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

NICOLE MAJESKI
SECRETARY

September 14, 2023

Mr. Scott Lobdell, P.E.
First State Engineering
630 Churchmans Road Suite 105
Newark, DE 19702

Dear Mr. Lobdell,

The enclosed TIS review letter for the **Garrison Lake Green Phase 2** (Protocol Tax Parcel: 3-00-03701-01-0100-00001) 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 performed 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 Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Group Project Engineer

AF:km
Enclosures
cc with enclosures: Christopher Moore, LMT Commercial Realty, LLC
Kris Connelly, Kent County Department of Planning Services
Michele Green, Kent County Department of Planning Services
Ms. Joanne M. Arellano, Johnson, Mirmiran, & Thompson, Inc.
Mr. Mir Wahed, Johnson, Mirmiran, & Thompson, Inc.
DelDOT Distribution

DelDOT

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Brad Eaby, Deputy Attorney General
Shanté Hastings, Deputy Secretary / Director, Transportation Solutions (DOTS)
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Peter Haag, Chief Traffic Engineer, Traffic, DOTS
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Sean Humphrey, Traffic Engineer, DelDOT Traffic, DOTS
Matthew Lichtenstein, Central District Engineer, Central District
Steve McCabe, Central District Public Works Manager, Central District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
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Pamela Steinebach, Director, Planning
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
Will Mobley, Acting Kent County Review Coordinator, Development Coordination
Michael Vandevander, Subdivision Manager, Development Coordination
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Sireen Muhtaseb, TIS Group Manager, Development Coordination

September 14, 2023

Ms. Annamaria Furmato
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202069012/PO#611882
Traffic Impact Study Services
Task 4B – Garrison Lake Green Phase II TIS

Dear Ms. Furmato:

Johnson, Mirmiran, and Thompson (JMT) has completed the Traffic Impact Study (TIS) for the Garrison Lake Green Phase II development. This review was assigned as Task Number 4B. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The developer expressed interest in obtaining a TIS waiver from Kent County. However, based on further coordination between DelDOT and Kent County, it was determined that the proposed development does not qualify for the County TIS waiver.

The TIS evaluates the impacts of a proposed 71 single-family detached home development in Kent County, Delaware. The site is located on the south side of Brenford Road (Kent Road 42), approximately 200 feet west of Ryan Road (Kent Road 146). The subject property is on an approximately 63.20-acre parcel that is currently zoned as AC (Agricultural Conservation) and the developer does not plan to rezone the land. Construction for the development is anticipated to be completed in 2027. One full access point is proposed on Brenford Road, west of Ryan Road.

DelDOT does not have any relevant or ongoing projects within the study area. However, there is a future railroad crossing upgrade DelDOT project proposed along Brenford Road. Given the proximity of the site to the railroad, the developer should coordinate with DelDOT Development Coordination Section regarding the railroad.

Section 5.3.k.2 of the Kent County Adequate Public Facilities Ordinance (APFO) states: "The specific traffic mitigation measures shall be chosen based on their ability to reduce the impact of traffic generated by the proposed subdivision or land development, in order to achieve and maintain the Level of Service standards for a minimum of two (2) years for roadway segments and intersections within the area of influence." Based on an April 14, 2008, meeting between DelDOT and Kent County Planning regarding the interpretation of the APFO, JMT has been instructed to perform the future two-year Level of Service maintenance analysis, for a date two years from when the construction of the development is anticipated to be complete. The two-year Level of Service maintenance analysis results (referred to as Case 4) are contained in this TIS review letter.

As part of the TIS, the following future scenarios were evaluated:

- Case 2 – 2027 without development
- Case 3 – 2027 with development
- Case 4 – 2029 with development

Based on the traffic impact study, we have the following comments and recommendations:

The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements. 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 responsible for adjusting timings.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
Brenford Road/Rabbit Chase Lane (Kent Road 145)/Willowwood Drive	X	X	Case 2 – 2027 without Development
	X	X	Case 3 – 2027 with Development
	X	X	Case 4 – 2029 with Development
Sunnyside Road/Rabbit Chase Lane/Halliwell Drive	X		Case 2 – 2027 without Development
	X		Case 3 – 2027 with Development
	X		Case 4 – 2029 with Development

*For the purposes of the TIS analysis, Brenford Road and Sunnyside Road are considered north/south roadways

Brenford Road/Rabbit Chase Lane (Kent Road 145)/Willowwood Drive (Table 5, Page 22)

The unsignalized Brenford Road intersection with Rabbit Chase Lane/Willowwood Drive would exhibit LOS deficiencies along the eastbound Rabbit Chase Lane approach under future conditions, with or without the proposed development (Case 2, 3, and 4) during the AM and PM peak hours. During the AM peak hour under Case 4 conditions, the eastbound Rabbit Chase Lane approach would operate at LOS F with a delay of 164.6 seconds per vehicle and a projected 95th percentile queue length of approximately 420 feet.

The deficiencies could be mitigated with the conversion of the intersection to an all-way stop-controlled intersection, a single-lane roundabout or a signalized intersection. DelDOT is evaluating the implementation of all-way stop-control from a safety standpoint but a longer-term solution should be determined. Additionally, a traffic signal warrant analysis was conducted for the intersection of Brenford Road and Rabbit Chase Lane/Willowwood Drive and the warrants for a traffic signal are not met. As traffic signal warrants are not met at this time, it is recommended that the developer enter into an agreement with DelDOT to contribute to the Traffic Signal Revolving Fund (TSRF) for a future traffic signal.

