



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

NICOLE MAJESKI
SECRETARY

December 30, 2022

Mr. Eric Ostimchuk, PE
Traffic Planning and Design, Inc.
111 E. Main Street, Suite A
Elkton, MD 21921

Dear Mr. Kramer:

The enclosed Traffic Impact Study (TIS) review letter for the proposed **Astro Plaza** (Tax Parcels: 08-055.10-094, 08-055.10-191, 08-055.10-096, 08-055.10-097, 08-055.10-098, 08-055.10-099, and 08-055.10-100) commercial 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) 760-2124.

Sincerely,

Claudy Joinville
Project Engineer

CJ:km
Enclosures
cc with enclosures:

Mr. Frank J. Vassallo IV, Astro Center, LLC
Mr. Mike Hoffman, Tarabicos, Grosso, & Hoffman, LLP
Mr. Colm DeAscanis, CDA Engineering, Inc.
Mr. Eric Kramer, Traffic Planning & Design (TPD)
Mr. David L. Edgell, Office of State Planning Coordination
Mr. George Haggerty, New Castle County Department of Land Use
Mr. Bradford Shockley, New Castle County Department of Land Use
Mr. Owen C. Robatino, New Castle County Department of Land Use
Mr. Andy Parker, McCormick & Taylor, Inc.
Mr. Tucker Smith, McCormick & Taylor, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Deputy Secretary, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszcz, Deputy Director, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Matthew Vincent, Chief of Project Development North, DOTS
Mark Galipo, Traffic Engineer, Traffic, DOTS
Brian Schilling, Canal District Engineer, Canal District
Jared Kauffmann, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Todd Sammons, Assistant Director, Development Coordination
Wendy Polasko, Subdivision Engineer, Development Coordination
John Pietrobono, New Castle Review Coordinator, Development Coordination
Sireen Muhtaseb, TIS Group Manager, Development Coordination
Annamaria Furmato, Project Engineer, Development Coordination
John Andrescavage, Subdivision Manager, Development Coordination
Thomas Gagnon, Subdivision Manager, Development Coordination
Philip Lindsey, Project Engineer, Development Coordination



December 27, 2022

Mr. Claudy Joinville
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1946F
Traffic Impact Study Services
Task No. 3A Subtask 10 – Astro Plaza

Dear Mr. Joinville:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Astro Plaza Redevelopment prepared by Traffic Planning and Design, Inc. (TPD), dated May 2, 2022. TPD prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Astro Plaza redevelopment, proposed on the northwest corner of the intersection of Capitol Trail (DE Route 2) and Meadowood Drive, in New Castle County. The proposed Astro Plaza redevelopment would consist of a 40,350 square-foot shopping center, a 3,400 square-foot fast-food restaurant with drive-through window, and a 5,620 square-foot convenience store with gas pumps. The proposed redevelopment would replace a 4,980 square-foot office, a 54,460 square-foot shopping center, and a 1,730 square-foot gas station with convenience store. While the existing gas station access points would be closed, four other existing access points are proposed to remain in this redevelopment. On Capitol Trail, there are one rights-in and one rights-in/rights-out/lefts-in that currently serve two of the parcels. On Meadowood Drive, there are one full access and a rights-out only access that currently serve five of the parcels. The proposed configuration will allow for cross-parcel access to all seven parcels, which is currently restricted, between Meadowood Drive and Capitol Trail. Construction is expected to be complete by 2024.

The subject land is located on a 6.99-acre assemblage of seven parcels. The land is zoned CR (Commercial Regional) in New Castle County, and the developer does not plan to rezone the land.

Currently, there are no active DelDOT projects within the study area.

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

The proposed Astro Plaza 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 intersections included in the scope of study.

Should the County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan by note or illustration. All applicable agreements (i.e. letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer shall improve the State-maintained road(s) on which they front (Capitol Trail (DE Route 2)), within the limits of their frontage, to meet DelDOT’s standards for their Functional Classification as found in Section 1.1 of the Development Coordination Manual and elsewhere therein. 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 is defined in Section 1 of the Development Coordination Manual, which states “This length includes the length of roadway perpendicular to lines created by the projection of the outside parcel corners to the roadway.” Questions on or appeals of this requirement should be directed to the DelDOT Subdivision Review Coordinator in whose area the development is located.

