



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

SHAILEN P. BHATT
SECRETARY

August 15, 2012

Mr. Lee Brubaker
Town Manager
32 West Avenue
Ocean View, DE 19970

Dear Mr. Brubaker:

This letter is to replace, in part, an April 2007 letter from our consultant, McCormick Taylor, regarding the results of a Traffic Impact Study for **Ocean View Beach Club** (SSR3990), which was then known as the Berzins Property or Canal Landing. Copies of that letter and our letter sending it to the Town are enclosed.

Since 2007, the sizes of the subject development and several other proposed developments in the area have changed. The subject development has been reduced from 337 dwellings, 25,000 square feet of retail space and a restaurant to 300 dwellings and 1,500 square feet of retail space. Most notably among other developments in the area, Millville by the Sea has been reduced from 3,000 dwellings and 260,000 square feet of commercial space to about 700 dwellings and no commercial space. Similarly, The Estuary, then proposed to be 1,050 dwellings, received preliminary plan approval for only 739 lots and has thus far recorded plans for only 22 of them. While we have not researched the matter, it seems likely that other development plans have not proceeded as quickly as was expected in 2007. Less development in the area means that there will be less traffic there.

Also, since 2007, we have continued to work on our planned road improvements in the area. Our DE 26 Detour Routes Project, Contract 21-112-04, is partially complete and we expect to finish it next spring. Construction of our DE 26 Atlantic Avenue Project, Contract #24-112-10, will follow.

Accordingly, we have revisited the numbered recommendations found on pages 3 through 5 of the April 11, 2007, letter and we now recommend that you replace them with the following items:



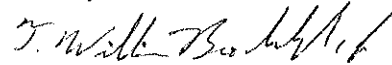
- 1) The developer should enter into an agreement with DelDOT to fund an equitable portion of the local matching funds for the project *SR 26, Atlantic Avenue, from Clarksville to Assawoman Canal* (State Contract 24-112-10). It is expected that similar agreements will be required of other developments in this area. Based on the development's projected p.m. peak hour traffic volume, compared to the total projected 2020 p.m. peak hour traffic volume, DelDOT has determined that this development's obligation would not exceed \$220,000.
- 2) The developer should improve Muddy Neck Road between Beaver Dam Road and the access opposite Oceanside Parkway in order to meet DelDOT local road standards. These standards include two eleven-foot travel lanes and two five-foot shoulders. Additionally, the horizontal and vertical alignments of the roadway should be improved as needed to conform to current DelDOT and AASHTO design criteria. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT will analyze the existing lanes' pavement section and will recommend an overlay thickness to the developer's engineer if necessary.
- 3) The developer should either enter into a traffic signal agreement with DelDOT for the intersection of Muddy Neck Road / Oceanside Parkway / Site Entrance or contribute an as-yet undetermined amount to DelDOT's Traffic Signal Revolving Fund for the same purpose. The agreement should include pedestrian signals, crosswalks, and interconnection at DelDOT's discretion.
- 4) The developer should install a right-turn lane and a through/left lane on the westbound Site Entrance, a left-turn lane on southbound Muddy Neck Road (presently estimated at 260 feet, including a 100-foot taper), and right-turn and left-turn lanes on northbound Muddy Neck Road. The northbound right turn lane's length is presently estimated at 240 feet including a 50-foot taper. The length of the northbound left turn lane has yet to be determined.
- 5) The developer should either enter into a traffic signal agreement with DelDOT for the intersection of Jefferson Bridge Road and Kent Avenue or contribute an as-yet undetermined amount to DelDOT's Traffic Signal Revolving Fund for the same purpose. The agreement should include pedestrian signals, crosswalks, and interconnection at DelDOT's discretion.
- 6) The following bicycle and pedestrian improvements should be completed:
 - a) A minimum of five-foot bicycle lane should be striped in addition to the right-turn lane at the entrance on Muddy Neck Road.
 - b) Right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of the right-turn lane at the entrance on Muddy Neck Road.

Mr. Lee Brubaker
August 15, 2012
Page 3 of 3

- c) Utility covers should be moved outside of the designated bicycle lane or be flush with the pavement.
- d) A minimum of ten-foot wide ADA compliant multiuse path should be added along all property frontages.
- e) Internal sidewalks should be included with this development and they should connect to the frontage multiuse path.

If you have any questions or concerns regarding this letter, you may contact me at (302) 760-2109.

Sincerely,



T. William Brockenbrough, Jr.
County Coordinator

TWB:km

Enclosures

cc with enclosures: Ms. Constance C. Holland, Office of State Planning Coordination
Mr. D.J. Hughes, Davis, Bowen & Friedel, Inc.
Mr. Andrew J. Parker, McCormick Taylor
Mr. Mir Wahed, Johnson, Mirmiran, and Thompson
DelDOT Distribution

DelDOT Distribution

Frederick H. Schranck, Deputy Attorney General
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Lisa Collins, Service Development Planner, Delaware Transit Corporation
J. Marc Coté, Subdivision Engineer, Development Coordination
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STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. Box 778
DOVER, DELAWARE 19903

CAROLANN WICKS, P.E.
SECRETARY

April 17, 2007

Mr. Conway Gregory
Town Manager
Town of Ocean View
P.O. Box 3
Ocean View, DE 19970

Dear Mr. Gregory:

The attached Traffic Impact Study (TIS) review letter for the **Berzins Property** 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 Rules and Regulations for Subdivision Streets and other accepted practices and procedures for such studies. DelDOT accepts this TIS review and concurs with the recommendations. We are providing it to you in fulfillment of our joint agreement regarding the review of TIS. If you have any questions concerning this letter or the attached review letter, please contact me at (302) 760-2134.

