



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

JENNIFER COHAN
SECRETARY

April 6, 2015

Mr. Eric Ostimchuk
Traffic Planning and Design, Inc.
2500 East High Street
Suite 650
Pottstown, Pennsylvania 19464

Dear Mr. Ostimchuk:

The enclosed Traffic Impact Study (TIS) review letter for the **Newtown Square** commercial development (Tax Parcels 10-033.00-037, 038, 039, 061, 062, 063 & 817) has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Standards and Regulations for Subdivision Streets and State Highway Access and other accepted practices and procedures for such studies. DelDOT accepts this review letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel
Project Engineer

TEB:km

Enclosures

cc with enclosures: Mr. Larry Tarabicos, Tarabicos & Grosso, L.L.P.
Mr. Steve Gorski, Duffield Associates, Inc.
Ms. Constance C. Holland, Office of State Planning Coordination
Ms. Eileen Fogarty, New Castle County Department of Land Use
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Owen Robatino, New Castle County Department of Land Use
Mr. Marco Boyce, New Castle County Department of Land Use
Mr. Mir Wahed, Johnson, Mirmiran & Thompson, Inc.
DelDOT Distribution

DelDOT Distribution

MaryPage Bailey, Deputy Attorney General
Robert McCleary, Director, Transportation Solutions (DOTS)
Drew Boyce, Director, Planning
Mark Luszcz, Chief Traffic Engineer, Traffic, DOTS
Mark Tudor, Assistant Director, Project Development North, DOTS
J. Marc Coté, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Thomas E. Meyer, Traffic Studies Manager, Traffic, DOTS
Kevin Canning, Canal District Engineer, North District
Matthew Lichtenstein, Canal District Public Works Engineer, Canal District
Wayne Henderson, Service Development Planner, Delaware Transit Corporation
Evan Horgan, Service Development Planner, Delaware Transit Corporation
Eric Pugliano, Service Development Planner, Delaware Transit Corporation
Ahmed Abdelmoteleb, New Castle Traffic Engineer, Traffic, DOTS
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Claudy Joinville, Project Engineer, Development Coordination
Kevin Hickman, Johnson, Mirmian & Thompson, Inc.



April 6, 2015

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

RE: Agreement No. 1654
Project Number T201469011
Traffic Impact Study Services
Task 4A-Newtown Square

Dear Mr. Brestel:

Johnson, Mirmiran and Thompson (JMT) has completed the review of the Traffic Impact Study (TIS) for Newtown Square, prepared by Traffic Planning and Design, Inc. (TPD). This review was assigned Task Number 4A. TPD prepared the report in a manner generally consistent with DelDOT's *Development Coordination Manual*.

The TIS evaluates the impacts of Newtown Square, a commercial development proposed at the northwest corner of the intersection of Delaware Route 7 (Bear-Christiana Road/New Castle Road 5) and Newtown Road (New Castle Road 68) in New Castle County. The development would consist of a 6,200 square foot high turnover/sit-down restaurant, a 2,500 square foot drive-in bank, and 14,000 square feet of specialty retail space. The subject property is on a 5.20-acre assemblage of parcels that is split into two zones, NC (Neighborhood Conservation) and CN (Commercial Neighborhood). As part of the proposed development, the NC portion would be rezoned as CN.

Two access points along Delaware Route 7 are proposed for the site. The northern access is proposed as lefts-in/rights-in/rights-out only, and the southern access is proposed as rights-in/rights-out only. In addition, per DelDOT's request, JMT has evaluated three additional access scenarios for the site. The first scenario includes the provision of one lefts-in/rights-in/rights-out only site access along Delaware Route 7, the second scenario includes the provision of one rights-in/rights-out only site access along Delaware Route 7, and the third scenario includes the provision of two rights-in/rights-out only site access points along Delaware Route 7, and one lefts-in/rights-in/rights-out site access point along Newtown Road. Construction for the proposed development is anticipated to be completed by 2016.

DelDOT currently has five relevant capital projects within the study area: *the US 40 and SR 7 Intersection Improvement* project (Contract #T201200104), the *Route 40 Corridor Improvements – 20 Year Transportation Plan* which includes the *SR 7, Newtown Road to SR 273* project (Contract



#T200312601), the *SR 1 Widening, SR 273 to the Roth Bridge* project (Contract #T200511001), the *SR 1 Northbound Auxiliary Lane, US Route 40 to SR 273* project (Contract #T201511001), and the *SR 72/SR 1 Diverging Diamond Interchange* project (Contract #T201511002).

The *US 40 and SR 7 Intersection Improvement* project (Contract #T201200104) includes the installation of signalized pedestrian crossings. The project is designed to improve pedestrian safety and mobility by installing signalized pedestrian crossings across the north and south legs of the intersection and the construction of sidewalk connections along both sides of Delaware Route 7. The anticipated construction start date is Spring/Summer of 2017. Additional information can be found on the DelDOT project website at http://deldot.gov/information/projects/us40_sr7/.

The *Route 40 Corridor Improvements – 20 Year Transportation Plan* details highway, transit, and bicycle and pedestrian improvements that will be needed to address already planned growth and development to enhance the quality of life in the US Route 40 Corridor. DelDOT conducts an annual monitoring effort to determine when planned projects should be implemented. The planned projects are divided into three phases where Phase I addresses immediate congestion and safety concerns. The *SR 7, Newtown Road to SR 273* project (Contract #T200312601) is in Phase I of the corridor improvement project. The project is designed to improve pedestrian and bicycle facilities as well as improve operational deficiencies at intersections along the Delaware Route 7 corridor from Newtown Road to Delaware Route 273. The project includes widening Delaware Route 7 from two to four travel lanes and improving pedestrian, bicycle, and transit facilities to address congestion and mobility issues. Additionally, the project includes the signalization of the Delaware Route 7 and School Bell Road intersection, which was completed in 2014. Additional information can be found on the DelDOT project website at http://deldot.gov/information/projects/sr7_sr273/index.shtml. Additional information about the *Route 40 Corridor Improvements – 20 Year Transportation Plan* can be found on the DelDOT website at <http://deldot.gov/information/projects/rt40/index.shtml>.

The *SR 1 Widening SR 273 to the Roth Bridge* project (Contract #T200511001) is designed to address congestion, improve system connectivity and improve safety on SR 1 from north of the SR 273 interchange to the Roth Bridge. The project consists of widening SR 1 with an additional travel lane in each direction, widening bridges to accommodate the additional travel lanes, and reconfiguring the supporting interchanges at Delaware Route 273, US Route 40, US Route 13/Tybouts Corner, and SR 72. This project has been placed on hold indefinitely. As such, to address congestion and improve operations along SR 1, two interim projects were developed and are discussed below. Additional information can be found on the DelDOT project website at <http://deldot.gov/information/projects/sr1/sr1-wide/>.

The *SR 1 Northbound Auxiliary Lane, US 40 to SR 273* project (Contract #T201511001) is designed to address operational and safety issues in the northbound direction of SR 1 between the on ramp at the US Route 40 interchange to the I-95 northbound flyover ramp by providing additional distance to accelerate and merge onto SR 1 from the US Route 40 ramp and reducing traffic delays in the AM peak period on SR 1 and US Route 40. The project consists of construction



of a new continuous SR 1 northbound auxiliary lane between US Route 40 and Delaware Route 273 to accommodate traffic entering SR 1 northbound from US Route 40 and exiting at Delaware Route 273. The anticipated construction start date is Fall of 2015. Additional information can be found on the DelDOT project website at <http://deldot.gov/information/projects/sr1/sr-1-Interim%20Improvements/index.shtml>.

The *SR 72/SR 1 Diverging Diamond Interchange* project (Contract #T201511002) is designed to improve traffic flow, congestion relief, and safety along Delaware Route 72 at the SR 1 interchange. This Diverging Diamond Interchange is a free flow interchange where the two directions of local traffic (Delaware Route 72) briefly drive on the left side of the road to allow continuous SR 1 access to occur without stopping or crossing traffic. The anticipated construction start date is Spring of 2016. Additional information can be found on the DelDOT project website at <http://deldot.gov/information/projects/sr1/sr-1-Interim%20Improvements/index.shtml>.

DelDOT's 2010 Hazard Elimination Program (HEP) identified Site K which is within the project area. Site K is a 1.39-mile corridor located along US Route 40 (New Castle Road 32) from 0.32-mile east of Glendale Boulevard to 0.01-mile east of Robin Drive North. The Site K Task I report included a crash summary as well as a review of the US Route 40 intersection with Delaware Route 7. Suggested Task I remedial improvements at the US Route 40 intersection with Delaware Route 7 included the installation of One Way, Divided Highway, Turn Lane, Do Not Enter, and Wrong Way signs in compliance with the *Delaware Manual on Uniform Traffic Control Devices (DE MUTCD)*. This intersection was further reviewed under Task II to identify alternatives to reduce northbound and southbound right turn rear end crashes as well as examine the need for pedestrian signals. Reversing the phase order of the northbound and southbound Delaware Route 7 signal phasing was also considered as a Task II recommendation to address the right turn rear end crash problem. Field visits confirm this phasing change has been implemented. Additionally, the installation of signalized pedestrian crossings was a Task II recommendation.

