



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
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JENNIFER COHAN
SECRETARY

MEMORANDUM

TO: Steve Sisson, Sussex County Review Coordinator, DelDOT Planning
FROM: Claudy Joinville, Project Engineer *e.j.*
DATE: January 14, 2016
SUBJECT: **Bayhealth Milford Medical Campus
Results of Traffic Operational Analysis (TOA) Review**

The Department has completed its review of the TOA for the proposed Bayhealth Milford Medical Campus (Tax Parcels 330-15.00-50.01, 50.11, 58.00, 58.01, 58.03, 58.04, 59.00, 59.01). The TOA was prepared by Becker Morgan, Inc., dated November 4, 2015. The analysis evaluates the traffic impacts of the proposed development, to be located on the southwest corner of the intersection of Cedar Creek Road (Delaware Route 30) and Wilkens Road (Sussex Road 206) in the City of Milford.

The proposed development would consist of a 350,000 square-foot hospital and ambulatory care facility. Three (3) access points are proposed for this project: the first entrance is proposed to be located on Cedar Creek Road, directly across from the Delaware Route 1 Southbound Ramp; the second entrance would be located along Wilkens Road directly across Gregory Boulevard; and the third entrance would also be located along Wilkens Road, directly across from Homestead Boulevard. Construction is anticipated to be complete by 2018.

The subject property is currently split-zoned as AR-1 (Agricultural Residential), R-3 (Garden Apartments / Townhomes) and C-3 (Highway Commercial), and the applicant is seeking to rezone the entire land to IS (Institutional Service District) in the City of Milford. A portion of the land (Tax Parcels 330-15.00-58.01, 58.04) is located outside of the City limits and the applicant is seeking annexation from Sussex County into the City.

It is anticipated that various land parcels, owned by the applicant, and located adjacent to the proposed hospital, will be developed in the future as additional uses. As a result, we find it appropriate to design the intersection of Cedar Creek Road and Delaware Route 1 Southbound Ramp / Site Entrance to include exclusive turn-lanes. Doing so will allow for more efficient operation of the intersection when the site is more fully developed. Because the proposed hospital alone would not require exclusive turn-lanes along the site entrance and Delaware Route 1 Southbound Ramp approaches to operate adequately, the additional lanes will be striped temporarily until the remaining parcels are developed. Similarly, we anticipate that a signal will be warranted at the intersection in

the future. For that reason, the applicant should enter a signal agreement whereby they would participate in funding that signal when it becomes warranted.

Based on our review, we find that the four (4) intersections and entrances analyzed would operate at a level of service (LOS) D or better during the morning and evening peak hours for both present and future conditions, and would meet the LOS criteria listed in Chapter 2 of the Development Coordination Manual.

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

1. The developer should construct the site entrance on Cedar Creek Road. The existing and proposed configurations are shown in the table below.

Approach	Current Configuration	Proposed Configuration*
Northbound Cedar Creek Road	One through lane and one right-turn lane	One left-turn lane, one through lane, and one right-turn lane
Southbound Cedar Creek Road	One left-turn lane and one through lane	One left-turn lane, one through lane, and one right-turn lane
Westbound Delaware Route 1 Ramp	One left-turn lane and one right-turn lane	One left-turn lane, one through lane, and one right-turn lane
Eastbound Site Entrance	Approach does not exist	One left-turn lane, one through lane, and one right-turn lane

**Proposed configuration reflects full build-out of hospital and the development of adjacent parcels. Exclusive left-turn lanes will be temporarily striped as they are not needed to support hospital traffic.*

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DeIDOT's Subdivision Section to determine final turn-lane lengths.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Cedar Creek Road	120 feet**	N / A
Southbound Cedar Creek Road	N / A	145 feet**
Westbound Delaware Route 1 Ramp	N / A	N / A
Eastbound Site Entrance	N/A	N/A

***turn-lane length based on deceleration + storage length per DeIDOT's Development Coordination Manual*

2. The developer should enter into a traffic signal agreement with DelDOT to fund an equitable portion of a signal at the intersection of Cedar Creek Road and Delaware Route 1 Southbound Ramp / Site Entrance when DelDOT determines that it is warranted. The agreement should include pedestrian signals, crosswalks and interconnection at DelDOT's discretion. One or more developers may enter into a traffic signal agreement for this intersection.

