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

NICOLE MAJESKI
SECRETARY

July 11, 2024

Mr. Marc Coté, P.E.
Rossi Group
555 E. Loockerman St., Suite 220
Dover, DE 19901

Dear Mr. Coté:

The enclosed Traffic Impact Study (TIS) review letter for **301 Business Park – North** (Tax Parcels: 23-073.00-001 & 23-073.00-002) industrial 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 Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Group Project Engineer

AF:km
Enclosures
cc with enclosures: Randy Mitchell, Mitchell Investment Co., LLC
Scott Lobdell, First State Engineering
Shawn Tucker, Barnes and Thornburg LLP
David L. Edgell, Office of State Planning Coordination
Morris Deputy, Town of Middletown
Antoni Sekowski, New Castle County Department of Land Use
Bradford Shockley, New Castle County Department of Land Use
Owen C. Robatino, New Castle County Department of Land Use
Joanne M. Arellano, Johnson, Mirmiran, & Thompson, Inc.
Mir Wahed, Johnson, Mirmiran, & Thompson, Inc.
DelDOT Distribution

DelDOT

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Deputy Secretary, Transportation Solutions (DOTS)
Mark Luszcz, Deputy Director, Operations and Support, Traffic, DOTS
Matthew Vincent, Assistant Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Sean Humphrey, Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Nathan Draper, Canal District Public Works Engineer, Canal District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Pamela Steinebach, Director, Planning
Todd Sammons, Assistant Director, Development Coordination, Planning
Wendy Polasko, Subdivision Engineer, Development Coordination, Planning
Randhir Sharma, New Castle Review Coordinator, Development Coordination, Planning
Pao Lin, New Castle County Subdivision Reviewer, Development Coordination, Planning
Sireen Muhtaseb, TIS Group Manager, Development Coordination, Planning
Philip Lindsey, TIS Group Engineer, Development Coordination, Planning
Ben Fisher, TIS Group Engineer, Development Coordination, Planning
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Steve Bayer, Regional Transportation Planner, Statewide & Regional Planning

July 10, 2024

Ms. Annamaria Furmato
Project Engineer
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No. 1945F
Project Number T202369005/PO#652973
Traffic Impact Study Services
Task 17-4 – 301 Business Park - North TIS

Dear Ms. Furmato:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study for the 301 Business Park - North development which was prepared by Rossi Group dated May 9, 2024. This review was assigned as Task Number 17-4. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual* and other Department standards.

A TIS dated October 9, 2023 was previously prepared for the site and evaluated the impacts of a development which would be comprised of up to 1,420,000 square feet of warehousing space in the Town of Middletown in New Castle County, Delaware. The October 9, 2023 TIS was completed in conjunction with the 301 Business Park South TIS, which was proposed to include up to 1,485,000 square feet of warehousing space. Since that TIS, the size of the proposed site has been reduced and a new TIS dated May 9, 2024 was prepared. This review is based on the May 9, 2024 TIS.

The May 9, 2024 TIS evaluates the impacts of a development which would be comprised of manufacturing space with 2,440 employees. The TIS was completed considering the 301 Business Park – South development to be comprised of manufacturing space with 500 employees. Additionally, the May 9, 2024 TIS incorporates updated traffic counts and an updated list of committed developments.

The proposed site is on an approximately 135.05-acre parcel (Tax Parcel: 23-073.00-002, 23-073.00-001, and 13-026.00-029) located on the northwest corner of the intersection of Middle Neck Road (New Castle Road 444) and Warwick Road (New Castle Road 299A). The land for the proposed development is currently zoned as MI (Manufacturing Industrial) in the Town of Middletown, and the developer does not plan to rezone the land.

Two full access points are proposed on Middle Neck Road. Construction is expected to be completed in 2024.

Relevant and On-Going Projects and Studies

DelDOT has relevant and ongoing projects within or surrounding the study area including the 2021 Hazard Elimination Program (HEP) – Task 1 Site D: SR 299 (Middletown Warwick Road) study. HEP Site D includes Middletown Warwick Road from 0.18 miles west of Levels Road to 0.12 miles east of Sandhill Drive and includes one study intersection: Levels Road and Middletown Warwick Road. The HEP Site D evaluation included a crash summary, field observations, a lighting warrant evaluation, and peak hour traffic volumes. The evaluation also included preliminary recommendations including striping improvements for the north leg crosswalk at Levels Road and Middletown Warwick Road. The corridor was also recommended to be retimed to reduce likelihood of rear end crashes and an additional study was recommended to consider transitioning one northbound through lane to an acceleration lane for the westbound right turn.

The proposed site is adjacent to the Westown Transportation Improvement District (TID) which was established as part of the Westown Master Plan. The Westown TID is bordered by Bunker Hill Road in the north, Green Giant Road in the south, Middle Neck Road in the west, and the Norfolk Southern railroad in the east. The *Westown TID CTP Cost Development Update Report* dated June 2023 is the latest traffic analysis conducted for the Westown TID. The report includes a recommendation to improve one study intersection: Middletown Warwick Road and Levels Road. To meet the Level of Service (LOS) standard for Westown TID which is LOS E, the intersection is recommended to be improved to provide dual left turn lanes along three of the approaches. These improvements, and the other improvements identified in the report, are part of the TID-CTP. The TID is operational and DelDOT continues to collect fees and monitor traffic to prioritize improvements recommended as part of the Westown TID.