In addition, DelDOT has two future pavement rehabilitation and resurfacing projects within the project area. The first project is Newtown Road from Delaware Route 7 to Smalleys Dam Road (New Castle Road 345) (Contract #T201206105) and involves milling, patching, overlays, and ADA upgrades. The anticipated construction start date is spring of 2015. The second project is US Route 40 from US Route 13 to Delaware Route 72. The scope of the work involves milling, patching, overlays, and ADA upgrades. Additionally, any improvements to the signalized intersections within the US Route 40 project limits, as recommended by DelDOT Traffic, will be included into the contract. A contract number has not yet been assigned and the anticipated construction start date is summer of 2015.

Also of note, as part of the Governors Square Commercial development, the intersection of Delaware Route 7 and Freedom Road is proposed to be signal-controlled with the eastbound and westbound Freedom Road lane configurations updated to one shared through/left turn lane and one right turn lane. However, the Newtown Square development will not be expected to contribute for these improvements.



Based on our review of the traffic impact study, we have the following comments and recommendations:

The proposed development will meet the New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) for all signalized intersections analyzed in this study with the exception of the Delaware Route 7 intersection with US Route 40. However, per the September 3, 2014 DeIDOT Scoping Meeting Minutes, the Delaware Route 7 intersection with US Route 40 is not required to be evaluated by New Castle County and therefore does not need to meet the county LOS standards.

Based on LOS evaluation criteria as stated in DeIDOT's *Development and Coordination Manual*, the following intersection exhibits LOS deficiencies without the implementation of physical roadway and/or traffic control improvements:

<i>Intersection</i>	<i>Situations for which deficiencies occur</i>
Delaware Route 7/US Route 40	2016 AM, PM, and Saturday without the Newtown Square development (Case 2) 2016 AM, PM, and Saturday with the Newtown Square development (Case 3)

The Delaware Route 7 and US Route 40 intersection exhibits LOS deficiencies during the future conditions with or without the Newtown Square development. Specifically, the intersection would operate at LOS E during each peak hour within Cases 2 and 3. The maximum projected delay during Cases 2 and 3 would take place during the PM peak hour. The PM peak hour projected delay would be 70.7 seconds and 72.4 seconds during the Case 2 and Case 3 conditions, respectively. Additionally, 95th percentile queue lengths of approximately 800 feet were calculated along the westbound US Route 40 through movement during the Case 3 PM and Saturday peak hours. These projected queues would spill back and negatively impact operations at the adjacent signalized intersection of US Route 40 with the Eden Square Shopping Center (which is approximately 300 feet east from the Delaware Route 7 and US Route 40 intersection). It should be noted that the westbound US Route 40 queues impact the US Route 40 intersection with the Eden Square Shopping Center under existing conditions as well. Specifically, the calculated 95th percentile queue lengths during the Case 1 PM and Saturday peak hours are approximately 640 feet and 430 feet, respectively.

Although the Delaware Route 7 and US Route 40 intersection exhibits LOS deficiencies with the development of Newtown Square, it is not recommended that the developer implement improvements at this intersection since the contribution from the Newtown Square development would have a minimal impact to the intersection operation. Furthermore, per the September 25, 2014 DeIDOT PLUS review letter, DeIDOT will not require the developer to improve this intersection to maintain a LOS D but will require contributions towards future DeIDOT improvements. Based on DeIDOT's *Route 40 Corridor Improvements – 20 Year Transportation*



Plan, this intersection will be improved which would mitigate any LOS deficiencies. As such, we recommend that the developer be responsible for an equitable contribution to the *US 40 and SR 7 Intersection Improvement* project (Contract #T201200104).

While the two proposed site access points met the DelDOT LOS criteria and had minimal queue lengths, initially DelDOT had concerns about the safety of placing two closely spaced entrances near the Delaware Route 7 and Newtown Road intersection. Specifically, this type of placement creates weaving conflicts between vehicles exiting the northern driveway and vehicles entering the southern driveway and between southbound through traffic and vehicles exiting the southern driveway and proceeding to execute southbound left turn or U-turn movements at the Delaware Route 7 and Newtown Road intersection. Based on further coordination with DelDOT Planning, three alternate access scenarios were evaluated.

The first access scenario includes the provision of only one lefts-in/rights-in/rights-out driveway and the second access scenario includes the provision of only one rights-in/rights-out driveway. Both access scenarios would operate at LOS B or better during each peak hour with projected maximum queue lengths that could be accommodated via the provided storage. In the first access scenario (only one lefts-in/rights-in/rights-out driveway along Delaware Route 7), the calculated 95th percentile queue lengths along the northbound Delaware Route 7 left turn movement is expected to be less than 10 feet during each peak hour.

In the second access scenario (only one rights-in/rights-out driveway along Delaware Route 7), there would be additional U-turn volumes added to the northbound Delaware Route 7 approach to Rivers End Drive. With this additional volume, the Delaware Route 7 and Rivers End Drive intersection would continue to operate at acceptable levels of service and the northbound Delaware Route 7 left turn storage length could accommodate the 95th percentile queue lengths during each peak hour. While a lefts-in/rights-in/rights-out entrance would satisfy DelDOT LOS and traffic operation criteria, the left-in onto the site would conflict with the newly constructed *SR 7, Newtown Road to SR 273* project. As part of the SR 7 project, DelDOT constructed a 16-foot wide landscaped median and any new median openings would undermine DelDOT's effort to promote the flow of through traffic along Delaware Route 7 by limiting the number of access points.

The third access scenario includes two rights-in/rights-out only driveways along Delaware Route 7 and one lefts-in/rights-in/rights-out only driveway along Newtown Road. The results of the third access scenario show that all three access points (two rights-in/rights-out only driveways along Delaware Route 7 and one lefts-in/rights-in/rights-out only driveway along Newtown Road) would operate at LOS B or better during each peak hour and the calculated 95th percentile queue lengths exiting each access point are expected to be less than five feet during each peak hour. The calculated 95th percentile queue length along the eastbound Newtown Road left turn movement is expected to be less than one foot during each peak hour.

An additional analysis was completed for this third access scenario, due to the potential weaving issue for vehicles exiting the southern driveway on Delaware Route 7 and attempting to make a U-turn at Newtown Road. Desirable weaving distances were derived from an Oregon Department



of Transportation (ODOT) Access Management Technical Services Bulletin on weaving in the vicinity of an intersection approach. Specifically, the bulletin describes desirable weaving distances for an urban area with speeds greater than 35 miles per hour.

For the southern driveway, 225 feet of weaving distance (two lane changes) is needed from this driveway to the back of queue for the southbound through movements of Delaware Route 7 at Newtown Road. Based on the AM peak hour, the southbound Delaware Route 7 95th percentile back of queue length from Newtown Road is 208 feet. The total roadway distance from the Delaware Route 7 stop bar at Newtown Road to the middle of the right turn lane (per ODOT's Bulletin) of the southern driveway is approximately 438 feet. The difference between the total roadway segment (438 feet) and the back of queue distance (208 feet) shows an available weaving distance of 230 feet, which is greater than the 225 feet required. Therefore, the weaving distance along Delaware Route 7 between the southern driveway and Newtown Road is sufficient.

Based on the evaluated access scenarios, we recommend that two rights-in/rights-out only driveways along Delaware Route 7 and one lefts-in/rights-in/rights-out only driveway along Newtown Road be provided. As Newtown Road has a Denial of Access, the developer will have to coordinate with DelDOT to pursue the right-of-way acquisition process and purchase the deeded access rights. The developer will be responsible for reimbursing DelDOT for all the funding needed to obtain the deeded access rights from FHWA.

For the westbound Newtown Road right turn lane at the site entrance, DelDOT's auxiliary lane spreadsheet showed a storage length of 145 feet (excluding taper) is needed for the westbound right turn lane at the Newtown Road site access when utilizing the 40 mile per hour posted speed limit. However, the right turn lane into the Newtown Road site access would be immediately adjacent to the Newtown Road signalized intersection with Delaware Route 7. As such, vehicles traversing westbound along Newtown Road are expected to travel at a lower speed when passing the site access. Therefore, with a 25 mile per hour speed and a driveway radius greater than 50 feet, we recommend that an 85 feet right turn lane (excluding taper) be provided. This criteria would meet DelDOT's auxiliary lane spreadsheet guidelines.

Should the County 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, if needed, due to changes in striping to the southbound Delaware Route 7 existing travel lanes from the Delaware Route 7 intersection with Newtown Road to approximately 1,200 feet north of that intersection 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 Newtown Road from the Delaware Route 7 intersection to approximately 400 feet west of that intersection 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 rights-in/rights-out only entrance for the proposed Newtown Square development on southbound Delaware Route 7 at the northern side of the property limits, approximately 800 feet north of the Delaware Route 7 intersection with Newtown Road, to be consistent with the proposed lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Site Entrance	Approach does not exist	One right turn lane
Northbound Delaware Route 7	Two through lanes	Two through lanes
Southbound Delaware Route 7	Two through lanes	Two through lanes and one right turn lane

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) is 190 feet for the southbound Delaware Route 7 right turn lane. It should be noted that the storage length based on the HCS analysis is shorter than what is reported here.

