



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

JENNIFER COHAN  
SECRETARY

April 28, 2016

Mr. Ted Williams  
Landmark Science and Engineering, Inc.  
100 West Commons Boulevard  
New Castle, DE 19720

Dear Mr. Williams,

The Department has completed its review of the Traffic Impact Study (TIS) for the Avon Property (Tax Parcel 09-016.00-007) commercial development, prepared by your firm and dated May 2015. The report was prepared in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed development, proposed to be located on the former Avon industrial site on the north side of Delaware Route 273, just east of the City of Newark, in New Castle County.

The proposed development would consist of 180 apartments, 40 age-restricted apartments, 199,650 square feet of retail space, restaurants totaling 12,200 square feet and 93,400 square feet of office space, to be developed on an approximately 46-acre parcel (Tax Parcel 09-016.00-007). Two access points are proposed on Delaware Route 273: one at the existing Avon Property entrance, and one at the Lowe's site access on Delaware Route 273 by means of interconnection. Construction is anticipated to be complete by 2018.

The land is currently zoned as I (Industrial) in New Castle County, and the developer proposes to rezone the land to CR (Commercial Regional).

DelDOT currently has one ongoing project within the study area, which is the Churchmans Crossing Area Monitoring Program. In 1995, in response to increasing area wide intersection congestion, DelDOT, New Castle County, and WILMAPCO began a study of the Churchmans Crossing area - not only to get a better understanding of the existing congestion levels, but also to forecast future congestion levels and develop recommendations to help alleviate the anticipated increase in congestion. In April of 1997, the Churchmans Crossing Study document was published, providing a summary of the Churchmans Crossing Infrastructure Investment Study findings and recommendations. Since the 1997 Study release, many transit, intersection, roadway, pedestrian, and bicycle projects have been planned, designed, and constructed in the Churchmans Crossing area. The program components have been monitored and analyzed annually to determine the timing of further improvement triggers. The proposed development is located outside the core of the Churchmans Crossing core area, and is within the fringe area.



In 2012, as part of the Hazard Elimination Program (HEP), DelDOT evaluated a section of Bala Road, which included the intersection of Delaware Route 273 / Bala Road / Red Mill Road, for safety and capacity concerns. This location was listed in the 2012 HEP Report as Site V. Initially, it was determined that the existing condition at the site should be maintained. However, DelDOT is currently developing a HEP project at this intersection to include an exclusive left-turn lane on the Red Mill Road approach. This project is currently in the planning stages, and construction is expected to be complete in fiscal year 2019.

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

Fourteen intersections were identified by DelDOT and New Castle County as being required for study to satisfy the level of service (LOS) requirements for both the New Castle County Unified Development Code (UDC) and DelDOT's Development Coordination Manual. Those intersections were listed in the scope for this TIS.

Of those intersections, the following four exhibit deficiencies without the implementation of physical roadway and / or traffic control improvements:

<b>Intersection</b>	<b>Situations for which deficiencies exist</b>	<b>Traffic Control</b>
Delaware Route 273 / Brookside Distributors Entrance / Winner Infiniti Entrance	2015 Existing: PM Peak Hour 2018 without development: PM Peak Hour 2018 with development: AM, PM, Saturday Mid-Day Peak Hours	Two-Way Stop (Unsignalized)*
Ruthar Drive / Gabor Industrial Complex Entrance	2018 without development: AM, PM, Saturday Mid-Day Peak Hours 2018 with development: AM, PM, Saturday Mid-Day Peak Hours	Two-Way Stop (Unsignalized)*
Red Mill Road / Ruthar Drive	2018 without development: PM Peak Hour 2018 with development: PM Peak Hour	Traffic Signal
Delaware Route 273 / Bala Road / Red Mill Road	2015 Existing: AM, PM Peak Hours 2018 without development: AM, PM Peak Hours 2018 with development: AM, PM Peak Hours	Traffic Signal
Red Mill Road / Connection to Prides Crossing	2018 with development: AM, PM Peak Hours	Two-Way Stop (Unsignalized)*

(\*Note: New Castle County's UDC does not have LOS requirements for two-way stop-controlled intersections)

The Brookside Distributors and Winner Infiniti entrances on Delaware Route 273 exhibit failing LOS due to the high traffic volumes along Delaware Route 273 when compared to the relatively low entrance volumes. Traffic queues leaving these businesses are very minimal for all scenarios analyzed. This intersection is unsignalized, and the heavy volume along Delaware Route 273 is unimpeded and moves well. For these reasons, we are not recommending any improvements be made to this intersection.