Summary of Analysis Results

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. The table below does not include any signalized intersections that exhibit LOS deficiencies that can be mitigated with signal timing optimization as optimization would not be the responsibility of the developer. Additionally, the table below does not include Westown TID intersections which operate at LOS E, as LOS E is the acceptable level of service for the TID.

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
Middle Neck Road / Warwick Road (New Castle Road 443A)	-	X	Case 3 – 2031 with Development

Middle Neck Road / Warwick Road (New Castle Road 443A) (See Table 3, Page 20, Development Improvement #4)
The unsignalized Middle Neck Road / Warwick Road (New Castle Road 443A) intersection would exhibit LOS deficiencies along the eastbound Middle Neck Road approach under future conditions with the proposed development during the PM peak hour. Under Case 3 conditions during the PM peak hour, the eastbound Middle Neck Road approach would operate at LOS F (97.2 seconds of delay per vehicle) with a projected 95th percentile queue length of approximately 370 feet.

Additional Case 3 scenarios were evaluated with the intersection as two-way stop-controlled with additional turn lanes and an all-way stop-control. As two-way stop-controlled with the provision of separate turn lanes along every approach, the eastbound Middle Neck Road approach would operate at LOS E (43.2 seconds of delay per vehicle) with a calculated 95th percentile queue length of approximately 230 feet. With the provision of an all-way stop-control the intersection would improve to operate at acceptable LOS D (28.3 seconds of delay per vehicle).

JMT conducted an all-way stop and signal justification study at the Middle Neck Road and Warwick Road intersection. Based on the results, interim all-way stop is warranted as a traffic signal is warranted under Warrants #2 (Four-Hour Vehicular Volume) and #3 (Peak Hour Volume) for both Cases 2 and 3. As a result of the intersection analysis results and that interim all-way stop control is warranted, DelDOT is amenable to consider all-way stop control contingent on if the Town of Middletown is in agreement with the installation. As such, the developer should obtain a resolution from the Town of Middletown indicating their concurrence to convert the Middle Neck Road/Warwick Road intersection to an all-way stop-controlled intersection.

On-Site Operations
Additionally, the developer should ensure the truck operations on-site would not impact adjacent roadways. Specifically, on-site truck circulation and truck parking accommodations should be provided to minimize truck spillback onto Middle Neck Road. Overnight parking should be provided for trucks that may arrive prior to the facility's operational hours.

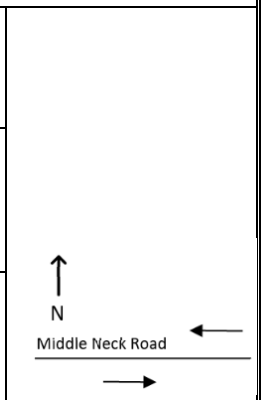
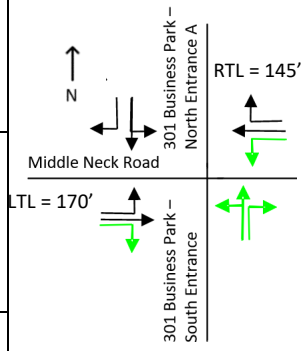
Development Improvements

Should the Town of Middletown approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan, unless a Design Deviation is requested and approved by the Department. 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. The following items should be implemented at the same time as site construction once all agency approvals and permits are secured and completed in accordance with DelDOT's Standards and Specifications.

1. The developer shall improve the State-maintained Roads on which they front (Middle Neck Road and Warwick Road), within the limits of their frontage. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. "Frontage" means the length along the state right-of-way of a single property tract where an entrance is proposed or required. If a single property tract has frontage along multiple roadways, any segment of roadway including an entrance shall be

improved to meet DelDOT's Functional Classification criteria as found in Section 1.1 of the Development Coordination Manual and elsewhere therein, and/or improvements established in the Traffic Operational Analysis and/or Traffic Impact Study. "Secondary Frontage" means the length along the state right-of-way of a single property tract where no entrance is proposed or required. The segment of roadway may be upgraded by improving the pavement condition of the existing roadway width. The Pavement Management Section and Subdivision Section will determine the requirements to improve the pavement condition.

2. The developer should construct an unsignalized Site Entrance A full access for the proposed 301 Business Park – North development along Middle Neck Road across from the proposed 301 Business Park – South site access. The intersection should be consistent with the lane configurations shown in the table below.

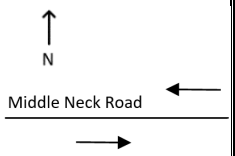
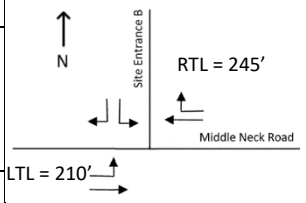
Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Middle Neck Road	One through lane		Eastbound Middle Neck Road	One left turn lane, one through lane, and one right turn lane*	
Westbound Middle Neck Road	One through lane		Westbound Middle Neck Road	One left turn lane*, one through lane, and one right turn lane	
Northbound 301 Business Park – South Entrance	Approach does not exist		Northbound 301 Business Park – South Entrance*	One shared left turn/through lane and one right turn lane	
Southbound 301 Business Park – North Entrance	Approach does not exist		Southbound 301 Business Park – North Entrance	One shared left turn/through lane and one right turn lane	

*To be constructed by the 301 Business Park – South development.

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the westbound right turn lane is 145 feet. An eastbound left turn lane is not warranted but should be provided to mirror the required westbound left turn lane for 301 Business Park – South. The recommended minimum storage length (excluding taper) of the eastbound left turn lane is 170 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths. The storage lengths for the eastbound right turn lane and westbound left turn lane are part of the 301 Business Park – South development and should be determined as part of that development.

