



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

JENNIFER COHAN
SECRETARY

March 4, 2020

Mr. Brian Clarke
Duffield Associates, Inc.
5400 Limestone Road
Wilmington, DE 19808

Dear Mr. Clarke:

The enclosed Traffic Impact Study (TIS) review letter for the **747 North DuPont Highway** (Protocol Tax Parcel 2-05-06805-01-1500-00001) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this 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. James Taylor, Duffield Associates
Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Dave Hugg, City of Dover
Ms. Dawn Melson-Williams, City of Dover
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.
Ms. Joanne Arellano, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General

Drew Boyce, Director, Planning

Shanté Hastings, Director, Transportation Solutions (DOTS)

Mark Luszcz, Deputy Director, Traffic, DOTS

Michael Simmons, Assistant Director, Project Development South, DOTS

J. Marc Coté, Assistant Director, Development Coordination

T. William Brockenbrough, Jr., County Coordinator, Development Coordination

Peter Haag, Chief Traffic Engineer, Traffic, DOTS

Chris Sylvester, Traffic Studies Manager, Traffic, DOTS

Matthew Lichtenstein, Central District Engineer, Central District

Richard McCabe, Central District Public Works Engineer, Central District

David Dooley, Service Development Planner, Delaware Transit Corporation

Stephen Wright, Kent Review Coordinator, Development Coordination

Anthony Aglio, Planning Supervisor, Statewide & Regional Planning

Joshua Schwartz, Subdivision Manager, Development Coordination

Jeff Steward, Kent Plan Reviewer, Central District

Mark Galipo, Traffic Engineer, Traffic, DOTS

Claudy Joinville, Project Engineer, Development Coordination



March 4, 2020

Mr. Troy Brestel
Project Engineer
Development Coordination
DelDOT Division of Planning
800 Bay Road
P O Box 778
Dover, DE 19903

RE: Agreement No. 1945F
Project Number T202069012
Traffic Impact Study Services
Task 1A-747 North DuPont Highway (DuPont Plaza)

Dear Mr. Brestel:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for 747 North DuPont Highway (DuPont Plaza), prepared by Duffield Associates, Inc. dated October 2019. This task was assigned as Task Number 1A. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of a proposed shopping center in the City of Dover, Kent County, Delaware. The development would be comprised of 51,075 square-feet of retail space and an 11,185 square-foot high turnover sit-down restaurant.

The site is located on the east side of US Route 13, south of Leipsic Road (Kent Road 88). Two access points along Leipsic Road, with one access via an existing entrance for the Comfort Inn & Suites Hotel were proposed as part of the May 8, 2019 DelDOT Scoping Meeting Memorandum. However, per the TIS, the previously proposed interconnection with the adjacent Comfort Inn & Suites Hotel is no longer being pursued. As a result, the TIS has modified the site traffic distribution to account for only one full access along Leipsic Road and a rights-in/rights-out access along northbound US Route 13. The subject property is on an approximately 10.00-acre portion of a 25-acre parcel that is zoned as SC-2 (Community Shopping Center) and rezoning is not needed to permit the proposed land use. Construction is anticipated to be complete in 2020.

DelDOT has several relevant and ongoing improvement projects within the study area. The US 13 Circulation Plan was developed in 2008 to reevaluate land use and roadway interconnections in north Dover centering on US Route 13. The study area for the Circulation Plan is bounded by the US Route 13/Jefferic Boulevard intersection to the south, the US Route 13/Scarborough Road intersection to the north, Delaware Route 1 to the east, and Silver Lake to the west. The purpose of the project was to determine how future development and traffic growth will affect the operation of the US Route 13 corridor and to develop potential roadway connector options that could be utilized to redistribute traffic. Data on existing intersection turning movement volumes, intersection geometry, and signal timing was collected to complete the analysis in



Synchro/SimTraffic. Within the study area of the TIS, the Plan recommended constructing a north/south roadway on the east side of US Route 13 (East Side Connector) to run parallel to US Route 13. The roadway would extend south from Scarborough Road, pass under the existing Leipsic Road at the Delaware Route 1 bridge, and then turn to the west and intersect US Route 13 opposite Lepore Drive. The existing Leipsic Road from Dover Downs to US Route 13 would become a service road for Dover Downs, Dover Crossroads (Berry Property), and the Home Depot. A connection between the Leipsic Road service road and the East Side Connector would also be provided. Additionally, Crawford Carroll Boulevard would be extended to College Road. The Plan recommended that the improvements be implemented by developers as development plans are submitted to DelDOT or become part of the CTP and be prioritized in a way to accommodate the future growth in the area.

DelDOT is conducting a pedestrian safety audit along US Route 13. The audit involves evaluating existing pedestrian facilities, reviewing crash data, obtaining pedestrian, bicycle, and vehicle traffic counts, and reviewing DART ridership along US Route 13 from Puncheon Run Connector to Scarborough Road. The audit is anticipated to be completed in Spring 2020.

The *US 13 Sidewalk Improvements* project (DelDOT Contract No. T201601201) recently constructed a sidewalk/multi-use path along US Route 13 between Townsend Boulevard and Leipsic Road. Construction was completed in Winter of 2019.

Additionally, DelDOT's 2017 Hazard Elimination Program (HEP) included Site B, which is within the project area. Site B is a 0.25-mile east-west corridor along College Road from 0.25 miles west of US Route 13 to US Route 13. The US Route 13 intersection with College Road is included. The Site B report included a crash summary and field observations at the intersection. Signing and signal improvements were recommended and have been implemented.

The proposed site is located within the US 13/Bay Road Corridor Transportation Improvement District (TID) which was established in Fall 2014 with the signing of a Memorandum of Understanding between the City, DelDOT, and the Dover/Kent County MPO called the "Agreement Regarding Dover US Route 13/Bay Road Corridor Transportation Improvement District". Currently, the US 13/Bay Road Corridor TID is bordered by Scarborough Road in the north, Puncheon Run Connector in the south, Governors Avenue in the west, and Delaware Route 1 in the east. DelDOT is in the process of developing the Land Use Transportation Plan (LUTP). A completion date has not been established.

Based on our review of the TIS, we have the following comments and recommendations: The following intersections exhibit level of service (LOS) deficiencies without the implementation of physical roadway and/or traffic control improvements.