The Gabor Industrial Complex entrance on Ruthar Drive exhibits failing LOS due to the traffic volumes along Ruthar Drive when compared to the entrance volumes. While traffic queues leaving these businesses can occur, this intersection is unsignalized, and the heavy volume along Ruthar Drive is unimpeded and moves well. For this reason, we are not recommending any improvements be made to this intersection.

In addition to the fourteen intersections mentioned above, four additional intersections were identified by DelDOT as being required for study to satisfy the level of service (LOS) requirements of DelDOT's Development Coordination Manual. Those intersections were listed in the scope for this TIS.

Of those intersections, the following exhibit deficiencies without the implementation of physical roadway and / or traffic control improvements:

Intersection	Situations for which deficiencies exist	Traffic Control
Capitol Trail (Delaware Route 2) / Red Mill Road	2015 Existing: AM, PM Peak Hours 2018 without development: AM, PM, Saturday Mid-Day Peak Hours 2018 with development: AM, PM, Saturday Mid-Day Peak Hours	Traffic Signal
Delaware Route 273 / Library Avenue (Delaware Route 72) / Capital Trail (Delaware Route 2)	2018 with development: PM, Saturday Mid-Day Peak Hours	Traffic Signal
East Delaware Avenue / Library Avenue / College Square Access	2018 without development: PM, Saturday Mid-Day Peak Hours 2018 with development: PM, Saturday Mid-Day Peak Hours	Traffic Signal

The intersection of Capitol Trail / Red Mill Road exhibits failing LOS due to the high traffic volumes traveling through the intersection. While adding turn lanes on the approaches of the intersection would mitigate the poor LOS and improve overall operation, the proximity of development on the southeastern quadrant of this intersection makes the construction of these turn lanes impossible without the acquisition of significant right-of-way from these properties. Adding these lanes could potentially render these properties unusable for their current land uses, and could require the acquisition of the entire properties, which could be very costly. Additionally, there is a cemetery in close proximity to the intersection on the northwestern quadrant. For these reasons, we are not recommending any improvements be made to this intersection.

The intersection of Delaware Route 273 / Library Avenue (Delaware Route 72) / Capital Trail (Delaware Route 2) exhibits failing LOS due to the high traffic volumes traveling through the intersection. While either grade-separation of the intersection or adding turn lanes on the approaches of the intersection would mitigate the poor LOS and improve overall operation, the proximity of development on the southwest and southeast corners of this intersection makes the construction of these improvement options impossible without the acquisition of significant rights-of-way from these properties. This acquisition could potentially render these properties unusable for their current land uses, and could require the acquisition of the entire properties, which could be very costly. It should also be noted that a third westbound through lane could be added to Delaware Route 273 to improve capacity, but again there is not enough space on Delaware Route 273 west of the intersection, where it becomes Main Street, to add the required receiving lane. For these reasons, we are not recommending any improvements be made to this intersection.

The intersection of East Delaware Avenue / Library Avenue / College Square Access exhibits failing LOS due to the high traffic volumes traveling through the intersection. Due to the unique characteristics of the road network surrounding the intersection, improvement options are limited. The addition of a third left-turn lane on the eastbound Delaware Avenue approach would necessitate changing the control on the westbound right-turn from the shopping center from a free right to stop control. However, to prevent the free flow of this movement would only degrade operations at this intersection, offsetting the benefit of the third eastbound left-turn lane. Additionally, the northbound and southbound approaches have limited potential for the addition of travel and / or receiving lanes due to the proximity and configurations of the immediately adjacent intersections (Delaware Route 273 / Library Avenue and Library Avenue / Wyoming Avenue). For these reasons, we are not recommending any improvements be made to this intersection.

Should New Castle County 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. Items 1 and 2 below are necessary to meet our understanding of the County's concurrency requirements.

1. For the intersection of Ruthar Drive / Red Mill Road, the developer should construct an additional left-turn lane on the eastbound Ruthar Drive approach.

