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

SHAILEN P. BHATT
SECRETARY

July 21, 2014

Mr. Carl Wilson
The Traffic Group, Inc.
Suite H
9900 Franklin Square Drive
Baltimore, MD 21236

Dear Mr. Wilson:

The enclosed Traffic Impact Study (TIS) review letter for the **Duck Creek Business Campus** (Tax Parcels 28-002.00-001 & 28-002.00-002) has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Standards and Regulations for Subdivision Streets and State Highway Access and other accepted practices and procedures for such studies. DelDOT accepts this review letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel
Project Engineer

TEB:km
Enclosures
cc with enclosures: Mr. Mark Parker, Becker Morgan Group, Inc.
Ms. Constance C. Holland, Office of State Planning Coordination
Ms. Eileen Fogarty, New Castle County Department of Land Use
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Owen Robatino, New Castle County Department of Land Use
Mr. David Hugg, Town of Smyrna
Mr. Andrew Parker, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Frederick H. Schranck, Deputy Attorney General
Robert McCleary, Director, Transportation Solutions (DOTS)
Drew Boyce, Director, Planning
Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS
Mark Tudor, Assistant Director, Project Development North, DOTS
J. Marc Coté, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Thomas E. Meyer, Traffic Studies Manager, Traffic, DOTS
Mark Alexander, Canal District Engineer, Canal District, DOTS
Kevin Canning, Canal District Public Works Engineer, Canal District, DOTS
Wayne Henderson, Service Development Planner, Delaware Transit Corporation
John Garcia, New Castle Subdivision Coordinator, Development Coordination
Pao Lin, Subdivision Manager, Development Coordination
Ahmed Abdelmoteleb, New Castle Traffic Engineer, Traffic, DOTS
Marco Boyce, Planning Supervisor, Statewide & Regional Planning
Claudy Joinville, Project Engineer, Development Coordination

July 18, 2014

Mr. Troy E. Brestel
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1655
Traffic Impact Study Services
Task No. 1 Subtask 1A – Duck Creek Business Campus

Dear Mr. Brestel,

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Duck Creek Business Campus prepared by The Traffic Group. (TTG), dated February 6, 2014. This review was assigned as Task Number 1 (Subtask 1A). TTG prepared the report in a manner generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*.

The TIS evaluates the impacts of the Duck Creek Business Campus, proposed to be located on the south side of Paddock Road (New Castle Road 30), bounded by Brick Store Landing Road (New Castle Road 30A) and Delaware Route 1 (New Castle Road 80), east of US Route 13 (DuPont Parkway / New Castle Road 1), within the Town of Smyrna in New Castle County, Delaware. The proposed development would consist of 420,000 square feet of office space and 960,000 square feet of general light industrial space on approximately 206 acres of land. Two full access points are proposed, one on Paddock Road and one on US Route 13. Construction is anticipated to be complete by 2018.

The land is currently zoned as IORP (Industrial Office Research Park) within the Town of Smyrna, and the developer does not propose to change the zoning.

DelDOT has no relevant active projects within the study area, although an Access Management Study in the early stages of development for the US Route 13 Corridor in Smyrna is currently on hold pending the results of this TIS. In correspondence included in the TIS, Mr. Bill Brockenbrough from the DelDOT Division of Planning notes that the intent of the Access Management Study is to develop a system of service roads and parking lots along the rear property lines of the strip development along US Route 13 in the study area and to also identify potential easement locations for the purpose of providing access for future development located on the west side of US Route 13. The goal is to create a boulevard section along US Route 13 from Duck Creek to the Delaware Route 1 interchange. This boulevard section would include improved pedestrian facilities along the business front and parking in the rear of the buildings.

This way, as the area redevelops, local business traffic can utilize the service roads for access and parking while creating a boulevard setting for shops and pedestrians along the frontage.

Ideally, the service road serving businesses along northbound US Route 13 and the Duck Creek Business Campus would share an access point on Paddock Road, and the service road would also intersect with the roadway for the business campus entrance on US Route 13. This scenario should be considered in the development of the site plan for the Duck Creek Business Campus, however, not enough is known about the redevelopment in this area to include the service road traffic in the TIS analysis.

Regarding DelDOT's Hazard Elimination Program (HEP), Glenwood Avenue (Delaware Route 300 / Kent Road 454) from School Lane to US Route 13 was selected as a 2009 site. The focus of this HEP site designation is to reduce the angle crash patterns along Glenwood Avenue at the Smyrna Mart shopping center driveways west of US Route 13. None of the HEP design alternatives involved upgrades to the intersection of Glenwood Avenue with US Route 13. There were a few recommended minor signing and pavement marking upgrades for this intersection, which have already been implemented.

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

The intersections shown below would not meet DelDOT's LOS criteria without the implementation of physical roadway and/or traffic control improvements. Many of these Level of Service (LOS) deficiencies would not be anticipated to occur and/or would not be as severe if a full-movement site access is built along US Route 13 (as in Case 3B).

Intersection	***Existing Traffic Control***	***Situations for which deficiencies occur***
Paddock Road & Site Entrance	N/A	2018 PM with Duck Creek Business Campus and limited access on US Route 13 (Case 3A)
US Route 13 & Paddock Road / Joe Goldsborough Road (New Castle Road 487)	Signalized	2018 with Duck Creek Business Campus (Case 3A AM & PM, and Case 3B PM)
Duck Creek Road / North Main Street (Kent Road 65) & Duck Creek Parkway (Kent Road 134)	Unsignalized	2013 Existing AM (Case 1); 2018 AM without and with Duck Creek Business Campus (Cases 2, 3A & 3B)
US Route 13 & Delaware Route 1 Northbound Ramps	Unsignalized	2018 AM & PM without and with Duck Creek Business Campus (Cases 2, 3A & 3B)

Should the Town of Smyrna choose to approve the proposed development with the full-movement site access along US Route 13, 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 improve Paddock Road from US Route 13 to Brick Store Landing Road as needed in order to meet DelDOT's minor collector road standards. These standards include but are not limited to twelve-foot travel lanes and eight-foot shoulders. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lane's pavement section and recommend an overlay thickness to the developer's engineer if necessary. This improvement can be deferred until the proposed Site Entrance on Paddock Road is to be constructed (as described below in Item No. 2).

