



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

August 20, 2012

SHAILEN P. BHATT  
SECRETARY

Mr. D.J. Hughes  
Davis, Bowen & Friedel, Inc.  
Milford Office  
23 North Walnut Street  
Milford, DE 19963

Dear Mr. Hughes:

The enclosed Traffic Impact Study (TIS) review letter for the **Hammond Property** commercial 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 Standards and Regulations for Subdivision Streets and State Highway Access 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:bs

Enclosures

cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination  
Mr. Richard Carmean, City Manager, City of Milford  
Mr. Mir Wahed, Johnson, Mirmiran, and Thompson  
DelDOT Distribution

## DelDOT Distribution

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Thomas Greve, Central District Engineer, Central District  
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Lisa Collins, Service Development Planner, Delaware Transit Corporation  
J. Marc Coté, Subdivision Engineer, Development Coordination  
T. William Brockenbrough, Jr., County Coordinator, Development Coordination  
Todd J. Sammons, Kent County Subdivision Manager, Development Coordination  
Marco Boyce, Planning Supervisor, Statewide & Regional Planning  
W. Paul Hogge, Project Engineer, Development Coordination



August 17, 2012

Mr. T. William Brockenbrough, P.E.  
County Coordinator  
DelDOT Division of Planning  
P O Box 778  
Dover, DE 19903

RE: Agreement No. 2048  
Traffic Impact Study Services  
**Task 7A-Hammond Property**

Dear Mr. Brockenbrough:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for the Hammond Property commercial development, prepared by Davis, Bowen & Friedel, Inc. dated November 2011. This review was assigned Task Number 7A. Davis, Bowen & Friedel, Inc. (DBF) prepared the report in a manner generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*.

The TIS evaluates the impacts of the proposed redevelopment of the Hammond Property located on the northwest corner of the US Route 113 (Kent Road 8) and Delaware Route 14 (Kent Road 36) intersection in the City of Milford. A vacant car dealership exists on the site with one access point along US Route 113 and two access points along Delaware Route 14. As submitted, the TIS states that the vacant car dealership would be removed and a 5,125 square foot Royal Farms with 16 fueling stations and a 1,408 square foot automated car wash would be constructed. However, an updated project scope now proposes the construction of a 13,225 square foot CVS pharmacy with drive-through window and a potential 3,563 square foot drive-in bank instead of the Royal Farms development. Although the proposed land use has changed, a revised TIS has not been required or provided since the TIS with the Royal Farms would contain a more conservative analysis. This is due to the Royal Farms having a higher trip generation than what is proposed as part of the new project scope. As a result, all analysis and queue length references contained within this review letter are based on the TIS for the previously proposed Royal Farms development.

The subject property is an approximately 2.69-acre parcel that is zoned C-3 (Commercial Highway) and the proposed redevelopment will be under the same zoning. Access would be provided via one right-in/right-out driveway along US Route 113 and one full-access driveway along Delaware Route 14. Construction is anticipated to be completed in 2012.

DelDOT currently has one relevant project within the study area, the US 113 North/South Study. The purpose of this study is to identify an alignment for a continuous limited access roadway from Delaware Route 1 north of Milford to the Delaware/Maryland state line. The study also identifies improvements to major east/west routes accessed from US Route 113. DelDOT and the Federal Highway Administration (FHWA) have divided the US 113 North/South Study into four



geographic areas. The four study areas include the Milford/Lincoln Area, the Ellendale Area, the Georgetown Area, and the Millsboro-South Area.

DelDOT formed a working group for the Milford/Lincoln Area of the US 113 North/South Study and reviewed several alternatives for bypasses around the Milford/Lincoln area as well as an on-alignment option for US Route 113. However, community consensus could not be reached and DelDOT stopped pursuing the US 113 North/South Study in the Milford/Lincoln Area in January 2008. While the US 113 North/South Study moves forward in the Ellendale, Georgetown, and Millsboro-South areas, no progress has been made in the Milford Area since July 2007 and no work is currently underway in the Milford/Lincoln area. For additional information regarding the US 113 North/South Study, please see the project website at <http://www.deldot.gov/information/projects/us113/index.shtml>

DelDOT's 2008 Hazard Elimination Program (HEP, f.k.a. HSIP) included two Task I reports, Site M and Site T, that were within the project area. Site M is a 0.29 mile section of Delaware Route 14 from US Route 113 to 0.20 miles west of Maple Avenue. The Site M report included a crash summary as well as a review of the signalized intersection of US Route 113 with Delaware Route 14. The suggested improvements within the Site M report includes replacing the northbound and southbound US Route 113 left-turn red circular signal heads with red left-turn arrow signal heads (this improvement was completed in September 2008); installing a 'No Merge Area' sign along with a yield line along the eastbound Delaware Route 14 right-turn lane, installing 'Signal Ahead' warning signs along the southbound, eastbound, and westbound approaches to the intersection; and restriping faded pavement markings.

Site T is a 0.69 mile section of US Route 113 from 0.19 miles south of Delaware Route 14 to 0.10 miles south of Rogers Drive. The Site T report included a crash summary and a review of the railroad crossing south of the US Route 113 and Delaware Route 14 intersection. The suggested improvement within the Site T report includes pavement restriping and the removal of the 'End 40 mph' sign along southbound US Route 113 south of Delaware Route 14.

Both the Site M and Site T reports recommended that additional studies be conducted at the US Route 113 and Delaware Route 14 intersection to evaluate the lane configurations and signal phasing currently being implemented. As a result, a Site M/T Task II Report, which is included in DelDOT's 2008 HEP, was completed to determine the benefits of revising the signal operation and/or lane configurations at the US Route 113 and Delaware Route 14 intersection. The Site M/T report also identified improvements at the railroad crossing south of the intersection.

