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

February 20, 2025

Ms. Nicole R. Elsier, P.E., PTOE
McMahon, a Bowman Company
835 Springdale Drive, Suite 200
Exton, PA 19341

Dear Ms. Elsier,

The enclosed Traffic Impact Study (TIS) review letter for the **School Bell Commons** (Tax Parcel: 1002800036) residential development has been completed under the responsible charge of a registered professional engineer whose firm is authorized to work in the State of Delaware. They have found the TIS to conform to DelDOT's Development Coordination Manual and other accepted practices and procedures for such studies. DelDOT accepts this letter and concurs with the recommendations. If you have any questions concerning this letter or the enclosed review letter, please contact me at Annamaria.Furmato@delaware.gov.

Sincerely,

Annamaria Furmato
TIS Group Project Engineer

AF:km
Enclosures
cc with enclosures: Robert P. Allen Jr, School Bell Development, LLC
Scott Lobdell, First State Engineering
Braden Garrison, McMahon, a Bowman Company
David L. Edgell, Office of State Planning Coordination
Antoni Sekowski, New Castle County Department of Land Use
Bradford Shockley, New Castle County Department of Land Use
Owen C. Robatino, New Castle County Department of Land Use
Mir Wahed, Johnson, Mirmiran, & Thompson, Inc.
Joanne M. Arellano, Johnson, Mirmiran, & Thompson, Inc.
DelDOT Distribution

DelDOT

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Mark Luszcz, Chief Engineer, Transportation Solutions (DOTS)
Brad Eaby, Deputy Attorney General, DOTS
Matthew Vincent, Chief Project Development North, DOTS
Peter Haag, Chief Traffic Engineer, DOTS
Wendy Carpenter, Traffic Calming & Subdivision Relations Manager, Traffic, DOTS
Sean Humphrey, Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, M&O
Nathan Draper, Canal District Public Works Engineer, M&O
Jared Kauffman, Service Development Planner, DTC
Tremica Cherry, Service Development Planner, DTC
Pamela Steinebach, Director, Planning
Anthony Aglio, Planning Supervisor, Active Transportation & Community Connections, Planning
Steve Bayer, Planning Supervisor, Statewide & Regional Planning, Planning
Anson Gock, Planner, Statewide & Regional Planning, Planning
Todd Sammons, Assistant Director, Development Coordination, Planning,
Wendy Polasko, Subdivision Engineer, Development Coordination, Planning
Randhir Sharma, New Castle Review Coordinator, Development Coordination, Planning
Ryan Schroder, New Castle Review Engineer, Development Coordination, Planning
Sireen Muhtaseb, TIS Engineer, Development Coordination, Planning
Ben Fisher, TIS Review Engineer, Development Coordination, Planning
Tijah Jones, TIS Review Engineer, Development Coordination, Planning

February 20, 2025

Ms. Sireen Muhtaseb, P.E.
TIS Group Manager
Delaware Department of Transportation
Development Coordination, Division of Planning
800 Bay Road
Dover, DE 19901

RE: Agreement No: 2138S
TIS Support Services – T202369005
Task Name: Task 1-1 School Bell Commons
JMT No.: 24-01365

Dear Ms. Muhtaseb:

Johnson, Mirmiran, and Thompson (JMT) has completed a review of the Traffic Impact Study (TIS) for the School Bell Commons development which was prepared by Bowman Consulting Group, Ltd. dated December 2, 2024. This review was assigned as Task Number 1-1. The report is prepared in a manner generally consistent with DelDOT's *Development Coordination Manual* and other Department standards.

The TIS evaluates the impacts of a proposed residential development in New Castle County, Delaware. The proposed development would be comprised of 232 single family senior adult housing on a 48.9-acre parcel (Tax Parcel: 10-028.00-036). The proposed number of single family senior adult housing units has been revised since the April 3, 2024 DelDOT Scoping Meeting Memorandum and DelDOT acknowledged this modification in the September 25, 2024 Preliminary TIS review letter.

The land is located on the east side of School Bell Road (New Castle Road 344), approximately 740 feet north of the intersection of School Bell Road and Jamestowne Drive, in New Castle County. The land is currently zoned as ST (Suburban Transition), and the developer does not plan to rezone the land.

One full access point is proposed on School Bell Road. Construction is anticipated to be complete in 2030.

Relevant and On-Going Projects and Studies

DelDOT has relevant and on-going improvement projects in the vicinity of the study area. The *SR 1 Widening, Road A to US 40* (DelDOT Contract No. T202011001) project, which was originally part of the *SR1 Widening, SR273 to the Roth Bridge* project (DelDOT Contract No. T200511001), proposes to identify and prioritize cost-effective short, mid, and long-term transportation infrastructure improvements to reduce congestion, reduce travel times, and improve safety, all while minimizing environmental impacts. This project is currently in the design and planning phase, with several public workshops already being held. The improvements as part of the project do not include the proposed site frontage and are for locations west of the TIS study area. At the

January 2022 public workshop, a preferred alternative depicting a single point urban interchange (SPUI) at the Delaware Route 1 and Delaware Route 273 interchange was presented. Additionally, a new Delaware Route 1 ramp connection at the Delaware Route 7 and Newtown Road intersection is proposed which would reduce the demand of vehicles utilizing Delaware Route 273 to and from Delaware Route 1. Construction dates have not yet been determined at this stage. More information regarding the project can be found at the following website:
https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202011001

The *Hazard Elimination Program (HEP),* formally known as the *Highway Safety Improvement Program (HSIP)*, identifies high crash locations and makes operational improvements to address safety concerns. Within the project area, the intersection of Christiana Road (Delaware Route 273) and Bear-Christiana Road (Delaware Route 7) approximately 0.23 miles north of School Bell Road is included in the 2020 HEP as Task I Site S-1. The preliminary recommendations as part of Task I Site S-1 include the remedial improvements of trimming the tree branches along southbound Bear-Christiana Road to increase the visibility of the signal heads. Additionally, the long-term improvements include consideration of constructing a second northbound Bear-Christiana Road right turn lane, signalizing the northbound right turns, and providing an overlap signal phase. Additionally, the study for Task I Site S-1 acknowledges that the improvements recommended as part of the *SR 1 Widening, Road A to US 40* project, specifically the improvements at the Delaware Route 1 and the Delaware Route 273 interchange as well as the construction of the Newtown Road ramps on Delaware Route 7 is expected to significantly reduce the demand of traffic utilizing Delaware Route 273 to and from Delaware Route 1. More general information regarding HEP/HSIP projects can be found in the following State DOT document:
https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-04/HSIP%28Delaware%29%202023%20Report.pdf

Summary of Analysis Results

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

The New Castle County Level of Service (LOS) Standards as stated in Section 40.11.210 of the Unified Development Code (UDC) apply to all signalized, all-way-stop, and roundabout intersections. Based on an evaluation of those intersections, one of them (Intersection number 8) will require the implementation of physical roadway and/or traffic control improvements per both DelDOT and UDC criteria.

Additionally, separate from the UDC but based on the LOS evaluation criteria as stated in DelDOT's Development Coordination Manual, none of the unsignalized study intersections exhibit LOS deficiencies.

