



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

NICOLE MAJESKI
SECRETARY

November 16, 2021

Ms. Betty Tustin
The Traffic Group, Inc.
104 Kenwood Court
Berlin, Maryland 21811

Dear Ms. Tustin:

The enclosed Traffic Impact Study (TIS) review letter for the **Deer Forest Road** (Tax Parcel: 135-5.00-38.19) 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. Robert Palmer, Beacon Engineering, LLC
Mr. David Edgell, Office of State Planning Coordination
Mr. Jamie Whitehouse, Sussex County Planning and Zoning
Mr. Andrew Parker, McCormick Taylor, Inc.
DelDOT Distribution

DelDOT Distribution

Brad Eaby, Deputy Attorney General
Shanté Hastings, Director, Transportation Solutions (DOTS)
Pamela Steinebach, Director, Planning
Mark Luszczyk, Deputy Director, Traffic, DOTS
Peter Haag, Chief Traffic Engineer, Traffic, DOTS
Michael Simmons, Assistant Director, Project Development South, DOTS
Todd Sammons, Assistant Director, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
Chris Sylvester, Traffic Studies Manager, Traffic, DOTS
Alistair Probert, South District Engineer, South District
Matthew Schlitter, South District Public Works Engineer, South District
Jared Kauffman, Service Development Planner, Delaware Transit Corporation
Tremica Cherry, Service Development Planner, Delaware Transit Corporation
Anthony Aglio, Planning Supervisor, Statewide & Regional Planning
Wendy Polasko, Subdivision Engineer, Development Coordination
Richard McCabe, Sussex Review Coordinator, Development Coordination
Mark Galipo, Traffic Engineer, Traffic, DOTS
Derek Sapp, Subdivision Manager, Development Coordination
Annamaria Furmato, Project Engineer, Development Coordination



November 10, 2021

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. 2A Subtask 04A – Deer Forest Road

Dear Mr. Joinville:

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Deer Forest Road commercial development prepared by The Traffic Group, dated May 28, 2021. The Traffic Group prepared the report in a manner generally consistent with DelDOT's Development Coordination Manual.

The TIS evaluates the impacts of the proposed Deer Forest commercial development, proposed to be located on the northwest corner of the intersection of US Route 113 and Deer Forest Road/E. Redden Road (Sussex Road 565) in Sussex County, Delaware. The proposed development would consist of two fast-food restaurants with drive-thru windows and 40,000 square feet of warehousing space on an approximately 9.39-acre parcel (Tax Parcels 135-5.00-38.19) Two access points are proposed: a full-movement access on Deer Forest Road and a right-in only access on US Route 113. Construction is anticipated to be completed in 2023.

The subject land is located on an approximately 9.39 acre parcel. The land is currently zoned as AR-1 (Agricultural Residential), and the developer plans to rezone the land to C-2 (Medium Commercial).

Currently, there are three DelDOT projects within the area of study.

The first initiative is DelDOT's Corridor Capacity Preservation Program (CCPP), a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 113, are able to efficiently carry regional traffic without impedance from the effects of local development. As proposed, the development appears to comply with the CCPP.

As for the second initiative, the proposed development is located within the boundary of the US Route 113 North/South Study, which aims to make various improvements throughout the US Route 113 corridor from the Maryland state line in Selbyville to Delaware Route 1, north of Milford. This proposed Deer Forest Road development site is within the Ellendale area of the project. A grade-separated intersection is proposed at the US Route 113 and Deer Forest Road/E.

Redden Road intersection and consequently there is a cul-de-sac proposed at Deer Forest Road which would remove the Deer Forest Road intersection at US Route 113. The current plan, which is subject to potentially change, shows an interchange ramp going directly through the middle of the proposed Deer Forest Road development site. This plan will likely cause any development on the parcel to be closed and demolished if the US Route 113 North/South Study improvements are to be constructed. A grade-separated interchange is also proposed at the US Route 113 and Wilson Road intersection. These improvements are not among the first high priority projects of the US Route 113 Corridor Improvement plan and are currently not yet funded in the current CTP. Design of these grade-separated interchanges is not anticipated to begin for at least several years.