The suggested improvements within the Site M/T report include installing a separate left turn lane, two through lanes, and a right turn lane along the eastbound Delaware Route 14 approach, installing a separate left turn lane, two through lanes, and a right turn lane along the westbound Delaware Route 14 approach, and implementing protected-only concurrent left turn phasing along the eastbound and westbound approaches. The recommended improvements also include installing signalized pedestrian crossing and converting the existing span wire signals to a box span traffic signal. The report states that three developments (Homestead, Wexford which is



formerly known as Bennett's Ridge and the Draper Property) will be responsible for part of these improvements. However, as of now all three developments are inactive.

The Site M/T report also suggested improvements along US Route 113 due to the railroad crossing south of the Delaware Route 14 intersection. These improvements include adding automatic gates, replacing the rail crossing surface, upgrading the rail preemption devices/operation at the US Route 113 and Delaware Route 14 intersection, and ensuring the signing and pavement markings at the crossing comply with the 2011 Delaware Manual on Uniform Traffic Control Devices (DE MUTCD). DeIDOT is actively pursuing these associated railroad crossing improvements.

It should be noted that contrary to the direction given in the November 12, 2010 scoping letter, the TIS did not analyze the Delaware Route 14 intersections with Masten Circle and Williamsville Road. The trip assignment for the proposed Hammond Property redevelopment revealed minimal impact on those locations. As such, DeIDOT initially allowed those intersections to be removed from the study area.

Based on our review, we have the following comments and recommendations which were established utilizing the results from the Royal Farms analyses but still relevant with the proposed CVS Pharmacy and drive-in bank:

While the intersection of US Route 113 and Delaware Route 14 would operate with acceptable levels of service under all future conditions, the queues along southbound US Route 113 and eastbound Delaware Route 14 would impact operations at the proposed site driveways. The right-in/right-out entrance on southbound US Route 113 is located approximately 160 feet north of the US Route 113/Delaware Route 14 intersection. With the development of the Hammond Property the southbound US Route 113 through queue would be longer than 400 feet during all peak hours. Any motorists who would want to navigate to the southbound US Route 113 left turn lane from the proposed US Route 113 right-in/right out site access would be obstructed by the southbound US Route 113 through queue. As such, a concrete median between the southbound US Route 113 through lanes and left-turn lanes will be required to prevent vehicles exiting the proposed driveway from accessing the left turn lanes.

The proposed full site access on Delaware Route 14 would be located approximately 340 feet west of the US Route 113 and Delaware Route 14 intersection (measured from the stop bar of the signalized intersection to the centerline of the proposed site access). The 95<sup>th</sup> percentile queue lengths for the right turn lane on eastbound Delaware Route 14 will be approximately 365 feet and 300 feet during the AM and PM peak hours, respectively. During the Saturday midday peak hour the 95<sup>th</sup> percentile queue length would be approximately 420 feet. Also, any vehicles turning left from the proposed site entrance potentially have to cross three lanes to access eastbound Delaware Route 14. Allowing left turns out from the Delaware Route 14 site entrance would impede the eastbound Delaware Route 14 traffic and potentially compromise the operation and safety of the intersection. In addition, with the proposed HEP recommended improvements the eastbound left turn queue would be increased due to a change in left turn lane configuration and phasing. Although the proposed full site access along Delaware Route 14



would operate with acceptable levels of service under all future conditions, there are concerns over allowing left turn movements from the access point and the vehicular queue lengths along the eastbound Delaware Route 14 right turn lane.

To address those concerns, it is recommended that an alternative entrance configuration specifically prohibiting left out movements from the Delaware Route 14 site access be designed. If after 3 years of final acceptance of the Delaware Route 14 full site access, the access is identified as a location in DeIDOT's HEP, then the alternative entrance configuration prohibiting left out movements would be installed. If after 3 years the site entrance has not been included as an HEP site, the full access would remain. With the provision of a right-in/right-out/left-in only site entrance, the existing Delaware Route 14 concrete median should be extended another 270 feet along the site frontage to prevent vehicles executing left turns out from the proposed site driveway onto eastbound Delaware Route 14. This alternative design should be included, reviewed and approved by DeIDOT concurrently with the full site access design.

Though we encourage the Hammond Property developer to seek a cross access easement between the Hammond Property and the Milford Square shopping center, we realize obtaining this easement is not at the sole discretion of the Hammond Property developer. However, if the left out movement from the Delaware Route 14 access is eliminated, benefits of this easement would include the ability for any exiting vehicles from the site destined to travel eastbound along Delaware Route 14 to access the Milford Square shopping center via the easement and access the Milford Square shopping center exit points on US Route 113 to make a right out, where the vehicles could then reach the signal at US Route 113 and Delaware Route 14 to make a left turn to continue east. In addition, any vehicles from the Hammond Property destined to travel north on US Route 113 are expected to utilize the signalized intersection of the Milford Square shopping center driveway with US Route 113.

As previously mentioned with regard to the HEP study, DeIDOT is actively pursuing improvements to the railroad grade crossing on northbound US Route 113 south of the US Route 113 and Delaware Route 14 intersection. Due to special requirements of these improvements, which include adding automatic gates, replacing the rail crossing surface, upgrading the rail preemption devices/operation at the US Route 113 and Delaware Route 14 intersection, and ensuring the signing and pavement marking at the crossing comply with the DE MUTCD, we do not recommend the developer be responsible for any part of the railway grade crossing improvements.

Should the City 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 should provide a bituminous concrete overlay to the right turn travel lane/shoulder along the southbound US Route 113 Hammond Property site frontage at DeIDOT's discretion. DeIDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.