The following table summarizes the study intersection identified to have LOS deficiencies based on the results from the TIS:

Intersection	LOS Deficiencies Occur		Case
	AM	PM	
8. Bear-Christiana Road (Delaware Route 7) / Christiana Road (DE Route 273)	-	X	Case 1 – 2024 Existing
	X	X	Case 2 – 2030 without Development
	X	X	Case 3 – 2030 with development

8. Bear-Christiana Road (Delaware Route 7) / Christiana Road (Delaware Route 273) (See Table 9, Page 27, Development Improvement #5)

The Bear-Christiana Road (Delaware Route 7) intersection with Christiana Road (Delaware Route 273) exhibits LOS deficiencies during the PM peak hour under existing conditions and during the AM and PM peak hours under future conditions, with or without the proposed development. Under Case 3 conditions, the signalized intersection would operate at LOS F during the PM peak hour with approximately 208 seconds of delay per vehicle and a calculated 95th percentile queue length along the westbound Christiana Road left turn movement of approximately 1,410 feet. The existing storage length along the westbound Christiana Road left turn movement is approximately 330 feet and would not accommodate the projected future queue length.

The deficiencies at the Bear-Christiana Road intersection with Christiana Road could be mitigated by modifying the lane configurations along each approach to the intersection. Specifically, the eastbound Christiana Road approach would provide one left turn lane, three through lanes, and one right turn lane, the westbound Christiana Road approach would provide three left turn lanes, two through lanes, and one right turn lane, the northbound Bear-Christiana Road approach would provide two left turn lanes, one through lane, and two right turn lanes, and the southbound Main Street approach would provide two left turn lanes, two through lanes, and one right turn lane. With these modifications, the signalized intersection would operate at LOS D during the PM peak hour with approximately 52 seconds of delay per vehicle and a calculated 95th percentile queue length along the westbound Christiana Road left turn movement of approximately 485 feet.

The improvements recommended as part of the *SR 1 Widening, Road A to US 40* project (DelDOT Contract No. T202011001), include a single point urban interchange (SPUI) at the Delaware Route 1 and Delaware Route 273 interchange and a new Delaware Route 1 ramp connection at the Delaware Route 7 and Newtown Road intersection. With these improvements, it is expected that the demand of vehicles utilizing the Bear-Christiana Road intersection with Christiana Road to access the Delaware Route 1 / Delaware Route 273 interchange would reduce. As such, we do not recommend the developer implement improvements at this intersection and it is recommended that the developer make an equitable contribution to the *SR 1 Widening, Road A to US 40* Project.

1. Site Entrance/School Bell Road (New Castle Road 344) (See Table 2, Page 20, Development Improvement #2 & #6f)

The unsignalized Site Entrance intersection with School Bell Road does not exhibit LOS deficiencies under future conditions with the proposed expansion. However, DelDOT has received speed related concerns along School Bell Road.

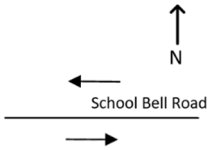
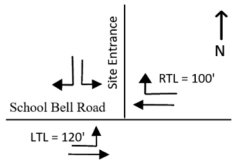
DelDOT evaluated the intersection as two-way stop controlled with auxiliary turn lanes. The developer is proposing to install separate right turn and left turn lanes along School Bell Road. With two-way stop control, the provision of a raised concrete island crossing treatment would provide traffic calming and discourage speeding. Therefore, it is recommended to have the Site Entrance intersection be two-way stop controlled with turn lanes and a raised concrete island. Pedestrian crossings along School Bell Road should be evaluated per NCHRP Report 562 methodology, and the proper treatment should be installed.

Development Improvements

Should New Castle County approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan, unless a Design Deviation is requested and approved by the Department. All applicable agreements (i.e., letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development. The following items should be implemented at the same time as site construction once all agency approvals and permits are secured and completed in accordance with DelDOT's Standards and Specifications.

1. The developer shall improve the State-maintained roads on which they front (School Bell Road), within the limits of their frontage. The improvements shall include both directions of travel, regardless of whether the developer's lands are on one or both sides of the road. "Frontage" means the length along the state right-of-way of a single property tract where an entrance is proposed or required. If a single property tract has frontage along multiple roadways, any segment of roadway including an entrance shall be improved to meet DelDOT's Functional Classification criteria as found in Section 1.1 of the Development Coordination Manual and elsewhere therein, and/or improvements established in the Traffic Operational Analysis and/or Traffic Impact Study. "Secondary Frontage" means the length along the state right-of-way of a single property tract where no entrance is proposed or required. The segment of roadway may be upgraded by improving the pavement condition of the existing roadway width. The Pavement Management Section and Subdivision Section will determine the requirements to improve the pavement condition.

2. The developer should construct an unsignalized full access Site Entrance along School Bell Road. The intersection should be designed with a raised concrete island along School Bell Road and be consistent with the lane configurations indicated in the table below:

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

Based on DelDOT's *Development Coordination Manual*, the recommended minimum storage length (excluding taper) of the westbound right turn lane is 100 feet and the eastbound left turn lane is 120 feet. The projected queues from the traffic analysis can be accommodated within the recommended storage lengths.

3. The developer should obtain a cross access easement to the adjacent property to the east (Tax Parcel: 10-028.00-055).

4. An interconnection to the Wedgewood subdivision to the east via Dutton Drive and Golden Drive should be provided. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the exact locations of the interconnections.

5. The developer should provide DelDOT an equitable cost contribution towards the improvements proposed at the study intersection of Bear-Christiana Road with Christiana Road as part of the *SR 1 Widening, Road A to US 40* Project (DelDOT Contract No. T202011001). The cost contribution is $52,180.00.

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

    a. The existing sidewalk along the School Bell Road site frontage should be verified on if it meets current compliance including providing a minimum width of five-feet. The developer should coordinate with DelDOT's Development Coordination Section during the plan review process to identify the location of repairs or replacement of sidewalk.

    b. Internal connections from the frontage sidewalk into the site are required.

c. ADA-compliant curb ramps and marked crosswalks should be provided along the site entrance.

d. Minimum five-foot wide bicycle lanes should be incorporated along the School Bell Road site frontage.

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

f. At the Site Entrance and School Bell Road intersection, a two-stage pedestrian crossing that includes a raised concrete island to minimize pedestrian delay and exposure while crossing School Bell Road should be provided. A NCHRP 562 analysis should be completed to determine the type of treatment and the pedestrian volume should be assumed to be met (i.e. 20 peds/hr.).

