



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

JENNIFER COHAN  
SECRETARY

August 8, 2018

Mr. Christopher Duke  
Becker Morgan Associates, Inc.  
250 South Main Street  
Newark, DE 19711

Dear Mr. Duke:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Royal Farms #337 – Selbyville** (Tax Parcels 533-16.00-42.00, 50.00, 50.01, 50.02 & 51.00) 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 review letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel  
Project Engineer

TEB:km

Enclosures

cc with enclosures: Mr. J. Michael Riemann, Becker Morgan Group, Inc.  
Ms. Constance C. Holland, Office of State Planning Coordination  
Ms. Stacey Long, Town Manager, Town of Selbyville  
Mr. Andrew Parker, McCormick Taylor, Inc.  
DelDOT Distribution

## DelDOT Distribution

Brad Eaby, Deputy Attorney General  
Robert McCleary, Director, Transportation Solutions (DOTS)  
Drew Boyce, Director, Planning  
Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS  
Michael Simmons, Assistant Director, Project Development South, DOTS  
J. Marc Coté, Assistant Director, Development Coordination  
T. William Brockenbrough, Jr., County Coordinator, Development Coordination  
Peter Håag, Traffic Studies Manager, Traffic, DOTS  
Alastair Probert, South District Engineer, South District  
Gemez Norwood, South District Public Works Manager, South District  
Jay Sammons, South District Permit Supervisor, South District  
Steve Sisson, Sussex Subdivision Coordinator, Development Coordination  
David Dooley, Service Development Planner, Delaware Transit Corporation  
Mark Galipo, Traffic Engineer, Traffic, DOTS  
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Claudy Joinville, Project Engineer, Development Coordination  
Kevin Hickman, Johnson, Mirmiran & Thompson, Inc.



August 7, 2018

Mr. Troy E. Brestel  
Project Engineer  
DelDOT Division of Planning  
P.O. Box 778  
Dover, DE 19903

RE: Agreement No. 1773  
Traffic Impact Study Services  
**Task No. 1A Subtask 12A – Royal Farms 337 Selbyville**

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Royal Farms 337 Selbyville prepared by Becker Morgan Group, Inc. dated July 2018. Becker Morgan Group prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a Royal Farms convenience store, proposed to be located on the southwest corner of US Route 113 (DuPont Boulevard / Sussex Road 113) and Delaware Route 54 (Cemetery Road / Sussex Road 377), within the Town of Selbyville in Sussex County, Delaware. The proposed development would consist of a 5,371 square-foot Royal Farms convenience store with 22 fueling stations on a 16.3 acre assemblage of parcels. Two access points are proposed; one full-movement access along Delaware Route 54 and one right-in/right-out access along southbound US Route 113.

The land is currently zoned GC (General Commercial) within the Town of Selbyville, and the developer seeks to develop under the existing zoning.

DelDOT currently has two projects within the study area. The Corridor Capacity Preservation Program (CCPP) is a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 113, are able to efficiently carry regional traffic without impedance from the effects of local development. As the Royal Farms development does not propose any new traffic signals, and site access along US Route 113 is limited to one right-in/right-out driveway, the proposed development appears to be compatible with the CCPP.

The second project is the US 113 North / South Study, which aims to make various improvements throughout the US Route 113 corridor from the Maryland state line in Selbyville to Delaware Route 1, north of Milford. This proposed Royal Farms site is within the Millsboro-South area of the project, which involves widening US Route 113 to include three through lanes in the Millsboro area (approximately 8 miles north of Selbyville), modifying/removing several

unsignalized crossovers from Millsboro to Selbyville (none near the proposed Royal Farms site), and providing a two-lane connector road north of Millsboro from US Route 113 to Delaware Route 24 to bypass downtown Millsboro.

Regarding the US Route 113 speed limit, when this TIS was scoped and prepared, the speed limit of southbound US Route 113 transitioned from 55 mph to 50 mph at the intersection with Delaware Route 54, and the first “50 MPH” speed limit signs were located within the proposed Royal Farms site frontage. The developer and the Town of Selbyville desired to move the speed limit transition further north so it would occur prior to the Delaware Route 54 intersection. The developer prepared a speed study and the Town of Selbyville requested the speed limit change from DelDOT. Based on the provided information and additional coordination, DelDOT authorized a speed restriction resolution (SSC 42-18) dated July 12, 2018 that set the US Route 113 speed limit at 50 mph in both directions from the Maryland state line (south end of Selbyville) to a point 1,150 feet north of Delaware Route 54.

