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

NICOLE MAJESKI
SECRETARY

September 14, 2021

Mr. Alex Meitzler
Traffic Planning and Design, Inc.
111 East Main Street, Suite A
Elkton, MD 21921

Dear Mr. Meitzler:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **First State Crossing** (Protocol Tax Parcel #0604800001) development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at (302) 760-2167.

Sincerely,

Troy Brestel

Troy Brestel
Project Engineer

TEB:km
Enclosures
cc with enclosures: Mr. Steve Collins, Claymont Properties, L.L.C.
Mr. Douglas Eitelman, VanDemark & Lynch, Inc.
Mr. David Edgell, Office of State Planning Coordination
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Owen Robatino, New Castle County Department of Land Use
Mr. Andrew Parker, McCormick Taylor, Inc.
DelDOT Distribution

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Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Matthew Vincent, Assistant Director, Project Development North, DOTS
Todd Sammons, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Jared Kauffmann, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Wendy Polasko, Subdivision Engineer, Development Coordination
Sireen Muhtaseb, New Castle Review Coordinator, Development Coordination
Jun Xie, Subdivision Manager, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Claudy Joinville, Project Engineer, Development Coordination
Annamaria Furmato, Project Engineer, Development Coordination

McCORMICK TAYLOR

September 9, 2021

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

RE: Agreement No. 1773
Traffic Impact Study Services
Task No. 1 Subtask 25A – First State Crossing with TPD Addendum #1

Dear Mr. Brestel:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the First State Crossing mixed-use development, prepared by Traffic Planning & Design, Inc. (TPD), dated June 2019 and updated August 2019, with Addendum #1 submitted in February 2020. TPD prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed First State Crossing mixed-use development. The site is located on the east side of Interstate 495, both sides of Philadelphia Pike (US Route 13 / New Castle Road 24), and the southwest side of Naamans Road (Delaware Route 92 / New Castle Road 17) in New Castle County.

The original TIS analyzed three phases of development. The land uses associated with each phase are outlined below and Lots are shown on a Site Plan on page 2 as provided in the original TIS.

Phase 1 (expected completion 2021):
- 420,000 SF industrial park (Lot 3)
- 275,000 SF general office (Lot 4)

Phase 2 (expected completion 2025):
- All Phase 1 developments
- 432,000 SF general office (Lot 1); 50,000 SF general office (Lot 3)
- 30,000 SF retail (Lot 1); 5,000 SF retail (Lot 3); 5,000 SF retail (Lot 4)
- 12,000 SF quality restaurant (Lot 1)
- 150 room hotel (Lot 4)
- 300 multi-family mid-rise apartments (Lot 4)

Full Buildout (expected completion 2030):
- All Phase 1 and Phase 2 developments
- 890 multi-family mid-rise townhomes (Lot 6)
- 312,000 SF general office (Lot 3 and Lot 4)
- 10 single-family detached homes (Lot 3)

$FILE$
$DATE$ $TIME$ $USER$ $MODEL$

SITE 1	
PARCEL 1A	13.1 - ACS
PARCEL 1B	6.6 - ACS
TOTAL	19.7 - ACS
OFFICE	432,000 - SF
COMMERCIAL	42,000 - SF
INDUSTRIAL	0 - SF
RESIDENTIAL	0 - UNITS
TOTAL	474,000 - SF

SITE 3	
PARCEL 3A	4.0 - ACS
PARCEL 3B	2.3 - ACS
PARCEL 3C	1.0 - ACS
PARCEL 3D	4.7 - ACS
PARCEL 3E	5.8 - ACS
PARCEL 3F	5.1 - ACS
PARCEL 3G	5.1 - ACS
TOTAL	38.0 - ACS
OFFICE	55,000 - SF
INDUSTRIAL	420,000 - SF
RESIDENTIAL	10 - UNITS
TOTAL	475,000 - SF

SITE 4	
PARCEL 4NA	10.3 - ACS
PARCEL 4NB	10.7 - ACS
PARCEL 4NC	7.7 - ACS
PARCEL 4D	4.3 - ACS
PARCEL 4S	17.1 - ACS
TOTAL	50.1 - ACS
OFFICE	537,000 - SF
COMMERCIAL	125,000 - SF
INDUSTRIAL	0 - SF
RESIDENTIAL	300 - UNITS
TOTAL	662,000 - SF

SITE 6	
TOTAL	149.2 - ACS
OFFICE	0 - SF
COMMERCIAL	0 - SF
INDUSTRIAL	0 - SF
APARTMENTS	288 - UNITS
TOWNHOMES	626 - UNITS
TOTAL	900 - UNITS

NCC TAX MAP LOCATION PLAN SCALE: 1" = 1,200'

CONCEPT PLAN - SITE 6
RESIDENTIAL
FIRST STATE CROSSING
INTERSTATE 495 & PHILADELPHIA PIKE
SCALE: 1" = 200' MAY 1, 2019

VANDEMARK & LYNCH, INC.
FILE NO. 24545.05-CONCEPT-01 REV F

KEY:
SCHEMATIC DRAWING:NOT TO SCALE

Est. 1989
TRAFFIC PLANNING AND DESIGN, INC.
www.TrafficPD.com | 610.326.3100 | TPD@TrafficPD.com

FIGURE 2

SITE PLAN
FIRST STATE CROSSING

It is noted that the land uses listed on page 1 were assumed in the original TIS as submitted by TPD in June 2019, and that the trip generation and operational analysis summaries within this review are based on those land use assumptions with exceptions as noted within this review. In February 2020, TPD submitted Addendum #1 with revised land use assumptions to reflect updated plans for the overall site. The revised land use would affect trip generation calculations and traffic volumes, most prominently at the Philadelphia Pike and Transit Center Drive intersection and up Philadelphia Pike to its intersection with Naamans Road. As such, TPD's Addendum #1 included updated operational analyses for three intersections along Philadelphia Pike. Our review accounted for the updated volumes/analyses at those three intersections. The following revised land uses were assumed in Addendum #1:

- 1,207 multifamily mid-rise homes (300 in Lot 4 and 907 in Lot 6)
- 380,000 SF industrial park (Lot 3)
- 989,000 SF general office (432 KSF in Lot 1, 94 KSF in Lot 3, and 463 KSF in Lot 4)
- 53,600 SF retail (25,600 in Lot 1 and 28,000 in Lot 4)
- 6,000 SF quality restaurant (Lot 1)
- 15,000 SF pharmacy (Lot 1)
- 5,585 SF convenience store with gas pumps (Lot 4)
- 25,310 SF grocery (Lot 4)

The phasing schedule for the revised land use reflected in Addendum #1 was not provided and is not known.

Access is proposed from both Naamans Road and Philadelphia Pike. The following access points are proposed on Naamans Road:

- Full-access driveway at the existing Tri-State Mall western access – signalized
- Right-in/right-out driveway across from the Tri-State Mall eastern access – unsignalized
- Exit only driveway across from Ridge Road (New Castle Road 17A) – signalized

The following access points are proposed on Philadelphia Pike:

- Two right-in/right-out driveways (one on each side of Philadelphia Pike, approximately 900 feet south of Naamans Road) – unsignalized
  (Note: as of August 2021, the driveway on the west side of Philadelphia Pike is no longer proposed)
- Full access driveways to both sides of Philadelphia Pike at the proposed Transit Center Drive intersection – signalized

The subject land consists of four tax parcels totaling 413 acres. Parcel 06-048.00-041 is currently zoned Industrial (I). The other parcels (06-048.00-001, 06-059.00-165, and 06-073.00-001) are currently zoned Heavy Industrial (HI). The developer seeks to rezone parcel 06-073.00-001 and parcel 06-048.00-001 to Suburban Transition (ST).

DelDOT has several projects and other initiatives within the study area. The first project involves a site in DelDOT's Hazard Elimination Program (HEP). 2011 Site N is a 1.99-mile corridor located

in Claymont along Philadelphia Pike from 0.10-mile north of Rolling Road to 0.17-mile south of Naamans Road. The project includes a "road diet" along Philadelphia Pike between Governor Printz Boulevard and Harvey Road, and evaluation of the need for protected/prohibited left-turn phasing at the intersections of Philadelphia Pike & Harvey Road and Philadelphia Pike & I-495 Northbound Ramps. The road diet on Philadelphia Pike between Governor Printz Boulevard and Harvey Road and the protected/prohibited left-turn phasing at Philadelphia Pike & I-495 Northbound Ramps have both been implemented. The Site N (Task II) report recommended further monitoring of left-turn crashes at Philadelphia Pike & Harvey Road; protected/permitted left-turn phasing on Philadelphia Pike remains in operation.

A second road diet project in the study area is located on Philadelphia Pike, north of Naamans Road to the Pennsylvania state line. It involves reducing Philadelphia Pike from two lanes to one lane in each direction with a center two-way left-turn lane, and includes changing eastbound Naamans Road at Philadelphia Pike from two left-turn lanes to one left-turn lane. Design plans have been completed by DelDOT, including changes to signing and striping as well as traffic signal design at Philadelphia Pike and Naamans Road. Construction of this road diet project is proceeding earlier than the First State Crossing development, so these changes were incorporated into all future conditions analysis for First State Crossing.

The Claymont train station is being relocated and will be called the Claymont Regional Transportation Center (CRTC). This project will relocate the existing Claymont train station approximately one-half mile to the north of its current location. The CRTC will provide approximately 870 parking spaces, improved access to the station by all modes of transportation, and direct transit access to the proposed First State Crossing development. The CRTC will connect to the existing roadway network via a new roadway ("Transit Center Drive") with a new traffic signal at Philadelphia Pike between Alcott Avenue and Naamans Road. Construction began in 2019 and is anticipated to be complete in 2023.

DelDOT's Traffic Section completed a Philadelphia Pike Pedestrian Safety Audit Study in 2018. This study identified several dozen recommendations for pedestrian safety enhancements along Philadelphia Pike from Lea Boulevard to the Pennsylvania state line. The recommendations were grouped into short-term, mid-term and long-term implementation timeframes. For the Claymont Regional Transportation Center project and the First State Crossing project, improvements being developed and designed for intersections along Philadelphia Pike should incorporate the recommendations of this pedestrian safety audit whenever appropriate.

WILMAPCO's 2017 North Claymont Area Master Plan (discussed in more detail on page 23 of this letter) identifies and recommends numerous potential future transportation improvements. One of the more significant potential projects discussed in the Master Plan is the potential construction of a diverging diamond interchange (DDI) at I-95 and Naamans Road to more efficiently accommodate anticipated future traffic. However, the potential DDI project has not moved beyond the preliminary idea/discussion stage.

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

The proposed First State Crossing development would 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 but one intersection included in the New Castle County scope of study. Only the signalized intersection of Darley Road and Peachtree Road would operate with LOS results that would be defined as deficient per the New Castle County UDC, in the weekday PM peak hour for all existing and future conditions, unless improvements are made.

Further, as also shown in the table on page 6, based on the criteria listed in Chapter 2 of DelDOT's *Development Coordination Manual*, four total intersections identified by DelDOT as being required for study would exhibit LOS deficiencies without the implementation of physical roadway and/or traffic control improvements. These include the aforementioned signalized intersection of Darley Road and Peachtree Road, one other signalized intersection that was not part of New Castle County's scope of study, and the stop-controlled minor street approaches at two unsignalized intersections. Because the unsignalized intersections are controlled by stop signs only on the minor street approaches, the deficiencies pertain to those approaches only, and the intersections are not subject to New Castle County's concurrency requirements.

Intersection	*Existing Traffic Control*	*Situations for which deficiencies occur*
Naamans Road and Tri-State Mall East Entrance/ Proposed Site Access A	Unsignalized	2025 with development w/ Spine Road PM (Case 4a); 2025 with development w/o Spine Road PM (Case 4b); 2030 with development w/ Spine Road (One-Way In) PM (Case 6a); 2030 with development w/o Spine Road (One-Way In) PM (Case 6b); 2030 with development w/ Spine Road (One-Way Out) (Case 6c); 2030 with development w/o Spine Road (One-Way Out) (Case 6d)
Philadelphia Pike and I-495 Southbound Ramps	Unsignalized	2021 without development PM (Case 2); 2021 with development w/ Spine Road PM (Case 3a); 2021 with development w/o Spine Road PM (Case 3b); 2025 with development w/ Spine Road AM & PM (Case 4a); 2025 with development w/o Spine Road AM & PM (Case 4b); 2030 without development PM (Case 5); 2030 with development w/ Spine Road (One-Way In) AM & PM (Case 6a); 2030 with development w/o Spine Road (One-Way In) AM & PM (Case 6b); 2030 with development w/ Spine Road (One-Way Out) AM & PM (Case 6c); 2030 with development w/o Spine Road (One-Way Out) AM & PM (Case 6d)
Philadelphia Pike and Darley Road/ Myrtle Avenue	Signalized	2030 with development w/ Spine Road (One-Way In) PM (Case 6a); 2030 with development w/o Spine Road (One-Way In) PM (Case 6b); 2030 with development w/ Spine Road (One-Way Out) PM (Case 6c); 2030 with development w/o Spine Road (One-Way Out) PM (Case 6d)
Darley Road and Peachtree Road	Signalized	2018 Existing PM (Case 1); 2021 without development PM (Case 2); 2021 with development w/ Spine Road PM (Case 3a); 2021 with development w/o Spine Road PM (Case 3b); 2025 with development w/ Spine Road PM (Case 4a); 2025 with development w/o Spine Road PM (Case 4b); 2030 without development PM (Case 5); 2030 with development w/ Spine Road (One-Way In) PM (Case 6a); 2030 with development w/o Spine Road (One-Way In) PM (Case 6b); 2030 with development w/ Spine Road (One-Way Out) PM (Case 6c); 2030 with development w/o Spine Road (One-Way Out) PM (Case 6d)

Naamans Road and Tri-State Mall East Entrance/Proposed Site Access A

This unsignalized intersection experiences LOS deficiencies in the weekday PM peak hour under several future with development scenarios, which will include the proposed Site Access A as a right-in/right-out driveway to be located across from the existing east driveway for the mall. The southbound Tri-State Mall stop-controlled left-turn egress movement is expected to operate at LOS E or LOS F in these scenarios.