2. The developer of Astro Plaza should maintain the existing right-in/right-out/left-in site access on Capitol Trail. The proposed configuration of the intersection is shown in the table below. Additional improvements at the intersection include a raised channelization island for the westbound right-turn and painted crosswalks connecting the existing sidewalks along Capitol Trail.

Approach	Existing Configuration	Proposed Configuration
Northbound YMCA Entrance	One right-turn only lane	One right-turn only lane
Southbound Site Entrance A	One right-turn only lane	One right-turn only lane
Eastbound Capitol Trail	One left-turn lane, two through lanes, and one right-turn lane	One left-turn lane, two through lanes, and one right-turn lane
Westbound Capitol Trail	One left-turn lane, two through lanes, and one right-turn lane	One left-turn lane, two through lanes, and one right-turn lane

As shown above, at this time no changes to the existing lane configurations at the site access intersection are recommended to be made by the developer of Astro Plaza.

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
Northbound YMCA Entrance	N/A	N/A
Southbound Site Entrance A	N/A	N/A
Eastbound Capitol Trail	310 feet **	N/A
Westbound Capitol Trail	N/A	145 feet *

* Turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet*. Existing turn-lane length is nearly equivalent to, or in excess of, the recommended minimum turn-lane length.

** Turn-lane length based on Tab-3 of DelDOT’s *Auxiliary Lane Worksheet*. Projected 10-year opposing volume exceeds the values available in Figure 5.2.9.3-a. Existing turn-lane length is more than the recommended minimum turn-lane length. Therefore, the existing eastbound left-turn lane does not need to be lengthened.

- The developer of Astro Plaza should maintain the existing right-in site access on Capitol Trail. The proposed configuration of the intersection is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Eastbound Capitol Trail	Divided Roadway	Divided Roadway
Westbound Capitol Trail Site Entrance B	Two through lanes, and one right-turn lane	Two through lanes, and one right-turn lane

As shown above, at this time no changes to the existing lane configurations at the site access intersection are recommended to be made by the developer of Astro Plaza.

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 Capitol Trail	N/A	N/A
Westbound Capitol Trail Site Entrance B	N/A	290 feet *

* Turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet*. Existing turn-lane length is nearly equivalent to, or in excess of, the recommended minimum turn-lane length.

- The developer of Astro Plaza should maintain the existing full access site entrance on Meadowood Drive. The proposed configuration of the intersection is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Northbound Meadowood Drive	Shared left/through/right-turn lane	One left-turn lane and a shared through/right-turn lane
Southbound Meadowood Drive	Shared left/through/right-turn lane	Shared left/through/right-turn lane
Eastbound Site Entrance C	Shared left/through/right-turn lane	Shared left/through/right-turn lane
Westbound Shopping Center Driveway	Shared left/through/right-turn lane	Shared left/through/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
Northbound Meadowood Drive	75 feet *	N/A
Southbound Meadowood Drive	N/A	Not Required ***
Eastbound Site Entrance C	N/A	N/A
Westbound Shopping Center Driveway	N/A	N/A

* Turn-lane length based on DelDOT’s *Auxiliary Lane Worksheet*.

*** Result based on DelDOT’s *Auxiliary Lane Worksheet*. Right-turn lane not required if entrance radius is greater than 50 feet.

- The developer of Astro Plaza should maintain the existing right-out site access on Meadowood Drive. The proposed configuration of the intersection is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Northbound Meadowood Drive	Single through lane (Divided Roadway)	Single through lane
Southbound Meadowood Drive	Shared left-turn/through lane, right-turn lane (Divided Roadway)	Left-turn lane, shared left-turn/through lane, right-turn lane
Eastbound Site Entrance D	Shared left-turn/right-turn lane	Right-turn only

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed below.