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

All existing intersections within the study area exhibit adequate level of service (LOS), so physical roadway and/or traffic control improvements to address any such deficiencies are not necessary. However, a number of items are recommended to accommodate site entrances, to satisfy requirements of DelDOT’s *Development Coordination Manual*, and to address bicycle and pedestrian needs.

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

1. The developer should improve Delaware Route 54 along the site frontage as needed in order to meet DelDOT’s major collector road standards. These standards include but are not limited to twelve-foot travel lanes and eight-foot shoulders. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT’s discretion. DelDOT should analyze the existing lanes’ pavement section and recommend an overlay thickness to the developer's engineer if necessary.

2. The developer should construct Site Access A on Delaware Route 54. The proposed configuration is shown in the table below.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Northbound Site Access A	Does not exist	One shared left/through/right-turn lane
Southbound Mumford (business) access	One shared left/right-turn lane	One shared left/through/right-turn lane
Eastbound Delaware Route 54	One shared left-turn/through lane	One shared left-turn/through lane and one right-turn lane
Westbound Delaware Route 54	One shared through/right-turn lane	One left-turn lane and one shared through/right-turn lane

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

<b>Approach</b>	<b>Left-Turn Lane</b>	<b>Right-Turn Lane</b>
Northbound Site Access A	N/A	N/A
Southbound Mumford (business) access	N/A	N/A
Eastbound Delaware Route 54	N/A	110 feet *
Westbound Delaware Route 54	95 feet *	N/A

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

3. The developer should construct Site Access B on US Route 113. The proposed configuration is shown in the table below.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Southbound US Route 113	One exclusive through lane and one shared through/right-turn lane	Two through lanes and one right-turn lane
Eastbound Site Access B	One right-turn lane (Sandy Branch office driveway)	One 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 during the site plan review process.

<b>Approach</b>	<b>Left-Turn Lane</b>	<b>Right-Turn Lane</b>
Southbound US Route 113	N/A	305 feet *
Eastbound Site Access B	N/A	N/A

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

It is noted that due to the distance between the location of the Site Access B on US Route 113 and the signalized intersection at Delaware Route 54, the developer has requested a 30-foot reduction from the recommended southbound right-turn lane length. DelDOT preliminarily agreed to this reduction provided that the speed limit was set at 50 miles per hour along the entire site frontage of US Route 113. By way of the speed restriction resolution (SSC 42-18) authorized by DelDOT on July 12, 2018, that has now occurred.

4. The following bicycle and pedestrian improvements should be included:
  - a. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane on eastbound Delaware Route 54 at the proposed site entrance.
  - b. Adjacent to the proposed right-turn lane on eastbound Delaware Route 54 at the proposed site entrance, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.
  - c. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.
  - d. Utility covers should be made flush with the pavement.
  - e. A minimum 15-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along US Route 113 and Delaware Route 54.
  - f. Within the easements along US Route 113 and Delaware Route 54, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed along each site frontage. Each shared-use path should have a minimum of a five-foot buffer from the roadway. Each shared-use path should connect to the shoulder in accordance with DelDOT’s *Shared Use Path and/or Sidewalk Termination Policy* dated June 19, 2014. The developer should coordinate with DelDOT’s Development Coordination Section to determine exact locations and details of the shared-use path connections at the property boundaries.
  - g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings within the development. 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. These internal sidewalks should connect to the frontage shared-use paths.
- 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, P.E., PTOE  
Project Manager

Enclosure

**General Information**

**Report date:** July 2018

**Prepared by:** Becker Morgan Group, Inc.

**Prepared for:** Two Farms, Inc.

**Tax parcel:** 533-16.00-42.00, 50.00, 50.01, 50.02, 51.00

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

**Project Description and Background**

**Description:** The proposed development would consist of a 5,371 square-foot Royal Farms convenience store with 22 fueling stations.

**Location:** The Royal Farms is proposed to be located on the southwest corner of US Route 113 (DuPont Boulevard / Sussex Road 113) and Delaware Route 54 (Cemetery Road / Sussex Road 377), within the Town of Selbyville in Sussex County, Delaware. A site location map and concept plan are included on pages 7 and 8.

**Amount of land to be developed:** approximately 16.3 acre assemblage of parcels

**Land use approval(s) needed:** Subdivision approval. The land is currently zoned GC (General Commercial) within the Town of Selbyville, and the developer seeks to develop under the existing zoning.

**Proposed completion date:** 2020

**Proposed access locations:** Two access points are proposed; one full-movement access along Delaware Route 54 and one right-in/right-out access along southbound US Route 113.

