



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

NICOLE MAJESKI  
SECRETARY

November 23, 2021

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

Dear Ms. Tustin:

The enclosed Traffic Operational Analysis (TOA) review letter for the **Turnberry (f.k.a. Unity Branch)** (Tax Parcels: 234-10.00-199.00, and 234-16.00-1.01, 1.02, 3.00, 4.00 and 5.00) 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 TOA to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2124.

Sincerely,

Claudy Joinville  
Project Engineer

CJ:km

Enclosures

cc with enclosures: Mr. Jason Palkewicz, Solutions IPeM  
Mr. David Edgell, Office of State Planning Coordination  
Mr. Jamie Whitehouse, Sussex County Planning and Zoning  
Ms. Joanne Arellano, Johnson, Mirmiran, & Thompson, Inc.  
DelDOT Distribution

## DelDOT Distribution

Brad Eaby, Deputy Attorney General  
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Steve McCabe, Sussex Review Coordinator, Development Coordination  
Mark Galipo, Traffic Engineer, Traffic, DOTS  
Brian Yates, Subdivision Manager, Development Coordination  
Annamaria Fumato, Project Engineer, Development Coordination



November 19, 2021

Mr. Claudy Joinville  
Project Engineer  
Delaware Department of Transportation  
Development Coordination, Division of Planning  
800 Bay Road  
Dover, DE 19901

RE: Agreement No. 1945F  
Project Number T202069012  
Traffic Impact Study Services  
Task 3-7A – Turnberry (f.k.a. Unity Branch) TOA

Dear Mr. Joinville:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Operational Analysis (TOA) for the Turnberry (f.k.a. Unity Branch) development, which was prepared by The Traffic Group, Inc., dated May 28, 2021. This review was assigned as Task Number 3-7A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TOA evaluates the impacts of a proposed residential development in Sussex County, Delaware. The development would be comprised of 195 single-family detached homes. The site is located on the southeast side of Hollyville Road (Sussex Road 48), southwest of Hurdle Ditch Road (Sussex Road 290). The subject property is on an approximately 145.4-acre assemblage of parcels. The land is currently zoned as AR-1 (Agricultural Residential) and the developer does not plan to rezone the land. One full access is proposed along Hollyville Road and construction is anticipated to be complete in 2027.

DelDOT currently does not have any active projects within the study area. However, the Hollyville Road and Zoar Road/Harmons Hill Road intersection was included in DelDOT's 2013 *Hazard Elimination Program* (HEP) as Site G. Site G is a 0.30-mile corridor along Zoar Road/Hollyville Road from 0.06 miles west of Avalon Road to 0.10 miles north of Harmons Hill Road. The Site G Task I Report included a crash evaluation and a sight distance review of the Hollyville Road and Zoar Road/Harmons Hill Road intersection. The Task I Report recommended that an additional study be performed at the Hollyville Road intersection with Zoar Road/Harmons Hill Road to determine improvements to reduce the potential for angle crashes.

The Site G Task II Report included additional evaluations to determine improvements at the Hollyville Road intersection with Zoar Road/Harmons Hill Road. The additional evaluations included a multi-way stop control warrant analysis, a traffic signal warrant analysis, a capacity and queue assessment, and a roundabout evaluation. The Task II Report recommended the interim improvement of an all-way stop control with warning beacons and signage, and the ultimate



improvement of a roundabout in conjunction with the developments in the area. Under existing conditions, the intersection is all-way stop-controlled.

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

Based on the level of service (LOS) evaluation criteria as stated in DelDOT's *Development Coordination Manual*, none of the intersections exhibit LOS deficiencies.

Although the proposed unsignalized two-way stop-controlled Site Entrance along Hollyville Road does not exhibit LOS deficiencies, DelDOT requested an analysis of the intersection configured as a roundabout as a traffic calming measure along Hollyville Road. With the implementation of a roundabout, the intersection would operate at LOS A during the weekday AM and PM peak hours under Case 3 future with development conditions. However, we do not recommend that the developer install a roundabout.