<b>Approach</b>	<b>Current Configuration</b>	<b>Proposed Configuration</b>
Northbound Red Mill Road	One left-turn lane, one through lane, one right-turn lane	One left-turn lane, one through lane, one right-turn lane
Southbound Red Mill Road	One left-turn lane, one through lane, one right-turn lane	One left-turn lane, one through lane, one right-turn lane
Eastbound Ruthar Drive	One left-turn lane, one through lane, one right-turn lane	Two left-turn lanes, one through lane, one right-turn lane
Westbound Ruthar Drive	One left-turn lane, one through lane, one right-turn lane	One left-turn lane, one through lane, one right-turn lane

A receiving lane to accommodate the additional eastbound left-turn will be needed on northbound Red Mill Road. Additionally, because of the geometric reconfiguration necessary to implement the additional eastbound left-turn, a "shadow" left-turn on the westbound Ruthar Drive approach may be necessary.

For these reasons, as well as potential limitations to this improvement as a result of grade issues and the proximity of this intersection to the Gabor Industrial Complex Entrance / Ruthar Drive intersection to the west, the developer should contact DelDOT's Development Coordination, Traffic and Bridge Sections early in the design of this improvement.

2. The developer should construct a third eastbound through lane on Delaware Route 273 from a point west of Red Mill Road to a point west of Salem Church Road, which could include the transition of the additional through lane to a right-turn lane onto Salem Church Road. The construction details and implementation of this lane should be coordinated with DelDOT's Subdivision Section.

3. The developer should provide a security fence along the property's frontage on the CSXT railroad line, located behind the subject property.
4. The following bicycle and pedestrian improvements should be included:
  - a. A right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane added to northbound Delaware Route 273 at the site entrances.
  - b. Any bike lanes to be added to Delaware Route 273 should be five feet wide.
  - c. Appropriate bicycle symbols, directional arrows, striping (including stop bars), and signing should be included along bicycle facilities and right-turn lanes within the project limits.
  - d. Utility covers should be made flush with the pavement.
  - e. Bike parking should be provided near each commercial building. Where building architecture permits, the parking should be covered.
  - f. A minimum of a five-foot sidewalk (with a minimum of a three-foot buffer from the roadway) that meets current AASHTO and ADA standards should be constructed along the site frontage on Delaware Route 273.
  - g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
  - h. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the property. These sidewalks should each be a minimum of five feet wide and should meet current AASHTO and ADA standards. These internal sidewalks should connect to the frontage sidewalks on Delaware Route 273.

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at [http://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 DelDOT'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).

Mr. Ted Williams  
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Additional details on our review of this TIS are attached. If you have any questions concerning this review, please contact me at (302) 760-2167. My email is [Troy.Brestel@state.de.us](mailto:Troy.Brestel@state.de.us).

Sincerely,



Troy Brestel  
Project Engineer

TEB:km

Enclosures

cc with enclosures:

Mr. Jerome Heisler, Jr., Reybold Venture Group  
Ms. Tigist Zegeye, WILMAPCO  
Mr. Daniel Blevins, WILMAPCO  
Mr. George Haggerty, New Castle County Department of Land Use  
Mr. Owen Robatino, New Castle County Department of Land Use  
Mr. Marco Boyce, New Castle County Department of Land Use  
Ms. Maureen Feeney Roser, City of Newark  
Ms. Annie Cordo, Deputy Attorney General  
Mr. Robert McCleary, Director, Transportation Solutions (DOTS)  
Mr. Drew Boyce, Director, Planning  
Mr. Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS  
Mr. Mark Tudor, Assistant Director, Project Development North,  
DOTS  
Mr. J. Marc Coté, Assistant Director, Development Coordination  
Mr. T. William Brockenbrough, Jr., County Coordinator, Development  
Coordination  
Mr. Jason Hastings, Bridge Engineer, Bridge, DOTS  
Mr. Peter Haag, Traffic Studies Manager, Traffic, DOTS  
Mr. Adam Weiser, Safety Engineer, Traffic, DOTS  
Mr. Jerry Lovell, Project Manager, Project Development North, DOTS  
Mr. David Dooley, Service Development Planner, Delaware Transit  
Corporation  
Mr. Anthony Aglio, Planning Supervisor, Statewide & Regional Planning  
Mr. Todd Sammons, Subdivision Engineer, Development Coordination  
Mr. Jeffrey Van Horn, New Castle County Subdivision Coordinator,  
Development Coordination  
Mr. Ahmed Abdelmoteleb, New Castle County Traffic Engineer, Traffic,  
DOTS  
Mr. Claudy Joinville, Project Engineer, Development Coordination  
Mr. Andrew Parker, McCormick Taylor, Inc.  
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.  
Mr. Kevin Hickman, Johnson, Mirmiran & Thompson, Inc.

