



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
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DOVER, DELAWARE 19903

JENNIFER COHAN
SECRETARY

April 2, 2019

Mr. D.J. Hughes
Davis, Bowen & Friedel, Inc.
1 Park Avenue
Milford, DE 19963

Dear Mr. Hughes:

The enclosed Traffic Operational Analysis (TOA) review letter for the proposed **1436 New Burton Road** (Tax Parcel ED-05-085.00-01-07.00) 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 TOA 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. Ring Lardner, Davis, Bowen & Friedel, Inc.
Ms. Constance C. Holland, Office of State Planning Coordination
Mr. David Hugg, City of Dover
Mr. Andrew Parker, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General

Drew Boyce, Director, Planning

Mark Luszc, 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 Haag, Traffic Studies Manager, Traffic, DOTS

Matthew Lichtenstein, Central District Engineer, Central District

Richard McCabe, Central District Public Works Engineer, Central District

Stephen Wright, Kent Subdivision Review Coordinator, Development Coordination

David Dooley, Service Development Planner, Delaware Transit Corporation

Mark Galipo, Traffic Engineer, Traffic, DOTS

Sarah Coakley, Principal Planner, Statewide & Regional Planning

Anthony Aglio, Planning Supervisor, Statewide & Regional Planning

Joshua Schwartz, Kent County Subdivision Reviewer, Development Coordination

Claudy Joinville, Project Engineer, Development Coordination



April 1, 2019

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. 1 Subtask 16 – 1436 New Burton Road

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Operational Analysis (TOA) for the 1436 New Burton Road business park development prepared by Davis, Bowen & Friedel, Inc. (DBF), dated December 2018. DBF prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TOA evaluates the impacts of the proposed 1436 New Burton Road business park. The site is located on the east side of POW-MIA Parkway (Kent Road 151) opposite Wyoming Mill Spur (Kent Road 151B), bounded by the Delmarva Central Railroad to the east, within the City of Dover, Kent County, Delaware.

According to the TOA, the proposed development may consist of 300 multi-family mid-rise units and a 285,000 square-foot business park, although the final land use composition has not yet been determined. For purposes of the TOA analysis, the site was evaluated as a 635,000 square-foot business park without any residential units (most conservative land use in terms of traffic generation).

One access point is proposed: a full-access site driveway is proposed via the addition of a fourth leg to the existing three-leg intersection of POW-MIA Parkway & Wyoming Mill Spur. The TOA notes that access cannot be provided along the New Burton Road side of the development due to the existing Delmarva Central Railroad. By state law, no new at-grade crossings are permitted. Construction of the development is anticipated to be complete by 2022.

The land consists of one 38.8-acre +/- parcel that is currently zoned IPM (Industrial Park Manufacturing) within the City of Dover. No rezoning is needed to permit development as a business park. Rezoning would be needed if the site is to be developed as a mixed-use development with a residential component.



Currently, there are two DelDOT capital projects within the area of study:

- HEP, KC, US 13 Lochmeath Way to Puncheon Run Connector (State Contract No. T201500202)
- HEP, KC, SR 8 & SR 15 Intersection Improvements (State Contract No. T201500201)

The US 13 Lochmeath Way to Puncheon Run Connector project is associated with DelDOT’s Hazard Elimination Program (HEP). This project includes the addition of a third travel lane in each direction of US Route 13 from Lochmeath Way (Kent Road 361) to Puncheon Run Connector, and in a later phase from Walnut Shade Road (Kent Road 30) to Lochmeath Way. The project will require roadway widening, stormwater management facilities, multiple intersection redesigns, traffic signal reconfigurations and multimodal improvements such as shared-use paths and bicycle lanes. It is noted that the project includes the intersection of US Route 13 and POW-MIA Parkway. Construction is anticipated to begin in 2021 and be completed by 2025.

The SR 8 & SR 15 Intersection Improvements project is also associated with DelDOT’s HEP, and it includes the intersection of Delaware Route 8 (Forest Avenue / Kent Road 51) and Delaware Route 15 (Saulsbury Road / Kent Road 156). The project proposes to install an additional through lane and left-turn lane on northbound and southbound Delaware Route 15 at the intersection. Construction is anticipated to begin in 2020 and be completed in 2021.