3. The developer should construct an unsignalized Site Entrance B full access for the proposed 301 Business Park – North development along Middle Neck Road, approximately 400 feet

west of the intersection with Warwick Road. The intersection should be consistent with the lane configurations shown in the table below.

Approach	Current Configuration		Approach	Proposed Configuration	
Eastbound Middle Neck Road	One through lane		Eastbound Middle Neck Road	One left turn lane and one through lane	
Westbound Middle Neck Road	One through lane		Westbound Middle Neck Road	One through lane and one right turn lane	
Southbound Site Entrance B	Approach does not exist		Southbound Site Entrance B	One left turn lane and one right turn lane	

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the westbound right turn lane is 245 feet and the eastbound left turn lane is 210 feet. The projected queues from the HCS analysis can be accommodated within the recommended storage lengths.

4. The developer should coordinate with the Town of Middletown and DelDOT Traffic on the implementation of converting the existing unsignalized Middle Neck Road and Warwick Road (New Castle Road 443A) intersection to all-way stop-control and maintain the existing lane configurations. The developer should coordinate with DelDOT's Development Coordination Section, along with the developer of 301 Business Park – South regarding the construction and equitable cost sharing of the proposed improvements.

5. 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 Middle Neck Road (New Castle Road 444) and Warwick Road (New Castle Road 299A) site frontages. Within the easement, the developer should construct a ten-foot-wide shared use path (SUP). The SUP 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 SUP. If feasible, the SUP should be placed behind utility poles and street trees should be provided within the buffer area. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact location of the SUP.

    b. An internal connection from the SUP into the site is required.

    c. A bicycle and pedestrian crossing should be provided at the Middle Neck Road/Warwick Road intersection.

d. ADA-compliant curb ramps and marked crosswalks should be provided along the site entrances.

e. Minimum five-foot wide bicycle lanes should be incorporated in the right turn lane and shoulder along the Middle Neck Road approaches to the site entrances.

f. Utility covers should be moved outside of any designated bicycle lanes and any proposed sidewalks or should be flush with the pavement.

Please note that this review generally focuses on capacity and level of service issues; additional safety, operational, and constructability 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.

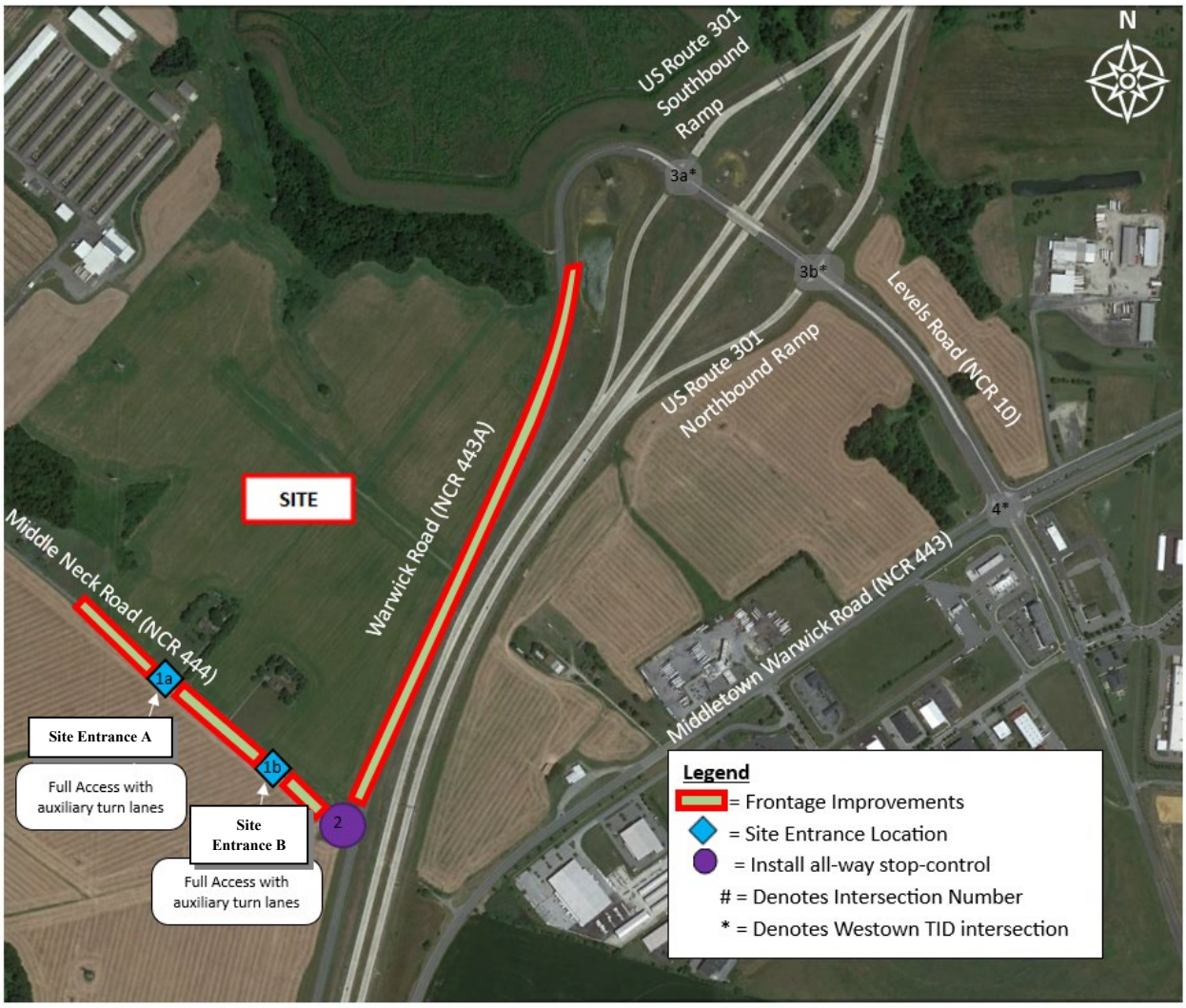
Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