### **General Information**

**Report date:** June, 2015

**Prepared by:** Landmark Science and Engineering, Inc.

**Prepared for:** Reybold Venture Group, Inc.

**Tax Parcel:** 09-016.00-007

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

### **Project Description and Background**

**Description:** 180 apartments, 40 age-restricted apartments, 199,650 square feet of retail space, restaurants totaling 12,200 square feet and 93,400 square feet of office space

**Location:** Former Avon industrial site on the north side of Delaware Route 273, just east of the City of Newark, in New Castle County.

**Amount of land to be developed:** approximately 46 acres

**Current zoning:** I (Industrial)

**Proposed zoning:** CR (Commercial Regional)

**Land use approval(s) needed:** County approval

**Proposed completion date:** 2018

**Proposed access location:** Two on Delaware Route 273

### **Livable Delaware**

*(Source: Delaware Strategies for State Policies and Spending, 2015 Update)*

**Location with respect to the Strategies for State Policies and Spending Map of Delaware:** The proposed location of the development is located within Investment Level 1.

### **Description of Investment Level:**

#### *Investment Level 1*

Investment Level 1 areas are often municipalities, towns, or urban / urbanizing places in counties. Density is generally higher than in the surrounding areas. There are a variety of transportation opportunities available. Buildings may have mixed uses, such as a business on the first floor and apartments above.

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. These areas would be a prime location for designating "pre-permitted areas" to help steer development where the citizens are most prepared to accept it.

Concerning transportation, 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, including the Safe Routes to School projects. Additionally, Level 1 areas are a first priority for planning projects and studies, bicycle facilities, signal-system enhancements, the promotion of interconnectivity of neighborhoods and public facilities. Street design and access should also be compatible to the context of an area.

**Proposed Development’s Compatibility with Livable Delaware:** Based on the above description, it appears that this development proposal is generally consistent with the 2015 update of the Livable Delaware “Strategies for State Policies and Spending.”

**Comprehensive Plans**

The proposed development is located within New Castle County.

**New Castle County Comprehensive Plan: (Source: New Castle County Comprehensive Plan Update, 2012)**

The site is located in an area with a Future Land Use designated as an Office / Commercial / Industrial Development Area (OCI).

**Proposed Development’s Compatibility with Comprehensive Plan:** Based on the above description, the proposed development generally adheres to the New Castle County Comprehensive Plan.

**Trip Generation**

Trip generation for the proposed development was computed based on rates and equations established in the Institute of Traffic Engineers (ITE) Trip Generation Manual (9<sup>th</sup> edition) and the ITE Trip Generation Handbook (2<sup>nd</sup> edition).

Table 1  
 Trip Generation for the Avon Property

Land Use	Morning Peak Hour			Evening Peak Hour			Saturday mid-day Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
<i>180 apartments</i>	18	74	92	76	41	117	47	46	93
<i>40 age-restricted apartments</i>	4	5	9	6	5	11	7	6	13
<i>199,650 SF of retail space</i>	148	90	238	457	495	952	713	657	1370
<i>12,200 SF of restaurants</i>	0	0	0	72	48	120	91	81	172
<i>93,400 SF of office space</i>	159	22	181	31	152	183	22	18	40



## **Overview of TIS**

### **Intersections examined:**

- 1) Delaware Route 273 / East Site Access
- 2) Delaware Route 273 / Old Ogletown Road (New Castle Road 18C) / West Site Access
- 3) Delaware Route 273 / Brookside Distributors Entrance / Winner Infiniti Dealership Entrance
- 4) Delaware Route 273 / Entrance to General Foods Industrial Site
- 5) Delaware Route 273 / Entrance to White Clay Center / Entrance to Storage Complex
- 6) Old Ogletown Road / Augusta Drive
- 7) Old Ogletown Road / Sullivan Drive
- 8) Old Ogletown Road / Bala Road (New Castle Road 91) / Delaware Route 273 Ramp
- 9) Delaware Route 273 / Ruthar Drive (New Castle Road 65)
- 10) Ruthar Drive / Gabor Industrial Complex Entrance
- 11) Ruthar Drive / Red Mill Road (New Castle Road 352)
- 12) Delaware Route 273 / Ramp to Old Ogletown Road / Red Mill Road
- 13) Red Mill Road / Connection to Prides Crossing
- 14) Delaware Route 273 / Salem Church Road (New Castle Road 348)

The following intersections are included to satisfy the conditions set forth in the Standards and Regulations for Subdivision Streets and State Highway Access. They are not needed to satisfy the conditions set forth in New Castle County's Unified Development Code.