<i>Intersection</i>	<i>Situations for which LOS deficiencies occur</i>
Site Entrance/US Route 13 (Rights-in/Rights-out)	2020 Saturday with development (Case 3)
US Route 13/Kings Highway/White Oak Road (Kent Road 66) *	2020 PM without development (Case 2) 2020 PM with development (Case 3)
US Route 13/Leipsic Road/N. State Street (Kent Road 3) *	2016 PM and Saturday Existing (Case 1) 2020 PM and Saturday without development (Case 2) 2020 PM and Saturday with development (Case 3)
N. State Street/Lepore Drive (Kent Road 3B) **	2016 AM, PM, and Saturday Existing (Case 1) 2020 AM, PM, and Saturday without development (Case 2) 2020 AM, PM, and Saturday with development (Case 3)
N. State Street/Walker Road (Kent Road 70)/N. Governors Avenue (Kent Road 3) **	2016 AM, PM, and Saturday Existing (Case 1) 2020 AM, PM, and Saturday without development (Case 2) 2020 AM, PM, and Saturday with development (Case 3)
US Route 13/College Road (Kent Road 99) *	2016 PM Existing (Case 1) 2020 PM without development (Case 2) 2020 PM with development (Case 3)

*For coordinated signals, HCS analysis was performed utilizing splits provided on the DelDOT Timing Plans.

**For uncoordinated signals operating as free, HCS analysis was performed utilizing splits consistent with the MAX 1 timings from the DelDOT Timing Plan.

The unsignalized Site Entrance along US Route 13 is proposed approximately 450 feet south of the southeast tangent point of the Leipsic Road/N. State Street intersection and exhibits LOS deficiencies during the Saturday peak hour under future conditions with the proposed development. These deficiencies occur along the westbound Site Entrance approach and can be mitigated with the provision of a right turn lane along northbound US Route 13. A northbound US Route 13 right turn lane would improve the intersection to operate at acceptable LOS D (33.2 seconds of delay per vehicle) along the westbound Site Entrance approach during the Saturday peak hour under Case 3 conditions.

The US Route 13 signalized intersections with Kings Highway/White Oak Road, Leipsic Road/N. State Street, and College Road exhibit LOS deficiencies under existing and future conditions, with or without the proposed development. However, with signal timing split optimization, these intersections would improve to operate at LOS D or better during all peak hours under existing and future conditions, with or without the proposed development.

Although the US Route 13/Townsend Boulevard/Lakeview Drive intersection operates at acceptable LOS under existing and future conditions, extensive queue lengths exist along the northbound US Route 13 left turn lane. Specifically, under Cases 1, 2, and 3 conditions during the weekday PM and Saturday peak periods, 95th percentile queue lengths of approximately 200 feet would exist along the northbound US Route 13 left turn lane and not be accommodated within the approximately 120 feet storage length. It appears the storage length can be extended to accommodate the projected queue with widening along the median. However, based on discussions between DelDOT and the City of Dover, additional mitigation to address the projected queue lengths is not required as part of this development.



Although the US Route 13/Kings Highway/White Oak Road intersection operates at acceptable LOS under existing and future conditions with signal timing optimization, extensive queue lengths exist along every approach to the intersection under Cases 1, 2, and 3 conditions during the weekday AM, PM, and Saturday peak periods. Specifically, 95th percentile queue lengths of approximately 260 feet and 560 feet are projected along the eastbound Kings Highway left turn lane and through/right turn lane, respectively. The projected queue length along the eastbound Kings Highway left turn lane would not be accommodated within the approximately 110-foot storage length. The projected eastbound Kings Highway through queue would spillback past the S. Lakeview Drive intersection. Along the westbound White Oak Road approach, a 95th percentile queue length of approximately 610 feet is projected which would spillback past three residential streets. Along the northbound US Route 13 approach, a 95th percentile queue length of approximately 930 feet is projected which would spillback past Maple Parkway. Along the southbound US Route 13 left turn lane, a 95th percentile queue length of approximately 330 feet is projected and approximately 280 feet of storage is provided.

It appears the storage length can be extended along the southbound US Route 13 left turn lane to accommodate the projected queue with widening along the median. Additionally, as part of the TLBT, LLC Dover and the Playtex/McGinnis committed developments, improvements are proposed at the US Route 13/Kings Highway/White Oak Road intersection and include the provision of dual left turn lanes along the eastbound and westbound approaches. However, based on discussions between DelDOT and the City of Dover, additional mitigation to address the projected queue lengths is not required as part of this development.

Although the US Route 13/College Road intersection operates at acceptable LOS under existing and future conditions with signal timing optimization, extensive queue lengths exist along the eastbound College Road approach to the intersection. Specifically, under Cases 1, 2, and 3 conditions during the weekday PM and Saturday peak periods, 95th percentile queue lengths of approximately 370 feet would exist along the eastbound College Road approach. The projected queues would not be accommodated within the storage lengths provided along the eastbound approach and would spillback past the N. College Road intersection. Based on discussions between DelDOT and the City of Dover, additional mitigation to address the projected queue lengths is not required as part of this development.

The N. State Street signalized intersections with Lepore Drive and Walker Road/N. Governors Avenue exhibit LOS deficiencies during the weekday AM, PM, and Saturday peak hours under existing and future conditions, with or without the proposed development. However, with signal timing optimization, these intersections would improve to operate at LOS D or better during all peak hours under existing and future conditions, with or without the proposed development.

Although the N. State Street/Lepore Drive intersection operates at acceptable LOS under existing and future conditions with signal timing optimization, extensive queue lengths exist along the westbound Lepore Drive approach to the intersection. Specifically, under Cases 1, 2, and 3 conditions during the weekday AM and PM peak periods, 95th percentile queue lengths of approximately 370 feet would exist along the westbound Lepore Drive approach. The projected



queues would not be accommodated within the storage lengths provided and the queue would spillback past the Vista Avenue intersection. Based on discussions between DelDOT and the City of Dover, additional mitigation to address the projected queue lengths is not required as part of this development.

Although the N. State Street/Walker Road/N. Governors Avenue intersection operates at acceptable LOS under existing and future conditions with signal timing optimization, extensive queue lengths exist along the eastbound Walker Road and northbound N. State Street approaches to the intersection. Specifically, under Cases 1, 2, and 3 conditions during the weekday AM and PM peak periods, 95th percentile queue lengths of approximately 540 feet and 190 feet would exist along the eastbound Walker Road left turn and northbound N. State Street left turn, respectively. The projected queues would not be accommodated within the storage lengths provided and the queue along eastbound Walker Road would spillback past the N. Bradford Street intersection. Based on discussions between DelDOT and the City of Dover, additional mitigation to address the projected queue lengths is not required as part of this development.

Three access points were originally proposed for the development: two access points along Leipsic Road (a western access to serve as the main entrance and an eastern access to serve as a truck delivery access), and one rights-in/rights-out access along US Route 13. However, an interconnection with the Comfort Inn & Suites Hotel for the western access along Leipsic Road is not being pursued, so the TIS has evaluated the proposed development with only one access along Leipsic Road.