A survey of other nearby intersections and access points along Naamans Road found no other unsignalized left-out movements to Naamans Road in this area. The unsignalized left-turn egress movement from the Tri-State Mall east driveway is expected to be challenging for drivers to negotiate, especially when traffic volumes increase with the First State Crossing Development. Drivers making a left out would be required to find a safe gap in five different traffic streams.

McCormick Taylor recommends that the developer coordinate with DelDOT's Development Coordination Section and the Tri-State Mall property owner to pursue restricting the left-out movement from the Tri-State Mall east driveway if the owner is amenable to it. The driveway would then allow for right-in/right-out/left-in movements. It appears that the left-out movement can be accommodated at the nearby signalized intersection of Naamans Road & Tri-State Mall west driveway.

Philadelphia Pike and I-495 Southbound Ramps

This unsignalized intersection experiences LOS deficiencies in weekday AM and weekday PM peak hours under several future scenarios, both with and without the First State Crossing development. The stop-controlled left-turn and stop-controlled right-turn from the I-495 Southbound off-ramp are both expected to experience LOS E or LOS F in these scenarios.

Signalization of the existing off-ramp location and configuration may not be desirable due to its proximity to the existing traffic signal at Philadelphia Pike & Darley Road/Myrtle Avenue, and the volumes alone may not warrant a signal. If a signal is not installed, it appears that mitigation of the LOS deficiencies would require a significant reconfiguration of the entire I-495/Philadelphia Pike interchange, such as possible conversion to a diverging diamond interchange (DDI). Because this intersection experiences LOS deficiencies without the First State Crossing development, and because there does not appear to be any feasible improvement to mitigate the LOS deficiencies that could be implemented in the near future, we do not recommend any improvements be made to this intersection.

It is also noted that the North Claymont Area Master Plan did not appear to recommend any operational improvements for this intersection, other than potentially tightening the radii of the I-495 ramps to improve walkability for pedestrians.

Philadelphia Pike and Darley Road/Myrtle Avenue

This signalized intersection experiences LOS deficiencies in the weekday PM peak hour under 2030 with development scenarios (i.e., development "Phase 3" only). The intersection is expected to operate at overall LOS E during these scenarios. However, given the constraints on the corners

of this intersection, which include the historic Darley House, the historic Claymont Stone School, Archmere Academy, and a gas station, it appears infeasible to widen or otherwise improve this intersection to mitigate future LOS deficiencies. This intersection was not included in New Castle County's scope of study, and is therefore not subject to LOS requirements of the UDC. For all of these reasons, we do not recommend any improvements be made to this intersection.

Darley Road and Peachtree Road

This signalized intersection experiences LOS deficiencies in the weekday PM peak hour for all existing, without development, and with development scenarios that were analyzed. It appears that the most significant contributing factor to the overall intersection LOS deficiencies is the configuration of eastbound Darley Road approach. All approaches at this intersection consist of one shared left-turn/through lane and one right-turn lane. When this lane configuration is analyzed using Highway Capacity Manual methodology, a vehicle waiting for a gap in oncoming traffic to make a left-turn movement will hold up through traffic behind it (i.e., through movement vehicles won't "go around" the left-turning vehicle). McCormick Taylor coded the lane configurations in the PM peak hour to match the existing field conditions, resulting in the PM peak hour deficiencies. However, the results presented in the TIS indicate acceptable LOS in the PM peak hours; this was because the eastbound approach was coded as one left-turn lane and one shared through/right-turn lane. This modified configuration allows through traffic to continue flowing while other vehicles wait to make left turns.

Real world conditions may operate somewhat better than the analyzed conditions using the true eastbound configuration of shared left/through lane and separate right-turn lane, because some through traffic would in fact go around a stopped left-turn vehicle. So while real-world conditions are not likely to be as poor as McCormick Taylor's analysis indicates, based on analyzed delays and projected turning movement volumes the eastbound lane configuration should be modified by creating a separate left-turn lane and a shared through/right-turn lane, so that through vehicles no longer have to use a dedicated right-turn lane as a "bypass" lane. This modification would address the anticipated LOS deficiencies.

Site Access E Design

Based on the traffic analyses and review of applicable land use and master planning documents, McCormick Taylor recommends that Site Access E should have a "One-Way Out" configuration at Naamans Road.

Spine Road

The study contemplated construction of the Spine Road as a continuous two-lane roadway through the site, crossing Naamans Creek and connecting Philadelphia Pike and Naamans Road. From a traffic impact perspective, while a continuous Spine Road would provide benefits in terms of additional capacity, lower travel times for some drivers, and reduced delays and queues along Naamans Road and Philadelphia Pike, it appears based on the analysis that moving forward without the continuous Spine Road would not necessarily lead to additional deficient intersections. The Department has determined it is not necessary for the developer to construct the continuous

Spine Road due in part to prohibitive costs and environmental concerns, and the absence of the Spine Road is acceptable since it is not needed for LOS concurrency.

Should the County choose to approve the proposed development under this access scheme (without Spine Road, One-Way Out), the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (e.g. 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 construct "Site Access A" on the south side of Naamans Road, opposite the existing Tri-State Mall eastern driveway. The First State Crossing "Site Access A" driveway is proposed as right-in/right-out. The developer should coordinate with DelDOT's Development Coordination Section and the Tri-State Mall property owner to restrict the existing left-turn egress from the southbound Tri-State Mall driveway if the owner is amenable to it. The proposed configuration is shown in the table below. Ongoing coordination will be required between the First State Crossing developer, the Tri-State Mall owner, and DelDOT to determine the final design, implementation, and responsibility of each party for improvements to this intersection.

Approach	Existing Configuration	Proposed Configuration
Eastbound Naamans Road	One left-turn lane and two through lanes	One left-turn lane, two through lanes, and one right-turn lane
Westbound Naamans Road	One U-turn-only lane, two through lanes, and one right-turn lane	One U-turn-only lane, two through lanes, and one right-turn lane
Northbound Site Access A	Does not exist	One right-turn-only lane
Southbound Tri-State Mall East Driveway	One left-turn lane and one right-turn lane	One right-turn-only lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. Only new turn lanes that provide access to First State Crossing are shown. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Naamans Road	Existing to remain	145 feet *

* Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*

At this location, concrete channelization islands should be added to physically restrict northbound left-turn and through movements, southbound left-turn and through movements, and lefts-in from westbound Naamans Road (while continuing to allow westbound u-turns). The developer should also install a "No Left Turn" sign (MUTCD R3-2) on the northbound, southbound and westbound approaches. The developer should

coordinate with DelDOT's Development Coordination Section to determine all design details during the site plan review.

2. The developer should construct "Site Access B" on the south side of Naamans Road, opposite the existing Tri-State Mall western driveway. In addition to adding a fourth leg to the intersection (Site Access B), a westbound left-turn lane and eastbound right-turn lane should be added. The proposed configuration is shown in the table below. Ongoing coordination will be required between the First State Crossing developer, the Tri-State Mall developer, and DelDOT to determine the final design, implementation, and responsibility of each party for improvements to this intersection.

Approach	Existing Configuration	Proposed Configuration
Eastbound Naamans Road	One left-turn lane and two through lanes	One left-turn lane, two through lanes, and one right-turn lane
Westbound Naamans Road	Two through lanes and one right-turn lane	One left-turn lane, two through lanes, and one right-turn lane
Northbound Site Access B	Does not exist	One shared left-turn/through lane and one right-turn lane
Southbound Tri-State Mall West Driveway	One left-turn lane and one right-turn lane	One shared left-turn/through lane and one right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. Only new turn lanes that provide access to/from First State Crossing are shown. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Naamans Road	Existing to remain	240 feet *
Westbound Naamans Road	100 feet **	Existing to remain
Northbound Site Access B	N/A	100 feet **

* Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*

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

3. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Naamans Road and Tri-State Mall West Driveway/Site Access B. The agreement will cover signal adjustments required by the physical improvements described in Item No. 2. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. The developer should coordinate with DelDOT on the design details and implementation of the traffic signal modifications.

4. The developer should construct "Site Access C" opposite the proposed "Transit Center Drive" roadway at a new signal on Philadelphia Pike that will be constructed as part of the Claymont Regional Transportation Center (CRTC) project. The proposed configuration is shown in the table below.

Approach	Configuration with CRTC project	Proposed Configuration with addition of First State Crossing
Eastbound Site Access C	Does not exist	One left-turn lane, one through lane, and one right-turn lane
Westbound Transit Center Drive	One left-turn lane and one right-turn lane	One exclusive left-turn lane, one shared left-turn/through lane, and one right-turn lane
Northbound Philadelphia Pike	Two through lanes and one channelized right-turn lane	One left turn lane, two through lanes and one channelized right-turn lane
Southbound Philadelphia Pike	One left-turn lane and two through lanes	One left-turn lane, two through lanes, and one right-turn lane

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths and other design details during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Eastbound Site Access C	190 feet *	190 feet *
Westbound Transit Center Drive	525 feet **	110 feet **
Northbound Philadelphia Pike	100 feet *	190 feet ***
Southbound Philadelphia Pike	260 feet **	190 feet ***

* Initial turn-lane length based on storage length per queuing analysis
** Initial turn-lane length based on storage length per queuing analysis, but lane could be longer depending on design of CRTC project improvements at this intersection
*** Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet,* but lane could be longer depending on design of CRTC project improvements at this intersection

If the developer desires to not construct the warranted right-turn lane on southbound Philadelphia Pike, they may apply for a design deviation. Details of the turn lane design or possible design deviation must be coordinated with DelDOT's Development Coordination Section.

5. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Philadelphia Pike and Transit Center Drive/Site Access C. The agreement will cover signal adjustments required by the physical improvements described in Item No. 4. Required adjustments might be minimal as most of the improvements proposed at this location, including the construction of Transit Center Drive and installation of a signal at a previous non-intersection, are scheduled to be constructed in 2020/2021 as part of DelDOT's CRTC project. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. The developer should coordinate with DelDOT on the design details and implementation of the traffic signal modifications.

6. The developer should construct "Site Access D" on the east side of Philadelphia Pike, approximately 900 feet south of Naamans Road. This site driveway is proposed as unsignalized right-in/right-out. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Westbound Site Access D	Does not exist	One right-turn-only lane
Northbound Philadelphia Pike	Two through lanes	Two through lanes and one right-turn lane
Southbound Philadelphia Pike	Two through lanes	Two through lanes

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below. The developer should coordinate with DelDOT's Development Coordination Section to determine final turn-lane lengths during the site plan review.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Philadelphia Pike	N/A	145 feet *

* Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*.

A concrete channelization island should be added at Site Access D where it intersects Philadelphia Pike to physically restrict westbound left-turn and through movements as well as lefts in from Philadelphia Pike. The developer should also install "No Left Turn" signs (MUTCD R3-2) on the westbound and southbound approaches. The developer should coordinate with DelDOT's Development Coordination Section to determine all design details during the site plan review.

7. The developer should construct "Site Access E" on the south side of Naamans Road, opposite Ridge Road. Site Access E should be designed as a one-lane "one-way out" roadway. Site Access E must be clearly marked and signed as "Do Not Enter" to prevent drivers on Naamans Road and Ridge Road from attempting to enter and travel the wrong way on Site Access E. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Eastbound Naamans Road	One U-turn/left-turn lane and two through lanes	One U-turn/left-turn lane and two through lanes
Westbound Naamans Road	One U-turn lane, two through lanes, and one channelized right-turn lane	One U-turn lane, two through lanes, and one channelized right-turn lane
Northbound Site Access E	Does not exist	One shared left/through/right-turn lane
Southbound Ridge Road	One left-turn lane and one right-turn lane	One left-turn lane and one right-turn lane

8. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Naamans Road and Ridge Road/Site Access E. The agreement will cover signal adjustments required by the physical improvements described in Item No. 7. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras at DelDOT's discretion. The developer should coordinate with DelDOT on the design details and implementation of the traffic signal modifications.

9. The developer should coordinate with DelDOT's Development Coordination Section to determine details of the design, implementation, and/or a possible equitable share contribution towards a future DDI at the Naamans Road/I-95 Interchange.

10. The developer should modify the intersection of Darley Road and Peachtree Road by reconfiguring the eastbound Darley Road approach from a shared left-turn/through lane and a separate right-turn lane to a separate left-turn lane and a shared through/right-turn lane. In addition to restriping Darley Road, this improvement may require widening of Darley Road on one or both sides of Peachtree Road, realigning the eastbound through receiving lane on the east side of the intersection, and relocating the existing DART bus stop on the southeast corner of the intersection. The developer should coordinate with DelDOT's Development Coordination Section to determine all design details.

11. The developer should enter into a traffic signal agreement with DelDOT for the intersection of Darley Road and Peachtree Road. The agreement will cover signal adjustments required by the physical improvements described in Item No. 10. The agreement should include pedestrian signals, crosswalks, interconnection, and ITS equipment such as CCTV cameras

at DelDOT's discretion. The developer should coordinate with DelDOT on the design details and implementation of the traffic signal modifications.

12. The developer should coordinate with DelDOT's Development Coordination Section regarding improvements associated with DelDOT's Claymont Regional Transportation Center (CRTC) project. This project will relocate the existing Claymont train station approximately one-half mile to the north of its current location, and will connect the new train station to the existing roadway network via a new roadway ("Transit Center Drive") with a new traffic signal at Philadelphia Pike between Alcott Avenue and Naamans Road. The design also features numerous bicycle and pedestrian improvements, and provides access to First State Crossing parcels between the CRTC and Philadelphia Pike. This project is currently under construction. The developer should coordinate with DelDOT's Development Coordination Section to determine details of the design, implementation, possible equitable share contribution towards the project, and any other needs for cooperation and coordination between the CRTC and First State Crossing projects.