2. The developer should provide a bituminous concrete overlay to the existing travel lanes along the Delaware Route 14 Hammond Property site frontage at DeIDOT's discretion. DeIDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.
3. The developer should construct a concrete median designed to prevent vehicles exiting the Hammond Property from making left turns from southbound US Route 113 onto Delaware Route 14. As part of the concrete island installation the developer should provide a bituminous concrete overlay to the existing southbound US Route 113 left turn lanes at DeIDOT's discretion. DeIDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.
4. The developer should construct a right-in/right-out site entrance for the Hammond Property on southbound US Route 113 to be consistent with the proposed lane configurations as shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound Site Approach	Approach does not exist	One right turn lane
Southbound US Route 113	Two through lanes	Two through lanes and one right turn lane

Based on DeIDOT's updated *Standards and Regulations for Subdivision Streets and State Highway Access*, the recommended southbound right turn length (excluding taper) is 240 feet. The storage lengths based on the HCS analysis provide shorter queue lengths than what is reported here.

5. The developer should construct a full site entrance on Delaware Route 14 to be consistent with the proposed lane configurations as shown in the table below.

Approach	Current Configuration	Proposed Configuration
Eastbound Delaware Route 14	One two-way left turn lane and two through lanes	One left turn lane and two through lanes
Westbound Delaware Route 14	One two-way left turn lane and two through lanes	Two through lanes and one right turn lane
Southbound Site Entrance	Approach does not exist	One shared left turn/right turn lane

The recommended minimum storage length (excluding taper) of the separate left turn and right turn lanes are listed below.



Approach	Left Turn Lane	Right Turn Lane
Eastbound Delaware Route 14	120 feet	-
Westbound Delaware Route 14	-	240 feet

The left turn and right turn storage lengths provided here are based on DeIDOT's updated *Standards and Regulations for Subdivision Streets and State Highway Access*. The storage lengths based on the HCS analysis provide shorter queue lengths than these minimum lengths.

The developer should also coordinate with DeIDOT's Traffic Section to determine the provision of advance lane assignment signs along the eastbound Delaware Route 14 approach to US Route 113.

6. If the Delaware Route 14 site entrance is identified for inclusion in an HEP location within 3 years of the entrance's final acceptance then the developer should modify the Delaware Route 14 site entrance as described in Item Number 5 by eliminating the left turn out from the site and by providing a right-in/right-out/left-in configuration (alternate site design) at the Delaware Route 14 site entrance. The developer would be responsible to fund and implement any intersection improvements, including but not limited to alternate design at the Delaware Route 14 site entrance. As part of the alternate design the developer should construct the extension of the existing concrete median from the intersection of US Route 113/Delaware Route 14 to be approximately 470 feet west along Delaware Route 14 to prevent any left turns out from the proposed site frontage onto Delaware Route 14.

This alternative Delaware Route 14 site design should be included, reviewed and approved by DeIDOT concurrently with the full access design.

7. To accommodate the two through lanes along the westbound Delaware Route 14 approach to US Route 113 as recommended within the HEP study, the developer should provide sufficient right-of-way for two westbound receiving lanes across the site frontage. Based on the offsite improvements plan prepared by DBF dated November 16, 2011, it appears that sufficient right-of-way is provided for two westbound receiving lanes along Delaware Route 14.
8. The following bicycle, pedestrian, and transit improvements should be included:
  - a. A minimum ten-foot wide permanent easement from the edge of the right-of-way should be dedicated to DeIDOT within the site frontage along US Route 113 and Delaware Route 14. Within this easement, a five-foot wide sidewalk that meets current AASHTO and ADA standards should be constructed. A five-foot minimum setback should be maintained from the back of curb to the sidewalk.



- b. Where the right turn lane is added on Delaware Route 14 a bicycle lane should also be provided through the right turn lane. A Right Turn Yield to Bikes sign (MUTCD R4-4) should be added at the start of the right turn lane.
- c. Where internal sidewalks are located alongside of parking spaces, a buffer, physical barrier or signage should be added to eliminate vehicular overhang onto the sidewalk.
- d. ADA compliant curb ramps and marked crosswalks should be provided at the site entrance. The use of Type 3 curb ramps is discouraged.
- e. Bicycle Warning signs (W11-1) should be placed on the frontage along Delaware Route 14.
- f. Covered bike parking racks should be provided near the building entrances.
- g. Utility covers should be moved outside of the designated bicycle lane 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 DeIDOT's subdivision review process.

Improvements in this TIS may be considered "significant" under DeIDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DeIDOT's website at [http://www.deldot.gov/information/pubs\\_forms/manuals/de\\_mutcd/index.shtml](http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml). For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DeIDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at [Adam.Weiser@state.de.us](mailto:Adam.Weiser@state.de.us).

Additional details on our review of the TIS 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 'David DuPlessis'.

David DuPlessis, P.E.  
cc: Mir Wahed, P.E., PTOE  
Enclosure

## **General Information**

**Report date:** November, 2011.

**Prepared by:** Davis, Bowen & Friedel, Inc.

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

**Tax Parcels:** MD-16-183.09-01-01.00, 02.00 & 03.00.

**Generally consistent with DelDOT's Standards and Regulations for Subdivision Streets and State Highway Access:** Yes.

## **Project Description and Background**

**Description:** 5,125 square feet Royal Farms with 16 fueling stations and a 1,408 square feet automated car wash.

*Note: The updated project scope now proposes for the construction of a 13,225 square foot CVS pharmacy with drive-through window and a potential 3,563 square foot drive-in bank instead of the Royal Farms development. Although the proposed land use has changed, a revised TIS has not been provided since the TIS with the Royal Farms would contain a more conservative analysis.*

**Location:** The project is proposed on the northwest corner of US Route 113 (Kent Road 8) and Delaware Route 14 (Milford-Harrington Highway/Kent Road 36) in the City of Milford in Kent County.