2. The developer should construct the Site Entrance on Paddock Road. This entrance driveway should be located approximately 800 feet east of US Route 13, as shown in the Site Location Map on Page 11. The proposed configuration is shown in the table below:

Approach	Current Configuration	Proposed Configuration
Northbound Site Entrance	Approach does not exist	One left-turn lane and one right-turn lane
Eastbound Paddock Road	One through lane	One through lane and one right-turn lane
Westbound Paddock Road	One through lane	One left-turn lane and one through 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 during the site plan review process.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Site Entrance	200 feet *	50 feet *
Eastbound Paddock Road	N/A	290 feet **
Westbound Paddock Road	210 feet **	N/A

* turn-lane length based on storage length per queuing analysis, with 50-foot minimum
** turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*

3. The developer should construct the Site Entrance on US Route 13. This entrance driveway should be located approximately 2,100 feet south of Paddock Road, as shown in the Site Location Map on Page 11. The proposed configuration is shown in the table below:

Approach	Current Configuration	Proposed Configuration
Northbound US Route 13	One left-turn/u-turn lane and two through lanes	One left-turn/u-turn lane, two through lanes and one right-turn lane
Southbound US Route 13	One u-turn lane and two through lanes	Two left-turn lanes and two through lanes
Westbound Site Entrance	Approach does not exist	Two left-turn lanes and one 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 during site plan review process.

Approach	Left-Turn Lane(s)	Right-Turn Lane
Northbound US Route 13	150 feet*	485 feet **
Southbound US Route 13	445 feet **	N/A
Westbound Site Entrance	535 feet **	740 feet **

* indicates existing turn lane length, final length to be determined by DelDOT during site plan review process

** turn-lane length based on storage length per queuing analysis

The developer should coordinate with DelDOT to determine design details and implementation of this improvement. If the intersection needs a fourth leg to accommodate the low-volume mobile home park driveway that exists on the west side of US Route 13 across from the approximate location of the proposed site entrance, DelDOT should work with the developer to determine details for that fourth leg.

The proposed site entrance on US Route 13 would initially be built as an unsignalized intersection. Therefore, the second southbound and westbound left-turn lanes described in the table above may be constructed initially, but would be striped out and closed to traffic until installation and implementation of the future traffic signal.

4. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and the 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 implementation and equitable cost sharing of the traffic signal. While a contribution to the Traffic Signal Revolving Fund is an alternative, there is no apparent reason why doing so would be to the developer's advantage.

Before implementing the improvements described above in Item No. 3, the developer should conduct a signal justification analysis and have it approved by DelDOT. Details of this analysis should be determined through coordination with DelDOT's Traffic Section.

5. The developer should improve the intersection of US Route 13 and Paddock Road / Joe Goldsborough Road. The proposed configuration is shown in the table below. The developer should coordinate with DelDOT to determine the design details of this improvement, how this improvement is to be implemented, and who should implement it. DelDOT may assign responsibility for implementing some of these improvements to other developments in the area; notably, the improvements on Joe Goldsborough Road may be assigned to the developer of the Watson Farm. This improvement can be deferred until the proposed Site Entrance on Paddock Road is to be constructed (as described above in Item No. 2).

Approach	Current Configuration	Proposed Configuration
Northbound US Route 13	One left-turn lane, two through lanes, and one right-turn lane	One left-turn lane, two through lanes, and one right-turn lane
Southbound US Route 13	One left-turn lane, two through lanes, and one right-turn lane	One left-turn lane, two through lanes, and one right-turn lane
Eastbound Joe Goldsborough Road	One shared through/left/right-turn lane	One left-turn lane and one shared through/right-turn lane
Westbound Paddock Road	One shared through/left-turn lane and one right-turn lane	One left-turn lane, one through lane, and one 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 during the site plan review process.

Approach	Left-Turn Lane(s)	Right-Turn Lane
Northbound US Route 13	180 feet *	270 feet *
Southbound US Route 13	695 feet **	50 feet *
Eastbound Joe Goldsborough Road	50 feet *	N/A
Westbound Paddock Road	400 feet *	610 feet *

* turn-lane length based on storage length per queuing analysis of Case 3B with improvements and US Route 13 protected-only left turns

** turn-lane length based on storage length per queuing analysis, of Case 3B with improvements and US Route 13 protected-only left turns, but length is limited by proximity to existing upstream median crossover

6. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and Paddock Road / Joe Goldsborough Road. The agreement will cover the signal adjustments required by the physical improvements noted in Item No. 5. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. Other developers may enter into a traffic signal agreement for this intersection as well. The developer should coordinate their efforts with DelDOT on the implementation and equitable cost sharing of the traffic signal. Alternatively, the developer may contribute to the Traffic Signal Revolving Fund.

7. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Duck Creek Road / North Main Street and Duck Creek Parkway. The agreement should include pedestrian signals, crosswalks and interconnection at DelDOT's discretion. Other developers may enter into a traffic signal agreement for this intersection as well. The developer should coordinate their efforts with DelDOT on the implementation and equitable cost sharing of the traffic signal. Alternatively, the developer may contribute to the Traffic Signal Revolving Fund.

8. The developer should enter into a traffic signal agreement with DelDOT for the intersection of US Route 13 and the Delaware Route 1 Northbound Ramps. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. Other developers may enter into a traffic signal agreement for this intersection as well. The developer should coordinate their efforts with DelDOT on the implementation and equitable cost sharing of

the traffic signal. Alternatively, the developer may contribute to the Traffic Signal Revolving Fund.

9. The developer should contribute towards the installation of a traffic signal and related improvements at the intersection of US Route 13 and the Delaware Route 1 Northbound Ramps, not covered by the signal agreement described above in Item No. 8. DelDOT has indicated that a signal was previously warranted for this location and is currently scheduled to be constructed within the next two years contingent on funding availability. Design plans for these improvements are being prepared by DelDOT and are currently in progress. If it is determined that additional proposed developments would contribute to higher traffic volumes at this intersection, those developers should be responsible for sharing the cost of this improvement. The developer should coordinate with DelDOT to determine the design details of this improvement, how this improvement is to be implemented, and who should implement it.

10. The following bicycle, pedestrian, and transit 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 eastbound Paddock Road at the site entrance.
    b. Adjacent to the right-turn lane added to eastbound Paddock Road at the 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.
    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 the building entrances within this development. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
    f. A 15-foot wide easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontages along Paddock Road and Brick Store Landing Road. Within the easement along Paddock Road, a minimum of a ten-foot wide shared-use path that meets current AASHTO and ADA standards should be constructed along the site frontage. The shared-use path should have a minimum of a five-foot buffer from the roadway. At all property boundaries, the shared-use path should connect to the shoulder of Paddock Road in accordance with DelDOT's *Shared Use Path and/or Sidewalk Termination Policy* dated September 16, 2013. The developer should coordinate with DelDOT to determine design details, implementation, and/or contribution towards the construction of this shared-use path. If it is physically impossible to construct one or more portions of the path, DelDOT will discuss alternatives with the developer.
    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 development. These sidewalks should each be a minimum of five feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. These internal sidewalks should connect the building entrances to the proposed frontage shared-use path along Paddock Road and to the potential bus shelter along US Route 13, if one is built there.
i. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to eliminate vehicular overhang onto the sidewalk.
j. The developer should coordinate with the Delaware Transit Corporation regarding the possibility of adding an ADA-compliant bus stop pad with a bus pull-off and amenities such as a shelter, trash receptacle, and lighting at the Paddock Road and/or US Route 13 proposed site entrance to the Duck Creek Business Campus. Internal sidewalks should be connected to any new transit facilities and parking facilities for bicyclists should be included. The developer should coordinate with the DTC regarding the details and implementation of the transit-related improvements.