13. The following bicycle, pedestrian and transit improvements should be included:

    a. The developer should coordinate with DelDOT, WILMAPCO, New Castle County, and the East Coast Greenway Alliance regarding bicycle and pedestrian improvements to be implemented along and near Philadelphia Pike within the study area. Many and various bicycle and pedestrian improvements have been proposed in association with the CRTC project, the North Claymont Area Master Plan and East Coast Greenway efforts, and DelDOT's 2018 Philadelphia Pike Pedestrian Safety Audit. A coordinated effort is needed to determine details of improvements to be implemented, along with the implementation schedule and responsible party for each improvement. Several bicycle, pedestrian and transit related improvements specific to First State Crossing are listed below. The following improvements may also be part of other efforts/initiatives listed above, but bear listing here to ensure they are not missed.

    b. Adjacent to the proposed right-turn lanes at all the site accesses on both Philadelphia Pike and Naamans Road, a minimum of a five-foot bicycle lane should be dedicated and striped with appropriate markings for bicyclists through the turn lane in order to facilitate safe and unimpeded bicycle travel.

    c. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.

    d. Utility covers should be made flush with the pavement.

    e. If clubhouses or other community facilities are constructed as shown on the site plan, bicycle parking should be provided near building entrances. Where building architecture provides for an awning, other overhang, or indoor parking, the bicycle parking should be covered.

f. A minimum 15-foot wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontages on Philadelphia Pike and Naamans Road.

g. Within the easement along the south side of Naamans Road, a minimum of a five-foot wide sidewalk that meets current AASHTO and ADA standards should be constructed along the site frontage, from the I-95 northbound off-ramp to Philadelphia Pike. Crosswalks will be required across the proposed site accesses. The sidewalk should have a minimum of a five-foot buffer from the roadway wherever feasible. At the eastern end, the sidewalk should connect to the existing sidewalk on the southwest corner of Naamans Road and Philadelphia Pike. As for the western end, the developer should coordinate with DelDOT to determine an acceptable termini or connection. It may be required to construct the sidewalk all the way to the existing sidewalk on the south side of the Naamans Road bridge over I-95. If so, crosswalks and pedestrian signals would need to be added for crossing the northbound I-95 off-ramp approach to Naamans Road, and a traffic signal agreement may be necessary. The developer should coordinate with DelDOT's Development Coordination Section to determine design details of the sidewalk and connections to adjacent sidewalks/properties.

h. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.

i. Internal sidewalks for pedestrian safety and to promote walking as a viable transportation alternative should be constructed within the development. These sidewalks should each be a minimum of five-feet wide (with a minimum of a five-foot buffer from the roadway) and should meet current AASHTO and ADA standards. These internal sidewalks should connect to the sidewalks (existing or proposed) along the Philadelphia Pike and Naamans Road frontages, as well as to other surrounding residential developments via internal connections.

j. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.

k. The developer should coordinate with the Delaware Transit Corporation (DTC) and the Southeastern Pennsylvania Transportation Authority (SEPTA) regarding the possibility of including bus stops within or adjacent to the site, in addition to the planned transit facilities directly associated with the CRTC project.

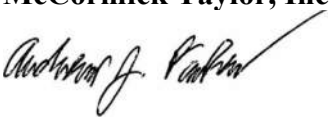
Improvements in this TIS may be considered "significant" under DelDOT's *Work Zone Safety and Mobility Procedures and Guidelines*. These guidelines are available on DelDOT's website at http://deldot.gov/Publications/manuals/de_mutcd/index.shtml.

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 site plan review process.

Additional details on our review of this TIS are attached. Please contact me at (610) 640-3500 or through e-mail at ajparker@mccormicktaylor.com if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.



Andrew J. Parker, PE, PTOE
Project Manager

Enclosure

General Information

Report date: June 2019, updated August 2019. Addendum #1 submitted February 2020.
Prepared by: Traffic Planning and Design, Inc. (TPD)
Prepared for: Vandemark and Lynch, Inc. & Commercial Development Co., Inc.
Tax parcels: 06-048.00-041, 06-048.00-001, 06-059.00-165, and 06-073.00-001
Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: Per the original TIS, the proposed First State Crossing development consists of the following land uses:

- 300 multi-family mid-rise apartments
- 890 multi-family mid-rise townhomes
- 120,000 SF (150-room) hotel
- 40,000 SF shopping center retail
- 1,069,000 SF general office
- 420,000 SF industrial park
- 10 single-family detached homes
- 12,000 SF quality restaurant

Per Addendum #1, the revised assumed land uses are as follows:

- 1,207 multifamily mid-rise homes
- 380,000 SF industrial park
- 989,000 SF general office
- 53,600 SF retail
- 6,000 SF quality restaurant
- 15,000 SF pharmacy
- 5,585 SF convenience store with gas pumps
- 25,310 SF grocery

Location: The site is located on the east side of Interstate 495, both sides of Philadelphia Pike (US Route 13 / New Castle Road 24), and the southwest side of Naamans Road (Delaware Route 92 / New Castle Road 17) in New Castle County. A site location map is included on page 19.
Amount of land to be developed: Approximately 413 acres
Land use approval(s) needed: Subdivision and rezoning approval. The land is split-zoned Industrial (I) and Heavy Industrial (HI) within New Castle County. The developer seeks to rezone parcel 06-073.00-001 and parcel 06-048.00-001 to Suburban Transition (ST).
Proposed completion year: Per the original TIS, the development was planned to be built in three phases. **Phase I**, anticipated to be complete in 2021, includes 420,000 SF industrial space and 275,000 SF general office. **Phase II**, anticipated to be complete in 2025, adds 482,000 SF general office, 40,000 SF retail space, 12,000 SF quality restaurant, 150-room hotel, and 300 multi-family homes. **Phase III** (Full Buildout) adds the remaining office space and residential units, and is anticipated to be complete in 2030. The phasing schedule for the revised land use reflected in Addendum #1 was not provided and is not known.

Proposed access locations:

On Naamans Road:

- Full-access driveway at the existing Tri-State Mall western access – signalized
- Right-in/right-out driveway across from the Tri-State Mall eastern access – unsignalized
- Exit only driveway across from Ridge Road (New Castle Road 17A) – signalized

On Philadelphia Pike:

- Two right-in/right-out driveways (one on each side of Philadelphia Pike, approximately 900 feet south of Naamans Road) – unsignalized
  (Note: as of August 2021, the driveway on the west side of Philadelphia Pike is no longer proposed)
- Full access driveways to both sides of Philadelphia Pike at the proposed Transit Center Drive intersection – signalized

Daily Traffic Volumes (per DelDOT Traffic Summary 2018):

- 2018 Average Annual Daily Traffic on Naamans Road: 15,265 vehicles/day
- 2018 Average Annual Daily Traffic on Philadelphia Pike: 13,639 vehicles/day


491
Naamans Creek Rd.
92
Naamans Rd.
Hickman Rd.
W. Ridge Rd.
Tri-State Mall
Darley Rd.
Darley Rd.
95
Myrtle Ave.
Philadelphia Pike
Existing Claymont Transit Center
13
495
Site Location Map
Proposed Entrance
N
Not to Scale
Graphics is approximation only. Based on conceptual site plan dated 5/1/2019.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2015 Delaware Strategies for State Policies and Spending

Location with respect to the Strategies for State Policies and Spending Map of Delaware: The proposed First State Crossing mixed-use development is located within Investment Level 1 and Investment Level 2. Portions of the site are in Out of Play areas.

Investment Level 1
Areas of the state designated as Investment Level 1 are most prepared for growth and are where the state can make cost-effective infrastructure investments in schools, roads, and public safety. In these areas, state investments and policies should support and encourage a wide range of uses and densities, promote a variety of transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investment Level 1 areas are often municipalities, towns, or urban/urbanizing places. Density is generally higher than in the surrounding areas. Overall, it is the state's intent to use its spending and management tools to maintain and enhance community character, to promote well-designed and efficient new growth, and to facilitate redevelopment in Investment Level 1 Areas.

Investment Level 2
Investment Level 2 reflects areas where growth is anticipated by local, county, and State plans in the near-term future. This investment level has many diverse characteristics. 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. These areas have been shown to be the most active portion of Delaware's developed landscape. They serve as transition areas between Level 1 and the more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings.

In Investment Level 2, 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 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, and provides essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community. Investment Level 2 areas are prime locations for designating "pre-permitted areas."

Out of Play
The Delaware State Strategies 2015 map indicates several out of play areas within the proposed development. These areas are not expected to be used for private development, typically due to serious legal or environmental constraints. The development of these sites should consider natural resources and the environment, emphasizing the protection of critical natural habitat, wildlife, and stormwater management/drainage areas.

Proposed Development's Compatibility with Strategies for State Policies and Spending:
The proposed First State Crossing mixed-use development contains a variety of land uses on approximately 413 acres located within Investment Level 1 and 2 areas. The land was previously occupied by a steel mill, which has been decommissioned/demolished. Investment Levels 1 and 2 reflect areas where growth is anticipated in the near-term future. Developments in these areas should generally provide a mix of higher-density land uses, a variety of housing types, promote walking/cycling/transit, and make efficient use of existing public infrastructure/services. As such, the proposed development generally appears to comply with the guidelines of the 2015 "Strategies for State Policies and Spending." However, further discussion will be needed regarding the portions of the development that are located on or adjacent to Out of Play areas. The design and construction of the site must account for the potential environmental and legal impacts that the proposed development will have on these areas. Additionally, the developer proposes to terminate the proposed Spine Road on either side of Naamans Creek. This would result in suboptimal connectivity between Philadelphia Pike and Naamans Road, as well as a lack of connectivity between development parcels 1 and 3.

Comprehensive Plan

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

Based on the 2012 Future Land Use Map, two of the development parcels are indicated as "HI [Heavy Industrial] Zoned Land." The remaining two development parcels are indicated as "Commercial/Office/Industrial Development Area."

Based on the comprehensive plan, commercial/office/industrial development areas are located primarily along transportation corridors and industrial areas. These areas will be targeted for revitalization and mixed-use projects that can leverage existing infrastructure and bring economic development to older, undervalued areas of the County.

The land is split-zoned Industrial (I) and Heavy Industrial (HI) within New Castle County. The developer seeks to rezone parcel 06-073.00-001 and parcel 06-048.00-001 to Suburban Transition (ST).

According to Section 40.02.200 of the New Castle County Unified Development Code (UDC), characteristics of the existing and proposed zoning districts are as follows:

Industrial (I) – Existing Zoning

- This district retains the older industrial areas. The character of these areas is suburban transition. Many of these areas are existing industrial parks. In keeping with evolving employment trends, a wider range of uses is permitted.
- The intensities of this district are intended to encourage industrial types of uses.
- Exterior storage is permitted, but is limited and must be screened from the view of collector or arterial roads.
- This district is intended to work in general unison with the OR and BP zoning districts to provide for a wide variety of uses by both location and general character to permit a consistency of employment related uses throughout the County.

Heavy Industrial (HI) – Existing Zoning

- The Heavy Industry District is to be used principally for larger heavy industrial developments not suited to other industrial districts and the uses that support those types of developments.
- Location of such districts typically has access to rail lines or navigable marine waterways in addition to roadway access.
- Districts shall be located to minimize adverse effects from neighboring districts such as noise, air pollution, and unsightly structures.
- This district shall be permitted in coastal zones provided that any use prohibited by the Delaware Coastal Zone Act shall remain prohibited, and provided that such districts were zoned M-3 under the former New Castle County zoning maps. No new HI districts shall be created in a coastal zone.

Suburban Transition (ST) – Proposed Zoning

- Provides for high quality, moderately high-density development with a full range of residential and limited nonresidential uses.
- Provide a suburban transition character while encouraging pedestrian linkages in addition to automobile access.
- Accommodates a range of housing types (from small single-family to multi-family).
- This district has specific location requirements:
    - Located in the central core of the southern sewer service area as described more fully in Resolution 06-069 and adopted by County Council on March 28, 2006, or
    - Development proposes gross density of less than five dwelling units per acre, or
    - Development proposes gross density of five dwelling units per acre or more and has access to transit service within one-quarter mile or is within two miles of a park and ride facility.

Proposed Development's Compatibility with the New Castle County Comprehensive Plan:
Additional discussion may be needed due to the proposed residential component within the "Commercial/Office/Industrial Development Area". Also, pending rezoning approval, discussion may be needed regarding the suitability of various components of the mixed-use development being located in certain zoning districts (I, HI and ST), such as residential uses proposed within I or HI zoned lands. That said, overall the proposed First State Crossing mixed-use development

appears to comply with the New Castle County Comprehensive Plan. The development is expected to revitalize underutilized lands along existing transportation corridors.

North Claymont Area Master Plan:
(Source: North Claymont Area Master Plan Final Report – January 2017)

WILMAPCO's 2017 North Claymont Area Master Plan provides a comprehensive vision that promotes economic activity, makes transit/walking/biking convenient and safe, and fosters a vibrant/livable community. The plan recommends new land uses, zoning updates, and guidelines for future development and growth in the North Claymont area.

The Recommended Scenario Map indicates that the area of the proposed First State Crossing development was planned for a mix of land uses. These included residential, marina and waterfront retail/recreation, industrial/flex space, and mixed-use office/retail/residential. The plan indicates the proposed Spine Road as a continuous, multimodal street connection between the Tri-State Mall property and the proposed Claymont Regional Transportation Center. The plan recommends a new roadway connection between Alcott Avenue and the Spine Road to allow left-turn access to the Knollwood neighborhood; the intersection of Philadelphia Pike & Alcott Avenue would be converted to an unsignalized right-in/right-out configuration to improve traffic operations along Philadelphia Pike.

Proposed Development's Compatibility with the North Claymont Area Master Plan:
While the North Claymont Area Master Plan does not establish legal requirements regarding the form of the built environment, its recommendations incorporate a wealth of stakeholder engagement, community feedback, and detailed analysis. The proposed First State Crossing development appears to generally comply with the goals and vision of the Master Plan. The development is expected to build on existing community strengths, provide a variety of housing, promote economic development, and improve regional/multimodal transportation options. However, certain design aspects of First State Crossing do not align with the vision set forth in the Master Plan. The Master Plan calls for the Spine Road to be continuous between Naamans Road and Philadelphia Pike with parking on one side. The First State Crossing TIS proposes that the Spine Road would not be continuous across Naamans Creek, and it would not have on-street parking. The Master Plan also calls for a roadway connection between Alcott Avenue to the Spine Road that would handle left-turn access to the Knollwood neighborhood and conversion of Philadelphia Pike & Alcott Avenue to an unsignalized right-in/right-out. The First State Crossing TIS does not recommend the new roadway connection or right-in/right-out configuration.