Approach	Left-Turn Lane	Right-Turn Lane
Northbound Meadowood Drive	N/A	N/A
Southbound Meadowood Drive	N/A	N/A
Eastbound Site Entrance D	N/A	N/A*

* The site egress is a right-turn lane, but as it is the only lane on the approach it doesn't have a set length.

6. The developer should make improvements to Meadowood Drive, north of Capitol Trail, to accommodate future queuing. Improvements could include, but are not limited to, a center two-way left-turn lane that will also function as a dedicated southbound left-turn lane. Primarily, a raised median should be maintained between Capitol Trail and the start of the two-way left-turn lane. The developer should coordinate with DelDOT's Development Coordination Section to determine final configuration on Meadowood Drive during the site plan review.
7. The developer should enter into a standard traffic signal agreement with DelDOT for the intersection of Capitol Trail (DE Route 2) and Meadowood Drive. At a minimum, the agreement should include the following: relocation of signal equipment potentially impacted by construction along the site frontages, addition of pedestrian signal equipment to accommodate a signalized at-grade crossing of Capitol Trail, realign signal heads to support the additional southbound left-turn lane, and signal timing adjustments based on these improvements. The developer should coordinate with DelDOT's Development Coordination Section to determine final scope of improvements and other design details during the site plan review. Note that because the proposed changes would impact the existing signal equipment and involve the addition of a turning lane, use of the Traffic Signal Revolving Fund (TSRF) is not applicable.
8. The developer should maintain the existing cross-access easement along their western property boundary to allow for interconnection to the adjacent shopping center (which currently includes the Newark Farmer's Market).
9. The following bicycle, pedestrian and transit improvements should be included:
 - a. Per the DelDOT Development Coordination Manual section 5.2.9.2, bicycle lanes are required where right turn lanes are being installed. No new right-turn lanes are being installed by the Astro Plaza developer, but the existing right-turn lane on westbound Capitol Trail at the site access is being maintained. The bicycle lane in this location

- appears to be substandard and its improvement may be required. The developer should coordinate with DelDOT's Subdivision Section regarding specific requirements.
- b. Appropriate bicycle symbols, directional arrows, pavement markings, and signing should be included along bicycle facilities and turn lanes within the project limits.
 - c. Utility covers should be made flush with the pavement.
 - d. 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.
 - e. A minimum 15-foot-wide permanent easement from the edge of the right-of-way should be dedicated to DelDOT within the site frontage along Capitol Trail.
 - f. The existing sidewalk within the easement along the Capitol Trail site frontage appears to be substandard and its improvement may be required. The developer should coordinate with DelDOT's Subdivision Section regarding specific requirements.
 - g. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
 - h. 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. Internal sidewalks in the development should connect to the sidewalks along Capitol Trail and Meadowood Drive.
 - i. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.
 - j. The developer should coordinate with the Delaware Transit Corporation (DTC) regarding design and construction of the bus stop pad at the location of the existing bus stop in the Capitol Trail site frontage, near the intersection with Meadowood Drive.
 - k. The developer should add, at least one, at-grade pedestrian crossing of Capitol Trail at the signalized intersection of Capitol Trail and Meadowood Drive. The crossing should include concrete channelizing islands for pedestrian refuge. DelDOT does not recommend the removal of the pedestrian bridge at the same intersection. However, if the bridge were replaced, it should be designed so that it is accessible to pedestrians with disabilities via ramps or elevators. The developer should coordinate with DelDOT's Subdivision Section regarding specific requirements and design details for the potential at-grade pedestrian crossing.



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.

A handwritten signature in black ink, appearing to read "Andrew J. Parker".

Andrew J. Parker, PE, PTOE
Project Manager

Enclosure

General Information

Report date: May 2, 2022

Prepared by: Traffic Planning and Design, Inc.

Prepared for: Fusco Management, Inc.

Tax parcels: 08-055.10-094, 08-055.10-191, 08-055.10-096, 08-055.10-097, 08-055.10-098, 08-055.10-099, and 08-055.10-100.

Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Astro Plaza redevelopment would consist of a 40,350 square-foot shopping center, a 3,400 square-foot fast-food restaurant with drive-through window, and a 5,620 square-foot convenience store with gas pumps. The proposed redevelopment would replace a 4,980 square-foot office, a 54,460 square-foot shopping center, and a 1,730 square-foot gas station with convenience store.

Location: The land is located on the northwest corner of the intersection of Capitol Trail (DE Route 2) and Meadowood Drive, in New Castle County. A site location map is included on page 8.

Amount of land to be developed: approximately 6.99 acres on an assemblage of seven parcels.

Land use approval(s) needed: The land is zoned CR (Commercial Regional) in New Castle County, and the developer does not plan to rezone the land.

Proposed completion year: 2024

Proposed access locations: Four access points are proposed for this redevelopment: One rights-in and one rights-in/rights-out/lefts-in on Capitol Trail that currently serve two of the parcels. One full access and a rights-out only access on Meadowood Drive that currently serve five of the parcels. The proposed configuration will allow for cross-parcel access to all seven parcels, which is currently restricted, between Meadowood Drive and Capitol Trail.

Daily Traffic Volumes (per DelDOT Vehicle Volume Summary 2021):

- 2021 Average Annual Daily Traffic on Capitol Trail (DE Route 2) 34,598 vehicles/day



Site Location Map
Proposed Entrance 



2020 Delaware Strategies for State Policies and Spending

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

The proposed Astro Plaza redevelopment is located within Investment Level 1.

Investment Level 1

Investment Level 1 Areas are often municipalities, towns, or urban/urbanizing places in counties. Density is generally higher than in the surrounding areas. There are a variety of transportation opportunities available. Buildings may have mixed uses, such as a business on the first floor and apartments above.

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, to promote well-designed and efficient new growth, and to facilitate redevelopment in Investment Level 1 Areas. These areas would be a prime location for designating "pre-permitted areas" to help steer development where the local government and citizens are most prepared to accept it.

Proposed Development's Compatibility with Strategies for State Policies and Spending:

The proposed Astro Plaza project includes the redevelopment of multiple commercial parcels and proposed land use includes a shopping center, a fast-food restaurant with drive-through window, and a convenience store with gas pumps in an Investment Level 1 area. Investment Level 1 supports this type of development. As such, the proposed development appears to comply with the guidelines set forth in the 2020 "Strategies for State Policies and Spending".

Comprehensive Plan

New Castle County Comprehensive Plan:

(Source: New Castle County Comprehensive Plan, Updated June 2012)

The New Castle County Comprehensive Plan 2012 Future Land Use Map indicates that the proposed development is located entirely within the Office/Commercial/Industrial Development Area (OCI).

The New Castle County Comprehensive Plan indicates that a combination of Centralized Southern Growth and Northern New Castle County Redevelopment (which calls for directing more of the future growth into the infill and Office/Commercial/Industrial (OCI) Development Areas north of the canal) is the most cost-effective, environmentally prudent and infrastructurally efficient manner to meet the County's future growth needs.

Proposed Development's Compatibility with Comprehensive Plan: The proposed Astro Plaza Redevelopment includes a shopping center, a fast-food restaurant with drive-through window, and a convenience store with gas pumps on approximately 6.99 acres on an assemblage of seven parcels. The land is currently zoned as CR (Commercial Regional). The developer does not plan

to rezone the land. The CR district is intended to provide for community and regional commercial services, with suburban transition character. Design controls shall promote circulation by foot and automobile within contiguous commercial or office areas. These design features are intended to lessen congestion on roads and create large commercial complexes rather than strip development. Mixed uses are permitted to provide residential customers within the development and transit facilities are required. The New Castle County Comprehensive Plan 2012 Future Land Use Map indicates that the proposed development parcel is within the Office/Commercial/Industrial Development Area (OCI) Area. The proposed development appears to comply with the New Castle County's Comprehensive Plan 2012 as well as the CR zoning.

Relevant Projects in the DelDOT Capitol Transportation Program

Currently, there are no active DelDOT projects within the study area.