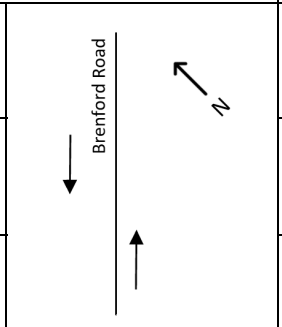
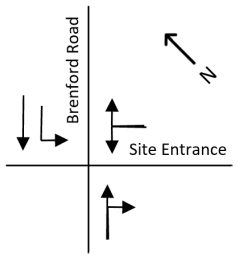
Sunnyside Road/Rabbit Chase Lane/Halliwell Drive (Table 7, Page 27)

The unsignalized Sunnyside Road intersection with Rabbit Chase Lane/Halliwell Drive would exhibit LOS deficiencies along the eastbound Halliwell Drive and westbound Rabbit Chase Lane approaches under future conditions, with or without the proposed development (Case 2, 3, and 4) during the AM peak hour. During the AM peak hour under Case 4 conditions, the eastbound Halliwell Drive approach would operate at LOS E with a delay of 48.2 seconds per vehicle and a projected 95th percentile queue length of approximately 40 feet. The westbound Rabbit Chase Lane approach would operate at LOS F with a delay of 126.9 seconds per vehicle and a projected 95th percentile queue length of approximately 515 feet. As part of the Centerville & Graceville development, the intersection is proposed to be converted to a single-lane roundabout which would mitigate the LOS deficiencies. As such, the developer should coordinate with DelDOT on the equitable cost sharing of the roundabout installation.

Should Kent County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer shall improve Brenford 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." The developer should coordinate with DelDOT's Development Coordination Section during the site plan review to determine the improvements.

2. The developer should construct an unsignalized full access for the proposed Garrison Lake Green Phase II development along Brenford Road, approximately 525 feet south of the southwest point of tangency at the intersection with Ryan Road. The intersection should be consistent with the lane configurations shown in the table below.

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

Based on DelDOT's *Development Coordination Manual,* the recommended minimum storage length (excluding taper) of the southbound Brenford Road left turn lane is 95 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

3. The developer should enter into an agreement with DelDOT to contribute to the Traffic Signal Revolving Fund (TSRF) for a future traffic signal at the Brenford Road intersection with Rabbit Chase Lane/Willowwood Drive. The TSRF contribution is $2,266.

4. The developer should coordinate with DelDOT on the equitable cost sharing of the proposed single-lane roundabout at the intersection of Sunnyside Road and Rabbit Chase Lane/Halliwell Drive. The percent contribution amount is 1.35%.

5. The following bicycle, pedestrian, and transit improvements should be included:

    a. A minimum fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Brenford Road site frontage. Within the easement, the developer should construct a ten-foot wide shared-use path (SUP) with an angled termination into the shoulder where the shoulder/bike lane is at least five feet wide. The SUP should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the SUP. If feasible, the SUP should be placed behind utility poles and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.

    b. Internal connection should be provided from the SUP into the site.

    c. ADA compliant curb ramps and marked crosswalks should be provided along the Site Entrance approach to Brenford Road.

    d. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Brenford Road approaches to the Site Entrance.

    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 TIS 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.

Additional details on the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this study.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

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

Enclosure

Recommendations Map

General Information

Report Date: June 2023
Prepared By: Johnson, Mirmiran, & Thompson
Prepared For: Garrison Lake Farms, L.P.
Tax Parcel: 3-00-03700-01-0100-00001
Generally Consistent with DelDOT's *Development Coordination Manual (DCM)*: Yes

Project Description and Background

Description: The proposed development consists of 71 single-family detached houses.
Location: The site is located on the south side of Brenford Road (Kent Road 42), approximately 200 feet west of Ryan Road (Kent Road 146), in Kent County, Delaware.
Amount of Land to be Developed: An approximately 63.20-acre parcel.
Land Use Approval Needed: Entrance Plan.
Proposed Completion Date: 2027.
Proposed Access Locations: One full access point is proposed on Brenford Road.

Daily Traffic Volumes:

- 2023 Average Annual Daily Traffic on Brenford Road: 3,854 vehicles per day.

*AADT was determined based on 7-day ATR data from May 4, 2023 to May 11, 2023 contained within the TIS report.

Site Map

**Graphic is an approximation based on the Site Plan prepared by First State Engineering, dated January 3, 2008, last revised October 1, 2010.*

Relevant and On-going Projects

DelDOT does not have any relevant or ongoing projects within the study area. However, there is a future railroad crossing upgrade DelDOT project proposed along Brenford Road. Proposed improvements may include widening the crossing for shoulders to be added and upgrading the warning devices including adding new signals and gates. The project is currently programmed for the fall of 2029.

Livable Delaware

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

Location with Respect to the Strategies for State Policies and Spending Map of Delaware: The proposed development is located within Investment Level 2, Investment Level 3, and Out of Play areas.

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.

Investment Level 3

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

pressure, areas with existing but disconnected development, and possible lack of adequate infrastructure.