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

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

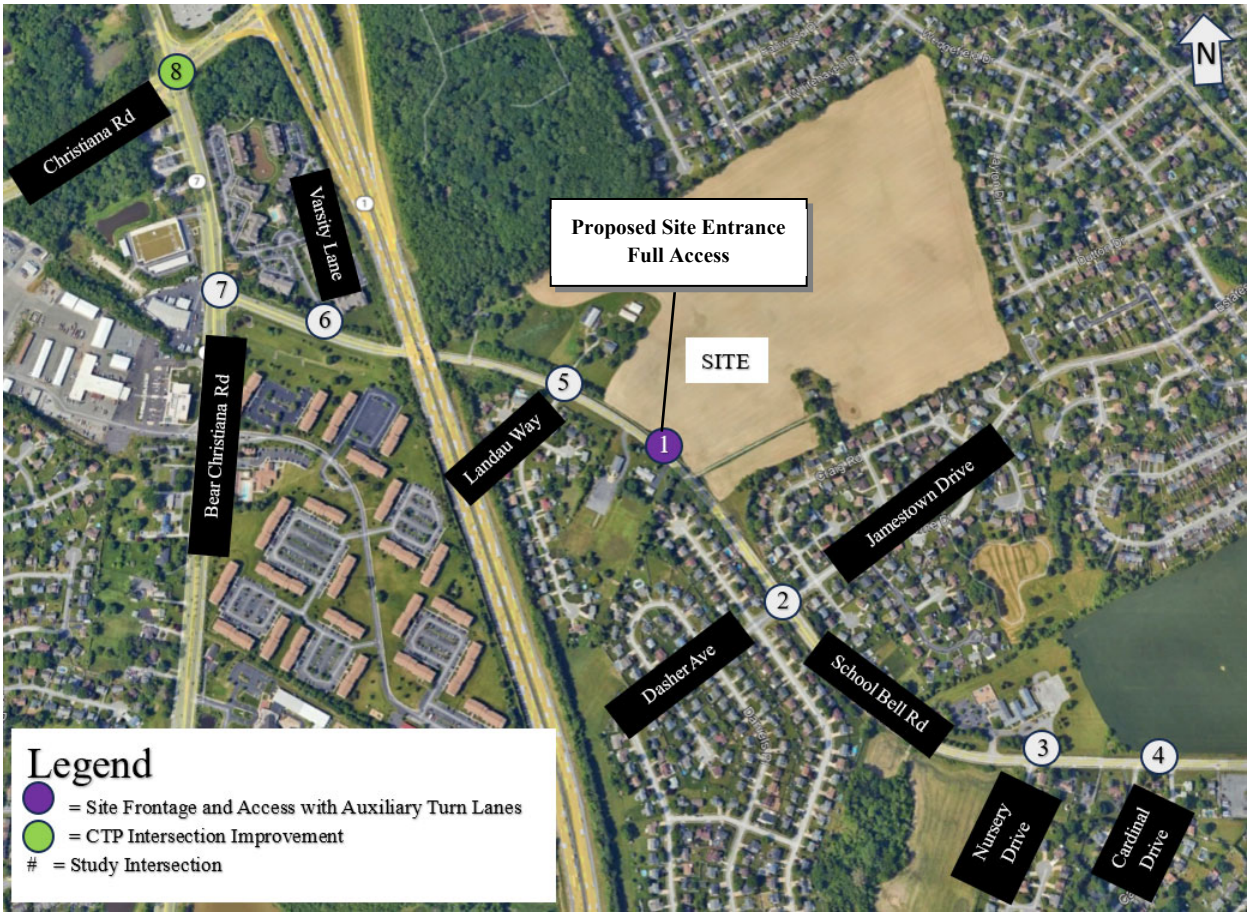
Additional details on our review of the TIS are attached. Please contact me at (302) 266-9600 if you have any questions concerning this review.

Sincerely,
Johnson, Mirmiran, and Thompson, Inc.

Joanne M. Arellano, P.E., PTOE

cc: Annamaria Furmato, EIT
Mir Wahed, P.E., PTOE
Hojjat Barati, EIT
Enclosure

Recommendations Map



General Information

Report date: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.
Prepared for: School Bell Development, LLC
Tax parcel: 10-028.00-036
Generally consistent with DelDOT's Development Coordination Manual (DCM): Yes

Project Description and Background

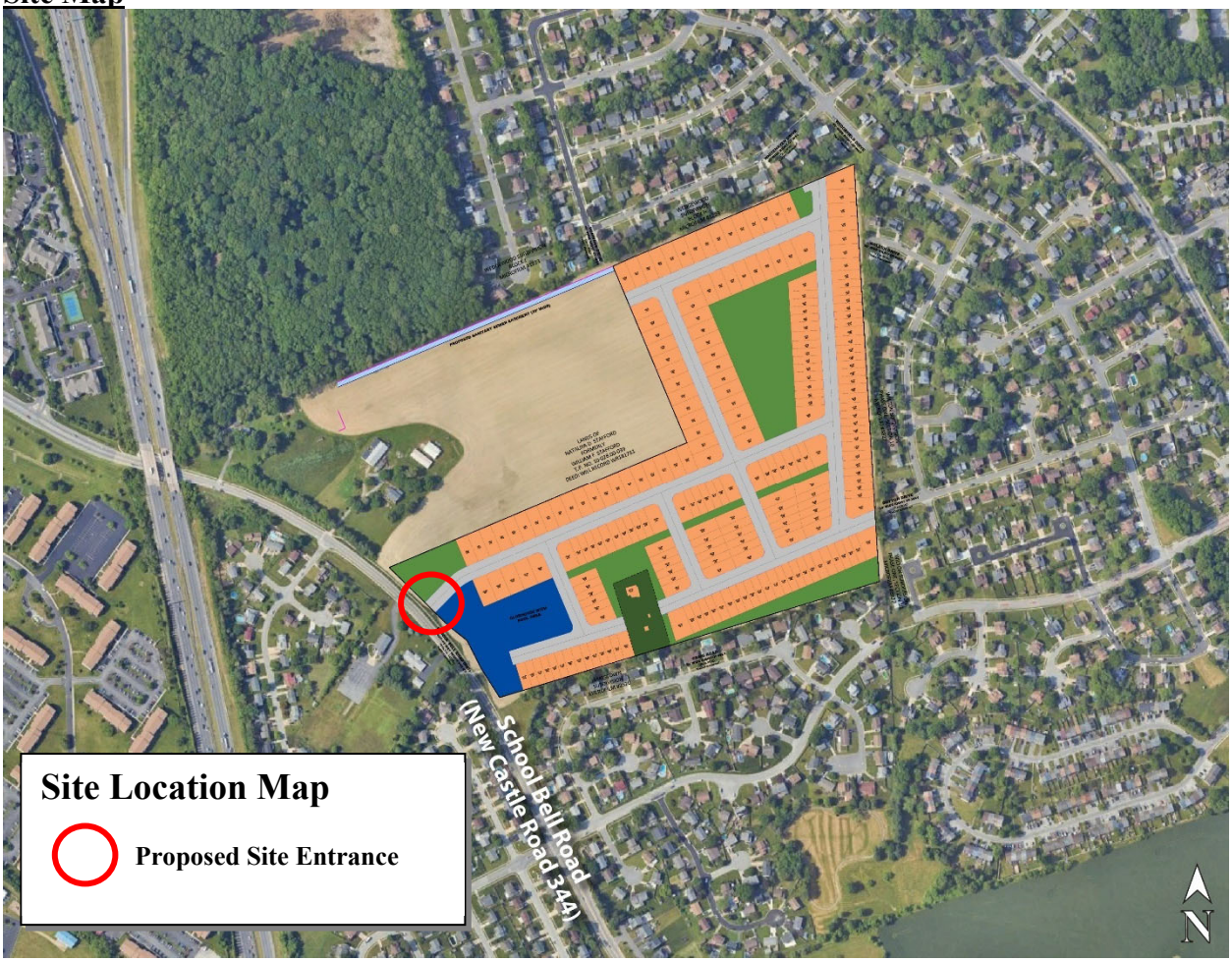
Description: The proposed development consists of 232 single-family senior adult houses. The proposed number of single family senior adult housing units has been revised since the April 3, 2024 DelDOT Scoping Meeting Memorandum and DelDOT acknowledged this modification in the September 25, 2024 Preliminary TIS review letter.
Location: The site is located on the north side of School Bell Road (New Castle Road 344), approximately 740 feet west of the intersection of School Bell Road and Jamestowne Drive in New Castle County, Delaware.
Amount of land to be developed: An approximately 48.9-acre parcel.
Land use approval(s) needed: Entrance Plan.
Proposed completion date: 2030.
Proposed access locations: One full access point is proposed on School Bell Road between Landau Way and Jamestowne Drive.