4. The developer should construct a rights-in/rights-out only entrance for the proposed Newtown Square development on southbound Delaware Route 7 at the southern side of the property limits, approximately 390 feet north of the Delaware Route 7 intersection with Newtown Road, to be consistent with the proposed lane configurations as shown in the table below:

Approach	Current Configuration	Proposed Configuration
Eastbound Site Entrance	Approach does not exist	One right turn lane
Northbound Delaware Route 7	Two through lanes	Two through lanes
Southbound Delaware Route 7	Two through lanes	Two through lanes and one right turn lane

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) is 190 feet for the southbound Delaware Route 7 right turn

lane. It should be noted that the storage length based on the HCS analysis is shorter than what is reported here.

5. The developer should improve Newtown Road in accordance with the following recommendations:
 - a. As Newtown Road has a Denial of Access, the developer should coordinate with DelDOT to pursue the right-of-way acquisition process and purchase the deeded access rights from FHWA. The developer should be responsible for reimbursing DelDOT for all the funding needed to obtain the deeded access rights.
 - b. The developer should construct a lefts-in/rights-in/rights-out only entrance for the proposed Newtown Square development on Newtown Road approximately 150 feet west of Delaware Route 7, to be consistent with the proposed lane configurations as shown in the table below:

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

Based on DelDOT's *Development Coordination Manual*, a storage length of 120 feet (excluding taper) is needed for the eastbound left turn lane on Newtown Road. Based on DelDOT's *Development Coordination Manual* and expected turn speed of 25 miles per hour from Delaware Route 7, we recommend that an 85 feet right turn lane (excluding taper) be provided.

- c. The concrete median on the Newtown Road eastbound approach to Delaware Route 7 should be extended to the Newtown Road Site Entrance approximately 200 feet west of the Delaware Route 7 intersection with Newtown Road to prohibit vehicles which may attempt to turn left from the site entrance.
 - d. The developer should construct a curb radius greater than 50 feet for the westbound Newtown Road right turn lane site entrance so that storage can be accommodated within the roadway segment between the site driveway and Delaware Route 7.
6. The developer should enter into an agreement with DelDOT to fund an equitable portion to the improvements planned for the US 40 and SR 7 Intersection Improvement project (Contract # T201200104). Pedestrian crossings will be added to the intersection and the existing lane configurations would be maintained. At least one other development,



Governors Square Commercial, is expected to be responsible for part of these improvements as well. The developer should coordinate with DelDOT on the implementation and equitable cost sharing of these improvements.

7. The following bicycle, pedestrian, and transit improvements should be included:
 - a. A five-foot wide ADA compliant sidewalk with a five-foot setback from the roadway should be constructed along the site frontage. The sidewalk should be within a 15 foot-wide dedicated permanent easement to DelDOT and/or State right-of-way. If feasible, the sidewalk should be placed behind utility poles and street trees should be provided within the buffer area.
 - b. Where internal sidewalks are located alongside of parking spaces, a buffer, physical barrier or signage should be added to eliminate vehicular overhang onto the sidewalk.
 - c. When a right turn lane is added along southbound Delaware Route 7, the five-foot wide bicycle lane should be maintained through the right turn lane in order to facilitate safe and unimpeded bicycle travel. A RIGHT TURN YIELD TO BIKES sign (MUTCD R4-4) should be added before the start of each right turn lane.
 - d. ADA compliant curb ramps and marked crosswalks should be provided at the site entrance. The use of Type 3 curb ramps is discouraged.
 - e. Bike parking should be provided near each building's entrance. Where the building architecture provides for an awning or other overhang, the bike parking should be covered.
 - f. Utility covers should be moved outside of any designated bicycle lanes or should be flush with the pavement.
 - g. The developer should coordinate with DART to determine a suitable location for a new bus stop located along the southbound Delaware Route 7 approach to Newtown Road. Coordination should include provisions for appropriate amenities (bus pad, shelter, etc.).

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

Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://www.deldot.gov/information/pubs_forms/manuals/de_mutcd/index.shtml. For any additional information regarding the work zone impact and mitigation procedures during construction please contact Mr. Adam Weiser of DelDOT's Traffic Section. Mr. Weiser can be reached at (302) 659-4073 or by email at Adam.Weiser@state.de.us.



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.

Mir Wahed,

Mir Wahed, P.E., PTOE

cc: Joanne Maulit, P.E., PTP
Richard A. Mishura
Enclosure

General Information

Report date: November 19, 2014

Prepared by: Traffic Planning and Design, Inc.

Prepared for: 706 Investments, LLC

Tax Parcels: 10-033.00-37, 038, 039, 061, 062, 063, and 817

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

Project Description and Background

Description: The development will consist of a 6,200 square foot high-turnover/sit-down restaurant, a 2,500 square foot drive-in bank, and 14,000 square feet of specialty retail space.

Location: The subject site is on the northwest corner of Delaware Route 7 (Bear-Christiana Road/New Castle Road 5) and Newtown Road (New Castle Road 68) in New Castle County.

Amount of Land to be developed: The subject property is a 5.2-acre assemblage of parcels.

Land Use approval(s) needed: Commercial Neighborhood rezoning approval.

Proposed completion date: 2016.

Proposed access locations: The proposed site is to be served by two access points to Delaware Route 7. The northern access is proposed as lefts-in/rights-in/rights-out only, while the southern access is proposed to be rights-in/rights-out only.

Daily Traffic Volumes:

- 2013 Average Annual Daily Traffic on Delaware Route 7: 20,171 vehicles per day.

Site Map



**Graphic is an approximation based on the Site Plan prepared by Traffic Planning and Design, Inc.*

Relevant and On-going Projects

DelDOT currently has five relevant capital projects within the study area: *the US 40 and SR 7 Intersection Improvement* project (Contract #T201200104), the *Route 40 Corridor Improvements – 20 Year Transportation Plan* which includes the *SR 7, Newtown Road to SR 273* project (Contract #T200312601), the *SR 1 Widening, SR 273 to the Roth Bridge* project (Contract #T200511001), the *SR 1 Northbound Auxiliary Lane, US Route 40 to SR 273* project (Contract #T201511001), and the *SR 72/SR 1 Diverging Diamond Interchange* project (Contract #T201511002).

The *US 40 and SR 7 Intersection Improvement* project (Contract #T201200104) includes the installation of signalized pedestrian crossings. The project is designed to improve pedestrian safety and mobility by installing signalized pedestrian crossings across the north and south legs of the intersection and the construction of sidewalk connections along both sides of Delaware Route 7. The anticipated construction start date is Spring/Summer of 2017. Additional information can be found on the DelDOT project website at http://deldot.gov/information/projects/us40_sr7/.

The *Route 40 Corridor Improvements – 20 Year Transportation Plan* details highway, transit, and bicycle and pedestrian improvements that will be needed to address already planned growth and development to enhance the quality of life in the US Route 40 Corridor. DelDOT conducts an annual monitoring effort to determine when planned projects should be implemented. The planned projects are divided into three phases where Phase I addresses immediate congestion and safety concerns. The *SR 7, Newtown Road to SR 273* project (Contract #T200312601) is in Phase I of the corridor improvement project. The project is designed to improve pedestrian and bicycle facilities as well as improve operational deficiencies at intersections along the Delaware Route 7 corridor from Newtown Road to Delaware Route 273. The project includes widening Delaware Route 7 from two to four travel lanes and improving pedestrian, bicycle, and transit facilities to address congestion and mobility issues. Additionally, the project includes the signalization of the Delaware Route 7 and School Bell Road intersection, which was completed in 2014. Additional information can be found on the DelDOT project website at http://deldot.gov/information/projects/sr7_sr273/index.shtml. Additional information about the *Route 40 Corridor Improvements – 20 Year Transportation Plan* can be found on the DelDOT website at <http://deldot.gov/information/projects/rt40/index.shtml>.

The *SR 1 Widening SR 273 to the Roth Bridge* project (Contract #T200511001) is designed to address congestion, improve system connectivity and improve safety on SR 1 from north of the SR 273 interchange to the Roth Bridge. The project consists of widening SR 1 with an additional travel lane in each direction, widening bridges to accommodate the additional travel lanes, and reconfiguring the supporting interchanges at Delaware Route 273, US Route 40, US Route 13/Tybouts Corner, and SR 72. This project has been placed on hold indefinitely. As such, to address congestion and improve operations along SR 1, two interim projects are discussed below. Additional information can be found on the DelDOT project website at <http://deldot.gov/information/projects/sr1/sr1-wide/>.

The *SR 1 Northbound Auxiliary Lane, US 40 to SR 273* project (Contract #T201511001) is designed to address operational and safety issues in the northbound direction of SR 1 between the on ramp at the US Route 40 interchange to the I-95 northbound flyover ramp by providing additional distance to accelerate and merge onto SR 1 from the US Route 40 ramp and reducing

traffic delays in the AM peak period on SR 1 and US Route 40. The project consists of construction of a new continuous SR 1 northbound auxiliary lane between US Route 40 and Delaware Route 273 to accommodate traffic entering SR 1 northbound from US Route 40 and exiting at Delaware Route 273. The anticipated construction start date is Fall of 2015. Additional information can be found on the DelDOT project website at <http://deldot.gov/information/projects/sr1/sr-1-Interim%20Improvements/index.shtml>.

