



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

NICOLE MAJESKI  
SECRETARY

April 15, 2022

Mr. Alan Decktor  
Pennoni Associates, Inc.  
18072 Davidson Drive  
Milton, DE 19968

Dear Mr. Decktor,

The enclosed Traffic Impact Study (TIS) review letter for the **Draper Farm** (Tax Parcels: 5-16-18200-01-1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, and 2100) 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 DeIDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DeIDOT 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. John Stamato, Ribera Development, LLC  
Mr. Mark Davidson, Pennoni Associates, Inc.  
Ms. Teresa Lord, Pennoni Associates, Inc.  
Mr. Rob Pierce, Planning and Economic Activities Coordinator, City of  
Milford  
Mr. Andrew Parker, McCormick & Taylor, Inc.  
DeIDOT Distribution

## DelDOT Distribution

Brad Eaby, Deputy Attorney General  
Shanté Hastings, Deputy Secretary / Director, Transportation Solutions (DOTS)  
Pamela Steinebach, Director, Planning  
Mark Luszcz, Deputy Director, DOTS  
Todd Sammons, Assistant Director, Development Coordination  
T. William Brockenbrough, Jr., County Coordinator, Development Coordination  
Wendy Polasko, Subdivision Engineer, Development Coordination  
Peter Haag, Chief Traffic Engineer, Traffic, DOTS  
Matthew Lichtenstein, Central District Engineer, Central District  
Erin Osborne, Central District Public Works Manager, Central District  
Jared Kaufmann, Service Development Planner, Delaware Transit Corporation  
Tremica Cherry, Service Development Planner, Delaware Transit Corporation  
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Olayiwola Okesola, Kent County Review Coordinator, Development Coordination  
Mark Galipo, Traffic Engineer, Traffic, DOTS  
Joshua Schwartz, Subdivision Manager, Development Coordination  
Annamaria Fumato, Project Engineer, Development Coordination



April 14, 2022

Mr. Claudy Joinville  
Project Engineer  
DelDOT Division of Planning  
P.O. Box 778  
Dover, DE 19903

RE: Agreement No. 1946F  
Traffic Impact Study Services  
**Task No. 3A Subtask 02A – Draper Farm**

Dear Mr. Joinville:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Draper Farm residential development prepared by Pennoni Associates, Inc. dated December 2021. Pennoni prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Draper Farm residential development, proposed to be located on the north side of Williamsville Road (Kent Road 443), west of Delaware Route 14 in the City of Milford, Kent County, Delaware. The proposed development would consist of 182 single-family detached houses and 158 low-rise multi-family housing units. One full-access driveway is proposed on Williamsville Road. Construction is expected to be complete by 2027.

The subject land is located on an approximately 133.00-acre assemblage of parcels. The land is currently zoned R-2 (Residential). The developer is seeking a Planned Unit development (PUD) overlay.

Currently, there is one active DelDOT capital project within the area of study: *HEP KC, US 113 and SR 14 Intersection Improvements* (State Project No. T201904201). This project involves the signalized intersection of US Route 113 (Dupont Boulevard) and Delaware Route 14 (N. Front Street / Milford Harrington Highway). Currently, there is a single left turn lane, a shared through-left turn lane, a dedicated through lane, and a channelized right turn lane on the eastbound Milford Harrington Highway approach. There is a single left turn lane, a shared through-left turn lane, and a channelized right turn lane on the westbound N. Front Street approach. Dupont Boulevard features dual left turn lanes, two through lanes, and a channelized right-turn lane. The project will add a dedicated through lane on the westbound N. Front Street approach via road widening, concrete islands at all corners of the intersection, pedestrian crosswalks, a westbound bicycle lane, and updated traffic signal equipment. The project is currently in the design and planning phase, with advanced utility work expected to start in Spring 2022. Construction is expected to begin in late 2022 and be completed by the end of 2023.