- 15) Capital Trail (Delaware Route 2) / Red Mill Road
- 16) Delaware Route 273 / Marrows Road (New Castle Road 351)
- 17) Delaware Route 273 / Library Avenue (New Castle Road 356)
- 18) East Delaware Avenue / Library Avenue

### **Conditions examined:**

- 1) Existing (2015);
- 2) 2018 without proposed development;
- 3) 2018 with proposed development.

**Peak hours evaluated:** all intersections were examined during the weekday morning, weekday evening, and Saturday mid-day peak hours.

### **Committed developments considered:**

1. 150 Red Mill Road (90,728 square feet of medical office space)
2. Gabor Industrial Park (30,325 square-foot warehouse)
3. FMC (8,000 square-foot addition to industrial facility)
4. Ogletown Baptist Church (13,440 square foot addition to existing building)
5. Scerni Industrial Park (5,700 square-foot addition to industrial facility)
6. Newark Commons – Phase II (2,470 movie theater, 98,959 square feet of office space, 20,200 square feet of restaurant space, 14,400 square feet of retail space, 53,833 square foot warehouse storage addition)

**Transit, Pedestrian, and Bicycle Facilities**

**Existing transit service:** Currently, DART Route 34 operates along Delaware Route 273 through the study area.

**Planned transit service:** Currently, there is no future planned service other than maintaining the existing service.

**Existing bicycle and pedestrian facilities:** The New Castle County Bicycle Map indicates that Delaware Route 273 is considered a Regional Bicycle Route, and has a separate bikeway.

**Planned bicycle and pedestrian facilities:** Other than those made on page 5, item 4, of this document, minor comments relating to bicycle and pedestrian improvements may be made during DelDOT's site plan review process.

**General HCS Analysis Comments**

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

There are no general comments concerning the HCS analysis.

Table 2  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DeIDOT <sup>2</sup>		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / East Site Entrance						
2015 Existing	N/A	N/A	N/A	N/A	N/A	N/A
2018 without development	N/A	N/A	N/A	N/A	N/A	N/A
2018 with development	C (21.2)	C (21.9)	C (22.1)	B (10.1)	C (21.7)	B (19.7)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> For the review of the analysis, DeIDOT used optimized signal timings, whereas the Consultant, in preparation of the analysis, used field-measured signal timings.

Table 3  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DeIDOT <sup>2</sup>		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Old Ogletown Road / West Site Entrance						
2015 Existing	C (27.0)	C (34.1)	C (27.5)	B (11.0)	B (14.6)	B (17.0)
2018 without development	C (26.4)	C (31.0)	C (28.8)	B (11.6)	B (16.5)	B (17.5)
2018 with development	C (29.0)	D (43.6)	D (39.6)	B (12.6)	B (19.8)	C (20.3)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> For the review of the analysis, DeIDOT used optimized signal timings, whereas the Consultant, in preparation of the analysis, used field-measured signal timings.