The SR 72/SR 1 Diverging Diamond Interchange project (Contract #T201511002) is designed to improve traffic flow, congestion relief, and safety along Delaware Route 72 at the SR 1 interchange. This Diverging Diamond Interchange is a free flow interchange where the two directions of local traffic (Delaware Route 72) briefly drive on the left side of the road to allow continuous SR 1 access to occur without stopping or crossing traffic. The anticipated construction start date is Spring of 2016. Additional information can be found on the DelDOT project website at <http://deldot.gov/information/projects/sr1/sr-1-Interim%20Improvements/index.shtml>.

DelDOT's 2010 Hazard Elimination Program (HEP) identified Site K which is within the project area. Site K is a 1.39-mile corridor located along US Route 40 (New Castle Road 32) from 0.32-mile east of Glendale Boulevard to 0.01-mile east of Robin Drive North. The Site K Task I report included a crash summary as well as a review of the US Route 40 intersection with Delaware Route 7. Suggested Task I remedial improvements at the US Route 40 intersection with Delaware Route 7 included the installation of One Way, Divided Highway, Turn Lane, Do Not Enter, and Wrong Way signs in compliance with the *Delaware Manual on Uniform Traffic Control Devices (DE MUTCD)*. This intersection was further reviewed under Task II to identify alternatives to reduce northbound and southbound right turn rear end crashes as well as examine the need for pedestrian signals. Reversing the phase order of the northbound and southbound Delaware Route 7 signal phasing was also considered as a Task II recommendation to address the right turn rear end crash problem. Field visits confirm this phasing change has been implemented. Additionally, the installation of signalized pedestrian crossings was a Task II recommendation.

In addition, DelDOT has two future pavement rehabilitation and resurfacing projects within the project area. The first project is Newtown Road from Delaware Route 7 to Smalleys Dam Road (New Castle Road 345) (Contract #T201206105) and involves milling, patching, overlays, and ADA upgrades. The anticipated construction start date is spring of 2015. The second project is US Route 40 from US Route 13 to Delaware Route 72. The scope of the work involves milling, patching, overlays, and ADA upgrades. Additionally, any improvements to the signalized intersections within the US Route 40 project limits, as recommended by DelDOT Traffic, will be included into the contract. A contract number has not yet been assigned and the anticipated construction start date is summer of 2015.

Also of note, as part of the Governors Square Commercial development, the intersection of Delaware Route 7 and Freedom Road is proposed to be signal-controlled with the eastbound and westbound Freedom Road lane configurations updated to one shared through/left turn lane and one right turn lane. However, the Newtown Square development will not be expected to contribute for these improvements.

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, 2010)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
Newtown Square 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 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. Furthermore, 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 near established residential communities and Investment Level 1 areas. According to Livable Delaware, Level 1 focuses on new or expansion of economic development projects located in these areas. Therefore, the proposed development is generally consistent with the 2010 update of the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans

(Source: New Castle County, 2012 Comprehensive Plan)

New Castle County Comprehensive Plan:

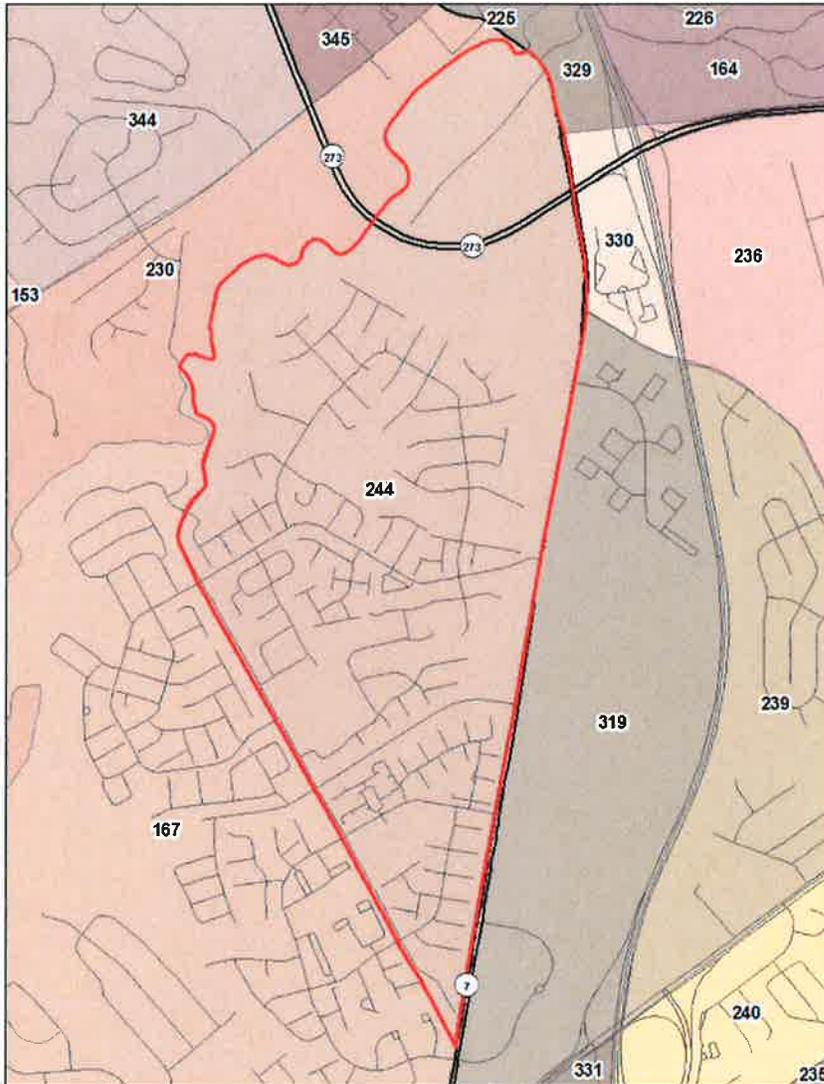
The subject property currently split-zoned as NC (Neighborhood Conservation, 3.21 acres) and CN (Commercial Neighborhood, 1.99 acres). The proposed development plans to rezone the NC portion as CN. According to the New Castle County Comprehensive Plan, the future land use of the property would be within the Office/Commercial/Industrial Development area (OCI) and the Medium Residential Density area.

Proposed Development's Compatibility with the New Castle County Comprehensive Plan:

Per the New Castle County Comprehensive Plan, mixed-use development, which include combined residential and commercial components, is encouraged in OCI areas. The proposed development consists of commercial uses and will be located adjacent to residential areas. As such, the development is generally compatible with the New Castle County Comprehensive Plan.

Transportation Analysis Zones (TAZ)

Transportation Analysis Zones (TAZ) where development would be located: 244



TAZ Boundaries (244):

- Current employment estimate for TAZ: 484 in 2010**
- Future employment estimate for TAZ: 484 in 2040**
- Current Population estimate for TAZ: 4,843 in 2010**
- Future Population estimate for TAZ: 4,422 in 2040**
- Current household estimate for TAZ: 1,860 in 2010**
- Future household estimate for TAZ: 1,888 in 2040**
- Relevant committed developments in the TAZ: Christiana Self Storage**

Would the addition of committed developments to current estimates exceed future projections: Yes.

Would the addition of committed developments and the proposed development to current estimates exceed future projections: Yes.

Trip Generation

As per the TIS, the trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 9th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Codes 820 (Shopping Center), 912 (Drive-In Bank), and 932 (High-Turnover Sit-Down Restaurant).

The peak period trip generation for the Newtown Square development is included in Table 1.

Table 1
NEWTOWN SQUARE

Land Use	ADT	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
14,000 Square Feet Shopping Center	598	8	5	13	25	27	52	35	32	67
Internal Capture		1	0	1	2	3	5	4	3	7
Sub-Total (External Trips)		7	5	12	23	24	47	31	29	60
Pass-By Trips		1	1	2	8	8	16	8	8	16
Net Primary Trips		6	4	10	15	16	31	23	21	44
2,500 Square Feet Drive-In Bank	370	17	13	30	31	30	61	34	32	66
Internal Capture		2	1	3	3	3	6	4	3	7
Sub-Total (External Trips)		15	12	27	28	27	55	30	29	59
Pass-By Trips		5	5	10	13	13	26	14	14	28
Net Primary Trips		10	7	17	15	14	29	16	15	31
6,200 Square Feet High-Turnover Sit-Down Restaurant	788	37	30	67	37	24	61	46	41	87
Internal Capture		4	3	7	4	2	6	5	4	9
Sub-Total (External Trips)		33	27	60	33	22	55	41	37	78
Pass-By Trips		10	10	20	12	12	24	17	17	34
Net Primary Trips		23	17	40	21	10	31	24	20	44
Net New Trips		39	28	67	51	40	91	63	56	119

Overview of TIS

Intersections examined:

1. Delaware Route 7 (Bear – Christiana Road/New Castle Road 5) / Northern Site Access
2. Delaware Route 7 / Southern Site Access
3. Delaware Route 7 / Newtown Road (New Castle Road 68)
4. Delaware Route 7 / Songsmith Drive
5. Delaware Route 7 / Entrance to DelDOT offices and yard / Entrance to Christiana Meadows
6. Delaware Route 7 / Rivers End Drive
7. Delaware Route 7 / School Bell Road (New Castle Road 344)
8. Delaware Route 7 / Freedom Road
10. Delaware Route 7 / US Route 40 (New Castle Road 32)
11. Newtown Road / Smalleys Dam Road (New Castle Road 345)
12. Smalleys Dam Road / Victoria Boulevard
13. Newtown Road / Picasso Circle
14. Smalleys Dam Road / Songsmith Drive / Freedom Road
15. Freedom Road / Colonial Circle

Note: The Delaware Route 7 and Delaware Route 273 intersection (Intersection 9) was a study location based on the July 14, 2014 DelDOT scoping letter. However, as per the direction given in the September 3, 2014 DelDOT scoping letter, this intersection was removed from the analysis.