3. The developer should construct the site entrance on Wilkens Road at Gregory Boulevard. The existing and proposed configurations are shown in the table below.

Approach	Current Configuration	Proposed Configuration
Northbound Site Entrance	Approach does not exist	One shared left-turn / through lane and one right-turn lane
Southbound Gregory Boulevard	One shared left-turn / through lane	One shared left-turn / through / right-turn lane
Eastbound Wilkens Road	One shared left-turn / through lane	One shared left-turn / through lane and one right-turn lane
Westbound Wilkens road	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 Subdivision Section to determine final turn-lane lengths.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Site Entrance	N / A	N / A
Southbound Gregory Boulevard	N / A	N / A
Eastbound Wilkens Road	N / A	240 feet**
Westbound Wilkens Road	210 feet **	N/A

**turn-lane length based on deceleration + storage length per DelDOT's *Development Coordination Manual*

4. The developer should construct the site entrance on Wilkens Road at Homestead Boulevard. The existing and proposed configurations are shown in the table below.

Approach	Current Configuration	Proposed Configuration
Northbound Site Entrance	Approach does not exist	One shared left-turn / through lane and one right-turn lane
Southbound Homestead Boulevard	One shared left-turn / right-turn lane	One shared left-turn / through lane and one right-turn lane
Eastbound Wilkens Road	One shared left- / through lane	One shared left-turn / through / right-turn lane
Westbound Wilkens Road	One through lane and one right lane	One shared left-turn / through lane, and one right-turn lane

5. In addition to constructing the two site entrances and the associated turn lanes on Wilkens Road, the developer should improve Wilkens Road between Cedar Creek Road and the western edge of the site frontage to meet DelDOT's local road standards. These standards include but are not limited to eleven-foot travel lanes and five-foot shoulders. As such, they necessarily include any needed improvements to the westbound shoulder between Homestead Boulevard and the West Shores residential development. The developer should provide a bituminous concrete overlay to the existing lanes' pavement section. DelDOT may recommend an overlay thickness to the developer's engineer if necessary.
6. The following bicycle pedestrian, and transit improvements should be included:
- a. The developer should provide a ten-foot wide shared-use path along the site frontage on the west side of Cedar Creek Road and the south side of Wilkens Road.
 - b. The developer should provide a fifteen-foot wide permanent easement along the site frontage on Cedar Creek Road and Wilkens Road, beyond any needed right-of-way dedication.
 - c. Where right-turn lanes are added, a five-foot wide bicycle lane should be provided through the right-turn lane in order to facilitate safe and unimpeded bicycle travel. A Right-Turn Yield to Bikes sign (R4-4) should be added before the start of each right-turn lane.
 - d. ADA-compliant curb and marked crosswalk should be provided at all site entrances.
 - e. The developer should provide a minimum of five-foot wide sidewalk within this development and, 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.
 - f. Bike parking should be provided near the building entrances within this development. Where the building architecture provides for an awning and other overhang, the bike parking should be covered.
 - g. Utility covers should be moved outside of any designated bicycle lanes or should be flush with the pavement.
 - h. The developer should coordinate with DART to provide bus stops to be located near the site entrance on Cedar Creek Road and near the eastern entrance on Wilkens Road.

Internal roads should be able to support transit buses for easy access and turnaround maneuvers on-site.

Please note that this analysis generally focuses on capacity and level of service issues. Level of Service (LOS) tables for the existing and future cases are attached with this memorandum.

If you have any questions, please contact me at (302) 760-2124.