Table 4  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Unsignalized Intersection <sup>1</sup>	LOS per TIS <sup>2</sup>			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Brookside Distributors Entrance / Winner Infiniti Entrance						
2015 Existing						
Eastbound DE 273 Left-Turn	C	B	B	C (15.4)	B (14.0)	B (12.0)
Westbound DE 273 Left-Turn	B	C	B	B (11.0)	C (15.1)	B (10.8)
Northbound Winner Infiniti Entrance	N/A	N/A	N/A	C (18.3)	D (26.9)	C (21.3)
Southbound Brookside Entrance	N/A	N/A	N/A	D (30.0)	F (53.0)	D (27.6)
2018 without development						
Eastbound DE 273 Left-Turn	C	C	B	C (16.6)	C (16.3)	B (13.2)
Westbound DE 273 Left-Turn	B	C	B	B (11.5)	C (17.9)	B (11.7)
Northbound Winner Infiniti Entrance	N/A	N/A	N/A	C (19.8)	E (36.0)	D (25.2)
Southbound Brookside Entrance	N/A	N/A	N/A	D (34.3)	F (75.6)	D (33.8)
2018 with development						
Eastbound DE 273 Left-Turn	C	C	C	C (17.4)	C (18.7)	C (15.9)
Westbound DE 273 Left-Turn	B	C	B	B (12.3)	C (20.0)	B (14.2)
Northbound Winner Infiniti Entrance	N/A	N/A	N/A	C (21.9)	E (44.1)	E (36.5)
Southbound Brookside Entrance	N/A	N/A	N/A	F (57.9)	F (97.3)	E (49.4)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The Consultant did not report the northbound and southbound total approach LOS. Also, for LOS values reported, the consultant did not report the seconds of delay.

Table 5  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Unsignalized Intersection <sup>1</sup>	LOS per TIS <sup>2</sup>			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Entrance to General Foods Industrial Site						
2015 Existing						
Westbound DE 273 Left-Turn	C	C	B	B (11.0)	B (14.8)	B (10.8)
Northbound General Foods Entrance	N/A	N/A	N/A	B (12.0)	C (15.2)	B (11.8)
2018 without development						
Westbound DE 273 Left-Turn	C	C	B	B (11.6)	C (17.5)	B (11.7)
Northbound General Foods Entrance	N/A	N/A	N/A	B (12.5)	C (17.2)	B (12.6)
2018 with development						
Westbound DE 273 Left-Turn	C	C	B	B (12.4)	C (19.5)	B (14.0)
Northbound General Foods Entrance	N/A	N/A	N/A	B (13.2)	C (18.7)	B (14.5)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The Consultant did not report the northbound total approach LOS. Also, for LOS values reported, the consultant did not report the seconds of delay.

**Table 6**  
**PEAK HOUR LEVELS OF SERVICE (LOS)**  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

<b>Signalized Intersection<sup>1</sup></b>	<b>LOS per TIS</b>			<b>LOS per DeIDOT<sup>2</sup></b>		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Entrance to White Clay Center / Stafford Way						
2015 Existing	C (29.6)	C (30.1)	B (17.8)	B (18.9)	C (32.4)	B (10.5)
2018 without development	C (28.4)	C (34.6)	C (30.8)	C (20.2)	D (52.0)	C (27.7)
2018 with development	C (23.5)	D (42.3)	C (32.6)	B (19.1)	D (53.8)	C (29.0)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> For the review of the analysis, DeIDOT used optimized signal timings, whereas the Consultant, in preparation of the analysis, used field-measured signal timings. Additionally, DeIDOT removed the northbound right-turn volume from the analysis – the northbound right-turn is channelized and has an acceleration lane on Delaware Route 273.

Table 7  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Unsignalized Intersection <sup>1</sup>	LOS per TIS <sup>2</sup>			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Old Ogletown Road / Augusta Drive						
2015 Existing						
Eastbound Old Ogletown Road Left-Turn	A	A	A	A (7.3)	A (7.3)	A (7.3)
Westbound Old Ogletown Road Left-Turn	A	A	A	A (7.3)	A (7.5)	A (7.4)
Northbound Augusta Drive	N/A	N/A	N/A	A (8.9)	A (9.2)	A (9.1)
Southbound Industrial Park Entrance	N/A	N/A	N/A	A (9.7)	B (10.3)	A (9.3)
2018 without development						
Eastbound Old Ogletown Road Left-Turn	A	A	A	A (7.3)	A (7.3)	A (7.3)
Westbound Old Ogletown Road Left-Turn	A	A	A	A (7.3)	A (7.5)	A (7.4)
Northbound Augusta Drive	N/A	N/A	N/A	A (8.9)	A (9.3)	A (9.2)
Southbound Industrial Park Entrance	N/A	N/A	N/A	A (9.7)	B (10.3)	A (9.4)
2018 with development						
Eastbound Old Ogletown Road Left-Turn	A	A	A	A (7.3)	A (7.3)	A (7.3)
Westbound Old Ogletown Road Left-Turn	A	A	A	A (7.3)	A (7.5)	A (7.4)
Northbound Augusta Drive	N/A	N/A	N/A	A (8.9)	A (9.4)	A (9.3)
Southbound Industrial Park Entrance	N/A	N/A	N/A	A (9.8)	B (10.4)	A (9.6)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The Consultant did not report the northbound and southbound total approach LOS. Also, for LOS values reported, the consultant did not report the seconds of delay.