Conditions examined:

1. Case 1 – 2014 Existing conditions.
2. Case 2 – 2016 No Build conditions without Newtown Square
3. Case 3 – 2016 Build conditions with Newtown Square

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

Committed Developments considered:

1. Governors Square Commercial (218,995 square feet of retail space and a 9,000 square foot restaurant)
2. Lincoln Center (181,470 square feet of retail space, 10,000 square feet of restaurant space, 499,863 square feet of general office space, a 230-room hotel, a 205-student daycare, 182 townhouses, 326 apartments)
3. Christiana Self Storage (83,876 square feet of mini-storage space, 1,000 square feet of office space)
4. St. Elizabeth Ann Seton Church (22,477 square foot expansion of existing church)
5. Whittington Woods (82 single-family detached houses)

Intersection Descriptions

1. **Delaware Route 7 (Bear-Christiana Road/New Castle Road 5) / Northern Site Access**
Type of Control: proposed stop controlled intersection (T-intersection)

Eastbound Approach: (Proposed Driveway) proposed one right turn lane, stop controlled
Northbound Approach: (Delaware Route 7) existing two through lanes; proposed one left turn lane and two through lanes
Southbound Approach: (Delaware Route 7) existing two through lanes; proposed two through lanes and one right turn lane

2. Delaware Route 7 / Southern Site Access

Type of Control: proposed stop controlled intersection (T-intersection)
Eastbound Approach: (Proposed Driveway) proposed one right turn lane, stop controlled
Northbound Approach: (Delaware Route 7) existing two through lanes
Southbound Approach: (Delaware Route 7) existing two through lanes; proposed two through lanes and one right turn lane

3. Delaware Route 7 / Newtown Road (New Castle Road 68)

Type of Control: existing signal controlled intersection
Eastbound Approach: (Newtown Road) existing one shared through/left turn lane and one channelized right turn lane
Westbound Approach: (Newtown Road) existing one shared through/left turn lane and one right turn lane
Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one channelized right turn lane
Southbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one channelized right turn lane

4. Delaware Route 7 / Songsmith Drive

Type of Control: existing signal controlled intersection
Eastbound Approach: (Songsmith Drive) existing one shared through/left turn lane and one right turn lane; proposed one left turn lane, one shared through/left turn lane, and one right turn lane
Westbound Approach: (Songsmith Drive) existing one shared through/left turn lane and one right turn lane; proposed one left turn lane, one shared through/left turn lane, and one right turn lane
Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane
Southbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane

Note: As part of the Governors Square Commercial development, the eastbound and westbound approaches to this intersection is being improved to provide exclusive left turn lanes. Both the TIS and JMT took this improvement into account during the future analyses.

5. Delaware Route 7 / Entrance to DelDOT offices and yard / Entrance to Christiana Meadows

Type of Control: existing signal controlled intersection
Eastbound Approach: (Entrance to DelDOT offices and yard) existing one shared through/left turn lane and one right turn lane

Westbound Approach: (Entrance to Christiana Meadows) existing one shared through/left turn lane and one right turn lane

Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane

Southbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one channelized right turn lane

6. Delaware Route 7 / Rivers End Drive

Type of Control: existing signal controlled intersection

Eastbound Approach: (Rivers End Drive) existing one left turn lane, one shared through/left turn lane, and one channelized right turn lane

Westbound Approach: (Church Entrance Road) existing one shared through/left turn lane and one right turn lane

Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one channelized right turn lane

Southbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one channelized right turn lane

7. Delaware Route 7 / School Bell Road (New Castle Road 344)

Type of Control: existing signal controlled intersection

Eastbound Approach: (Wheaton Storage Entrance) existing one shared through/left turn/right turn lane

Westbound Approach: (School Bell Road) existing one shared through/left turn lane and one right turn lane

Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one channelized right turn lane

Southbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane

8. Delaware Route 7 / Freedom Road

Type of Control: existing stop controlled intersection; proposed signal controlled intersection

Eastbound Approach: (Freedom Road) existing one left turn lane and one right turn lane, stop controlled; proposed one shared left turn/through lane and one right turn lane

Westbound Approach: (Freedom Road) existing one shared left turn/through/right turn lane, stop controlled; proposed one shared left turn/through lane and one right turn lane

Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane

Southbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane

Note: As part of the Governors Square Commercial development, this intersection will be signal-controlled. Both the TIS and JMT took this improvement into account during the future analyses.

10. Delaware Route 7 / US Route 40 (New Castle Road 32)

Type of Control: existing signal controlled intersection

Eastbound Approach: (US Route 40) existing two left turn lanes, three through lanes, and one channelized right turn lane

Westbound Approach: (US Route 40) existing two left turn lanes, three through lanes, and one channelized right turn lane

Northbound Approach: (Delaware Route 7) existing one left turn lane, two through lanes, and one right turn lane

Southbound Approach: (Delaware Route 7) existing two left turn lanes, two through lanes, and one right turn lane

11. Newtown Road / Smalleys Dam Road (New Castle Road 345)

Type of Control: existing all-way stop controlled intersection

Eastbound Approach: (Newtown Road) existing one shared left turn/through/right turn lane, stop controlled

Westbound Approach: (Newtown Road) existing one shared through/left turn lane and one channelized right turn lane, stop controlled

Northbound Approach: (Smalleys Dam Road) existing one left turn lane, one through lane and one right turn lane, stop controlled

Southbound Approach: (Smalleys Dam Road) existing one left turn lane and one shared through/right turn lane, stop controlled

12. Smalleys Dam Road / Victoria Boulevard

Type of Control: existing stop controlled intersection (T-intersection)

Westbound Approach: (Victoria Boulevard) existing one shared left turn/right turn lane, stop controlled

Northbound Approach: (Smalleys Dam Road) existing one shared through/right turn lane

Southbound Approach: (Smalleys Dam Road) existing one shared through/left turn lane

13. Newtown Road / Picasso Circle

Type of Control: existing stop controlled intersection (T-intersection)

Eastbound Approach: (Newtown Road) existing one shared through/left turn lane, stop controlled

Westbound Approach: (Newtown Road) existing one shared through/right turn lane

Southbound Approach: (Picasso Circle) existing one shared left turn/right turn lane, stop controlled

14. Smalleys Dam Road / Songsmith Drive / Freedom Road

Type of Control: existing stop controlled intersection

Eastbound Approach: (Songsmith Drive) existing one left turn lane and one shared through/right turn lane, stop controlled

Westbound Approach: (Freedom Road) existing one shared through/left turn/right turn lane, stop controlled

Northbound Approach: (Smalleys Dam Road) existing one shared through/left turn lane and one right turn lane

Southbound Approach: (Smalleys Dam Road) existing one shared through/left turn lane and one right turn lane

15. Freedom Road / Colonial Circle

Type of Control: existing stop controlled intersection (T-intersection)

Eastbound Approach: (Freedom Road) existing one shared through/left turn lane

Westbound Approach: (Freedom Road) existing one shared through/right turn lane

Southbound Approach: (Colonial Circle) existing one shared left turn/right turn lane, stop controlled

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Delaware Transit Corporation (DTC) currently provides existing services via DART Route 54, Route 40, and Route 23 within the study area. The designated bus stops for Route 54 that exist within the study area are located at every signalized intersection along Delaware Route 7, from Delaware Route 273 to Rivers End Drive and along Smalleys Dam Road at its intersections with Rivers End Drive, Victoria Boulevard, and Songsmith Drive/Freedom Road. Additionally, DART Route 54 provides 19 round trips on Mondays through Fridays from 5:35 a.m. to 9:39 p.m. and 10 round trips on Saturdays from 7:10 a.m. to 8:19 p.m. The designated bus stops for DART Route 40 that exist within the study area are located at every signalized intersection along Delaware Route 7, from Delaware Route 273 to Songsmith Drive. Additionally, DART Route 40 provides 25 round trips on Mondays through Fridays from 4:40 a.m. to 11:35 p.m. and 14 round trips on Saturdays from 6:14 a.m. to 8:14 p.m. The designated bus stop for Route 23 that exists within the study area is located at the Delaware Route 7 with Delaware Route 273 Park & Ride facility. This Park & Ride facility also provides access to DART Routes 54 and 40. Additionally, DART Route 23 provides 17 round trips on Mondays through Fridays from 5:50 a.m. to 11:25 p.m. and 6 round trips on Saturdays from 7:00 a.m. to 8:38 p.m.