Based on DelDOT's *Development Coordination Manual*, a bypass lane is warranted along the westbound Leipsic Road approach to the Site Entrance. However, construction of a bypass lane would not be feasible at this location due to the auxiliary lanes for the Comfort Inn & Suites Hotel/Home Depot Entrance intersection located directly west of the Site Entrance intersection. Therefore, it is recommended that the developer restripe approximately 800 feet along Leipsic Road to provide a two-way left-turn lane (TWLTL) from the Comfort Inn & Suites Hotel entrance to the access road located behind the Home Depot. The developer should submit a plan to DelDOT depicting the design and limits of the two-way-left-turn lane.

Should the City of Dover approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. 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 provide a bituminous concrete overlay to the existing travel lanes along the eastbound Leipsic Road site frontage in the area affected by entrance plan construction, including any auxiliary lanes, at DelDOT's discretion. DelDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer, if necessary.



2. The developer should provide a bituminous concrete overlay to the existing travel lanes along the northbound US Route 13 site frontage in the area affected by entrance plan construction, including any auxiliary lanes, at DelDOT’s discretion. DelDOT should analyze the existing lanes’ pavement section and recommend an overlay thickness to the developer’s engineer, if necessary.

3. The developer should construct a full access site entrance for the proposed DuPont Plaza development on Leipsic Road, approximately 650 feet east of the southeast point of tangency of the intersection with US Route 13 to be consistent with the lane configurations shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Leipsic Road	One through lane	One two-way left turn lane, one through lane, and one right turn lane
Westbound Leipsic Road	One through lane	One two-way left turn lane and one through lane
Northbound Site Entrance	Approach does not exist	One shared left turn/right turn lane

Based on DelDOT’s Development Coordination Manual, the recommended minimum storage length is 190 feet (excluding taper) for the eastbound Leipsic Road right turn lane. The right turn lane should be designed as a continuous right turn lane starting just west of the Comfort Inn & Suites Hotel driveway located approximately 125 feet west of the Leipsic Road Site Entrance. The calculated queue lengths from the HCS analysis can be accommodated within the recommended storage length.

Additionally, the developer should install an approximately 800-foot two-way left-turn lane (TWLTL) along Leipsic Road from the Comfort Inn & Suites Hotel Entrance/Home Depot Entrance to the access road located behind the Home Depot. The developer should submit a plan to DelDOT’s Development Coordination Section and other pertinent Sections depicting the design and limits. The final design of the TWLTL and the Leipsic Road Site Entrance should be determined during the Entrance Plan review process.

4. The developer should construct a rights-in/rights-out site entrance for the proposed DuPont Plaza development on US Route 13, approximately 450 feet south of the southeast point of tangency of the intersection with Leipsic Road/N. State Road to be consistent with the lane configurations shown in the table below:



Approach	Current Configuration	Proposed Configuration
Northbound US Route 13	Three through lanes	Three through lanes and one right turn lane
Westbound Site Entrance	Approach does not exist	One right turn lane

Based on DelDOT’s Development Coordination Manual, the recommended minimum storage length is 240 feet (excluding taper) for the northbound US Route 13 right turn lane. However, there is an existing continuous right turn lane along northbound US Route 13 that begins at the Fairfield Inn & Suites driveway and terminates 125 feet south of the proposed site entrance. The developer should reconfigure the existing continuous right turn lane to terminate at the proposed site entrance. A channelizing island should be provided at the US Route 13 Site Entrance. The developer should submit a plan to DelDOT’s Development Coordination Section and other pertinent Sections depicting the design along the site frontage. The final design of the site entrance should be determined during the Entrance Plan review process.

5. Interconnections or cross access easements to the adjacent properties [764 Leipsic Road (Comfort Inn & Suites Hotel), 779 N. DuPont Highway (Pizza Hut), 737 N. DuPont Highway (Speedway Café), 705 N. DuPont Highway (Tasty Crabhouse), and 653 Jefferic Boulevard (Public Storage)] should be provided. The developer should coordinate with DelDOT’s Development Coordination Section to determine the locations and feasibilities of the interconnections.
6. A stub street for a future connection to Buckson Drive should be provided. The developer should coordinate with DelDOT’s Development Coordination Section to determine the exact location.
7. The following bicycle, pedestrian, and transit improvements should be included:
 - a. A minimum fifteen-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT along the US Route 13 site frontage.
 - b. The developer should construct a ten-foot wide sidewalk to match the sidewalk recently completed as part of the *US 13 Sidewalk Improvements* project (DelDOT Contract No. T201601201). The sidewalk should be designed to meet current AASHTO and ADA standards. A minimum five-foot setback should be maintained from the edge of the pavement to the sidewalk. The first five-feet of sidewalk counted inward can be included within the minimum five-foot setback. The developer should coordinate with



DelDOT's Development Coordination section during the plan review process to identify the exact location of the sidewalk.

- c. ADA compliant curb ramps and marked crosswalks should be provided along the Leipsic Road Site Entrance approach to Leipsic Road and the US Route 13 Site Entrance approach to US Route 13. The use of diagonal curb ramps is discouraged.
- d. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the eastbound Leipsic Road approach to the Leipsic Road Site Entrance and the northbound US Route 13 approach to US Route 13 Site Entrance.
- e. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks/shared-use paths or should be flush with the pavement.
- f. Bike parking should be provided near the building entrances. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
- g. Where internal sidewalks are located alongside of the parking spaces, a buffer, physical barrier, or signage should be added to eliminate vehicular overhang onto the sidewalk.
- h. An 8 to 10-foot wide walkway path should be installed through the site to connect from US Route 13 to Leipsic Road. The developer should coordinate with DelDOT's Development Coordination Section to determine the exact location of the walkway.
- i. A Type 2 bus stop should be installed at the Leipsic Road site entrance. The developer should coordinate with DART and DelDOT on the location, design, as well as the amenities to provide.

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 Plan Review process.

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 https://www.deldot.gov/Publications/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Don Weber, Assistant Director for Traffic Operations and Management. Mr. Weber can be reached at (302) 659-4651 or by email at Don.Weber@delaware.gov.



Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

A handwritten signature in black ink, appearing to read 'Joanne M. Arellano'.

Joanne M. Arellano, P.E., PTOE

cc: Mir Wahed, P.E., PTOE
Enclosure

General Information

Report date: October 2019

Prepared by: Duffield Associates, Inc.

Prepared for: Rojan DD 15, LLC

Tax Parcels: 2-05-068.05-01-15.00-00001

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

Project Description and Background

Description: The developer seeks to develop 51,075 square feet of retail space and an 11,185 square-foot high turnover sit-down restaurant.

Location: The subject site is located on the east side of US Route 13 and south of Leipsic Road (Kent Road 88), in the City of Dover.

Amount of Land to be developed: An approximately 10.00-acre portion of a 25-acre parcel.