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

Out of Play

These lands which are not available for development include publicly owned lands, private conservation lands, lands for which serious legal and/or environmental constraints on development are identified, and lands in some form of permanent open-space protection. These areas are generally not expected to be the location of private development activities such as residential subdivisions or commercial shopping centers. However, government entities, private property owners, and conservation organizations are still expected to invest in these areas for the purposes in which they were acquired and preserved. There may also be times when private property owners could be able to build or redevelop on these lands in accordance with State and local environmental and land use regulations.

Proposed Development's Compatibility with Livable Delaware:
The proposed site is located in Investment Level 2, Investment Level 3, and Out of Play. Investment Level 2 areas are the priority for creating and sustaining a variety of housing types. The proposed development is surrounded by a variety of housing types including single-family detached houses, apartments, duplexes, townhouses, and age-restricted detached houses. Investment Level 3 areas include lands that are adjacent to or intermingled with fast-growing areas within counties or municipalities that are otherwise categorized as Investment Levels 1 or 2 and development may be appropriate in the near term. The proposed site is adjacent to the fast-growing city of Dover which is categorized as Investment Level 1. Out of Play areas are not available for private development. The Out of Play area at the southern end of the property is a wetland and will remain untouched by the developer. There is a 25-foot buffer between the edge of the proposed developed land and the start of the wetland. Therefore, the proposed development is generally consistent with the 2020 update of the Livable *Delaware Strategies for State Policies and Spending.*

Comprehensive Plan

(Source: Kent County Comprehensive Plan, 2018)

Kent County Comprehensive Plan:
Per the *Kent County Comprehensive Plan Existing Land Use Map,* the proposed development is currently zoned as Agricultural Land and Open Space, and Forests. Per the *Kent County*

Comprehensive Plan Future Land Use Map, the proposed development is designated as Low Density Residential.

Proposed Development's Compatibility with the Kent County Comprehensive Plan:
The *Kent County Comprehensive Plan* states that Low Density Residential areas are zoned as Agricultural Conservation or Agricultural Residential. The proposed site is currently zoned as Agricultural Conservation and the developer does not plan to rezone. Permitted land use for Low Density Residential includes single-family detached houses. The proposed development will consist of 71 single-family detached houses. Therefore, the proposed development is consistent with the *Kent County Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 11th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 210 (Single-Family Detached Houses).

Table 1
Garrison Lake Green Phase II Trip Generation

Land Use	ADT	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
71 Units Single-Family Detached Houses (ITE 210)	736	14	41	55	45	27	72

Overview of TIS

Intersections Examined:

1. Site Entrance / Brenford Road (Kent Road 42)
2. Brenford Road / Ryan Road (Kent Road 146)
3. Brenford Road / Hickory Ridge Road (Kent Road 149)
4. Brenford Road / Rabbit Chase Lane (Kent Road 145) / Willowwood Drive
5. Ryan Road / Sunnyside Road (Kent Road 90)
6. Sunnyside Road / Rabbit Chase Lane / Halliwell Drive
7. Sunnyside Road / Hillyard Road (Kent Road 147)
8. US Route 13 / Hickory Ridge Road / Spring Meadow Drive
9. Brenford Road / Hillyard Road
10. Brenford Road / Masseys Millpond Road (Kent Road 148)
11. Brenford Road / Moorton Road (Kent Road 92)

Conditions Examined:

1. Case 1 – 2023 Existing
2. Case 2 – 2027 without Development

3. Case 3 – 2027 with Development
4. Case 4 – 2029 with Development

Committed Developments Considered:

1. Hidden Brook (398 single-family detached houses, 128 built)
2. Stonington (642 single-family attached houses)
3. Auburn Meadows Subdivision (262 single-family senior adult houses, 12 built)
4. Heritage Trace Phase II (335 single-family detached houses, 193 built)
5. Green Hill Farm Estates (138 single-family detached houses, 80 built)
6. Centerville and Graceville (a.k.a. Meadows of Smyrna) (826 units of mid-rise multi-family houses, 309 single-family detached houses, 500 student elementary school)
7. Old County Farm (412 single-family detached houses, 75 built)

*Committed development information provided supersedes the information provided by the January 20, 2023, DelDOT Scoping Meeting Memorandum. The trip generation was based on site visits and correspondence with DelDOT, Kent County, the Town of Cheswold, and the Town of Smyrna, conducted in May 2023.

Peak Hours Evaluated: Weekday AM and PM.

Intersection Descriptions

1. **Site Entrance / Brenford Road (Kent Road 42)**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Westbound Approach: (Site Entrance) Proposed one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Brenford Road) Existing one through lane; proposed one shared through/right turn lane.
   Southbound Approach: (Brenford Road) Existing one through lane; proposed one left turn lane and one through lane.

   *Brenford Road is designated as a north/south roadway throughout the study area.

2. **Brenford Road / Ryan Road (Kent Road 146)**
   Type of Control: Existing two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Ryan Road) Existing one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Brenford Road) Existing one shared left turn/through lane.
   Southbound Approach: (Brenford Road) Existing one shared through/right turn lane.

   *Brenford Road is designated as a north/south roadway throughout the study area.

3. **Brenford Road / Hickory Ridge Road (Kent Road 149)**
   Type of Control: Existing two-way stop-controlled intersection (T-intersection).
   Westbound Approach: (Hickory Ridge Road) Existing one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Brenford Road) Existing one shared through/right turn lane.
   Southbound Approach: (Brenford Road) Existing one left turn lane and one through lane.

   *Brenford Road is designated as a north/south roadway throughout the study area.