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

Recommendations Map



General Information
Report date: May 9, 2024
Prepared by: Rossi Group
Prepared for: Middleneck Investments, LLC.
Tax Parcels: 23-073.00-001, 23-073.00-002, and 13-026.00-029
Generally consistent with DelDOT's Development Coordination Manual (DCM): Yes

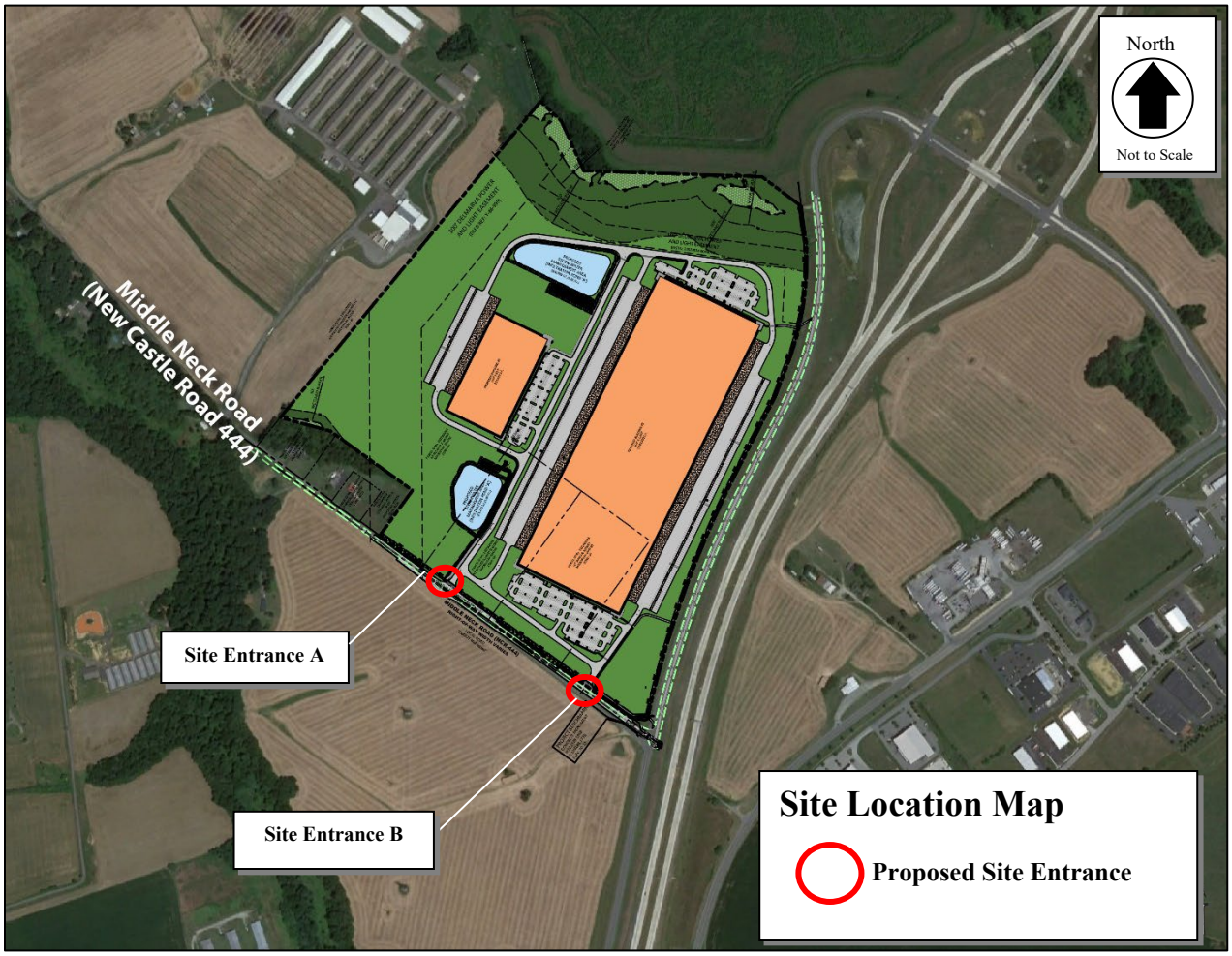
Project Description and Background

Description: The proposed development consists of manufacturing space with 2,440 employees.
Location: The site is located on the northwest corner of the intersection of Middle Neck Road (New Castle Road 444) and Warwick Road (New Castle Road 299A) in the town of Middletown, Delaware.
Amount of Land to be developed: An approximately 135.05-acre portion assemblage of parcels.
Land Use approval(s) needed: Entrance Plan.
Proposed completion date: 2024
Proposed access locations: Two full access points are proposed on Middle Neck Road.
Daily Traffic Volumes:

- 2022 Average Annual Daily Traffic on Middle Neck Road: 1,145 vehicles per day
- 2022 Average Annual Daily Traffic on Warwick Road: 5,842 vehicles per day

*AADT is sourced from DelDOT Gateway.