Planned transit service: The TIS contacted Wayne Henderson, Service Development Planner at the DTC and JMT contacted David Dooley, Transit Planner at the DTC. In a January 9, 2015 email, Mr. Dooley recommended that a new stop be located along southbound Delaware Route 7 at its intersection with Newtown Road. The new stop should have a concrete pad with a shelter. Sidewalk connectivity should be provided from the bus stop to the entrance of Newtown Square and to the pedestrian connections at Newtown Road.

Existing bicycle and pedestrian facilities: According to DelDOT's *Delaware Bicycle Facility Master Plan* (October 2005) and the *New Castle County Bicycle Map*, connector and regional bicycle routes exist within the study area. The regional bicycle route runs along the Delaware Route 7 corridor and traverses through nine of the project's study intersections (the Delaware Route 7 intersections with Northern Site Access, Southern Site Access, Newtown Road, Songsmith Drive, DelDOT entrance/Christiana Meadows, Rivers End Drive, School Bell Road, Freedom Road, and US Route 40). The connector bicycle route runs along US Route 40 and traverses through one of the project's study intersections (the US 40 intersection with SR 7).

Planned bicycle and pedestrian facilities: The TIS and JMT contacted Mr. Marco Boyce, DelDOT's Bicycle and Pedestrian Coordinator. In a December 9, 2014 email, Mr. Boyce stated that along the Delaware Route 7 site frontage, sidewalk should be buffered further away from the roadway placed into access easement areas as necessary. Street trees should be planted within the buffer areas between the sidewalk and edge of pavement per *New Castle County – Unified*

Development Code. Additionally, a bike lane must be maintained between the right turn lanes and through lanes.

Mr. Boyce also stated that there are two potential shared pathway improvement projects that are located within the study area. One pathway would be located along US Route 40 and would traverse through the US Route 40 and Delaware Route 7 intersection. The second pathway would be along Delaware Route 7 and Smalleys Dam Road and would traverse through the Songsmith Drive and Delaware Route 7 intersection as well as the Smalleys Dam Road intersection with Freedom Road.

Bicycle Level of Service and Bicycle Compatibility Index: According to the League of Illinois Bicyclists (LIB), Bicycle Level of Service (BLOS) is an emerging national standard for quantifying the bike-friendliness of a roadway by measuring on-road bicyclist comfort levels for specific roadway geometries and traffic conditions. Utilizing the 10-year projected AADT along the site frontages, the BLOS with the construction of the proposed development and the provision of 5' bike lanes are summarized below. The BLOS was determined utilizing the calculators published on the LIB website: <http://www.bikelib.org/roads/blos/blosform.htm>

- Delaware Route 7 – BLOS: C

Previous Comments

None.

General HCS Analysis Comments

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

1. Traffic Planning and Design, Inc. (TPD) performed signalized intersection analysis using HCS 2010 Streets Version 6.50 whereas JMT used HCS 2010 Streets Version 6.65. As such, some of the results are different between the two analyses.
2. Per DelDOT's *Development Coordination Manual*, JMT utilized the future 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 the existing PHF, whichever was higher. The TIS maintained the existing PHF throughout the future cases.
3. At some intersections, JMT used heavy vehicle percentages consistent with the traffic count data whereas the TIS did not.
4. Per DelDOT's *Development Coordination Manual*, JMT utilized heavy vehicle percentages per lane group at the signalized intersections. However, at some signalized locations the TIS based the percentages per movement.
5. Per DelDOT's *Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement in 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 analysis of future scenarios. The TIS maintained the heavy vehicle percentages utilized in their existing cases throughout the future cases.
6. The TIS input approach grades into the analysis, whereas JMT did not as this information may not be accurately provided in the analysis.
7. JMT analyzed the signalized intersections from Delaware Route 7 and Songsmith Drive to Delaware Route 7 and School Bell Road as a corridor which allowed the input of offset data. The TIS did not input offset data as they individually analyzed each intersection.
8. JMT utilized right-turn-on-red volumes within the signalized intersection analyses and proportionally increased them for the future cases. The TIS maintained the existing right-turn-on-red volumes throughout the future cases.
9. JMT maintained the minimum green time along every movement consistent with the DelDOT timing plans whereas the TIS did not follow at some intersections.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ¹ Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7 (Bear Christiana Road/New Castle Road 5)/ Northern Site Access						
2016 with development of Newtown Square (Case 3) ^{2,3}						
Eastbound Site Access Right	B (10.5)	B (14.6)	B (11.2)	A (9.6)	B (11.8)	A (9.6)
Northbound Delaware Route 7 Left	A (9.3)	B (14.2)	B (10.1)	A (9.1)	B (14.0)	A (9.6)
2016 with development of Newtown Square (Case 3) with Lefts-in/Rights-in/Right-Out Entrance Configuration ⁴						
Eastbound Site Access Right	-	-	-	A (9.7)	B (12.4)	B (10.1)
Northbound Delaware Route 7 Left	-	-	-	A (9.1)	B (14.0)	A (9.7)
2016 with development of Newtown Square (Case 3) with Rights-in/Rights-Out Entrance Configuration ⁵						
Eastbound Site Access Right	-	-	-	A (9.7)	B (12.4)	B (10.1)

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

² The TIS did not input heavy vehicle percentages whereas JMT utilized a 3% heavy vehicle percentage for each movement.

³ JMT included upstream signal information in the analysis whereas the TIS did not.

⁴ This scenario provides only one access along Delaware Route 7 which would be configured as one lefts-in/rights-in/rights-out driveway.

⁵ This scenario provides only one access along Delaware Route 7 which would be configured as one rights-in/rights-out driveway.

Table 2 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ¹ Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7 (Bear Christiana Road/New Castle Road 5)/ Northern Site Access						
2016 with development of Newtown Square (Case 3) with Newtown Road Access ⁶						
Eastbound Site Access Right	-	-	-	A (9.6)	B (11.8)	A (9.3)

⁶ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁷ Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Southern Site Access						
2016 with development of Newtown Square (Case 3) ^{8,9}						
Eastbound Site Access Right	B (10.5)	C (15.1)	B (11.4)	A (9.7)	B (11.8)	A (9.7)
2016 with development of Newtown Square (Case 3) <i>with Newtown Road Access</i> ¹⁰						
Eastbound Site Access Right	-	-	-	A (9.7)	B (11.7)	A (9.6)

⁷ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁸ The TIS did not input heavy vehicle percentages whereas JMT utilized a 3% heavy vehicle percentage for each movement.

⁹ JMT included upstream signal information in the analysis whereas the TIS did not.

¹⁰ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ¹¹	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Newtown Road (New Castle Road 68)						
Existing (Case 1)	B (14.5)	B (10.4)	A (7.4)	C (21.6)	B (15.2)	B (15.7)
2016 without development of Newtown Square (Case 2)	B (13.1)	B (10.3)	A (8.3)	C (22.9)	B (14.7)	C (20.0)
2016 with development of Newtown Square (Case 3)	B (13.9)	B (10.3)	A (9.6)	C (23.6)	B (14.7)	C (20.6)
2016 with development of Newtown Square (Case 3) <i>with Newtown Road Access</i> ¹²	-	-	-	C (24.6)	B (14.6)	B (19.5)

¹¹ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

¹² This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ¹³	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Songsmith Drive						
Existing (Case 1)	B (11.9)	B (18.9)	C (21.2)	B (16.8)	C (20.2)	C (25.3)
2016 without development of Newtown Square (Case 2) ^{14,15}	B (11.4)	C (28.9)	D (49.2)	B (15.9)	C (28.2)	C (31.5)
2016 with development of Newtown Square (Case 3) ^{14,15}	B (11.3)	C (29.1)	D (48.9)	B (15.8)	C (28.1)	C (31.5)

¹³ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

¹⁴ As part of the Governors Square Commercial development, the eastbound and westbound approaches to this intersection is being improved to provide exclusive left turn lanes. Both the TIS and JMT took this improvement into account during the future analyses.

¹⁵ During the Saturday peak hour, the TIS utilized a peak hour factor of 0.92 whereas JMT utilized a peak hour factor of 0.98 consistent with the traffic counts.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ¹⁶	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Entrance to DelDOT offices and yard/Entrance to Christiana Meadows^{17,18}						
Existing (Case 1) ¹⁹	A (9.4)	A (2.8)	A (3.8)	B (11.7)	B (11.4)	B (12.5)
2016 without development of Newtown Square (Case 2)	A (9.6)	A (2.7)	A (3.7)	B (12.3)	B (12.1)	B (13.2)
2016 with development of Newtown Square (Case 3)	A (9.7)	A (2.7)	A (3.8)	B (12.3)	B (12.3)	B (13.2)

¹⁶ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

¹⁷ During the PM peak hour, the TIS utilized volumes that did not incorporate the October seasonal adjustment factors whereas JMT did.