**Daily Traffic Volumes (per DelDOT Traffic Summary 2017):**

- 2017 Average Annual Daily Traffic on US Route 113: 19,677 vpd
- 2017 Average Annual Daily Traffic on Delaware Route 54: 1,245 vpd





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

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

The proposed Royal Farms is located within Investment Level 2.

Investment Level 2 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 state's more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity.

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

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

The proposed Royal Farms is comprised of a 5,371 square-foot convenience store with 22 fueling stations and is located within an Investment Level 2 area. Investment Level 2 reflects areas where growth is anticipated by local, county, and State plans in the near term future. As such, the proposed development generally appears to comply with the guidelines of Investment Level 2 areas as described in the 2015 "Strategies for State Policies and Spending."

## **Comprehensive Plan**

### **Sussex County Comprehensive Plan:**

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

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed Royal Farms is in the Town of Selbyville, a municipality. Sussex 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.

**Town of Selbyville Comprehensive Plan:**

*(Source: Town of Selbyville Comprehensive Plan, September 2007)*

The Town of Selbyville's Comprehensive Plan Future Land Use Map indicates that the proposed Royal Farms site is planned for "Shopping, Business or Trade" land use. It would appear that the proposed convenience store with gas pumps fits within the intended land use for this location.

The Town of Selbyville zoning map shows that the proposed development will be located on lands currently zoned GC (General Commercial). Based on the Town of Selbyville Code of Ordinances §200-83 and 84, the purpose of this district is to provide sufficient space in appropriate locations for a wide variety of commercial and miscellaneous service activities generally serving a wide area and located particularly along certain existing major thoroughfares where a general mixture of commercial and service activity now exists. Filling stations and general retail, as would be characterized by the proposed Royal Farms, are permitted uses.

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

The proposed development appears to comply with the Town of Selbyville's Comprehensive Plan. The Royal Farms is proposed on land that is planned for shopping, business or trade use, and the land is currently zoned GC (General Commercial). The proposed commercial facility generally aligns with both the Future Land Use Map and the existing zoning.

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

DelDOT currently has two projects within the study area. The Corridor Capacity Preservation Program (CCPP) is a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 113, are able to efficiently carry regional traffic without impedance from the effects of local development. As the Royal Farms development does not propose any new traffic signals, and site access along US Route 113 is limited to one right-in/right-out driveway, the proposed development appears to be compatible with the CCPP.

The second project is the US 113 North / South Study, which aims to make various improvements throughout the US Route 113 corridor from the Maryland state line in Selbyville to Delaware Route 1, north of Milford. This proposed Royal Farms site is within the Millsboro-South area of the project, which involves widening US Route 113 to include three through lanes in the Millsboro area (approximately 8 miles north of Selbyville), modifying/removing several unsignalized crossovers from Millsboro to Selbyville (none near the proposed Royal Farms site), and providing a two-lane connector road north of Millsboro from US Route 113 to Delaware Route 24 to bypass downtown Millsboro.

**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 uses were utilized to estimate the amount of new traffic generated for this development:

- 5,371 sf convenience market with 22 fueling stations (Super Convenience Market/Gas Station - ITE Land Use Code 960)

Table 1  
ROYAL FARMS PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			SAT Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Royal Farms (5,371 sf / 22 f.p.)	203	203	406	186	187	373	179	179	358
Pass-By Trips	-128	-128	-256	-64	-64	-128	-61	-61	-122
<b>TOTAL "NEW" TRIPS</b>	<b>75</b>	<b>75</b>	<b>150</b>	<b>123</b>	<b>123</b>	<b>246</b>	<b>118</b>	<b>118</b>	<b>236</b>

Table 2  
ROYAL FARMS DAILY TRIP GENERATION

Land Use	Weekday Daily			Saturday Daily		
	In	Out	Total	In	Out	Total
Royal Farms (5,371 sf / 22 f.p.)	2249	2249	4498	1880	1880	3760
<b>TOTAL TRIPS</b>	<b>2249</b>	<b>2249</b>	<b>4498</b>	<b>1880</b>	<b>1880</b>	<b>3760</b>

**Overview of TIS**

**Intersections examined:**

- 1) Delaware Route 54 & Proposed Site Access A
- 2) US Route 113 & Proposed Site Access B
- 3) US Route 113 & Delaware Route 54

**Conditions examined:**

- 1) 2018 existing conditions (case 1)
- 2) 2020 without Royal Farms (case 2)
- 3) 2020 with Royal Farms (case 3)