CJ:km

Enclosures

cc: Jeff Portmann, Interim City Manager, City of Milford
Lawrence Lank, Director, Sussex County Planning and Zoning
Janelle Cornwell, Manager, Sussex County Planning and Zoning
Christopher Duke, Becker Morgan Group, Inc.
Drew Boyce, Director, Planning
J. Marc Coté, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Jeff Reed, South District Engineer, DOTS
Gemez Norwood, South District Public Works Supervisor, DOTS
Brian Clarke, Traffic Engineer, Traffic, DOTS
Troy Brestel, Project Engineer, Development Coordination
Will T. Mobley, Subdivision Manager, Development Coordination

Table 1
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Operational Analysis for Bayhealth Milford Medical Campus
Report dated November 5, 2015
Prepared by Becker Morgan Group, Inc.

Unsignalized Intersection ¹ Two-Way Stop Control (T-intersection)	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Cedar Creek Road & Delaware Route 1 Ramp				
2015 Existing (Case 1)				
Westbound Delaware Route 1 Ramp	B (11.1)	B (12.7)	B (11.2)	B (12.8)
2018 without Bayhealth Milford Medical Campus (Case 2)				
Westbound Delaware Route 1 Ramp	B (11.4)	B (12.9)	B (11.5)	B (13.0)
2018 with Bayhealth Milford Medical Campus (Case 3)				
Eastbound Site Entrance	B (12.3)	B (13.9)	B (12.4)	B (14.0)
Westbound Delaware Route 1 Ramp	B (13.0)	C (15.1)	B (12.6)	B (14.8)

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

Table 2
 PEAK HOUR LEVELS OF SERVICE (LOS)
*based on Traffic Operational Analysis for Bayhealth Milford Medical Campus
 Report dated November 5, 2015
 Prepared by Becker Morgan Group, Inc.*

Unsignalized Intersection ² Two-Way Stop Control (T-intersection)	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Wilkins Road & Gregory Boulevard				
2018 without Bayhealth Milford Medical Campus (Case 2)				
Southbound Gregory Boulevard	A (9.7)	B (10.6)	A (9.7)	B (10.7)
2018 with Bayhealth Milford Medical Campus (Case 3)				
Northbound Site Entrance	B (10.7)	B (12.9)	B (10.7)	B (13.0)
Southbound Gregory Boulevard	B (10.4)	B (11.3)	B (10.2)	B (11.3)

Table 3
 PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Operational Analysis for Bayhealth Milford Medical Campus
Report dated November 5, 2015
Prepared by Becker Morgan Group, Inc.

Unsignalized Intersection ³ Two-Way Stop Control (T-intersection)	LOS per TOA		LOS per DeIDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Wilkens Road & Homestead Boulevard				
2015 Existing (Case 1)				
Southbound Homestead Boulevard	A (9.5)	A (9.5)	A (9.5)	A (9.5)
2018 without Bayhealth Milford Medical Campus (Case 2)				
Southbound Homestead Boulevard	A (9.9)	A (10.0)	B (10.1)	B (10.3)
2018 with Bayhealth Milford Medical Campus (Case 3)				
Northbound Site Entrance	B (10.1)	B (10.7)	B (10.1)	B (10.6)
Southbound Homestead Boulevard	B (11.3)	B (11.4)	B (11.3)	B (11.4)

² For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

³ For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) 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 Operational Analysis for Bayhealth Milford Medical Campus
Report dated November 5, 2015
Prepared by Becker Morgan Group, Inc.

Signalized Intersection ⁴	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Cedar Creek Road & Wilkens Road				
2015 Existing (Case 1)	B (13.6)	B (13.9)	B (13.4)	B (13.3)
2018 without Bayhealth Milford Medical Campus (Case 2)	B (13.8)	B (14.1)	B (13.9)	B (14.0)
2018 with Bayhealth Milford Medical Campus (Case 3)	B (14.1)	B (14.7)	B (14.3)	B(14.3)

⁴ For both unsignalized and signalized intersection analyses, the numbers in parentheses following levels of service (LOS) are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.