




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

JENNIFER COHAN
SECRETARY

MEMORANDUM

TO: Sireen Muhtaseb, New Castle Review Coordinator
FROM: Troy Brestel, Project Engineer 
DATE: August 10, 2020
SUBJECT: **Blue Diamond Park (Protocol Tax Parcel #1004500007)
Results of Traffic Operational Analysis (TOA)**

We have reviewed the traffic operational analysis (TOA) for the proposed Blue Diamond Park development, submitted by Duffield Associates on July 10, 2020. The analysis evaluates the traffic impacts of the proposed development, which is to be located on the north side of Hamburg Road (New Castle Road 381), the south side of Federal School Lane (New Castle Road 380), and the east side of US Route 13, in New Castle County. The proposed development would replace an existing recreation facility, temporary UPS facility, and borrow pit.

The proposed redevelopment would consist of a 1,333,337 square foot logistics facility. Three access points are proposed: One lefts-in / rights-in / rights-out access on US Route 13, one full access on Federal School Lane, and one full access on Hamburg Road. Construction is expected to be complete in 2021.

As a general comment, the details of the proposed entrances and off-site improvements will need to be coordinated with DelDOT's Development Coordination section so that they are designed and constructed appropriately.

Based on our review, we find the following:

All current movements at the proposed site entrance on US Route 13, configured as a lefts-in / rights-in / rights-out approach, would operate at level of service (LOS) D or better during the a.m. and p.m. peak hours for the future build condition, and would meet the LOS criteria listed in Chapter 2 of the Development Coordination Manual (Note: the eastbound approach shows that it would operate at lower than LOS D in this analysis, but that approach has been closed). Based on DelDOT's Auxiliary Lane Worksheet (version 2020.1, dated 4/15/2020), a 425-foot northbound right-turn lane into the entrance is required. Where the developer plans to build the entrance (approximately 1,650 feet north of Hamburg Road), a crossover exists that has separate northbound and southbound left-turn and right-turn lanes on US Route 13 that served prior land uses. Therefore, the existing northbound right-turn lane will need to be extended to a total length of 425 feet, while the existing southbound left-turn lane is adequate to serve the proposed development.

All movements at the proposed site entrance on Hamburg Road, configured as a full movement approach, would operate at level of service (LOS) D or better during the a.m. and p.m. peak hours for the future build condition, and would meet the LOS criteria listed in Chapter 2 of the Development Coordination Manual. Based on DelDOT's Auxiliary Lane Worksheet (version 2020.1, dated 4/15/2020), a 260-foot eastbound left-turn lane into the entrance is required. Where the developer plans to build the entrance (approximately 1,100 feet east of US Route 13), an entrance exists that has a separate eastbound left-turn lane on Hamburg Road. Therefore, the existing eastbound left-turn lane will need to be extended to a total length of 260 feet; no westbound right-turn lane is required.

All movements at the proposed site entrance on Federal School Lane, configured as a full movement approach, would operate at level of service (LOS) D or better during the a.m. and p.m. peak hours for the future build condition, and would meet the LOS criteria listed in Chapter 2 of the Development Coordination Manual. Based on DelDOT's Auxiliary Lane Worksheet (version 2020.1, dated 4/15/2020), no left-turn or right-turn lanes are required. Where the developer plans to build the entrance (approximately 1,200 feet east of US Route 13), an entrance exists that does not have any eastbound or westbound turn lanes.

All movements at the intersection of the DE Route 1 Northbound Ramp, Bear-Tybouts Road, and Reybold Drive would operate at level of service (LOS) D or better during the a.m. and p.m. peak hours for the existing, future no-build, and future build conditions, and would meet the LOS criteria listed in Chapter 2 of the Development Coordination Manual.