The unsignalized two-way stop-controlled Hollyville Road intersection with Hurdle Ditch Road also does not exhibit LOS deficiencies. Additionally, based on a field visit, sight distance is sufficient along every approach to the intersection. However, based on the *Road Design Manual*, a separate left turn lane should be provided along the northbound approach of Hollyville Road to Hurdle Ditch Road. As such, it is recommended the developer improve the northbound Hollyville Road approach to Hurdle Ditch Road to provide a separate left turn lane.

The subject study is a TOA which was scoped to address specific intersections where DelDOT required additional information to determine the need for offsite improvements. Although the Delaware Route 5 and Hollyville Road/Hollymount Road intersection is not a study intersection, per the February 5, 2021 Scoping Meeting Memorandum, DelDOT will require that the developer enter into a traffic signal agreement at the intersection of Delaware Route 5 and Hollyville Road/Hollymount Road.

Should Sussex 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 Hollyville Road within the limits of their frontage to meet DelDOT's standards for Functional Classification as found in Section 1.1 of the *Development Coordination Manual* and elsewhere therein. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. Frontage is defined in Section 1 of the *Development Coordination Manual*, which states "This length includes the length of roadway perpendicular to lines created by the projection of the outside parcel corners to the roadway." Questions on or appeals of this requirement should be directed to the DelDOT Subdivision Review Coordinator in whose area the development is located.



- The developer should construct a full access site entrance on Hollyville Road, approximately 3,350 feet north of the northeast point of tangency at the Zoar Road/Harmons Hill Road intersection. The intersection should be consistent with the lane configurations shown in the table below.

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

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length is 240 feet (excluding taper) for the northbound Hollyville Road right turn lane and 135 feet (excluding taper) for the southbound Hollyville Road left turn lane. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage lengths.

- The developer should modify the Hollyville Road intersection with Hurdle Ditch Road to be consistent with the lane configurations shown in the table below:

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Eastbound Hurdle Ditch Road	One shared left turn/right turn lane	No change
Northbound Hollyville Road	One shared left turn/through lane	One left turn lane and one through lane
Southbound Hollyville Road	One shared through/right turn lane	No change

Based on the *Road Design Manual*, the recommended minimum storage length is 80 feet (excluding taper) for the northbound Hollyville Road left turn lane. The calculated queue length from the HCS analysis can be accommodated within the recommended storage length. The developer should submit a plan to DelDOT depicting the design of the intersection during the Entrance Plan review process.

- The developer should enter into a traffic signal agreement with DelDOT for the intersection of Delaware Route 5 and Hollyville Road/Hollymount Road. The signal agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV



cameras at DelDOT's discretion. At DelDOT's discretion, the developer may contribute to the Traffic Signal Revolving Fund in lieu of a traffic signal agreement.

5. The following bicycle, pedestrian, and transit improvements should be included:
  - a. A minimum of fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the Hollyville Road site frontage. Within the easement, the developer should construct a ten-foot wide shared-use path (SUP). The SUP should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the SUP. If feasible, the SUP should be placed behind utility poles and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.
  - b. At least one internal connection of a sidewalk or shared use path should be provided from the shared-use path along Hollyville Road.
  - c. A SUP connection along the eastern side of Hollyville Road should be provided between the proposed SUPs for this site and the Fairmont site.
  - d. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the northbound Hollyville Road approach to the site entrance.
  - e. ADA compliant curb ramps and marked crosswalks should be provided along the Site Entrance approach to Hollyville Road. The use of diagonal curb ramps is discouraged. The curb ramps should be designed to accommodate the SUP.
  - f. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/SUP or should be flush with the pavement.

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

Improvements in this TOA 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](https://www.deldot.gov/Publications/manuals/de_mutcd/index.shtml). For any additional information regarding the work zone impact and mitigation procedures during construction, please contact Mr. Jeff VanHorn, Assistant Director for Traffic Operations and Management. Mr. VanHorn can be reached at (302) 659-4606 or by email at [Jeffrey.VanHorn@delaware.gov](mailto:Jeffrey.VanHorn@delaware.gov).



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

Sincerely,  
Johnson, Mirmiran, and Thompson, Inc.

A handwritten signature in black ink, appearing to read 'Joanne M. Arellano', is written in a cursive style.