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:

<i>Intersection</i>	<i>Existing Traffic Control</i>	<i>Situations for which deficiencies occur</i>
DE Route 14 and Williamsville Road	Unsignalized	2027 with development PM (Case 3)
US Route 113 and DE Route 14	Signalized	2021 existing Saturday (Case 1); 2027 without development PM and Saturday (Case 2) 2027 with development PM and Saturday (Case 3)

DE Route 14 and Williamsville Road

This existing unsignalized intersection experiences LOS deficiencies during the weekday afternoon peak hour at the northbound Williamsville Road approach during the future with development scenario. Because this intersection already has separate turn lanes on each approach, thus ruling out relatively simple geometric modifications to alleviate the deficiency, we recommend that a traffic signal be constructed at this intersection when warranted. To that end, the developer should enter into a traffic signal agreement with DelDOT for this intersection. A contribution to DelDOT’s Traffic Signal Revolving Fund (TSRF) is an option in that regard, in which case the amount of the contribution would be determined through coordination with DelDOT’s Development Coordination Section.

US Route 113 and Delaware Route 14

This existing signalized intersection experiences LOS deficiencies during the Saturday mid-day peak hour during existing conditions and during both the weekday PM and Saturday peak hours during all future conditions without improvements. It is noted that this intersection will soon be improved by DelDOT’s HEP KC, US 113 and SR 14 Intersection Improvements Project, which will help to alleviate the LOS deficiencies. The developer should provide an equitable share contribution toward that project as stated below in Item No. 4.

Should the City of Milford choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer shall improve the State-maintained road(s) on which they front (Williamsville Road), within the limits of their frontage, to meet DelDOT’s standards for their Functional Classification as found in Section 1.1 of the Development Coordination Manual and elsewhere therein. The improvements shall include both directions of travel, regardless of whether the developer’s lands are on one or both sides of the road. Frontage is defined in Section 1 of the Development Coordination Manual, which states “This length includes the length of roadway perpendicular to lines created by the projection of

the outside parcel corners to the roadway.” Questions on or appeals of this requirement should be directed to the DelDOT Subdivision Review Coordinator in whose area the development is located.

2. The developer should construct the full-movement site access on Williamsville Road. The proposed configuration is shown in the table below.

<b>Approach</b>	<b>Existing Configuration</b>	<b>Proposed Configuration</b>
Eastbound Williamsville Road	One through lane	One left-turn lane and one through lane
Westbound Williamsville Road	One through lane	One through lane and one right-turn lane
Southbound Site Access	Approach does not exist	One shared left/right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT’s Development Coordination Section to determine final turn-lane lengths and other design details during the site plan review.

<b>Approach</b>	<b>Left-Turn Lane</b>	<b>Right-Turn Lane</b>
Eastbound Williamsville Road	95 feet *	N/A
Westbound Williamsville Road	N/A	145 feet *
Southbound Site Access	N/A	N/A

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

3. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Delaware Route 14 and Williamsville Road. A signal may be constructed there when warranted as determined by DelDOT. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT’s discretion. A contribution to DelDOT’s Traffic Signal Revolving Fund (TSRF) is also an option.
4. The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT’s HEP KC, US 113 and SR 14 Intersection Improvements Project. The amount of the contribution should be determined through coordination with DelDOT’s Development Coordination Section.

5. The following bicycle and pedestrian improvements should be included:
  - a. Per the DeIDOT 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. If clubhouses or other community facilities are constructed within the site, bicycle parking should be provided near building entrances. Where building architecture provides for an awning, other overhang, or indoor parking, the bicycle parking should be covered.
  - e. A minimum 15-foot wide permanent easement from the edge of the right-of-way should be dedicated to DeIDOT within the site frontage along Williamsville Road.
  - f. Within the easement along the Williamsville Road site frontage, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards 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 eastern and western property boundaries, the shared-use path should connect to the adjacent property or to the shoulder in accordance with DeIDOT's *Shared-Use Path and/or Sidewalk Termination Reference Guide* dated August 1, 2018. The developer shall coordinate with DeIDOT'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 both boundaries of the property.
  - g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
  - h. 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 Williamsville Road.
  - i. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.



Improvements in this TIS may be considered “significant” under DelDOT’s *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT’s website at [http://deldot.gov/Publications/manuals/de\\_mutcd/index.shtml](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](mailto:ajparker@mccormicktaylor.com) if you have any questions concerning this review.

Sincerely,

**McCormick Taylor, Inc.**

A handwritten signature in black ink, appearing to read "Andrew J. Parker".