11. Due to the proximity of the proposed development to the Smyrna Airport, we recommend that deed restrictions be required similar to the attached Avigation Nuisance Easement and Non-Suit Covenant (pages 32 and 33). The applicant should contact Mr. Michael Kirkpatrick at (302) 760-2153 of DelDOT's Statewide and Regional Planning Section to determine whether the proposed development is within the Runway Protection Zone. If so, restrictions may apply.

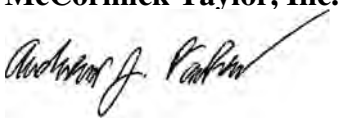
Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml. For any additional information regarding 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.

Please note that this review generally focuses on capacity and level of service issues; additional safety and operational issues will be further addressed through DelDOT's subdivision review process.

Additional details on our review of this TIS are attached. Please contact me at (302) 738-0203 or through e-mail at ajparker@mtmail.biz if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.



Andrew J. Parker, P.E., PTOE
Project Manager

Enclosure

General Information

Report date: February 6, 2014
Prepared by: The Traffic Group, Inc. (TTG)
Prepared for: KRM Development Corp.
Tax parcel: 28-002.00-001 & 28-002.00-002
Generally consistent with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*: Yes

Project Description and Background

Description: The proposed development would consist of 420,000 square feet of office space and 960,000 square feet of general light industrial space.
Location: Duck Creek Business Campus is proposed to be located on the south side of Paddock Road (New Castle Road 30), bounded by Brick Store Landing Road (New Castle Road 30A) and Delaware Route 1 (New Castle Road 80), east of US Route 13 (DuPont Parkway / New Castle Road 1), within the Town of Smyrna in New Castle County, Delaware. A site location map is included on Page 11.
Amount of land to be developed: approximately 206 acres of land
Land use approval(s) needed: Subdivision approval. The land is currently zoned as IORP (Industrial Office Research Park) within the Town of Smyrna, and the developer does not propose to change the zoning.
Proposed completion date: 2018
Proposed access locations: Two full access points are proposed, one on Paddock Road and one on US Route 13.
Daily Traffic Volumes (per DelDOT Traffic Summary 2012):

- 2012 Average Annual Daily Traffic on Paddock Road: 2,456 vpd
- 2012 Average Annual Daily Traffic on US Route 13: 29,241 vpd


1
PADDOCK ROAD
DELAWARE EMERGENCY MANAGEMENT AGENCY
BRICK STORE LANDING ROAD
BRICK STORE LANDING ROAD
SMYRNA LANDING ROAD
KOREAN WAR VETERANS MEMORIAL HIGHWAY
WAWA
DUPONT PKWY
TRUE VALUE
13
McDONALD'S
ACME
ROYAL FARMS
MAPLE ST
OAK DRIVE
HARKINS DRIVE
FAIRFIELD DRIVE
LARAGO DRIVE
BALDWIN DRIVE
Site Location Map
Entrances
N
not to scale
Graphics is approximation only. Based on conceptual site plan included in TIS dated February 4, 2014.

Delaware Strategies for State Policies and Spending – 2010 Update

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed Duck Creek Business Campus is mainly located in an Investment Level 2 area. Portions of the site are also located within Investment Level 1 and the area along the northern banks of Duck Creek is located within an Out of Play area. Based on the Site Plan for the proposed Duck Creek Business Campus, no buildings or roads will be constructed within the Out of Play area.

Investment Level 1

Investment Level 1 Areas are areas of the state that are most prepared for growth and where the state can make cost-effective infrastructure investments for schools, roads, and public safety. In these 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. Investment Level 1 Areas are often municipalities, towns, or urban/urbanizing places in counties. Density is generally higher than in the surrounding areas. 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.

Investment Level 2

Investment Level 2 Areas, like Investment Level 1 Areas, are areas prepared for growth and where the state can make cost-effective infrastructure investments for schools, roads, and public safety. In these 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. Investment Level 2 Areas serve as transition areas between Level 1 and the state's more open, less populated areas.

Out of Play

These lands which are not at all available for development include publicly-owned lands, lands for which serious legal and/or environmental constraints on development are identified, and lands in some form of permanent open-space protection.

Proposed Development's Compatibility with Strategies for State Policies and Spending: The proposed Duck Creek Campus is located within Investment Level 1 and Level 2 areas, and is to be developed as a mix of office space and light industrial use. This type of development is consistent with the character of Investment Level 1 and Level 2 areas, as it will bring high-quality employers close to existing infrastructure, services and residences. It is therefore concluded that the proposed development generally complies with the policies stated in the 2010 update of the "Strategies for State Policies and Spending."

Comprehensive Plan

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

The New Castle County Comprehensive Plan Future Land Use Map indicates that the proposed Duck Creek Business Campus development is within a municipality. The specific permitted uses and densities governing new construction within an incorporated municipality will be governed by that municipality's zoning ordinance, its public water and sewer capacities, and its comprehensive planning policies.

Town of Smyrna Comprehensive Plan:
(Source: Smyrna U.S. 13 Corridor Plan and Design Book, dated November 15, 2012)

An official, certified version of the Town of Smyrna's Comprehensive Plan was last updated in August 2005, but a Comprehensive Plan Update is currently pending certification. As part of the pending update, planning information for the US Route 13 corridor was updated in late 2012 with the development of the *US 13 Corridor Plan*, which was submitted to the State of Delaware as a Comprehensive Plan Amendment. The goals of the *US 13 Corridor Plan* are to update the land use and transportation facilities along US Route 13 and transform the look, feel and function of the corridor to better suit Smyrna's vision. This will include aesthetic and operational enhancements to better serve motorists, pedestrians and cyclists and link the historic Town of Smyrna with the new growth to the north and south. The limits of the master plan stretch from the northern Delaware Route 1 interchange to the southern Delaware Route 1 interchange on either end of Smyrna, which encompasses the entire portion of US Route 13 within the TIS study area. Materials included in that *US 13 Corridor Plan* are referenced below.