Joanne M. Arellano, P.E., PTOE

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

Enclosure

## **General Information**

**Report date:** May 28, 2021

**Prepared by:** The Traffic Group, Inc.

**Prepared for:** Schell Brothers, LLC

**Tax Parcels:** 234-10.00-199.00 and 234-16.00-1.01, 1.02, 3.00, 4.00 and 5.00

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

## **Project Description and Background**

**Description:** The TOA evaluates the impacts of a residential development consisting of 195 single-family detached homes.

**Location:** The subject site is located on the southeast side of Hollyville Road, southwest of Hurdle Ditch Road in Sussex County, Delaware.

**Amount of Land to be developed:** An approximately 145.4-acre assemblage of parcels.

**Land Use approval(s) needed:** Entrance Plan.

**Proposed completion date:** 2027.

**Proposed access locations:** One access point: full access entrance on Hollyville Road.

### **Daily Traffic Volumes:**

- 2019 Average Annual Daily Traffic on Hollyville Road (Sussex Road 48): 4,371



## Site Map



*\*Graphic is an approximation based on the Preliminary Plat prepared by The Traffic Group, Inc. dated October 16, 2020.*

## Relevant and On-going Projects

DelDOT currently does not have any active projects within the study area. However, the Hollyville Road and Zoar Road/Harmons Hill Road intersection was included in DelDOT's 2013 *Hazard Elimination Program* (HEP) as Site G. Site G is a 0.30-mile corridor along Zoar Road/Hollyville Road from 0.06 miles west of Avalon Road to 0.10 miles north of Harmons Hill Road. The Site G Task I Report included a crash evaluation and a sight distance review of the Hollyville Road and Zoar Road/Harmons Hill Road intersection. The Task I Report recommended that an additional

study be performed at the Hollyville Road intersection with Zoar Road/Harmons Hill Road to determine improvements to reduce the potential for angle crashes.

The Site G Task II Report included additional evaluations to determine improvements at the Hollyville Road intersection with Zoar Road/Harmons Hill Road. The additional evaluations included a multi-way stop control warrant analysis, a traffic signal warrant analysis, a capacity and queue assessment, and a roundabout evaluation. The Task II Report recommended the interim improvement of an all-way stop control with warning beacons and signage, and the ultimate improvement of a roundabout in conjunction with the developments in the area. Under existing conditions, the intersection is all-way stop controlled.

### **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 the Investment Level 4.

#### *Investment Level 4*

Delaware's Investment Level 4 Areas are rural in nature and are where the bulk of the state's open space/natural areas and agricultural industry is located. These areas contain agribusiness activities, farm complexes, and small settlements. They typically include historic crossroads or points of trade, often with rich cultural ties. Delaware's Investment Level 4 Areas are also the location of scattered residential uses, featuring almost entirely single-family detached residential structures. Delaware's Investment Level 4 Areas also include many unincorporated communities, typically with their own distinctive character and identity. Investment Level 4 Areas depend on a transportation system primarily of secondary roads linked to roadways used as regional thoroughfares for commuting and trucking.

It is the state's intent to discourage additional urban and suburban development in Investment Level 4 Areas unrelated to agriculture and to the areas' needs. In Investment Level 4 Areas, the state's investments and policies should retain the rural landscape and preserve open spaces and farmlands, support farmland-related industries, and establish defined edges to more concentrated development. The focus for the Level 4 Areas will be to preserve and maintain existing facilities in safe working order, corridor-capacity preservation, and the enhancement of transportation facilities to support agricultural business. The lowest priority is given to transit system enhancements.

#### **Proposed Development's Compatibility with Livable Delaware:**

The proposed site would be located in Investment Level 4. The 2020 *Delaware Strategies for State Policies and Spending* states that in Investment Level 4, the priority is to sustain homes and vitality of small rural communities. Investment Level 4 areas feature almost entirely single-family detached residential structures. However, new residential development activities are not supported in Investment Level 4 areas. The proposed development is residential, and the site is comprised of agricultural lands and wildlife habitats. Therefore, the proposed development is generally not

consistent with the 2020 update of the Livable Delaware “Strategies for State Policies and Spending.”

**Comprehensive Plan**

(Source: *Sussex County 2018 Comprehensive Plan*)

**Sussex County Comprehensive Plan:**

Per the Sussex County Comprehensive plan, the proposed development is in an area designated as an Agricultural Residential District (AR-1) and the developer does not plan to rezone the land.