Site Map



**Graphic is an approximation based on the Major Land Development Plan dated October 9, 2023 and prepared by First State Engineering.*

Relevant and On-going Projects

DelDOT has relevant and ongoing projects within or surrounding the study area including the 2021 Hazard Elimination Program (HEP) – Task 1 Site D: SR 299 (Middletown Warwick Road) study. HEP Site D includes Middletown Warwick Road from 0.18 miles west of Levels Road to 0.12 miles east of Sandhill Drive and includes one study intersection: Levels Road and Middletown Warwick Road. The HEP Site D evaluation included a crash summary, field observations, a lighting warrant evaluation, and peak hour traffic volumes. The evaluation also included preliminary recommendations including striping improvements for the north leg crosswalk at Levels Road and Middletown Warwick Road. The corridor was also recommended to be retimed to reduce likelihood of rear end crashes and an additional study was recommended to consider transitioning one northbound through lane to an acceleration lane for the westbound right turn.

The proposed site is located within the Westown Transportation Improvement District (TID) which was established as part of the Westown Master Plan. The Westown TID is bordered by

Bunker Hill Road in the north, Green Giant Road in the south, Middle Neck Road in the west, and the Norfolk Southern railroad in the east. The Westown TID CTP Cost Development Update Report dated June 2023 is the latest traffic analysis conducted for the Westown TID. The report includes a recommendation to improve one study intersection: Middletown Warwick Road and Levels Road. To meet the Level of Service (LOS) standard for Westown TID which is LOS E, the intersection is recommended to be improved to provide dual left turn lanes along three of the approaches. These improvements, and the other improvements identified in the report, are part of the TID-CTP. The TID is operational and DelDOT continues to collect fees and monitor traffic to prioritize improvements recommended as part of the Westown TID.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, 2020)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
The proposed development is located within Investment Levels 2, 3 and 4.

Investment Level 2

These areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. They serve as transition areas between Level 1 and the state's more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2 Areas, like 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. Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use its spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

Level 2 Areas share similar priorities as with the Level 1 Areas where the aim remains to: make context sensitive transportation system capacity enhancements, preserve existing facilities, make safety enhancements, make transportation system capacity improvements, create transit system enhancements, ensure ADA accessibility, and close gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 2 Areas are ideal locations for Transportation Improvement Districts and Complete Community Enterprise Districts. Other priorities for Level 2 Areas include: Corridor Capacity Preservation, off-alignment multi-use paths, interconnectivity of neighborhoods and public facilities, and signal-system enhancements.

Investment Level 3

Investment Level 3 Areas generally fall into two categories. The first category covers lands that are in the long-term growth plans of counties or municipalities where development is not necessary to accommodate expected population growth during a five-year planning period (or longer). In these instances, development in Investment Level 3 may be least appropriate for new growth and development in the near term. The second category includes lands that are adjacent to or intermingled with fast-growing areas within counties or municipalities that are otherwise categorized as Investment Levels 1 or 2. Environmentally sensitive features, agricultural-preservation issues, or other infrastructure issues most often impact these lands. In these instances, development and growth may be appropriate in the near term, but the resources on the site and in the surrounding area should be carefully considered and accommodated by state agencies and local government with land-use authority. Investment Level 3 is further characterized by areas with new development separated from existing development by a substantial amount of vacant land that is not contiguous with existing infrastructure, areas that are experiencing some development pressure, areas with existing but disconnected development, and possible lack of adequate infrastructure.

The state will consider investing in infrastructure within Investment Level 3 Areas once the Investment Level 1 and 2 Areas are substantially built out, or when the infrastructure or facilities are logical extensions of existing systems and deemed appropriate to serve a particular area. The priorities in the Level 3 Areas are for DelDOT to focus on regional movements between towns and other population centers. DelDOT also supports the development and implementation of Transportation Improvement Districts in Investment Level 3 areas. Local roadway improvements will be made by developers and property owners as development occurs. Lower priority is given to transportation system–capacity improvements and transit-system enhancements.

Investment Level 4

Delaware's Investment Level 4 Areas are rural in nature, and are where the bulk of the state's open space/natural areas and agricultural industry is located. These areas contain agribusiness activities, farm complexes, and small settlements. They are typically found at historic crossroads or points of trade, often with rich cultural ties. Delaware's Investment Level 4 Areas are also the location of scattered residential uses, featuring almost entirely single-family detached residential structure. Delaware's Investment Level 4 Areas also include many unincorporated communities, typically with their own distinctive character and identity. Investment Level 4 Areas depend on a transportation system primarily of secondary roads linked to roadways used as regional thoroughfares for commuting and trucking.

It is the state's intent to discourage additional urban and suburban development in Investment Level 4 Areas unrelated to agriculture and to the areas' needs. In Investment Level 4 Areas, the state's investments and policies should retain the rural landscape and preserve open spaces and farmlands, support farmland-related industries, and establish defined edges to more concentrated development. The focus for the Level 4 Areas will be to preserve and maintain existing facilities in safe working order, corridor-capacity preservation, and the enhancement of transportation facilities to support agricultural business.