Finally, traffic signal upgrades were designed in summer 2021 for the intersection of US Route 113 and Deer Forest Road/E. Redden Road, which consist of converting from span wire to mast arms, modifying US Route 113 left-turn phasing to flashing red arrow (FRA) operation, connecting to fiber, and various traffic signal equipment upgrades. This signal upgrade project was initiated by DelDOT's Hazard Elimination Program (HEP), with this location being 2018 HEP Site J. Recommendations of that HEP assessment included consideration of a full signal rebuild including mast arms and converting the northbound and southbound left-turn phasing to FRA, and ultimately these recommendations moved forward into design. These signal improvements are currently being implemented by DelDOT.

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

All existing intersections within the study area exhibit adequate level of service (LOS) in all scenarios, so physical roadway and/or traffic control improvements to address any such deficiencies are not necessary. However, a number of items are recommended to accommodate site entrances, to satisfy requirements of DelDOT's *Development Coordination Manual*, and to address bicycle and pedestrian needs.

At DelDOT's request, we also conducted a weave analysis for the section of southbound US Route 113 between Redden Road (north of the site) and the proposed right-in only site access along US Route 113. This was desired to evaluate the weave involving drivers coming from southbound US Route 113 destined to turn into the site access versus drivers coming from Redden Road turning onto southbound US Route 113 and destined to remain on US Route 113 past the site access. The weave segment includes an existing right-turn for the downstream signal at Deer Forest Road, which also serves as an acceleration-deceleration lane as it runs all the way back to Redden Road approximately 1,300 feet to the north. Based on the concept plan included in the TIS, the proposed site access would be located approximately 600 feet south of Redden Road. In the worst-case scenario, which is future with development during the summer Saturday peak hour, the analysis indicates the weave segment would operate acceptably at LOS B.

Should Sussex 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 (Deer Forest Road and US Route 113), 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 should construct the full movement site access on Deer Forest Road as far as possible from US Route 113. The proposed configuration is shown in the table below.

Approach	Existing Configuration	Proposed Configuration
Eastbound Deer Forest Road	One through lane	One left-turn lane and one through lane
Westbound Deer Forest Road	One through lane	One through lane and one right-turn lane
Southbound Site Access	Approach does not exist	One shared left/right-turn lane

The eastbound Deer Forest Road left-turn lane should be constructed as a continuous left-turn lane to serve the site access and the downstream intersection at US Route 113.

Initial recommended minimum turn-lane lengths (excluding tapers) of the separate turn lanes are listed on the next page. 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 Deer Forest Road	135 feet *	N/A
Westbound Deer Forest Road	N/A	190 feet **
Southbound Site Access	N/A	N/A

- * Length shown is the minimum required length of a dedicated left turn-lane for a 45 mph Local Road.
- ** Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet* and assuming an effective entrance radius of less than or equal to 50 feet as indicated in the TIS. The length of this turn lane may be affected by the close proximity of US Route 113. Additional discussion is required during site plan review.

3. The developer should construct a site access on southbound US Route 113 as a rights-in only access. This entrance should be located along US Route 113 approximately 700 feet north of the stop bar at the signalized intersection with Deer Forest Road. To further reinforce that this access point is a one-way entrance only (not an exit from the site onto US Route 113), Do Not Enter signs (MUTCD R5-1) and arrow pavement markings shall be installed and oriented to face potential exiting traffic along this internal entrance driveway. The proposed configuration for this site access is shown in the table below.