Consistent with the Master Plan, consideration should be given to constructing the Spine Road as a continuous roadway between Philadelphia Pike and Naamans Road. If that occurs, traffic calming measures may be appropriate to control vehicle speeds and to reduce the potential for the Spine Road to be used as a significant "cut-through" route. If the Spine Road is not built as continuous roadway, additional intersection improvements may be needed elsewhere to accommodate more circuitous travel patterns. A new roadway connection between Alcott Avenue and the Spine Road may be beneficial, and if that occurs the intersection of Philadelphia Pike & Alcott Avenue should be converted to an unsignalized right-in/right-out configuration.

Relevant DelDOT Projects

DelDOT has several projects and other initiatives within the study area. The first project involves a site in DelDOT's Hazard Elimination Program (HEP). 2011 Site N is a 1.99-mile corridor located in Claymont along Philadelphia Pike from 0.10-mile north of Rolling Road to 0.17-mile south of Naamans Road. The project includes a "road diet" along Philadelphia Pike between Governor Printz Boulevard and Harvey Road, and evaluation of the need for protected/prohibited left-turn phasing at the intersections of Philadelphia Pike & Harvey Road and Philadelphia Pike & I-495 Northbound Ramps. The road diet on Philadelphia Pike between Governor Printz Boulevard and Harvey Road and the protected/prohibited left-turn phasing at Philadelphia Pike & I-495 Northbound Ramps have both been implemented. The Site N (Task II) report recommended further monitoring of left-turn crashes at Philadelphia Pike & Harvey Road; protected/permitted left-turn phasing on Philadelphia Pike remains in operation.

A second road diet project in the study area is located on Philadelphia Pike, north of Naamans Road to the Pennsylvania state line. It involves reducing Philadelphia Pike from two lanes to one lane in each direction with a center two-way left-turn lane, and includes changing eastbound Naamans Road at Philadelphia Pike from two left-turn lanes to one left-turn lane. Design plans have been completed by DelDOT, including changes to signing and striping as well as traffic signal design at Philadelphia Pike and Naamans Road. Construction of this road diet project is proceeding earlier than the First State Crossing development, so these changes were incorporated into all future conditions analysis for First State Crossing.

The Claymont train station is being relocated and will be called the Claymont Regional Transportation Center (CRTC). This project will relocate the existing Claymont train station approximately one-half mile to the north of its current location. The CRTC will provide approximately 870 parking spaces, improved access to the station by all modes of transportation, and direct transit access to the proposed First State Crossing development. The CRTC will connect to the existing roadway network via a new roadway ("Transit Center Drive") with a new traffic signal at Philadelphia Pike between Alcott Avenue and Naamans Road. Construction began in 2019 and is anticipated to be complete in 2023.

DelDOT's Traffic Section completed a Philadelphia Pike Pedestrian Safety Audit Study in 2018. This study identified several dozen recommendations for pedestrian safety enhancements along Philadelphia Pike from Lea Boulevard to the Pennsylvania state line. The recommendations were grouped into short-term, mid-term and long-term implementation timeframes. For the Claymont Regional Transportation Center project and the First State Crossing project, improvements being developed and designed for intersections along Philadelphia Pike should incorporate the recommendations of this pedestrian safety audit whenever appropriate.

WILMAPCO's 2017 North Claymont Area Master Plan (discussed in more detail on page 23 of this letter) identifies and recommends numerous potential future transportation improvements. One of the more significant potential projects discussed in the Master Plan is the potential construction of a diverging diamond interchange (DDI) at I-95 and Naamans Road to more efficiently accommodate anticipated future traffic. However, the potential DDI project has not moved beyond the preliminary idea/discussion stage.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Tenth Edition, published by the Institute of Transportation Engineers (ITE). The following land uses were utilized to estimate the amount of new traffic generated for this development at full buildout:

- 10 single-family detached homes (ITE Land Use Code 210)
- 1,190 multifamily mid-rise homes (ITE Land Use Code 221)
- 420,000 SF industrial park (ITE Land Use Code 130)
- 150 room hotel (ITE Land Use Code 310)
- 1,069,000 SF general office (ITE Land Use Code 710)
- 40,000 SF retail (ITE Land Use Code 820)
- 12,000 SF quality restaurant (ITE Land Use Code 931)

The TIS analyzed the development with the Spine Road continuous between Philadelphia Pike and Naamans Road ("with Spine Road") and without the Spine Road continuous across Naamans Creek ("without Spine Road"). The two scenarios have unique trip generation characteristics, which are summarized on the following pages.

It is noted that the above land uses were assumed in the original TIS as submitted by TPD in June 2019, and that the trip generation and operational analysis summaries on subsequent pages of this review are based on those land use assumptions with exceptions as described immediately below. In February 2020, TPD submitted Addendum #1 with revised land use assumptions to reflect updated plans for the overall site. The revised land use would affect trip generation calculations and traffic volumes, most prominently at the Philadelphia Pike & Transit Center Drive intersection and up Philadelphia Pike to its intersection with Naamans Road. As such, TPD's Addendum #1 included updated operational analyses for three intersections along Philadelphia Pike. Our review accounted for the updated volumes/analyses at those three intersections. The following revised land uses were assumed in Addendum #1:

- 1,207 multifamily mid-rise homes
- 380,000 SF industrial park
- 989,000 SF general office
- 53,600 SF retail
- 6,000 SF quality restaurant
- 15,000 SF pharmacy
- 5,585 SF convenience store with gas pumps
- 25,310 SF grocery

Table 1A
FIRST STATE CROSSING AM PEAK HOUR TRIP GENERATION (per original TIS)
WITH SPINE ROAD

Land Use	Internal Trips	External Trips			Pass-By Trips			New Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
10 KSF retail	16	87	54	141	0	0	0	87	54	141
10 single-family detached homes	1	3	8	11	0	0	0	3	8	11
1,190 multi-family mid-rise homes	39	91	258	349	0	0	0	91	258	349
420 KSF industrial park	0	136	32	168	0	0	0	136	32	168
150 room hotel	7	37	26	63	0	0	0	37	26	63
637 KSF general office	63	483	79	562	0	0	0	483	79	562
12 KSF quality restaurant	1	4	4	8	0	0	0	4	4	8
30 KSF retail	20	91	56	147	0	0	0	91	56	147
432 KSF general office	52	328	53	381	0	0	0	328	53	381
TOTAL	**199**	**1260**	**570**	**1830**	**0**	**0**	**0**	**1260**	**570**	**1830**

Table 2B
FIRST STATE CROSSING PM PEAK HOUR TRIP GENERATION (per original TIS)
WITH SPINE ROAD

Land Use	Internal Trips	External Trips			Pass-By Trips			New Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
10 KSF retail	8	44	47	91	16	16	32	28	31	59
10 single-family detached homes	1	6	4	10	0	0	0	6	4	10
1,190 multi-family mid-rise homes	38	268	171	439	0	0	0	268	171	439
420 KSF industrial park	0	35	133	168	0	0	0	35	133	168
150 room hotel	7	40	39	79	0	0	0	40	39	79
637 KSF general office	53	97	511	608	0	0	0	97	511	608
12 KSF quality restaurant	11	56	27	83	0	0	0	56	27	83
30 KSF retail	27	94	102	196	34	34	68	60	68	128
432 KSF general office	55	64	338	402	0	0	0	64	338	402
TOTAL	**200**	**546**	**932**	**2076**	**50**	**50**	**100**	**654**	**1322**	**1976**

Table 3C
FIRST STATE CROSSING AM PEAK HOUR TRIP GENERATION (per original TIS)
WITHOUT SPINE ROAD

Land Use	Internal Trips	External Trips			Pass-By Trips			New Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
5 KSF retail	9	90	55	145	0	0	0	90	55	145
10 single-family detached homes	1	3	8	11	0	0	0	3	8	11
420 KSF industrial park	0	136	32	168	0	0	0	136	32	168
50 KSF general office	4	59	10	69	0	0	0	59	10	69
5 KSF retail	11	89	54	143	0	0	0	89	54	143
1,190 multi-family mid-rise homes	27	94	267	361	0	0	0	94	267	361
150 room hotel	5	38	27	65	0	0	0	38	27	65
587 KSF general office	40	463	75	538	0	0	0	463	75	538
12 KSF quality restaurant	1	4	4	8	0	0	0	4	4	8
30 KSF retail	20	91	56	147	0	0	0	91	56	147
432 KSF general office	52	328	53	381	0	0	0	328	53	381
TOTAL	**170**	**1395**	**641**	**2036**	**0**	**0**	**0**	**1395**	**641**	**2036**

Table 4D
FIRST STATE CROSSING PM PEAK HOUR TRIP GENERATION (per original TIS)
WITHOUT SPINE ROAD

Land Use	Internal Trips	External Trips			Pass-By Trips			New Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
5 KSF retail	5	26	28	54	10	10	20	16	18	34
10 single-family detached homes	1	6	4	10	0	0	0	6	4	10
420 KSF industrial park	0	35	133	168	0	0	0	35	133	168
50 KSF general office	5	9	45	54	0	0	0	9	45	54
5 KSF retail	5	26	28	54	10	10	20	16	18	34
1,190 multi-family mid-rise homes	38	268	171	439	0	0	0	268	171	439
150 room hotel	7	40	39	79	0	0	0	40	39	79
587 KSF general office	49	90	43	563	0	0	0	90	473	563
12 KSF quality restaurant	11	56	27	83	0	0	0	56	27	83
30 KSF retail	27	94	102	196	34	34	68	60	68	128
432 KSF general office	55	64	338	402	0	0	0	64	338	402
TOTAL	**203**	**714**	**1388**	**2102**	**54**	**54**	**108**	**660**	**1334**	**1994**

Table 5A
FIRST STATE CROSSING DAILY TRIP GENERATION (per original TIS)
WITH SPINE ROAD

Land Use	**New Trips**		
	In	Out	Total
40 KSF retail	1613	1612	3225
10 single-family detached homes	63	63	126
1190 multi-family mid-rise homes	3242	3242	6484
420 KSF industrial park	991	990	1981
150 room hotel	633	633	1266
1,069 KSF general office	5283	5282	10565
12 KSF quality restaurant	503	503	1006
TOTAL	**12328**	**12325**	**24653**

Table 6B
FIRST STATE CROSSING DAILY TRIP GENERATION (per original TIS)
WITHOUT SPINE ROAD

Land Use	**New Trips**		
	In	Out	Total
40 KSF retail	1613	1612	3225
10 single-family detached homes	63	63	126
1190 multi-family mid-rise homes	3242	3242	6484
420 KSF industrial park	991	990	1981
150 room hotel	633	633	1266
1,069 KSF general office	5283	5282	10565
12 KSF quality restaurant	503	503	1006
TOTAL	**12328**	**12325**	**24653**

Overview of TIS

Intersections examined:

1) Naamans Road & East Mall Entrance/Site Entrance A
2) Naamans Road & West Mall Entrance/Site Entrance B
3) Philadelphia Pike & Transit Center Drive/Site Entrance C/Spine Road
4) Philadelphia Pike & Site Entrance D/Site Entrance F
5) Philadelphia Pike & Alcott Avenue
6) Philadelphia Pike & I-495 Northbound Ramps
7) Philadelphia Pike & I-495 Southbound Ramps
8) Philadelphia Pike & Darley Road/Myrtle Avenue
9) Philadelphia Pike & Manor Avenue
10) Philadelphia Pike & Seminole Avenue/Wiltshire Road
11) Philadelphia Pike & Governor Printz Boulevard
12) Darley Road & Worth Lane
13) Darley Road & Naamans Drive
14) Darley Road & Ruby Drive
15) Darley Road & Peachtree Road
16) Naamans Road & Hickman Road
17) Naamans Road & Ridge Road/Site Access E
18) Naamans Road & Philadelphia Pike
19) Naamans Road & I-95 Northbound Ramps
20) Naamans Road & I-95 Southbound Ramps
21) Naamans Road & Peachtree Road/Society Drive
22) Naamans Road & Society Drive
23) Naamans Road & Carpenter Station Road

Cases examined:

1) 2018 existing (Case 1)
2) 2021 without First State Crossing (Case 2)
3a) 2021 with First State Crossing Phase I, with Spine Road (Case 3a)
3b) 2021 with First State Crossing Phase I, without Spine Road (Case 3b)
4a) 2025 with First State Crossing Phases I and II, with Spine Road (Case 4a)
4b) 2025 with First State Crossing Phases I and II, without Spine Road (Case 4b)
5) 2030 without First State Crossing (Case 5)
6a) 2030 with First State Crossing Full Build, with Spine Road, One-Way In (Case 6a)
6b) 2030 with First State Crossing Full Build, without Spine Road, One-Way In (Case 6b)
6c) 2030 with First State Crossing Full Build, with Spine Road, One-Way Out (Case 6c)
6d) 2030 with First State Crossing Full Build, without Spine Road, One-Way Out (Case 6d)

Note that "one-way in" and "one-way out" refer to the configuration of Site Access E at Naamans Road. Also note that for Cases 6c and 6d, intersections 3, 4 and 18 were analyzed using volumes in TPD Addendum #1 with revised land use, dated February 5, 2020.