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>
POW-MIA Parkway and Wyoming Mill Spur / Proposed Site Access	Unsignalized	2022 with development PM (Case 3)

The study intersection (POW-MIA Parkway and Wyoming Mill Spur / Proposed Site Access) as proposed in the TOA exhibits deficiencies in the 2022 weekday PM peak hour with the addition of the 1436 New Burton Road development. In this scenario, under the future land use / projected volumes assumed in the TOA, the westbound site driveway egress would operate at LOS F with a 95th percentile queue of approximately five vehicles (125 feet).

Analysis indicates that exclusive lanes for the westbound site access approach would not sufficiently alleviate the deficiency. Converting the intersection to all-way stop control was also considered, but this type of intersection would result in very poor operations for the higher-volume northbound and southbound POW-MIA Parkway approaches and for the overall intersection (all at LOS F in both AM and PM peak hours, with lengthy northbound and southbound queues).

As detailed in the submitted TOA, a roundabout was not considered viable for the proposed site access intersection. POW-MIA Parkway is presently designed to facilitate a future widening to

two through lanes in each direction in the future. While it would be possible to design a single-lane roundabout that could be modified to a multi-lane roundabout in the future, DelDOT guidance states that multi-lane roadways are currently considered to be inappropriate locations for roundabouts in Delaware.

Given the anticipated LOS deficiencies for the unsignalized condition, a Traffic Signal Justification Study (TSJS) was prepared as part of the 1436 New Burton Road TOA, and it was evaluated as part of this review. This study examined whether a signal should be installed to address the remaining anticipated deficiencies. The signal warrant analysis that was included in the TOA concluded that a signal is not warranted under full build-out conditions. Additionally, signalized analysis indicates acceptable operations of LOS B in both the AM and PM peak hours under full build-out.

Upon review of the TSJS as presented in the TOA, McCormick Taylor found that at least one of the MUTCD signal warrants (Warrant 1, Eight-Hour Vehicular Volume) was extremely close to being satisfied in the full build-out condition. In fact, the projected volumes exceed the minimum volume criteria for seven of the eight required hours. Further, a number of inputs and assumptions used in the TSJS were debatable, to the extent that other justifiable choices for these inputs would have resulted in a different outcome for the signal warrant analysis in the full build-out condition. However, given the assumed yet uncertain land use composition, a signal would not likely come close to being warranted until a large proportion of the development is constructed.

The signal warrants, combined with future intersection performance results, indicate this intersection is a candidate for signalization once most or all of the development has been constructed. The site access should be constructed as an unsignalized intersection in the opening day condition, and operations should be monitored to determine if delays and queues are becoming lengthy enough to trigger re-evaluation of signal warrants based on actual volumes at that time. If, at any point in the future, either DelDOT or the developer is interested in evaluating conditions to determine if construction of a traffic signal is warranted, an updated TSJS should be prepared.

Should the City of Dover 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 construct the full site access on POW-MIA Parkway at Wyoming Mill Spur. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Northbound POW-MIA Parkway	One left-turn lane and one through lane	One left-turn lane, one through lane, and one right-turn lane
Southbound POW-MIA Parkway	One through lane and one right-turn lane	One left-turn lane, one through lane, and one right-turn lane

Eastbound Wyoming Mill Spur	One left-turn lane and one right-turn lane	One shared left-turn/through lane and one right-turn lane
Westbound Site Access	Approach does not exist	One shared left-turn/through lane and one right-turn lane

The developer should coordinate with DelDOT’s Development Coordination Section to determine final turn-lane lengths and other design details, including the need for these improvements to accommodate possible future widening of POW-MIA Parkway, during site plan review.

2. The developer should enter into a traffic signal agreement with DelDOT for design and construction of a future traffic signal for the intersection of POW-MIA Parkway and Wyoming Mill Spur / Proposed Site Access. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT’s discretion. The developer should coordinate with DelDOT on the design details and implementation of the traffic signal. The agreement should provide for installation and activation of the signal at DelDOT’s discretion.