**Amount of Land to be developed:** Approximately 2.69 acres of land.

**Land Use approval(s) needed:** Commercial.

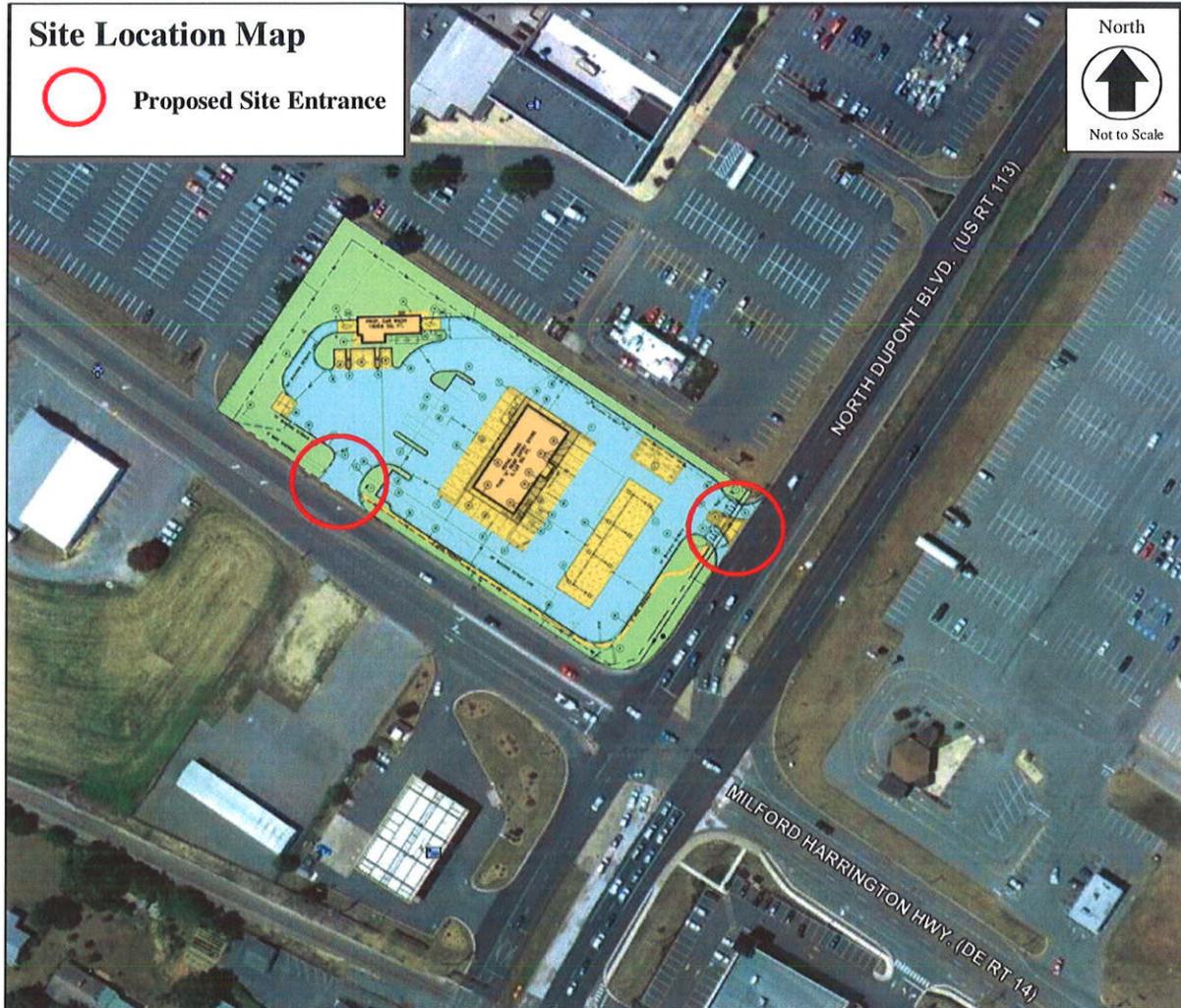
**Proposed completion date:** 2012.

**Proposed access locations:** Two access points are proposed, one right-in/right-out access on US Route 113 and one full access on Delaware Route 14.

### **Daily Traffic Volumes:**

- 2010 Average Annual Daily Traffic on US Route 113 (Kent Road 8): 26,088 vehicles per day.
- 2010 Average Annual Daily Traffic on Delaware Route 14 (Kent Road 36): 13,977 vehicles per day.

**Site Map**



*\*Graphic is an approximation based on the November 2010 Site Plan prepared by Davis, Bowen & Friedel, Inc.*

*\*\* The updated project scope now proposes for the construction of a CVS pharmacy with a drive-through window and a drive-in bank instead of the Royal Farms development. An updated Site Plan is not available at this time. As such, the Site Plan prepared for the previously proposed Royal Farms development is shown above.*

**Relevant and On-going Projects**

DelDOT currently has one relevant project within the study area, the US 113 North/South Study. The purpose of this study is to identify an alignment for a continuous limited access roadway from the vicinity of Delaware Route 1 north of Milford to the Delaware/Maryland state line. The study also identifies improvements to major east/west routes accessed from US Route 113. DelDOT and the Federal Highway Administration (FHWA) have divided the US 113

North/South Study into four geographic areas. The four study areas include the Milford/Lincoln Area, the Ellendale Area, the Georgetown Area, and the Millsboro-South Area.

DelDOT formed a working group for the Milford/Lincoln Area of the US 113 North/South Study and reviewed several alternatives for bypasses around the Milford/Lincoln area as well as an on-alignment option for US Route 113. However, community consensus could not be reached and DelDOT stopped pursuing the US 113 North/South Study in the Milford/Lincoln Area in January 2008. While the US 113 North/South Study moves forward in the Ellendale, Georgetown, and Millsboro-South areas, no progress has been made in the Milford Area since July 2007 and no work is currently underway in the Milford/Lincoln area. For additional information regarding the US 113 North/South Study, please see the project website at <http://www.deldot.gov/information/projects/us113/index.shtml>

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The suggested improvements within the Site M/T report include installing a separate left turn lane, two through lanes, and a right turn lane along the eastbound Delaware Route 14 approach, installing a separate left turn lane, two through lanes, and a right turn lane along the westbound Delaware Route 14 approach, and implementing protected-only concurrent left turn phasing along the eastbound and westbound approaches. The recommended improvements also include installing signalized pedestrian crossing and converting the existing span wire signals to a box span traffic signal. The report states that three developments (Homestead, Wexford which is formerly known as Bennett's Ridge and the Draper Property) will be responsible for part of the

improvements to address future capacity and safety issues. However, as of now all three developments are currently inactive.