4. **Brenford Road / Rabbit Chase Lane (Kent Road 145) / Willowwood Drive**
   Type of Control: Existing two-way stop-controlled intersection (Four-legged).
   Eastbound Approach: (Rabbit Chase Lane) Existing one shared left turn/through lane and one right turn lane, stop-controlled.
   Westbound Approach: (Willowwood Drive) Existing one shared left turn/through lane and one right turn lane, stop-controlled.
   Northbound Approach: (Brenford Road) Existing one left turn lane, one through lane and one channelized right turn lane.
   Southbound Approach: (Brenford Road) Existing one left turn lane, one through lane and one right turn lane.

   *Brenford Road is designated as a north/south roadway throughout the study area.

5. **Ryan Road / Sunnyside Road (Kent Road 90)**
   Type of Control: Existing two-way stop-controlled intersection (T-intersection).
   Westbound Approach: (Ryan Road) Existing one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Sunnyside Road) Existing one shared through/right turn lane.
   Southbound Approach: (Sunnyside Road) Existing one shared left turn/through lane.

6. **Sunnyside Road / Rabbit Chase Lane / Halliwell Drive**
   Type of Control: Existing two-way stop-controlled intersection (Four-legged).
   Eastbound Approach: (Halliwell Drive) Existing one shared left turn/through/right turn lane, stop-controlled.
   Westbound Approach: (Rabbit Chase Lane) Existing one shared left turn/through/right turn lane, stop-controlled.
   Northbound Approach: (Sunnyside Road) Existing one shared left turn/through/right turn lane.
   Southbound Approach: (Sunnyside Road) Existing one shared left turn/through lane and one right turn lane.

7. **Sunnyside Road / Hillyard Road (Kent Road 147)**
   Type of Control: Existing two-way stop-controlled intersection (Four-legged).
   Eastbound Approach: (Hillyard Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Westbound Approach: (Hillyard Road) Existing one shared left turn/through/right turn lane, stop-controlled.
   Northbound Approach: (Sunnyside Road) Existing one shared left turn/through/right turn lane.
   Southbound Approach: (Sunnyside Road) Existing one shared left turn/through/right turn lane.

8. **US Route 13 / Hickory Ridge Road / Spring Meadow Drive**
   Type of Control: Existing signalized intersection (Four-legged).
   Eastbound Approach: (Hickory Ridge Road) Existing one shared left turn/through lane and one right turn lane.
   Westbound Approach: (Spring Meadow Drive) Existing one shared left turn/through/right turn lane.
   Northbound Approach: (US Route 13) Existing one left turn lane, two through lanes and one right turn lane.
   Southbound Approach: (US Route 13) Existing one left turn lane, two through lanes and one right turn lane.

9. **Brenford Road / Hillyard Road**
   Type of Control: Existing two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (Hillyard Road) Existing one shared left turn/right turn lane, stop-controlled.
   Northbound Approach: (Brenford Road) Existing one shared left turn/through lane.
   Southbound Approach: (Brenford Road) Existing one shared through/right turn lane.

   *Brenford Road is designated as a north/south roadway throughout the study area.

10. **Brenford Road / Masseys Millpond Road (Kent Road 148)**
    Type of Control: Existing two-way stop-controlled intersection (T-intersection).
    Eastbound Approach: (Masseys Millpond Road) Existing one shared left turn/right turn lane, stop-controlled.
    Northbound Approach: (Brenford Road) Existing one shared left turn/through lane.
    Southbound Approach: (Brenford Road) Existing one shared through/right turn lane.

    *Brenford Road is designated as a north/south roadway throughout the study area.

11. Brenford Road / Moorton Road (Kent Road 92)

Type of Control: Existing two-way stop-controlled intersection (T-intersection).
Westbound Approach: (Moorton Road) Existing one shared left turn/right turn lane, stop-controlled.
Northbound Approach: (Brenford Road) Existing one shared through/right turn lane.
Southbound Approach: (Brenford Road) Existing one shared left turn/through lane.

*Brenford Road is designated as a north/south roadway throughout the study area.

Transit, Pedestrian, and Bicycle Facilities

Existing Transit Service: Per DelDOT Gateway, DART Route 120 and 302 operate along US Route 13 and have two stops within the study area located at the US Route 13, Hickory Ridge Road and Spring Meadow Drive intersection. Route 120 provides 29 round trips from 5:32 AM to 9:55 PM on weekdays, and nine round trips from 9:02 AM to 5:55 PM on Saturdays. Route 302 provides six round trips from 5:50 AM to 9:13 PM on weekdays.

Planned Transit Service: Per email correspondence on June 16, 2023, from Mr. Jared Kauffman, Fixed-Route Planner for DART, no improvements were recommended.

Existing Bicycle and Pedestrian Facilities: According to DelDOT's Sussex County Delaware Bicycle Map, several study roadways are considered bicycle routes. A statewide bicycle route runs through the study area along Hillyard Road, turning onto Brenford Road, and then onto Moorton Road. Brenford Road and US Route 13 are considered connector bicycle routes. Pedestrian crosswalks exist on the north and east side of the Brenford Road, Rabbit Chase Lane, and Willowwood Drive intersection; west side of the Sunnyside Road, Rabbit Chase Lane, and Halliwell Drive intersection; east side of the US Route 13, Hickory Ridge Road and Spring Meadow Drive intersection. Bike lanes exist along Brenford Road and Sunnyside Road.