Sincerely,

Todd J. Sammons
Project Engineer

TS:km
Enclosures
cc with enclosures:

Ms. Constance C. Holland, Office of State Planning Coordination
Mr. Dennis Hughes, Davis, Bowen & Friedel, Inc.
Mr. Scott Diehl, McCormick Taylor
DelDOT Distribution

DelDOT Distribution

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Marc Coté, Subdivision Engineer, Development Coordination
T. William Brockenbrough, Jr., County Coordinator, Development Coordination
John T. Fiori, Subdivision Manager, Development Coordination
Troy Brestel, Project Engineer, Development Coordination

April 11, 2007

Mr. Todd J. Sammons
Project Engineer
DelDOT Division of Planning
P.O. Box 778
Dover, DE 19903

RE: Agreement No. 1294
Traffic Impact Study Review Services
Task No. 121 – Berzins Property

Dear Mr. Sammons,

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the Berzins Property performed by Davis, Bowen, & Friedel (DBF) dated July 2006. This review was assigned as Task Number 121. DBF prepared the report in a manner generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*.

The TIS evaluates the impacts of the Berzins Property, a proposed mixed-use development consisting of approximately 337 dwelling units (183 single-family detached houses, 32 duplexes, 86 townhouses, 36 condominiums and 16 rental condominiums), 25,000 square feet of retail/office space, and a 3,000 square foot quality restaurant on approximately 72.72 acres. The development is proposed to be located on the northeast side of Muddy Neck Road (Sussex Road 361) just west of the Assawoman Canal near the Town of Ocean View, Sussex County, Delaware. One access point is proposed along Muddy Neck Road. Construction of this project is expected to be complete by 2010. The scope of this project was changed from its original configuration. This change was recorded in an October 2005 meeting with DelDOT.

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

As shown in the table below, eight intersections exhibit level of service deficiencies without the implementation of physical roadway and/or traffic control improvements.

This area has significant levels of seasonal traffic, particularly along the main roads. If this development is approved as currently proposed, the improvements required to achieve acceptable Levels of Service for Saturday peak hour conditions (and in some cases, afternoon peak hour conditions), at most of the intersections along Delaware Route 26 exceed what is already planned for the *SR 26, Atlantic Avenue, from Clarksville to Assawoman Canal* project. They also exceed the intersection improvements completed as part of a DelDOT project in 2001 (Delaware Route 26 and Delaware Route 1 and Delaware Route 26 and Kent Avenue). These additional capacity improvements may not be feasible based on physical limitations, impacts to adjacent properties, and strong public opposition.

Even with the planned and just completed DelDOT projects noted in this review letter, three intersections on Delaware Route 26 are still projected to have LOS deficiencies during one or more time periods: West Avenue, Kent Avenue and Delaware Route 1. However, no recommendations are made in this letter in respect to these intersections because it is not feasible to acquire the necessary rights-of-way without major impacts on adjacent property and due to the existing physical limitations.

Deficiencies in the vicinity of the Berzins Property are projected to be particularly severe by 2010, with volume-to-capacity ratios at signalized intersections in the range of 1.3 to 2.3 during certain peak periods (see LOS tables for details). Given the level of traffic congestion expected on Delaware Route 26, significant improvements are recommended throughout the roadway network off of Delaware Route 26.

<i>Intersection</i>	<i>Situations for which deficiencies occur</i>
Muddy Neck Road and Clearwater Subdivision / Site Entrance	2010 PM and Saturday with development
Muddy Neck Road and Beaver Dam Road (Sussex Road 368)	2010 PM and Saturday with and without development
Muddy Neck Road / Kent Avenue and Double Bridges Road (Sussex Road 363)	2010 Saturday with development
Delaware Route 26 and West Avenue (Sussex Road 361)	2010 AM, PM and Saturday with and without development
Delaware Route 26 and Kent Avenue (Sussex Road 361)	2010 Saturday with and without development
Delaware Route 1 and Delaware Route 26	2010 PM and Saturday with and without development
Jefferson Bridge Road (Sussex Road 361A) and Kent Avenue	2010 PM and Saturday with and without development
Delaware Route 1 and Jefferson Bridge Road	2010 Saturday with and without development

DelDOT currently has two relevant projects within the study area. The first project is *SR 26 Local Roadway Improvement Project, from Delaware Route 17 to Muddy Neck Road* (State Contract No. 21-112-04). Improvements include pavement widening to include eleven-foot wide lanes and five-foot wide shoulders, and the addition of turn lanes at various intersections. Design plans are essentially complete for this project, and funding for right-of-way acquisition is available. There is currently no state funding available for construction. Should funding become available, construction is anticipated to begin in 2008 and be completed by 2009.