The Site M/T report also suggested improvements along US Route 113 due to the railroad crossing south of the Delaware Route 14 intersection. These improvements include adding automatic gates, replacing the rail crossing surface, upgrading the rail preemption devices/operation at the US Route 113 and Delaware Route 14 intersection, and ensuring the signing and pavement markings at the crossing comply with the 2011 Delaware Manual on Uniform Traffic Control Devices (DE MUTCD). DelDOT is actively pursuing these associated railroad crossing improvements.

### **Livable Delaware**

*(Source: Delaware Strategies for State Policies and Spending, 2010)*

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

The proposed development is located within Investment Level 1.

#### **Investment Level 1**

These areas are often municipalities, towns, or urban/urbanizing places in counties where density is generally higher than in surrounding areas. In 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. 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.

In Level 1 Areas the state's first priority will be for preserving existing facilities and making safety improvements. Level 1 areas will also be the highest priority for context sensitive transportation system capacity enhancements, transit-system enhancements, ADA accessibility, and for closing gaps in the pedestrian system. Further, Level 1 areas are the first priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity between neighborhoods and public facilities.

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

The proposed Hammond Property commercial development falls within Investment Level 1 and is to be developed with commercial services relatively consistent with the character of other existing commercial developments in the area. According to Livable Delaware, use of the land located within Investment Level 1 areas includes the retention and expansion of existing businesses, including redevelopment and reuse of underused or abandoned sites. In addition, the land being developed as part of this project is included in the City of Milford's limits, and is being constructed in an area that the City has zoned as Commercial. Therefore, this commercial development appears to be generally consistent with the 2010 update of the Livable Delaware "Strategies for State Policies and Spending."

**Comprehensive Plans**

*(Source: City of Milford, 2008 Comprehensive Plan)*

**City of Milford Comprehensive Plan:**

The proposed commercial development is situated within the City of Milford. This parcel is currently zoned as Highway Commercial (C3), and it will maintain the same zoning classification in the future. This future land use is described as a variety of retail and services including convenience stores and sit-down restaurants.

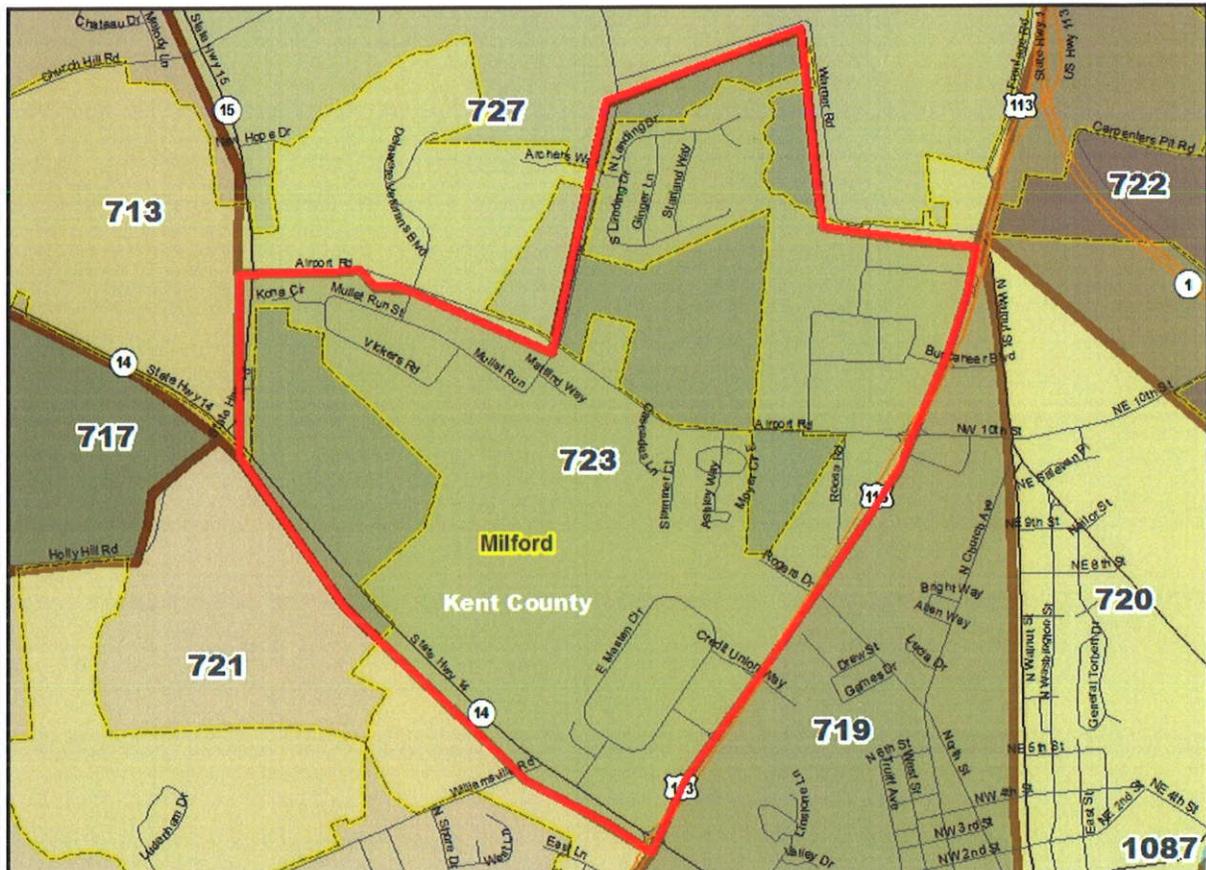
**Proposed Development's Compatibility with the City of Milford Comprehensive Plan:**

The proposed Hammond Property commercial development maintains the same zoning and is generally compatible with the City's Comprehensive Plan, which includes the goal of redeveloping existing under-utilized properties, such as the Hammond Property development. As such, the commercial development is generally compatible with the City of Milford's Comprehensive Plan.