Land Use approval(s) needed: Entrance Plan.

Proposed completion date: 2020.

Proposed access location: Two access points along Leipsic Road, with one access via an existing entrance for the Comfort Inn & Suites Hotel were proposed as part of the May 8, 2019 DelDOT Scoping Meeting Memorandum. However, per the TIS, the previously proposed interconnection with the adjacent Comfort Inn & Suites Hotel is no longer being pursued. As a result, the development is proposing only one full access along Leipsic Road and one rights-in/rights-out access along northbound US Route 13.

Daily Traffic Volumes:

- 2018 Average Annual Daily Traffic on US Route 13: 52,164 vehicles per day.
- 2018 Average Annual Daily Traffic on Leipsic Road: 4,738 vehicles per day

Site Map



**Graphic is an approximation based on the Site Development Master Plan prepared by Duffield Associates, Inc. dated July 3, 2019.*

Relevant and On-going Projects

DelDOT has several relevant and ongoing improvement projects within the study area. The US 13 Circulation Plan was developed in 2008 to reevaluate land use and roadway interconnections in north Dover centering on US Route 13. The study area for the Circulation Plan is bounded by the US Route 13/Jefferic Boulevard intersection to the south, the US Route 13/Scarborough Road intersection to the north, Delaware Route 1 to the east, and Silver Lake to the west. The purpose of the project was to determine how future development and traffic growth will affect the operation of the US Route 13 corridor and to develop potential roadway connector options that could be utilized to redistribute traffic. Data on existing intersection turning movement volumes, intersection geometry, and signal timing was collected to complete the analysis in Synchro/SimTraffic. Within the study area of the TIS, the Plan recommended constructing a north/south roadway on the east side of US Route 13 (East Side Connector) to run parallel to US Route 13. The roadway would extend south from Scarborough Road, pass under the existing

Leipsic Road at the Delaware Route 1 bridge, and then turn to the west and intersect US Route 13 opposite Lepore Drive. The existing Leipsic Road from Dover Downs to US Route 13 would become a service road for Dover Downs, Dover Crossroads (Berry Property), and the Home Depot. A connection between the Leipsic Road service road and the East Side Connector would also be provided. Additionally, Crawford Carroll Boulevard would be extended to College Road. The Plan recommended that the improvements be implemented by developers as development plans are submitted to DelDOT or become part of the CTP and be prioritized in a way to accommodate the future growth in the area.

DelDOT is conducting a pedestrian safety audit along US Route 13. The audit involves evaluating existing pedestrian facilities, reviewing crash data, obtaining pedestrian, bicycle, and vehicle traffic counts, and reviewing DART ridership along US Route 13 from Puncheon Run Connector to Scarborough Road. The audit is anticipated to be completed in Spring 2020.

The *US 13 Sidewalk Improvements* project (DelDOT Contract No. T201601201) recently constructed a sidewalk/multi-use path along US Route 13 between Townsend Boulevard and Leipsic Road. Construction was completed in Winter of 2019.

Additionally, DelDOT's 2017 Hazard Elimination Program (HEP) included Site B, which is within the project area. Site B is a 0.25-mile east-west corridor along College Road from 0.25 miles west of US Route 13 to US Route 13. The US Route 13 intersection with College Road is included. The Site B report included a crash summary and field observations at the intersection. Signing and signal improvements were recommended and have been implemented.

The proposed site is located within the US 13/Bay Road Corridor Transportation Improvement District (TID) which was established in Fall 2014 with the signing of a Memorandum of Understanding between the City, DelDOT, and the Dover/Kent County MPO called the "Agreement Regarding Dover US Route 13/Bay Road Corridor Transportation Improvement District". Currently, the US 13/Bay Road Corridor TID is bordered by Scarborough Road in the north, Puncheon Run Connector in the south, Governors Avenue in the west, and Delaware Route 1 in the east. DelDOT is in the process of developing the Land Use Transportation Plan (LUTP). A completion date has not been established.

Livable Delaware

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

Location with respect to the Strategies for State Policies and Spending Map of Delaware:

The proposed development is located within the Investment Level 1 area.

Investment Level 1

These areas are often municipalities, towns, or urban/urbanizing places in counties where density is generally higher than in surrounding areas. 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.

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. Further, Level 1 areas are the first priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity between neighborhoods and public facilities.

Proposed Development's Compatibility with Livable Delaware:

The proposed development is located in the Investment Level 1 area. According to Livable Delaware, Level 1 areas support and encourage a wide range of uses and enhance community identity and integrity. Additionally, redevelopment is encouraged on underused and abandoned sites. The proposed project promotes the redevelopment of an abandoned site with a shopping center use. Therefore, the proposed development is generally consistent with the 2015 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans

(Source: City of Dover 2019 Comprehensive Plan)

City of Dover Comprehensive Plan:

Per the *City of Dover Comprehensive Plan Land Development Plan Map*, the proposed development is in an area designated for commercial high intensity development.

Proposed Development's Compatibility with the City of Dover Comprehensive Plan:

Per the *City of Dover Comprehensive Plan Land Development Plan Map*, the proposed development is in an area designated for commercial high intensity development consisting of traditional shopping and retail centers. The proposed development is a shopping center. Therefore, the proposed development is generally consistent with the *City of Dover 2019 Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 10th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 820 (shopping center) and Land Use Code 932 (high turnover sit-down restaurant). The trip generation was approved by DelDOT during the PTIS review.

Table 1
DuPont Plaza Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
51,075 SF Shopping Center (ITE Code 820)	3,807	110	68	178	159	172	331	190	175	365
11,185 SF High Turnover Sit-down Restaurant (ITE Code 932)	1,255	61	50	111	68	42	110	64	62	126
Total Trips	5,062	171	118	289	227	214	441	254	237	491
Pass-by Trips for Shopping Center (ITE Code 820)*		-	-	-	54	59	113	49	46	95
Pass-by Trips for High Turnover Sit-down Restaurant (ITE Code 932)**		-	-	-	24	23	47	-	-	-
New Trips		171	118	289	149	132	281	205	191	396

*Pass-by percentages of 34% and 26% were applied to the PM and Saturday peak hours, respectively, consistent with the *ITE Trip Generation Handbook, 3rd Edition*.

**Pass-by percentage of 43% was applied to the PM peak hour, consistent with the *ITE Trip Generation Handbook, 3rd Edition*.

