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

SHANTÉ A. HASTINGS
SECRETARY

July 9, 2025

Mr. Marc Coté, PE
Rossi Group
555 E. Loockerman Street, Suite 220
Dover, DE 19901

Dear Mr. Coté,

The enclosed Traffic Impact Study (TIS) review letter for the **Ellery Farm** (Tax Parcels: 1-00-02800-02-5000-00001) 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 found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Review Engineer

AF:km
Enclosures
cc with enclosures: Jonathan Contant KHovnanian Delaware Operations, LLC
Charles Barnett, Morris & Ritchie Assoc., Inc.
Davis Stammler, Morris & Ritchie Assoc., Inc.
Kris Connelly, Kent County Planning and Zoning
Andrew J. Parker, McCormick Taylor, Inc.
Tucker Smith, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT

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Lanie Clymer, Deputy Secretary
Mark Luszcz, Chief Engineer, Transportation Solutions (DOTS)
Brad Eaby, Deputy Attorney General, DOTS
Michael Simmons, Chief Project Development South, DOTS
Peter Haag, Chief Traffic Engineer, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Sean Humphrey, Traffic Engineer, Traffic, DOTS
Matthew Lichtenstein, Central District Engineer, M&O
Steve McCabe, Central District Public Works Manager, M&O
Jared Kaufman, Service Development Planner, DTC
Tremica Cherry, Service Development Planner, DTC
Anthony Aglio, Planning Supervisor, Active Transportation & Community Connections, Planning
Anson Gock, Planner, Statewide & Regional Planning, Planning
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
Will Mobley, Acting Kent Review Coordinator, Development Coordination
Brian Williams, Kent Review Engineer, Development Coordination
Sireen Muhtaseb, TIS Engineer, Development Coordination
Ben Fisher, TIS Review Engineer, Development Coordination
Tijah Jones, TIS Review Engineer, Development Coordination

July 9, 2025

Ms. Sireen Muhtaseb, PE
TIS Engineer
DelDOT Development Coordination
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 2139S
Traffic Impact Study Services
Task No. 1 Subtask 4 – Ellery Farm

Dear Ms. Muhtaseb:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Ellery Farm development prepared by Rossi Group, dated April 24, 2025. Rossi prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Ellery Farm development to be located on the east side of US Route 13 at the northeast corner of the intersection of US Route 13 and Twin Willows Road (Kent Road 84) in Kent County, Delaware. The proposed development would consist of 332 single-family attached houses. Access to the site is proposed along US Route 13 via one right-in/right-out entrance and along Twin Willows Road (Kent Road 84) via one full-movement entrance. Construction is anticipated to be completed in 2031.

The subject land is located on an approximately 82.08-acre parcel. The land is currently zoned as RM (Multifamily Residential) within a Growth Zone and the developer does not plan to rezone.

Relevant and On-Going Projects and Studies

Currently, DelDOT has several relevant and ongoing projects within the area of study.

The *HEP KC, US13 & Brenford/Big Oak Rd. Intersection Improvements* (State Contract No. T202104203) project involves intersection improvements to the US Route 13 / Brenford Road / Big Oak Road intersection including additional turn lanes and pedestrian improvements. Specifically, a second left turn lane is proposed for the northbound US Route 13 approach, a right turn lane is proposed for the westbound Big Oak Road approach, and a left turn lane, shared left/through lane, and right turn lane are proposed for the eastbound Brenford Road approach. Bike lanes are also proposed along Brenford Road and Big Oak Road. Construction is anticipated to start in the fall of 2025 and is anticipated to be completed in summer 2026. More information is available at the following link:
https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202104203

A DelDOT Traffic project that was implemented in spring 2025 modified the crossover on US Route 13 at Cory Lane / Dominik Boulevard to prohibit northbound left/U-turns, eastbound left-turn and through movements, and westbound left-turn and through movements. This project was completed after the turning movement counts were completed for this TIS.

The Dover Kent County Metropolitan Planning Organization (MPO) is planning a study in FY-26 along Hickory Ridge Road between Brenford Road and US Route 13 and continuing onto Spring Meadow Drive. The study will focus on pedestrian and vehicle safety. The study was requested by local residents and was initiated due to an increase in pedestrian traffic and transit ridership in the area and recent crash activity at the intersection of US Route 13 and Hickory Ridge Road. The MPO does not intend to study the actual intersection of US Route 13 and Hickory Ridge Road as it was included in the scope of this TIS.

The future Cheswold Area Transportation Improvement District (TID) is currently under development between DelDOT and Kent County. The future Cheswold Area TID would be south of the proposed development, and four of the TIS study intersections are also identified as TID Study Intersections, including: US Route 13 at Messina Hill Road, US Route 13 and Hickory Ridge Road, US Route 13 and Twin Willows Road, and US Route 13 and Big Oak Road. The intersection of US Route 13 at Messina Hill Road is the only TIS intersection located within the TID Boundary, but the TID Study Area includes additional intersections outside the TID Boundary such as the others mentioned above. 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. Certain intersection improvements to be identified as part of the future Cheswold Area TID would typically require contributions from developers within the TID. Presently, DelDOT and the County are still working toward establishing the TID and have not completed any traffic signal warrant analyses. Because the Ellery Farms development is located outside the future Cheswold Area TID Boundary, the developer would not have an obligation to contribute to the TID. It is unknown when the TID will be fully operational.

Summary of Analysis Results

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

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

Intersection	*Existing Traffic Control*	*Situations for which deficiencies occur*
3. US Route 13 / Twin Willows Road	Unsignalized	2024 existing PM (Case 1) 2031 without development AM and PM (Case 2) 2031 with development AM and PM (Case 3)
5. US Route 13 / Messina Hill Road	Unsignalized	2024 existing PM (Case 1) 2031 without development AM and PM (Case 2) 2031 with development AM and PM (Case 3)
6. US Route 13 / Village Drive	Unsignalized	2031 without development PM (Case 2) 2031 with development PM (Case 3)
7. US Route 13 / Ridgewood Drive	Unsignalized	2031 without development PM (Case 2) 2031 with development PM (Case 3)
9. US Route 13 / Brenford Road / Big Oak Road	Signalized	2031 without development AM and PM (Case 2) 2031 with development AM and PM (Case 3)
11. US Route 13 / Smyrna Toll Plaza Road / Canwit Drive	Signalized	2031 without development PM (Case 2) 2031 with development AM and PM (Case 3)

3. US Route 13 / Twin Willows Road (See Recommendations 4 and 5 & Table 4, Page 25)
This unsignalized intersection, which is a future Cheswold Area TID Study Intersection located outside the TID Boundary, experiences LOS deficiencies in Cases 1, 2, and 3 on the eastbound and westbound Twin Willows Road approaches and the northbound US Route 13 left turn/U-turn. In Case 2 during the PM peak hour the westbound approach is expected to operate at LOS F with 75 seconds of delay and queues over 65 feet long. In Case 3 with the Ellery Farm development, the westbound approach is expected to operate at LOS F with 956 seconds of delay and queues over 300 feet long. These deficiencies could be mitigated by the provision of a signal or a single-lane roundabout. However, due to the nature of the US Route 13 corridor, a roundabout may not be feasible. The developer completed a Traffic Signal Justification Study (TSJS) that has been reviewed and accepted by DelDOT, which demonstrates that the warrants for a traffic signal are met with 2031 Build (Case 3) volumes. With a traffic signal, the intersection is expected to operate at LOS B in Case 3 during the AM and PM peaks. Therefore, the developer should enter into signal agreement with DelDOT to design and construct a traffic signal.