The second project is *SR 26, Atlantic Avenue, from Clarksville to Assawoman Canal* (State Contract 24-112-10). A concept plan exists for this project, and DelDOT is currently working on the design. Improvements include a continuous center left-turn lane the length of the corridor, plus additional turn lanes at certain intersections. There is currently no state funding for right-of-way acquisition or construction. Should funding become available, construction is anticipated to begin in 2009 and be completed by 2012.

Should the Town of Ocean View choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. The recommendations have been based on Case 4, which includes the impacts associated with the proposed Berzins Property and other committed developments including Millville by the Sea (Millville Township). All applicable agreements (i.e., letter agreements for off-site improvements and traffic signal agreements) should be executed prior to entrance plan approval for the proposed development.

1. The developer should enter into an agreement with DelDOT to fund an equitable portion of the local matching funds for the project *SR 26, Atlantic Avenue, from Clarksville to Assawoman Canal* (State Contract 24-112-10). At this time, it is expected that this agreement will be required of at least three other developments in this area. DelDOT expects to determine the cost sharing based on each development's projected p.m. peak hour traffic volume, compared to the total projected 2020 p.m. peak hour traffic volume.
2. The developer should enter into an agreement with DelDOT to fund an equitable portion of the local matching funds for the project *SR 26 Local Roadway Improvement Project, from Delaware Route 17 to Muddy Neck Road* (State Contract No. 21-112-04). At this time, it is expected that this agreement will be required of at least three other developments in this area. DelDOT expects to determine the cost sharing based on each development's projected p.m. peak hour traffic volume, compared to the total projected 2020 p.m. peak hour traffic volume.
3. The developer should improve Muddy Neck Road between Beaver Dam Road and Double Bridges Road in order to meet DelDOT local road standards. These standards include two eleven-foot travel lanes and two five-foot shoulders. Additionally, the horizontal and vertical alignments of the roadway should be improved as needed to conform to current DelDOT and AASHTO design criteria. The developer should provide a bituminous concrete overlay to the existing travel lanes, at DelDOT's discretion. DelDOT should analyze the existing lanes' pavement section and recommend an overlay thickness to the developer's engineer if necessary.
4. The developer should enter into an agreement with DelDOT to fund an equitable portion of the improvements required at the intersection of Muddy Neck Road and Beaver Dam Road. These improvements include exclusive left and right-turn lanes on the eastbound Beaver Dam Road approach, and an exclusive left-turn lane on the northbound Muddy Neck Road approach (to replace the existing northbound bypass lane). These improvements are beyond the improvements currently planned by DelDOT as part of State Contract No. 21-112-04.

5. The developer should install a single-lane roundabout at the intersection of Muddy Neck Road and Clearwater Subdivision / Site Entrance. A preliminary concept will need to be designed in order to determine if this improvement is feasible. Should a roundabout be determined to be infeasible at this location, the developer should provide turning lanes at this intersection. These lanes should include a separate right-turn lane on the westbound Site Entrance, a separate left-turn lane and a separate right-turn lane on northbound Muddy Neck Road, and a separate left-turn lane on southbound Muddy Neck Road. If a roundabout at the intersection of Muddy Neck Road and Clearwater Subdivision / Site Entrance is determined to not be feasible. The developer should enter into a traffic signal agreement with DeIDOT. The agreement should include pedestrian signals, crosswalks, and interconnection at DeIDOT's discretion.
6. The developer should improve the intersection of Muddy Neck Road / Kent Avenue and Double Bridges Road. These improvements include a separate right-turn lane on the northbound approach of Double Bridges Road. This improvement will be required of at least one other proposed development in the area (Estuary). After additional discussion with other affected developers and at DeIDOT's discretion, it is anticipated that one developer will take the lead on implementing the improvements and the other developers will fund an equitable portion.
7. The developer should enter into a traffic signal agreement with DeIDOT for the intersection of Jefferson Bridge Road and Kent Avenue. The agreement should include pedestrian signals, crosswalks, and interconnection at DeIDOT's discretion.
8. The developer should improve the intersection of Delaware Route 1 and Jefferson Bridge Road. These improvements include a separate left-turn lane on eastbound Jefferson Bridge Road, a separate left-turn lane and a separate right-turn lane on westbound Jefferson Bridge Road, a second left-turn lane on northbound Delaware Route 1, and a second westbound receiving lane on Jefferson Bridge Road.
9. The developer should enter into a traffic signal agreement with DeIDOT for the intersection of Delaware Route 1 and Jefferson Bridge Road. This agreement will cover the signal adjustments required by the physical improvements noted in Item No. 8. The agreement should include pedestrian signals, crosswalks, and interconnection at DeIDOT's discretion.
10. The following bicycle and pedestrian improvements should be completed:
 - a. A minimum of five-foot bicycle lane should be striped in addition to any right-turn lane at the entrance on Muddy Neck Road.
 - b. Right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of any right-turn lane along Muddy Neck Road.
 - c. Utility covers should be moved outside of the designated bicycle lane or be flush with the pavement.

- d. A minimum of ten-foot wide ADA compliant multiuse path should be added along all property frontages.
- e. Internal sidewalks should be included with this development and they should connect to the frontage multiuse path.

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

Additional details on our review of this TIS are attached. Please contact me at (302) 738-0203 or through e-mail at sjdiehl@mtmail.biz if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.