Planned Bicycle and Pedestrian Facilities: Per email correspondence on June 22, 2023, from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- Referring to the State Strategies and Spending Map this site is within Level 1. Per the DelDOT SUP/Sidewalk Policy a non-motorized facility is required unless there is a physical impossibility. It would be recommended to install a 10' shared-use path along the property frontage of Brenford Road with angled terminations into the shoulder to the northern property limits and tie into the SUP shown at the southern property limits on Sheet 2.
- If a right turn lane is warranted, then a separate 5' wide bike lane shall be provided along the limits of the right turn lane and follow the striping as per the DE MUTCD, Figure 9C-1E.
- Provide pedestrian access into the site from the frontage sidewalk.
- At this time Active Transportation & Community Connections (ATCC) has no bicycle/pedestrian improvement projects within the area of this project.

- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if the right turn lane is warranted, then a separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).
- There could be additional and/or revised comments once the project is discussed at a pre-submittal meeting and/or plans are submitted for LONO/ENT review/approval.

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 DelDOT Gateway.

- Brenford Road LTS: 4

Crash Evaluation

Per the crash data from May 1, 2020, to May 1, 2023, provided by the Delaware Department of Transportation (DelDOT), a total of 72 crashes were reported within the study area. Of the 72 crashes reported, one fatality occurred at the US Route 13 intersection with Hickory Ridge Road and Spring Meadow. The fatal crash occurred in dark lighting conditions and was an angle crash as a result of the driver failing to yield right of way.

At the US Route 13 intersection with Hickory Ridge Road and Spring Meadow Drive, 23 crashes were reported over the three-year period including 12 angle, six rear-end, two sideswipe, two collisions not between two vehicles, and one other.

At the Brenford Road and Hickory Ridge Road intersection, 14 crashes were reported over the three-year period including five angle, three rear-end, two sideswipe, two collisions not between two vehicles, one head-on, and one other.

The remaining intersections each reported less than 10 crashes within the three-year study period.

Signal Warrant Analysis

A signal warrant analysis was performed for the Brenford Road and Rabbit Chase Lane/Willowwood Drive intersection. The evaluation was conducted using traffic volume data and geometric conditions in accordance with the Delaware Manual on Uniform Traffic Control Devices (DEMUTCD). As the study intersection has a posted speed limit of 35 mph and lies in a community with a population of greater than 10,000, the DE MUTCD's reduced volume criteria

was not applied. Due to the limited traffic data available, only the Peak Hour and Four Hour volumes warrants were evaluated. The evaluation is based on the existing lane configurations. No volumes warrants are met under 2029 conditions with the proposed development (Case 4). The crash warrant (based on both the MUTCD and the IA-I9.3 – Alternative Signal Warrant 7) is not met. Additionally, the remaining warrants are not met.

Previous Comments

None.

Sight Distance Evaluation

No sight distance constraints were noted at the proposed site entrance location per a field visit conducted on May 16, 2023.

General HCS Analysis Comments

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

1) JMT used version 7.9.6 of HCS7 to complete the analysis.

2) Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in the Case 2, Case 3 and Case 4 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.

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.

4) Per DelDOT's *Development Coordination Manual,* JMT utilized the existing PHF for the Case 1 scenario and a future PHF for Case 2, Case 3 and Case 4 scenarios of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Site Entrance / Brenford Road (Kent Road 42) [2]	Weekday AM	Weekday PM
2027 with Development (Case 3)		
Westbound Site Entrance Approach	B (11.0)	B (11.3)
Southbound Brenford Road Left Turn	A (8.1)	A (8.1)
2029 with Development (Case 4)		
Westbound Site Entrance Approach	B (11.0)	B (11.3)
Southbound Brenford Road Left Turn	A (8.1)	A (8.1)

[1] For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] The westbound Site Entrance approach was modeled with one shared left turn/right turn lane. The northbound Brenford Road approach was modeled with one shared through/right turn lane. The southbound Brenford Road approach was modeled with one left turn lane and one through lane.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Brenford Road / Ryan Road (Kent Road 146)	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Eastbound Ryan Road Approach	B (10.6)	B (11.6)
Northbound Brenford Road Left Turn	A (7.6)	A (7.8)
2027 without Development (Case 2)		
Eastbound Ryan Road Approach	B (13.0)	B (14.7)
Northbound Brenford Road Left Turn	A (7.8)	A (8.3)
2027 with Development (Case 3)		
Eastbound Ryan Road Approach	B (13.6)	C (15.3)
Northbound Brenford Road Left Turn	A (7.9)	A (8.4)
2029 with Development (Case 4)		
Eastbound Ryan Road Approach	B (13.6)	C (15.3)
Northbound Brenford Road Left Turn	A (7.9)	A (8.4)

Table 4
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Brenford Road / Hickory Ridge Road (Kent Road 149)	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Westbound Hickory Ridge Road Approach	B (11.1)	B (13.9)
Southbound Brenford Road Left Turn	A (7.8)	A (8.0)
2027 without Development (Case 2)		
Westbound Hickory Ridge Road Approach	B (14.1)	D (24.4)
Southbound Brenford Road Left Turn	A (8.2)	A (8.3)
2027 with Development (Case 3)		
Westbound Hickory Ridge Road Approach	B (14.8)	D (29.4)
Southbound Brenford Road Left Turn	A (8.3)	A (8.4)
2029 with Development (Case 4)		
Westbound Hickory Ridge Road Approach	B (14.8)	D (30.1)
Southbound Brenford Road Left Turn	A (8.3)	A (8.4)