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 use was utilized to estimate the amount of new traffic generated for this development:

- 40,350 square-foot Shopping Center (ITE Land Use Code 820)
- 3,400 square-foot Fast Food w/ Drive Thru (ITE Land Use Code 934)
- 5,620 square-foot Super Convenience w/ Gas Station (ITE Land Use Code 960)

Table 1
ASTRO PLAZA PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Midday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
40,350 sf Shopping Center	--	--	38	--	--	154	--	--	182
External Trips	21	13	34	55	60	115	78	71	149
Pass-by Trips	-4	-4	-8	-20	-20	-40	-20	-20	-40
3,400 sf Fast Food w/ Drive Thru	--	--	137	--	--	111	--	--	187
External Trips	68	65	133	37	35	72	77	74	151
Pass-by Trips	-33	-33	-66	-18	-18	-36	-31	-31	-62
5,620 sf Super Convenience w/ Gas Station	--	--	467	--	--	389	--	--	359
External Trips	234	233	467	194	195	389	180	179	359
Pass-by Trips	-177	-177	-354	-148	-148	-296	-119	-119	-238
TOTAL TRIPS	109	97	206	100	104	204	165	154	319

Overview of TIS

Intersections examined:

- 1) Site Entrance A & Capitol Trail (DE Route 2) – Rights-in/rights-out/WB lefts-in
- 2) Site Entrance B & Capitol Trail – EB Rights-in
- 3) Site Entrance C & Meadowood Drive – Full access
- 4) Site Entrance D & Meadowood Drive – SB Rights-out
- 5) Capitol Trail & Meadowood Drive – Signalized

Conditions examined:

- 1) 2021 Existing (Case 1)
- 2) 2024 No-Build (Case 2)
- 3) 2024 Build (Case 3)

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

Committed developments considered:

- 1) New Castle County Engineering Building: 68,225 SF office building and 2,400 SF EMS building (replacing existing 29,812 SF office building).
- 2) YMCA Kirkwood Highway: Unbuilt additions totaling 26,887 net SF (existing 54,912 SF).
- 3) Delaware Park: Unbuilt 46,793 SF clubhouse/grandstand addition.
- 4) Harmony Industrial Site; Lot 13-B-1: Unbuilt additions totaling 41,000 SF (existing 52,975 SF).
- 5) Harmony Industrial Site; Parcel 30: Unbuilt 8,000 SF office addition (existing 25,000 SF office/warehouse building).
- 6) 150 Red Mill Road: Unbuilt 90,728 SF medical building (existing 59,880 SF office).
- 7) Milltown Square: Unbuilt 42,000 SF medical building.

Intersection Descriptions

1) Site Entrance A & Capitol Trail (DE Route 2)

Type of Control: unsignalized right-in/right-out/left-in.

Eastbound Approach: (Capitol Trail) one left-turn lane into site, two through lanes, and one right-turn lane into YMCA.

Westbound Approach: (Capitol Trail) one left-turn lane into YMCA, two through lanes, and one right-turn lane into site.

Southbound approach: (Site Entrance A) one right-turn lane.

Northbound Approach: (YMCA) one right-turn lane.

2) Site Entrance B & Capitol Trail

Type of Control: unsignalized right-in only.

Eastbound Approach: (Capitol Trail) raised median prevents access to Site Entrance B.

Westbound Approach: (Capitol Trail) two through lanes, and one right-turn lane.

3) Site Entrance C & Meadowood Drive

Type of Control: unsignalized full access.

Eastbound Approach: (Site Entrance C) one shared left/through/right lane.

Westbound Approach: (Shopping Center Driveway) one shared left/through/right lane.

Northbound Approach: (Meadowood Drive) one shared left/through/right lane (TIS proposes a left-turn lane between Capitol Trail and Site Entrance C).

Southbound Approach: (Meadowood Drive) one shared left/through/right lane.

4) Site Entrance D & Meadowood Drive

Type of Control: unsignalized right-out only

Eastbound Approach: (Site Entrance D) one right-out driveway

Northbound Approach: (Meadowood Drive) one through lane.