Proposed Development's Compatibility with Livable Delaware:
The proposed site is located within Investment Levels 2, 3 and 4. In Investment Level 2, the priority is for job creation and retention. Investment Level 3 areas include areas adjacent to fast-growing areas within Investment Levels 1 and 2. In Investment Level 4, the focus is on keeping areas preserved and open to rural spaces. Most of the property is within Investment Level 2 and the proposed warehousing which would create jobs is consistent with the 2020 update of Livable Delaware Strategies for State Policies and Spending.

Comprehensive Plan

(Source: 2022 Middletown Comprehensive Plan)

Middletown Comprehensive Plan:
Per the Existing Zoning, the development is zoned AR-1 (Agricultural Residential).
Per the Future Land Use map, the portion of the development located within Middletown is within an area designated for industrial development.

Proposed Development's Compatibility with Middletown Comprehensive Plan:
The Future Land Use map indicates the property to be for warehousing and is therefore consistent with the Middletown Comprehensive Plan Update.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the 11th Edition of the ITE *Trip Generation Manual*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 140 (Manufacturing).

Table 1
301 Business Park – North Trip Generation

Land Use	ADT	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
LUC 140; 2,440 Employees	5,551	449	166	615	202	344	546

Overview of TIS

Intersections examined:

1. Site Entrances / Middle Neck Road (New Castle Road 444) – Full Access
    a. Site Entrance A / Middle Neck Road
    b. Site Entrance B / Middle Neck Road
2. Middle Neck Road / Warwick Road (New Castle Road 299A)
3. US Route 301 / Warwick Road – Grade Separated Intersection
    a. Warwick / US Route 301 Southbound Ramps
    b. Levels Road (New Castle Road 10) / US Route 301 Northbound Ramps
4. Middletown Warwick Road (New Castle Road 443) / Levels Road

Conditions Examined:

1. Case 1 – 2023 existing
2. Case 2 – 2031 without development
3. Case 3 – 2031 with development

Committed Developments Considered:

1. 301 Business Park – South (500 employees manufacturing space)
2. Chapel Creek (R Acres – West)
3. Abbey Creek (R Acres – East)
4. STA Middletown Campus
5. 929 Warwick Road
6. Poole Property

The list of committed development supersedes that provided in the May 23, 2023 Scoping Meeting Memorandum.

Peak Hours Evaluated: Weekday AM and PM.

Intersection Descriptions

1a. Site Entrance A / Middle Neck Road (New Castle Road 444)

Type of Control: Proposed two way stop controlled intersection.

Eastbound Approach: (Middle Neck Road) Existing one through lane and proposed one shared left turn / through lane.

Westbound Approach: (Middle Neck Road) Existing one through lane and proposed one shared through/ right turn lane.

Northbound Approach: (Entrance for 301 Business Park - South) Proposed one shared left turn/ through/ right turn lane.

Southbound Approach: (Site Entrance A) Proposed one shared left turn/ through/ right turn lane.

1b. Site Entrance B / Middle Neck Road

Type of Control: Proposed two way stop controlled intersection.

Eastbound Approach: (Middle Neck Road) Existing one through lane and proposed one left turn lane and one through lane.

Westbound Approach: (Middle Neck Road) Existing one through lane and proposed one through lane and one right turn lane.

Southbound Approach: (Site Entrance B) Proposed one shared left turn/ through/ right turn lane.

2. Middle Neck Road / Warwick Road (New Castle Road 299)

Type of Control: Existing two-stop controlled intersection.

Eastbound Approach: (Middle Neck Road) Existing one shared left turn/right turn lane.

Northbound Approach: (Warwick Road) Existing one shared left turn/through lane.

Southbound Approach: (Warwick Road) Existing one shared through/ right turn lane.

3a. Warwick Road / US Route 301 Southbound Ramps

Type of Control: Existing signalized intersection.

Eastbound Approach: (Warwick Road) Existing one through lane and one right turn lane.

Westbound Approach: (Warwick Road) Existing one left turn lane and one through lane.

Southbound Approach: (US Route 301 Southbound Ramps) Existing one left turn lane, one shared left turn / through lane, and one right turn lane.

3b. Levels Road (New Castle Road 10) / US Route 301 Northbound Ramps

Type of Control: Existing two-way stop-controlled intersection.

Eastbound Approach: (Levels Road) Existing one through lane and one right turn lane.

Westbound Approach: (Levels Road) Existing one left turn lane and one through lane.

Northbound Approach: (US Route 301 Northbound Ramps) Existing one shared left turn / through lane and one right turn lane.

4. Middletown Warwick Road (New Castle Road 443) / Levels Road

Type of Control: Existing signalized intersection.

Eastbound Approach: (Levels Road) Existing two left turn lanes, one through lane, and one right turn lane.

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

Northbound Approach: (Middletown Warwick Road) Existing one left turn lane, two through lanes, and one right turn lane.

Southbound Approach: (Middletown Warwick Road) Existing one left turn lane, two through lanes and one right turn lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, DART Bus Route 302 traverses through the Middletown Warwick Road intersection with Levels Road. There are no bus stops at any of the study intersections.

Planned transit service: DelDOT sent an email to Mr. Jared Kauffman on October 23, 2023. A response has not yet been received.

Existing bicycle and pedestrian facilities: According to DelDOT's New Castle County Bicycle Map, there is a connector bicycle route that runs along Warwick Road and Levels Road.