Some movements at the intersection of US Route 13 and Federal School Lane would operate at worse than LOS D during the a.m. and p.m. peak hours for the existing, future no-build, and future build conditions. However, the poor LOS is limited to the westbound Federal School Lane approach and northbound US Route 13 left turn and is due to the heavier traffic volumes along US Route 13. The traffic queue for the left-turn lane along the Federal School Lane approach during the future build condition is approximately 225 feet, while the traffic queue for the right-turn lane is approximately 50 feet. Therefore, to allow vehicles to access the right-turn lane without being blocked by the traffic queue from the left-turn lane, we recommend that the developer extend the right-turn lane to 275 feet (which includes a 50 foot taper), starting from the stop bar on the left-turn lane. The traffic queue for the northbound US Route 13 left-turn is less than 25 feet, and no mitigation is needed for it.

The intersection of US Route 13, Bear-Tybouts Road, and Hamburg Road would operate at level of service (LOS) D or better during the a.m. and p.m. peak hours for the existing, future no-build, and future build conditions, and would meet the LOS criteria listed in Chapter 2 of the Development Coordination Manual. The westbound Hamburg Road approach is currently configured as an exclusive left-turn lane and a shared through / right-turn lane. During the p.m. peak hour for the future build condition, the traffic queue for the left-turn lane is approximately 475 feet, while the traffic queue for the shared through / right-turn lane is approximately 450 feet. While the length of the existing left-turn lane is approximately 690 feet (excluding taper) and is adequate to support left-turning vehicles, vehicles wanting to turn right currently have to wait in the traffic queue for the shared through / right-turn lane. Additionally, there is an access on Hamburg Road to the existing E & F Auto Sales business that is approximately 40 feet from the stop bar on the Hamburg Road approach, further hindering traffic operations.

To improve traffic operations at this intersection and along Hamburg Road, we recommend the developer be required to do the following:

- A) Install an exclusive right-turn lane along the westbound Hamburg Road approach. The length of this turn lane would be 370 feet (excluding taper).
- B) Relocate the existing access to the existing E & F Auto Sales business on Hamburg Road to the east to align with the existing access to the BP gas station / Dunkin' Donuts store.

Please note that this analysis generally focuses on capacity and level of service issues. Other comments relating to bicycle, pedestrian, and frontage improvements may be made during the plan review process. Level of Service tables for the existing and future cases are attached with this memorandum.

TB:km

cc: Keith Stoltz, Churchmans 273, L.L.C.
Michael Kaszyski, Duffield Associates, Inc.
Shawn Tucker, Faegre, Drinker, Biddle & Reath, L.L.P.
J. Marc Coté, Director, Planning
Pamela Steinebach, Assistant Director, Project Development North, DOTS
Todd Sammons, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Chris Sylvester, Traffic Studies Manager, Traffic, DOTS
Claudy Joinville, Project Engineer, Development Coordination
Will Mobley, Johnson, Mirmiran & Thompson, Inc.

Table 1
 PEAK HOUR LEVELS OF SERVICE (LOS)
 Blue Diamond Park – TOA
 Prepared by Duffield Associates, Inc.

Unsignalized Intersection ¹	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Site Entrance A / US Route 13 2021 with full development				
Northbound US Route 13 Left -Turn	B (11.2)	C (18.5)	B (11.2)	C (20.3)
Southbound US Route 13 Left-Turn	C (23.2)	B (11.0)	C (23.2)	B (11.4)
Eastbound Private Driveway ²	C (16.7)	D (27.5)	C (22.5)	F (50.4)
Westbound Site Entrance A	C (23.8)	B (12.6)	C (23.8)	B (13.1)

¹ Numbers in parentheses are average seconds of delay per vehicle.

² This approach has been closed, as the previous development is no longer in service.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
Blue Diamond Park – TOA
Prepared by Duffield Associates, Inc.

Unsignalized Intersection¹	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Site Entrance B / Hamburg Road 2021 with full development				
Southbound Site Entrance B	A (9.2)	B (10.3)	A (9.2)	B (10.4)
Eastbound Hamburg Road Left-Turn	A (7.5)	A (7.9)	A (7.5)	A (7.9)

¹ Numbers in parentheses are average seconds of delay per vehicle.

Table 3
 PEAK HOUR LEVELS OF SERVICE (LOS)
 Blue Diamond Park – TOA
 Prepared by Duffield Associates, Inc.