Overview of TIS

Intersections examined:

1. Leipsic Road (Kent Road 88)/Comfort Inn & Suites Hotel Entrance/Home Depot Entrance*
2. Site Entrance/Leipsic Road
3. Site Entrance/US Route 13 (rights-in/rights-out)
4. US Route 13/Townsend Boulevard/Lakeview Drive
5. US Route 13/Kings Highway/White Oak Road (Kent Road 66)
6. US Route 13/Leipsic Road/N. State Street (Kent Road 3)
7. N. State Street/Lepore Drive (Kent Road 3B)
8. N. State Street/Walker Road (Kent Road 70)/N. Governors Avenue (Kent Road 3)
9. US Route 13/College Road (Kent Road 99)

*Per the TIS, the previously proposed interconnection with the adjacent Comfort Inn & Suites Hotel is no longer being pursued. As a result, the intersection of Leipsic Road/Comfort Inn & Suites Hotel/Home Depot is no longer considered a site entrance.

Note: The May 8, 2019 DelDOT Scope of Work Memorandum listed the US Route 13/E. Division Street (Kent Road 16) and the US Route 13/Scarborough Road (Kent Road 294) intersections as study intersections. However, DelDOT has determined that those intersections do not need to be evaluated in the TIS due to their distance from the site, the small amount of traffic that the proposed development would send through them, and the difficulty of making further improvements at them.

Conditions examined:

1. Case 1 – Existing (2016)
2. Case 2 – 2020 without development
3. Case 3 – 2020 with development

Committed Developments considered:

1. TLBT, LLC Dover (36,000 square foot grocery store)

Peak hours evaluated: Weekday morning, Weekday evening, and Saturday midday peak hours.

Intersection Descriptions

1. Leipsic Road (Kent Road 88)/Comfort Inn & Suites Hotel Entrance/Home Depot Entrance

Type of Control: Existing unsignalized intersection (four-leg intersection)

Eastbound Approach: (Leipsic Road) Existing one left turn lane and one through lane

Westbound Approach: (Leipsic Road) Existing one left turn lane, one through lane, and one right turn lane

Northbound Approach: (Comfort Inn & Suites Hotel Entrance) Existing one shared left turn/through/right turn lane

Southbound Approach: (Home Depot Entrance) Existing one left turn lane and one right turn lane

2. Site Entrance/Leipsic Road

Type of Control: Existing unsignalized intersection (T-intersection)

Eastbound Approach: (Leipsic Road) Existing one through lane; proposed one through lane and one right turn lane

Westbound Approach: (Leipsic Road) Existing one through lane; proposed one shared left turn/through lane

Northbound Approach: (Site Entrance B) Proposed one shared left turn/right turn lane

3. Site Entrance /US Route 13 (rights-in/rights-out)

Type of Control: Proposed unsignalized intersection (T-intersection)

Westbound Approach: (Site Entrance) Proposed one right turn lane

Northbound Approach: (US Route 13) Existing three through lanes; proposed two through lanes and one shared through/right turn lane

Southbound Approach: (US Route 13) Existing three through lanes

4. US Route 13/Townsend Boulevard/Lakeview Drive

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (Lakeview Drive) Existing one shared left turn/through lane and one right turn lane

Westbound Approach: (Townsend Boulevard) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane

Northbound Approach: (US Route 13) Existing one left turn lane, three through lanes, and one channelized right turn lane

Southbound Approach: (US Route 13) Existing one left turn lane, two through lanes, and one shared through/right turn lane

5. US Route 13/Kings Highway/White Oak Road (Kent Road 66)

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (Kings Highway) Existing one left turn lane and one shared through/right turn lane

Westbound Approach: (White Oak Road) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane

Northbound Approach: (US Route 13) Existing one left turn lane, two through lanes and one shared through/right turn lane

Southbound Approach: (US Route 13) Existing one left turn lane, two through lanes, and one shared through/right turn lane

6. US Route 13/Leipsic Road/N. State Street (Kent Road 3)

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (N. State Street) Existing two left turn lanes, one shared left turn/through lane, and one channelized right turn lane

Westbound Approach: (Leipsic Road) Existing two left turn lanes, one through lane, and one channelized right turn lane

Northbound Approach: (US Route 13) Existing one left turn lane, three through lanes, and one channelized right turn lane*

Southbound Approach: (US Route 13) Existing one left turn lane, three through lanes, and one right turn lane

*Note: the left turn/u-turn lane along the northbound US Route 13 approach is located approximately 200 feet south of the intersection.

7. N. State Street/Lepore Drive (Kent Road 3B)/Hiawatha Lane

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (Hiawatha Lane) Existing one shared left turn/through/right turn lane

Westbound Approach: (Lepore Drive) Existing one left turn lane and one shared through/right turn lane

Northbound Approach: (N. State Street) Existing one left turn lane and one shared through/right turn lane

Southbound Approach: (N. State Street) Existing one left turn lane, one through lane, and one right turn lane

8. N. State Street/Walker Road (Kent Road 70)/N. Governors Avenue (Kent Road 3)

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (Walker Road) Existing one left turn lane and one right turn lane

North Eastbound Approach: (N. Governors Avenue) Existing one through lane

Northbound Approach: (N. State Street) Existing one left turn lane and one through lane

Southbound Approach: (N. State Street) Existing one through lane and one right turn lane

9. US Route 13/College Road (Kent Road 99)

Type of Control: Existing signalized intersection (four-legged intersection)

Eastbound Approach: (College Road) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane

Westbound Approach: (Shopping Center Entrance) Existing one left turn lane, one shared left turn/through lane, and one channelized right turn lane

Northbound Approach: (US Route 13) Existing two left turn lane, three through lanes, and one right turn lane

Southbound Approach: (US Route 13) Existing two left turn lanes, three through lanes, and one channelized right turn lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Delaware Transit Corporation (DTC) currently provides existing services within the study area via DART Routes 101, 108, 109, 112, and 301. Per the DelDOT Gateway, a bus stop exists at the proposed site entrance on Leipsic Road for DART Route 108. DART Route 101 provides 31 round trips on weekdays from 6:00 AM to 9:28 PM and 17 round trips on Saturdays from 9:00 AM to 5:28 PM. DART Route 108 provides 15 round trips on weekdays from 6:00 AM to 8:52 PM and 9 round trips on Saturdays from 9:00 AM to 5:52 PM. DART Route 109 provides 20 round trips on weekdays from 6:30 AM to 9:49 PM and 9 round trips on Saturdays from 9:30 AM to 6:19 PM. DART Route 112 provides 31 round trips on weekdays from 6:00 AM to 9:52 PM and 9 round trips on Saturdays from 9:30 AM to 6:22 PM. DART Route 301 provides 18 round trips on weekdays from 5:00 AM to 8:47 PM and 2 round trips on Saturdays from 9:00 AM to 6:05 PM.

Planned transit service: Per email correspondence on January 16, 2020 with Ms. Tremica Cherry-Wall, Planner at the DTC, a Type 2 bus stop should be installed along eastbound Leipsic Road at the intersection with the site entrance, across from the existing bus stop. Additionally, a Type 2 bus stop should be installed along southbound US Route 13 at the intersection with Townsend Boulevard/Lakeview Drive, to connect with existing sidewalk.