Table 5
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control [1]	**LOS per HCS**	
Brenford Road / Rabbit Chase Lane (Kent Road 145) / Willowwood Drive	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Eastbound Rabbit Chase Lane Approach	B (14.8)	B (13.6)
Westbound Willowwood Drive Approach	B (14.1)	B (12.6)
Northbound Brenford Road Left Turn	A (7.8)	A (8.0)
Southbound Brenford Road Left Turn	A (7.7)	A (7.7)
2027 without Development (Case 2)		
Eastbound Rabbit Chase Lane Approach	F (155.3)	E (35.8)
Westbound Willowwood Drive Approach	C (19.2)	C (15.8)
Northbound Brenford Road Left Turn	A (8.2)	A (8.6)
Southbound Brenford Road Left Turn	A (7.8)	A (7.8)
2027 with Development (Case 3)		
Eastbound Rabbit Chase Lane Approach	F (161.1)	E (36.7)
Westbound Willowwood Drive Approach	C (19.3)	C (15.9)
Northbound Brenford Road Left Turn	A (8.2)	A (8.6)
Southbound Brenford Road Left Turn	A (7.8)	A (7.8)
2029 with Development (Case 4)		
Eastbound Rabbit Chase Lane Approach	F (164.6)	E (38.2)
Westbound Willowwood Drive Approach	C (19.5)	C (16.2)
Northbound Brenford Road Left Turn	A (8.2)	A (8.6)
Southbound Brenford Road Left Turn	A (7.9)	A (7.8)

Table 5 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection All-Way Stop Control [1]	**LOS per HCS**	
Brenford Road / Rabbit Chase Lane (Kent Road 145) / Willowwood Drive [3]	Weekday AM	Weekday PM
2027 without Development (Case 2)		
Eastbound Rabbit Chase Lane Approach	C (21.4)	B (13.2)
Westbound Willowwood Drive Approach	B (12.0)	B (10.8)
Northbound Brenford Road Approach	C (16.8)	B (13.9)
Southbound Brenford Road Approach	B (13.1)	C (15.7)
Overall LOS	C (21.4)	B (14.4)
2027 with Development (Case 3)		
Eastbound Rabbit Chase Lane Approach	C (21.7)	B (13.2)
Westbound Willowwood Drive Approach	B (12.0)	B (10.8)
Northbound Brenford Road Approach	C (17.1)	B (14.0)
Southbound Brenford Road Approach	C (13.2)	C (16.0)
Overall LOS	C (17.3)	B (14.6)
2029 with Development (Case 4)		
Eastbound Rabbit Chase Lane Approach	C (21.7)	B (13.3)
Westbound Willowwood Drive Approach	B (12.0)	B (10.8)
Northbound Brenford Road Approach	C (17.1)	B (14.1)
Southbound Brenford Road Approach	B (13.2)	C (16.2)
Overall LOS	C (17.3)	B (14.7)

[3] The intersection was modeled as an all-way stop-controlled intersection with one left turn lane, one through lane, and one right turn lane along the northbound and southbound Brenford Road approaches, and one shared left turn/through lane and one right turn lane along the eastbound Rabbit Chase Lane and westbound Willowwood Drive approaches.

Table 5 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Roundabout [1]	**LOS per HCS**	
Brenford Road / Rabbit Chase Lane (Kent Road 145) / Willowwood Drive [4]	Weekday AM	Weekday PM
2027 without Development (Case 2)		
Eastbound Rabbit Chase Lane Approach	A (7.2)	A (7.0)
Westbound Willowwood Drive Approach	A (7.2)	A (5.1)
Northbound Brenford Road Approach	A (8.7)	A (6.1)
Southbound Brenford Road Approach	A (6.4)	A (7.6)
Overall LOS	A (7.5)	A (6.9)
2027 with Development (Case 3)		
Eastbound Rabbit Chase Lane Approach	A (7.3)	A (7.0)
Westbound Willowwood Drive Approach	A (7.3)	A (5.1)
Northbound Brenford Road Approach	A (8.8)	A (6.1)
Southbound Brenford Road Approach	A (6.5)	A (7.6)
Overall LOS	A (7.6)	A (6.9)
2029 with Development (Case 4)		
Eastbound Rabbit Chase Lane Approach	A (7.3)	A (7.1)
Westbound Willowwood Drive Approach	A (7.3)	A (5.2)
Northbound Brenford Road Approach	A (8.8)	A (6.2)
Southbound Brenford Road Approach	A (6.5)	A (7.6)
Overall LOS	A (7.6)	A (7.0)

[4] JMT modeled the intersection as a single-lane roundabout.