Scott Diehl, P.E., PTOE
Project Manager

Enclosure

General Information

Report date: July 2006

Prepared by: Davis, Bowen, & Friedel (DBF)

Prepared for: Integrity Communities LLC

Tax Parcel: 1-34-17.00-11.00

Generally consistent with DelDOT's Rules and Regulations for Subdivision Streets: Yes

Project Description and Background

Description: This project proposes a mixed-use development consisting of approximately 337 dwelling units (183 single-family detached houses, 32 duplexes, 86 townhouses, 36 condominiums and 16 rental condominiums), 25,000 square feet of retail/office space and a 3,000 square foot quality restaurant.

Location: The proposed project is located on the northeast side of Muddy Neck Road (Sussex Road 361) just west of the Assawoman Canal.

Amount of land to be developed: 72.72 acres

Land use approval(s) needed: Subdivision approval, annexation approval and rezoning from AR-1 to MR-RPC (Residential Planned Community)

Proposed completion date: 2010

Proposed access locations: One access point on Muddy Neck Road

Livable Delaware

(Source: Delaware Strategies for State Policies and Spending, July 2004)

Location with respect to the Strategies for State Policies and Spending Map of Delaware:
The proposed Berzins Property development is located within Investment Level 3.

Description of Investment Level:

Investment Level 3

These areas are portions of the county designated for growth, development districts, or long-term annexation. Areas classified as an Investment Level 3 will be considered for state investing after the Level 1 and 2 areas are substantially built out or when the facilities are logical extensions of existing systems and deemed appropriate to serve a particular area. Many of the areas within the Investment Level 3 designation include important farmland and natural resources along with portions of roadways that are designated for corridor capacity protection. Therefore the character pattern and timing of growth along with federally mandated air and water quality goals should be considered on a case-by-case basis for areas within this designation.

In Investment Level 3 Areas, the state will continue to invest in the regional roadway network and roadway safety while continuing to protect the capacity of major transportation corridors. Roadway improvements to support new development are not encouraged in Investment Level 3 and funds will not be allocated for these types of improvements until they have been allocated to Level 1 and 2 areas.

Proposed Development's Compatibility with Livable Delaware:

It appears that the facilities proposed are logical extensions of existing systems and are appropriate to serve the Ocean View area. As such, the Berzins development seems compatible with the Livable Delaware "Strategies for State Policies and Spending."

Comprehensive Plans

Sussex County Comprehensive Plan: *(Source: January 1, 2003 Sussex County Comprehensive Plan Update)*

The proposed development is located in an area designated as a low density Environmentally Sensitive Developing Area. Environmentally Sensitive Developing Areas are defined as a Developing District with special environmental design and protection requirements. New regulations are in place in these areas to control the density of development, preserve open space and valuable habitat, and to prevent excessive levels of sediments and nutrients in waterways. Regulated areas include Indian River, Indian River Bay and Rehoboth Bay. Residential Planned Communities and Village Style development is encouraged in these areas to provide open space and protect habitat. If a central wastewater system is provided, residential density would be permitted up to the maximum allowable density of the underlying zoning districts. Industrial uses in these areas are regulated by the Delaware Coastal Zone Act, however they do not regulate commercial, residential warehousing or distribution activities.

Town of Ocean View Comprehensive Plan: *(Source: Comprehensive Land Use Plan Update for the Town of Ocean View, January 2004)*

A petition to annex the Berzins parcel into the Town of Ocean View has been received by the town. As part of this annexation the zoning would be changed from AR-1 (Agricultural Residential) to R-3. The R-3 zoning would allow for a Residential Planned Community zoning overlay with a variety of housing types.

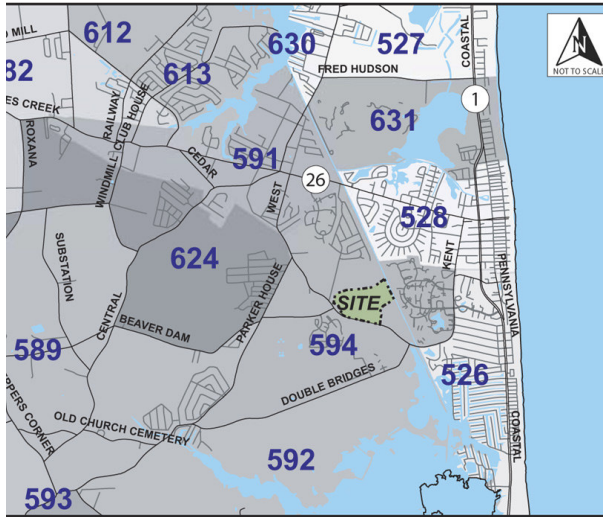
The development is located within a growth area identified in the Ocean View Comprehensive Plan. Residential Planned Communities, with a variety of housing types and neighborhood businesses, are encouraged in this area (District 3).

Proposed Development's Compatibility with the Sussex County Comprehensive Plans:

The Berzins Development is generally compatible with the Sussex County Comprehensive Plan and the Ocean View Comprehensive Plan.