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

**Committed developments considered:** None

### **Intersection Descriptions**

**1) Delaware Route 54 & Proposed Site Access A**

**Type of Control:** existing one-way stop (T-intersection), proposed two-way stop (four-leg intersection)

**Northbound approach:** (proposed Site Access A) proposed one shared left/through/right-turn lane, stop controlled

**Southbound approach:** (Mumford Sheet Metal Access) existing one shared left/right-turn lane; proposed one shared left/through/right-turn lane (note the Mumford access is approximately 600 feet long and uncontrolled, with vehicles entering and exiting the property at various points along the frontage)

**Eastbound approach:** (Delaware Route 54) existing one shared through/left-turn lane; proposed one shared through/left-turn lane and one right-turn lane

**Westbound approach:** (Delaware Route 54) existing one shared through/right-turn lane; proposed one left-turn lane and one shared through/right-turn lane

**2) US Route 113 & Proposed Site Access B**

**Type of Control:** existing one-way stop (right-in/right-out driveway); proposed one-way stop (right-in/right-out driveway)

**Southbound approach:** (US Route 113) existing one exclusive through lane and one shared through/right-turn lane; proposed two through lanes and one right-turn lane

**Eastbound approach:** (existing Sandy Branch office building driveway, proposed Site Access B) existing one right-turn lane, stop controlled; proposed one right-turn lane, stop controlled

**3) US Route 113 & Delaware Route 54**

**Type of Control:** signalized four-leg intersection

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

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

**Eastbound approach:** (Delaware Route 54) one shared through/left-turn lane and one channelized right-turn lane

**Westbound approach:** (Delaware Route 54) one shared through/left-turn lane and one channelized right-turn lane

### **Safety Evaluation**

**Crash Data:** McCormick Taylor reviewed the Delaware Crash Analysis Reporting System (CARS) data that was provided in Appendix F of the TIS. The data includes reportable crashes that occurred within a one-tenth mile radius of the intersection of US Route 113 & Delaware Route 54 from March 13, 2015 through March 13, 2018.

Of particular concern for safety evaluations are fatal crashes and crashes involving pedestrians or pedalcyclists. During the study period, no fatal crashes were reported and no crashes involved pedestrians or pedalcyclists. One crash involved a motorcycle. A breakdown of all crashes is provided below.

At the intersection of US Route 113 & Delaware Route 54, there was a total of 22 crashes. Of the 22 crashes, 8 (36%) resulted in personal injury. None of the crashes involved a pedestrian or a pedalcyclist. There were no alcohol related crashes. The types of crashes were front to rear (55%), angle (32%), not a collision between two vehicles (9%), and other (5%). 82% of the crashes occurred during daylight hours. The crashes occurred on a variety of surface conditions, including dry (82%), wet (14%), and mud/gravel (5%). The most common primary contributing circumstances included driver inattention, distraction, or fatigue (36%), disregard traffic signal (18%), following too close (18%), and deer in roadway (9%).

**Sight Distance:** No significant sight distance issues have been reported or indicated by crash data. The study area generally consists of straight and flat roadways and, and there are few potential sight distance obstructions. No significant issues were noted during field observations.

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

**Existing transit service:** Becker Morgan Group contacted David Dooley, a Senior Planner with the Delaware Transit Corporation (DTC) to determine existing and planned transit services near the proposed development. DTC does not currently serve this immediate area and has no plans for future service at the site.

**Planned transit service:** Based on coordination with DTC representatives, there are currently no plans to provide transit service to the proposed development. DTC requested sidewalks along the site frontages to create an easier retrofit for transit facilities should transit service ever come to this area in the future.

**Existing bicycle and pedestrian facilities:** According to the Sussex County bicycle map, Delaware Route 54 is classified as a “regional bicycle route”. Delaware Route 54 does not have any bike lanes west of US Route 113, and it does have a bike lane for a short distance in the eastbound direction east of US Route 113. US Route 113 itself is an undesignated road, in terms of bicycling routes, and it does not have any bike lanes in this area.

There are few existing pedestrian facilities throughout the study area. There are no marked crosswalks, curb ramps, or pedestrian signals at the intersection of US Route 113 & Delaware Route 54. There are no sidewalks along the site frontage of the future Royal Farms site. There is a sidewalk along the site frontages of the existing Rite-Aid store on the southwest corner of US Route 113 & Delaware Route 54, but that sidewalk does not connect to the intersection.

**Planned bicycle and pedestrian facilities:** Becker Morgan Group contacted a representative of DelDOT’s Local Systems Planning Section to determine pedestrian and bicycle accommodations for the proposed development. Anthony Aglio requested bike lanes on the Delaware Route 54

site frontage and a shared-use path on both the US Route 113 and Delaware Route 54 site frontages.