¹⁸ During the PM peak hour, the TIS utilized a peak hour factor of 0.92 whereas JMT utilized a peak hour factor of 0.93 consistent with the traffic counts.

¹⁹ During the Saturday peak hour, JMT utilized volumes consistent with the volume figure from the report whereas the TIS did not.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ²⁰	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Rivers End Drive						
Existing (Case 1) ²¹	B (16.6)	A (7.4)	B (10.1)	C (21.4)	A (9.4)	B (15.1)
2016 without development of Newtown Square (Case 2)	B (15.4)	A (7.3)	B (11.3)	C (20.9)	A (9.7)	B (15.5)
2016 with development of Newtown Square (Case 3)	B (15.3)	A (7.3)	B (11.3)	C (20.9)	A (9.8)	B (16.1)
2016 with development of Newtown Square (Case 3) with Rights-In/Rights-Out Entrance Configuration ²²	-	-	-	C (20.6)	A (9.8)	B (16.1)
2016 with development of Newtown Square (Case 3) with Newtown Road Access ²³	-	-	-	C (22.6)	A (9.9)	B (16.1)

²⁰ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

²¹ During the Saturday peak hour, JMT utilized volumes consistent with the volume figure from the report whereas the TIS did not.

²² This scenario provides only one access along Delaware Route 7 which would be configured as one rights-in/rights-out driveway.

²³ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ²⁴	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ School Bell Road (New Castle Road 344)						
Existing (Case 1) ²⁵	A (9.0)	A (4.1)	A (5.8)	B (18.9)	A (8.3)	A (6.0)
2016 without development of Newtown Square (Case 2) ²⁶	A (8.5)	A (4.2)	A (5.7)	B (16.8)	A (8.3)	A (5.2)
2016 with development of Newtown Square (Case 3) ²⁶	A (8.5)	A (3.9)	A (5.7)	B (16.7)	A (8.4)	A (5.1)

²⁴ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

²⁵ During the Saturday peak hour, JMT utilized a westbound left turn volume of 40 vehicles consistent with the volume figure from the report whereas the TIS did not.

²⁶ During the PM peak hour, JMT utilized volumes consistent with the volume figure from the report whereas the TIS did not.

Table 9
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ²⁷ Two-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Freedom Road²⁸						
Existing (Case 1) ²⁹						
Eastbound Freedom Road Left	C (19.9)	F (52.5)	C (17.0)	C (21.9)	D (34.5)	C (17.3)
Eastbound Freedom Road Right	A (9.8)	B (12.5)	A (9.7)	A (9.8)	B (10.7)	A (9.5)
Eastbound Freedom Road Approach	C (16.7)	E (36.1)	B (13.6)	C (18.2)	C (24.8)	B (13.7)
Westbound Freedom Road Approach ³⁰	-	D (25.8)	-	-	C (23.7)	-
Northbound Delaware Route 7 Left	A (8.7)	B (11.5)	A (8.6)	A (8.9)	B (11.1)	A (8.5)
Southbound Delaware Route 7 Left	A (9.5)	A (9.2)	A (9.5)	A (9.7)	A (9.2)	A (9.5)

²⁷ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

²⁸ JMT included upstream signal information in the analysis whereas the TIS did not.

²⁹ During the AM peak hour, JMT utilized volumes consistent with the report whereas the TIS did not.

³⁰ LOS and delay results are not presented during the AM peak hour and Saturday peak hours as there were no volumes along that approach.

Table 9 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ²⁷	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ Freedom Road³¹						
2016 without development of Newtown Square (Case 2)	C (28.0)	C (30.5)	B (12.5)	C (26.5)	C (29.1)	B (16.5)
2016 with development of Newtown Square (Case 3)	C (28.1)	C (30.7)	B (12.4)	C (26.5)	C (29.3)	B (16.5)
2016 with development of Newtown Square (Case 3) with Newtown Road Access ³²	-	-	-	C (26.5)	C (29.2)	B (16.5)

³¹ As part of the Governors Square Commercial development, this intersection will be signal-controlled. Both the TIS and JMT took this improvement into account during the future analyses. The TIS modeled the signal with a 120 second cycle length during every peak period. JMT modeled the signal with a 120 second cycle length during the AM and PM peak periods and a 90 second cycle length during the Saturday peak period. Both the TIS and JMT modeled the eastbound and westbound approaches to provide one shared through/left turn lane and one right turn lane, and the existing lane configurations along the northbound and southbound approaches were maintained.

³² This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 10
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ³³	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Delaware Route 7/ US Route 40 (New Castle Road 32) ³⁴						
Existing (Case 1) ^{35,36}	D (42.2)	D (38.5)	C (24.7)	D (51.0)	D (47.5)	C (34.4)
2016 without development of Newtown Square (Case 2) ^{35, 36}	D (48.5)	D (52.3)	D (52.1)	E (59.7)	E (70.7)	E (56.4)
2016 with development of Newtown Square (Case 3) ³⁷	D (54.8)	D (54.5)	D (49.9)	E (60.3)	E (72.4)	E (58.0)

³³ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

³⁴ The TIS utilized right-turn-on-red volumes and protected northbound and southbound right turns during the protected eastbound and westbound phases. However, JMT only utilized right-turn-on-red volumes.

³⁵ The TIS utilized arbitrary cycle lengths during each peak period analysis. However, JMT utilized a cycle length of 150 seconds for each analysis per the DelDOT Timing Plan.

³⁶ The TIS modeled eastbound and westbound left turn movements as protected and permitted. However, JMT modeled the eastbound and westbound left turn movements as protected only based on field observations.

³⁷ JMT utilized the existing right-turn-on-red volumes and proportionally increased them for this future case. The TIS utilized the existing right-turn-on-red volumes and then decreased the northbound and southbound volumes for this future case.

Table 11
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ³⁸ All-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday MIDDAY	Weekday AM	Weekday PM	Saturday MIDDAY
Newtown Road/ Smalleys Dam Road (New Castle Road 345) ^{39,40}						
Existing (Case 1)						
Eastbound Newtown Road Approach	A (9.07)	B (13.69)	A (8.93)	A (8.97)	B (13.63)	A (8.93)
Westbound Newtown Road Approach	B (11.21)	A (9.07)	A (8.62)	A (9.86)	A (9.05)	A (8.60)
Northbound Smalleys Dam Road Approach	B (10.44)	B (10.27)	A (8.91)	B (10.25)	B (10.03)	A (8.93)
Southbound Smalleys Dam Road Approach	A (8.95)	B (10.13)	A (9.19)	A (8.68)	B (10.09)	A (9.20)
Overall Intersection	B (10.24)	B (11.64)	A (8.91)	A (9.72)	B (11.55)	A (8.91)
2016 without development of Newtown Square (Case 2)						
Eastbound Newtown Road Approach	A (9.24)	C (15.03)	A (9.45)	A (9.15)	C (15.25)	A (9.52)
Westbound Newtown Road Approach	B (11.38)	A (9.47)	A (8.96)	A (10.00)	A (9.52)	A (9.01)
Northbound Smalleys Dam Road Approach	B (10.55)	B (10.52)	A (9.18)	B (10.43)	B (10.34)	A (9.24)
Southbound Smalleys Dam Road Approach	A (9.02)	B (10.41)	A (9.46)	A (8.75)	B (10.41)	A (9.54)
Overall Intersection	B (10.37)	B (12.41)	A (9.24)	A (9.86)	B (12.48)	A (9.30)

³⁸ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

³⁹ The northbound Smalleys Dam Road approach provides three lanes. However, HCS does not allow the input of three lanes on an approach for an all-way stop analysis. As such, both JMT and the TIS used a separate left turn lane and shared through/right turn lane on the northbound Smalleys Dam Road approach.

⁴⁰ The TIS used the higher movement heavy vehicle percentage for shared lanes. JMT used the heavy vehicle percentage based on lane group for shared lanes.