5. US Route 13 / Messina Hill Road (See Recommendation 6 & Table 6, Page 27)
This unsignalized intersection, which is a future Cheswold Area TID intersection located within the TID Boundary, experiences LOS deficiencies in Cases 1, 2 and 3 on the eastbound Messina

Hill Road approach during the PM peak hours and Cases 2 and 3 during the AM peak hour. In Case 2 during the PM peak hour the eastbound approach is expected to operate at LOS F with 362 seconds of delay and queues over 252 feet long. In Case 3 with the Ellery Farm development, the eastbound approach is expected to operate at LOS F with 402 seconds of delay. These deficiencies could be mitigated by the provision of a signal or a single-lane roundabout. However, due to the nature of the US Route 13 corridor, a roundabout may not be feasible. The developer completed a Traffic Signal Justification Study (TSJS) that has been reviewed and accepted by DelDOT, which demonstrates that the warrants for a traffic signal are met with 2031 Build (Case 3) volumes. With a traffic signal in Case 3, the intersection is expected to operate at LOS B during the AM peak and LOS A during the PM peak. To help fund future improvements at this intersection, the developer should make an equitable share contribution to the Traffic Signal Revolving Fund (TSRF).

6. US Route 13 / Village Drive (See Table 7, Page 28)

This unsignalized intersection experiences LOS deficiencies in Cases 2 and 3 on the minor eastbound Village Drive approach and southbound US Route 13 U-turn movement during the PM peak hour. In Case 2 during the PM peak hour the eastbound approach is expected to operate at LOS E with 46 seconds of delay and queues of less than one vehicle long. In Case 3 with the Ellery Farm development, the eastbound approach is expected to operate at LOS E with 50 seconds of delay and queues remaining less than one vehicle long. The closure of the southbound U-turn lane would reduce delays on the minor eastbound approach, however the LOS deficiency would remain. Although a traffic signal would likely mitigate the LOS deficiency at this intersection, it is unlikely that the intersection would satisfy the warrants for signalization. It is not recommended that the developer make any improvements at this intersection to address the LOS deficiencies on the minor eastbound Village Drive approach and southbound US Route 13 U-turn movement.

7. US Route 13 / Ridgewood Drive (See Table 8, Page 29)

This unsignalized intersection experiences LOS deficiencies in Cases 2 and 3 on the minor eastbound and westbound approaches during the PM peak hour. In Case 2 during the PM peak hour the westbound approach is expected to operate at LOS F with 53 seconds of delay and queues over 35 feet long. In Case 3 with the Ellery Farm development, the westbound approach is expected to operate at LOS F with 57 seconds of delay and queues over 37 feet long. Although a traffic signal would likely mitigate the LOS deficiency at this intersection, it is unlikely that the intersection would satisfy the warrants for signalization. It is not recommended that the developer make any improvements at this intersection to address the LOS deficiencies on the minor eastbound and westbound approaches.

9. US Route 13 / Brenford Road / Big Oak Road (See Recommendation 7 & Table 10, Page 31)

This signalized intersection experiences LOS deficiencies in the Case 2 and 3 AM and PM peaks. In Case 2 during the PM peak hour the intersection is expected to operate at LOS F with 84 seconds of delay. In Case 3 during the PM peak with the Ellery Farm development, the intersection is expected to operate at LOS F with 88 seconds of delay. The *HEP KC, US13 & Brenford/Big Oak Rd. Intersection Improvements* (State Contract No. T202104203) project will add capacity to this intersection with additional turn lanes. With the proposed improvements in Case 3, the intersection is expected to operate at LOS D in both peak hours. As such, it is recommended that the developer

make an equitable share contribution to the *HEP KC, US13 & Brenford/Big Oak Rd. Intersection Improvements* (State Contract No. T202104203) project.

11. US Route 13 / Smyrna Toll Plaza Road / Canwit Drive (See Recommendation 8 & Table 12, Page 33)

This signalized intersection experiences LOS deficiencies in Cases 2 during the PM peak hour and Case 3 during the AM and PM peak hours. In Case 2 during the PM peak hour the intersection is expected to operate at LOS F with 107 seconds of delay. In Case 3 with the Ellery Farm development, the intersection is expected to operate at LOS F with 115 seconds of delay. This delay accounts for the adjusted volume distribution due to the spring 2025 DelDOT project at the median crossover to the north on US Route 13 at Cory Lane / Dominik Boulevard. The developer recommended signal timing adjustments which could reduce but not mitigate these deficiencies in the PM peak. To fully mitigate the LOS deficiencies at this intersection, major geometric changes would be required. This would include widening the eastbound and westbound approaches to include two left turn lanes, one through lane, and one right turn lane, and changing the signal phasing to concurrent side street phases with protected left-turn phases. With these improvements, the intersection would operate at LOS C with 32 seconds of delay in the AM peak hour and LOS D with 52 seconds of delay in the PM peak hour. To help fund future improvements at this intersection, the developer should make an equitable share contribution to the Traffic Signal Revolving Fund (TSRF).

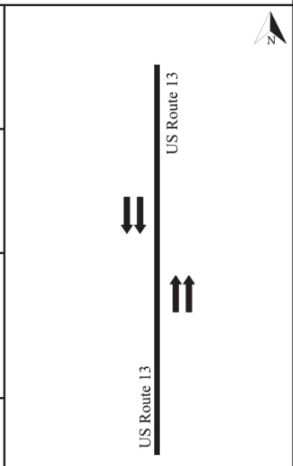
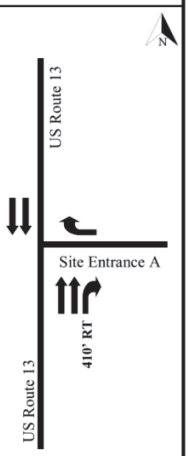
Development Improvements

Should Kent County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan, entrance plans or construction plans by note or illustration, unless a Design Deviation is requested and approved by the Department. 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. The following items should be implemented at the same time as site construction once all agency approvals and permits are secured and completed in accordance with DelDOT's Standards and Specifications.