**Proposed Development’s Compatibility with the Sussex County Comprehensive Plan:**

The *Sussex County Comprehensive Plan* indicates that the study area falls in a Low-Density Rural Area. The plan states that in these areas, low-density housing developments with 2 houses per acre are appropriate. Additionally, a portion of the development in these areas is required to be left as open space. The proposed development is a low-density housing development with less than 2 houses per acre, and it includes plans for open space. Therefore, the proposed development is generally consistent with the *Sussex 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, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 210 (single-family detached housing). The trip generation was approved by DelDOT during the Preliminary Traffic Operational Analysis (PTOA) review.

**Table 1**  
Turnberry (f.k.a. Unity Branch) Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
195 Single-Family Homes (ITE Code 210)	1,922	36	107	143	122	71	193

**Overview of TOA**

**Intersections examined:**

1. Site Entrance / Hollyville Road (Sussex Road 48)
2. Hollyville Road / Zoar Road (Sussex Road 48) / Harmons Hill Road (Sussex Road 302)
3. Hollyville Road / Hurdle Ditch Road (Sussex Road 290)

**Conditions examined:**

1. Case 1 – 2021 Existing
2. Case 2 – 2027 without Development

3. Case 3 – 2027 with Development

**Committed Developments considered:**

1. Fairmont (104 single-family detached houses)
2. Woodridge (188 single-family detached houses, 159 unbuilt)
3. Liberty East (121 single-family detached houses, 99 unbuilt)
4. Wetherby (126 single-family detached houses)
5. Independence (a.k.a. Indigo Run) (455 single-family detached houses, 124 unbuilt)

Note: Committed development information provided in the TOA supersedes the information provided in the February 5, 2021 DelDOT Scoping Meeting Memorandum.

**Peak hours evaluated:** Weekday morning and weekday evening.

**Intersection Descriptions**

**1. Site Entrance / Hollyville Road (Sussex Road 48)**

**Type of Control:** Proposed two-way stop-controlled intersection (T-intersection)

**Westbound Approach:** (Site Entrance) Proposed one shared left turn/right turn lane.

**Northbound Approach:** (Hollyville Road) Existing one through lane, proposed one through lane and one right turn lane.

**Southbound Approach:** (Hollyville Road) Existing one through lane, proposed one left turn lane and one through lane.

**2. Hollyville Road / Zoar Road (Sussex Road 48) / Harmons Hill Road (Sussex Road 302)**

**Type of Control:** Existing all-way stop-controlled intersection (four-legged)

**Eastbound Approach:** (Zoar Road) Existing one shared left turn/through/right turn lane.

**Westbound Approach:** (Harmons Hill Road) Existing one shared left turn/through/right turn lane.

**Northbound Approach:** (Hollyville Road) Existing one shared left turn/through/right turn lane.

**Southbound Approach:** (Hollyville Road) Existing one shared left turn/through/right turn lane.

**3. Hollyville Road / Hurdle Ditch Road (Sussex Road 290)**

**Type of Control:** Existing two-way stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Hurdle Ditch Road) Existing one shared left turn/right turn lane, stop-controlled.

**Northbound Approach:** (Hollyville Road) Existing one shared left turn/through lane.

**Southbound Approach:** (Hollyville Road) Existing one shared through/right turn lane.

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

**Existing transit service:** Per DelDOT Gateway, Delaware Transit Corporation (DTC) currently does not provide transit service within the study area.

**Planned transit service:** Per email correspondence on July 1, 2021 with Mr. Jared Kauffman, Planner for DART, transit improvements are not being requested in the area at this time.

**Existing bicycle and pedestrian facilities:** According to DelDOT's Sussex County Bicycle Map, a Connector Bicycle Route exists within the study area. The Connector Bicycle Route exists along Hollyville Road, and it traverses through 3 study intersections (Site Entrance, Zoar Road/Harmons Hill Road, and Hurdle Ditch Road).