**Transportation Analysis Zones (TAZ)**

Transportation Analysis Zones (TAZ) where development would be located: 723

TAZ Boundaries:



\*Graphic has been taken from the Planning and Development Coordination Application.

\*TAZ723 is referred to as K209 as per Kent County MPO.

**Current employment estimate for TAZ: 1,061 in 2010**

**Future employment estimate for TAZ: 1,475 in 2040**

**Current Population estimate for TAZ: 966 in 2010**

**Future Population estimate for TAZ: 1,292 in 2040**

**Current household estimate for TAZ: 393 in 2010**

**Future household estimate for TAZ: 525 in 2040**

**Relevant committed developments in the TAZ: None.**

**Would the addition of committed developments to current estimates exceed future projections: No.**

**Would the addition of committed developments and the proposed development to current estimates exceed future projections: No.**

**Trip Generation**

As per the TIS, the trip generation for the previously proposed Royal Farms development was determined by using a combination of an article, "Trip-Generation Characteristics for Convenience Stores", in the August 2001 edition of the ITE Journal, and equations contained in the *Trip Generation, 8<sup>th</sup> Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 853 (Convenience Market with Gas Pumps).

For the weekday peak hours, data from the article based on the number of fueling stations was used to project traffic. For the weekday daily, Saturday daily, and Saturday peak hour traffic, the ITE *Trip Generation* report was used. The weekday daily traffic was based on the building area of the convenience store. The Saturday daily and peak hour traffic was based on the number of fueling stations. The peak period trip generations for the Hammond Property commercial development with the previously proposed Royal Farms are included in Table 1.

**Table 1**  
**HAMMOND PROPERTY TRIP GENERATION**

Land Use	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Convenience Market with Gas Pumps	146	146	292	133	132	265	82	78	160
Pass-By	111	111	222	101	101	202	61	61	122
<b>Net New Trips</b>	<b>35</b>	<b>35</b>	<b>70</b>	<b>32</b>	<b>31</b>	<b>63</b>	<b>21</b>	<b>17</b>	<b>38</b>

The updated project scope now proposes for the construction of a 13,225 square foot CVS pharmacy with drive-through window and a potential 3,563 square foot drive-in bank instead of the Royal Farms development. Although the proposed land use has changed, a revised TIS has not been provided since the TIS with the Royal Farms would contain a more conservative analysis. This is due to the Royal Farms having a higher trip generation than what is proposed as part of the new project scope.

The following table depicts a trip generation comparison prepared by DBF for an April 5, 2012 DelDOT meeting. The table shows the difference in trip generation between the previously proposed Royal Farms development and the new project scope that contains a CVS pharmacy with drive-through window and a drive-in bank. Data from the ITE *Trip Generation* report based on ITE Land Use Code 881 (Pharmacy with Drive-Through Window) and ITE Land Use Code 912 (Drive-In Bank) was utilized to develop the weekday and Saturday peak hour traffic based on building area. It should be noted that an internal capture credit was taken into account for the proposed pharmacy and drive-in bank development.

TRIP GENERATION COMPARISON

Land Use	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Convenience Market with Gas Pumps	146	146	292	133	132	265	82	78	160
Pharmacy with Drive-Through and Drive-In Bank	38	27	65	97	96	193	73	70	143
<b>Proposed Trip Reduction*</b>	<b>-108</b>	<b>-119</b>	<b>-227</b>	<b>-36</b>	<b>-36</b>	<b>-72</b>	<b>-9</b>	<b>-8</b>	<b>-17</b>

\* This calculation didn't consider the pass-by trip reduction.

**Overview of TIS**

**Intersections examined:**

1. US Route 113 (Kent Road 8) and Site Entrance
2. Delaware Route 14 (Kent Road 36) and Site Entrance
3. US Route 113 and Delaware Route 14

**Conditions examined:**

1. Case 1 - 2010 Existing conditions
2. Case 2 - 2012 No Build conditions without redevelopment of the Hammond Property
3. Case 3 - 2012 Build conditions with redevelopment of the Hammond Property

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

**Committed Developments considered:**

None.

**Intersection Descriptions**

**1. US Route 113 and Site Entrance (Right-In/Right-Out)**

**Type of Control:** Proposed right-in/right-out only stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Site Entrance) proposed channelized right turn lane

**Southbound Approach:** (US Route 113) proposed one right turn lane and two existing through lanes

**2. Delaware Route 14 and Site Entrance (Proposed Full Access)**

**Type of Control:** proposed stop-controlled intersection (T-intersection)

**Eastbound Approach:** (Delaware Route 14) proposed two-way left turn lane and two existing through lanes

**Westbound Approach:** (Delaware Route 14) proposed two-way left turn lane and a right turn lane, and existing two through lanes

**Southbound Approach:** (Site Entrance) proposed shared left turn/right turn lane

### 3. US Route 113 and Delaware Route 14

**Type of Control:** signalized intersection

**Eastbound Approach:** (Delaware Route 14) one left turn lane, one shared through/left turn lane, one through lane, and one channelized right turn lane

**Westbound Approach:** (Delaware Route 14) one left turn lane, one shared through/left turn lane, and one channelized right turn lane

**Northbound Approach:** (US Route 113) two left turn lanes, two through lanes, one right turn lane

**Southbound Approach:** (US Route 113) two left turn lanes, two through lanes, one right turn lane

### Transit, Pedestrian, and Bicycle Facilities

**Existing transit service:** Existing DART Route 303 currently travels within the Milford area. Route 303 operates between Dover and Georgetown, Monday through Friday from 5:00 a.m. to 8:47 p.m. It currently serves Milford with 10 round trips from the Super Walmart along US Route 113, approximately 1 mile north of the subject site.

