.3)
Eastbound Hollymount Road	F (99.0)	F (167.2)	F (87.0)	F (100.4)	F (173.7)	F (90.3)
2026 without Chase Oaks (Case 2)						
Northbound Delaware Route 24 - Left	B (10.7)	B (13.8)	B (11.1)	B (10.7)	B (13.8)	B (11.1)
Eastbound Hollymount Road	F (832.2)	F (2,401.5)	F (1,707.4)	F (834.2)	F (2,404.8)	F (1,704.7)
2026 with Chase Oaks (Case 3)						
Northbound Delaware Route 24 - Left	B (10.9)	B (14.0)	B (11.3)	B (10.9)	B (13.9)	B (11.3)
Eastbound Hollymount Road	F (962.2)	F (2,779.1)	F (1,991.7)	F (964.3)	F (2,782.0)	F (1,988.6)

<sup>17</sup> For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Traffic Impact Study for Chase Oaks*  
*Report dated May 10, 2019*  
 Prepared by The Traffic Group, Inc.

Signalized Intersection <sup>18</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 24 &amp; Hollymount Road / Sloan Road<sup>19</sup></b>						
2026 with Chase Oaks (Case 3) – <i>realigned, four-leg, intersection</i>	N/A	N/A	N/A	B (13.2)	D (38.7)	D (52.6)

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

<sup>19</sup> The proposed realignment of Hollymount Road and Sloan Road / Pinewater Road will include a traffic signal to mitigate the intersection with acceptable level of service during the 2026 build-out condition.