Approach	Current Configuration	Proposed Configuration
Southbound US Route 113	Two through lanes and One right-turn lane for downstream intersection at Deer Forest Road	Two through lanes, one right-turn lane for downstream intersection at Deer Forest Road, and one right-turn lane for site access

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

Approach	Left-Turn Lane	Right-Turn Lane
Southbound US Route 113	N/A	365 feet *

- * This is the separate right-turn lane for the site access that should be constructed off of the existing right-turn lane for the downstream intersection at Deer Forest Road. Initial turn-lane length based on DelDOT's *Auxiliary Lane Worksheet*.

4. As stated above in Item No. 2, the eastbound Deer Forest Road left-turn lane should be constructed as a continuous left-turn lane to serve the site access and the downstream intersection at US Route 113. Continuing east of the site access, the eastbound Deer Forest Road approach to the US Route 113 intersection should consist of one 11' wide shared through/left-turn lane, one 11' wide right-turn lane and one 5' wide paved shoulder. Deer

Forest Road must be widened on both sides of the road to construct the lanes needed in both directions between the site access and US Route 113.

5. The developer should enter into a standard traffic signal agreement with DelDOT for the intersection of US Route 113 and Deer Forest Road / E. Redden Road, in association with the developer improvements along Deer Forest Road between the site access and US Route 113 as described above in Item No. 4.
6. The following bicycle and pedestrian 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.
 - 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 frontages along Deer Forest Road and US Route 113.
 - f. ADA compliant curb ramps and crosswalks should be provided at all pedestrian crossings, including all site entrances. Type 3 curb ramps are discouraged.
 - g. 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.
 - h. Where internal sidewalks are located alongside of parking spaces, a buffer should be added to prevent vehicular overhang onto the sidewalk.

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 2021

Prepared by: The Traffic Group, Inc.

Prepared for: Shields Properties, LLC

Tax parcel: 135-5.00-38.19

Generally consistent with DelDOT's Development Coordination Manual: Yes

Project Description and Background

Description: The proposed Deer Forest Road commercial development would consist of two fast-food restaurants with drive-thru windows and 40,000 square feet of warehousing space.

Location: The land is located on the northwest corner of the intersection of US Route 113 and Deer Forest Road/E. Redden Road (Sussex Road 565) in Sussex County, Delaware. A site location map is included on page 8.

Amount of land to be developed: approximately 9.39 acre parcel

Land use approval(s) needed: Subdivision approval. The land is zoned AR-1 (Agricultural Residential), and the developer plans to rezone the land to C-2 (Medium Commercial).

Proposed completion year: 2023

Proposed access locations: Full movement access on Deer Forest Road and a Right-in access on US Route 113

Daily Traffic Volumes (per DelDOT Traffic Summary 2019):

- 2019 Average Annual Daily Traffic on US Route 113:
 - North of Deer Forest Road: 22,074 vehicles/day
 - South of Deer Forest Road: 25,553 vehicles/day
- 2019 Average Annual Daily Traffic on Deer Forest Road: 1,529 vehicles/day



2020 Delaware Strategies for State Policies and Spending

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

The Deer Forest Road development is located within Investment 4, as described below.

Investment Level 4

Delaware's Investment Level 4 Areas are rural in nature and are where the bulk of the state's open space/natural areas and agricultural industry is located. These areas contain agribusiness activities, farm complexes, and small settlements. They typically include historic crossroads or points of trade, often with rich cultural ties (for example, unincorporated areas like Clarksville in Sussex County and Port Penn in New Castle County).

Investment Level 4 Areas also boast undeveloped natural areas, such as forestlands, and large recreational uses, such as state and county parks and fish and wildlife preserves. Level 4 Areas may include natural habitats that are important for providing "ecosystem services" such as improving water quality and reducing flood risk. Sometimes, private recreational facilities, such as campgrounds or golf courses (often with associated residential developments), are also situated in Investment Level 4 Areas.

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

The proposed Deer Forest Road Development project consists of two fast food restaurants. Investment Level 4 should emphasize only development that is compatible with and enhances agriculture, agribusiness, appropriate visitor activities, and similar economic activities. As such, additional discussion regarding compatibility is recommended.