Andrew J. Parker, PE, PTOE  
Project Manager

Enclosure

## **General Information**

**Report date:** December 2021

**Prepared by:** Pennoni Associates, Inc.

**Prepared for:** Ribera Development, LLC

**Tax parcels:** 5-16-182.00-01-11.00, 5-16-182.00-01-12.00, 5-16-182.00-01-13.00, 5-16-182.00-01-14.00, 5-16-182.00-01-15.00, 5-16-182.00-01-16.00, 5-16-182.00-01-17.00, 5-16-182.00-01-18.00, 5-16-182.00-01-19.00, 5-16-182.00-01-20.00, 5-16-182.00-01-21.00

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

## **Project Description and Background**

**Description:** The proposed Draper Farms development consists of 182 single-family detached houses and 158 low-rise multi-family housing units.

**Location:** The land is located on the north side of Williamsville Road (Kent Road 443), west of DE Route 14 in the City of Milford, Kent County, Delaware. A site location map is included on page 7.

**Amount of land to be developed:** approximately 133.00-acre assemblage of parcels

**Land use approval(s) needed:** Subdivision approval. The land is currently zoned R-2 (Residential). The developer is seeking a Planned Unit development (PUD) overlay.

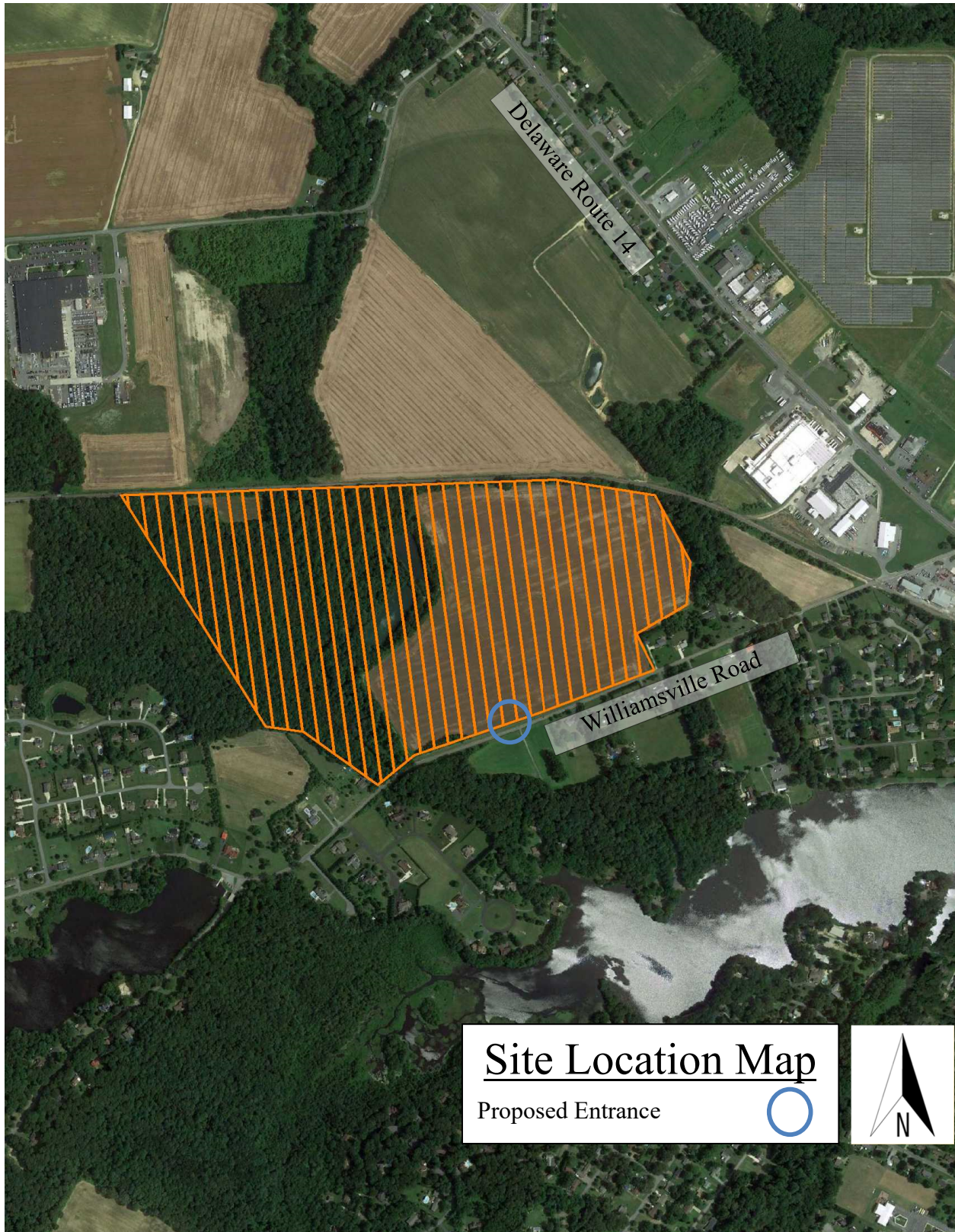
**Proposed completion year:** 2027

**Proposed access locations:** One full-access driveway is proposed on Williamsville Road

**Daily Traffic Volumes (per DelDOT Traffic Summary 2019):**

- 2019 Average Annual Daily Traffic on Williamsville Road: 2,242 vehicles/day





## Site Location Map

Proposed Entrance



## **2020 Delaware Strategies for State Policies and Spending**

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

The majority of the proposed Draper Farm development is located within Investment Levels 1 and 2. A small portion of the property is located within Investment Level 3 area.

#### *Investment Level 1*

Investment Level 1 Areas are often municipalities, towns, or urban/urbanizing places in counties. Density is generally higher than in the surrounding areas. There are a variety of transportation opportunities available. Buildings may have mixed uses, such as a business on the first floor and apartments above.

In Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote a variety of transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Overall, it is the State's intent to use its spending and management tools to maintain and enhance community character, to promote well-designed and efficient new growth, and to facilitate redevelopment in Investment Level 1 Areas. These areas would be a prime location for designating "pre-permitted areas" to help steer development where the local government and citizens are most prepared to accept it.

#### *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 Draper Farms Development project consists of 185 single-family detached houses and 158 low-rise multi-family housing units developed in an Investment Level 1 and 2 area. Investment Levels 1 and 2 both support the development of residential growth with infrastructure and essential neighborhood services. Both Investment levels encourage a broad mix of housing options. However, a small part of the property is in Investment Level 3 area. Further discussion may be required to determine if the proposed development complies with the Strategies.

**Comprehensive Plan**

**Kent County Comprehensive Plan:**

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