Table 8  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Unsignalized Intersection <sup>1</sup>	LOS per TIS <sup>2</sup>			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Old Ogletown Road / Sullivan Drive						
2015 Existing						
Eastbound Old Ogletown Road Left-Turn	A	A	A	A (7.4)	A (7.5)	A (7.4)
Southbound Sullivan Drive	N/A	N/A	N/A	A (9.3)	A (9.6)	A (9.3)
2018 without development						
Eastbound Old Ogletown Road Left-Turn	A	A	A	A (7.4)	A (7.5)	A (7.4)
Southbound Sullivan Drive	N/A	N/A	N/A	A (9.4)	A (9.6)	A (9.4)
2018 with development						
Eastbound Old Ogletown Road Left-Turn	A	A	A	A (7.4)	A (7.5)	A (7.4)
Southbound Sullivan Drive	N/A	N/A	N/A	A (9.4)	A (9.7)	A (9.5)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The Consultant did not report the southbound total approach LOS. Also, for LOS values reported, the consultant did not report the seconds of delay.

Table 9  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

All-Way Stop-Controlled Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Old Ogletown Road / Bala Road / Delaware Route 273 Ramp						
2015 Existing	A (8.42)	B (10.74)	A (8.31)	A (8.51)	A (8.45)	A (8.00)
2018 without development	A (8.45)	B (10.80)	A (8.33)	A (8.54)	A (8.50)	A (8.03)
2018 with development	A (8.46)	B (11.25)	A (8.51)	A (8.56)	A (8.60)	A (8.10)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 10  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT <sup>2</sup>		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Ruthar Drive						
2015 Existing	C (22.0)	C (22.0)	B (11.9)	C (20.7)	C (23.5)	B (10.5)
2018 without development	C (24.0)	D (38.6)	B (14.0)	C (22.5)	D (37.2)	B (11.6)
2018 with development	C (31.0)	D (54.8)	C (28.4)	C (26.0)	D (54.0)	C (20.3)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> DelDOT removed the southbound right-turn volume from the analysis – the southbound right-turn is channelized and has an acceleration lane on Delaware Route 273.

Table 11  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Unsignalized Intersection <sup>1</sup>	LOS per TIS <sup>2</sup>			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Ruthar Drive / Gabor Industrial Complex Entrance						
2015 Existing						
Eastbound Ruthar Drive Left-Turn	A	A	A	A (9.9)	A (10.0)	A (7.6)
Northbound Gabor Drive	D	D	D	C (21.1)	D (28.3)	B (10.9)
Southbound Office Entrance	C	D	B	C (16.0)	C (22.8)	B (13.1)
2018 without development						
Eastbound Ruthar Drive Left-Turn	B	B	A	B (10.8)	B (10.9)	A (8.2)
Northbound Gabor Drive	E	E	E	D (31.9)	F (*)	C (17.5)
Southbound Office Entrance	D	F	E	E (35.5)	F (*)	F (52.0)
2018 with development						
Eastbound Ruthar Drive Left-Turn	B	C	B	B (11.2)	B (11.4)	A (9.0)
Northbound Gabor Drive	F	F	F	E (37.9)	F (*)	D (28.3)
Southbound Office Entrance	F	F	F	E (43.5)	F (*)	F (*)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> For the LOS values reported, the Consultant did not report the seconds of delay.

Table 12  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DeIDOT <sup>2</sup>		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Red Mill Road / Ruthar Drive						
2015 Existing	C (30.3)	D (39.7)	C (27.0)	C (25.1)	C (31.8)	C (22.0)
2018 without development	C (32.2)	D (53.7)	C (27.5)	C (27.9)	D (55.0)	C (27.4)
2018 with development	D (35.1)	E (62.5)	D (39.9)	C (29.6)	E (63.0)	C (30.4)
2018 with development – with improvement <sup>3</sup>	C (32.4)	D (43.7)	C (33.7)	C (28.4)	D (38.5)	C (28.4)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> DeIDOT removed all right-turn volume from the analysis – the right-turns on each approach are channelized and have acceleration lanes on their receiving routes.