Transportation Analysis Zones (TAZ) where development would be located:
594 (Peninsula Code designation)

TAZ Boundaries:



Current employment estimate for TAZ: 462
in 2005

Future employment estimate for TAZ: 651
in 2030

Current population estimate for TAZ: 1106
in 2005

Future population estimate for TAZ: 1334
in 2030

Current household estimate for TAZ: 493
in 2005

Future household estimate for TAZ: 628
in 2030

**Relevant committed developments in the
TAZ:** South Hampton, Waterside, Hunter's
Run, and Bethany Meadows

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

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

Relevant Projects in the DelDOT Capital Transportation Program (2006-2011)

DelDOT currently has two relevant projects within the study area. The first project is *SR 26 Local Roadway Improvement Project, from Delaware Route 17 to Muddy Neck Road* (State Contract No. 21-112-04). Improvements include pavement widening to include eleven-foot wide lanes and five-foot wide shoulders, and the addition of turn lanes at various intersections. Design plans are essentially complete for this project, and funding for right-of-way acquisition is available. There is currently no state funding for construction available. Should funding become available, construction is anticipated to begin in 2008 and be completed by 2009.

The second project is *SR 26, Atlantic Avenue, from Clarksville to Assawoman Canal* (State Contract 24-112-10). A concept plan exists for this project, and DelDOT is currently working on the design. Improvements include a continuous center left-turn lane the length of the corridor, plus additional turn lanes at certain intersections. There is currently no state funding for right-of-way acquisition or construction. Should funding become available, construction is anticipated to begin in 2009 and be completed by 2012.

Trip Generation

Table 1. Trip Generation – Berzins Property

Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
<u>Residential Land Use</u>									
215 Single-Family Detached Houses	40	120	160	134	79	213	109	93	202
138 Residential Condo/Townhouses	11	56	67	52	26	78	45	38	83
Subtotal	51	176	227	186	105	291	154	131	285
Internal Capture	0	0	0	4	3	7	5	5	10
TOTAL RESIDENTIAL TRIPS	51	176	227	182	102	284	149	126	275
<u>Office Land Use</u>									
General Office Space – 12,500 Square Feet ¹	32	4	36	3	16	19	3	2	5
Internal Capture	0	0	0	1	1	2	1	0	1
TOTAL OFFICE TRIPS	32	4	36	2	15	17	2	2	4
<u>Retail Land Uses</u>									
Specialty Retail Commercial Space – 12,500 Square Feet ²	0	0	0	22	29	51	32	30	62
Internal Capture Trips ³	0	0	0	2	4	6	3	4	7
Net External Trips	0	0	0	20	25	45	29	26	55
Pass-by Trips	0	0	0	7	9	15	11	10	21
Primary Retail Space Trips	0	0	0	13	16	30	18	16	34
Quality Restaurant – 3,000 Square Feet	1	1	2	15	7	22	19	13	32
Internal Capture Trips ⁴	0	0	0	2	1	3	2	2	4
Net External Trips	1	1	2	13	6	19	17	11	28
Pass-by Trips	0	0	0	6	3	8	7	5	12
Primary Restaurant Space Trips	1	1	2	7	3	11	10	6	16
TOTAL PRIMARY RETAIL TRIPS	1	1	2	20	19	39	28	22	50
TOTAL PRIMARY SITE TRIPS	84	181	265	204	136	340	179	150	329

¹ Trip generation for the AM peak was based on equation, whereas the trip generation for the PM peak was based on rate. ITE guidance suggests using the rate when the size of the development is significantly below the average size of development studied—which is the case for the Berzins Property.

² Trip generation for AM and PM peaks were based on data for Specialty Retail Center (LUC 814). Trip generation for Saturday peak was based on data for Shopping Center (LUC 820).

³ Internal Capture for PM and Saturday peaks were based on PM peak hour data for Shopping Center (LUC 820), even though the PM peak hour trip generation was based on data for Specialty Retail Center (LUC 814). ITE does not provide pass-by data for the Saturday peak.

⁴ Internal Capture for Saturday peak was based on PM peak hour data for Quality Restaurant (LUC 931). ITE does not provide pass-by data for the Saturday peak.

Overview of TIS

Intersections examined:

- 1) Muddy Neck Road and Clearwater Subdivision / Berzins Property Site Entrance
- 2) Muddy Neck Road and Beaver Dam Road (Sussex Road 368)
- 3) Delaware Route 26 and West Avenue (Sussex Road 361)
- 4) Parker House Road (Sussex Road 362) and Beaver Dam Road
- 5) Double Bridges Road (Sussex Road 363) and Muddy Neck Road / Kent Avenue (Sussex Road 361)
- 6) Delaware Route 26 and Kent Avenue
- 7) Delaware Route 1 and Delaware Route 26
- 8) Kent Avenue and Jefferson Bridge Road (Sussex Road 361A)
- 9) Delaware Route 1 and Jefferson Bridge Road

Conditions examined:

- 1) 2005 Existing conditions (Case 1)
- 2) 2010 Without Berzins Property (Case 2)
- 3) 2010 With Berzins Property (Case 3)
- 4) 2010 With Berzins Property and Millville by the Sea (Case 4)

Peak hours evaluated: weekday morning (AM) and weekday evening (PM) peak hours as well as the summer Saturday mid-day peak hour.