Unsignalized Intersection¹	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Site Entrance C / Federal School Lane				
2021 with full development				
Northbound Site Entrance C	A (9.7)	A (9.7)	A (9.8)	A (9.7)
Westbound Federal School Lane Left-Turn	A (7.4)	A (7.5)	A (7.4)	A (7.5)

¹ Numbers in parentheses are average seconds of delay per vehicle.

Table 4
 PEAK HOUR LEVELS OF SERVICE (LOS)
 Blue Diamond Park – TOA
 Prepared by Duffield Associates, Inc.

Unsignalized Intersection ¹	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
DE Route 1 Northbound Ramp / Bear-Tybouts Road / Reybold Drive				
2020 Existing				
Southbound Reybold Road	C (15.2)	C (15.8)	C (19.5)	C (21.2)
Eastbound Bear-Tybouts Road Left-Turn	A (7.5)	A (7.8)	A (7.6)	A (7.8)
Westbound Bear-Tybouts Road Left-Turn	A (8.7)	A (8.2)	A (8.8)	A (8.5)
2021 without development				
Southbound Reybold Road	C (15.4)	C (16.4)	C (19.9)	C (22.0)
Eastbound Bear-Tybouts Road Left-Turn	A (7.5)	A (7.8)	A (7.6)	A (7.8)
Westbound Bear-Tybouts Road Left-Turn	A (8.7)	A (8.4)	A (8.8)	A (8.5)
2021 with full development				
Southbound Reybold Road	C (16.7)	C (17.5)	C (22.4)	C (24.4)
Eastbound Bear-Tybouts Road Left-Turn	A (7.5)	A (7.8)	A (7.6)	A (7.8)
Westbound Bear-Tybouts Road Left-Turn	A (8.9)	A (8.5)	A (9.0)	A (8.7)

¹ Numbers in parentheses are average seconds of delay per vehicle.

Table 5
 PEAK HOUR LEVELS OF SERVICE (LOS)
 Blue Diamond Park – TOA
 Prepared by Duffield Associates, Inc.

Unsignalized Intersection ¹	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US Route 13 / Federal School Lane				
2020 Existing				
Northbound US Route 13 Left-Turn	B (12.9)	E (42.8)	B (13.4)	F (50.3)
Southbound US Route 13 Left-Turn	C (19.9)	B (10.4)	C (21.8)	B (10.8)
Westbound Federal School Lane	F (58.3)	C (21.0)	F (90.8)	D (29.9)
2021 without development				
Northbound US Route 13 Left-Turn	C (15.4)	E (46.6)	C (16.3)	F (55.2)
Southbound US Route 13 Left-Turn	C (20.8)	B (11.5)	C (22.8)	B (12.1)
Westbound Federal School Lane	F (133.6)	D (25.6)	F (235.0)	E (41.2)
2021 with full development				
Northbound US Route 13 Left-Turn	C (15.7)	E (46.3)	C (16.5)	F (56.4)
Southbound US Route 13 Left-Turn	C (21.9)	B (11.7)	C (24.3)	B (12.3)
Westbound Federal School Lane	F (133.6)	D (25.1)	F (238.6) ²	E (41.4)

¹ Numbers in parentheses are average seconds of delay per vehicle.

² In this scenario, the length of the traffic queue for the westbound left-turn lane is approximately 225 feet.

Table 6
 PEAK HOUR LEVELS OF SERVICE (LOS)
 Blue Diamond Park – TOA
 Prepared by Duffield Associates, Inc.

Signalized Intersection¹	LOS per TOA		LOS per DelDOT	
	Weekday AM	Weekday PM	Weekday AM	Weekday PM
US Route 13 / Bear-Tybouts Road / Hamburg Road				
2020 Existing	C (30.9)	C (32.5)	C (31.3)	D (36.9)
2021 without development	C (33.2)	D (35.7)	C (32.2)	D (37.7)
2021 with full development	D (38.0)	D (37.8)	D (35.7)	D (40.8)
2021 with full development and the addition of an exclusive right-turn lane on Hamburg Road	-	-	C (28.3)	D (40.2)

¹ Numbers in parentheses are average seconds of delay per vehicle.