Daily traffic volumes:

- 2023 Average Annual Daily Traffic (AADT) on School Bell Road (New Castle Road 344): 3,950 vehicles per day.

*AADT is sourced from DelDOT Traffic Summary.

Site Map



**Graphic is an approximation based on Figure 2 contained within the December 2, 2024 Final Traffic Impact Study for School Bell Commons prepared by Bowman Consulting Group, Ltd.*

Relevant and On-going Projects

DelDOT has relevant and on-going improvement projects in the vicinity of the study area. The *SR 1 Widening, Road A to US 40* (DelDOT Contract No. T202011001) project, which was originally part of the *SR1 Widening, SR273 to the Roth Bridge* project (DelDOT Contract No. T200511001), proposes to identify and prioritize cost-effective short, mid, and long-term transportation infrastructure improvements to reduce congestion, reduce travel times, and improve safety, all while minimizing environmental impacts. This project is currently in the design and planning phase, with several public workshops already being held. The improvements as part of the project do not include the proposed site frontage and are for locations west of the TIS study area. At the January 2022 public workshop, a preferred alternative depicting a single point urban interchange (SPUI) at the Delaware Route 1 and Delaware Route 273 interchange was presented. Additionally, a new Delaware Route 1 ramp connection at the Delaware Route 7 and Newtown Road intersection is proposed which would reduce the demand of vehicles utilizing Delaware Route 273 to and from Delaware Route 1. Construction dates have not yet been determined at this stage. More information regarding the project can be found at the following website:

https://deldot.gov/projects/index.shtml?dc=details&projectNumber=T202011001

The *Hazard Elimination Program (HEP),* formally known as the *Highway Safety Improvement Program (HSIP)*, identifies high crash locations and makes operational improvements to address safety concerns. Within the project area, the intersection of Christiana Road (Delaware Route 273) and Bear-Christiana Road (Delaware Route 7) approximately 0.23 miles north of School Bell Road is included in the 2020 HEP as Task I Site S-1. The preliminary recommendations as part of Task I Site S-1 include the remedial improvements of trimming the tree branches along southbound Bear-Christiana Road to increase the visibility of the signal heads. Additionally, the long-term improvements include consideration of constructing a second northbound Bear-Christiana Road right turn lane, signalizing the northbound right turns, and providing an overlap signal phase. Additionally, the study for Task I Site S-1 acknowledges that the improvements recommended as part of the *SR 1 Widening, Road A to US 40* project, specifically the improvements at the Delaware Route 1 and the Delaware Route 273 interchange as well as the construction of the Newtown Road ramps on Delaware Route 7 is expected to significantly reduce the demand of traffic utilizing Delaware Route 273 to and from Delaware Route 1. More general information regarding HEP/HSIP projects can be found in the following State DOT document:
https://highways.dot.gov/sites/fhwa.dot.gov/files/2024-04/HSIP%28Delaware%29%202023%20Report.pdf

Livable Delaware

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

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
The proposed development is located within Investment Levels 1 and 2.

Investment Level 1
These areas are often municipalities, towns, or urban/urbanizing places in counties where density is generally higher than in surrounding areas. In Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote a variety of transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Overall, it is the state's intent to use its spending and management tools to maintain and enhance community character, and to promote well-designed and efficient new growth in Investment Level 1 Areas.

In Level 1 Areas, the state's first priority will be for preserving existing facilities and making safety improvements. Level 1 areas will also be the highest priority for context sensitive transportation system capacity enhancements, transit-system enhancements, ADA accessibility, and for closing gaps in the pedestrian system, including the Safe Routes to School projects. Investment Level 1 Areas are ideal locations for Transportation Improvement Districts as well as Complete Community Enterprise Districts. Further, Level 1 areas are the priority for planning projects and studies, bicycle facilities, signal-system enhancements, and the promotion of interconnectivity of neighborhoods and public facilities.

Investment Level 2
These areas can be composed of less developed areas within municipalities, rapidly growing areas in the counties that have or will have public water and wastewater services and utilities, areas that are generally adjacent to or near Investment Level 1 Areas, smaller towns and rural villages that should grow consistently with their historic character, and suburban areas with public water, wastewater, and utility services. They serve as transition areas between Level 1 and the state's more open, less populated areas. They generally contain a limited variety of housing types, predominantly detached single-family dwellings. In Investment Level 2 Areas, like Investment Level 1 Areas, state investments and policies should support and encourage a wide range of uses and densities, promote other transportation options, foster efficient use of existing public and private investments, and enhance community identity and integrity. Investments should encourage departure from the typical single-family-dwelling developments and promote a broader mix of housing types and commercial sites encouraging compact, mixed-use development where applicable. Overall, the State's intent is to use its spending and management tools to promote well-designed development in these areas. Such development provides for a variety of housing types, user-friendly transportation systems, essential open spaces and recreational facilities, other public facilities, and services to promote a sense of community.

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

Proposed development's compatibility with Livable Delaware:
The proposed development is located within Investment Levels 1 and 2. Level 1 prioritizes fostering healthy lifestyles through walkable neighborhoods, recreational opportunities, and infrastructure that supports aging or disabled individuals. These areas aim to enable residents to remain in their communities by providing accessible medical facilities, essential retail establishments, and personal support services. The proposed development consists of 232 senior adult houses-single families. Therefore, the proposed development is consistent with the 2020 update of *Livable Delaware Strategies for State Policies and Spending.*

Comprehensive Plan

(Source: New Castle County Comprehensive Plan, 2050)

New Castle County Comprehensive Plan:
Per the Current Zoning Map, the development is zoned as Suburban Transition. Per the Future Land Use Map, the development is zoned as Residential.

Proposed development's compatibility with New Castle County Comprehensive Plan:
The *New Castle County Comprehensive Plan* states that the future land use plan for Residential Districts encourages development in certain areas, including Suburban Transition District, where

appropriate infrastructure is present. The developer plans to build houses on the property. Therefore, the development is generally consistent with the *NCC Comprehensive Plan*.

Trip Generation

The trip generation for the proposed development was determined by using the comparable land use and rates/equations contained in the *Trip Generation, 11th Edition: An ITE Informational Report*, published by the Institute of Transportation Engineers (ITE) for ITE Land Use Code 251 (Senior Adult Housing – Single-Family).

Table 1
School Bell Commons Trip Generation

Land Use	ADT	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
232 Senior Adult Housing – Single-Family (ITE LUC 251)	1,212	24	50	74	52	33	85

Trip generation was reviewed by DelDOT as part of the Preliminary TIS (PTIS) submission.