**Planned transit service:** JMT and Davis, Bowen & Friedel, Inc. contacted Lisa Collins, Service Development Planner of DTC. In an email dated October 26, 2011, she noted that no additional transit accommodations are necessary within the vicinity of the site since Route 303 serves the project area from the Super Walmart stop.

**Existing bicycle and pedestrian facilities:** According to DelDOT's *Delaware Bicycle Facility Master Plan* (October 2005), Delaware Route 14 is a designated Regional Bicycle Route.

Per the *Kent County Bicycle Map*, the following bicycle routes exist in the vicinity of the site:

- A Statewide Bicycle Route exists approximately 1.5 miles north of the site and can be accessed at the North Walnut Street intersection with US Route 113. This route runs across the state of Delaware beginning at Wilmington and ending at Selbyville.
- A Regional Bicycle Route (K-6) runs along Delaware Route 14 along the southern site frontage of the subject property. This route runs along Delaware Route 14 from the Maryland-Delaware state line to Slaughter Beach via State Route 36 in Sussex County. This route traverses through two of the project's intersections along Delaware Route 14 (the Site Entrance and US Route 113).
- A Recreational Connector Bicycle Route exists approximately 0.2 miles west of the site and can be accessed at the Williamsville Road intersection with Delaware Route 14. This Recreational Connector Bicycle Route begins at Farmington Road and continues on Williamsville Road until it connects with the Regional Bicycle Route at its intersection with Delaware Route 14.
- A Recreational Connector Bicycle Route exists about 1 mile south of the site and can be accessed at the US Route 113 intersection with Lakeview Avenue. This Recreational Connector Bicycle Route begins at Greenhurst Farm Road in Sussex County and runs

along Shawnee Road/Lakeview Avenue/Causey Avenue until its intersection with Walnut Street.

**Planned bicycle and pedestrian facilities:** JMT and Davis, Bowen & Friedel, Inc. contacted Mr. Anthony Aglio, DelDOT's Bicycle Coordinator. In an email dated November 15, 2011, he recommended that a bike lane be provided in front of the proposed Delaware Route 14 site frontage.

### Previous Comments

None.

### General HCS Analysis Comments

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

1. The updated project scope now proposes for the construction of a 13,225 square foot CVS pharmacy with drive-through window and a potential 3,563 square foot drive-in bank instead of the Royal Farms development. Although the proposed land use has changed, a revised TIS has not been provided since the TIS with the Royal Farms would contain a more conservative analysis. As a result, all the analyses within this review letter are based on the TIS for the previously proposed Royal Farms development.
2. Davis, Bowen & Friedel, Inc. performed analyses using HCS2000 Version 4.1f. JMT used HCS+T7F, Version 5.5. As such, some of the results are different between the two analyses.
3. The TIS and JMT both applied the peak hour factors in accordance to the guidelines provided in the *DelDOT Standards and Regulations for Subdivision Streets and State Highway Access*.
4. The *DelDOT Standards and Regulations for Subdivision Streets and State Highway Access* recommends using 3% heavy vehicles for each movement at intersections when there is a significant change in intersection volume. As such, JMT applied changes to the truck percentages when volumes were identified to have a significant increase. When a significant increase was not present, the existing truck percentages were utilized and low existing truck percentages were increased to be a minimum of 3%. The TIS used existing truck percentages based on traffic counts for Cases 1, 2, and 3 at the US Route 113 intersection with Delaware Route 14. The TIS increased any existing low truck percentages at the US Route 113 intersection with Delaware Route 14 to be a minimum of 2%.
5. The TIS and JMT used different signal timing parameters and percent turns using shared lanes when analyzing the US Route 113 signalized intersection with Delaware Route 14. The TIS utilized different percentages for turns using shared lanes. However, JMT

utilized percentages based on observations within the DelDOT 2008 HEP (f.k.a. HSIP) Site M/T Task II Report.

6. The TIS and JMT used Arrival Type 4 along the southbound US Route 113 approach to Delaware Route 14 which DelDOT found acceptable as per their March 11, 2011 correspondence to DBF.
  
7. The *DelDOT Standards and Regulations for Subdivision Streets and State Highway Access* recommends using a base saturation flow rate of 1,750 pcphgpl for signalized intersections south of the Chesapeake and Delaware (C&D) Canal. The TIS and JMT both applied this to the weekday morning and evening peak hour analyses. However, during the summer Saturday analyses both the TIS and JMT applied a 1,900 pcphgpl base saturation flow rate to the northbound and southbound through movements along US Route 113 which DelDOT confirmed to be acceptable. All other approaches still use 1,750 pcphgpl during the Saturday peak hour.

Table 2  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Hammond Property  
Report dated November 2011  
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection <sup>1</sup> Two-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
US Route 113/ Site Entrance						
2012 with Hammond Property (Case 3)						
Eastbound Site Entrance	B (10.4)	B (12.1)	B (13.6)	B (10.4)	B (12.1)	B (13.6)

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

Table 3  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Hammond Property  
Report dated November 2011  
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection <sup>2</sup> Two-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
<b>Delaware Route 14/ Site Entrance<sup>3</sup></b>						
2012 with Hammond Property (Case 3)						
Eastbound Delaware Route 14-Left	A (8.2)	A (8.8)	A (8.4)	A (8.3)	A (8.9)	A (8.4)
Southbound Site Entrance	B (13.4)	B (13.6)	B (12.6)	B (13.7)	B (13.9)	B (12.7)
2012 with Hammond Property (Case 3) with Modified Access <sup>4</sup>						
Eastbound Delaware Route 14-Left	-	-	-	A (8.3)	A (8.9)	A (8.4)
Southbound Site Entrance	-	-	-	A (9.2)	A (9.4)	A (9.0)

<sup>2</sup> For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>3</sup> The TIS and JMT used different signal timing parameters when incorporating the upstream signal information at the Delaware Route 14 unsignalized intersection with the Site Entrance.