1. The developer shall improve the State-maintained roads on which they front (US Route 13 and Twin Willows Road), within the limits of their frontage. 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" means the length along the state right-of-way of a single property tract where an entrance is proposed or required. If a single property tract has frontage along multiple roadways, any segment of roadway including an entrance shall be improved to meet DelDOT's Functional Classification criteria as found in Section 1.1 of the Development Coordination Manual and elsewhere therein, and/or improvements established in the Traffic Operational Analysis and/or Traffic Impact Study. "Secondary Frontage" means the length along the state right-of-way of a single property tract where no entrance is proposed or required. The segment of roadway may be upgraded by improving the pavement condition of the existing roadway width. The Pavement Management Section

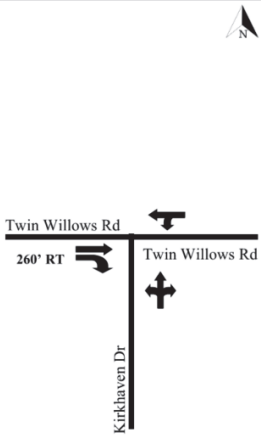
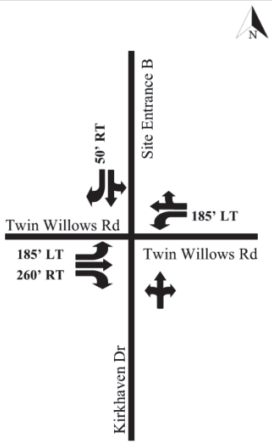
and Subdivision Section will determine the requirements to improve the pavement condition.

2. The developer should design and construct the right-in/right-out Site Entrance A on US Route 13. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound	Approach does not exist.		Eastbound	No Change.	
Westbound	Approach does not exist.		Westbound Site Entrance A	One right turn lane. Stop or yield control.	
Northbound US Route 13	Two through lanes.		Northbound US Route 13	Two through lanes and one right turn lane.	
Southbound US Route 13	Two through lanes.		Southbound US Route 13	No Change.	

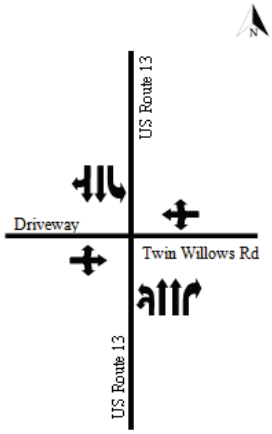
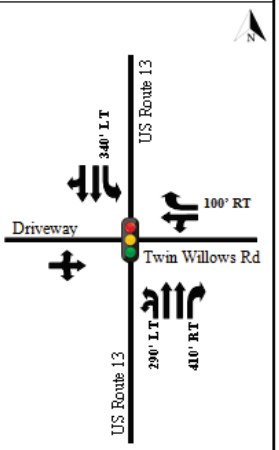
At the proposed Site Entrance A intersection, a northbound right-turn lane and a is warranted on US Route 13 based on DelDOT's Auxiliary Lane Worksheet. Initial recommended minimum turn lane length (excluding taper) is: 410-foot northbound right-turn lane on US Route 13. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn lane lengths and other design details during the site plan review.

3. The developer should design and construct the full-movement Site Entrance B on Twin Willows Road. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Twin Willows Road	One through lane and one right turn lane.		Eastbound Twin Willows Road	One left turn lane, one through lane, and one right turn lane.	
Westbound Twin Willows Road	One shared left turn/through lane.		Westbound Twin Willows Road	One left turn lane and one shared through/ right turn lane.	
Northbound Kirkhaven Drive	One shared left/ through/right turn lane. Stop control.		Northbound Kirkhaven Drive	No change.	
Southbound	Approach does not exist.		Southbound Site Entrance B	One shared left turn/through lane and one right turn lane. Stop control.	

At the proposed Site Entrance B intersection, an eastbound left-turn lane is warranted on Twin Willows Road based on DelDOT's Auxiliary Lane Worksheet. Initial recommended minimum turn lane lengths (excluding taper) are: 185-foot eastbound left-turn lane and a 185-foot westbound left-turn lane. The existing 260-foot eastbound right-turn lane on Twin Willows Road at Kirkhaven Drive exceeds the minimum recommended 240-foot turn lane length (excluding taper) based on DelDOT's Auxiliary Lane Worksheet. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn lane lengths and other design details during the site plan review.

4. The developer should design and construct improvements at the intersection of US Route 13 and Twin Willows Road as required for signalization of the intersection. The proposed configuration is shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Driveway	One shared left/ through/right turn lane. Uncontrolled.		Eastbound Driveway	No change	
Westbound Twin Willows Road	One shared left/ through/right turn lane. Stop controlled.		Westbound Twin Willows Road	One shared left/ through lane and one channelized right turn lane.	
Northbound US Route 13	One U-Turn/left turn lane, two through lanes, and one right turn lane.		Northbound US Route 13	No change	
Southbound US Route 13	One left turn lane, one through lane, and one shared through/right turn lane.		Southbound US Route 13	No change.	

At the intersection of US Route 13 and Twin Willows Road, a dedicated westbound right-turn lane with channelization is recommended. Initial recommended minimum turn lane lengths (excluding tapers) are a 100-foot westbound right-turn lane, a 290-foot northbound U-Turn/left-turn lane, a 410-foot northbound right-turn lane, and a 340-foot southbound left-turn lane. At the signalized intersection the developer should also construct signalized pedestrian crossings on the northern and eastern legs of the intersection. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn lane lengths and other design details during the site plan review.

5. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and Twin Willows Road to design and construct a traffic signal and to cover the physical improvements described above in Item No. 4. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion.

6. The developer should contribute to the Traffic Signal Revolving Fund (TSRF) for potential future improvements at the intersection of US Route 13 and Messina Hill Road. The TSRF contribution amount is $9,091.80. The developer should coordinate with DelDOT's Development Coordination Section to determine the terms of the TSRF contribution.

7. The developer should make an equitable share contribution to DelDOT's *HEP KC, US13 & Brenford/Big Oak Rd. Intersection Improvements* (State Contract No. T202104203) project which will add capacity to this intersection with additional turn lanes. The actual

amount of the contribution is based on 20% of the estimated construction cost of the project. The developer's contribution amount will be $23,910.00 and the developer should coordinate with DelDOT's Subdivision Section on the equitable cost payment terms.

8. The developer should contribute to the Traffic Signal Revolving Fund (TSRF) for potential future improvements at the intersection of US Route 13 and Smyrna Toll Plaza Road / Canwit Drive. The TSRF contribution amount is $5,456.33. The developer should coordinate with DelDOT's Development Coordination Section to determine the terms of the TSRF contribution.

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

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

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

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

   d. A minimum 15-foot-wide permanent easement from the edge of the final determined right-of-way should be dedicated to DelDOT within the site frontages along US Route 13 and Twin Willows Road. Along the frontages, a minimum of a 10-foot wide shared-use path should be constructed. The shared-use path should meet AASHTO and ADA standards and should have a minimum of a five-foot buffer from the roadway. At the property boundaries, the shared-use path should connect to the adjacent property or to the shoulder in accordance with DelDOT's Development Coordination Manual. The developer shall coordinate with DelDOT's Development Coordination Section through the plan review process to determine the details of the shared-use path design and connections/terminations at or before the boundaries of the property.

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

   f. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. Internal sidewalks in the development should connect to the proposed shared-use path along the site frontages.

g. Construct two new Type 2 (5'x8') bus stop pads on US Route 13, just north of Twin Willows Road, with one pad on either side of US Route 13. Sidewalks or a shared use path should connect the recommended bus stops to the recommended signalized pedestrian crossing on the northern leg of the intersection of US Route 13 and Twin Willows Road. Bus stop pads should connect to shared use paths and sidewalks. Location, size, and type of bus pad will be determined through coordination with the Delaware Transit Corporation (DTC).