Existing bicycle and pedestrian facilities: According to DelDOT's *Kent County Bicycle Map*, Statewide and Connector Bicycle Routes exist within the study area. The Statewide Bicycle Route exists along Leipsic Road and N. State Road and traverses through five of the study intersections (Site Entrance A, Comfort Inn & Suites Hotel Entrance/Home Depot Entrance, US Route 13, and Walker Road/N. Governors Avenue). The Connector Bicycle Route exists along US Route 13 and traverses through five of the study intersections (College Road, Leipsic Road/N. State Street, Site Entrance C, Townsend Boulevard/Lakeview Drive, and Kings Highway/White Oak Road). Pedestrian facilities currently exist at seven of the study intersections: US Route 13/Leipsic Road/N. State Street, Leipsic Road/Comfort Inn & Suites Hotel Entrance/Home Depot Entrance, US Route 13/College Road, US Route 13/Townsend Boulevard/Lakeview Drive, US Route 13/Kings Highway/White Oak Road, N. State Street/Lepore Drive, and N. State Street/Walker Road/N. Governors Avenue.

Planned bicycle and pedestrian facilities: Per email correspondence on January 13, 2020 from Mr. John Fiori, DelDOT's Bicycle Coordinator, the following improvements were recommended:

- A 10-foot wide sidewalk should be provided along the US Route 13 site frontage to match the recently completed US 13 Sidewalk Improvements project.
- A separate 8 to 10-foot wide shared-use path shall be installed through this site to connect from US Route 13 to Leipsic Road, location to be determined.

- Internal connections to the adjacent Comfort Inn & Suites Hotel and Pizza Hut are required. If the interconnections cannot be constructed, then a cross-access easement shall be established.
- Internal bicycle racks should be provided at all the stores.
- If DART recommends a bus pad with shelter near the site, the pad will need to be extended to include two 1-Loop Bike Racks (see DelDOT Detail M-4).
- The site shall construct a stub street for a future connection to Buckson Drive. The intent is to extend Buckson Drive to Leipsic Road. To do this, the entrance/access road from Leipsic Road may need to be converted to a “service road” with right-of-way established.
- Per the DCM, the site shall dedicate right-of-way per the roadway classification and establish a 15-foot wide permanent easement along the property frontage.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if the right turn lane is warranted, then a bike lane shall be incorporated along the right turn lane.

Bicycle Level of Traffic Stress in Delaware: Researchers with the Mineta Transportation Institute developed a framework to measure low-stress connectivity, which can be used to evaluate and guide bicycle network planning. Bicycle LTS analysis uses factors such as the speed of traffic, volume of traffic, and the number of lanes to rate each roadway segment on a scale of 1 to 4, where 1 is a low-stress place to ride and 4 is a high-stress place to ride. It analyzes the total connectivity of a network to evaluate how many destinations can be accessed using low-stress routes. Developed by planners at the Delaware Department of Transportation (DelDOT), the bicycle Level of Traffic Stress (LTS) model will be applied to bicycle system planning and evaluation throughout the state. The Bicycle LTS for the roadways under existing conditions along the site frontage are summarized below. The Bicycle LTS was determined utilizing the map on the DelDOT Gateway.

- Leipsic Road – LTS: 3 and 4
- US Route 13 – LTS: 4

Crash Evaluation

Per the crash data included in the TIS from September 13, 2016 to September 13, 2019, a total of 490 crashes occurred within the study area. 451 of these crashes occurred along the US Route 13 corridor from White Oak Road to College Road, three of which were fatal crashes. Two of the fatalities were pedestrians struck by vehicles. One pedestrian fatality occurred at the Townsend Boulevard intersection and the other occurred mid-block, south of the College Road intersection. The third fatality was a bicyclist struck by a vehicle at College Road.

Previous Comments

Comments from DelDOT regarding the traffic volumes from the Preliminary Traffic Impact Study (PTIS) were not addressed in the final TIS. JMT updated these volumes accordingly, and the updated volumes have been used in the JMT analysis.

General HCS Analysis Comments

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

1. For the intersection analyses, the TIS used HCS7 version 7.8, whereas JMT used HCS7 version 7.8.5
2. Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in the Case 2 and Case 3 future scenario analyses, unless the existing heavy vehicle percentage was greater than 3% and there was no significant increase of vehicles along that movement, in which case the existing heavy vehicle percentage was used for analysis of future scenarios. The TIS utilized arbitrary heavy vehicle percentages.
3. Per DelDOT's *Development Coordination Manual* and coordination with DelDOT Planning, JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph along roadways and site entrances, whereas the TIS did not.
4. Per DelDOT's *Development Coordination Manual*, JMT utilized the existing PHF for the Case 1 scenario and a future PHF for Cases 2 and 3 scenarios of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph or the existing PHF, whichever was higher. The TIS used arbitrary values.
5. JMT analyzed the signalized intersections along US Route 13 as a corridor which allowed the input of offset data. The TIS did not input offset data as they individually analyzed each intersection. This analysis difference could cause discrepancies between the TIS and JMT's level of service results.
6. JMT and the TIS utilized a saturation flow rate of 1,900 pc/h/ln at intersections along US Route 13 consistent with other TIS reviews along US Route 13 in Dover.
7. Per DelDOT's *Development Coordination Manual*, JMT utilized a base saturation flow rate of 1,750 pc/h/ln at intersections along N. State Street, whereas the TIS maintained the HCS default value of 1,900 pc/h/ln.
8. JMT utilized an Arrival Type 4 along the northbound and southbound US Route 13 through movements to account for progression along the coordinated corridor whereas the TIS used default Arrival Type 3.
9. For the signalized intersection analyses along US Route 13, the TIS applied a Central Business District (CBD) type of environment whereas JMT did not.
10. JMT utilized bicycle and pedestrian counts consistent with the existing turning movement counts whereas the TIS did not.

11. JMT incorporated pedestrian signal timings into the signalized intersection analyses whereas the TIS did not.
12. At the signalized intersections, JMT incorporated right turn on red volumes whereas the TIS did not.
13. JMT utilized updated Cases 3 volumes. As discussed with DelDOT, the updated volumes were created to address some volume development inconsistencies identified in the TIS report.