<sup>4</sup> The modified access configures the Delaware Route 14 site driveway with right in, right out, and left in movements. The left out movement would be prohibited.

Table 4  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Hammond Property  
Report dated November 2011  
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection <sup>5</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
US Route 113/ Delaware Route 14 <sup>6,7,8</sup>						
2010 Existing (Case 1)	D (38.4)	D (45.4)	D (45.8)	D (36.5)	D (40.5)	D (48.3)
2012 without Hammond Property (Case 2)	D (39.0)	D (47.1)	D (47.5)	D (37.0)	D (42.1)	D (50.4)
2012 without Hammond Property (Case 2) with Timing Modifications <sup>9</sup>	C (28.1)	-	D (45.0)	C (32.5)	D (39.6)	D (48.7)
2012 without Hammond Property (Case 2) with Improvements <sup>10,11</sup>	-	-	D (44.0)	D (35.8)	D (40.6)	D (43.8)
2012 with Hammond Property (Case 3)	D (40.4)	D (49.5)	D (50.5)	D (37.5)	D (42.8)	D (54.7)

<sup>5</sup> For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>6</sup> The TIS used existing heavy vehicle percentages with a minimum of 2%. JMT used heavy vehicle percentages based on DelDOT guidelines.

<sup>7</sup> 120 second cycle length utilized during the AM and PM peak hours and 150 second cycle length utilized during the Saturday peak hour per DelDOT recommendations.

<sup>8</sup> The TIS used right-turn-on-red volumes. JMT did not use right-turn-on-red volumes, rather the movements were modeled as permissive within the signal phasing.

<sup>9</sup> The TIS utilized the optimized cycle lengths of 75 seconds during the AM peak hour and 110 seconds during the Saturday peak hour. The TIS did not provide an optimized cycle length during the PM peak hour that differed from the DelDOT recommended 120 second cycle length. To minimize queue lengths along the eastbound approach, JMT utilized the optimized cycle lengths of 90 seconds during the AM and PM peak hours and 120 seconds during the Saturday peak hour.

<sup>10</sup> The improvements incorporate the recommended HEP modifications of reconfiguring the eastbound Delaware Route 14 approach to provide one left turn lane, two through lanes, and one right turn lane and adjusting the Delaware Route 14 signal phasing to eliminate the eastbound/westbound split phase operation and provide concurrent protected left turn phasing. JMT's analysis incorporated the modification of the westbound Delaware Route 14 approach to provide one left turn lane, two through lanes, and one right turn lane. However, the TIS incorporated the modification of providing one left turn lane, one through lane, and one right turn lane.

<sup>11</sup> The TIS did not provide an AM and PM peak hour analysis that incorporated the HEP improvements since acceptable LOS and queue lengths were reported under the existing lane configurations during Case 2.

Table 4 (Continued)  
PEAK HOUR LEVELS OF SERVICE (LOS)  
Based on Traffic Impact Study for Hammond Property  
Report dated November 2011  
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection <sup>12</sup>	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
US Route 113/ Delaware Route 14 <sup>13,14</sup>						
2012 with Hammond Property (Case 3) with Timing Modifications <sup>15</sup>	C (28.2)	-	D (47.5)	C (33.0)	D (40.8)	D (54.3)
2012 with Hammond Property (Case 3) with Improvements <sup>16</sup>	D (37.0)	D (40.7)	D (50.9)	D (36.0)	D (40.9)	D (44.5)
2012 with Hammond Property (Case 3) with Modified Access <sup>17</sup>	-	-	-	D (37.2)	D (42.7)	D (54.7)
2012 with Hammond Property (Case 3) with Improvements and Modified Access <sup>16,17</sup>	-	-	-	D (35.9)	D (40.9)	D (44.4)

<sup>12</sup> For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>13</sup> The TIS used existing heavy vehicle percentages with a minimum of 2%. JMT used heavy vehicle percentages based on DelDOT guidelines.

<sup>14</sup> The TIS used right-turn-on-red volumes. JMT did not use right-turn-on-red volumes, rather the movements were modeled as permissive within the signal phasing.

<sup>15</sup> The TIS utilized the optimized cycle lengths of 75 seconds during the AM peak hour and 110 seconds during the Saturday peak hour. The TIS did not provide an optimized cycle length during the PM peak hour that differed from the DelDOT recommended 120 second cycle length. To minimize queue lengths along the eastbound approach, JMT utilized the optimized cycle lengths of 90 seconds during the AM and PM peak hours and 120 seconds during the Saturday peak hour.

<sup>16</sup> The improvements incorporate the recommended HEP modifications of reconfiguring the eastbound Delaware Route 14 approach to provide one left turn lane, two through lanes, and one right turn lane and adjusting the Delaware Route 14 signal phasing to eliminate the eastbound/westbound split phase operation and provide concurrent protected left turn phasing. JMT's analysis incorporated the modification of the westbound Delaware Route 14 approach to provide one left turn lane, two through lanes, and one right turn lane. However, the TIS incorporated the modification of providing one left turn lane, one through lane, and one right turn lane.

<sup>17</sup> The modified access configures the Delaware Route 14 site driveway with right in, right out, and left in movements. The left out movement would be prohibited.