Overview of TIS

Intersections examined:

1. Site Entrance / School Bell Road (New Castle Road 344)
2. School Bell Road / Dasher Avenue / Jamestowne Drive
3. School Bell Road / Nursery Drive
4. School Bell Road / Cardinal Avenue
5. School Bell Road / Landau Way
6. School Bell Road / Varsity Lane
7. School Bell Road / Bear – Christiana Road (Delaware Route 7)
8. Bear-Christiana Road / Christiana Road (Delaware Route 273)

Conditions examined:

1. Case 1 – 2024 existing
2. Case 2 – 2030 without development
3. Case 3 – 2030 with development

Committed developments considered:

1. **School Bell Crossing Shopping Center:** 41,800 sf retail, 69,769 sf supermarket; 5,600 sf convenience market with 16 fueling positions and 118,031 sf of self-storage space.
2. **School Bell Center; Phase 1:** 19,998 sf. retail building.
3. **Dasher Farm:** 48 single family detached houses.
4. **Dover Federal Credit Union:** 24,000 sf. shopping center.
5. **Soneji Property:** 20 multi-family (low-rise) apartments.

6. **504 (498) Pulaski Highway (Prices Toyota):** 19,600 sf. used car sales and auto repair building.
7. **Delaware Auto Court:** 71-room hotel and 19,125 sf. shopping center.
8. **Garret Woods:** 40 single family detached houses and 126 single family attached houses.
9. **Lincoln Center:** 181,470 sf. retail space, 10,000 sf. restaurant, 499,863 sf. office, 80,004 sf. hotel, 10,000 sf. daycare, 326 apartments (mid-rise), and 182 townhomes (mid-rise).
10. **Governors Square Commercial:** Proposed 96,936 sf. retail building.
11. **Newtown Square:** Proposed 8,900 sf. shopping center and 4,000 sf. office building. Built out 14,000 sf retail, 2,500 sf drive-in bank, and 6,200 sf restaurant.
12. **650 Churchmans Road:** 890,348 sf. warehouse
13. **Blue Diamond Park:** 2,123,271sf. of warehouse.

a. **Promenade at Christiana (Eagle Run Road north side, east of SR 273):** Total 443,300 sf retail.
b. **Christiana Town Center (SR 273 east side, south of Eagle Run Road):** 16,000 sf restaurant.
c. **Christiana Town Center II (behind Christiana Town Center):** Total 200,000 sf retail.
d. **Hudson Village III (SR 273 west side, across from Christiana Town Center):** 5,200 sf fast-food restaurant with drive-thru, and 7,300 sf restaurant.
e. **Walker Farm (SR 58 south side and SR 273 north side):** Total 837,600 sf warehouse.
f. **613 Pulaski Highway/Royal Farms (US 40 north side and School Bell Road south side):** 4,649 sf convenience store with 16 gas pumps.
g. **Delaware Business Systems (SR 37 west side):** 7,000 sf office building.
h. **201 Airport Road (SR 37 west side and Old Churchmans Road north side):** 8,500 sf office building.
i. **Hertrich of New Castle (US 13/40 east side & Quigley Boulevard south side):** 22,445 sf auto sales space.
j. **Sheridan Nissan (SR 273 south side, east of US 13/40 east side):** 3,600 sf auto sales space.
k. **Parkway Industrial Park (US 13/40 east side), south of Quigley Boulevard):** Unbuilt 21,600 sf warehouse.
l. **Christiana Care; Lisa Drive Logistics Center (Lisa Drive end):** Unbuilt 125,000 SF warehouse.
m. **Microtel Inn (US 13/40 east side), south of Lisa Drive):** Unbuilt 19,624 sf/48 room hotel.
n. **Coastal Midlantic (US 13/40 east side), south of Lisa Drive):** Unbuilt 19,800 sf self-storage buildings.
o. **NKS Distributors (SR 58 south side), across from Century Boulevard):** Unbuilt 31,019 sf industrial space.
p. **Word to the Bride Tabernacle Church (Old State Road east side and Llangollen Boulevard south side):** Unbuilt 2,736 sf church.
q. **Old State Road Hotel (Old State Road west side, across from Llangollen Boulevard):** Unbuilt 37,434 sf/80-room hotel.
r. **Churchmans Industrial Center; Lot 7 (Parkway Circle south side, west of Churchmans Road Extension):** Unbuilt 25,000 sf warehouse.
s. **Windsor Forest Addition (Edinburgh Drive west side, south of SR 273):** Unbuilt 18 low rise apartments.

t. **Wilmington Manor Fire Co. Addition (US 13/40, north of their junction)**: Unbuilt 16,432 sf addition to fire station.
u. **Highway Word of Faith Church and Daycare (SR 273 south side, east of SR 37):** 10,000 sf daycare and 9,775 sf church.
v. **Walmart Addition (US 40 north side and Wilton Boulevard east side):** Unbuilt 30,000 sf addition to the existing building.
w. **Faithful Friends Animal Shelter (SR 37 west side, south of SR 58):** Unbuilt 2,427 sf Phase II addition to existing building.
x. **Halko (SR 58 north side and King Avenue west side):** Unbuilt 28,550 sf warehouse.
y. **505 New Churchmans Road (SR 58 south side, west of SR 273):** Unbuilt 17,672 sf flex warehouse.
z. **New Castle Square Mall (SR 273 north side, west of SR 58):** Unbuilt 6,663 sf bank with drive-thru.
aa. **J&M Commercial Park, Lot 8 (J&M Drive east side, north of SR 58):** Unbuilt 7,150 sf warehouse building.
bb. **Nicholas & Joanne Tsaganos (US 13 west side, north of Bear Road):** Unbuilt 5,500 sf retail building.
cc. **758 Grantham Lane (Grantham Lane south side, west of SR 9):** 142,359 sf warehouse.
dd. **St. Elizabeth Ann Seton Church (SR 7 west side, across from Rivers End Drive):** Total 55.147 sf church.
ee. **J.P. Morgan (SR 7 east side, across from Newtown Road):** Total 338,395 sf office space.
ff. **111 South DuPont Highway Restaurant and Retail (US 13/40 west side and SR 273 south side):** Unbuilt 11,174 SF retail building

The committed development information contained within the TIS report supersedes the April 3, 2024, Scoping Meeting Memorandum.

Peak hours evaluated: Weekday morning and weekday evening peak hours.

Intersection Descriptions

1. **Site Entrance / School Bell Road (New Castle Road 344)**
   Type of Control: Proposed two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (School Bell Road) Existing one through lane. Proposed one left turn and one through lane.
   Westbound Approach: (School Bell Road) Existing one through lane. Proposed one through and one right turn lane.
   Southbound Approach: (Site Entrance) Proposed one left turn lane and one right turn lane.

2. **School Bell Road / Dasher Avenue / Jamestowne Drive**
   Type of Control: Two-way stop-controlled intersection.
   Eastbound Approach: (School Bell Road) Existing one left turn lane, one through lane, and one right turn lane.
   Westbound Approach: (School Bell Road) Existing one left turn lane, one through lane, and one right turn lane.

Northbound Approach: (Dasher Avenue) Existing one shared left turn/through/right turn lane, stop-controlled.
Southbound Approach: (Jamestowne Drive) Existing one shared left turn/through/right turn lane, stop-controlled.

3. **School Bell Road / Nursery Drive**
   Type of Control: Two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (School Bell Road) Existing one shared through/right turn lane.
   Westbound Approach: (School Bell Road) Existing one shared left turn/through lane.
   Northbound Approach: (Nursery Driveway) Existing one shared left turn/right turn lane, stop-controlled.