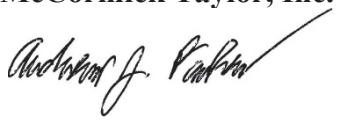
Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's site plan review process.

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

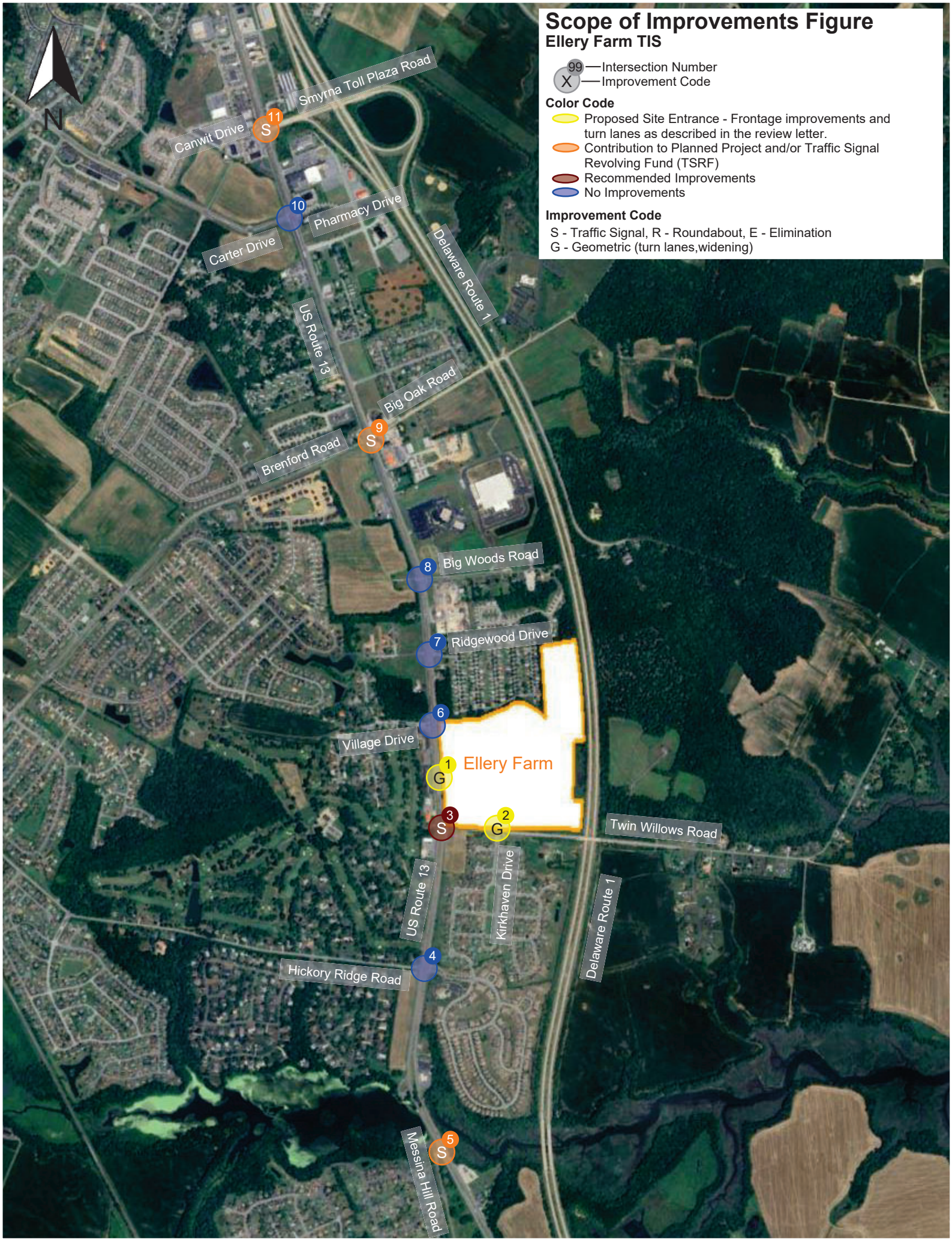
Sincerely,

McCormick Taylor, Inc.



Andrew J. Parker, PE, PTOE
Project Manager

Enclosure


Scope of Improvements Figure
Ellery Farm TIS
99 — Intersection Number
X — Improvement Code
Color Code
Proposed Site Entrance - Frontage improvements and turn lanes as described in the review letter.
Contribution to Planned Project and/or Traffic Signal Revolving Fund (TSRF)
Recommended Improvements
No Improvements
Improvement Code
S - Traffic Signal, R - Roundabout, E - Elimination
G - Geometric (turn lanes,widening)
N
Smyrna Toll Plaza Road
Canwit Drive
S 11
Pharmacy Drive
10
Carter Drive
Delaware Route 1
US Route 13
Big Oak Road
S 9
Brenford Road
8 Big Woods Road
7 Ridgewood Drive
6
Village Drive
Ellery Farm
G 1
S 3
G 2
Twin Willows Road
US Route 13
Kirkhaven Drive
Delaware Route 1
4
Hickory Ridge Road
S 5
Messina Hill Road