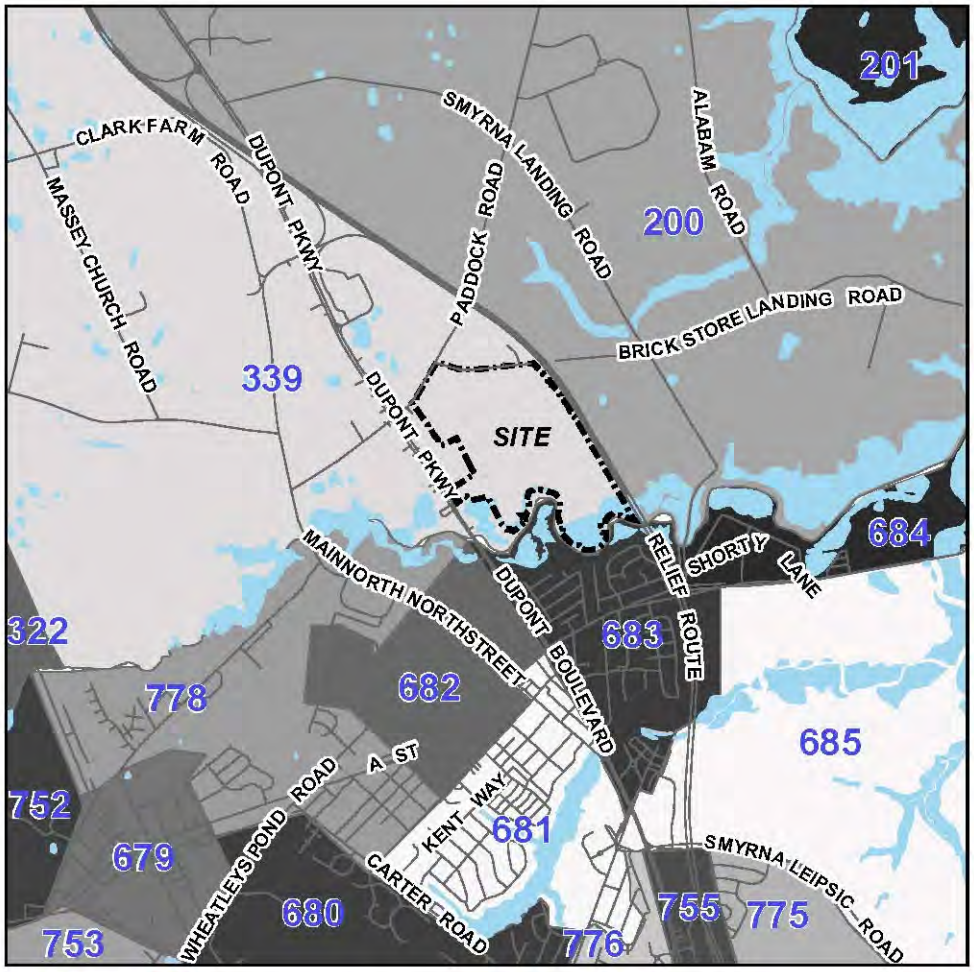
On the Existing Land Use Map (dated 2010), the proposed development is shown as Employment Center / Light Industry. The draft Future Land Use Map shows this area as Employment Center. As envisioned in the US 13 Corridor Plan, in the Northern Section of the Corridor adjacent to the proposed Duck Creek Business Campus, the intersection of US Route 13 and Paddock Road would become a node for development activity that extends to Duck Creek and begins to create a road network in the properties to the east. The intersection would function as an entrance into the town of Smyrna, alerting drivers that they are entering a unique place. The creation of a road network to the southeast incorporates those properties as a development site for less visibility-dependent uses such as an office park or light industrial uses, as was originally planned as the Duck Creek Business Park and included as an Employment Center.

Proposed Development's Compatibility with Comprehensive Plans: The proposed Duck Creek Business Campus is planned to consist of 420,000 square feet of office space and 960,000 square feet of general light industrial space. Given the site's current IORP (Industrial Office Research Park) within the Town of Smyrna and the draft future land use designation of Employment Center, this development appears to be compatible with the New Castle County and Town of Smyrna Comprehensive Plans.

Transportation Analysis Zones (TAZ)

Transportation Analysis Zones (TAZ) where development would be located: 339

TAZ Boundaries:



Current employment estimate for TAZ: 349 jobs in 2010
Future employment estimate for TAZ: 779 jobs in 2035
Current population estimate for TAZ: 1,040 people in 2010
Future population estimate for TAZ: 4,951 people in 2035
Current household estimate for TAZ: 350 houses in 2010
Future household estimate for TAZ: 1,794 houses in 2035
Relevant committed developments in TAZ: None
Would the addition of committed developments to current estimates exceed future projections: No
Would the addition of committed developments and the proposed development to current estimates exceed future projections: No for populations and households, unknown for employment

Relevant Projects in the DelDOT Capital Transportation Program (FY 2014 – FY 2019)

DelDOT has no relevant active projects within the study area, although an Access Management Study in the early stages of development for the US Route 13 Corridor in Smyrna is currently on hold pending the results of this TIS. In correspondence included in the TIS, Mr. Bill Brockenbrough from the DelDOT Division of Planning notes that the intent of the Access Management Study is to develop a system of service roads and parking lots along the rear property lines of the strip development along US Route 13 in the study area and to also identify potential easement locations for the purpose of providing access for future development located on the west side of US Route 13. The goal is to create a boulevard section along US Route 13 from Duck Creek to the Delaware Route 1 interchange. This boulevard section would include improved pedestrian facilities along the business front and parking in the rear of the buildings.

This way, as the area redevelops, local business traffic can utilize the service roads for access and parking while creating a boulevard setting for shops and pedestrians along the frontage. Ideally, the service road serving businesses along northbound US Route 13 and the Duck Creek Business Campus would share an access point on Paddock Road, and the service road would also intersect with the roadway for the business campus entrance on US Route 13. This scenario should be considered in the development of the site plan for the Duck Creek Business Campus, however, not enough is known about the redevelopment in this area to include the service road traffic in the TIS analysis.