Committed developments considered:

- 1) The Estuary (1,050 single-family detached houses)
- 2) Barrington Park (150 single-family detached houses and 300 condominiums)
- 3) Pettinaro Project on Railway Road (480 condominiums)
- 4) Bay Forest Club (475 single-family detached houses and 326 townhouses)
- 5) Bethany Ridge (244 single-family detached houses)
- 6) Robinson Tract (68 townhouses and 106,400 square feet of retail space)
- 7) Doves Landing (140 single-family detached houses, 142 townhouses, 120 apartments, and a 147,500 square foot shopping center)
- 8) Windmill Property (106 townhouses)
- 9) Korotki Property (265 apartments and 105 single-family detached houses)
- 10) Forest Landing (444 single-family detached houses)
- 11) Fairway Village (312 single-family detached houses)
- 12) Silver Woods (400 single-family detached houses)
- 13) South Hampton (154 single-family detached houses, 48 townhouses, and 132 mini-storage units)
- 14) Waterside (103 apartments, 4,000 square feet of general office space, and 6,000 square feet of retail commercial space)
- 15) Hunter's Run (88 single-family detached houses)
- 16) Bethany Meadows (232 single-family detached houses and 188 condominiums)

- 17) Bethany Bay (100 single-family detached houses)
- 18) Wedgefield/Avon Park (148 single-family detached houses, 25 accessed from Windmill Road and 123 accessed from Central Avenue)
- 19) Bear Trap Dunes (25,000 square feet of retail commercial space, 336 single-family dwellings, 180 apartments/condominiums, 184 townhouses, 27-hole golf course)
- 20) Millville by the Sea (Case 4 only – 1565 single-family detached houses, 1435 townhouses, 130,000 square feet of general office space, and 130,000 square feet of retail commercial space)

Intersection Descriptions

1) Muddy Neck Road & Clearwater Subdivision / Site Entrance:

Type of Control: two-way stop-controlled (T-intersection), proposed two-way stop-controlled intersection

Eastbound approach: (Clearwater Subdivision) one shared left/right lane, stop-controlled

Westbound approach: (Proposed Site Entrance) proposed one shared left/through lane and one right-turn lane, stop controlled

Northbound approach: (Muddy Neck Road) one left/through lane and one bypass through lane, proposed one left-turn lane, one through lane, and one right-turn lane

Southbound approach: (Muddy Neck Road) one through lane and one very short right-turn lane, proposed one left-turn lane, one through lane, and one very short right-turn lane

2) Muddy Neck Road & Beaver Dam Road:

Type of Control: two-way stop-controlled (T-intersection)

Eastbound approach: (Beaver Dam Road) one shared left/right lane, stop-controlled

Northbound Approach: (Muddy Neck Road) one left/through lane and one bypass through lane

Southbound approach: (Muddy Neck Road) one through lane and one right-turn lane

3) Delaware Route 26 & West Avenue:

Type of Control: signalized four-leg intersection

Eastbound approach: (Delaware Route 26) one shared left/through/right lane

Westbound approach: (Delaware Route 26) one shared left/through/right lane

Northbound approach: (West Avenue) one shared left/through and one right-turn lane

Southbound approach: (West Avenue) one shared left/through/right lane

4A) Parker House Road & Beaver Dam Road (North):

Type of Control: two-way stop-controlled (T-intersection)

Westbound approach: (Beaver Dam Road) one shared left/right lane, stop-controlled

Northbound approach: (Parker House Road) one shared through/right lane

Southbound approach: (Parker House Road) one shared left/through lane

4B) Parker House Road & Beaver Dam Road (South):

Type of Control: two-way stop-controlled (T-intersection)

Eastbound approach: (Beaver Dam Road) one shared left/right lane, stop-controlled

Northbound approach: (Parker House Road) one shared left/through lane

Southbound approach: (Parker House Road) one shared through/right lane

5) Muddy Neck Road / Kent Avenue & Double Bridges Road:

Type of Control: two-way stop-controlled (T-intersection)

Eastbound approach: (Muddy Neck Road) one shared through/right lane

Westbound approach: (Kent Avenue) one shared left/through lane

Northbound approach: (Double Bridges Road) one shared left/right lane, stop controlled

6) Delaware Route 26 & Kent Avenue:

Type of Control: signalized three-leg intersection

Eastbound approach: (Delaware Route 26) one through lane and one right-turn lane

Westbound approach: (Delaware Route 26) one left-turn lane and one through lane

Northbound approach: (Kent Avenue) one left-turn lane and one channelized right-turn lane

7) Delaware Route 1 & Delaware Route 26:

Type of Control: signalized four-leg intersection

Eastbound approach: (Delaware Route 26) one left-turn lane, one through lane, and one channelized right-turn lane

Westbound approach: (Delaware Route 26) one left-turn lane, one through lane, and one right-turn lane

Northbound approach: (Delaware Route 1) one left-turn lane, two through lanes, and one channelized right-turn lane

Southbound approach: (Delaware Route 1) one left-turn lane, two through lanes, and one channelized right-turn lane

8) Jefferson Bridge Road & Kent Avenue:

Type of Control: two-way stop-controlled (T-intersection)

Westbound approach: (Jefferson Bridge Road) one shared left/right lane, stop-controlled

Northbound approach: (Kent Avenue) one shared through/right lane

Southbound approach: (Kent Avenue) one shared left/through lane

9) Delaware Route 1 & Jefferson Bridge Road:

Type of Control: signalized four-leg intersection

Eastbound approach: (Jefferson Bridge Road) one shared left/through lane and one right-turn lane

Westbound approach: (Jefferson Bridge Road) one shared left/through/right lane

Northbound approach: (Delaware Route 1) one left-turn lane, one through lane, and one shared through/right lane

Southbound approach: (Delaware Route 1) one left-turn lane, one through lane, and one shared through/right lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: There is no direct public transit line serving the Ocean View area.