Peak hours evaluated:

- Weekday morning and evening peak hours

Committed developments considered:

- Darley Green (Philadelphia Pike & Darley Road): unbuilt 3 single-family detached homes, 38 duplexes, 138 townhomes, 60 stacked townhomes, 38 manor homes, 8 apartments, 8,000 SF retail
- Presidential Towers (Society Drive): unbuilt 115 apartments
- Society Office Complex (Society Drive): unbuilt 6,200 SF general office
- Brandywine Pavilion (Naamans Road & Marsh Road): unbuilt 36,682 SF office, 18,068 SF retail, 13 apartments
- Relocation of Claymont Train Station (relocation from Myrtle Avenue to proposed Transit Center Drive)

Intersection Descriptions

1) **Naamans Road & East Mall Entrance/Site Access A**
   Type of Control: Existing one-way stop control; proposed two-way stop control
   Eastbound Approach: (Naamans Road) one left-turn lane and two through lanes
   Westbound Approach: (Naamans Road) one left-turn lane, two through lanes, and one right-turn lane
   Northbound Approach: (Site Access A) proposed one right-turn lane, stop control
   Southbound Approach: (Tri-State Mall Driveway) existing one left-turn lane and one right-turn lane, stop control

2) **Naamans Road & West Mall Entrance/Site Entrance B**
   Type of Control: Signalized
   Eastbound Approach: (Naamans Road) one left-turn lane and two through lanes
   Westbound Approach: (Naamans Road) two through lanes and one right-turn lane
   Northbound Approach: (Site Access B) proposed one shared left/through/right-turn lane
   Southbound Approach: (Tri-State Mall Driveway) one left-turn lane and one right-turn lane

3) **Philadelphia Pike & Transit Center Drive/Site Entrance C/Spine Road**
   Type of Control: Does not currently exist; will be signalized once CRTC project is complete
   Eastbound Approach: (Site Entrance C/Spine Road) proposed one shared left-turn/through lane and one right-turn lane
   Westbound Approach: (Transit Center Drive) proposed one left-turn lane, one shared left-turn/through lane, and one right-turn lane
   Northbound Approach: (Philadelphia Pike) proposed one left-turn lane, two through lanes, and one right-turn lane
   Southbound Approach: (Philadelphia Pike) proposed one left-turn lane, one through lane, and one shared through/right-turn lane
   Note: while the TIS analyzed the northbound Philadelphia Pike approach with two right-turn lanes, the design of this intersection as part of the Claymont Regional Transportation Center (CRTC) project includes only one channelized right-turn lane, which allows for acceptable operations and appears to be more appropriate considering pedestrian activity. Also, as of August 2021, the eastbound Site Entrance C approach will have a separate left-turn lane and the eastbound right-turn lane will not be channelized.

4) Philadelphia Pike & Site Entrance D/Site Entrance F

Type of Control: Two-way stop control (right-in/right-out site entrances)
Eastbound Approach: (Site Entrance F) proposed one right-turn lane, stop control
Westbound Approach: (Site Entrance D) proposed one right-turn lane, stop control
Northbound Approach: (Philadelphia Pike) proposed one through lane and one shared through/right-turn lane
Southbound Approach: (Philadelphia Pike) proposed one through lane and one shared through/right-turn lane
Note: As of August 2021, Site Entrance F is no longer proposed.

5) Philadelphia Pike & Alcott Avenue

Type of Control: Signalized
Eastbound Approach: (Alcott Avenue) one shared left-turn/right-turn lane
Northbound Approach: (Philadelphia Pike) one left-turn lane and two through lanes
Southbound Approach: (Philadelphia Pike) one through lane and one shared through/right-turn lane

6) Philadelphia Pike & I-495 Northbound Ramps

Type of Control: Signalized
Westbound Approach: (I-495 Northbound Off- Ramp) one shared left-turn/through lane and one channelized right-turn lane
Northbound Approach: (Philadelphia Pike) one left-turn lane and two through lanes
Southbound Approach: (Philadelphia Pike) two through lanes and one channelized right-turn lane

7) Philadelphia Pike & I-495 Southbound Ramps

Type of Control: One-way stop control (T-intersection)
Eastbound Approach: (I-495 Southbound Off-Ramp) one left-turn lane and one channelized right-turn lane, stop control
Northbound Approach: (Philadelphia Pike) one through lane and one shared through/right-turn lane
Southbound Approach: (Philadelphia Pike) two through lanes and one channelized right-turn lane

8) Philadelphia Pike & Darley Road/Myrtle Avenue

Type of Control: Signalized
Eastbound Approach: (Darley Road) one shared left-turn/through lane and one right turn lane
Westbound Approach: (Myrtle Avenue) one shared left-turn/through/right-turn
Northbound Approach: (Philadelphia Pike) one left-turn lane, one through lane, one shared through/right-turn lane, and one bicycle lane
Southbound Approach: (Philadelphia Pike) one left-turn lane, one through lane, one shared through/right-turn lane, and one bicycle lane

9) Philadelphia Pike & Manor Avenue

Type of Control: Signalized
Eastbound Approach: (Manor Avenue) one shared left-turn/through/right-turn lane
Westbound Approach: (Manor Avenue) one shared left-turn/through/right-turn lane
Northbound Approach: (Philadelphia Pike) one left-turn lane, one through lane, one shared through/right-turn, and one bicycle lane
Southbound Approach: (Philadelphia Pike) one left-turn lane, one through lane, one shared through/right-turn lane, and one bicycle lane

10) Philadelphia Pike & Seminole Avenue/Wiltshire Road

Type of Control: Signalized
Eastbound Approach: (Seminole Avenue) one shared left-turn/through/right-turn lane
Westbound Approach: (Wiltshire Road) one shared left-turn/through/right-turn lane
Northbound Approach: (Philadelphia Pike) one shared left-turn/through lane, one shared through/right-turn lane, and one bicycle lane
Southbound Approach: (Philadelphia Pike) one shared left-turn/through lane, one shared through/right-turn lane, and one bicycle lane

11) Philadelphia Pike & Governor Printz Boulevard

Type of Control: Signalized
Westbound Approach: (Governor Printz Boulevard) one left-turn lane and one right-turn lane
Northbound Approach: (Philadelphia Pike) one through lane, one shared through/right-turn lane, and one bicycle lane
Southbound Approach: (Philadelphia Pike) two left-turn lanes, one through lane, and one bicycle lane

12) Darley Road & Worth Lane

Type of Control: One-way stop control (T-intersection)
Eastbound Approach: (Darley Road) one through lane and one right-turn lane
Westbound Approach: (Darley Road) one shared left-turn/through lane
Northbound Approach: (Worth Lane) one shared left-turn/right-turn lane, stop control

13) Darley Road & Naamans Drive

Type of Control: Signalized
Eastbound Approach: (Darley Road) one through lane and one right-turn lane
Westbound Approach: (Darley Road) one shared left-turn/through lane
Northbound Approach: (Naamans Drive) one shared left-turn/right-turn lane

14) Darley Road & Ruby Drive

Type of Control: Signalized
Eastbound Approach: (Darley Road) one shared left-turn/through lane and one right-turn lane
Westbound Approach: (Darley Road) one shared left-turn/through lane one right-turn lane
Northbound Approach: (Ruby Drive) one shared left-turn/through/right-turn lane
Southbound Approach: (Brandywine Community School Driveway) one shared left-turn/through/right-turn lane

15) Darley Road & Peachtree Road

Type of Control: Signalized
Eastbound Approach: (Darley Road) one shared left-turn/through lane and one right-turn lane
Westbound Approach: (Darley Road) one shared left-turn/through lane and one right-turn lane
Northbound Approach: (Peachtree Road) one shared left-turn/through lane and one right-turn lane
Southbound Approach (Peachtree Road) one shared left-turn/through lane and one right-turn lane

16) Naamans Road & Hickman Road

Type of Control: Yield control (T-intersection)
Westbound Approach: (Naamans Road) two through lanes, one bicycle lane, and one channelized right-turn lane
Southbound Approach: (Hickman Road) one channelized right-turn lane, yield control

17) Naamans Road & Ridge Road/Site Access E (Exit Only)

Type of Control: Signalized
Eastbound Approach: (Naamans Road) one left-turn lane and two through lanes
Westbound Approach: (Naamans Road) one u-turn lane, two through lanes, and one channelized right-turn lane
Northbound Approach: (Site Access E – Exit Only) proposed one shared left-turn/through/right-turn lane
Southbound Approach: (Ridge Road) one left-turn lane and one right-turn lane

18) Naamans Road & Philadelphia Pike

Type of Control: Signalized
Eastbound Approach: (Naamans Road) existing two left-turn lanes and one channelized right-turn lane; proposed (per Philadelphia Pike road diet) one left-turn lane, one bicycle lane, and one channelized right-turn lane
Northbound Approach: (Philadelphia Pike) existing two left-turn lanes and two through lanes; proposed (road diet) two left-turn lanes and one through lane
Southbound Approach: (Philadelphia Pike) one through lane and one channelized right-turn lane; proposed (road diet) one through lane, one bicycle lane, and one channelized right-turn lane

19) Naamans Road & I-95 Northbound Ramps

Type of Control: Signalized
Eastbound Approach: (Naamans Road) one left-turn lane, one shared left-turn/through lane and one through lane
Westbound Approach: (Naamans Road) two through lanes one channelized right-turn lane
Northbound Approach: (I-95 Northbound Off-Ramp) one left-turn lane, one shared left-turn/through lane and one channelized right-turn lane

20) Naamans Road & I-95 Southbound Ramps

Type of Control: Signalized
Eastbound Approach: (Naamans Road) two through lanes and one channelized right-turn lane
Westbound Approach: (Naamans Road) one left-turn lane and two through lanes
Southbound Approach: (I-95 Southbound Off-Ramp) one left-turn lane and one channelized right-turn lane

21) Naamans Road & Peachtree Road/Society Drive

Type of Control: Signalized
Eastbound Approach: (Naamans Road) two left-turn lanes, two through lanes, and one channelized right-turn lane
Westbound Approach: (Naamans Road) two left-turn lanes, two through lanes, and one channelized right-turn lane
Northbound Approach: (Peachtree Road) one left-turn lane, one through lane, and one channelized right-turn lane
Southbound Approach: (Society Drive) two left-turn lanes, one through lane, and one channelized right-turn lane

22) Naamans Road & Society Drive

Type of Control: Yield control (T-intersection)
Eastbound Approach: (Naamans Road) one left-turn lane and two through lanes
Westbound Approach: (Naamans Road) two through lanes and one yield control right-turn lane
Southbound Approach: (Society Drive) one channelized right-turn lane, yield control

23) Naamans Road & Carpenter Station Road

Type of Control: Signalized
Eastbound Approach: (Naamans Road) one left-turn lane, one through lane, and one shared through/right-turn lane
Westbound Approach: (Naamans Road) one left-turn lane, two through lanes, and one channelized right-turn lane
Northbound Approach: (Carpenter Station Road) one left-turn lane, one through lane, and one channelized right-turn lane
Southbound Approach: (Carpenter Station Road) one left-turn lane and one shared through/right-turn lane

Safety Evaluation

Crash Data: Per current DelDOT policy, review of crash data was not conducted at this time.

Sight Distance: Based on a field visit conducted in June 2019, there were no notable sight distance concerns at the study intersections. As always, sight distances should be confirmed during the site plan review process for all proposed movements at the site accesses. The designer must verify that adequate sight distance will be provided for both ingress and egress movements at the proposed site driveways.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates several fixed-route transit bus routes near the proposed First State Crossing development.

DART routes 13 and 61 both stop on-site at the Tri-State Mall and near the intersection of Philadelphia Pike & Darley Road. Routes 31 and 61 have stops near the intersection of Philadelphia Pike & Myrtle Avenue and at the existing Claymont train station.

SEPTA bus route 113 stops on-site at the Tri-State Mall and provides service to Chester, Darby, and 69th Street Transportation Centers in Pennsylvania.

The existing Claymont train station (located at Myrtle Avenue & Marion Avenue) is served by SEPTA's Wilmington/Newark regional rail line. This rail line connects Claymont to Center City Philadelphia, Wilmington, Newark, and intermediate points in Pennsylvania and Delaware. Claymont station is served by approximately 20 round trips on weekdays, and eight round trips on weekends. Based on the SEPTA Fiscal Year 2019 Annual Service Plan, the existing Claymont station sees approximately 1,200 total passengers (boarding plus alighting) on an average weekday. Based on SEPTA's website, the existing Claymont station has a total of 497 free parking spaces. A pedestrian bridge over I-495 provides access to parking spaces along Governor Printz Boulevard Extension.

Planned transit service: The TIS states that TPD attempted to contact a DTC representative regarding planed transit service, but they did not receive a response. McCormick Taylor also attempted to contact a DTC representative to confirm future transit needs; DTC did not respond or provide any comments.

Completion of the Claymont Regional Transportation Center (CRTC) is expected in 2021. This project will relocate the existing Claymont train station approximately one-half mile to the north of its current location. The CRTC will provide approximately 870 parking spaces, improved access to the station by all modes of transportation, and direct transit access to the proposed First State Crossing development. DART and/or SEPTA will likely modify fixed-route transit bus schedules and routes to service the CRTC.

Existing bicycle and pedestrian facilities: Several study area roadways are identified as "Bicycling Routes" on the *New Castle County Bicycle Map* published by DelDOT.

- Naamans Road
  - Regional bicycle route with bikeway
  - Over 10,000 vehicles daily
- Philadelphia Pike
  - Regional bicycle route without bikeway
    - Bicycle lanes have been added to portions of Philadelphia Pike
  - Over 10,000 vehicles daily south of Darley Road
- Darley Road
  - Unclassified roadway with bikeway
- Governor Printz Boulevard
  - Connector bicycle route with bikeway

The East Coast Greenway (ECG) is a walking and biking route stretching 3,000 miles from Maine to Florida. Heading north from Bellevue State Park, the ECG runs along Governor Printz Boulevard to Philadelphia Pike. The ECG continues along Philadelphia Pike to the Pennsylvania State Line. While much of the ECG is currently comprised of on-road segments, the ECG designation is moved to protected trails as they are constructed.

Existing sidewalks along the site frontages on Philadelphia Pike are present but substandard in many places. There are existing sidewalks on the north side of Naamans Road, but none along the south side along the site frontage. There is a pedestrian overpass over I-495, connecting Philadelphia Pike near Darley Road west of I-495 to the Knollwood community east of I-495. There is second pedestrian overpass over I-495 further to the south, connecting Governor Printz Boulevard Extension to the existing Claymont train station. Based on the North Claymont Area Master Plan, the area generally lacks comfortable routes for pedestrians.