Regarding DelDOT's Hazard Elimination Program (HEP), Glenwood Avenue (Delaware Route 300 / Kent Road 454) from School Lane to US Route 13 was selected as a 2009 site. The focus of this HEP site designation is to reduce the angle crash patterns along Glenwood Avenue at the Smyrna Mart shopping center driveways west of US Route 13. None of the HEP design alternatives involved upgrades to the intersection of Glenwood Avenue with US Route 13. There were a few recommended minor signing and pavement marking upgrades for this intersection, which have already been implemented.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Ninth 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:

- 420,000 square feet of General Office (ITE Land Use Code 710)
- 960,000 square feet of Light Industrial (ITE Land Use Code 110)

Table 1
DUCK CREEK BUSINESS CAMPUS PEAK HOUR TRIP GENERATION

Land Use	**AM Peak Hour**			**PM Peak Hour**		
	In	Out	Total	In	Out	Total
420,000 sf general office space	531	72	603	93	456	549
960,000 sf light industrial	919	125	1044	146	1069	1215
TOTAL TRIPS	**1450**	**197**	**1647**	**239**	**1525**	**1764**

Table 2
DUCK CREEK BUSINESS CAMPUS DAILY TRIP GENERATION

Land Use	**Weekday ADT**		
	In	Out	Total
420,000 sf general office space	1,954	1,954	3,908
960,000 sf light industrial	3,535	3,535	7,070
TOTAL TRIPS	**5,489**	**5,489**	**10,978**

Overview of TIS

Intersections examined:

1) Paddock Road & Site Entrance
2) US Route 13 & Site Entrance
3) Paddock Road & Brick Store Landing Road
4) US Route 13 & Paddock Road / Joe Goldsborough Road (New Castle Road 487)
5) US Route 13 & Glenwood Avenue
6) Duck Creek Road (New Castle Road 486) & Joe Goldsborough Road
7) Duck Creek Road / North Main Street (Kent Road 65) & Duck Creek Parkway (Kent Road 134)
8) US Route 13 & Delaware Route 1 Southbound Ramps / Duck Creek Road
9) US Route 13 & Delaware Route 1 Northbound Ramps

Conditions examined:

1) 2013 existing conditions (Case 1)
2) 2018 without Duck Creek Business Campus (Case 2)
3) 2018 with Duck Creek Business Campus and limited access (rights-in/rights-out/lefts-in) on US Route 13 (Case 3A)
4) 2018 with Duck Creek Business Campus and full access on US Route 13 (Case 3B)

Note: Traffic counts from 2006 were approved to be reused for purposes of this study.

Peak hours evaluated: Weekday morning and evening peak hours

Committed developments considered:

1) Smyrna Medical Center (120,000 square feet of medical/dental office space; approx. 33% built and in use at the time of the 2006 traffic counts)

Intersection Descriptions

1) Paddock Road & Site Entrance

Type of Control: proposed two-way stop-controlled (T-intersection)
Northbound approach: (Site Entrance) proposed one left-turn lane and one right-turn lane, stop-controlled
Eastbound approach: (Paddock Road) existing one through lane; proposed one through lane and one right-turn lane
Westbound approach: (Paddock Road) existing one through lane; proposed one left-turn lane and one through lane

2) US Route 13 & Site Entrance

Type of Control: existing unsignalized median crossover; proposed signalized three-leg intersection
Northbound approach: (US Route 13) existing one left-turn/u-turn lane and two through lanes; proposed two through lanes and one right-turn lane
Southbound approach: (US Route 13) existing one u-turn lane and two through lanes; proposed two left-turn lanes and two through lanes
Westbound approach: (Site Entrance) proposed two left-turn lanes and one right-turn lane

3) Paddock Road & Brick Store Landing Road

Type of Control: two-way stop-controlled (T-intersection)
Northbound approach: (Brick Store Landing Road) one shared left/right-turn lane, stop-controlled
Eastbound approach: (Paddock Road) one shared through/right-turn lane
Westbound approach: (Paddock Road) one shared through/left-turn lane

4) US Route 13 & Paddock Road / Joe Goldsborough Road

Type of Control: signalized four-leg intersection
Northbound approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane
Southbound approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane
Eastbound approach: (Joe Goldsborough Road) one shared left/through/right-turn lane
Westbound approach: (Paddock Road) one shared through/left-turn lane and one channelized right-turn lane

5) US Route 13 & Glenwood Avenue
Type of Control: signalized four-leg intersection
Northbound approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane
Southbound approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane
Eastbound approach: (Glenwood Avenue) one exclusive left-turn lane, one shared through/left-turn lane, and one right-turn lane
Westbound approach: (Business Driveway) one left-turn lane and one shared left/through/right-turn lane

6) Duck Creek Road & Joe Goldsborough Road
Type of Control: two-way stop-controlled (T-intersection)
Northbound approach: (Duck Creek Road) one through lane and one right-turn lane
Southbound approach: (Duck Creek Road) one shared through/left-turn lane
Westbound approach: (Joe Goldsborough Road) one shared left/right-turn lane, stop-controlled

7) Duck Creek Road / North Main Street & Duck Creek Parkway
Type of Control: two-way stop-controlled (T-intersection)
Northbound approach: (North Main Street) one shared through/left-turn lane
Southbound approach: (Duck Creek Road) one shared through/right-turn lane
Eastbound approach: (Duck Creek Parkway) one shared left/right-turn lane, stop-controlled

8) US Route 13 & Delaware Route 1 Southbound Ramps / Duck Creek Road
Type of Control: signalized four-leg intersection
Northbound approach: (US Route 13) one left-turn lane, two through lanes, and one channelized right-turn lane
Southbound approach: (US Route 13) one left-turn lane, two through lanes, and one right-turn lane
Eastbound approach: (Duck Creek Road) one shared left/through/right-turn lane
Westbound approach: (Delaware Route 1 Southbound Ramp) one exclusive left-turn lane, one shared through/left-turn lane, and one channelized right-turn lane

9) US Route 13 & Delaware Route 1 Northbound Ramps
Type of Control: two-way stop-controlled (T-intersection)
Northbound approach: (US Route 13) one left-turn lane and two through lanes
Southbound approach: (US Route 13) two through lanes and one channelized right-turn
Eastbound approach: (Delaware Route 1 Northbound Ramp) one stop-controlled left-turn lane and one yield-controlled channelized right-turn lane

Safety Evaluation

Crash Data: Crash data was obtained for January 21, 2011 through January 21, 2014 for the intersections and roadway segments within the study area. The crash data request returned a total of 108 reportable crashes, including 2 fatal crashes and 33 injuries. Most of the crashes occurred along the high volume US Route 13 corridor and were of the angle and front-to-rear varieties. The contributing circumstances are typically due to driver error via inattention, failure to yield/disregarding signal, careless driving, and following too close. There were three alcohol related crashes. The crashes at or near each intersection are as follows:

- Paddock Road & Brick Store Landing Road
  - 1 crash reported (injury)
- US 13 & Paddock Road / Joe Goldsborough Road
  - 23 crashes reported (12 property damage, 10 injury, 1 fatal)
- US 13 & Glenwood Avenue (SR 300)
  - 33 crashes reported (21 property damage, 12 injury)
- Duck Creek Road & Joe Goldsborough Road
  - 7 crashes reported (5 property damage, 2 injury)
- Duck Creek Parkway & Duck Creek Road / North Main Street
  - 2 crashes reported (2 property damage)
- US 13 & SR 1 Southbound Ramps / Duck Creek Road
  - 26 crashes reported (20 property damage, 6 injury)
- US 13 & SR 1 Northbound Ramps
  - 16 crashes reported (13 property damage, 2 injury, 1 fatal)

Sight Distance: With generally straight and flat roadways, and few potential visual obstructions, sight distance is adequate throughout the study area. No problematic sight distance issues have been reported or indicated by crash data, and no major problems were observed during field observations in the area.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: The Delaware Transit Corporation (DTC) currently operates Inter County Bus DART Route 301 which connects Wilmington and Dover. The nearest stop is at the Smyrna Rest Stop Park & Ride, approximately 1.2 miles to the north of the site. The overall goal of the service is to reduce one-way travel time for commuters between Dover and Wilmington, making the commute comparable to that of a single-occupant vehicle. The route currently operates 16 round trips on weekdays and two round trips on Saturdays. The DTC also operates local Kent County DART Route 120 serving Dover, Cheswold and Smyrna via US Route 13. This route begins/ends at the Smyrna Rest Stop Park & Ride and also stops on US Route 13 at Mount Vernon Street, approximately 0.75 miles south of the site. Route 120 currently operates 21 round trips per day. During the summer months, the DTC also offers the Beach Connection Bus Route 305 from Wilmington to the Rehoboth Beach Park & Ride on weekends and holidays. This route also stops at the Smyrna Rest Stop Park & Ride.

Planned transit service: TTG contacted Mr. Wayne Henderson, Service Development Planner for the DTC, on January 27th, 2014 to determine whether DTC has any additional routes planned to serve the area. Mr. Henderson provided comments on January 28th, 2014 mentioning the existing DART Routes 301 and 120 that currently serve the area. He suggested planning an efficiently located central stop for local bus Route 120, depending on the type of businesses and number of employees the proposed business campus generates. The TIS states that the developer will contact DTC regarding the possibility of creating a bus stop at Paddock Road or near the proposed access point on US Route 13.

Existing bicycle and pedestrian facilities: According to DelDOT's Kent County Bicycle Map, US Route 13 is designated as a Connector Bicycle Route with a bikeway and Paddock Road is classified as a Connector Bicycle Route without a bikeway. US Route 13 has wide shoulders, except where turn lanes are present at intersections, and no designated bike lanes. Paddock Road currently features narrow gravel shoulders and no designated bike lanes. According to the bicycle level of service (BLOS) calculator developed by the *League of Illinois Bicyclists*, US Route 13 operates at BLOS A and Paddock Road operates at BLOS D. There are no existing sidewalks along either US Route 13 or Paddock Road along the proposed site frontage. There are no pedestrian facilities at any of the study area intersections, except for the intersection of US Route 13 and Glenwood Avenue which features crosswalks, pedestrian signals and ADA compliant curb ramps for the southern, eastern and western legs of the intersection.

Planned bicycle and pedestrian facilities: TTG contacted Marco Boyce, Anthony Aglio and Daniel Lacombe with DelDOT's Bicycle and Pedestrian Facilities Team via email on January 27, 2014 regarding planned or requested bicycle and pedestrian facilities in the area of this proposed development. Mr. Boyce deferred to Mr. Aglio and Mr. Lacombe, but the developer did not document any further response and we assume none was received. McCormick Taylor also contacted Marco Boyce and Anthony Aglio via email on March 27, 2014 but no response was received.

Previous Comments

All comments from DelDOT's Scoping Letter, Preliminary TIS (PTIS) Review and updated PTIS Review were addressed in the Final TIS submission, with the following exceptions:

- There were no indications that the applicant either identified the amount of development that can proceed before access on Paddock Road is necessary or demonstrated that the site entrance on US Route 13 and the intersection of US Route 13 and Paddock Road will operate acceptably before the Paddock Road access and associated intersection improvements are installed. These were requested in the Scoping Letter.
- There were no indications that the developer resolved an issue with DelDOT's Traffic Section in which Traffic Section wanted the development's entrance on Paddock Road limited to right turns only.

General HCS Analysis Comments

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

1) For unsignalized intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized intersections, the TIS and McCormick Taylor applied HV by lane group. For future conditions, the TIS generally assumed a future HV equal to existing HV, but sometimes assumed 2% for movements where existing HV is less than 2% and significant changes in volumes are expected. The TIS also assumed 2% HV for future movements to and from the proposed site access points. McCormick Taylor assumed future HV to be the same as existing HV, and assumed 3% HV for future movements to and from the proposed site access points on US Route 13 and Paddock Road, per DelDOT's Subdivision Manual.

2) For existing conditions, the TIS and McCormick Taylor determined, for each intersection, overall intersection peak hour factors (PHF). For future conditions, the TIS and McCormick Taylor assumed future PHF equal to existing PHF. The TIS and McCormick Taylor analyzed the intersection of Duck Creek Parkway and Duck Creek Road / North Main Street for the AM peak hour with a default PHF of 0.88 in addition to the existing PHF of 0.60 to illustrate how the intersection would operate without a high-volume 15 minute peak interval due to two nearby schools on Duck Creek Parkway.

3) For analyses of signalized intersections, McCormick Taylor used a base saturation flow rate of 1,750 pcphgpl per DelDOT's Subdivision Manual. The developer did not note the base saturation flow rates used in their analysis, either in the letter or the capacity analysis appendix.

4) The HCS analyses included in the TIS did not always reflect the lane widths observed in the field by McCormick Taylor. McCormick Taylor's HCS analyses incorporated our field-measured lane widths.

5) The TIS and McCormick Taylor used different signal timings when analyzing the signalized intersections in some cases.