The Kent County Comprehensive Plan Future Land Use Map indicates that the proposed Draper Farms development is in the City of Milford, a municipality. Kent County strongly favors directing development to municipalities that desire it. The specific permitted uses and densities governing new construction within an incorporated municipality will continue to be governed by that municipality’s zoning ordinance, its public water and sewer capacities, and its comprehensive planning policies.

**City of Milford Comprehensive Plan:**

*(Source: City of Milford Comprehensive Plan, 2018 Update, Certified May 2018)*

The City of Milford’s Comprehensive Plan Future Land Use Map indicates that the proposed Draper Farms site is planned for “Low Density Residential” land use. The Low Density Residential District represents typical single-family detached dwellings and duplex development. These units receive full urban services. Other dwelling types may be allowed as part of a density bonus by providing additional open space and amenities of development or through a conditional use of a Planned Unit Development by Milford City Council. Neighborhood commercial and office-type uses that do not detract from the residential character of the area may be found in this area as well.

**Proposed Development’s Compatibility with Comprehensive Plan:**

The proposed Draper Farms residential development project includes 182 single family detached houses and 158 low-rise multi-family housing units on an approximately 133.00-acre assemblage of parcels. The land is currently zoned as R-2 (Residential) which corresponds to the “Low Density Residential” future land use designation per the 2018 update to the 2008 City of Milford Comprehensive Plan. The Low Density Residential District is described above. It would appear that the proposed Draper Farms residential development fits within the intended land use for this location.

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

Currently, there is one active DelDOT capital project within the area of study: *HEP KC, US 113 and SR 14 Intersection Improvements* (State Project No. T201904201). This project involves the signalized intersection of US Route 113 (Dupont Boulevard) and Delaware Route 14 (N. Front Street / Milford Harrington Highway). Currently, there is a single left turn lane, a shared through-left turn lane, a dedicated through lane, and a channelized right turn lane on the eastbound Milford Harrington Highway approach. There is a single left turn lane, a shared through-left turn lane, and a channelized right turn lane on the westbound N. Front Street approach. Dupont Boulevard features dual left turn lanes, two through lanes, and a channelized right-turn lane. The project will add a dedicated through lane on the westbound N. Front Street approach via road widening, concrete islands at all corners of the intersection, pedestrian crosswalks, a westbound bicycle lane, and updated traffic signal equipment. The project is currently in the design and planning phase, with advanced utility work expected to start in Spring 2022. Construction is expected to begin in late 2022 and be completed by the end of 2023.