Southbound Approach: (Meadowood Drive) one shared left/through lane and one right-turn lane (TIS proposes one left-turn lane, one shared left-turn/through lane, and one right-turn lane).

5) Capitol Trail & Meadowood Drive

Type of Control: signalized intersection

Eastbound Approach: (Capitol Trail) one left-turn lane, two through lanes, and one right-turn lane

Westbound Approach: (Capitol Trail) one left-turn lane, two through lanes, and one right-turn lane

Northbound Approach: (Meadowood Drive) one left-turn lane, and one shared through/right-turn lane.

Southbound Approach: (Meadowood Drive) one shared left-turn/through lane, and one right-turn lane (TIS proposes one left-turn lane, one shared left-turn/through lane, and one right-turn lane).

Safety Evaluation

Crash Data: The TIS did not include a review of Delaware Crash Analysis Reporting System (CARS) data. Per the DelDOT Development Coordination Manual section 2.2.8.5.D.1, if an intersection in the study area, or a location along the site frontage, has been addressed in current or past Highway Safety Improvement Programs (HSIPs) the TIS shall report on the status or results of its inclusion in the HSIP program. The Capitol Trail corridor, including the intersection of Capitol Trail and Meadowood Drive was included in the 2003 Hazard Elimination Program (HEP). In the 2003 HEP, Task 1 Report, remedial improvements were recommended and made at the intersection of Capitol Trail and Meadowood Drive. There were no recommendations for Task 2 studies.

Sight Distance: The proposed site entrance A on Capitol Trail is located on a divided roadway and allows for right-in/right-out/left-in movements. Capitol Trail is relatively straight and flat in this area, so there is ample sight distance for drivers looking east (left) when exiting the proposed development. As always adequacy of available sight distance should be confirmed during the site plan review process for all proposed movements at the site access. This is especially true for site entrances C and D where the grading and alignment will change in the proposed condition. Aside

from the site access, the study area generally consists of relatively flat roadways and there are few visual obstructions. Sight distance appears adequate throughout the study area.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates one bus route that travels through the study area. Bus Route 6 provides weekday and weekend service along Capitol Trail/Kirkwood Highway and includes bus stops along eastbound and westbound Capitol, just west of Meadowood Drive in the site frontage. The bus stop along eastbound Capitol trail includes a bus shelter with a pad connected to sidewalks.

Planned transit service: DTC has requested that the existing bus stop on westbound Capitol Trail have a Type 2 shelter pad (12' x 8') installed, and that a pedestrian accessway into the site be constructed that does not use the adjacent vehicular entrance driveway.

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

- Capitol Trail:
 - Regional Bicycle Route with bikeway
 - Over 10,000 vehicles daily

There are existing sidewalks on both sides of Capitol Trail and Meadowood Drive adjacent to the site. Several sections of the sidewalk and curb ramps appear to not be ADA compliant. There are crosswalks with pedestrian signals crossing Meadowood Drive at the intersection with Capitol Trail. A Pedestrian bridge crosses Capitol Trail, just west of Meadowood Drive, but it does not accommodate pedestrians with disabilities. There are limited bicycle pavement markings along Capitol Trail in both directions and they do not meet the current standards in the Delaware MUTCD.

Planned bicycle and pedestrian facilities: The developer should add, at least one, at-grade pedestrian crossing of Capitol Trail at the signalized intersection of Capitol Trail and Meadowood Drive. The crossing should include concrete channelizing islands for pedestrian refuge. DelDOT does not recommend the removal of the pedestrian bridge at the same intersection. However, if the bridge were replaced, it should be designed so that it is accessible to pedestrians with disabilities via ramps or elevators.

DTC has requested that a pedestrian accessway into the site be constructed that does not use the adjacent vehicular entrance driveway. The Developer is proposing to upgrade the pedestrian sidewalk and curb ramps along the frontage of the property.

Previous Comments

In a review letter dated February 2, 2022, DeIDOT indicated that the traffic count data was acceptable and directed TPD to proceed to the Preliminary TIS.