6) The TIS and McCormick Taylor conservatively input no right-turn-on-red (RTOR) volumes for existing and future conditions analyses, but did analyze right-turn movements as overlapping protected left-turn phases.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [1] **Two-Way Stop Control**	**LOS per TIS**		**LOS per McCormick Taylor**	
Paddock Road & Site Entrance	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 with Duck Creek Business Campus and Limited Access on US 13 (Case 3A)				
Northbound Site Entrance	C (20.0)	F (444.6)	C (20.1)	F (446.3)
Westbound Paddock Road – Left	A (9.6)	A (7.8)	A (9.6)	A (7.8)
2018 with Duck Creek Business Campus and Full Access on US 13 (Case 3B)				
Northbound Site Entrance	C (15.7)	D (29.8)	C (15.8)	D (30.0)
Westbound Paddock Road – Left	A (9.6)	A (7.8)	A (9.6)	A (7.8)

Signalized Intersection [1]	**LOS per TIS**		**LOS per McCormick Taylor**	
Paddock Road & Site Entrance	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 with Duck Creek Business Campus and Limited Access on US 13 (Case 3A) *With Improvement Option 1* [2]	A (9.3)	C (20.8)	A (9.0)	C (20.5)

[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.
[2] Improvement Option 1 for Case 3A (2018 full build with limited access to US 13) is a signalized intersection with a left turn lane and a shared left/right-turn lane on the northbound Site Entrance approach.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Signalized Intersection [3]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Site Entrance [4]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 with Duck Creek Business Campus and Limited Access on US 13 (Case 3A)	B (12.9)	B (12.3)	B (13.1)	B (16.5)
2018 with Duck Creek Business Campus and Full Access on US 13 (Case 3B)	C (24.7)	C (29.7)	C (20.4)	C (27.0)

[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.
[4] The analysis for the proposed signalized intersection did not include a fourth leg accessing the mobile home community directly west of US Route 13 from the proposed site access. The minimal traffic generated from the mobile home community will not have a significant impact on the operations of the signal.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [5] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Paddock Road & Brick Store Landing Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)				
Northbound Brick Store Landing Road	B (11.6)	B (11.6)	B (11.6)	B (11.6)
Westbound Paddock Road – Left	A (8.1)	A (7.6)	A (8.0)	A (8.6)
2018 without Duck Creek Business Campus (Case 2)				
Northbound Brick Store Landing Road	B (12.1)	B (12.2)	B (12.1)	B (12.2)
Westbound Paddock Road – Left	A (8.2)	A (7.6)	A (8.1)	A (8.7)
2018 with Duck Creek Business Campus (Case 3A & 3B)				
Northbound Brick Store Landing Road	B (13.1)	B (13.5)	B (13.1)	B (13.6)
Westbound Paddock Road – Left	A (8.2)	A (7.8)	A (8.1)	A (9.1)

[5] 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 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Signalized Intersection [6]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Paddock Road / Joe Goldsborough Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)	C (25.5)	C (29.0)	C (30.8)	C (33.4)
2018 without Duck Creek Business Campus (Case 2)	C (28.1)	C (32.2)	C (33.3)	D (37.2)
2018 with Duck Creek Business Campus (Case 3A)	E (70.1)	F (212.8)	E (71.4)	F (189.2)
2018 with Duck Creek Business Campus (Case 3A) *With Improvement Option 1* [7]	D (46.9)	F (139.2)	D (53.5)	F (134.1)
2018 with Duck Creek Business Campus (Case 3B)	E (57.3)	F (95.5)	D (50.5)	D (49.3)
2018 with Duck Creek Business Campus (Case 3B) *With Protected Lefts Only*	N/A	N/A	D (54.5)	E (58.1)
2018 with Duck Creek Business Campus (Case 3B) *With Improvement Option 1* [6]	D (46.9)	D (40.9)	D (43.6)	D (37.6)
2018 with Duck Creek Business Campus (Case 3B) *With Protected Lefts Only & Improvement Option 1* [7]	N/A	N/A	D (47.1)	D (39.0)

[6] 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.
[7] Improvement Option 1 consists of adding separate left-turn lanes to the eastbound Joe Goldsborough Road approach and the westbound Paddock Road approach.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Signalized Intersection [8]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Glenwood Avenue	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)	C (21.0)	C (24.1)	C (26.0)	C (26.1)
2018 without Duck Creek Business Campus (Case 2)	C (23.4)	C (27.8)	C (26.8)	C (27.3)
2018 with Duck Creek Business Campus (Case 3A & 3B)	C (31.0)	D (35.9)	D (37.3)	D (39.0)

[8] 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 8
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [9] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Duck Creek Road & Joe Goldsborough Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)				
Southbound Duck Creek Road – Left	A (8.2)	A (7.9)	A (8.2)	A (7.8)
Westbound Joe Goldsborough Road	B (14.3)	B (13.2)	B (14.0)	B (12.2)
2018 without Duck Creek Business Campus (Case 2)				
Southbound Duck Creek Road – Left	A (8.4)	A (8.0)	A (8.3)	A (7.9)
Westbound Joe Goldsborough Road	C (15.5)	B (14.1)	C (15.1)	B (13.0)
2018 with Duck Creek Business Campus (Case 3A & 3B)				
Southbound Duck Creek Road – Left	A (8.6)	A (8.1)	A (8.6)	A (8.0)
Westbound Joe Goldsborough Road	C (16.1)	C (18.9)	C (15.6)	C (16.7)

[9] 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 9
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [10] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
Duck Creek Road / North Main Street & Duck Creek Parkway	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)				
Northbound N. Main Street – Left	A (8.4)	A (8.2)	A (8.4)	A (8.2)
Eastbound Duck Creek Parkway	F (255.1)	B (14.2)	F (256.9)	B (14.2)
2013 Existing (Case 1) *with AM Peak PHF = 0.88*				
Northbound N. Main Street – Left	A (7.9)	-	A (8.0)	-
Eastbound Duck Creek Parkway	C (23.9)	-	C (23.9)	-
2018 without Duck Creek Business Campus (Case 2)				
Northbound N. Main Street – Left	A (8.5)	A (8.2)	A (8.5)	A (8.4)
Eastbound Duck Creek Parkway	F (308.0)	B (13.2)	F (310.1)	B (15.0-)
2018 without Duck Creek Business Campus (Case 2) *with AM Peak PHF = 0.88*				
Northbound N. Main Street – Left	A (8.2)	-	A (8.0)	-
Eastbound Duck Creek Parkway	D (26.2)	-	D (26.4)	-
2018 with Duck Creek Business Campus (Case 3A & 3B)				
Northbound N. Main Street – Left	A (8.6)	A (8.4)	A (8.6)	A (8.7)
Eastbound Duck Creek Parkway	F (432.1)	B (14.9)	F (438.0) [11]	C (17.6)
2018 with Duck Creek Business Campus (Case 3A & 3B) *with AM Peak PHF = 0.88*				
Northbound N. Main Street – Left	A (8.0)	-	A (8.0)	-
Eastbound Duck Creek Parkway	D (33.3)	-	D (33.5) [12]	-

[10] 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.
[11] The 95th percentile queue length for the eastbound approach during the Case 3 AM peak hour (with PHF = 0.60 as determined by actual peak hour count data) is approximately 37 vehicles.
[12] The 95th percentile queue length for the eastbound approach during the Case 3 AM peak hour (with PHF = 0.88) is approximately 7 vehicles.