4. **School Bell Road / Cardinal Drive**
   Type of Control: Two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (School Bell Road) Existing one shared through/right turn lane.
   Westbound Approach: (School Bell Road) Existing one shared left turn/through lane.
   Northbound Approach: (Cardinal Drive) Existing one shared left turn/right turn lane, stop-controlled.

5. **School Bell Road / Landau Way**
   Type of Control: Two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (School Bell Road) Existing one through lane and one right turn lane.
   Westbound Approach: (School Bell Road) Existing one shared left turn/through lane.
   Northbound Approach: (Landau Way) Existing one shared left turn/right turn lane, stop-controlled.

   * A private driveway is located at the southbound leg of the intersection.

6. **School Bell Road / Varsity Lane**
   Type of Control: Two-way stop-controlled intersection (T-intersection).
   Eastbound Approach: (School Bell Road) Existing one left turn lane and one through lane.
   Westbound Approach: (School Bell Road) Existing one through lane and one yield-controlled channelized right turn lane.
   Southbound Approach: (Varsity Lane) Existing one left turn lane and one yield-controlled channelized right turn lane.

7. **School Bell Road / Bear-Christiana Road (Delaware Route 7)**
   Type of Control: Existing four-legged signalized intersection.
   Eastbound Approach: (Private Driveway) Existing one shared left turn/through/right turn lane.
   Westbound Approach: (School Bell Road) Existing one shared left turn/through lane and one right turn lane.
   Northbound Approach: (Delaware Route 7) Existing one left turn lane, two through lanes and one yield-controlled channelized right turn lane.

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

8. **Bear-Christiana Road (Delaware Route 7) / Christiana Road (Delaware Route 273)**
   Type of Control: Existing four-legged signalized intersection.
   Eastbound Approach: (Christiana Road, Delaware Route 273) Existing one left turn lane, two through lanes and one yield-controlled channelized right turn lane.
   Westbound Approach: (Christiana Road, Delaware Route 273) Existing two left turn lanes, two through lanes, and one free-movement channelized right turn lane.
   Northbound Approach: (Delaware Route 7) Existing two left turn lanes, one through lane, and one right turn lane.
   Southbound Approach: (Delaware Route 7) Existing one left turn lane, one shared left turn/through lane, one through lane, and one yield-controlled channelized right turn lane.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Per DelDOT Gateway, DART Routes 10, 54 and 64 run through the project area along Christiana Road and Bear Christiana Road, with a total of six bus stops.

Planned transit service: Per email correspondence from Jared Kauffman, DART Fixed-Route Planner, on January 9, 2025, DART does not have any comments.

Existing bicycle and pedestrian facilities: Per DelDOT's New Castle County Bicycle, several study roadways are considered bicycle routes. School Bell Road is categorized as a connector bicycle route. Christiana Road (Delaware Route 273) and Bear-Christiana Road (Delaware Route 7) are identified as regional bicycle routes. Bicycle lanes are present on northbound Delaware Route 7. At the Bear-Christiana Road and School Bell Road intersection, pedestrian crosswalks are present along northbound Bear-Christiana Road from School Bell Road to the Private Driveway, as well as along the West Crossover to School Bell Road. Additionally, crosswalks exist along southbound Delaware Route 7 from East Crossover to the Private Driveway. At the Bear-Christiana Road and Christiana Road intersection, pedestrian crosswalks are present along westbound Christiana Road crossing Delaware Route 7 from the northbound to southbound lanes. Additionally, there is a pedestrian crosswalk crossing the northbound Delaware Route 7 lanes near the northern side of the intersection. Pedestrian crosswalks are also present along the southern side of School Bell Road and at its intersections with Landau Way, Dasher Avenue/Jamestowne Drive, Cardinal Avenue, and Nursery Drive.

Planned bicycle and pedestrian facilities: Per email correspondence from Linda Osiecki, DelDOT's Bicycle Coordinator, on December 13, 2024, DelDOT has the following recommendations:

- The site is in state investment levels 1 and 2.
- There is an existing sidewalk along the east side of N344, where it will need to be verified if the side meets current compliance to include but not limited to slopes and

minimum width (5'). If not, it will need to be removed and replaced along the property frontage. Repairs or replacement for poor condition would also be needed.
- Provide a sidewalk on each side of the internal subdivision streets along with a connection to the sidewalk along N344.
- At this time Active Transportation & Community Connections (ATCC) has no bicycle/pedestrian improvement projects within the area of this project.
- All entrance, roadway and/or intersection improvements required shall incorporate bicycle and pedestrian facilities. Per the DCM, if a right turn lane is warranted, then a separate bike lane shall be incorporated along the right turn lane; if a left turn lane is required any roadway improvements shall include a shoulder matching the roadway functional classification or existing conditions (minimum 5-feet).
- There could be additional and/or revised comments once project is discussed at a pre-submittal meeting and/or plans are submitted for LONO/ENT review/approval.

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

- School Bell Road LTS: 3

Crash Evaluation

Per the crash data included in the TIS from January 11, 2021, to January 11, 2024, provided by the Delaware Department of Transportation (DelDOT), a total of 175 crashes were reported within the study area. Among these, 26 crashes were injury related, and 149 crashes were property damage only.

145 Crashes were reported at the Bear-Christiana Road and Christiana Road intersection, including 95 rear-end, 23 angle, 15 sideswipe (same direction), six not a collision between two vehicles, four head-on, one sideswipe (opposite direction), and one other.

26 Crashes were reported at the Bear-Christiana Road and School Bell Road intersection, including nine rear-end, nine angle, four not a collision between two vehicles, three head-on, and one sideswipe (same direction).

Three crashes were reported at the School Bell Road and Landau Way intersection, including one rear-end, one angle, and one not a collision between vehicles.

One rear-end crash was reported at the School Bell Road and Dasher Avenue/Jamestowne Drive intersection.

Previous Comments

All comments from the PTIS have been addressed in the Final TIS.

Sight Distance Evaluation

No sight distance constraints were noted at the proposed site entrance location per the field visit conducted on December 26, 2024.

General Synchro Analysis Comments

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

1) Both JMT and the TIS used HCM 7th edition within Synchro 12 traffic analysis software to complete the analysis.

2) Per DelDOT's *Development Coordination Manual*, JMT utilized the future intersection PHF of 0.80 for roadways with less than 500 vph, 0.88 for roadways between 500 and 1,000 vph, and 0.92 for roadways with more than 1,000 vph, or used the existing PHF if higher while the TIS utilized the existing PHF.

3) JMT and the TIS utilized the existing heavy vehicle percentage for each movement greater than 100 vph in the Case 1 - Existing analysis.

4) Per DelDOT's *Development Coordination Manual* and coordination with DelDOT Planning, JMT used a heavy vehicle percentage of 5% for each movement less than 100 vph along roadways in the analyses whereas the TIS utilized the existing heavy vehicle percentage.

5) JMT and the TIS assumed a heavy vehicle percentage of 3% for site traffic.

6) Per DelDOT's *Development Coordination Manual*, JMT used a heavy vehicle percentage of 3% for each movement greater than 100 vph in Case 2 and Case 3 future scenario analysis, unless the existing heavy vehicle percentage was greater than 3% and there was no significant increase of vehicles along that movement, in which case the existing heavy vehicle percentage was used for the analysis of future scenarios, whereas the TIS utilized existing heavy vehicle percentages.