Entering into a Traffic Signal Revolving Fund agreement for this intersection is an option instead of the traditional traffic signal agreement. The developer should coordinate with DelDOT’s Development Coordination Section regarding the appropriate type of agreement needed and details thereof.

3. The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT’s HEP, KC, US 13 Lochmeath Way to Puncheon Run Connector Project. The amount of the contribution should be determined through coordination with DelDOT’s Development Coordination Section.
4. The developer should coordinate with DelDOT regarding an equitable share contribution toward DelDOT’s HEP, KC, SR 8 & SR 15 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. Adjacent to the proposed right-turn lane on northbound POW-MIA Parkway 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.
 - 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.

Relevant Projects in the DelDOT Capital Transportation Program

Currently, there two DelDOT capital projects within the area of study:

- HEP, KC, US 13 Lochmeath Way to Puncheon Run Connector (State Contract No. T201500202)
- HEP, KC, SR 8 & SR 15 Intersection Improvements (State Contract No. T201500201)

The US 13 Lochmeath Way to Puncheon Run Connector project is associated with DelDOT's Hazard Elimination Program (HEP). This project includes the addition of a third travel lane in each direction of US Route 13 from Lochmeath Way (Kent Road 361) to Puncheon Run Connector, and in a later phase from Walnut Shade Road (Kent Road 30) to Lochmeath Way. The project will require roadway widening, stormwater management facilities, multiple intersection redesigns, traffic signal reconfigurations and multimodal improvements such as shared-use paths and bicycle lanes. It is noted that the project includes the intersection of US Route 13 and POW-MIA Parkway. Construction is anticipated to begin in 2021 and be completed by 2025.

The SR 8 & SR 15 Intersection Improvements project is also associated with DelDOT's HEP, and it includes the intersection of Delaware Route 8 (Forest Avenue / Kent Road 51) and Delaware Route 15 (Saulsbury Road / Kent Road 156). The project proposes to install an additional through lane and left-turn lane on northbound and southbound Delaware Route 15 at the intersection. Construction is anticipated to begin in 2020 and be completed in 2021.

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:

- 635,000 square feet of Business Park (ITE Land Use Code 770)

Alternate land use described in the TOA (less conservative, and therefore not used in analysis):

- 300 units of Multifamily Housing (Mid-Rise) Homes (ITE Land Use Code 221)
- 285,000 square feet of Business Park (ITE Land Use Code 770)

Table 1
1436 NEW BURTON ROAD PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
635,000 sf business park	155	99	254	129	144	267
TOTAL TRIPS	155	99	254	129	144	267

Table 2
1436 NEW BURTON ROAD DAILY TRIP GENERATION

Land Use	Weekday Daily		
	In	Out	Total
635,000 sf business park	3730	3730	7460
TOTAL TRIPS	3730	3730	7460

Overview of TOA

Intersections examined:

- 1) POW-MIA Parkway & Wyoming Mill Spur / Proposed Site Access

Conditions examined:

- 1) 2018 existing (Case 1)
- 2) 2022 without 1436 New Burton Road development (Case 2)
- 3) 2022 with 1436 New Burton Road development (Case 3)

Peak hours evaluated: Weekday morning and evening peak hours

Committed developments considered:

- 1) Eden Hill (324 Apartments, 217 Townhomes [77 occupied], 110 duplexes [6 occupied], 88 single-family detached houses, 171,310 square feet commercial space [17,930 square feet occupied], 289,781 square feet medical office space [140,181 square feet occupied], and a 65,000 square foot skilled nursing facility [occupied])
- 2) Dunkin' Donuts Shopping Center (33,996 square foot shopping center)

Intersection Descriptions

1) POW-MIA Parkway & Wyoming Mill Spur / Proposed Site Access

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

Northbound approach: (POW-MIA Parkway) existing one left turn lane and one through lane; proposed one left-turn lane, one through lane and one right-turn lane

Southbound approach: (POW-MIA Parkway) existing one through lane and one channelized right-turn lane; proposed one left-turn lane, one through lane and one channelized right-turn lane