<sup>3</sup> This improvement consists of the addition of an eastbound left-turn lane.

Table 13  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Bala Road / Red Mill Road						
2015 Existing	F (355.4)	F (375.3)	F (216.7)	F (101.5)	F (87.4)	C (28.2)
2018 without development	F (351.8)	F (360.5)	F (209.2)	F (107.3)	F (115.7)	C (29.6)
2018 with development	F (336.5)	F (342.4)	F (191.2)	F (109.8)	F (132.1)	D (36.6)
2018 with development – with improvements <sup>2</sup>	N/A	N/A	N/A	D (48.8)	D (36.5)	C (32.1)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> Improvements at this intersection would consist of the installation of an exclusive left-turn lane along the southbound Red Mill Road approach and the addition of a through lane along the eastbound Delaware Route 273 approach.

Table 14  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Unsignalized Intersection <sup>1</sup>	LOS per TIS <sup>2</sup>			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Red Mill Road / Connection to Prides Crossing						
2015 Existing						
Eastbound Connector Left-Turn	N/A	N/A	N/A	N/A	N/A	N/A
Southbound Red Mill Road	N/A	N/A	N/A	N/A	N/A	N/A
2018 without development						
Eastbound Connector Left-Turn	N/A	N/A	N/A	N/A	N/A	N/A
Southbound Red Mill Road	N/A	N/A	N/A	N/A	N/A	N/A
2018 with development						
Eastbound Connector Left-Turn	N/A	N/A	N/A	B (10.3)	B (13.3)	A (8.6)
Southbound Red Mill Road	N/A	N/A	N/A	F (*)	F (389.5)	B (14.3)

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<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

<sup>2</sup> The Consultant analyzed the incorrect intersection in this instance.

Table 15  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DeIDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Salem Church Road						
2015 Existing	C (31.7)	C (24.2)	B (13.8)	B (19.9)	B (17.6)	B (12.9)
2018 without development	D (41.0)	D (35.6)	B (17.0)	C (22.4)	C (20.6)	B (15.0)
2018 with development	D (53.0)	D (47.1)	C (26.7)	C (25.5)	C (24.1)	B (19.7)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.



Table 16  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Capital Trail / Red Mill Road						
2015 Existing	E (66.1)	F (80.9)	D (43.0)	F (117.2)	F (101.5)	D (45.5)
2018 without development	E (78.8)	F (108.3)	D (47.8)	F (134.7)	F (128.3)	E (58.2)
2018 with development	F (84.1)	F (109.0)	E (58.0)	F (138.9)	F (136.1)	E (75.3)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 17  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Marrows Road						
2015 Existing	C (24.5)	C (27.4)	C (23.9)	C (22.0)	C (28.9)	C (22.6)
2018 without development	C (26.0)	C (28.7)	C (25.1)	C (23.4)	C (29.5)	C (25.2)
2018 with development	C (31.3)	C (33.2)	D (38.4)	C (27.1)	D (35.7)	D (49.7)

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<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 18  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
Delaware Route 273 / Library Avenue / Capital Trail						
2015 Existing	C (24.1)	D (35.7)	D (40.4)	C (28.0)	D (43.8)	D (35.4)
2018 without development	C (25.5)	D (47.1)	C (30.4)	C (29.1)	D (52.5)	D (40.8)
2018 with development	C (29.8)	E (58.2)	F (89.8)	C (32.1)	E (60.2)	F (94.1)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 19  
 PEAK HOUR LEVELS OF SERVICE (LOS)  
 Avon Property - TIS  
 Prepared by Landmark Science and Engineering, Inc.

Signalized Intersection <sup>1</sup>	LOS per TIS			LOS per DelDOT		
	Weekday AM	Weekday PM	Saturday Mid-day	Weekday AM	Weekday PM	Saturday Mid-day
East Delaware Avenue / Library Avenue / College Square Access						
2015 Existing	C (26.9)	D (47.8)	D (43.5)	C (27.8)	D (54.8)	D (49.9)
2018 without development	C (28.2)	D (53.9)	D (47.3)	C (30.7)	E (63.4)	E (66.1)
2018 with development	C (30.8)	E (61.8)	E (67.5)	D (37.2)	E (75.3)	F (117.7)

<sup>1</sup> The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.