**Trip Generation**

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Tenth 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:

- 182 Single-family Detached Housing Units (ITE Land Use Code 210)
- 158 Multi-family Housing (Low-Rise) Units (ITE Land Use Code 220)

Table 1  
DRAPER FARMS PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
LUC 210: 182 Single Family Detached Housing	33	101	134	114	67	181	92	79	171
LUC 220: 158 Multi-Family Housing (Low-Rise)	17	57	74	56	33	89	60	51	111
<b>TOTAL TRIPS</b>	<b>50</b>	<b>158</b>	<b>208</b>	<b>170</b>	<b>100</b>	<b>270</b>	<b>152</b>	<b>130</b>	<b>282</b>

**Overview of TIS**

**Intersections examined:**

- 1) Williamsville Road (KR 443) and Proposed Site Access
- 2) DE Route 14 and DE Route 15 / Holly Hill Road (KR 447)
- 3) DE Route 14 and Williamsville Road (KR 443)
- 4) US Route 113 and DE Route 14
- 5) Williamsville Road (KR 443) and N. Shore Drive (KR 456)

**Conditions examined:**

- 1) 2021 Existing (Case 1)
- 2) 2027 No-Build (Case 2)
- 3) 2027 Build (Case 3)

**Peak hours evaluated:** Weekday morning and evening and Saturday mid-day peak hours

**Committed developments considered:**

- 1) Hickory Glen (159 townhouse units and 240 multi-family units)
- 2) Dogwood Meadows (137 single-family detached housing)
- 3) Southfield (100 single-family detached housing)

**Intersection Descriptions**

**1) Site Entrance & Williamsville Road**

**Type of Control:** proposed minor stop-controlled T-intersection

**Southbound Approach:** (Site Entrance) proposed one shared left/right-turn lane, stop-controlled

**Eastbound Approach:** (Williamsville Road) proposed left-turn lane and through lane

**Westbound Approach:** (Williamsville Road) proposed right-turn lane, bike lane, and through lane

**2) DE Route 14 and DE Route 15 / Holly Hill Road (KR 447)**

**Type of Control:** 4-legged signalized intersection

**Northbound Approach:** (Holly Hill Road) one left turn lane and one shared through/right-turn lane

**Southbound Approach:** (DE 15) one left turn lane, one through lane, one right-turn lane

**Westbound Approach:** (DE 14) one left-turn lane, one through lane, one right-turn lane

**Eastbound Approach:** (DE 14) left-turn lane, shared through/right-turn lane, one bicycle lane

**3) DE Route 14 and Williamsville Road (KR 443)**

**Type of Control:** minor stop-controlled T-intersection

**Northbound Approach:** (Williamsville Road) one left-turn lane and one right turn lane.

**Westbound Approach:** (DE 14) one left-turn lane and one through lane

**Eastbound Approach:** (DE 14) one through lane and one right turn lane

**4) US Route 113 and DE Route 14**

**Type of Control:** 4-legged signalized intersection

**Northbound Approach:** (US 113) two left-turn lanes, two through lanes, and one channelized right-turn lane.

**Southbound Approach:** (US 113) two left-turn lanes, two through lanes, and one channelized right-turn lane.

**Westbound Approach:** (DE 14) one left-turn lane, one shared left-turn/through lane, and one channelized right-turn lane.

**Eastbound Approach:** (DE 14) one left-turn lane, one shared left-turn/through lane, one through lane, and one channelized right-turn lane.