Comprehensive Plan

Sussex County Comprehensive Plan:

(Source: Sussex County Comprehensive Plan, March 2019)

The Sussex County Comprehensive Plan Future Land Use Map indicates that the proposed Deer Forest Road development is considered to be in a "commercial area" as per future land use zoning categories.

Proposed Development's Compatibility with Comprehensive Plan:

The proposed Deer Forest Road fast food development is located on an approximately 9.39 acre parcel. The land is currently zoned as AR-1 (Agricultural Residential), and the developer plans to rezone the land to C-2 (Medium Commercial). It would appear that the proposed Deer Forest Road residential development fits within the intended land use for this location.

Relevant Projects in the DelDOT Capital Transportation Program

Currently, there are three DelDOT projects within the area of study.

The first initiative is DelDOT's Corridor Capacity Preservation Program (CCPP), a statewide program intended to sustain the through capacity of adopted highway corridors by various means such as limiting access points and using service roads for local vehicle trips. The general purpose of the program is to ensure that existing principal arterial roadways, including this section of US Route 113, are able to efficiently carry regional traffic without impedance from the effects of local development. As proposed, the development appears to comply with the CCPP.

As for the second initiative, the proposed development is located within the boundary of the US Route 113 North/South Study, which aims to make various improvements throughout the US Route 113 corridor from the Maryland state line in Selbyville to Delaware Route 1, north of Milford. This proposed Deer Forest Road development site is within the Ellendale area of the project. A grade-separated intersection is proposed at the US Route 113 and Deer Forest Road/E. Redden Road intersection and consequently there is a cul-de-sac proposed at Deer Forest Road which would remove the Deer Forest Road intersection at US Route 113. The current plan, which is subject to potentially change, shows an interchange ramp going directly through the middle of the proposed Deer Forest Road development site. This plan will likely cause any development on the parcel to be closed and demolished if the US Route 113 North/South Study improvements are to be constructed. A grade-separated interchange is also proposed at the US Route 113 and Wilson Road intersection. These improvements are not among the first high priority projects of the US Route 113 Corridor Improvement plan and are currently not yet funded in the current CTP. Design of these grade-separated interchanges is not anticipated to begin for at least several years.

Finally, traffic signal upgrades were designed in summer 2021 for the intersection of US Route 113 and Deer Forest Road/E. Redden Road, which consist of converting from span wire to mast arms, modifying US Route 113 left-turn phasing to flashing red arrow (FRA) operation, connecting to fiber, and various traffic signal equipment upgrades. This signal upgrade project was initiated by DelDOT's Hazard Elimination Program (HEP), with this location being 2018 HEP Site J. Recommendations of that HEP assessment included consideration of a full signal rebuild including mast arms and converting the northbound and southbound left-turn phasing to FRA, and ultimately these recommendations moved forward into design. These signal improvements are currently being implemented by DelDOT.

Trip Generation

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

- Fast Food w/ Drive Thru (ITE Land Use Code 934)
- Warehousing (ITE Land Use Code 150)

Table 1
DEER FOREST ROAD PEAK HOUR TRIP GENERATION

Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Fast Food w/ Drive Thru	123	119	242	102	95	197	168	162	330
Pass-by Trips	-60	-58	-118	-51	-48	-99	-84	-81	-165
Warehousing	23	7	30	9	24	33	1	1	2
TOTAL TRIPS	86	58	154	60	71	131	85	82	167

Overview of TIS

Intersections examined:

- 1) US Route 113 and Deer Forest Road
- 2) US Route 113 and Wilson Road (Sussex Road 244)
- 3) Site Access A/US Route 113 (Right-in only)
- 4) Site Access B and Deer Forest Road (Sussex Road 565)

Conditions examined:

- 1) 2019 Existing (Case 1)
- 2) 2025 No-Build (Case 2)
- 3) 2025 Build (Case 3)

Peak hours evaluated: Weekday morning and evening and Saturday mid-day peak hours

Committed developments considered:

There were no identified committed developments to be included in this study.