**Planned bicycle and pedestrian facilities:** Per email correspondence dated July 1, 2021, from Ms. Linda Osiecki, DelDOT's Pedestrian Coordinator, and email correspondence dated July 2, 2021, 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 4. Per the DelDOT SUP/Sidewalk Policy a non-motorized facility is not required unless the site generates over 2,000-trips or there is an existing facility adjacent to the site. If the facility is required, it would be recommended that a 10-foot wide shared-use path be installed with angled terminations into the shoulder and shared-use path extended to both property lines.
- If the SUP is required, at least one internal connection of a sidewalk or shared use path from the shared-use path along Hollyville Road.
- Per the Development Coordination Manual (DCM) the site shall dedicate right-of-way per the roadway classification and establish a 15' wide permanent easement along the property frontage.
- 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.
- Construct frontage SUP with angled terminations and pedestrian access into the site as shown on the plans.
- A bicycle/pedestrian crossing of the Hollyville Road intersection with Zoar Road/Harmons Hill Road should be provided from the proposed SUP along the eastern side of Hollyville Road. The crossing should include marked crosswalks and receiving curb ramps at full SUP width.
- A SUP connection along the southern side of Hollyville Road should be provided between the proposed SUPs for this site and the Fairmont site. If the connection is not provided, marked crosswalks and receiving curb ramps at full SUP width should be provided at the Hollyville Road intersection with Hurdle Ditch Road.

**Bicycle Level of Traffic Stress in Delaware:** Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity

of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the map on the DelDOT Gateway.

- Hollyville Road – LTS: 4

### **Crash Evaluation**

Per the crash data included in the TOA from March 3, 2018 to March 3, 2021 and provided by the Delaware Crash Analysis Reporting System, a total of eight crashes were reported in the area of the Hollyville Road/Hurdle Ditch Road intersection. Of the eight crashes reported, five were single vehicle incidents, two were rear end collisions, and one was a sideswipe crash. Three of the crashes resulted in injuries.

A total of 14 crashes were reported in the area of the Hollyville Road/Zoar Road/Harmons Hill Road intersection. Of the 14 crashes reported, six were single vehicle incidents, five were rear end collisions, one was a front-to-front collision, one was an angle crash, and one was other/unknown. Two of the crashes resulted in injuries and no fatalities were reported within the study area.

### **Previous Comments**

All comments made during the Preliminary TOA (PTOA) were addressed in the Final TOA (FTOA).

**General HCS Analysis Comments**

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

1. JMT and the TOA utilized version 7.9.5 of HCS7.
2. Due to a lack of heavy vehicle count data and per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in all cases, whereas the TOA utilized various heavy vehicle percentages.
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. A heavy vehicle percentage of 3% was utilized for movements entering and exiting the proposed site.
4. Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for the Case 1 scenario and a future PHF for Cases 2 and 3 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. The TOA utilized existing PHF for all cases.

Table 2  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for Turnberry (f.k.a. Unity Branch)  
Report Dated May 28, 2021  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) <sup>1</sup>	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Site Entrance /Hollyville Road (Sussex Road 48)				
2027 with Development (Case 3) <sup>2</sup>				
Westbound Site Entrance Approach	B (13.8)	B (12.8)	B (13.0)	B (13.2)
Southbound Hollyville Road Left Turn	A (8.1)	A (8.1)	A (8.0)	A (8.1)

Table 2 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for Turnberry (f.k.a. Unity Branch)  
Report Dated: May 28, 2021  
Prepared by The Traffic Group, Inc.

Roundabout <sup>1</sup>	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Site Entrance /Hollyville Road (Sussex Road 48) <sup>3</sup>				
2027 with Development (Case 3)				
Westbound Site Entrance Approach	-	-	A (4.9)	A (4.1)
Northbound Hollyville Road Approach	-	-	A (4.9)	A (5.1)
Southbound Hollyville Road Approach	-	-	A (4.6)	A (5.3)
Overall	-	-	A (4.8)	A (5.1)

<sup>1</sup> For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The TOA utilized a PHF of 0.80 during the AM peak hour, whereas JMT utilized a PHF of 0.88 per DelDOT's *Development Coordination Manual*.

<sup>3</sup> Per request from DelDOT, JMT performed an additional analysis of the intersection as a single lane roundabout.