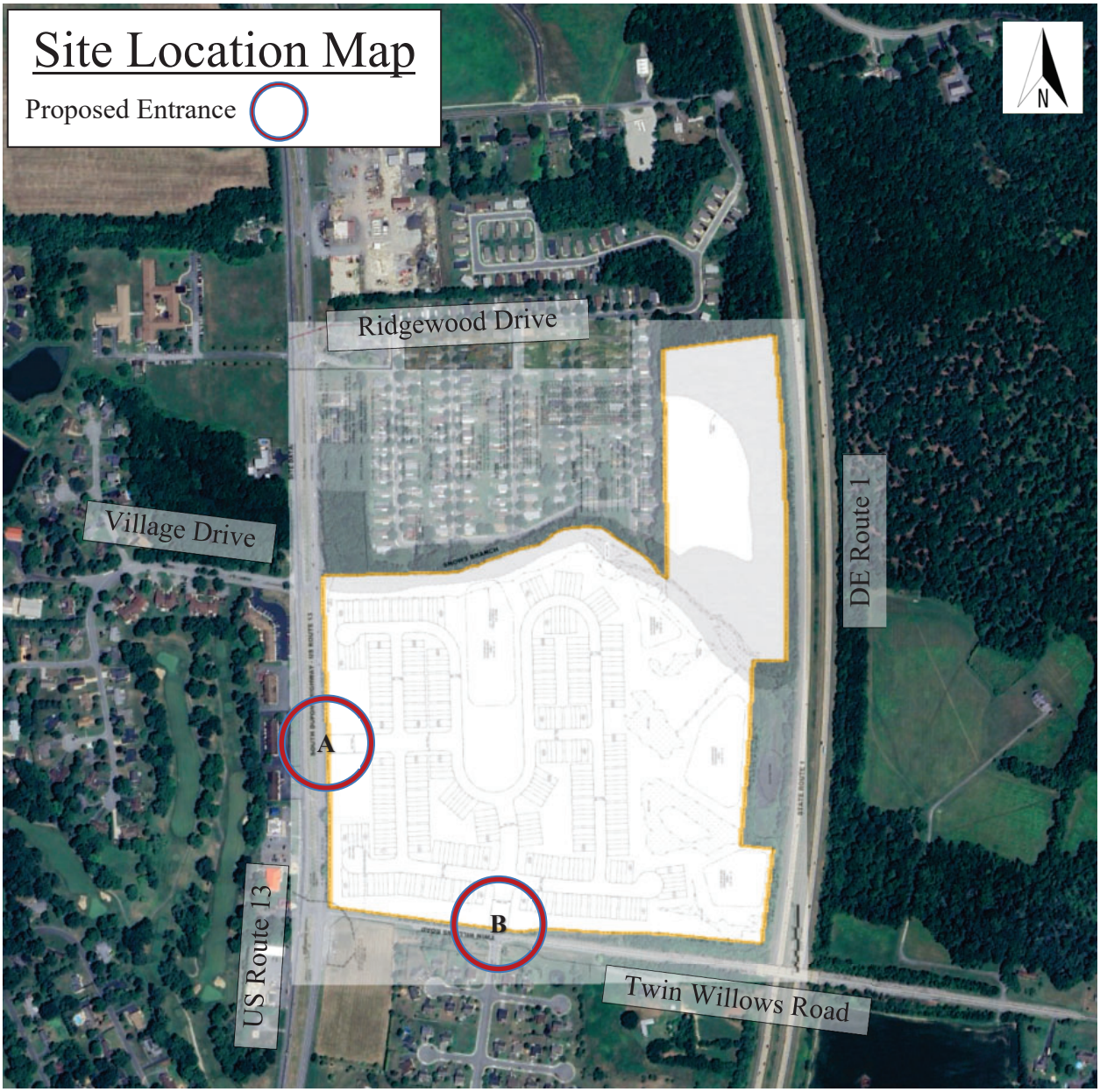
General Information

Report date: April 24, 2025
Prepared by: Rossi Group
Prepared for: K. Hovnanian Delaware Division, Inc.
Tax parcel: 1-00-02800-02-5000-00001
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Ellery Farm development consists of 332 single-family attached houses.
Location: This site is located on the east side of US Route 13 at the northeast corner of the intersection of US Route 13 and Twin Willows Road (Kent Road 84), in Kent County, Delaware. A site location map is included on page 13.
Amount of land to be developed: an approximately 82.08-acre parcel.
Land use approval(s) needed: The land is currently zoned as RM (Multifamily Residential) within a Growth Zone and the developer does not plan to rezone.
Proposed completion year: 2031
Proposed access locations: Access to the site is proposed along US Route 13 via one right-in/right-out entrance and one full-movement entrance along Twin Willows Road (Kent Road 84).
Average Daily Traffic Volumes (per DelDOT Traffic Summary 2024):

- US Route 13: 27,667 vehicles/day
- Twin Willows Road: 475 vehicles/day


Site Location Map
Proposed Entrance
N
Ridgewood Drive
Village Drive
DE Route 1
A
B
US Route 13
Twin Willows Road

2020 Delaware Strategies for State Policies and Spending

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed Ellery Farm development is located within Investment Level 2.

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

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

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

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed Ellery Farm development consists of approximately 332 single-family attached houses in an Investment Level 2 area. Investment Level 2 is an area where growth is anticipated by local, County, and State plans in the near-term future. As such, the proposed development appears to comply with the guidelines set forth in the 2020 "Strategies for State Policies and Spending".

Comprehensive Plan

Kent County Comprehensive Plan:
(Source: Kent County Comprehensive Plan, October, 2018)

The Kent County Comprehensive Plan Future Land Use Map indicates that the proposed Ellery Farm site is within the designated "Growth Zone Overlay" and on a site designated as "Highway Commercial".

Proposed Development's Compatibility with Comprehensive Plan:
The proposed development project includes 332 single-family attached houses on an approximately 82.08-acre parcel. The property is in a Highway Commercial Area and is currently zoned RM (Multifamily Residential). As such, it would appear that the proposed Ellery Farm development may fit within the intended land use for this location.

Relevant and On-Going Projects and Studies

Currently, DelDOT has several relevant and ongoing projects within the area of study.

The *HEP KC, US13 & Brenford/Big Oak Rd. Intersection Improvements* (State Contract No. T202104203) project involves intersection improvements to the US Route 13 / Brenford Road / Big Oak Road intersection including additional turn lanes and pedestrian improvements. Specifically, a second left turn lane is proposed for the northbound US Route 13 approach, a right turn lane is proposed for the westbound Big Oak Road approach, and a left turn lane, shared left/through lane, and right turn lane are proposed for the eastbound Brenford Road approach. Bike lanes are also proposed along Brenford Road and Big Oak Road. Construction is anticipated to start in the fall of 2025 and is anticipated to be completed in summer 2026. More information is available at the following link:
https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202104203

A DelDOT Traffic project that was implemented in spring 2025 modified the crossover on US Route 13 at Cory Lane / Dominik Boulevard to prohibit northbound left/U-turns, eastbound left-turn and through movements, and westbound left-turn and through movements. This project was completed after the turning movement counts were completed for this TIS.

The Dover Kent County Metropolitan Planning Organization (MPO) is planning a study in FY-26 along Hickory Ridge Road between Brenford Road and US Route 13 and continuing onto Spring Meadow Drive. The study will focus on pedestrian and vehicle safety. The study was requested by local residents and was initiated due to an increase in pedestrian traffic and transit ridership in the area and recent crash activity at the intersection of US Route 13 and Hickory Ridge Road. The MPO does not intend to study the actual intersection of US Route 13 and Hickory Ridge Road as it was included in the scope of this TIS.

The future Cheswold Area Transportation Improvement District (TID) is currently under development between DelDOT and Kent County. The future Cheswold Area TID would be south of the proposed development, and four of the TIS study intersections are also identified as TID Study Intersections, including: US Route 13 at Messina Hill Road, US Route 13 and Hickory Ridge Road, US Route 13 and Twin Willows Road, and US Route 13 and Big Oak Road. The intersection of US Route 13 at Messina Hill Road is the only TIS intersection located within the TID Boundary, but the TID Study Area includes additional intersections outside the TID Boundary such as the others mentioned above. 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. Certain intersection improvements to be identified as part of the future Cheswold Area TID would typically require contributions from developers within the TID. Presently, DelDOT and the County are still working toward establishing the TID and have not completed any traffic signal warrant analyses. Because the Ellery Farms development is located outside the future Cheswold Area TID Boundary, the developer would not have an obligation to contribute to the TID. It is unknown when the TID will be fully operational.

Trip Generation

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

- Single-Family Attached Housing (ITE Land Use Code 215)

Table 1
Peak Hour Trip Generation

ITE Land Use Codes	Units	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
215	332	2,479	42	125	167	115	80	195
Total Trips		**2,479**	**42**	**125**	**167**	**115**	**80**	**195**

Overview of TIS

Intersections examined:

1) Site Entrance A / US Route 13
2) Site Entrance B / Twin Willows Road (Kent Road 84) / Kirkhaven Drive
3) US Route 13 / Twin Willows Road
4) US Route 13 / Hickory Ridge Road (Kent Road 149) / Spring Meadow Drive
5) US Route 13 / Messina Hill Road (Kent Road 102)
6) US Route 13 / Village Drive
7) US Route 13 / Ridgewood Drive
8) US Route 13 / Big Woods Road (Kent Road 2A)
9) US Route 13 / Brenford Road (Kent Road 42) / Big Oak Road (Kent Road 325)
10) US Route 13 / S Carter Road (Kent Road 137) / Pharmacy Drive
11) US Route 13 / Smyrna Toll Plaza Road (Kent Road 150B) / Canwit Drive

Conditions examined:

1) 2024 existing (Case 1)
2) 2031 without development (Case 2)
3) 2031 with development (Case 3)

Peak hours evaluated: Weekday morning and evening peak hours.