Planned bicycle and pedestrian facilities: Per email correspondence on November 13, 2023, from John Fiori, DelDOT's Bicycle Coordinator, the following recommendations were made:

- Referring to the State Strategies and Spending Map this site is within Level 2. Per the DelDOT SUP/Sidewalk Policy a non-motorized facility is required unless there is a physical impossibility but if the site generates over 2000-AADT, then the non-motorized facility is required. Therefore, provide a 10' wide SUP along both property frontages with the angled termination to the shoulder of the roadways.
- Provide an internal connection from the SUP.
- Provide bike-ped crossing of Middle Neck Road at Warwick Road intersection.
- If a right turn lane is warranted, then a separate 5' wide bike lane shall be provided along the limits of the right turn lane and follow the striping as per the DE MUTCD, Figure 9C-1E.
- At this time Active Transportation & Community Connections (ATCC) has no bicycle/pedestrian improvement projects within the area of this project.
- The site shall dedicate right-of-way per the roadway classification and establish a 15' wide permanent easement along all property roadway frontages.
- 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 separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).
- There could be additional and/or revised comments once project is discussed at a pre-submittal meeting and/or plans are submitted for LONO/ENT review/approval.

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 DelDOT Gateway.

- Middle Neck Road: 4
- Warwick Road: 3

Crash Evaluation

Per the crash data included in the TIS from September 15, 2019 to September 15, 2022, provided by the Delaware Department of Transportation (DelDOT), a total of 58 crashes were reported within the Middletown Warwick Road and Warwick Road / Levels Road intersection. Of the reported crashes, 40 were front to rear crashes, 12 were angle crashes, three were sideswipe crashes, and three were classified as not a collision between two vehicles type crashes. There were no fatalities reported.

Previous Comments

All comments from the May 9, 2024 Final TIS were addressed in the June 3, 2024 Final TIS submission.

Sight Distance Evaluation

No sight distance constraints were noted at the proposed site entrance locations per a field visit conducted on November 1, 2023.

All-Way Stop and Traffic Signal Justification Study

JMT conducted an all-way stop and signal justification study at the Middle Neck Road and Warwick Road (New Castle Road 299) intersection. The study takes into account the 301 Business Park – North development to be comprised of manufacturing space with 2,440 employees, the 301 Business Park – South development to be comprised of manufacturing space with 500 employees, and evaluated three cases (Case 1 – Existing (2022), Case 2 – 2024 Future without Development, and Case 3 – 2024 Future with Development).

Based on the results, interim all-way stop is warranted as a traffic signal is warranted under Warrants #2 (Four-Hour Vehicular Volume) and #3 (Peak Hour Volume) for both Cases 2 and 3. The crash warrant is not met based on crash data from the last 3 years.

General HCS Analysis Comments

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

1) The TIS used HCS Version 7.9.5 to complete the analysis, while JMT used HCS 2023.

2) Per DelDOT's *Development Coordination Manual*, JMT utilized the future intersection PHF 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 used the existing PHF if higher, whereas the TIS utilized the existing PHF for all cases.

3) JMT utilized the existing heavy vehicle percentage for each movement greater than 100 vph in the Case 1 existing scenario while the TIS utilized the existing heavy vehicle percentage for each movement.

4) 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 in the analyses whereas the TIS utilized the existing heavy vehicle percentage.

5) Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in Case 2 and Case 3 future scenario analysis, 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 the analysis of future scenarios.

6) JMT utilized existing signal timings for existing conditions (Case 1), whereas the TIS did not.

7) JMT utilized a heavy vehicle percentage of 5% for each movement entering and exiting the proposed site in Case 3 future scenario analysis, whereas the TIS used a heavy vehicle percentage of 3%.

8) The HCS analysis accounts for the 301 Business Park – North development which would be comprised of manufacturing space with 2,440 employees and the 301 Business Park – South development which would be comprised of manufacturing space with 500 employees.

Table 2a
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Site Entrance A and Middle Neck Road (New Castle Road 444)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2024 with Development (Case 3) [2]				
Eastbound Site Entrance South Approach	A (9.2)	A (9.1)	A (9.4)	A (9.2)
Westbound Site Entrance A North Approach	B (11.4)	B (10.7)	B (12.4)	B (11.7)
Northbound Middle Neck Road Left Turn	A (7.6)	A (7.4)	A (7.7)	A (7.5)
Southbound Middle Neck Road Left Turn	A (7.5)	A (7.4)	A (7.6)	A (7.5)

[1] For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] Both JMT and the TIS modeled the eastbound approach and westbound approach as one shared left turn/through lane and one right turn lane.

Table 2b
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Site Entrance B and Middle Neck Road (New Castle Road 444)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2031 with Development (Case 3) [3]				
Westbound Site Entrance B Approach	B (12.7)	B (13.8)	B (13.2)	B (14.5)
Southbound Middle Neck Road Left Turn	A (8.8)	A (7.9)	A (8.9)	A (7.9)

[3] Both JMT and the TIS modeled the westbound approach as one left turn lane and one right turn lane.