Planned bicycle and pedestrian facilities: According to the TIS, construction and/or upgrades of sidewalk along the site frontages will be required. Extensive pedestrian accommodations and connections are also proposed within the site.

As per the Development Coordination Manual section 3.5.4.2, shared-use path/sidewalk construction shall be required for all projects requesting Entrance Plan Approval or Entrance Permit in all Investment Level 1 and Investment Level 2 Areas. Therefore, shared-use path/sidewalk construction shall be required along all site frontages.

All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the Development Coordination Manual, if a right turn lane is warranted, then a 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 classification or existing conditions.

Incorporating a continuous shared-use path for the East Coast Greenway (ECG) is a central focus of the North Claymont Area Master Plan. From south to north, the Master Plan calls for the ECG

to travel along Governor Printz Boulevard Extension and cross Interstate 495 using the existing pedestrian bridge at the existing Claymont train station. The trail would then continue north through the vacated Claymont train station parking lot, behind the Addick Estates neighborhood, and extend to new walking/cycling facilities along Philadelphia Pike. Near Naamans Road, the ECG would utilize an existing underpass to travel below the Amtrak/SEPTA railroad tracks before realigning with Philadelphia Pike to the Pennsylvania state line. The TIS states that the First State Crossing development plan is consistent with the recommended ECG route.

Previous Comments

It appears that all substantive comments from DelDOT's TIS Scoping Memorandum, Traffic Count Review and other correspondence were addressed in the Final TIS submission. Based on discrepancies found with future projected volumes during initial review of the TIS, TPD revised the TIS volumes and analyses and resubmitted the TIS. Further coordination regarding future transit bus service will be needed with the appropriate agencies. Further coordination regarding the design of the potential Spine Road (no longer being pursued), Alcott Avenue, and the Tri-State Mall eastern driveway will also be needed with the appropriate agencies and property owners.

General HCS Analysis Comments
(see table footnotes on the following pages for specific comments)

1) Both TPD and McCormick Taylor utilized the Highway Capacity Manual (HCM) 6th Edition module within Synchro 10 to complete the traffic analyses.

2) As per HCM methodologies, TPD and McCormick Taylor applied percent heavy vehicles (HV) by movement at two-way stop control and roundabout intersections, HV by lane at all-way stop control intersections, and HV by lane group at signalized intersections. In general, existing HV were applied to future conditions as well. For new intersections, 3% was assumed as per the DelDOT Development Coordination Manual section 2.2.8.11.6.H.

3) For existing conditions, TPD and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F.

4) For analyses of signalized intersections, TPD and McCormick Taylor used a base saturation flow rate of 1,900 pc/hr/ln per DelDOT's Development Coordination Manual section 2.2.8.11.6.I.

5) The TIS and McCormick Taylor used different signal timings when analyzing the signalized intersections in some cases. For many signalized intersections, analyses of future scenarios reflect optimized signal timings.

6) McCormick Taylor used field-measured roadway grades in all analyses. It appears that TPD may have assumed 0% roadway grades throughout the study area.

7) The "One-Way In / One-Way Out" notation used throughout the summary tables refers to the configuration of Site Access E at the intersection of Naamans Road & Ridge Road.

Table 3
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study – Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection [1] One-Way Stop Control	**LOS per TIS**		**LOS per McCormick Taylor**	
1) Naamans Road & East Mall Entrance [2]/ Right-In/Right-Out Site Access A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Naamans Road – Left	A (7.9)	A (8.8)	A (8.0)	A (9.1)
Westbound Naamans Road – U Turn	B (10.0)	B (11.8)	B (10.1)	B (11.9)
Southbound East Mall Entrance – Left	B (14.9)	D (34.7)	B (12.0)	C (19.2)
Southbound East Mall Entrance – Right			A (9.0)	A (9.8)
2021 without First State Crossing (Case 2)				
Eastbound Naamans Road – Left	A (8.0)	A (9.2)	A (8.1)	A (9.6)
Westbound Naamans Road – U Turn	B (10.5)	B (12.6)	B (10.5)	B (12.7)
Southbound East Mall Entrance – Left	C (16.2)	F (62.6)	B (12.5)	C (22.6)
Southbound East Mall Entrance – Right			A (9.1)	B (10.1)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)				
Eastbound Naamans Road – Left	A (8.1)	A (9.2)	A (8.2)	A (9.6)
Westbound Naamans Road – U Turn	B (10.5)	B (12.9)	B (10.6)	B (12.9)
Southbound East Mall Entrance – Left	C (16.9)	F (66.8)	B (12.8)	C (23.1)
Southbound East Mall Entrance – Right			A (9.2)	B (10.1)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)				
Eastbound Naamans Road – Left	A (8.1)	A (9.5)	A (8.1)	B (10.0)
Westbound Naamans Road – U Turn	B (11.7)	B (13.0)	B (11.7)	B (13.0)
Southbound East Mall Entrance – Left	C (19.4)	F (95.7)	B (14.0)	D (26.0)
Southbound East Mall Entrance – Right			A (9.2)	B (10.4)

[1] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[2] In select scenarios, it appears that TPD coded the Southbound Tri-State Mall approach as a single shared left-turn/right-turn lane. Based on Updated August 2019 field data, this approach is one left-turn lane and one right-turn lane. McCormick Taylor analyzed the approach based on the existing field configuration.

Table 3 (continued)
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study – Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection [3] One-Way Stop Control	**LOS per TIS**		**LOS per McCormick Taylor**	
1) Naamans Road & East Mall Entrance [4]/ Right-In/Right-Out Site Access A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)				
Northbound Site Access A – Right	B (10.0)	B (11.3)	B (10.0)	B (11.4)
Eastbound Naamans Road – Left	A (8.5)	A (9.5)	A (8.6)	A (9.9)
Westbound Naamans Road – Left	B (11.2)	C (15.3)	B (11.2)	C (15.3)
Southbound East Mall Entrance – Left	D (25.2)	F (267.4)	C (15.9)	E (39.1)
Southbound East Mall Entrance – Right	B (10.0)	B (11.5)	A (9.6)	B (10.4)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)				
Northbound Site Access A – Right	B (11.1)	B (12.5)	B (11.2)	B (12.6)
Eastbound Naamans Road – Left	A (9.0)	B (10.5)	A (9.1)	B (11.2)
Westbound Naamans Road – Left	C (16.6)	C (20.5)	C (16.7)	C (20.5)
Southbound East Mall Entrance – Left	F (58.6)	F (802.1)	D (26.3)	F (106.5)
Southbound East Mall Entrance – Right	B (10.5)	B (12.2)	B (10.0)	B (11.2)
2030 without First State Crossing (Case 5)				
Eastbound Naamans Road – Left	A (8.1)	A (9.3)	A (8.1)	A (9.8)
Westbound Naamans Road – U Turn	B (10.7)	B (13.1)	B (10.8)	B (13.1)
Southbound East Mall Entrance – Left	C (16.9)	F (76.8)	B (12.9)	C (24.3)
Southbound East Mall Entrance – Right			A (9.2)	B (10.2)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)				
Northbound Site Access A – Right	B (10.1)	B (11.8)	B (10.1)	B (11.8)
Eastbound Naamans Road – Left	A (8.6)	A (9.6)	A (8.6)	B (10.1)
Westbound Naamans Road – Left	B (11.6)	C (17.0)	B (11.6)	C (17.3)
Southbound East Mall Entrance – Left	D (26.6)	F (360.2)	C (16.4)	E (48.4)
Southbound East Mall Entrance – Right	B (10.0)	B (11.7)	A (9.6)	B (10.4)

[3] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

[4] In select scenarios, it appears that TPD coded the Southbound Tri-State Mall approach as a single shared left-turn/right-turn lane. Based on Updated August 2019 field data, this approach is one left-turn lane and one right-turn lane. McCormick Taylor analyzed the approach based on the existing field configuration.

Table 3 (continued)
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study – Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection [5] One-Way Stop Control	**LOS per TIS**		**LOS per McCormick Taylor**	
1) Naamans Road & East Mall Entrance [6]/ Right-In/Right-Out Site Access A	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)				
Northbound Site Access A – Right	B (11.3)	B (13.2)	B (11.4)	B (13.2)
Eastbound Naamans Road – Left	A (9.3)	B (10.9)	A (9.4)	B (11.6)
Westbound Naamans Road – Left	C (17.9)	D (25.8)	C (18.0)	D (25.8)
Southbound East Mall Entrance – Left	F (78.0)	F (1334.8)	D (30.9)	F (207.0)
Southbound East Mall Entrance – Right	B (10.9)	B (12.6)	B (10.2)	B (11.4)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)				
Northbound Site Access A – Right	B (10.0)	B (11.4)	B (10.0)	B (11.5)
Eastbound Naamans Road – Left	A (8.8)	A (9.8)	A (8.8)	B (10.3)
Westbound Naamans Road – Left	B (11.3)	C (15.9)	B (11.4)	C (15.7)
Southbound East Mall Entrance – Left	D (28.7)	F (392.0)	C (17.1)	E (46.5)
Southbound East Mall Entrance – Right	B (10.2)	B (11.9)	A (9.8)	B (10.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)				
Northbound Site Access A – Right	B (11.3)	B (13.2)	B (11.4)	B (13.2)
Eastbound Naamans Road – Left	A (9.3)	B (10.9)	A (9.4)	B (11.6)
Westbound Naamans Road – Left	C (17.9)	D (25.8)	C (18.0)	D (25.8)
Southbound East Mall Entrance – Left	F (78.0)	F (1334.8)	D (30.9)	F (207.0)
Southbound East Mall Entrance – Right	B (10.9)	B (12.6)	B (10.2)	B (11.4)

[5] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[6] In select scenarios, it appears that TPD coded the Southbound Tri-State Mall approach as a single shared left-turn/right-turn lane. Based on Updated August 2019 field data, this approach is one left-turn lane and one right-turn lane. McCormick Taylor analyzed the approach based on the existing field configuration.

Table 4
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[7]	**LOS per TIS**		**LOS per McCormick Taylor**	
2) Naamans Road & West Mall Entrance/Site Entrance B	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (2.1)	A (6.5)	A (2.5)	A (5.9)
2021 without First State Crossing (Case 2)	A (2.4)	B (12.9)	A (2.3)	A (5.4)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (2.9)	A (8.4)	A (3.0)	A (8.7)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (2.2)	A (5.5)	A (2.0)	A (5.0)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (7.9)	C (30.4)	A (7.9)	C (31.1)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (5.2)	B (18.6)	A (5.2)	C (23.6)
2030 without First State Crossing (Case 5)	A (2.3)	A (5.6)	A (2.2)	A (5.2)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	C (28.5)	D (36.0)	C (28.7)	D (36.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (5.0)	C (20.4)	A (5.0)	C (26.5)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	B (17.4)	D (45.1)	B (10.3)	C (33.9)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	B (15.8)	D (36.7)	A (5.0)	C (26.5)

[7] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 5
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[8]	**LOS per TIS**		**LOS per McCormick Taylor** [9]	
3) Philadelphia Pike & Site Entrance C/Spine Rd/Transit Center Dr [10]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 without First State Crossing (Case 2)	A (3.7)	B (16.4)	A (1.0)	B (17.7)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (8.0)	D (37.6)	A (6.7)	D (37.6)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (4.1)	D (41.0)	A (4.2)	D (39.4)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	B (11.6)	D (48.6)	B (11.6)	D (42.7)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	B (10.3)	D (48.4)	A (6.9)	D (49.1)
2030 without First State Crossing (Case 5)	A (3.8)	B (16.5)	A (1.0)	B (19.1)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	C (32.2)	D (45.9)	C (32.6)	D (49.4)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	B (10.8)	D (51.2)	B (10.9)	D (47.5)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c) [11]	C (24.4)	D (46.3)	C (25.7)	D (50.4)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d) [11]	B (12.6)	D (51.6)	B (11.1)	D (51.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d) [11] with modified Site Entrance C approach [12]	N/A	N/A	B (11.1)	D (51.7)

[8] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[9] HCM methodology allows a maximum of 60 seconds to be entered for unsignalized delay. Synchro's percentile delay methodology indicates that the eastbound site driveway channelized right-turn will experience greater than 60 seconds of unsignalized delay in some scenarios. Therefore, HCM results cannot be reported accurately. McCormick Taylor's LOS/delay are as per Synchro percentile delay methodology.
[10] It appears that TPD analyzed the eastbound site driveway approach with a channelized right-turn lane. By default, HCM methodology excludes the unsignalized delay for channelized right-turns from the overall intersection delay; it appears that the TIS did not use alternate methods to calculate delay for the channelized eastbound right-turn. However, assuming zero delay for this movement does not appear to be an appropriate assumption. In order to account for the unsignalized delay, McCormick Taylor referenced the delay calculated by Synchro's percentile delay methodology and input this delay value into the HCM window for the eastbound channelized right-turn lane.
[11] Analysis per TPD Addendum #1 with revised land use, dated February 5, 2020. Includes one NB right-turn lane.
[12] As of August 2021, the eastbound Site Entrance C approach will have a separate left-turn lane and the eastbound right-turn lane will not be channelized.