**5) Williamsville Road (KR 443) and N. Shore Drive (KR 456)**

**Type of Control:** minor stop-controlled T-intersection

**Northbound Approach:** (N. Shore Drive) one shared left-turn/right-turn lane

**Westbound Approach:** (Williamsville Road) one shared through/right-turn lane

**Eastbound Approach:** (Williamsville Road) one shared through/right-turn lane

**Safety Evaluation**

**Crash Data:** Delaware Crash Analysis Reporting System (CARS) data was provided in Appendix E of the TIS for the period from January 1, 2017 through September 2, 2021. The crash data shows that a significant number of crashes occurred at the intersection of DE Route 14 and DE Route 15 / Holly Hill Road and the intersection of US 113 and DE Route 14. 43 intersection crashes occurred at DE Route 14 and DE Route 15 / Holly Hill Road, accounting for 25% of all crashes within the study limits. Of those 43 crashes, 16 were rear-end crashes and 13 were angle crashes (17% and 36%, respectively). The intersection of US 113 and DE Route 14 accounted for 69% of all crashes within the intersection. Of those 120 crashes, 74 were rear-end crashes, 20 were angle crashes, and 20 were sideswipe crashes. It is noted that the DelDOT Project “*HEP KC, US 113 & SR 14 Intersection Improvements*” is set to address deficiencies at the intersection of US 113 and DE Route 14.

**Sight Distance:** The proposed site access on Williamsville Road has an unobstructed view looking from the proposed southbound driveway approach with no visual obstructions in either direction. As always adequacy of available sight distance must be confirmed during the site plan review process for all proposed movements at the site access.

**Transit, Pedestrian, and Bicycle Facilities**

**Existing transit service:** Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates one bus route that travels through the study area (Intercounty Bus Route 210, located approximately 1,500 feet north of DE Route 14 and runs along US Route 113).

**Planned transit service:** Based on coordination with DTC representatives, there are no requests for transit-related improvements or facilities associated with the proposed development.

**Existing bicycle and pedestrian facilities:** There are no existing pedestrian facilities throughout most of the study intersections. There are limited sidewalks at the northwest and southeast quadrants of the intersection of US 113 and DE Route 14. Bicycles are permitted to utilize the shoulder along DE Route 14. DE Route 14 is designated as a regional bike route, and DE Route 15 and Williamsville Road are both designated as a connector bike routes on the *Kent County Bicycle Map* published by DelDOT.

**Planned bicycle and pedestrian facilities:** Through coordination with DelDOT, additional pedestrian and bicycle facilities are being proposed at the intersection of US 113 and DE Route 14 via DelDOT Project “*HEP KC, US 113 & SR 14 Intersection Improvements*”. The proposed Draper Farms Development is located within the Investment Level 1 area of the State Strategies and Spending Map. Due to its investment level, a 10’ shared-use path is proposed along the site frontage of Williamsville Road. Furthermore, a bike lane should be installed between the through lane and the proposed right-turn lane into the development.

### **Previous Comments**

In a review letter dated November 5, 2021, the traffic counts used for the Draper Farms development were accepted but the trip distribution and assignment at the intersection of US Route 113 and DE Route 14 needed to be revised. Those concerns appear to have been addressed and accepted per a response letter dated December 15, 2021.

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 Pennoni Associates and McCormick Taylor utilized Highway Capacity Software (HCS) version 7.8.5 to complete the traffic analyses.
- 2) For two-way stop control intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized and all-way stop control intersections, the TIS and McCormick Taylor applied HV by lane group using existing data. The TIS and McCormick Taylor generally assumed future HV to be the same as existing HV at all intersections. Both the TIS and McCormick Taylor assumed 3% HV for future movements to and from the proposed site access points (as per DelDOT’s Development Coordination Manual section 2.2.8.11.6.H).
- 3) For existing conditions, the TIS and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts that were available. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F where applicable.
- 4) For analyses of all intersections, McCormick Taylor and the TIS assumed 2% grade for all movements.

Table 2  
Peak Hour Levels of Service (LOS)  
Based on Draper Farms Traffic Impact Study – December 2021  
Prepared by Pennoni Associates, Inc.

Unsignalized Intersection <sup>1</sup> One-Way Stop (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Williamsville Road &amp; Site Access</b>						
2027 Build Condition (Case 3)						
Site Access	B (11.6)	B (12.9)	-	B (11.6)	B (12.9)	-
Northbound Williamsville Road - Lefts	A (7.5)	A (8.2)	-	A (7.5)	A (8.2)	-

<sup>1</sup> 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 Draper Farms Traffic Impact Study – December 2021  
Prepared by Pennoni Associates, Inc.