7) Both JMT and the TIS utilized a Saturation Flow Rate of 1,900 vehicles per hour per lane for signalized analysis.

8) JMT and the TIS utilized the same PHF for every movement.

Table 2
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
1 - Site Entrance/School Bell Road (New Castle Road 344)[2]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3 – 2030 with Development				
Eastbound School Bell Road Left Turn	A (8.2)	A (8.4)	A (8.2)	A (8.4)
Southbound Site Entrance Left Turn	-	-	C (16.0)	C (20.7)
Southbound Site Entrance Right Turn	-	-	B (11.0)	B (11.2)
Southbound Site Entrance Approach	B (12.4)	B (13.8)	-	-

[1] For signalized and unsignalized analysis, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds.
[2] JMT and the TIS modeled the intersection as an unsignalized two-way stop-controlled intersection with one through lane and one left turn lane along the School Bell Road eastbound approach and one through lane and one right turn lane along the School Bell Road westbound approach. JMT utilized separate turn lanes for the southbound Site Entrance approach, while the TIS used the shared left turn/right turn lane. Besides, JMT used 0.88 as the PHF while the TIS used 0.92 as the PHF for site entrance.

Table 3
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
2 - School Bell Road/Dasher Avenue/Jamestowne Drive[3]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – 2024 Existing				
Eastbound School Bell Road Left Turn	A (7.7)	A (7.8)	A (7.6)	A (7.9)
Westbound School Bell Road Left Turn	A (7.9)	A (7.9)	A (7.8)	A (8.0)
Northbound Dasher Avenue Approach	B (12.6)	B (13.5)	B (12.5)	B (13.6)
Southbound Jamestowne Drive Approach	B (10.6)	B (10.7)	B (10.5)	B (10.8)
Case 2 – 2030 without Development				
Eastbound School Bell Road Left Turn	A (7.9)	A (8.2)	A (7.9)	A (8.3)
Westbound School Bell Road Left Turn	A (8.1)	A (8.2)	A (8.0)	A (8.3)
Northbound Dasher Avenue Approach	C (16.4)	C (21.1)	C (16.2)	C (21.4)
Southbound Jamestowne Drive Approach	B (11.7)	B (12.3)	B (11.6)	B (12.5)
Case 3 – 2030 with Development				
Eastbound School Bell Road Left Turn	A (7.9)	A (8.3)	A (7.9)	A (8.4)
Westbound School Bell Road Left Turn	A (8.1)	A (8.2)	A (8.0)	A (8.3)
Northbound Dasher Avenue Approach	C (16.8)	C (21.8)	C (16.7)	C (22.1)
Southbound Jamestowne Drive Approach	B (11.8)	B (12.6)	B (11.7)	B (12.7)

[3] JMT and the TIS analyzed the intersection as a two-way stop-controlled intersection with one left turn lane, one through lane, and one right turn lane along the eastbound and westbound School Bell Road approaches, and a shared left turn/through/right turn lane along the northbound Dasher Avenue and southbound Jamestowne Road approaches.

Table 4
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
3 - School Bell Road/Nursey Drive[4]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – 2024 Existing				
Westbound School Bell Road Left Turn	A (8.4)	A (8.1)	A (7.8)	A (7.8)
Northbound Nursery Drive Approach	B (10.7)	B (10.7)	B (10.7)	B (10.7)
Case 2 – 2030 without Development				
Westbound School Bell Road Left Turn	A (8.7)	A (8.4)	A (8.1)	A (8.1)
Northbound Nursery Drive Approach	B (11.8)	B (12.2)	B (11.9)	B (12.1)
Case 3 – 2030 with Development				
Westbound School Bell Road Left Turn	A (8.8)	A (8.5)	A (8.1)	A (8.1)
Northbound Nursery Drive Approach	B (12.0)	B (12.3)	B (12.1)	B (12.3)

[4] JMT and the TIS analyzed the intersection as a two-way stop-controlled intersection with a shared through/right turn lane along the eastbound School Bell Road approach, a shared left turn/through lane along the westbound School Bell Road approach, and a shared left turn/right turn lane along the northbound Nursery Drive approach.

Table 5
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
4 - School Bell Road/ Cardinal Drive[5]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – 2024 Existing				
Westbound School Bell Road Left Turn	A (7.8)	A (0.0)	A (7.8)	A (0.0)
Northbound Cardinal Drive Approach	B (11.2)	B (12.2)	B (11.3)	B (12.3)
Case 2 – 2030 without Development				
Westbound School Bell Road Left Turn	A (8.0)	A (0.0)	A (8.0)	A (0.0)
Northbound Cardinal Drive Approach	B (12.8)	C (15.1)	B (12.8)	C (15.3)
Case 3 – 2030 with Development				
Westbound School Bell Road Left Turn	A (8.0)	A (0.0)	A (8.1)	A (0.0)
Northbound Cardinal Drive Approach	B (13.1)	C (15.4)	B (13.1)	C (15.6)

[5] JMT and the TIS analyzed the intersection as a two-way stop-controlled intersection with a shared through/right turn lane along the eastbound School Bell Road approach, a shared left turn/through lane along the westbound School Bell Road approach, and a shared left turn/right turn lane along the northbound Cardinal Drive approach.

Table 6
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
5 - School Bell Road/Landau Way[6]	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – 2024 Existing				
Westbound School Bell Road Left Turn	A (8.1)	A (8.3)	A (7.8)	A (8.0)
Northbound Landau Way Approach	B (12.2)	B (14.2)	B (11.9)	B (14.1)
Case 2 – 2030 without Development				
Westbound School Bell Road Left Turn	A (8.3)	A (8.8)	A (8.0)	A (8.5)
Northbound Landau Way Approach	B (14.7)	C (20.4)	B (14.2)	C (20.2)
Case 3 – 2030 with Development				
Westbound School Bell Road Left Turn	A (8.4)	A (9.0)	A (8.1)	A (8.6)
Northbound Landau Way Approach	C (15.5)	C (22.3)	C (15.0)	C (22.0)

[6] JMT and the TIS analyzed the intersection as a two-way stop-controlled intersection with a shared through/left turn lane and one right turn lane along the eastbound School Bell Road approach, a shared left turn/through/right turn lane along the westbound School Bell Road approach, and a shared left turn/through/right turn lane along the northbound Landau Way and southbound Private Driveway approaches.