Table 6
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[13]	**LOS per TIS**		**LOS per McCormick Taylor**	
4) Philadelphia Pike & Site Entrance D/Site Entrance F [14]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)				
Westbound Site Entrance D – Right	B (10.8)	B (12.3)	B (10.8)	B (12.3)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)				
Westbound Site Entrance D – Right	B (10.9)	B (13.0)	B (10.9)	B (13.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)				
Westbound Site Entrance D – Right	B (11.2)	B (13.2)	B (11.2)	B (13.3)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)				
Westbound Site Entrance D – Right	B (12.1)	C (15.4)	B (12.2)	C (15.5)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)				
Westbound Site Entrance D – Right	B (12.0)	B (14.4)	B (12.0)	B (14.5)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)				
Westbound Site Entrance D – Right	B (14.9)	C (19.5)	B (14.9)	C (19.6)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c) [15]				
Westbound Site Entrance D – Right	B (12.0)	B (14.6)	B (12.1)	B (14.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d) [15]				
Westbound Site Entrance D – Right	B (13.6)	C (18.2)	B (13.7)	C (18.3)

[13] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[14] In the TIS, Site Entrance F on the north side of Philadelphia Pike has zero volume entering and exiting in every analysis scenario. Therefore delays on the eastbound Site Entrance F approach are not shown in this table. However, as of August 2021, Site Entrance F is no longer proposed.
[15] Analysis per TPD Addendum #1 with revised land use, dated February 5, 2020.

Table 7
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[16]	**LOS per TIS**		**LOS per McCormick Taylor**	
5) Philadelphia Pike & Alcott Avenue	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (3.7)	A (4.4)	A (4.5)	A (2.8)
2021 without First State Crossing (Case 2)	A (4.5)	A (4.9)	A (3.5)	A (9.4)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (4.8)	A (5.4)	A (2.8)	A (5.1)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (3.7)	A (5.2)	A (2.8)	A (5.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (3.0)	A (5.8)	A (2.2)	A (5.7)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (3.0)	A (6.1)	A (2.1)	A (6.0)
2030 without First State Crossing (Case 5)	A (4.2)	A (5.0)	A (3.3)	A (9.6)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	A (3.0)	A (6.2)	A (2.0)	A (5.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (2.7)	A (6.2)	A (1.9)	A (6.2)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	A (3.1)	A (6.2)	A (2.0)	A (5.8)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	A (2.7)	A (6.2)	A (1.9)	A (6.2)

[16] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 8
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[17]	**LOS per TIS**		**LOS per McCormick Taylor**	
6) Philadelphia Pike & I-495 Northbound Ramps	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (25.0)	D (41.1)	C (25.8)	D (40.2)
2021 without First State Crossing (Case 2)	C (28.6)	F (88.8)	C (24.4)	C (31.3)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	C (24.3)	C (33.4)	C (22.6)	C (25.8)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	C (24.3)	C (33.4)	C (22.5)	C (25.8)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	C (20.1)	C (30.9)	C (21.1)	C (26.9)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	B (16.6)	C (29.2)	C (21.0)	C (26.9)
2030 without First State Crossing (Case 5)	C (29.0)	F (104.6)	C (24.6)	C (32.9)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	C (22.1)	D (36.6)	C (20.7)	D (36.3)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	C (22.3)	D (37.1)	C (20.9)	D (36.9)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	C (22.1)	D (36.6)	C (20.7)	D (36.3)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	C (22.3)	D (37.1)	C (20.9)	D (36.9)

[17] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 9
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[18] **One-Way Stop Control (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
7) Philadelphia Pike & **I-495 Southbound Ramps**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound I-495 Southbound Ramps – Left	B (14.2)	C (17.8)	C (19.0)	D (25.5)
Eastbound I-495 Southbound Ramps – Right	B (12.4)	C (16.5)	B (12.7)	C (17.3)
2021 without First State Crossing (Case 2)				
Eastbound I-495 Southbound Ramps – Left	C (15.9)	D (32.0)	C (22.5)	F (57.8)
Eastbound I-495 Southbound Ramps – Right	B (13.1)	D (33.9)	B (13.6)	E (41.1)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)				
Eastbound I-495 Southbound Ramps – Left	C (18.9)	E (42.6)	D (29.5)	F (87.9)
Eastbound I-495 Southbound Ramps – Right	B (13.4)	E (47.6)	B (13.9)	F (61.6)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)				
Eastbound I-495 Southbound Ramps – Left	C (19.0)	E (43.0)	D (29.8)	F (89.7)
Eastbound I-495 Southbound Ramps – Right	B (13.4)	E (47.9)	B (13.9)	F (62.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)				
Eastbound I-495 Southbound Ramps – Left	D (29.2)	F (87.7)	F (62.4)	F (269.5)
Eastbound I-495 Southbound Ramps – Right	B (14.4)	F (103.2)	C (15.1)	F (140.3)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)				
Eastbound I-495 Southbound Ramps – Left	D (32.2)	F (87.7)	F (75.4)	F (269.5)
Eastbound I-495 Southbound Ramps – Right	B (14.6)	F (104.3)	C (15.3)	F (141.6)
2030 without First State Crossing (Case 5)				
Eastbound I-495 Southbound Ramps – Left	C (17.1)	E (36.3)	D (25.3)	F (70.1)
Eastbound I-495 Southbound Ramps – Right	B (13.8)	E (43.5)	B (14.4)	F (55.3)

[18] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 9 (continued)
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[19] **One-Way Stop Control (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
7) Philadelphia Pike & **I-495 Southbound Ramps**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)				
Eastbound I-495 Southbound Ramps – Left	E (41.3)	F (303.8)	F (121.6)	F (1058.7)
Eastbound I-495 Southbound Ramps – Right	C (16.4)	F (148.8)	C (17.5)	F (196.3)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)				
Eastbound I-495 Southbound Ramps – Left	E (47.9)	F (303.8)	F (160.0)	F (1058.7)
Eastbound I-495 Southbound Ramps – Right	C (16.7)	F (150.2)	C (17.8)	F (198.1)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)				
Eastbound I-495 Southbound Ramps – Left	E (41.3)	F (303.8)	F (121.6)	F (1058.7)
Eastbound I-495 Southbound Ramps – Right	C (16.4)	F (148.8)	C (17.5)	F (196.3)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)				
Eastbound I-495 Southbound Ramps – Left	E (47.9)	F (303.8)	F (160.0)	F (1058.7)
Eastbound I-495 Southbound Ramps – Right	C (16.7)	F (150.2)	C (17.8)	F (198.1)

[19] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 10
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[20]	**LOS per TIS**		**LOS per McCormick Taylor**	
8) Philadelphia Pike & Darley Road/Myrtle Avenue	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (22.3)	D (49.5)	C (25.5)	D (39.6)
2021 without First State Crossing (Case 2)	C (28.7)	D (40.8)	C (23.6)	C (31.6)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	D (35.1)	D (47.6)	C (31.2)	D (35.4)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	D (35.2)	D (47.6)	C (31.4)	D (35.4)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	D (49.8)	D (38.1)	D (36.0)	D (54.0)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	D (49.1)	D (38.3)	D (37.6)	D (54.4)
2030 without First State Crossing (Case 5)	C (29.6)	D (48.7)	C (28.2)	D (37.8)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	D (43.6)	D (50.1)	D (38.6)	E (63.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	D (44.4)	D (50.6)	D (40.3)	E (73.8)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	D (43.6)	D (50.1)	D (37.1)	E (63.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	D (44.4)	D (50.6)	D (40.3)	E (73.8)

[20] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 11
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[21]	**LOS per TIS**		**LOS per McCormick Taylor**	
9) Philadelphia Pike & Manor Avenue	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (5.5)	A (5.5)	A (4.3)	A (3.5)
2021 without First State Crossing (Case 2)	A (7.8)	A (6.6)	A (5.2)	A (3.8)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (7.5)	A (6.4)	A (5.0)	A (3.6)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (7.5)	A (6.4)	A (5.0)	A (3.6)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (7.1)	A (6.6)	A (4.1)	A (3.1)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (7.1)	A (6.6)	A (4.0)	A (3.1)
2030 without First State Crossing (Case 5)	A (7.7)	A (6.3)	A (4.4)	A (3.6)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	A (4.6)	A (6.7)	A (3.9)	A (3.0)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (7.2)	A (6.7)	A (3.8)	A (3.0)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	A (4.6)	A (6.7)	A (3.9)	A (3.0)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	A (7.2)	A (6.7)	A (3.8)	A (3.0)

[21] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 12
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[22]	**LOS per TIS**		**LOS per McCormick Taylor**	
10) Philadelphia Pike & Seminole Avenue/Wiltshire Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (4.4)	A (3.5)	A (4.9)	A (3.4)
2021 without First State Crossing (Case 2)	A (6.1)	A (4.2)	A (4.7)	A (3.2)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (6.1)	A (4.1)	A (4.5)	A (3.1)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (6.1)	A (4.1)	A (4.5)	A (3.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (6.0)	A (3.9)	A (4.2)	A (2.9)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (5.9)	A (3.9)	A (4.1)	A (2.9)
2030 without First State Crossing (Case 5)	A (5.9)	A (4.1)	A (4.5)	A (3.1)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	A (5.8)	A (3.9)	A (4.0)	A (2.8)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (5.8)	A (3.9)	A (4.0)	A (2.8)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	A (5.8)	A (3.9)	A (4.0)	A (2.8)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	A (5.8)	A (3.9)	A (4.0)	A (2.8)

[22] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 13
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[23]	**LOS per TIS**		**LOS per McCormick Taylor**	
11) Philadelphia Pike & Governor Printz Boulevard	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	B (13.6)	B (13.4)	B (12.1)	B (16.6)
2021 without First State Crossing (Case 2)	B (12.4)	B (16.2)	B (13.0)	B (19.9)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	B (11.9)	B (17.6)	B (13.4)	C (21.7)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	B (11.9)	B (17.6)	B (13.4)	C (21.7)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	B (12.8)	C (20.3)	B (14.7)	C (30.2)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	B (13.3)	C (20.4)	B (14.9)	C (30.6)
2030 without First State Crossing (Case 5)	B (12.9)	B (17.4)	B (14.1)	C (21.9)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	B (13.8)	C (21.5)	B (16.3)	D (40.5)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	B (14.0)	C (21.6)	B (16.5)	D (40.8)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	B (13.8)	C (21.5)	B (16.3)	D (40.5)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	B (14.0)	C (21.6)	B (16.5)	D (40.8)

[23] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 14
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[24] **One-Way Stop Control (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
12) Darley Road & **Worth Lane**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Northbound Worth Lane – Left/Right	B (13.7)	C (19.7)	B (13.0)	C (17.3)
Westbound Darley Road – Left	A (8.4)	A (8.6)	A (8.5)	A (8.6)
2021 without First State Crossing (Case 2)				
Northbound Worth Lane – Left/Right	C (15.2)	Error [25]	B (14.2)	C (20.8)
Westbound Darley Road – Left	A (8.6)	A (8.9)	A (8.6)	A (8.9)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)				
Northbound Worth Lane – Left/Right	C (16.2)	D (27.5)	B (14.2)	C (22.5)
Westbound Darley Road – Left	A (8.7)	A (8.9)	A (8.6)	A (8.9)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)				
Northbound Worth Lane – Left/Right	C (16.2)	D (27.5)	C (15.0)	C (22.5)
Westbound Darley Road – Left	A (8.7)	A (8.9)	A (8.8)	A (8.9)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)				
Northbound Worth Lane – Left/Right	C (18.4)	D (33.1)	C (16.8)	D (26.0)
Westbound Darley Road – Left	A (9.0)	A (9.1)	A (9.0)	A (9.2)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)				
Northbound Worth Lane – Left/Right	C (19.0)	D (33.6)	C (17.3)	D (26.3)
Westbound Darley Road – Left	A (9.1)	A (9.1)	A (9.1)	A (9.2)
2030 without First State Crossing (Case 5)				
Northbound Worth Lane – Left/Right	C (15.7)	Error [25]	B (14.6)	C (22.1)
Westbound Darley Road – Left	A (8.7)	A (9.0)	A (8.7)	A (8.9)

[24] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[25] Traffic volumes on the Worth Lane approach were incorrectly set to 0 in the TIS. The TIS does not provide accurate results for this approach.

Table 14 (continued)
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[26] **One-Way Stop Control (T-Intersection)**	**LOS per TIS**		**LOS per McCormick Taylor**	
12) Darley Road & **Worth Lane**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)				
Northbound Worth Lane – Left/Right	C (19.1)	E (37.1)	C (17.4)	D (28.3)
Westbound Darley Road – Left	A (9.1)	A (9.3)	A (9.1)	A (9.3)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)				
Northbound Worth Lane – Left/Right	C (19.8)	E (37.6)	C (17.9)	D (28.5)
Westbound Darley Road – Left	A (9.1)	A (9.3)	A (9.2)	A (9.3)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)				
Northbound Worth Lane – Left/Right	C (19.1)	E (37.1)	C (17.4)	D (28.3)
Westbound Darley Road – Left	A (9.1)	A (9.3)	A (9.1)	A (9.3)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)				
Northbound Worth Lane – Left/Right	C (19.8)	E (37.6)	C (17.9)	D (28.5)
Westbound Darley Road – Left	A (9.1)	A (9.3)	A (9.2)	A (9.3)

[26] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 15
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[27]	**LOS per TIS**		**LOS per McCormick Taylor**	
13) Darley Road & Naamans Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (2.4)	A (2.5)	A (2.5)	A (2.6)
2021 without First State Crossing (Case 2)	A (5.3)	A (2.8)	A (5.1)	A (2.8)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (5.4)	A (3.1)	A (5.3)	A (3.4)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (5.4)	A (3.1)	A (5.3)	A (3.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (5.4)	A (3.9)	A (5.4)	A (3.6)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (5.4)	A (3.9)	A (5.5)	A (3.6)
2030 without First State Crossing (Case 5)	A (5.3)	A (2.9)	A (5.2)	A (2.9)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	A (5.4)	A (4.1)	A (5.5)	A (3.8)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (5.4)	A (4.1)	A (5.6)	A (3.8)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	A (5.4)	A (4.1)	A (5.5)	A (3.8)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	A (5.4)	A (4.1)	A (5.6)	A (3.8)

[27] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 16
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[28]	**LOS per TIS**		**LOS per McCormick Taylor**	
14) Darley Road & Ruby Drive	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (4.5)	A (4.7)	A (9.1)	A (3.7)
2021 without First State Crossing (Case 2)	A (7.1)	A (5.2)	A (6.1)	A (4.0)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (7.2)	A (5.6)	A (6.1)	A (6.5)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (7.2)	A (5.6)	A (6.1)	A (4.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (7.6)	A (8.8)	A (6.5)	A (6.5)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (7.7)	B (10.3)	A (6.6)	A (6.5)
2030 without First State Crossing (Case 5)	A (7.3)	A (5.6)	A (6.3)	A (4.1)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	A (7.9)	B (12.7)	A (6.7)	A (7.2)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (7.9)	B (13.0)	A (6.8)	A (7.4)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	A (7.9)	B (12.7)	A (6.7)	A (7.2)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	A (7.9)	B (13.0)	A (6.8)	A (7.4)

[28] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 17
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[29]	**LOS per TIS**		**LOS per McCormick Taylor**	
15) Darley Road & Peachtree Road	Weekday AM	Weekday PM [30]	Weekday AM	Weekday PM [31]
2018 Existing (Case 1)	B (14.8)	B (17.9)	B (15.1)	F (133.0)
2021 without First State Crossing (Case 2)	B (17.7)	B (18.9)	C (20.3)	F (171.9)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	B (17.9)	B (19.3)	C (20.5)	F (189.0)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	B (17.9)	B (19.3)	C (20.5)	F (188.0)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	B (18.6)	C (22.2)	C (21.2)	F (246.5)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	B (18.7)	C (22.1)	C (21.4)	F (246.5)
2030 without First State Crossing (Case 5)	B (18.0)	C (20.3)	C (20.7)	F (212.8)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	B (18.8)	C (25.5)	C (21.5)	F (276.9)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	B (18.9)	C (25.5)	D (41.2)	F (278.3)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	B (18.8)	C (25.5)	C (21.5)	F (253.4)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	B (18.9)	C (25.5)	D (41.2)	F (293.2)

[29] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[30] The TIS used an inaccurate lane configuration on the eastbound Darley Road approach in the PM analyses. The lane configuration is one shared left-turn/through lane and one right-turn lane. In the PM analyses, the TIS coded one left-turn lane and one shared through/right-turn lane.
[31] With existing eastbound Darley Road lane configuration (one shared left-turn/through lane and one right-turn lane) and optimized traffic signal splits (maintains the existing cycle length).