Table 5 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Signalized Intersection [1]	**LOS per HCS**	
Brenford Road / Rabbit Chase Lane (Kent Road 145) / Willowwood Drive [5]	Weekday AM	Weekday PM
2027 without Development (Case 2)	C (23.5)	C (21.5)
2027 with Development (Case 3)	C (23.5)	C (21.6)
2029 with Development (Case 4)	C (23.5)	C (21.6)

[5] The intersection was modeled as a signalized intersection with a 90 second cycle length, protected-permissive left turn phases along the northbound and southbound approaches, and split phases along the eastbound and westbound approaches. Existing lane configurations were utilized and a right turn overlap was used to simulate right turn on red volumes.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Ryan Road / Sunnyside Road (Kent Road 90)	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Westbound Ryan Road Approach	B (10.8)	B (10.7)
Southbound Sunnyside Road Left Turn	A (7.7)	A (7.6)
2027 without Development (Case 2)		
Westbound Ryan Road Approach	B (12.0)	B (11.7)
Southbound Sunnyside Road Left Turn	A (7.9)	A (7.7)
2027 with Development (Case 3)		
Westbound Ryan Road Approach	B (12.1)	B (11.9)
Southbound Sunnyside Road Left Turn	A (7.9)	A (7.7)
2029 with Development (Case 4)		
Westbound Ryan Road Approach	B (12.1)	B (11.9)
Southbound Sunnyside Road Left Turn	A (7.9)	A (7.7)

Table 7
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control [1]	**LOS per HCS**	
Sunnyside Road / Rabbit Chase Lane / Halliwell Drive	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Eastbound Halliwell Drive Approach	C (20.6)	B (13.1)
Westbound Rabbit Chase Lane Approach	C (16.0)	B (12.6)
Northbound Sunnyside Road Left Turn	A (7.5)	A (7.7)
Southbound Sunnyside Road Left Turn	A (8.1)	A (7.7)
2027 without Development (Case 2)		
Eastbound Halliwell Drive Approach	E (45.9)	C (24.6)
Westbound Rabbit Chase Lane Approach	F (115.6)	D (29.8)
Northbound Sunnyside Road Left Turn	A (7.5)	A (7.8)
Southbound Sunnyside Road Left Turn	A (8.6)	A (8.2)
2027 with Development (Case 3)		
Eastbound Halliwell Drive Approach	E (47.5)	D (25.1)
Westbound Rabbit Chase Lane Approach	F (122.4)	D (30.9)
Northbound Sunnyside Road Left Turn	A (7.5)	A (7.8)
Southbound Sunnyside Road Left Turn	A (8.6)	A (8.2)
2029 with Development (Case 4)		
Eastbound Halliwell Drive Approach	E (48.2)	D (25.4)
Westbound Rabbit Chase Lane Approach	F (126.9)	D (32.0)
Northbound Sunnyside Road Left Turn	A (7.5)	A (7.8)
Southbound Sunnyside Road Left Turn	A (8.6)	A (8.3)

Table 7 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection All-Way Stop Control [1]	**LOS per HCS**	
Sunnyside Road / Rabbit Chase Lane / Halliwell Drive [6]	Weekday AM	Weekday PM
2027 without Development (Case 2)		
Eastbound Halliwell Drive Approach	B (11.1)	A (9.8)
Westbound Rabbit Chase Lane Approach	C (19.7)	B (10.9)
Northbound Sunnyside Road Approach	C (15.3)	B (10.9)
Southbound Sunnyside Road Approach	C (19.6)	C (20.6)
Overall LOS	C (18.3)	C (15.6)
2027 with Development (Case 3)		
Eastbound Halliwell Drive Approach	B (11.2)	A (9.9)
Westbound Rabbit Chase Lane Approach	C (20.0)	B (11.0)
Northbound Sunnyside Road Approach	C (15.8)	B (11.1)
Southbound Sunnyside Road Approach	C (19.9)	C (21.4)
Overall LOS	C (18.6)	C (16.0)
2029 with Development (Case 4)		
Eastbound Halliwell Drive Approach	B (11.2)	A (9.9)
Westbound Rabbit Chase Lane Approach	C (20.2)	B (11.1)
Northbound Sunnyside Road Approach	C (16.0)	B (11.1)
Southbound Sunnyside Road Approach	C (20.2)	C (21.8)
Overall LOS	C (18.8)	C (16.3)

[6] JMT modeled with the intersection as an all-way stop-controlled intersection with the existing lane configurations.

Table 7 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Roundabout [1]	**LOS per HCS**	
Sunnyside Road / Rabbit Chase Lane / Halliwell Drive [7]	Weekday AM	Weekday PM
2027 without Development (Case 2)		
Eastbound Halliwell Drive Approach	A (5.1)	A (5.3)
Westbound Rabbit Chase Lane Approach	A (9.0)	A (5.4)
Northbound Sunnyside Road Approach	A (6.9)	A (5.6)
Southbound Sunnyside Road Approach	A (6.1)	A (7.1)
Overall LOS	A (7.5)	A (6.3)
2027 with Development (Case 3)		
Eastbound Halliwell Drive Approach	A (5.1)	A (5.4)
Westbound Rabbit Chase Lane Approach	A (9.1)	A (5.5)
Northbound Sunnyside Road Left Turn	A (7.0)	A (5.7)
Southbound Sunnyside Road Left Turn	A (6.1)	A (7.2)
Overall LOS	A (7.6)	A (6.4)
2029 with Development (Case 4)		
Eastbound Halliwell Drive Approach	A (5.1)	A (5.4)
Westbound Rabbit Chase Lane Approach	A (9.2)	A (5.5)
Northbound Sunnyside Road Left Turn	A (7.0)	A (5.7)
Southbound Sunnyside Road Left Turn	A (6.1)	A (7.3)
Overall LOS	A (7.6)	A (6.4)

[7] JMT modeled the intersection as a single-lane roundabout.