Table 7
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Unsignalized Intersection Two-Way Stop Control[1]	**LOS per TIS**		**LOS per JMT**	
6 - School Bell Road / Varsity Lane[7]	Weekday	Weekday	Weekday	Weekday
Case 1 – 2024 Existing				
Eastbound School Bell Road Left Turn	A (8.0)	A (7.9)	A (7.9)	A (7.9)
Southbound Varsity Lane Left Turn	B (12.8)	B (14.1)	B (12.6)	B (14.3)
Southbound Varsity Lane Right Turn	B (10.1)	A (9.9)	B (10.1)	A (10.0)
Case 2 – 2030 without Development				
Eastbound School Bell Road Left Turn	A (8.3)	A (8.3)	A (8.2)	A (8.4)
Southbound Varsity Lane Left Turn	C (15.5)	C (19.2)	C (15.2)	C (19.5)
Southbound Varsity Lane Right Turn	B (11.0)	B (11.0)	B (11.1)	A (11.1)
Case 3 – 2030 without Development				
Eastbound School Bell Road Left Turn	A (8.5)	A (8.4)	A (8.3)	A (8.5)
Southbound Varsity Lane Left Turn	C (16.4)	C (20.6)	C (16.1)	C (21.0)
Southbound Varsity Lane Right Turn	B (11.4)	B (11.2)	B (11.4)	B (11.3)

[7] JMT and the TIS analyzed the intersection as a two-way stop-controlled intersection with a left turn lane and a through lane along the eastbound School Bell Road approach, a through lane and a right turn lane along the westbound School Bell Road approach, and a separate left turn lane and a right turn lane along the southbound Varsity Lane approach. JMT modeled the westbound School Bell Road right turn lane as yield while the TIS modeled it as free.

Table 8
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
7 - School Bell Road/Bear-Christiana Road (DE Route 7)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – 2024 Existing[8, 9]	B (16.4)	B (13.0)	C (22.1)	B (13.2)
Case 1 – 2024 Existing *with signal optimization*[8, 9, *10*]	-	-	B (15.3)	B (12.9)
Case 2 – 2030 without Development *with signal optimization*[8, 9, 10, *11*]	C (28.5)	C (26.4)	C (23.1)	C (30.8)
Case 3 – 2030 with Development *with signal optimization*[8, 9, 10]	D (35.7)	C (29.2)	C (28.3)	C (33.2)

[8] JMT and the TIS analyzed the intersection as a signalized intersection with split phasing using a cycle length of 100 seconds in the AM and PM peak hours with the Bear-Christiana Road northbound and southbound left turns and U-turns controlled by a protected phase, with one left turn lane, two through lanes, and one right turn lane along the northbound and southbound Bear-Christiana Road approaches, and one shared left turn/through/right turn lane along the eastbound Driveway approach, and one shared left turn/through lane and one right turn lane along the westbound School Bell Road approach. The TIS switched the phase timings for eastbound and westbound splits during the AM and PM peak hours for existing case 1. The signal is along a coordinated corridor.
[9] JMT and the TIS added the U-turn volumes to the left turns as the HCM 7th edition cannot analyze U-turning movements.
[10] Signal optimization scenario includes optimizing green split times while maintaining the existing cycle length.
[11] The TIS did not include any U-turn movements for northbound Bear-Christiana Road approach in case 2 PM peak hour, while JMT did.

Table 9
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
8 - Bear-Christiana Road/Christiana Road (DE Route 273)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 1 – 2024 Existing[9, 12, 13, 14]	D (44.0)	E (60.5)	F (86.6)	F (92.4)
Eastbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	5’	13’
Westbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	238’	710’
Northbound Bear-Christiana Road Right Turn 95th Percentile Queue Length	-	-	1490’	693’
Southbound Bear-Christiana Road Left Turn 95th Percentile Queue Length	-	-	73’	220’
Case 1 – 2024 Existing *with signal optimization*[9, 10, 12, 13, 14]	-	-	D (49.1)	F (88.3)
Eastbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	-	13’
Westbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	-	675’
Northbound Bear-Christiana Road Right Turn 95th Percentile Queue Length	-	-	-	680’
Southbound Bear-Christiana Road Through 95th Percentile Queue Length	-	-	-	430’

[12] JMT analyzed the intersection as a signalized intersection with split phasing using a cycle length of 150 seconds in the AM and PM peak hours with the Christiana Road eastbound and westbound left turns and U-turns controlled by a protected phase, with one left turn lane, two through lanes, and one right turn lane along eastbound Christiana Road approach, two left turn lanes, two through lanes, and one right turn lane along the westbound Christiana Road approach, two left turn lanes, one through lane, and one right turn lane along the northbound Bear-Christiana Road approach, and one left turn lane, one shared left turn/through lane, one through lane, and one right turn lane along the southbound Main Street approach. The signal is along a coordinated corridor.
[13] JMT used the traffic counts consistent with the volume diagrams dated January 23, 2024, however the TIS used the traffic counts dated April 23, 2024. Therefore, the TIS used different volumes and heavy vehicle percentages.
[14] The TIS modeled the eastbound Christiana Road right turn, westbound Christiana Road right turn, and southbound Main Street right turn movements as unsignalized. However, JMT modeled the eastbound Christiana Road right turn and southbound Main Street right turn as yield-controlled and westbound Christiana Road right turn as unsignalized.

Table 9 (Continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
8 - Bear-Christiana Road/Christiana Road (DE Route 273)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 2 – 2030 without Development *with signal optimization*[9, 10, 12, 13, 14, 15]	F (148.7)	F (211.9)	F (89.4)	F (199.8)
Eastbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	5’	23’
Eastbound Christiana Road Through 95th Percentile Queue Length	-	-	838’	1945’
Westbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	580’	1325’
Northbound Bear-Christiana Road Right Turn 95th Percentile Queue Length	-	-	1060’	1525’
Southbound Bear-Christiana Road Through 95th Percentile Queue Length	-	-	220’	703’
Case 3 – 2030 with Development *with signal optimization*[9, 10, 12, 15]	F (153.5)	F (216.2)	F (91.3)	F (208.2)
Eastbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	5’	23’
Eastbound Christiana Road Through 95th Percentile Queue Length	-	-	838’	1945’
Westbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	600’	1408’
Northbound Bear-Christiana Road Right Turn 95th Percentile Queue Length	-	-	1100’	1485’
Southbound Bear-Christiana Road Through 95th Percentile Queue Length	-	-	223’	753’

[15] The TIS did not include any U-turn movements in Cases 2 and 3 AM and PM peak hours, while JMT did.

Table 9 (Continued)
Peak Hour Levels of Service (LOS)
Based on Traffic Impact Study for School Bell Commons
Report Dated: December 2, 2024
Prepared by: Bowman Consulting Group, Ltd.

Signalized Intersection[1]	**LOS per TIS**		**LOS per JMT**	
8 - Bear-Christiana Road/Christiana Road (DE Route 273)	Weekday AM	Weekday PM	Weekday AM	Weekday PM
Case 3– 2030 with Development *with Improvement* [9, 10, 16]	-	-	D (50.6)	D (52.4)
Eastbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	5’	23’
Westbound Christiana Road Left Turn 95th Percentile Queue Length	-	-	268’	485’
Northbound Bear-Christiana Road Left Turn 95th Percentile Queue Length	-	-	540’	590’
Southbound Bear-Christiana Road Left Turn 95th Percentile Queue Length	-	-	50’	160’
Southbound Bear-Christiana Road Through 95th Percentile Queue Length	-	-	148’	443’

[16] With Improvement, JMT analyzed the intersection as a signalized intersection with split phasing using a cycle length of 150 seconds in the AM and PM peak hours with the Christiana Road eastbound and westbound left turns and U-turns controlled by a protected phase, with one left turn lane, three through lanes, and one right turn lane along the eastbound Christiana Road approach, three left turn lanes, two through lanes, and one right turn lane along the westbound Christiana Road approach, two left turn lanes, one through lane, and two right turn lanes along the northbound Bear-Christiana Road approach, and two left turn lanes, two through lanes, and one right turn lane along the southbound Main Street approach. The signal is along a coordinated corridor.