Table 3  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for Turnberry (f.k.a. Unity Branch)  
Report Dated: May 28, 2021  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection All-Way Stop Control <sup>1</sup>	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Hollyville Road/Zoar Road (Sussex Road 48)/Harmons Hill Road (Sussex Road 302)</b>				
2021 Existing (Case 1)				
Eastbound Zoar Road Approach	B (10.4)	B (10.1)	B (10.4)	B (10.2)
Westbound Harmons Hill Road Approach	A (9.3)	A (8.7)	A (9.4)	A (8.8)
Northbound Hollyville Road Approach	A (9.6)	A (8.9)	A (9.7)	A (9.0)
Southbound Hollyville Road Approach	A (9.9)	A (9.3)	A (9.9)	A (9.3)
Overall	A (9.9)	A (9.5)	A (9.9)	A (9.5)
2027 without Development (Case 2)				
Eastbound Zoar Road Approach	B (12.8)	B (13.7)	B (12.1)	B (13.8)
Westbound Harmons Hill Road Approach	B (12.0)	B (10.5)	B (11.5)	B (10.7)
Northbound Hollyville Road Approach	B (11.9)	B (11.1)	B (11.3)	B (11.2)
Southbound Hollyville Road Approach	B (13.3)	B (12.1)	B (12.4)	B (12.2)
Overall	B (12.6)	B (12.2)	B (11.9)	B (12.3)

Table 3 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for Turnberry (f.k.a. Unity Branch)  
Report Dated: May 28, 2021  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection All-Way Stop Control <sup>1</sup>	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Hollyville Road/Zoar Road (Sussex Road 48)/Harmon Hill Road (Sussex Road 302)</b>				
2027 with Development (Case 3)				
Eastbound Zoar Road Approach	B (13.7)	C (15.5)	B (12.9)	C (15.7)
Westbound Harmons Hill Road Approach	B (12.6)	B (11.2)	B (12.1)	B (11.3)
Northbound Hollyville Road Approach	B (12.7)	B (12.4)	B (12.0)	B (12.6)
Southbound Hollyville Road Approach	C (15.8)	B (13.7)	B (14.3)	C (13.8)
Overall	B (14.0)	B (13.7)	B (13.0)	B (13.8)

Table 3 (continued)  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for Turnberry (f.k.a. Unity Branch)  
Report Dated: May 28, 2021  
Prepared by The Traffic Group, Inc.

Roundabout <sup>1</sup>	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Hollyville Road/Zoar Road (Sussex Road 48)/Harmon Hill Road (Sussex Road 302)<sup>4</sup></b>				
2027 with Development (Case 3)				
Eastbound Zoar Road Approach			A (5.8)	A (6.6)
Westbound Harmons Hill Road Approach	-	-	A (5.8)	A (5.3)
Northbound Hollyville Road Approach	-	-	A (5.4)	A (6.3)
Southbound Hollyville Road Approach	-	-	A (6.4)	A (5.7)
Overall	-	-	A (5.9)	A (6.0)

<sup>4</sup> JMT performed an additional analysis of the intersection as a single lane roundabout.

Table 4  
Peak Hour Levels Of Service (LOS)  
Based on Traffic Operational Analysis for Turnberry (f.k.a. Unity Branch)  
Report Dated: May 28, 2021  
Prepared by The Traffic Group, Inc.

Unsignalized Intersection Two-way Stop Control (T-Intersection) <sup>1,5</sup>	LOS per TOA		LOS per JMT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>Hollyville Road /Hurdle Ditch Road (Sussex Road 290)</b>				
2021 Existing (Case 1)				
Northbound Hollyville Road Left Turn	A (7.6)	A (7.7)	A (7.6)	A (7.8)
Eastbound Hurdle Ditch Road Approach	A (9.7)	A (9.9)	A (9.7)	A (9.9)
2027 without Development (Case 2)				
Northbound Hollyville Road Left Turn	A (7.8)	A (8.0)	A (7.8)	A (7.9)
Eastbound Hurdle Ditch Road Approach	B (10.3)	B (11.5)	B (10.3)	B (11.1)
2027 with Development (Case 3)				
Northbound Hollyville Road Left Turn	A (7.8)	A (8.1)	A (7.9)	A (8.1)
Eastbound Hurdle Ditch Road Approach	B (10.6)	B (11.8)	B (10.7)	B (11.9)

<sup>5</sup> Due to a lack of recent count data and per DelDOT's *Development Coordination Manual*, both the TOA and the TIS utilized a PHF for all cases 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.