Committed developments considered:

1) **Stonington** (166 single-family detached houses)
2) **Lynnbury Woods** (126 single-family detached house)
3) **Auburn Meadows Subdivision f.k.a. Virdin Property** (130 Senior Adult Housing, Single-Family)
4) **Green Hill Farm Estates** (48 single-family detached houses)
5) **Heritage Trace Phase II** (62 single-family detached houses)
6) **Hidden Brook** (229 single-family detached houses)
7) **Centerville** (370 Multi-family Housing, Low Rise)
8) **The Meadows (Graceville)** (294 single family detached housing, 400 single-family attached housing, and a 666-student middle school)
9) **Worthington** (40 single-family detached houses, 172 single-family attached housing, and 206 multi-family low-rise units)
10) **Simon's Corner Apartments** (270 multi-family low-rise units)

Intersection Descriptions

1) **Site Entrance A / US Route 13**
   Type of Control: Proposed minor-stop controlled T-intersection.
   Eastbound Approach: (Site Entrance A) proposed one right-turn lane. Stop control.
   Northbound Approach: (US Route 13) two through lanes, one proposed right-turn lane.
   Southbound Approach: (US Route 13) two through lanes.

2) **Site Entrance B / Twin Willows Road / Kirkhaven Drive**
   Type of Control: Proposed two-way stop-controlled intersection.
   Eastbound Approach: (Twin Willows Road) one through lane and one right-turn lane. Proposed one left-turn lane, one through lane, and one right-turn lane.
   Westbound Approach: (Twin Willows Road) one shared left-turn/through lane. Proposed one left-turn lane and one shared through/right-turn lane.
   Northbound Approach: (Kirkhaven Drive) one shared left-turn/through/right-turn lane. Stop control.
   Southbound Approach: (Site Entrance B) proposed one shared left-turn/through lane and one right-turn lane. Stop control.

3) **US Route 13 / Twin Willows Road**
   Type of Control: Minor Stop-Controlled T-intersection.
   Eastbound Approach: (Private Driveway) one shared left-turn/through/right-turn lane. Uncontrolled.
   Westbound Approach: (Twin Willows Road) one shared left-turn/through/right-turn lane. Stop control.
   Northbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.
   Southbound Approach: (US Route 13) one left-turn lane and two through lanes.

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

5) **US Route 13 / Messina Hill Road**
   Type of Control: Minor Stop-Controlled T-intersection.
   Eastbound Approach: (Messina Hill Road) one shared left-turn/right-turn lane. Stop control.
   Northbound Approach: (US Route 13) one left-turn lane, two through lanes.
   Southbound Approach: (US Route 13) two through lanes, and one right-turn lane.

6) **US Route 13 / Village Drive**
Type of Control: Minor Stop-Controlled T-intersection.
Eastbound Approach: (Village Drive) one left-turn lane and one right-turn lane. Stop control.
Northbound Approach: (US Route 13) one left-turn lane and two through lanes.
Southbound Approach: (US Route 13) one U-turn lane, two through lanes, and one right-turn lane.

7) **US Route 13 / Ridgewood Drive**
Type of Control: Two-way Stop-Controlled intersection.
Eastbound Approach: (Commercial Driveway) one shared left-turn/through/right-turn lane. Stop Control.
Westbound Approach: (Ridgewood Drive) one shared left-turn/through/right-turn lane. Stop control.
Northbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.
Southbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.

8) **US Route 13 / Big Woods Road**
Type of Control: Signalized intersection.
Westbound Approach: (Big Woods Road) one left-turn lane and one right-turn lane.
Northbound Approach: (US Route 13) one U-turn lane, two through lanes, and one right-turn lane.
Southbound Approach: (US Route 13) one left-turn lane and two through lanes.

9) **US Route 13 / Brenford Road / Big Oak Road**
Type of Control: Signalized intersection.
Eastbound Approach: (Brenford Road) one shared left-turn/through/right-turn lane.
Westbound Approach: (Big Oak Road) one shared left-turn/through/right-turn lane.
Northbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right- turn lane.
Southbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right- turn lane.

10) **US Route 13 / S Carter Road / Pharmacy Drive**
Type of Control: Signalized intersection.
Eastbound Approach: (S Carter Road) one left-turn lane, one through lane, and one right-turn lane.
Westbound Approach: (Pharmacy Drive) one left-turn lane, one through lane, and one right-turn lane.
Northbound Approach: (US Route 13) two left-turn lanes, two through lanes, and one right-turn lane.
Southbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.

11) US Route 13 / Smyrna Toll Plaza Road / Canwit Drive

Type of Control: Signalized intersection.

Eastbound Approach: (Canwit Drive) one left-turn lane, one shared left-turn/through lane, and one right-turn lane.

Westbound Approach: (Smyrna Toll Plaza Road) one left-turn lane, one shared left-turn/through lane, one channelized right-turn lane.

Northbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.

Southbound Approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane.

Safety Evaluation

Crash Data: Delaware Crash Analysis Reporting System (CARS) data was provided in the TIS for the three-year period from December 30, 2021, through December 30, 2024, at the ten existing study intersections. The crash data indicates that 269 crashes occurred within the study area over that timeframe. The signalized intersections of US Route 13 at Smyrna Toll Plaza Road / Canwit Drive and US Route 13 at Carter Road / Pharmacy Drive experienced the highest crash frequency with 80 and 70 crashes each, respectively.

The most common crash type at the intersection of US Route 13 at Smyrna Toll Plaza Road / Canwit Drive was front to rear, with forty-seven (47). Twenty-five (25) of the front to rear crashes were due to driver inattention. There were no fatalities in the study area during the three-year period.

Sight Distance: The study area generally consists of relatively flat roadways and there are few visual obstructions. As always, the adequacy of available sight distance should be confirmed during the site plan review process for all proposed movements at the site accesses.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates one fixed-route transit bus route (Routes 302) that travels along US Route 13. The nearest bus stops are located to the south at the intersection of US Route 13 / Hickory Ridge Road / Spring Meadow Drive and to the north at US Route 13 / Brenford Road. Neither location is convenient to future residents of the proposed development.

Planned transit service: Delaware Transit Corporation (DTC) has requested that the developer construct bus stop pads on both sides of US Route 13 north of Twin Willows Road. Additionally, DTC requested that a signalized pedestrian crossing be constructed to connect the two bus pads across US Route 13. The location, size, and type of bus pad will be determined through coordination with DTC.