Table 2
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Leipsic Road (Kent Road 88)/Comfort Inn & Suites Hotel Entrance/Home Depot Entrance ^{2,3}						
2016 Existing (Case 1)						
Eastbound Leipsic Road Left Turn	A (7.6)	A (7.7)	A (7.7)	A (7.7)	A (7.8)	A (7.8)
Westbound Leipsic Road Left Turn	A (8.7)	A (9.0)	A (8.8)	A (7.4)	A (7.6)	A (7.5)
Northbound Comfort Inn & Suites Hotel Entrance	A (8.3)	A (8.2)	A (8.4)	B (10.8)	B (14.6)	C (15.3)
Southbound Home Depot Entrance	A (9.1)	A (9.6)	A (9.7)	A (9.3)	A (9.8)	B (10.1)
2020 without development (Case 2)						
Eastbound Leipsic Road Left Turn	A (7.6)	A (7.7)	A (7.8)	A (7.7)	A (7.8)	A (7.8)
Westbound Leipsic Road Left Turn	A (8.7)	A (9.0)	A (8.8)	A (7.4)	A (7.6)	A (7.5)
Northbound Comfort Inn & Suites Hotel Entrance	A (8.3)	A (8.2)	A (8.4)	B (10.9)	B (14.7)	C (15.5)
Southbound Home Depot Entrance	A (9.1)	A (9.6)	A (9.7)	A (9.4)	A (9.9)	B (10.1)

¹ For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

² The TIS implemented a critical headway time of 0.00 seconds along the northbound Comfort Inn & Suites Hotel Entrance left turn, whereas JMT maintained default HCS critical headway time.

³ The TIS modeled Comfort Inn & Suites Hotel Entrance/Home Depot Entrance as an east/west roadway and Leipsic Road as a north/south roadway, whereas JMT modeled Leipsic Road as an east/west roadway and the Comfort Inn & Suites Hotel Entrance/Home Depot Entrance as a north/south roadway.

Table 2 (continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Leipsic Road (Kent Road 88)/Comfort Inn & Suites Hotel Entrance/Home Depot Entrance ^{2,3}						
2020 with development (Case 3)						
Eastbound Leipsic Road Left Turn	A (7.6)	A (7.8)	A (7.7)	A (7.9)	A (8.1)	A (8.2)
Westbound Leipsic Road Left Turn	A (8.7)	A (9.1)	A (9.3)	A (7.7)	A (7.9)	A (7.8)
Northbound Comfort Inn & Suites Hotel Entrance	A (8.3)	A (8.1)	A (8.8)	B (12.9)	C (19.9)	C (23.0)
Southbound Home Depot Entrance	A (9.1)	A (9.9)	A (9.8)	A (10.0)	B (11.0)	B (11.8)

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Site Entrance B/Leipsic Road						
2020 with development (Case 3) with Access Option A ⁴						
Westbound Leipsic Road Left Turn	A (7.6)	A (8.0)	A (7.9)	A (7.7)	A (8.1)	A (8.0)
Northbound Site Entrance B	B (11.3)	B (14.1)	B (14.0)	B (12.0)	B (14.8)	B (14.6)
2020 with development (Case 3) with Access Option B ⁵						
Westbound Leipsic Road Left Turn	-	-	-	A (7.7)	A (8.1)	A (8.0)
Northbound Site Entrance B	-	-	-	B (11.3)	B (13.5)	B (13.1)
2020 with development (Case 3) with Access Option C ⁶						
Westbound Leipsic Road Left Turn	-	-	-	A (7.7)	A (8.1)	A (8.0)
Northbound Site Entrance B	-	-	-	B (11.3)	B (13.5)	B (13.1)

⁴ Access Option A includes providing one shared through/right turn lane along eastbound Leipsic Road, one shared left turn/through lane along westbound Leipsic Road, and one shared left turn/right turn lane along northbound Site Entrance B.

⁵ Access Option B includes providing one through lane and one right turn lane along eastbound Leipsic Road, one shared left turn/through lane along westbound Leipsic Road, and one shared left turn/right turn lane along northbound Site Entrance B.

⁶ Access Option C includes providing one through lane and one right turn lane along eastbound Leipsic Road, one left turn lane and one through lane along westbound Leipsic Road, and one shared left turn/right turn lane along northbound Site Entrance B.

Table 4
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection Two-Way Stop Control (T-intersection) ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
Site Entrance C/US Route 13 (Rights-in/Rights-out)						
2020 with development (Case 3) ^{7, 8}						
Westbound Site Entrance C Right Turn	C (15.0)	D (30.5)	D (34.1)	C (15.2)	D (31.8)	E (36.8)
2020 with development (Case 3) <i>with auxiliary lane</i> ⁹						
Westbound Site Entrance C Right Turn	-	-	-	B (14.6)	D (29.2)	D (33.2)

⁷ The TIS and JMT configured the northbound US Route 13 approach as two through lanes and one shared through/right turn lane into the site.

⁸ The TIS included major street median storage, where TIS did not per existing conditions.

⁹ JMT conducted an additional analysis with the northbound US Route 13 approach configured as three through lanes and one channelized right turn lane.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
US Route 13/Townsend Boulevard/Lakeview Drive¹⁰						
2016 Existing (Case 1)	B (14.6)	C (20.0)	B (18.8)	C (20.9)	C (30.0)	C (26.9)
2016 Existing (Case 1) with Signal Optimization ¹¹	-	-	-	B (15.4)	B (19.7)	C (21.8)
2020 without development (Case 2)	B (14.6)	C (21.1)	C (20.5)	C (20.7)	C (30.4)	C (26.7)
2020 without development (Case 2) with Signal Optimization ¹¹	-	-	-	B (15.2)	C (20.5)	C (22.0)
2020 with development (Case 3)	B (14.7)	C (21.9)	C (21.6)	C (20.8)	C (30.3)	C (26.5)
2020 with development (Case 3) with Signal Optimization ¹¹	-	-	-	B (15.2)	C (20.7)	C (22.3)

¹⁰ JMT assumed 50% turns in the shared left turn/through lane along the westbound approach whereas the TIS assumed 0%.

¹¹ JMT optimized the signal timing splits while maintaining the existing signal cycle lengths and offsets.

Table 6
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
US Route 13/Kings Highway/White Oak Road (Kent Road 66) ¹²						
2016 Existing (Case 1)	C (24.8)	E (61.6)	D (41.7)	C (30.9)	D (53.5)	D (45.1)
2020 without development (Case 2)	C (27.8)	E (73.6)	D (53.4)	C (31.8)	E (56.7)	D (47.8)
2020 without development (Case 2) with Signal Optimization ¹¹	-	-	-	C (23.7)	D (47.9)	D (36.3)
2020 with development (Case 3)	C (30.4)	E (60.7)	D (50.6)	C (32.1)	E (57.6)	D (48.6)
2020 with development (Case 3) with Signal Optimization ¹¹	-	-	-	C (23.7)	D (49.9)	D (38.1)

¹² JMT assumed 40% turns in the shared left turn/through lanes along the eastbound and westbound approaches whereas the TIS assumed 0%.