A second review letter from DeIDOT, dated March 10, 2022, provided several review comments on the Preliminary TIS. The comments asked TPD to include a seasonal adjustment table, revise the proposed site trip generation, revise the trip distribution, revise trip generation for the YMCA Kirkwood Highway and Delaware Park committed development, and update future volumes based on these revisions.

In an email dated March 31, 2022, DeIDOT confirmed that the proposed site trip generation used in the Preliminary TIS was acceptable. An additional email dated April 14, 2022, confirmed that the trip generation for the Delaware Park committed development was acceptable.

It appears that all substantive comments from DeIDOT's TIS Scoping Memorandum, Traffic Count Review, Preliminary TIS Review, and other correspondence were addressed in the Final TIS submission.

General HCS Analysis Comments

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

- 1) TPD used Highway Capacity Software (HCS) version 7.6 to complete the traffic analyses. McCormick Taylor used HCS 2022.
- 2) For two-way stop control intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For the signalized intersection, the TIS and McCormick Taylor applied HV by lane group using existing data. The TIS and McCormick Taylor generally assumed future HV to be the same as existing HV at all intersections other than site access. For site accesses, 3% was assumed as per the DelDOT Development Coordination Manual section 2.2.8.11.6.H.
- 3) For existing and future No-Build conditions, the TIS and McCormick Taylor used PHFs calculated from existing data. For future conditions at site entrances C and D, McCormick Taylor determined PHFs as per guidance in DelDOT's Development Coordination Manual section 2.2.8.11.6.F, which resulted in a PHF of 0.92 in all three peak hours. The TIS used PHFs that matched the existing data at the intersection of Capitol Trail and Meadowood Drive, for future conditions at site entrances C and D.
- 4) For analyses of signalized intersections, the TIS and McCormick Taylor used a base saturation flow rate of 1,900 pc/hr/ln per DelDOT's Development Coordination Manual.
- 5) The TIS and McCormick Taylor used different signal timings when analyzing the signalized intersection. The TIS uses the same signal timing for the Existing AM and PM scenarios. The TIS also used protected-permissive left turn phasing for the Capitol Trail approaches.
- 6) For analyses of all intersections, the TIS and McCormick Taylor applied approach grades consistent with existing conditions.
- 7) McCormick Taylor selected Area Type as Other, in the signalized HCS models. In some cases, the TIS selected the CBD (Central Business District) Area Type.

Table 2
Peak Hour Levels of Service (LOS)
Based on Astro Plaza Traffic Impact Study – May 2, 2022
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ¹ Right-in / Right-out / Left-in	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Site Entrance A / YMCA Driveway & Capitol Trail						
2021 Existing (Case 1)						
Eastbound Capitol Trail – Lefts	B (13.2)	C (24.7)	C (19.4)	B (13.2)	C (24.7)	C (19.4)
Westbound Capitol Trail – Lefts	C (17.0)	B (13.1)	B (13.2)	C (17.1)	B (13.4)	B (13.2)
Northbound YMCA Entrance – Rights	B (13.5)	C (15.2)	B (14.5)	B (13.5)	C (15.2)	B (14.5)
Southbound Site Entrance A – Rights	B (12.9)	C (15.2)	B (12.6)	B (12.9)	C (15.2)	B (12.6)
2024 Without Development (Case 2)						
Eastbound Capitol Trail – Lefts	B (14.6)	D (34.3)	D (25.4)	B (14.6)	D (34.3)	D (25.4)
Westbound Capitol Trail – Lefts	C (20.5)	B (15.0)	B (14.8)	C (20.7)	B (15.6)	C (15.1)
Northbound YMCA Entrance – Rights	B (15.0)	C (18.7)	C (17.4)	B (15.0)	C (18.4)	C (17.4)
Southbound Site Entrance A – Rights	B (13.7)	C (16.9)	B (13.7)	B (13.7)	C (16.9)	B (13.7)
2024 With Development (Case 3)						
Eastbound Capitol Trail – Lefts	B (11.1)	D (34.2)	D (27.7)	B (11.2)	D (34.3)	D (27.8)
Westbound Capitol Trail – Lefts	C (20.3)	B (14.7)	B (14.7)	C (20.5)	C (15.2)	C (15.1)
Northbound YMCA Entrance – Rights	B (14.9)	C (17.7)	C (17.1)	B (14.9)	C (17.7)	C (17.1)
Southbound Site Entrance A – Rights	B (13.6)	C (20.0)	C (15.9)	B (13.6)	C (20.0)	C (15.9)

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.