Table 11 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ³⁸ All-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Newtown Road/ Smalleys Dam Road (New Castle Road 345)^{39,40}						
2016 with development of Newtown Square (Case 3)						
Eastbound Newtown Road Approach	A (9.29)	C (15.25)	A (9.54)	A (9.20)	C (15.48)	A (9.61)
Westbound Newtown Road Approach	B (11.44)	A (9.53)	A (9.03)	B (10.04)	A (9.58)	A (9.07)
Northbound Smalleys Dam Road Approach	B (10.58)	B (10.56)	A (9.22)	B (10.46)	B (10.38)	A (9.29)
Southbound Smalleys Dam Road Approach	A (9.05)	B (10.45)	A (9.50)	A (8.77)	B (10.47)	A (9.58)
Overall Intersection	B (10.41)	B (12.53)	A (9.30)	A (9.90)	B (12.61)	A (9.36)
2016 with development of Newtown Square (Case 3) <i>with Newtown Road Access⁴¹</i>						
Eastbound Newtown Road Approach	-	-	-	A (9.21)	C (15.59)	A (9.64)
Westbound Newtown Road Approach	-	-	-	A (9.97)	A (9.52)	A (9.09)
Northbound Smalleys Dam Road Approach	-	-	-	B (10.48)	B (10.42)	A (9.33)
Southbound Smalleys Dam Road Approach	-	-	-	A (8.79)	B (10.52)	A (9.62)
Overall Intersection	-	-	-	A (9.89)	B (12.63)	A (9.39)

⁴¹ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 12
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁴² Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Smalleys Dam Road/ Victoria Boulevard						
Existing (Case 1)						
Westbound Victoria Boulevard Approach	B (10.2)	B (10.8)	B (10.2)	B (10.4)	B (11.2)	B (10.5)
Southbound Smalleys Dam Road Through/Left	A (7.4)	A (8.4)	A (7.6)	A (7.4)	A (8.4)	A (7.6)
2016 without development of Newtown Square (Case 2)						
Westbound Victoria Boulevard Approach	B (10.2)	B (10.8)	B (10.3)	B (10.5)	B (11.2)	B (10.6)
Southbound Smalleys Dam Road Through/Left	A (7.4)	A (8.4)	A (7.6)	A (7.4)	A (8.4)	A (7.6)
2016 with development of Newtown Square (Case 3)						
Westbound Victoria Boulevard Approach	B (10.2)	B (10.8)	B (10.3)	B (10.5)	B (11.2)	B (10.6)
Southbound Smalleys Dam Road Through/Left	A (7.4)	A (8.4)	A (7.6)	A (7.4)	A (8.4)	A (7.6)
2016 with development of Newtown Square (Case 3) <i>with Newtown Road Access</i> ⁴³						
Westbound Victoria Boulevard Approach	-	-	-	B (10.5)	B (11.3)	B (10.7)
Southbound Smalleys Dam Road Through/Left	-	-	-	A (7.4)	A (8.5)	A (7.6)

⁴² For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁴³ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 13
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁴⁴ Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Newtown Road/Picasso Circle⁴⁵						
Existing (Case 1)						
Eastbound Newtown Road Through/Left	A (7.4)	A (7.5)	A (7.4)	A (9.5)	A (9.3)	A (9.4)
Southbound Picasso Circle Approach	A (9.7)	A (9.6)	A (9.3)	B (10.1)	A (9.9)	A (9.6)
2016 without development of Newtown Square (Case 2)						
Eastbound Newtown Road Through/Left	A (7.4)	A (7.6)	A (7.4)	A (9.5)	A (9.4)	A (9.6)
Southbound Picasso Circle Approach	A (9.8)	A (10.0)	A (9.7)	B (10.2)	B (10.4)	B (10.1)
2016 with development of Newtown Square (Case 3)						
Eastbound Newtown Road Through/Left	A (7.4)	A (7.6)	A (7.4)	A (9.6)	A (9.5)	A (9.6)
Southbound Picasso Circle Approach	A (9.9)	B (10.0)	A (9.8)	B (10.3)	B (10.5)	B (10.2)

⁴⁴ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁴⁵ JMT analyzed the eastbound Newtown Road approach as stop controlled consistent with field conditions. However, the TIS analyzed the approach as free flow.

Table 14
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁴⁶ Two-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Smalleys Dam Road/Songsmith Drive/Freedom Road						
Existing (Case 1)						
Eastbound Songsmith Drive Left	A (9.4)	A (9.6)	B (10.5)	A (9.4)	A (9.8)	B (10.7)
Eastbound Songsmith Drive Through/Right	A (9.4)	B (10.1)	A (9.8)	A (9.5)	B (10.3)	A (10.0)
Eastbound Songsmith Drive Approach	A (9.4)	B (10.1)	B (10.3)	A (9.5)	B (10.3)	B (10.5)
Westbound Freedom Road Approach	A (9.9)	B (11.6)	A (10.0)	A (9.9)	B (11.7)	B (10.1)
Northbound Smalleys Dam Road Through/Left	A (7.4)	A (7.4)	A (7.5)	A (7.4)	A (7.4)	A (7.5)
Southbound Smalleys Dam Road Through/Left/Right	A (7.4)	A (7.6)	A (7.3)	A (7.4)	A (7.6)	A (7.3)
2016 without development of Newtown Square (Case 2)						
Eastbound Songsmith Drive Left	A (9.5)	A (9.9)	B (10.7)	A (9.6)	B (10.1)	B (10.9)
Eastbound Songsmith Drive Through/Right	A (10.0)	B (10.3)	A (10.0)	B (10.1)	B (10.5)	B (10.1)
Eastbound Songsmith Drive Approach	A (10.0)	B (10.3)	B (10.5)	B (10.1)	B (10.5)	B (10.7)
Westbound Freedom Road Approach	B (10.2)	B (12.0)	B (10.2)	B (10.3)	B (12.2)	B (10.3)
Northbound Smalleys Dam Road Through/Left	A (7.4)	A (7.4)	A (7.5)	A (7.4)	A (7.4)	A (7.5)
Southbound Smalleys Dam Road Through/Left/Right	A (7.4)	A (7.6)	A (7.3)	A (7.4)	A (7.6)	A (7.3)

⁴⁶ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

Table 14 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁴⁶ Two-Way Stop Control	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Smalleys Dam Road/Songsmith Drive/Freedom Road						
2016 with development of Newtown Square (Case 3)						
Eastbound Songsmith Drive Left	A (9.5)	A (9.9)	B (10.7)	A (9.7)	B (10.1)	B (10.9)
Eastbound Songsmith Drive Through/Right	A (10.0)	B (10.3)	A (10.0)	B (10.1)	B (10.5)	B (10.1)
Eastbound Songsmith Drive Approach	A (10.0)	B (10.3)	B (10.5)	B (10.1)	B (10.5)	B (10.7)
Westbound Freedom Road Approach	B (10.2)	B (12.0)	B (10.2)	B (10.3)	B (12.3)	B (10.3)
Northbound Smalleys Dam Road Through/Left	A (7.4)	A (7.4)	A (7.5)	A (7.4)	A (7.4)	A (7.5)
Southbound Smalleys Dam Road Through/Left/Right	A (7.4)	A (7.6)	A (7.3)	A (7.4)	A (7.6)	A (7.3)
2016 with development of Newtown Square (Case 3) with Newtown Road Access ⁴⁷						
Eastbound Songsmith Drive Left	-	-	-	A (9.7)	B (10.1)	B (10.9)
Eastbound Songsmith Drive Through/Right	-	-	-	B (10.1)	B (10.5)	B (10.1)
Eastbound Songsmith Drive Approach	-	-	-	B (10.1)	B (10.5)	B (10.7)
Westbound Freedom Road Approach	-	-	-	B (10.3)	B (12.3)	B (10.3)
Northbound Smalleys Dam Road Through/Left	-	-	-	A (7.4)	A (7.4)	A (7.5)
Southbound Smalleys Dam Road Through/Left/Right	-	-	-	A(7.4)	A (7.6)	A (7.3)

⁴⁷ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 15
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁴⁸ Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Existing (Case 1)						
Eastbound Freedom Road Through/Left	A (7.3)	A (7.4)	A (7.3)	A (7.3)	A (7.4)	A (7.3)
Southbound Colonial Circle Approach	A (9.3)	A (8.9)	A (8.7)	A (9.3)	A (8.9)	A (8.6)
2016 without development of Newtown Square (Case 2) ⁴⁹						
Eastbound Freedom Road Through/Left	A (7.4)	A (7.5)	A (7.4)	A (7.4)	A (7.5)	A (7.4)
Southbound Colonial Circle Approach	A (9.7)	A (9.1)	A (8.8)	A (9.5)	A (9.0)	A (8.7)
2016 with development of Newtown Square (Case 3) ^{49,50}						
Eastbound Freedom Road Through/Left	A (7.4)	A (7.5)	A (7.4)	A (7.4)	A (7.5)	A (7.4)
Southbound Colonial Circle Approach	A (9.7)	A (9.1)	A (8.9)	A (9.6)	A (9.0)	A (8.7)

⁴⁸ For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁴⁹ JMT included upstream signal information in the analysis whereas the TIS did not.

⁵⁰ During the Saturday peak hour, JMT utilized a westbound through volume of 46 vehicles consistent with the volume figure from the report whereas the TIS did not.

Table 15 (Continued)
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁵⁰ Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Freedom Road/ Colonial Circle						
2016 with development of Newtown Square (Case 3) with Newtown Road Access ⁵¹						
Eastbound Freedom Road Through/Left	-	-	-	A (7.4)	A (7.5)	A (7.4)
Southbound Colonial Circle Approach	-	-	-	A (9.5)	A (9.0)	A (8.7)

⁵¹ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.

Table 16
PEAK HOUR LEVELS OF SERVICE (LOS)
Based on Traffic Impact Study for Newtown Square Development
Report Dated November 19, 2014
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁵² Two-Way Stop Control (T-intersection)	LOS per TIS			LOS per JMT		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Newtown Road/Site Access						
2016 with development of Newtown Square (Case 3) with Newtown Road Access ⁵³						
Eastbound Newtown Road Left	-	-	-	A (7.5)	A (8.3)	A (7.7)
Southbound Site Access Right	-	-	-	A (8.7)	B (10.5)	A (9.1)

⁵² For signalized and unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.

⁵³ This scenario provides one lefts-in/rights-in/rights-out driveway along Newtown Road and two rights-in/rights-out driveways along Delaware Route 7.