Table 7 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Signalized Intersection [1]	**LOS per HCS**	
Sunnyside Road / Rabbit Chase Lane / Halliwell Drive [8]	Weekday AM	Weekday PM
2027 without Development (Case 2) *with optimized timings*	C (26.0)	C (21.1)
2027 with Development (Case 3) *with optimized timings*	C (26.0)	C (21.2)
2029 with Development (Case 4) *with optimized timings*	C (26.1)	C (21.2)

[8] JMT modeled the intersection with a dedicated left turn lane, through lane, and right turn lane on the northbound and southbound approaches and protected/permissive left turns. The eastbound and westbound approaches were modeled with a dedicated right turn lane and through/left turn lane and split phasing. Signal phasing included a right turn overlap to simulate right turn on red volumes. The cycle length was optimized at 120 seconds.

Table 8
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control [1]	**LOS per HCS**	
Sunnyside Road / Hillyard Road (Kent Road 147)	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Eastbound Hillyard Road Approach	B (14.0)	C (16.3)
Westbound Hillyard Road Approach	B (12.1)	B (13.8)
Northbound Sunnyside Road Left Turn	A (7.5)	A (7.7)
Southbound Sunnyside Road Left Turn	A (7.5)	A (7.5)
2027 without Development (Case 2)		
Eastbound Hillyard Road Approach	C (20.7)	D (29.3)
Westbound Hillyard Road Approach	C (16.8)	C (21.3)
Northbound Sunnyside Road Left Turn	A (7.7)	A (7.8)
Southbound Sunnyside Road Left Turn	A (7.6)	A (7.6)
2027 with Development (Case 3)		
Eastbound Hillyard Road Approach	C (20.9)	D (30.3)
Westbound Hillyard Road Approach	C (16.8)	C (21.4)
Northbound Sunnyside Road Left Turn	A (7.7)	A (7.8)
Southbound Sunnyside Road Left Turn	A (7.6)	A (7.6)
2029 with Development (Case 4)		
Eastbound Hillyard Road Approach	C (21.2)	D (31.4)
Westbound Hillyard Road Approach	C (17.0)	C (21.7)
Northbound Sunnyside Road Left Turn	A (7.7)	A (7.8)
Southbound Sunnyside Road Left Turn	A (7.6)	A (7.6)

Table 9
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Signalized Intersection [1]	**LOS per HCS**	
US Route 13 / Hickory Ridge Road / Spring Meadow Drive	Weekday AM	Weekday PM
2023 Existing (Case 1) *with existing DelDOT timings*	D (37.9)	D (42.2)
2027 without Development (Case 2) *with optimized timings* [9]	C (28.7)	C (28.1)
2027 with Development (Case 3) *with optimized timings* [9]	C (29.4)	C (32.6)
2029 with Development (Case 4) *with optimized timings* [9]	C (29.6)	C (33.0)

[9] Signal timing optimization kept the cycle length at the existing 150 seconds as part of a coordinated corridor and optimized the phase splits.

Table 10
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Brenford Road / Hillyard Road	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Eastbound Hillyard Road Approach	B (10.1)	B (11.2)
Northbound Brenford Road Left Turn	A (7.6)	A (7.8)
2027 without Development (Case 2)		
Eastbound Hillyard Road Approach	B (11.9)	B (13.9)
Northbound Brenford Road Left Turn	A (7.9)	A (8.2)
2027 with Development (Case 3)		
Eastbound Hillyard Road Approach	B (12.0)	B (14.0)
Northbound Brenford Road Left Turn	A (7.9)	A (8.2)
2029 with Development (Case 4)		
Eastbound Hillyard Road Approach	B (12.0)	B (14.2)
Northbound Brenford Road Left Turn	A (7.9)	A (8.3)

Table 11
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Brenford Road / Masseys Millpond Road (Kent Road 148)	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Eastbound Masseys Millpond Road Approach	A (9.9)	B (10.8)
Northbound Brenford Road Left Turn	A (7.6)	A (7.8)
2027 without Development (Case 2)		
Eastbound Masseys Millpond Road Approach	B (12.1)	B (14.0)
Northbound Brenford Road Left Turn	A (7.9)	A (8.2)
2027 with Development (Case 3)		
Eastbound Masseys Millpond Road Approach	B (12.2)	B (14.2)
Northbound Brenford Road Left Turn	A (7.9)	A (8.2)
2029 with Development (Case 4)		
Eastbound Masseys Millpond Road Approach	B (12.2)	B (14.3)
Northbound Brenford Road Left Turn	A (8.0)	A (8.2)

Table 12
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for Garrison Lake Green Phase II
Report Dated: June 2023
Prepared by JMT

Unsignalized Intersection Two-Way Stop Control (T-intersection) [1]	**LOS per HCS**	
Brenford Road / Moorton Road (Kent Road 92)	Weekday AM	Weekday PM
2023 Existing (Case 1)		
Westbound Moorton Road Approach	A (9.3)	B (10.1)
Southbound Brenford Road Left Turn	A (7.7)	A (7.7)
2027 without Development (Case 2)		
Westbound Moorton Road Approach	B (10.1)	B (11.4)
Southbound Brenford Road Left Turn	A (7.9)	A (8.1)
2027 with Development (Case 3)		
Westbound Moorton Road Approach	B (10.1)	B (11.5)
Southbound Brenford Road Left Turn	A (7.9)	A (8.1)
2029 with Development (Case 4)		
Westbound Moorton Road Approach	B (10.1)	B (11.5)
Southbound Brenford Road Left Turn	A (7.9)	A (8.2)