Table 3
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Middle Neck Road / Warwick Road (New Castle Road 443A)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 Existing (Case 1)				
Eastbound Warwick Road Left Turn	A (7.5)	A (7.9)	A (7.5)	A (7.9)
Southbound Middle Neck Road Approach	B (10.1)	B (12.0)	B (10.0)	B (11.7)
2031 without Development (Case 2)				
Eastbound Warwick Road Left Turn	A (7.8)	A (8.1)	A (7.8)	A (8.1)
Southbound Middle Neck Road Approach	B (11.5)	B (14.7)	B (11.6)	B (14.7)
2031 with Development (Case 3)				
Eastbound Warwick Road Left Turn	A (9.3)	A (8.6)	A (9.1)	A (8.6)
Southbound Middle Neck Road Approach	C (24.6)	F (94.5)	C (23.7)	F (97.2)

Table 3 (Continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Unsignalized Intersection Two-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Middle Neck Road / Warwick Road (New Castle Road 443A)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2031 with Development (Case 3) *with Improvements I*[4]				
Eastbound Warwick Road Left Turn	-	-	A (9.1)	A (8.6)
Southbound Middle Neck Road Approach	-	-	C (21.8)	F (82.9)
2031 with Development (Case 3) *with Improvements II*[5]				
Eastbound Warwick Road Left Turn	A (9.3)	A (8.6)	A (9.1)	A (8.6)
Southbound Middle Neck Road Approach	B (14.5)	E (42.5)	B (14.2)	E (43.2)

[4] JMT modeled the eastbound approach with one shared left turn/through lane, the westbound approach as one shared through/right turn lane, and the southbound approach with one left turn lane and one right turn lane.
[5] Both JMT and the TIS modeled the eastbound approach with one left turn lane and one through lane, the westbound approach as one through lane and one right turn lane, and the southbound approach with one left turn lane and one right turn lane.

Table 3 (Continued)
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Unsignalized Intersection All-Way Stop Control (T-Intersection) [1]	**LOS per TIS**		**LOS per JMT**	
Middle Neck Road / Warwick Road (New Castle Road 443A)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2031 with Development (Case 3)				
Eastbound Warwick Road Approach	-	-	B (12.0)	B (14.8)
Westbound Warwick Road Approach	-	-	D (29.3)	D (34.4)
Southbound Middle Neck Road Approach	-	-	B (13.5)	D (28.4)
Overall	-	-	C (22.4)	D (28.3)

Table 4a
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Warwick Road / US Route 301 Southbound Ramps [6, 7, 8]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 Existing (Case 1)	C (21.1)	C (25.2)	C (26.0)	C (27.0)
2031 without Development (Case 2)	-	-	C (34.4)	C (32.1)
2031 without Development (Case 2) *with signal optimization* [9]	D (40.1)	C (32.9)	B (17.2)	B (19.7)
2031 with Development (Case 3)	-	-	E (57.4)	D (40.1)
2031 with Development (Case 3) *with signal optimization* [9]	C (32.8)	D (36.1)	C (23.1)	C (24.6)

[6] JMT modeled the intersection as 24-hour free, whereas the TIS modeled the intersection as coordinated with a 90 second cycle length.
[7] JMT assumed a 50% share for WBL movements for the left turn/through lane per field observations.
[8] JMT assumed a 50% split for right turns on red for the AM peak hour.
[9] Signal optimization scenario includes optimizing green split times. Case 2 optimization cycle length is 60 seconds, Case 3 optimization cycle length is 90 seconds.

Table 4b
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
Levels Road (New Castle Road 10) / US Route 301 Northbound Ramps[10]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 Existing (Case 1)				
Eastbound Levels Road Left Turn	A (8.4)	A (8.5)	A (7.6)	A (7.9)
Northbound US Route 301 Ramps Approach	A (9.6)	B (10.6)	A (9.3)	B (10.2)
2031 without Development (Case 2)				
Eastbound Levels Road Left Turn	A (9.1)	A (9.8)	A (7.9)	A (8.2)
Northbound US Route 301 Ramps Approach	B (11.4)	B (12.0)	B (11.4)	B (11.7)
2031 with Development (Case 3)				
Eastbound Levels Road Left Turn	B (10.6)	B (11.4)	A (8.9)	A (8.9)
Northbound US Route 301 Ramps Approach	C (17.6)	C (17.0)	D (27.0)	C (22.5)

[10] The TIS modeled the minor street approach with a two-stage left turn, whereas JMT did not.

Table 5
Peak Hour Levels Of Service (LOS)
Based on Traffic Impact Study for 301 Business Park - North
Report Dated: May 9, 2024
Prepared by: Rossi Group

Signalized Intersection [1]	**LOS per TIS**		**LOS per JMT**	
Middletown Warwick Road (New Castle Road 443) / Levels Road[11]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2023 Existing (Case 1)	D (41.6)	D (40.4)	D (35.2)	D (53.0)
2031 without Development (Case 2) *with signal optimization* [12]	D (44.7)	E (63.4)	D (44.7)	D (53.3)
2031 without Development (Case 2) *with Westown TID LOS E improvements*[13]	D (46.0)	D (42.4)	D (39.2)	D (50.4)
2031 with Development (Case 3) *with signal optimization*	-	-	D (45.3)	E (58.2)
2031 with Development (Case 3) *with Westown TID LOS E improvements* [13]	E (58.9)	D (49.8)	D (40.9)	D (54.9)

[11] JMT modeled the westbound and southbound approaches as arrival type 4 and modeled the eastbound and northbound approaches as arrival type 3, while the TIS modeled all approaches as arrival type 3. JMT modeled the intersection with Field Measured Phase Times selected, whereas the TIS did not.

[12] Signal optimization scenario includes optimizing green split times. For the AM peak hour, a 150 second cycle length was used for Case 2 and a 120 second cycle length was used for Case 3.

[13] Westown TID LOS E scenario includes the provision of an additional left turn lane along the northbound Middletown Warwick Road approach, and to modify one of the southbound Middletown Warwick Road through lanes to be a second left turn lane. JMT modified the southbound right turn lane to no longer be free-flow, whereas the TIS maintained the movements as free-flow.