Table 9 (continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Signalized Intersection [13]	**LOS per TIS**		**LOS per McCormick Taylor**	
Duck Creek Road / North Main Street & Duck Creek Parkway	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 with Duck Creek Business Campus (Case 3A & 3B) *With Improvement Option 1* [14]	N/A	N/A	D (41.4)	B (10.5)

[13] 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.
[14] Improvement Option 1 consists of converting the existing unsignalized intersection to a signalized intersection and the addition of a separate right-turn lane and left-turn lane on the eastbound Duck Creek Parkway approach. Analysis was performed for the AM peak hour with PHF = 0.60.

Table 10
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Signalized Intersection [15]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Delaware Route 1 Southbound Ramps / Duck Creek Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)	C (32.9)	C (21.5)	D (46.1)	D (39.5)
2018 without Duck Creek Business Campus (Case 2)	D (39.3)	C (23.7)	D (53.4)	C (24.1)
2018 with Duck Creek Business Campus (Case 3A & 3B)	D (50.7)	C (29.3)	D (54.4)	C (30.4)

[15] 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 11
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Duck Creek Business Campus
Report dated February 6, 2014
Prepared by The Traffic Group, Inc.

Unsignalized Intersection [16] **Two-Way Stop Control (T-intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Delaware Route 1 Northbound Ramps	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2013 Existing (Case 1)				
Northbound US Route 13 – Left	B (12.0)	B (11.1)	B (11.8)	B (11.0)
Eastbound SR 1 Northbound Off-Ramp	D (30.1)	C (22.6)	D (34.8)	D (29.7)
2018 without Duck Creek Business Campus (Case 2)				
Northbound US Route 13 – Left	B (14.1)	B (12.1)	B (13.8)	B (12.1)
Eastbound SR 1 Northbound Off-Ramp	E (47.1)	D (28.7)	F (55.2)	E (40.5)
2018 with Duck Creek Business Campus (Case 3A & 3B)				
Northbound US Route 13 – Left	D (32.5)	C (16.7)	D (30.7)	C (16.6)
Eastbound SR 1 Northbound Off-Ramp	F (84.9)	F (134.7)	F (91.8) [17]	F (191.1) [18]

Signalized Intersection [16]	**LOS per TIS**		**LOS per McCormick Taylor**	
US Route 13 & Delaware Route 1 Northbound Ramps	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 with Duck Creek Business Campus (Case 3A & 3B) *With Improvement Option 1* [19]	C (26.7)	B (19.4)	D (39.8)	C (34.4)

[16] 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.
[17] The 95th percentile queue length for the eastbound left-turn movement during the Case 3 AM peak hour is approximately 5 vehicles.
[18] The 95th percentile queue length for the eastbound left-turn movement during the Case 3 PM peak hour is approximately 7 vehicles.
[19] Improvement Option 1 consists of converting the existing unsignalized intersection to a signalized intersection. TIS assumed protected-permitted northbound left turns, while McCormick Taylor assumed protected-only left turns.

Avigation Nuisance Easement & Non-Suit Covenant

This indenture made this _____ day of _____, 20_____, by and between _____, hereinafter referred to as Grantor, and _____ hereinafter referred to as Grantee, witnesseth:

WHEREAS the Grantor is the owner in fee of a certain parcel of land ("the Property") in the County of _____, State of Delaware; and

WHEREAS said parcel of land is near or adjacent to _____, an operating airport ("Airport"); and

WHEREAS the Grantee is the owner of said airport; and

WHEREAS the Grantor proposes to make a use of said Property and to develop thereon the following:

_____

_____

_____

_____

, which use and development require approval by Municipal and County authorities subject to the applicable provisions of law; and

WHEREAS the Grantor has been advised that the subject Property is located adjacent to the Airport; that the present and future impacts of Airport operations might be considered annoying to users of the Property for its stated purpose and might interfere with the unrestricted use and enjoyment of the Property in its intended use; that these Airport impacts might change over time, for example and not by way of limitation by an increase in the number of aircraft using the Airport, louder aircraft, seasonal variations, and time-of-day variations; that changes in Airport, air traffic control operating procedures or in Airport layout could result in increased noise impacts; and that the Grantor's and users' own personal perceptions of the noise exposure could change and that his or her sensitivity to aircraft noise could increase;

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements and conditions contained herein, the parties hereto agree as follows:

Grantor does hereby grant a permanent nuisance and avigation easement ("Easement") to Grantee over all of the following described real estate:

By virtue of this agreement, the Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to Grantee or any successor agency legally authorized to operate said airport, any and all claims for damage of any kind whatsoever incurred as a result of aircraft using the Easement granted herein regardless of any future changes in volume or character of aircraft overflights, or changes in airport design and operating policies, or changes in air traffic control procedures.

The Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, does further hereby covenant and agree with the Grantee, its successors and assigns, that it will not, from and after the effective date hereof, sue, prosecute, molest, or trouble the Grantee, its successors and assigns, in respect to or on account of the flight of any and all aircraft over or near the said parcel of land, or for any effects resulting wherefrom including but not limited to noise, air pollution, or any and all other possible damages to or taking of said property resulting from such flights.

These covenants and agreements shall run with the land of the Grantor, as hereinabove described, for the benefit of the Grantee, and its successors and assigns in the ownership, use and operation of the aforesaid Airport.

Grantee, its successors and assigns, shall have and hold said Easement and all rights appertaining thereto until said Airport shall be abandoned and shall cease to be used for airport purposes.

If any provision of this Easement or any amendments hereto, or the application thereof to any person, thing or circumstances is held invalid, such invalidity shall not affect the provisions or application of this Easement or such amendments that can be given effect without the invalid provisions or application, and to this end the provisions of this Easement and such amendments are declared to be severable.

IN WITNESS WHEREOF, the Grantor has hereunto set its hand and seal the day and year first above written.

_____(SEAL)

_____(SEAL)

NOTARY ACKNOWLEDGEMENT

STATE OF DELAWARE

ss.

COUNTY OF KENT

BE IT REMEMBERED that on this _____ day of _____, 20_____ personally, came before me, the subscriber, a Notary Public for the State and County aforesaid,
_____, party(ies) to this Indenture, known to me personally to be such, and acknowledged this Indenture, to his/her (their) act or deed.

GIVEN under my Hand and Seal of office the day and year first above written.

_____
Notary Public, State of Delaware

My Commission Expires _____