### **Previous Comments**

All comments from DelDOT's scoping letter, traffic count review and other correspondence appear to be addressed in the final TIS submission, although it does not appear that the TIS contacted DelDOT's Project Managers regarding the two DelDOT Projects identified in the scoping letter.

### **General HCS Analysis Comments**

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

- 1) For unsignalized intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized 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 point (as per DelDOT's Development Coordination Manual).
- 2) For existing conditions, the TIS and McCormick Taylor determined and utilized overall intersection peak hour factors (PHF). For future conditions, the TIS and McCormick Taylor generally assumed existing PHF or 0.92 (whichever was higher) for all intersections other than the proposed site entrances. At the site entrances, future PHF were based on the DelDOT Development Coordination Manual.
- 3) For analyses of all intersections, the TIS and McCormick Taylor used a base saturation flow rate of 1,750 pc/hr/ln per DelDOT's Development Coordination Manual.
- 4) The TIS and McCormick Taylor used different cycle lengths and/or signal timing parameters when analyzing the signalized intersections in some cases.
- 5) At the intersection of US Route 113 and Delaware Route 54, both the TIS and McCormick Taylor input existing right turn on red (RTOR) volumes for existing and future conditions.
- 6) Both the TIS and McCormick Taylor used the most recent version of Highway Capacity Software (HCS7).

Table 3  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Royal Farms 337 Selbyville  
Report dated July 2018  
Prepared by Becker Morgan Group, Inc.

Unsignalized Intersection <sup>1</sup> Two-Way Stop Control	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>1) Delaware Route 54 &amp; Proposed Site Access A</b>						
2018 existing (Case 1)						
Southbound Mumford (business) access	A (9.8)	A (9.0)	A (5.0)	A (9.8)	A (9.0)	A (0.0)
Eastbound Delaware Route 54 – Left	A (7.4)	A (7.5)	A (7.4)	A (7.4)	A (7.5)	A (7.4)
2020 without Royal Farms (Case 2)						
Southbound Mumford (business) access	A (9.9)	A (9.1)	A (5.0)	A (9.9)	A (9.1)	A (0.0)
Eastbound Delaware Route 54 – Left	A (7.4)	A (7.6)	A (7.4)	A (7.4)	A (7.5)	A (7.4)
2020 with Royal Farms (Case 3)						
Northbound Site Access A	B (10.8)	B (10.3)	A (9.7)	B (10.8)	B (10.3)	A (9.7)
Southbound Mumford (business) access	C (15.5)	A (9.0)	A (5.0)	C (15.5)	A (9.0)	A (0.0)
Eastbound Delaware Route 54 – Left	A (7.4)	A (7.5)	A (7.3)	A (7.4)	A (7.5)	A (7.3)
Westbound Delaware Route 54 – Left	A (7.9)	A (7.7)	A (7.6)	A (7.9)	A (7.7)	A (7.6)

<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 4  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Royal Farms 337 Selbyville  
Report dated July 2018  
Prepared by Becker Morgan Group, Inc.

Unsignalized Intersection <sup>2</sup> One-Way Stop Control (Right-in/Right-Out)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>2) US Route 113 &amp; Proposed Site Access B</b>						
2018 existing (Case 1)						
Eastbound office driveway – Right	B (11.5)	B (11.1)	B (13.7)	B (11.5)	B (11.1)	B (13.6)
2020 without Royal Farms (Case 2)						
Eastbound office driveway – Right	B (11.5)	B (11.2)	B (13.9)	B (11.5)	B (11.2)	B (13.7)
2020 with Royal Farms (Case 3)						
Eastbound Site Access B – Right	B (12.5)	B (11.8)	C (15.3)	B (12.5)	B (11.8)	C (15.3)

<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 5  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Royal Farms 337 Selbyville  
Report dated July 2018  
Prepared by Becker Morgan Group, Inc.

Signalized Intersection <sup>3</sup>	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
<b>3) US Route 113 &amp; Delaware Route 54</b>						
2018 existing (Case 1)	C (25.7)	C (26.7)	C (23.7)	B (15.8)	B (16.9)	B (15.3)
2020 without Royal Farms (Case 2)	C (25.7)	C (27.0)	C (25.2)	B (15.8)	B (17.1)	B (15.6)
2020 with Royal Farms (Case 3)	C (32.3)	C (31.9)	C (31.7)	C (20.2)	C (20.3)	B (19.5)

<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.