Eastbound approach: (Wyoming Mill Spur) existing one left turn lane and one channelized right-turn lane, stop-controlled; proposed one shared through/left-turn lane and one channelized right-turn lane, stop-controlled

Westbound approach: (Proposed Site Access) proposed one shared through/left-turn lane and one right-turn lane, stop-controlled

Safety Evaluation

The Delaware Crash Analysis Report System (CARS) data in the TOA covers October 17, 2015 – October 17, 2018. The data includes crashes within a 0.1 mile radius of the study intersection (POW-MIA Parkway & Wyoming Mill Spur). For the proposed site entrance, the data covers approximately 0.2 miles along the POW-MIA Parkway site frontage. It should be noted that the studied roadway (POW-MIA Parkway) opened to traffic in September 2017; as such, there is insufficient data to conduct a full Safety Evaluation of existing conditions.

No site access points are proposed along the New Burton Road frontage. According to the TOA narrative, the existing Delmarva Central Railroad precludes the possibility of site access along that frontage.

During the study period, there were:

- 2 reportable crashes
 - 2 property damage only crashes
 - 0 personal injury crashes
 - 0 fatal crashes
 - 0 pedestrian crashes
 - 0 pedacycle crashes
 - 0 crashes involving alcohol
 - 1 crash involved a deer

An intersection crash summary is provided below.

Within one year of POW-MIA Parkway being open, two crashes occurred along the site frontage. Both crashes were single vehicle crashes resulting in property damage only. There were no pedestrian or pedacycle crashes. There is no notable trend of contributing circumstances and/or driver actions. Based on the limited data available, there do not appear to be any existing crash patterns to be addressed by the 1436 New Burton Road developer at this location.

McCormick Taylor also conducted online research to determine if any fatal crashes have occurred between the end of the crash study period (October 2018) and the time of the TOA review (January 2018). No fatal crashes were found to have occurred.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: There is no existing Delaware Transit Corporation (DTC) transit service along POW-MIA Parkway. DART does not currently serve this immediate area and has no plans for future service at the site. The nearest accessible existing transit service runs along US Route 13, approximately 1.3 miles from the site, and includes DART routes 103, 104, and 303.

Planned transit service: Based on coordination with DTC representatives, there are currently no plans to provide transit service to the proposed development.

Existing bicycle and pedestrian facilities: There are marked bicycle lanes in both directions on POW-MIA Parkway and Wyoming Mill Spur. There is a shared-use path (SUP) with a grass buffer along the west side of POW-MIA Parkway, and a SUP without a buffer along the south side of Wyoming Mill Spur. There is a marked crosswalk across the west leg of the intersection (the Wyoming Mill Spur approach).

Planned bicycle and pedestrian facilities: DBF contacted a representative of DelDOT's Local Systems Planning Section to determine pedestrian and bicycle accommodations for the proposed development. John Fiori mentioned the requirement for a path, but stated a 10' SUP was already constructed along POW-MIA Parkway as part of the West Dover Connector Project. He indicated that an easement would be required along the site frontage. He requested that entrance improvements incorporate bicycle and pedestrian facilities, and that an internal sidewalk/path connection be provided from the existing SUP into the site. He requested adequate outdoor and indoor bicycle facilities be installed within the site to promote bicycle usage.

Previous Comments

It appears that all substantive comments from DelDOT's Scoping Letter, Traffic Count Review, and other correspondence were addressed in this TOA submission.

It is noted that DBF did not submit a preliminary TOA, but instead went straight from Traffic Count Approval to submission of the Final TOA.

General HCS Analysis Comments

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

- 1) For unsignalized intersections, DBF and McCormick Taylor applied percent heavy vehicles (HV) by movement using existing data. For signalized intersections, DBF and McCormick Taylor applied HV by lane group using existing data. As per the DelDOT Development Coordination Manual, if an existing turning movement had less than 100 vehicles per hour, a 5% HV was assumed in existing conditions. For future years, DBF used 3% HV if existing traffic counts were a poor indicator of future traffic conditions, i.e. if future volume increases were significant. Heavy vehicle percentages are generally consistent between McCormick Taylor's and DBF's analysis.
- 2) For existing conditions, the TOA and McCormick Taylor determined and utilized overall intersection peak hour factors (PHF). For future conditions, the TIS and McCormick Taylor assumed existing PHF or 0.92, whichever was greater.
- 3) The TOA and McCormick Taylor used different signal timings when analyzing the signalized intersections in some cases.