Intersection Descriptions

1) US Route 113 and Deer Forest Road

Type of Control: signalized divided highway intersection

Northbound Approach: (US Route 113) one left turn lane, two through lanes, and one channelized right turn lane

Southbound Approach: (US Route 113) one left turn lane, two through lanes, and one channelized right turn lane

Westbound Approach: (E. Redden Road) channelized right-turn movement off of one shared through/left-turn lane

Eastbound Approach: (Deer Forest Road) channelized right-turn movement off of one shared through/left-turn lane

2) US Route 113 & Wilson Road

Type of Control: signalized divided highway intersection

Northbound Approach: (US Route 113) left turn lane, two through lanes, and a channelized right turn lane

Southbound Approach: (US Route 113) left turn lane, two through lanes, and a channelized right turn lane

Westbound Approach: (Wilson Road) one left turn only lane and one channelized right turn lane

3) Site Access A & US Route 113 (rights-in only)

Type of Control: proposed access via uncontrolled-right turn only lane

Southbound Approach: (US Route 113) existing two dedicated through lanes and one additional through lane that serves as right-turn lane for downstream intersection at Deer Forest Road, and one proposed right-turn lane into the site

4) Site Access B & Deer Forest Road (Sussex Road 565)

Type of Control: proposed unsignalized T-intersection

Southbound Approach: (proposed Site Access) proposed shared left / right turn lane exiting the site

Westbound Approach: (Deer Forest Road) existing one through lane, proposed one through lane and one right-turn lane

Eastbound Approach: (Deer Forest Road) existing one through lane, proposed one shared through/left-turn lane and one bypass lane

Safety Evaluation

Crash Data: Delaware Crash Analysis Reporting System (CARS) data was provided in Appendix A of the TIS for the three-year period from March 3, 2018, through March 3, 2021.

US Route 113 and Deer Forest Road/E. Redden Road (Sussex Road 565): The crash data indicates that at or within a 0.1-mile radius of the intersection of US Route 113 and Deer Forest Road, 33 crashes occurred. Eighteen (54.6%) crashes were front to rear, eleven (33.3%) were angle, one (3%) was sideswipe, same direction, one (3%) was not a collision between two vehicles,

and one (3%) was other or unknown type of crash. Twelve (36.4%) of the crashes involved personal injury and none involved a fatality. Three (9.1%) of the crashes were alcohol related.

US Route 113 and Wilson Road (Sussex Road 244): Twenty-two crashes occurred at or within a 0.1-mile radius of the intersection of US Route 113 and Wilson Road during the three-year study period. Eleven (50%) crashes were front to rear, one (4.6%) was angle, seven (31.8%) were sideswipe, same direction, one (4.6%) was sideswipe, opposite direction crashes, and two (9.1%) were not a collision between two vehicles. Six (27.3%) of the crashes involved personal injury and none involved a fatality. One (4.6%) of the crashes was alcohol related.

Sight Distance: The proposed site access on US 113 is limited looking in either direction from the proposed southbound driveway approach due to trees. As always adequacy of available sight distance must be confirmed during the site plan review process for all proposed movements at the site access.

Sight distance appears adequate at the proposed sight access on Deer Forest Road. In that location, Deer Forest Road is a relatively flat roadway with few visual obstructions.

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: Based on the current DART Bus Stop Map, the Delaware Transit Corporation (DTC) currently operates no bus routes in the study area.

Planned transit service: Based on coordination with DTC representatives, there are no requests for transit-related improvements associated with the proposed development.

Existing bicycle and pedestrian facilities: There are no pedestrian paths or designated bicycle lanes at the intersections within the study area. No sections of roadways within the study area are identified as “Bicycling Routes” on the *Sussex County Bicycle Map* published by DelDOT.