Signalized Intersection <sup>2</sup>	LOS per TIS		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
<b>DE Route 14 &amp; DE Route 15 / Holly Hill Road</b>				
2021 Existing Condition (Case 1)	C (23.9)	C (22.7)	B (16.2)	B (16.8)
2027 No Build Condition (Case 2)	C (29.4)	C (25.5)	B (19.8)	B (19.4)
2027 Build Condition (Case 3)	C (29.7)	C (26.5)	B (20.0-)	C (20.2)

<sup>2</sup> 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 Draper Farms Traffic Impact Study – December 2021  
Prepared by Pennoni Associates, Inc.

Unsignalized Intersection <sup>3</sup> One-Way Stop (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>DE Route 14 &amp; Williamsville Road</b>						
2021 Existing Condition (Case 1)						
Westbound DE Route 14 – Lefts	A (9.0)	A (9.0)	-	A (9.0)	A (9.0)	-
Northbound Williamsville Road	C (15.8)	C (20.7)	-	C (15.8)	C (20.7)	-
2027 No Build Condition (Case 2)						
Westbound DE Route 14 – Lefts	A (9.6)	A (9.4)	-	A (9.6)	A (9.4)	-
Northbound Williamsville Road	C (20.1)	D (33.7)	-	C (20.1)	D (33.7)	-
2027 Build Condition (Case 3)						
Westbound DE Route 14 – Lefts	A (9.9)	B (10.4)	-	A (9.9)	B (10.4)	-
Northbound Williamsville Road	D (30.3)	F (104.6)	-	D (30.3)	F (104.6)	-
Signalized Intersection	LOS per TIS			LOS per McCormick Taylor		
<b>DE Route 14 &amp; Williamsville Road</b>	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
2027 No Build Condition (Case 2) w/ Signal	A (9.1)	A (9.1)	-	A (9.3)	A (9.1)	-
2027 Build Condition (Case 3) w/ Signal	B (13.0)	B (12.1)	-	B (13.5)	B (12.2)	-

<sup>3</sup> 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 5  
Peak Hour Levels of Service (LOS)  
Based on Draper Farms Traffic Impact Study – December 2021  
Prepared by Pennoni Associates, Inc.

Signalized Intersection <sup>4</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>US Route 113 &amp; DE Route 14</b>						
2021 Existing Condition (Case 1)	C (34.2)	D (46.2)	F (103.6)	C (33.0)	D (45.2)	F (81.0)
2027 No Build Condition (Case 2)	D (35.7)	E (61.3)	F (139.2)	D (37.7)	E (57.5)	F (107.2)
2027 No Build Condition (Case 2) w/ DelDOT Project Improvements	D (36.4)	D (47.7)	F (115.2)	D (35.4)	D (43.9)	F (81.8)
2027 Build Condition (Case 3)	D (44.6)	E (71.9)	F (152.9)	D (39.8)	E (66.8)	F (117.3)
2027 Build Condition (Case 3) w/ DelDOT Project Improvements	D (39.1)	D (52.6)	F (125.3)	D (39.5)	D (47.7)	F (87.5)

<sup>4</sup> 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 6  
Peak Hour Levels of Service (LOS)  
Based on Draper Farms Traffic Impact Study – December 2021  
Prepared by Pennoni Associates, Inc.

Unsignalized Intersection <sup>5</sup> One-Way Stop (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
<b>Williamsville Road &amp; N. Shore Drive</b>						
2021 Existing Condition (Case 1)						
Westbound N. Shore Drive	A (9.1)	A (9.8)	-	A (9.1)	A (9.8)	-
Southbound Williamsville Road - Lefts	A (7.5)	A (7.5)	-	A (7.5)	A (7.5)	-
2027 No Build Condition (Case 2)						
Westbound N. Shore Drive	A (9.2)	A (9.9)	-	A (9.2)	A (9.9)	-
Southbound Williamsville Road - Lefts	A (7.5)	A (7.5)	-	A (7.5)	A (7.5)	-
2027 Build Condition (Case 3)						
Westbound N. Shore Drive	B (10.1)	B (11.3)	-	B (10.1)	B (11.3)	-
Southbound Williamsville Road - Lefts	A (7.9)	A (7.7)	-	A (7.9)	A (7.7)	-

<sup>5</sup> 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.