Planned transit service: There were no indications that DBF contacted the Delaware Transit Corporation (DTC) for comments on transit facilities, as requested in the scoping letter. According to the DTC website, no additional transit plans are anticipated in this area.

Existing bicycle and pedestrian facilities: The *Delaware Kent and Sussex Counties Bicycle Touring Map* designates Muddy Neck Road, Beaver Dam Road, Parker House Road, and Double Bridges Road as having above average cycling conditions with low vehicular volumes (less than 2,000 ADT); Delaware Route 26 and SR 1 as having above average cycling conditions with high vehicular volumes (greater than 10,000 ADT); Kent Avenue south of Jefferson Bridge Road as having above average cycling conditions with moderate vehicular volumes (between 2000 and 10,000 ADT); and West Avenue and Kent Avenue north of Jefferson Bridge Road as having average cycling conditions with moderate vehicular volumes (between 2000 and 10,000 ADT). The C.R.A.B. (Come Ride Around the Bay) Ride bicycle route follows Beaver Dam Road, Muddy Neck Road, and Double Bridges Road. Kent Avenue and Double Bridges Road are on a local bicycle loop. And SR 1 is on Delaware Bicycle Route 1.

Planned bicycle and pedestrian facilities: There were no indications that DBF contacted DelDOT for comments on bicycle and pedestrian facilities, as requested in the scoping letter. McCormick Taylor contacted Joseph Cantalupo of DelDOT, and received a letter detailing bicycle/pedestrian requirements from Stephen Bayer dated September 20, 2006.

The following bicycle, pedestrian, and transit improvements should be made:

- a. The shoulder along Muddy Neck Road should be maintained.
- b. A minimum of five-foot bicycle lane should be striped in addition to any right-turn lane at the entrance on Muddy Neck Road.
- c. Right-turn yield to bikes sign (MUTCD R4-4) should be added at the start of any right-turn lane along Muddy Neck Road.
- d. A minimum of ten-foot wide ADA compliant multiuse path should be added along all property frontages.
- e. Internal sidewalks should be included with this development and they should connect to the frontage multiuse path.

Previous Comments

All comments from DelDOT's Scoping Letter and Preliminary TIS Review were addressed in the Final TIS submission, except as follows:

- The applicant did not contact Mr. Joseph Cantalupo, Assistant Director for Statewide & Regional Planning.
- The applicant did not contact Mr. David Dooley, a Service Development planner at the Delaware Transit Corporation.
- The requested evaluation to determine conformance with applicable DelDOT, AASHTO and MUTCD standards was not completed.

General HCS Analysis Comments

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

- 1) The TIS calculated the truck percents per movement in the two-way stop controlled unsignalized intersection analyses. McCormick Taylor calculated the truck percents per lane group.
- 2) For the future cases, McCormick Taylor applied a minimum PHF of 0.92 for the Livable Delaware Investment Level 1 and 2 Areas, and applied a minimum of 0.88 for the Livable Delaware Investment Level 3 and 4 Areas.
- 3) McCormick Taylor did not input RTOR volumes in the signalized intersection analyses. Instead of using RTOR volumes, McCormick Taylor applied the overlap right-turn phases when there are no conflicting flows for right-turn movements on separate right-turn lanes.
- 4) McCormick Taylor did not agree with the use of the Upstream Filtering/Metering Adjustment Factor in the future cases due to unknown situations of the upstream signals. The default value of 1.0 was assumed during these conditions.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ¹ Two-Way Stop Control (T intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Muddy Neck Road & Clearwater Subdivision / Site Entrance						
2005 Existing (Case 1)						
Eastbound Clearwater Subdivision	A (9.8)	B (11.1)	B (13.3)	A (9.8)	B (11.5)	B (13.2)
Northbound Muddy Neck Road – Left	A (7.7)	A (7.7)	A (8.2)	A (7.7)	A (7.7)	A (8.2)
2010 Without Development (Case 2)						
Eastbound Clearwater Subdivision	B (11.4)	B (14.3)	C (16.6)	B (11.4)	C (15.3)	C (16.5)
Northbound Muddy Neck Road – Left	A (8.2)	A (8.0)	A (8.6)	A (8.2)	A (8.0)	A (8.6)
2010 With Development (Case 3)						
Eastbound Clearwater Subdivision	B (13.4)	D (29.3)	D (33.5)	B (13.4)	D (29.3)	D (32.7)
Westbound Site Entrance	B (12.8)	C (21.8)	D (32.0)	B (12.8)	C (21.8)	D (32.0)
Northbound Muddy Neck Road – Left	A (8.2)	A (8.0)	A (8.6)	A (8.2)	A (8.0)	A (8.6)
Southbound Muddy Neck Road – Left	A (7.6)	A (8.8)	A (8.8)	A (7.6)	A (8.8)	A (8.8)
2010 With Development and Millville by the Sea Development (Case 4)						
Eastbound Clearwater Subdivision	C (15.9)	E (45.8)	F (56.1)	C (15.9)	E (45.8)	F (54.7)
Westbound Site Entrance	C (15.8)	E (39.0)	F (73.8)	C (15.8)	E (39.0)	F (73.8)
Northbound Muddy Neck Road – Left	A (8.6)	A (8.3)	A (9.0)	A (8.6)	A (8.3)	A (9.0)
Southbound Muddy Neck Road – Left	A (7.8)	A (9.4)	A (9.4)	A (7.8)	A (9.4)	A (9.4)