Table 3
Peak Hour Levels of Service (LOS)
Based on Astro Plaza Traffic Impact Study – May 2, 2022
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ² Right-in	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Site Entrance B & Capitol Trail ³						
2021 Existing (Case 1)						
Westbound Capitol Trail – Rights	--	--	--	--	--	--
2024 Without Development (Case 2)						
Westbound Capitol Trail – Rights	--	--	--	--	--	--
2024 With Development (Case 3)						
Westbound Capitol Trail – Rights	--	--	--	--	--	--

² 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.

³ HCS does not calculate delay for uncontrolled right-turn movements

Table 4
Peak Hour Levels of Service (LOS)
Based on Astro Plaza Traffic Impact Study – May 2, 2022
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁴ Right-in / Right-out / Left-in	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Site Entrance C & Meadowood Drive						
2021 Existing (Case 1)						
Eastbound Site Entrance C – Lefts	--	--	--	--	--	--
Northbound Meadowood Drive – Lefts	--	--	--	--	--	--
2024 Without Development (Case 2)						
Eastbound Site Entrance C – Lefts	--	--	--	--	--	--
Northbound Meadowood Drive – Lefts	--	--	--	--	--	--
2024 With Development (Case 3)						
Eastbound Site Entrance C – Lefts	B (11.0)	B (11.5)	B (11.4)	B (11.0)	B (11.6)	B (11.8)
Northbound Meadowood Drive – Lefts	A (7.9)	A (7.8)	A (7.9)	A (7.9)	A (7.9)	A (7.9)

⁴ 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 Astro Plaza Traffic Impact Study – May 2, 2022
Prepared by Traffic Planning and Design, Inc.

Unsignalized Intersection ⁵ Right-out	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Site Entrance D & Meadowood Drive						
2021 Existing (Case 1)						
Eastbound Site Entrance D – Rights	--	--	--	--	--	--
2024 Without Development (Case 2)						
Eastbound Site Entrance D – Rights	--	--	--	--	--	--
2024 With Development (Case 3)						
Eastbound Site Entrance D – Rights	A (9.2)	A (9.2)	A (9.2)	A (9.3)	A (9.2)	A (9.3)

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.

Table 6
Peak Hour Levels of Service (LOS)
Based on Astro Plaza Traffic Impact Study – May 2, 2022
Prepared by Traffic Planning and Design, Inc.

Signalized Intersection ⁶	LOS per TIS ⁷			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Midday	Weekday AM	Weekday PM	Saturday Midday
Capitol Trail & Meadowood Drive						
2021 Existing (Case 1)						
Overall	B (19.6)	C (22.1)	C (22.1)	C (31.3)	C (34.1)	C (30.7)
2024 Without Development (Case 2)						
Overall	C (20.4)	C (24.3)	C (22.4)	C (31.6)	C (33.3)	D (35.1)
2024 With Development (Case 3a)						
Overall	C (25.5)	C (25.9)	C (25.7)	D (36.3)	D (44.1)	D (37.8)
Case 3 with Improvements ⁸	B (15.1)	B (15.7)	B (16.2)	D (35.9)	D (42.7)	D (37.4)

⁶ 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.

⁷ The TIS used Protected-Permissive left-turn phasing for eastbound and westbound left-turns which results in less delay per vehicle as compared to Protected-Only left-turn phasing, which was used by McCormick Taylor.

⁸ Improvements include a dedicated left-turn lane on the southbound approach in addition to the shared left/through lane and right-turn lane.