Planned bicycle and pedestrian facilities: A representative from DelDOT’s Statewide and Regional Planning Section requested a Shared-Use Path along the Deer Forest Road site frontage.

Previous Comments

In a review letter dated March 10, 2021, the traffic counts used for the Deer Forest Road development were flagged for revision. Initially, the summer Saturday mid-day peak hour counts were seasonally adjusted. DelDOT requested that the summer Saturday mid-day peak hour counts do not get seasonally adjusted. It appears that these corrections were made as the adjusted traffic counts were accepted via a review letter dated April 29, 2021.

It appears that all substantive comments from DelDOT’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) For two-way stop control intersections, the TIS and McCormick Taylor applied heavy vehicle factors (HV) by movement using existing data. For signalized and all-way stop control intersections, 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. Both the TIS and McCormick Taylor assumed 3% HV for future movements to and from the proposed site access points (as per DelDOT's Development Coordination Manual section 2.2.8.11.6.H).
- 2) For existing conditions, the TIS and McCormick Taylor determined overall intersection peak hour factors (PHF) for each intersection based on the turning movement counts that were available. Future PHFs were determined as per the DelDOT Development Coordination Manual section 2.2.8.11.6.F where applicable.
- 3) For analyses of all intersections, McCormick Taylor and the TIS assumed 0% grade for all movements.

Table 2
Peak Hour Levels of Service (LOS)
Based on Deer Forest Road Traffic Impact Study – May 2021
Prepared by The Traffic Group

Signalized Intersection ¹ Divided Highway	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
US 113 & Deer Forest Road						
2020 Existing Condition (Case 1)						
Overall	A (9.0)	A (8.3)	A (7.2)	A (9.0)	A (8.3)	A (7.2)
2023 No Build Condition (Case 2)						
Overall	A (9.0)	A (8.3)	A (7.4)	A (9.0)	A (8.3)	A (7.4)
2023 Build Condition (Case 3a)						
Overall	B (15.4)	B (11.9)	B (15.9)	B (15.4)	B (11.9)	B (16.7)
2023 Build Condition (Case 3b)						
Overall	B (15.6)	B (12.0)	B (16.1)	B (15.6)	B (12.0)	B (16.9)

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 Deer Forest Road Traffic Impact Study – May 2021
Prepared by The Traffic Group

Signalized Intersection ² Divided Highway	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
US 113 & Wilson Road						
2020 Existing Condition (Case 1)						
Overall	B (10.3)	A (8.4)	N/A	B (18.0)	B (14.2)	N/A
2023 No Build Condition (Case 2)						
Overall	B (10.2)	A (8.4)	N/A	B (18.1)	B (14.2)	N/A
2023 Build Condition (Case 3a)						
Overall	B (10.5)	A (8.6)	N/A	B (17.5)	B (14.8)	N/A
2023 Build Condition (Case 3b)						
Overall	B (10.5)	A (8.6)	N/A	B (17.5)	B (14.8)	N/A

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.

Table 4
Peak Hour Levels of Service (LOS)
Based on Deer Forest Road Traffic Impact Study – May 2021
Prepared by The Traffic Group

Unsignalized Intersection ³ One-Way Stop (T-Intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Summer Saturday	Weekday AM	Weekday PM	Summer Saturday
Site Access B & Deer Forest Road						
2023 Build Condition (Case 3a)						
Eastbound Deer Forest Road (Lefts)	A (7.6)	A (7.7)	A (7.7)	A (7.6)	A (7.7)	A (7.7)
Southbound Site Access (Left / Right)	A (10.0)	A (10.0)	B (10.2)	A (10.0)	B (10.0)	B (10.2)
2023 Build Condition (Case 3b)						
Eastbound Deer Forest Road (Lefts)	A (7.5)	A (7.6)	A (7.5)	A (7.5)	A (7.6)	A (7.5)
Southbound Site Access (Left / Right)	A (10.0)	A (10.0)	B (10.2)	A (10.0)	A (10.0)	B (10.2)

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