Table 1
Peak Hour Levels of Service (LOS)
Based on Traffic Operational Analysis for 1436 New Burton Road
Report dated December 2018
Prepared by DBF, Inc.

Unsignalized Intersection ¹ Two-Way Stop Control	LOS per TOA		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
POW-MIA Parkway & Wyoming Mill Spur / Proposed Site Access				
2018 Existing (Case 1)				
Northbound POW-MIA Parkway – Left	A (8.3)	A (8.8)	A (8.2)	A (8.8)
Eastbound Wyoming Mill Spur	B (13.9)	B (13.9)	B (13.9)	B (13.9)
2022 without 1436 New Burton (Case 2)				
Northbound POW-MIA Parkway – Left	A (8.5)	A (9.5)	A (8.5)	A (9.5)
Eastbound Wyoming Mill Spur	C (15.5)	C (16.8)	C (15.5)	C (16.8)
2022 with 1436 New Burton (Case 3)				
Northbound POW-MIA Parkway – Left	A (8.5)	A (9.5)	A (8.5)	A (9.5)
Southbound POW-MIA Parkway – Left	A (9.0)	A (8.6)	A (9.0)	A (8.7)
Eastbound Wyoming Mill Spur	D (27.6)	D (27.6)	D (27.6)	D (28.5)
Westbound Site Access	D (26.5)	F (72.6)	D (26.5)	F (81.1) ²
2022 with 1436 New Burton (Case 3) with Improvement Option 1 ³				
Northbound POW-MIA Parkway – Left	-	A (9.5)	-	A (9.5)
Southbound POW-MIA Parkway – Left	-	A (8.6)	-	A (8.7)
Eastbound Wyoming Mill Spur	-	D (27.6)	-	D (28.5)
Westbound Site Access	-	F (52.5)	-	F (57.7) ⁴

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

² The 95th percentile queue length on the westbound approach for Case 3 PM is approximately five vehicles (125').

³ Improvement Option 1 consists of the addition of an exclusive left-turn lane on the westbound site access approach, such that the westbound approach would have one left-turn lane, one through lane and one right-turn lane.

⁴ The 95th percentile queue length on the westbound approach for Case 3 PM with Improvement Option 1 is approximately four vehicles (100').

Table 2 (continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Operational Analysis for 1436 New Burton Road
Report dated December 2018
Prepared by DBF, Inc.

Unsignalized Intersection ⁵ All-Way Stop Control	LOS per TOA		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
POW-MIA Parkway & Wyoming Mill Spur / Proposed Site Access				
2022 with 1436 New Burton (Case 3) <i>with Improvement Option 2</i> ⁶				
Northbound POW-MIA Parkway	F (101.8)	F (51.7)	F (101.2)	F (53.6)
Southbound POW-MIA Parkway	F (56.5)	F (169.2)	F (56.3)	F (168.4)
Eastbound Wyoming Mill Spur	C (16.4)	B (14.2)	C (16.4)	B (14.3)
Westbound Site Access	B (14.0)	B (14.5)	B (14.0)	B (14.7)
Overall Intersection	F (65.5)	F (96.3)	F (65.2)	F (96.9)

⁵ For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

⁶ Improvement Option 2 consists of converting the intersection to all-way stop control.

Table 4
Peak Hour Levels of Service (LOS)
*Based on Traffic Operational Analysis for 1436 New Burton Road
Report dated December 2018
Prepared by DBF, Inc.*

Signalized Intersection ⁷	LOS per TOA		LOS per McCormick Taylor	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
POW-MIA Parkway & Wyoming Mill Spur / Proposed Site Access 2022 with 1436 New Burton (Case 3)	B (17.7)	B (17.2)	B (18.3)	B (17.8)

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