Existing bicycle and pedestrian facilities: According to DelDOT's Kent County Bicycle Map, Big Oak Road (Kent Road 325) and Branford Road (Kent Road 42) are Suggested Connector Bicycle Routes without Bikeway. US Route 13 is a Suggested Connector Bicycle Route with Bikeway, though it is noted to be challenging for cyclists. There are no existing pedestrian facilities in the area surrounding the proposed development.

Planned bicycle and pedestrian facilities: DelDOT's *HEP KC, US13 & Brenford/Big Oak Rd. Intersection Improvements* (State Contract No. T202104203) project proposes to add signalized pedestrian crossings on the east, south, and west legs of the intersection of US Route 13 and Brenford Road / Big Oak Road. The same project also proposes shared use paths along the south side of Brenford Road, west of US Route 13 and along the north side of Big Oak Road, east of US Route 13.

Previous Comments

The initial scoping memorandum between the developer and DelDOT was dated December 18, 2024.

In a review letter dated January 21, 2025, DelDOT commented on the traffic counts and seasonally adjusted traffic volumes. The developer was asked to revise several volume figures, address all comments, apply the growth factors provided, and proceed with the Preliminary TIS.

In a second review letter dated March 6, 2025, DelDOT commented on the Preliminary TIS. The developer was asked to update volume exhibits, include reference material regarding the committed development distributions in the appendices, confirm the land use used for the committed development Worthington, provide correspondence with the local land use agency about the land use for the Centerville committed development, update distributions for various committed developments, revise the Heritage Trace Phase II trip generation, provide certificates of occupancy, confirm the status of the Cheswold Readiness Center with Kent County, update all future volume figures in accordance with the comments. The developer was then directed to resubmit the Preliminary TIS.

In a third review letter dated April 10, 2025, DelDOT commented on the Preliminary TIS. The developer was asked to revise the trip generation for committed developments that are partially built, update committed development distributions, and update all future volume figures in accordance with the comments. The developer was then directed to resubmit the Preliminary TIS.

It should be noted that the TIS does not include a copy of email correspondence from DelDOT directing the developer to proceed with the Final TIS.

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

General HCS Analysis Comments

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

1) Both the TIS and McCormick Taylor utilized Highway Capacity Software (HCS) to complete the traffic analyses.

2) The TIS analyzed the signalized study intersections using cycle lengths that did not always align with the active signal timing. McCormick Taylor utilized the signal timing programs from the appropriate intersection timesheets provided by the DelDOT TMC.

3) The TIS and McCormick Taylor generally used heavy vehicle percentages (HV%) from turning movement counts for existing and future conditions (as per DelDOT's Development Coordination Manual section 2.2.8.11.6.H). McCormick Taylor and the TIS assumed 3% HV for future movements and at the proposed site entrance.

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

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

Table 2
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Unsignalized Intersection [1] **Stop-Controlled Right-In/Right-Out**	**LOS per TIS**		**LOS per McCormick Taylor**	
1. Site Entrance A / US Route 13	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2031 Build (Case 3)				
Westbound Site Entrance A	C (15.5)	C (19.8)	C (15.5)	C (19.8)

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

Table 3
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Unsignalized Intersection [2] **Two-Way Stop**	**LOS per TIS**		**LOS per McCormick Taylor**	
2. Site Entrance B / **Twin Willows Road / Kirkhaven Drive**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Eastbound Twin Willows Road – Left	-	-	-	-
Westbound Twin Willows Road – Left	A (7.5)	A (7.6)	A (7.7)	A (8.6)
Northbound Kirkhaven Drive	A (8.9)	A (8.9)	A (8.9)	A (9.0)
Southbound Site Entrance A	-	-	-	-
2031 No Build (Case 2)				
Eastbound Twin Willows Road – Left	-	-	-	-
Westbound Twin Willows Road – Left	A (7.5)	A (7.6)	A (7.8)	A (8.5)
Northbound Kirkhaven Drive	A (9.0)	A (9.0)	A (9.0)	A (9.0)
Southbound Site Entrance A	-	-	-	-
2031 Build (Case 3)				
Eastbound Twin Willows Road – Left	A (7.3)	A (7.4)	A (7.3)	A (7.4)
Westbound Twin Willows Road – Left	A (7.5)	A (7.6)	A (7.8)	A (8.5)
Northbound Kirkhaven Drive	B (10.4)	B (11.4)	B (10.4)	B (11.6)
Southbound Site Entrance A	A (8.7)	A (8.7)	A (8.7)	A (8.7)

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

Table 4
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Unsignalized Intersection [3] **One-Way Stop (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
3. US Route 13 / Twin Willows Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Eastbound Private Driveway	C (22.7)	E (39.3)	C (22.7)	E (45.5)
Westbound Twin Willows Road	C (15.1)	D (27.5)	C (15.1)	D (27.7)
Northbound US Route 13 – Left/U-Turn	B (12.9)	D (27.3)	B (12.8)	F (52.4)
Southbound US Route 13 – Left/U-Turn	B (13.1)	C (16.7)	B (13.1)	C (16.7)
2031 No Build (Case 2)				
Eastbound Private Driveway	E (39.2)	F (86.8)	E (39.2)	F (86.7)
Westbound Twin Willows Road	C (21.7)	F (74.7)	C (21.6)	F (74.5)
Northbound US Route 13 – Left/U-Turn	C (19.5)	E (44.0)	C (19.4)	E (39.6)
Southbound US Route 13 – Left/U-Turn	C (18.4)	D (32.3)	C (18.4)	D (32.3)
2031 Build (Case 3)				
Eastbound Private Driveway	E (44.4)	-- [4]	E (43.8)	-- [4]
Westbound Twin Willows Road	E (48.2)	F (957.1)	F (73.6)	F (956.1)
Northbound US Route 13 – Left/U-Turn	C (19.5)	E (44.0)	C (19.4)	E (39.6)
Southbound US Route 13 – Left/U-Turn	C (19.6)	F (67.9)	C (18.8)	F (67.9)
2031 Build (Case 3) – Signalized				
Overall	B (16.3)	B (11.8)	B (11.2)	B (12.4)

[3] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[4] LOS and delay results are not calculated by the HCS models at this intersection for this scenario.

Table 5
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Signalized Intersection [5]	**LOS per TIS**		**LOS per McCormick Taylor** [6]	
4. US Route 13 / Hickory Ridge Road / Spring Meadow Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Overall	B (16.0)	B (19.4)	B (18.0)	B (17.8)
2031 No Build (Case 2)				
Overall	F (112.8)	E (56.6)	D (35.6)	D (36.4)
2031 Build (Case 3)				
Overall	D (54.6)	E (62.3)	C (33.2)	D (37.7)

[5] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[6] Differences between MT and TIS analysis: 1) MT used 150 second cycle for AM and PM following patterns 311 and 331 for AM and PM as shown on Time-of-Day Data from DelDOT TMC. The TIS used 115 second cycles. 2) MT modeled the westbound approach with a shared left/through/right-turn lane. The TIS used a shared left/through lane and a dedicated right-turn lane. 3) MT used a PHF of 0.96 following the turning movement count data. The TIS used a 0.92 PHF.