Table 7a
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
US Route 13/Leipsic Road/N. State Street (Kent Road 3) ^{13,14,15}						
2016 Existing (Case 1)	B (15.8)	C (28.3)	C (21.4)	D (35.7)	F (116.6)	F (122.4)
2016 Existing (Case 1) <i>with Signal Optimization</i> ¹¹	-	-	-	C (23.0)	C (31.9)	C (22.0)
2020 without development (Case 2)	B (15.8)	C (28.9)	C (21.7)	D (35.6)	F (115.2)	F (139.1)
2020 without development (Case 2) <i>with Signal Optimization</i> ¹¹	-	-	-	C (23.2)	C (33.4)	C (22.6)
2020 with development (Case 3)	C (20.6)	C (31.7)	C (27.8)	D (37.8)	F (119.5)	F (136.2)
2020 with development (Case 3) <i>with Signal Optimization</i> ¹¹	-	-	-	C (34.6)	D (44.0)	D (40.4)

¹³ The TIS included the southbound US Route 13 channelized right-turn lane in the analysis whereas JMT did not.

¹⁴ JMT included the eastbound N. State Street channelized right-turn lane in the analysis whereas the TIS did not.

¹⁵ JMT assumed 40% turns in the shared left turn/through lane along the eastbound approach whereas the TIS assumed 0%.

Table 7b
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Unsignalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
US Route 13/Leipsic Road/N. State Street (Kent Road 3) ¹⁶						
2016 Existing (Case 1)						
Northbound US Route 13 U-Turn	-	-	-	B (12.9)	C (17.9)	C (16.5)
2020 without development (Case 2)						
Northbound US Route 13 U-Turn	-	-	-	B (13.1)	C (19.0)	C (17.4)
2020 with development (Case 3)						
Northbound US Route 13 U-Turn	-	-	-	B (13.4)	C (20.4)	C (18.7)

¹⁶ JMT conducted an additional analysis to evaluate the northbound US Route 13 U-turn as this is a YIELD-controlled unsignalized movement located approximately 200 feet south of the US Route 13/Leipsic Road/N. State Street signalized intersection.

Table 8
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
N. State Street/Lepore Drive (Kent Road 3B)						
2016 Existing (Case 1) ¹⁷	C (25.1)	C (22.1)	B (19.6)	F (86.2)	F (278.1)	E (73.6)
2016 Existing (Case 1) with signal optimization ¹⁸	-	-	-	C (33.1)	D (36.1)	C (23.9)
2020 without development (Case 2) ¹⁷	C (24.9)	C (22.6)	B (19.8)	F (83.5)	F (274.2)	E (75.9)
2020 without development (Case 2) with signal optimization ¹⁸	-	-	-	C (33.4)	D (36.4)	C (25.5)
2020 with development (Case 3) ¹⁷	C (24.4)	C (23.0)	B (18.9)	F (92.9)	F (303.9)	F (88.7)
2020 with development (Case 3) with signal optimization ¹⁸	-	-	-	C (33.9)	D (38.5)	C (25.9)

¹⁷ For Cases 1, 2, and 3, JMT utilized splits consistent with the MAX 1 timings from the DelDOT Timing Plan, whereas the TIS used optimized timings.

¹⁸ JMT signal timing optimization scenario incorporated a cycle length of 120 seconds for the AM and Saturday peak hours, and 150 seconds for the PM peak hour.

Table 9
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
N. State Street/Walker Road (Kent Road 70)/N. Governors Avenue (Kent Road 3) ^{19, 20, 21}						
2016 Existing (Case 1)	C (24.3)	C (28.1)	B (19.4)	E (74.7)	F (136.0)	E (65.3)
2016 Existing (Case 1) <i>with signal optimization</i> ²²	-	-	-	D (37.9)	D (47.5)	C (30.2)
2020 without development (Case 2)	C (24.6)	C (28.6)	B (19.5)	E (74.7)	F (136.6)	E (65.6)
2020 without development (Case 2) <i>with signal optimization</i> ²²	-	-	-	D (38.2)	D (47.4)	C (30.4)
2020 with development (Case 3)	C (25.3)	C (30.0)	C (20.6)	E (76.2)	F (140.6)	E (67.0)
2020 with development (Case 3) <i>with signal optimization</i> ²²	-	-	-	D (39.4)	D (49.8)	C (31.6)

¹⁹ For HCS modeling purposes, JMT configured N. Governors Avenue as the eastbound approach, Walker Road as the westbound approach, and N. State Road as the northbound and southbound approaches. The TIS configured Walker Road as the eastbound approach, N. State Road as the westbound and southbound approaches, and N. Governors Avenue as the northbound approach.

²⁰ JMT modeled N. State Road as the major roadway with protected left turn lag phasing along the northbound approach and permitted left turn phasing along the southbound approach. The Walker Road and N. Governors Avenue approaches were modeled as split phase. A right turn overlapping phase was modeled along the southbound N. State Road approach consistent with existing conditions. Left and right turning movements from each approach were maintained as left and right turning movements, respectively, despite the modified intersection geometry, to accurately capture operations and performance at the intersection.

²¹ JMT conducted an additional Synchro analysis of the intersection to more accurately capture the effect of the southbound N. State Street right turn overlapping phase. The southbound right turn delay calculated by Synchro was inputted as the unsignalized delay for the movement in the optimized HCS analysis.

²² JMT signal timing optimization scenario incorporated a cycle length of 120 seconds for the AM, PM, and Saturday peak hours.

Table 10
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for DuPont Plaza
Report Dated: October 2019
Prepared by Duffield Associates, Inc.

Signalized Intersection ¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Peak	Weekday AM	Weekday PM	Saturday Peak
US Route 13/College Road (Kent Road 99)²³						
2016 Existing (Case 1)	C (21.9.)	C (33.4)	D (44.6)	B (15.0)	E (56.8)	D (38.0)
2016 Existing (Case 1) <i>with Signal Optimization</i> ¹¹	-	-	-	B (12.5)	C (24.5)	C (26.9)
2020 without development (Case 2)	C (22.2)	C (34.8)	D (48.0)	B (15.1)	E (70.9)	D (44.6)
2020 without development (Case 2) <i>with Signal Optimization</i> ¹¹	-	-	-	B (12.4)	C (25.3)	C (28.0)
2020 with development (Case 3)	C (23.0)	D (35.3)	D (49.9)	B (16.1)	E (75.9)	D (48.8)
2020 with development (Case 3) <i>with Signal Optimization</i> ¹¹	-	-	-	B (12.4)	C (26.4)	C (29.5)

²³ JMT assumed 40% turns in the shared left turn/through lanes along the eastbound and westbound approaches whereas the TIS assumed 0%.