Table 18
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[32] **One-Way Stop Control**	**LOS per TIS**		**LOS per McCormick Taylor**	
16) Naamans Road & **Hickman Road**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Southbound Hickman Road – Right	A (9.6)	B (10.8)	A (9.4)	B (10.3)
2021 without First State Crossing (Case 2)				
Southbound Hickman Road – Right	A (9.8)	B (11.5)	A (9.6)	B (10.8)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)				
Southbound Hickman Road – Right	B (10.0)	B (11.6)	A (9.8)	B (10.9)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)				
Southbound Hickman Road – Right	B (10.0)	B (12.1)	A (9.8)	B (11.3)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)				
Southbound Hickman Road – Right	B (10.9)	B (12.2)	B (10.5)	B (11.8)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)				
Southbound Hickman Road – Right	B (12.3)	B (14.1)	B (11.5)	B (12.7)
2030 without First State Crossing (Case 5)				
Southbound Hickman Road – Right	A (9.9)	B (11.7)	A (9.6)	B (11.0)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)				
Southbound Hickman Road – Right	B (11.0)	B (12.5)	B (10.6)	B (11.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)				
Southbound Hickman Road – Right	B (13.2)	C (15.1)	B (12.2)	B (13.4)

[32] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 18 (continued)
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[33] One-Way Stop Control	**LOS per TIS**		**LOS per McCormick Taylor**	
16) Naamans Road & Hickman Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)				
Southbound Hickman Road – Right	B (11.4)	B (12.8)	B (10.9)	B (11.8)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)				
Southbound Hickman Road – Right	B (13.2)	C (15.1)	B (12.2)	B (13.4)

[33] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 19
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[34]	**LOS per TIS**		**LOS per McCormick Taylor**	
17) Naamans Road & Ridge Road/Site Access E [35]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (22.4)	D (42.9)	C (26.1)	D (42.9)
2021 without First State Crossing (Case 2)	C (24.8)	D (43.2)	C (24.9)	D (44.0)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	C (26.4)	D (44.7)	C (26.5)	D (45.1)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	C (23.9)	D (42.9)	C (24.0)	D (43.5)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	C (30.5)	D (54.8)	C (30.7)	D (55.9)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	C (24.0)	D (47.3)	C (24.2)	D (48.2)
2030 without First State Crossing (Case 5)	C (24.7)	D (46.6)	C (24.9)	D (47.3)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	C (21.4)	D (44.1)	C (21.5)	D (45.0)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	B (18.2)	D (42.8)	B (18.3)	D (50.2)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	D (52.4)	D (53.4)	C (30.9)	D (39.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	D (52.3)	D (38.8)	C (26.0)	D (50.7)

[34] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[35] The "One-Way In / One-Way Out" notation used throughout this review letter refers to the configuration of Site Access E.

Table 20
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[36]	**LOS per TIS**		**LOS per McCormick Taylor**	
18) Naamans Road & Philadelphia Pike	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (26.8)	C (30.1)	C (28.1)	C (27.0)
2021 without First State Crossing (Case 2)	C (29.6)	C (34.2)	C (29.7)	C (31.1)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	C (29.3)	C (31.2)	C (29.4)	C (33.1)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	C (29.7)	C (33.9)	C (29.7)	D (36.2)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	C (29.3)	C (33.6)	C (29.3)	D (35.7)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	C (34.6)	C (33.6)	C (34.7)	C (32.5)
2030 without First State Crossing (Case 5)	C (29.4)	C (34.8)	C (29.4)	C (31.5)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	C (30.0)	D (36.4)	C (30.0)	D (36.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	D (38.4)	C (33.3)	D (38.6)	C (32.2)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c) [37]	C (28.8)	C (34.1)	C (29.5)	D (36.4)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d) [37]	D (35.1)	D (37.8)	D (35.8)	C (34.3)

[36] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.
[37] Analysis per TPD Addendum #1 with revised land use, dated February 5, 2020.

Table 21
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[38]	**LOS per TIS**		**LOS per McCormick Taylor**	
19) Naamans Road & I-95 Northbound Ramps	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (30.9)	D (44.1)	D (38.4)	D (45.4)
2021 without First State Crossing (Case 2)	C (34.8)	D (46.4)	D (39.5)	D (47.1)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	D (35.3)	D (48.2)	D (40.1)	D (48.2)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	D (35.3)	D (48.2)	D (40.1)	D (48.2)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	D (37.0)	D (51.9)	D (41.8)	D (52.4)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	D (37.4)	D (52.5)	D (42.0)	D (52.1)
2030 without First State Crossing (Case 5)	D (35.2)	D (47.3)	D (39.8)	D (47.9)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	D (39.1)	D (54.6)	D (42.7)	D (51.1)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	D (39.5)	D (54.2)	D (42.9)	D (50.7)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	D (39.1)	D (53.4)	D (42.7)	D (51.2)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	D (39.5)	D (54.2)	D (42.9)	D (50.7)

[38] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 22
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[39]	**LOS per TIS**		**LOS per McCormick Taylor**	
20) Naamans Road & I-95 Southbound Ramps	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	A (3.7)	A (6.0)	A (4.5)	A (6.1)
2021 without First State Crossing (Case 2)	A (4.3)	A (6.1)	A (4.5)	A (6.2)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	A (4.3)	A (6.3)	A (4.4)	A (6.4)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	A (4.3)	A (6.3)	A (4.4)	A (6.4)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	A (5.3)	A (7.4)	A (5.4)	A (7.4)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	A (5.3)	A (7.4)	A (5.4)	A (7.5)
2030 without First State Crossing (Case 5)	A (4.3)	A (6.2)	A (4.4)	A (6.3)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	A (5.6)	A (7.5)	A (5.7)	A (7.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	A (5.7)	A (7.5)	A (5.8)	A (7.6)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	A (5.6)	A (6.2)	A (5.7)	A (7.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	A (5.7)	A (7.5)	A (5.8)	A (7.6)

[39] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 23
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[40]	**LOS per TIS**		**LOS per McCormick Taylor**	
21) Naamans Road & Peachtree/Society Drive [41]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (28.5)	C (29.3)	C (30.7)	C (28.4)
2021 without First State Crossing (Case 2)	C (32.3)	C (29.2)	C (33.0)	C (29.7)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	C (32.4)	C (28.7)	C (31.4)	C (29.1)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	C (32.4)	C (28.7)	C (33.0)	C (29.1)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	C (32.8)	C (28.4)	C (33.3)	C (29.0)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	C (34.7)	C (28.4)	C (33.2)	C (29.0)
2030 without First State Crossing (Case 5)	C (32.3)	C (29.2)	C (32.9)	C (29.6)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	C (32.4)	C (28.9)	C (31.4)	C (28.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	C (32.4)	C (28.9)	C (31.4)	C (28.6)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	C (32.4)	C (28.9)	C (32.8)	C (29.6)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	C (32.4)	C (28.9)	C (31.4)	C (29.6)

[40] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

[41] All approaches have a yield-control, channelized right-turn movement. By default, HCM methodology excludes the unsignalized delay for channelized right-turns from the overall intersection delay; it appears that the TIS did not use alternate methods to calculate delay for the channelized right-turns. Based on intersection geometry, lane configurations, and local knowledge, McCormick Taylor determined that unsignalized delay for the southbound Society Drive approach should be accounted for in the overall intersection delay. In order to account for the unsignalized delay, McCormick Taylor referenced the delay calculated by Synchro's percentile delay methodology and input this delay value into the HCM window for the southbound channelized right-turn lane.

Table 24
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[42] **One-Way Stop Control**	**LOS per TIS**		**LOS per McCormick Taylor**	
22) Naamans Road & **Society Drive**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)				
Eastbound Naamans Road – Left	A (9.7)	B (12.8)	A (9.7)	B (12.8)
Southbound Society Drive – Right	B (11.9)	C (15.8)	B (11.9)	C (15.8)
2021 without First State Crossing (Case 2)				
Eastbound Naamans Road – Left	A (10.0)	B (13.7)	B (10.0)	B (13.8)
Southbound Society Drive – Right	B (12.4)	C (17.0)	B (12.4)	C (17.1)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)				
Eastbound Naamans Road – Left	B (10.0)	B (14.3)	B (10.1)	B (14.4)
Southbound Society Drive – Right	B (12.5)	C (17.7)	B (12.5)	C (17.9)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)				
Eastbound Naamans Road – Left	B (10.0)	B (14.3)	B (10.1)	B (14.4)
Southbound Society Drive – Right	B (12.5)	C (17.7)	B (12.5)	C (17.9)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)				
Eastbound Naamans Road – Left	B (10.3)	C (16.5)	B (10.4)	C (16.6)
Southbound Society Drive – Right	B (12.9)	C (20.4)	B (12.9)	C (20.6)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)				
Eastbound Naamans Road – Left	B (10.4)	C (16.5)	B (10.4)	C (16.6)
Southbound Society Drive – Right	B (13.0)	C (20.5)	B (13.0)	C (20.6)
2030 without First State Crossing (Case 5)				
Eastbound Naamans Road – Left	B (10.2)	B (14.4)	B (10.2)	B (14.5)
Southbound Society Drive – Right	B (12.7)	C (17.7)	B (12.7)	C (17.9)

[42] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 24 (continued)
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection[43] **One-Way Stop Control**	**LOS per TIS**		**LOS per McCormick Taylor**	
22) Naamans Road & **Society Drive**	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)				
Eastbound Naamans Road – Left	B (10.7)	C (17.4)	B (10.7)	C (17.6)
Southbound Society Drive – Right	B (13.4)	C (21.5)	B (13.4)	C (21.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)				
Eastbound Naamans Road – Left	B (10.7)	C (17.4)	B (10.8)	C (17.6)
Southbound Society Drive – Right	B (13.5)	C (21.6)	B (13.5)	C (21.7)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)				
Eastbound Naamans Road – Left	B (10.7)	C (17.4)	B (10.7)	C (17.6)
Southbound Society Drive – Right	B (13.4)	C (21.5)	B (13.4)	C (21.7)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)				
Eastbound Naamans Road – Left	B (10.7)	C (17.4)	B (10.8)	C (17.6)
Southbound Society Drive – Right	B (13.5)	C (21.6)	B (13.5)	C (21.7)

[43] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.

Table 25
Peak Hour Levels of Service (LOS)
Based on First State Crossing Traffic Impact Study - Updated August 2019
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection[44]	**LOS per TIS**		**LOS per McCormick Taylor**	
23) Naamans Road & Carpenter Station Road	Weekday AM	Weekday PM	Weekday AM	Weekday PM
2018 Existing (Case 1)	C (27.0)	D (36.6)	D (40.5)	D (45.3)
2021 without First State Crossing (Case 2)	C (30.8)	D (37.6)	D (45.3)	D (47.6)
2021 with First State Crossing – Phase 1, with Spine Road (Case 3a)	C (31.6)	D (37.8)	D (44.5)	D (48.0)
2021 with First State Crossing – Phase 1, without Spine Road (Case 3b)	C (31.6)	D (37.8)	D (44.5)	D (48.0)
2025 with First State Crossing – Phase 2, with Spine Road (Case 4a)	D (35.2)	D (39.9)	D (49.4)	D (53.0)
2025 with First State Crossing – Phase 2, without Spine Road (Case 4b)	D (36.1)	D (39.9)	D (50.6)	D (53.0)
2030 without First State Crossing (Case 5)	C (31.4)	D (39.0)	D (44.3)	D (50.0)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way In (Case 6a)	D (44.2)	D (41.3)	D (47.9)	D (50.5)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way In (Case 6b)	D (36.9)	D (41.4)	D (48.9)	D (50.5)
2030 with First State Crossing – Full Buildout, with Spine Road, One-Way Out (Case 6c)	D (44.2)	D (41.3)	D (47.9)	D (50.5)
2030 with First State Crossing – Full Buildout, without Spine Road, One-Way Out (Case 6d)	D (36.9)	D (41.4)	D (48.9)	D (50.5)

[44] For both unsignalized and signalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, LOS analysis results are given for only the overall intersection delay.