Table 6
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Unsignalized Intersection [7] **One-Way Stop-Control (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
5. US Route 13 / Messina Hill Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Eastbound Messina Hill Road	D (31.7)	F (56.9)	D (31.1)	F (57.2)
Northbound US Route 13 – Left/U-Turn	B (10.3)	C (17.2)	B (10.3)	C (17.5)
2031 No Build (Case 2)				
Eastbound Messina Hill Road	F (338.7)	F (359.6)	F (326.8)	F (361.6)
Northbound US Route 13 – Left/U-Turn	B (14.1)	D (28.1)	B (14.1)	D (28.9)
2031 Build (Case 3)				
Eastbound Messina Hill Road	F (393.0)	F (399.5)	F (379.6)	F (401.8)
Northbound US Route 13 – Left/U-Turn	B (14.6)	D (29.6)	B (14.6)	D (30.5)
2031 Build (Case 3) – Signalized				
Overall	A (8.2)	A (6.6)	B (10.5)	A (8.9)

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

Table 7
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Unsignalized Intersection [8] **One-Way Stop-Control (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
6. US Route 13 / Village Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Eastbound Village Drive	C (16.2)	D (27.9)	C (16.3)	D (27.9)
Northbound US Route 13 – Left/U-Turn	B (10.0)	B (13.4)	B (10.0)	B (13.4)
Southbound US Route 13 – U-Turn	C (16.1)	C (21.6)	C (15.3)	C (21.6)
2031 No Build (Case 2)				
Eastbound Village Drive	C (24.0)	E (46.1)	C (24.1)	E (46.4)
Northbound US Route 13 – Left/U-Turn	B (12.5)	C (17.4)	B (12.5)	C (17.4)
Southbound US Route 13 – U-Turn	C (23.5)	E (38.4)	C (21.8)	E (39.6)
2031 Build (Case 3)				
Eastbound Village Drive	C (24.6)	E (49.8)	C (24.8)	E (49.8)
Northbound US Route 13 – Left/U-Turn	B (12.7)	C (18.2)	B (12.7)	C (18.2)
Southbound US Route 13 – U-Turn	D (25.4)	E (40.6)	C (23.4)	E (40.6)

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

Table 8
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Unsignalized Intersection [9] Two-Way Stop	**LOS per TIS**		**LOS per McCormick Taylor**	
7. US Route 13 / Ridgewood Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Eastbound Commercial Driveway	C (15.8)	D (26.5)	C (15.8)	D (265)
Westbound Ridgewood Drive	C (18.8)	D (28.0)	C (18.9)	D (28.0)
Northbound US Route 13 – Left	A (9.6)	B (11.5)	A (9.6)	B (11.5)
Southbound US Route 13 – Left	B (10.2)	B (12.2)	B (10.7)	B (12.2)
2031 No Build (Case 2)				
Eastbound Commercial Driveway	C (23.2)	E (48.1)	C (23.2)	E (48.1)
Westbound Ridgewood Drive	D (28.5)	F (53.4)	D (28.5)	F (53.4)
Northbound US Route 13 – Left	B (11.9)	B (14.8)	B (11.9)	B (14.8)
Southbound US Route 13 – Left	B (12.0)	C (16.0)	B (12.8)	C (16.0)
2031 Build (Case 3)				
Eastbound Commercial Driveway	C (23.9)	F (52.1)	C (23.9)	F (52.1)
Westbound Ridgewood Drive	D (30.7)	F (57.4)	D (30.7)	F (57.4)
Northbound US Route 13 – Left	B (12.0)	C (15.3)	B (12.0)	C (15.3)
Southbound US Route 13 – Left	B (12.4)	C (16.4)	B (13.3)	C (16.4)

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

Table 9
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Signalized Intersection [10]	**LOS per TIS**		**LOS per McCormick Taylor**	
8. US Route 13 / Big Woods Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Overall	A (5.0)	A (7.6)	A (5.7)	A (6.7)
2031 No Build (Case 2)				
Overall	A (5.6)	A (9.9)	A (5.9)	A (8.5)
2031 Build (Case 3)				
Overall	A (5.8)	B (10.2)	A (6.0)	A (8.7)

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

Table 10
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Signalized Intersection [11]	**LOS per TIS**		**LOS per McCormick Taylor**	
9. US Route 13 / Brenford Road / Big Oak Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Overall	F (87.7)	D (38.8)	C (31.7)	C (30.8)
2031 No Build (Case 2)				
Overall	F (86.6)	D (42.0)	E (74.9)	F (83.5)
2031 Build (Case 3)				
Overall	F (85.1)	D (44.0)	E (76.1)	F (87.6)
2031 Build (Case 3) – w/ DelDOT project improvements (T202104203)				
Overall	--	--	D (39.5)	D (51.2)

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

Table 11
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Signalized Intersection [12]	**LOS per TIS**		**LOS per McCormick Taylor** [13]	
10. US Route 13 / S. Carter Road / Pharmacy Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Overall	E (55.0)	E (56.4)	C (29.4)	D (38.3)
2031 No Build (Case 2)				
Overall	F (70.8)	F (114.0)	D (36.8)	D (52.8)
2031 Build (Case 3)				
Overall	F (70.8)	F (129.5)	D (37.0)	D (55.0)

[12] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[13] Differences between MT and TIS analysis: 1) MT used 120 second cycle for AM and PM following patterns 19 and 25 for AM and PM as shown on Tactics Data from DelDOT TMC. The TIS used 160 second cycles. 2) MT modeled protected/permitted left-turn phasing on the side street approaches based on the 5-section heads and observed signal operations. The TIS modeled these as Protected-Only left-turn phasing.

Table 12
Peak Hour Levels of Service (LOS)
Based on the Ellery Farm Traffic Impact Study
Prepared by Rossi Group – April 2025

Signalized Intersection [14]	**LOS per TIS**		**LOS per McCormick Taylor**	
11. US Route 13 / Smyrna Toll Plaza Road / Canwit Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 Existing (Case 1)				
Overall	C (32.4)	E (57.4)	C (32.7)	D (51.7)
2031 No Build (Case 2)				
Overall	D (37.0)	F (89.9)	D (37.8)	F (91.2)
2031 Build (Case 3)				
Overall	D (37.4)	F (94.2)	D (38.1)	F (94.9)
2031 Build (Case 2) – Adjusted Volumes [15]				
Overall	--	--	D (39.6)	F (106.9)
2031 Build (Case 3) – Adjusted Volumes [15]				
Overall	--	--	D (40.1)	F (114.9)
2031 Build (Case 3) – Adjusted Volumes w/ improvements [16]				
Overall	--	--	C (32.3)	D (52.2)

[14] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[15] A recent DelDOT project modified the crossover on US Route 13 at Cory Lane / Dominik Boulevard to prohibit northbound left/U-turns, eastbound left-turn and through movements, and westbound left-turn and through movements. This project was completed after the turning movement counts were completed for this TIS. As a result, turning movement volumes at the intersection of US Route 13 / Smyrna Toll Plaza Road / Canwit Drive have changed and this analysis represents development Case 3 with adjusted volumes.
[16] Intersection improvements to mitigate the LOS deficiency include widening the eastbound and westbound approaches to include two left turn lanes, one through lane, and one right turn lane, and changing the signal phasing to concurrent side street phases with protected left-turn phases.