Signalized Intersection ¹	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Muddy Neck Road & Clearwater Subdivision / Site Entrance						
2010 With Development and Millville by the Sea Development (Case 4)	N/A	N/A	N/A	B (0.44)	A (0.49)	A (0.51)

¹ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

Table 2 - Continued
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Roundabout Intersection ²	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Muddy Neck Road & Clearwater Subdivision / Site Entrance						
2010 With Development (Case 3)						
Eastbound Clearwater Subdivision	N/A	N/A	N/A	A (8.4)	B (10.5)	B (11.5)
Westbound Site Entrance	N/A	N/A	N/A	A (7.0)	A (8.8)	A (8.9)
Northbound Muddy Neck Road	N/A	N/A	N/A	A (8.3)	A (9.0)	A (8.9)
Southbound Muddy Neck Road	N/A	N/A	N/A	A (8.9)	A (9.4)	A (9.2)
2010 With Development and Millville by the Sea Development (Case 4)						
Eastbound Clearwater Subdivision	N/A	N/A	N/A	A (9.5)	B (11.4)	B (13.1)
Westbound Site Entrance	N/A	N/A	N/A	A (7.4)	A (10.0)	B (10.1)
Northbound Muddy Neck Road	N/A	N/A	N/A	A (8.2)	A (9.2)	A (9.1)
Southbound Muddy Neck Road	N/A	N/A	N/A	A (8.9)	A (9.3)	A (9.3)

² McCormick Taylor analyzed the roundabout using aaSIDRA. The numbers in parentheses following levels of service are average delay per vehicle, measured in seconds, calculated with the aaSIDRA model. The analysis assumed an environment factor of 1.2.

Table 3
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ³ Two-Way Stop Control (T intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Muddy Neck Road & Beaver Dam Road						
2005 Existing (Case 1)						
Eastbound Beaver Dam Road	A (10.0)	B (12.0)	B (12.6)	A (10.0)	B (12.0)	B (12.6)
Northbound Muddy Neck Road – Left	A (7.6)	A (8.0)	A (8.1)	A (7.6)	A (8.0)	A (8.1)
2010 Without Development (Case 2)						
Eastbound Beaver Dam Road	B (11.6)	C (15.1)	C (19.6)	B (11.5)	B (14.3)	C (17.8)
Northbound Muddy Neck Road – Left	A (7.7)	A (8.5)	A (8.7)	A (7.7)	A (8.4)	A (8.6)
2010 With Development (Case 3)						
Eastbound Beaver Dam Road	B (12.7)	C (21.2)	D (33.1)	B (12.4)	C (19.0)	D (26.7)
Northbound Muddy Neck Road – Left	A (7.9)	A (9.0)	A (9.1)	A (7.9)	A (8.9)	A (9.0)
2010 With Development and Millville by the Sea Development (Case 4)						
Eastbound Beaver Dam Road	C (15.7)	F (60.9)	F (134.2)	C (15.3)	E (42.5)	F (89.5)
Northbound Muddy Neck Road – Left	A (8.1)	A (9.9)	B (10.0)	A (8.0)	A (9.6)	A (9.8)
2010 With Development and Millville by the Sea Development (Case 4) <i>With Improvement Option</i> ⁴						
Eastbound Beaver Dam Road	B (13.9)	C (19.4)	D (26.9)	B (13.6)	C (17.8)	C (23.5)
Northbound Muddy Neck Road – Left	A (8.1)	A (9.9)	B (10.0)	A (8.0)	A (9.6)	A (9.8)

³ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

⁴ The improvement Option includes a separate left-turn lane on the eastbound approach.

Table 4
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ⁵	LOS per TIS			LOS per McCormick Taylor ⁶		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 26 & West Avenue						
2005 Existing (Case 1)	B (0.50)	B (0.50)	C (0.71)	B (0.48)	B (0.50)	C (0.71)
2010 Without Development (Case 2)	F (0.89)	F (1.17)	F (1.52)	D (0.91)	F (1.20)	F (1.51)
2010 Without Development (Case 2) With Improvement Option-1 ⁷	D (0.95)	C (0.78)	E (1.00)	D (0.90)	B (0.78)	F (1.12)
2010 Without Development (Case 2) With DelDOT Improvements ⁸	N/A	N/A	N/A	C (0.85)	B (0.74)	F (1.14)
2010 With Development (Case 3)	F (0.95)	F (1.22)	F (1.55)	D (0.92)	F (1.23)	F (1.55)
2010 With Development (Case 3) With Improvement Option-1 ⁷	E (0.97)	C (0.81)	F (1.07)	D (0.92)	C (0.79)	F (1.16)
2010 With Development (Case 3) With DelDOT Improvements ⁸	N/A	N/A	N/A	C (0.85)	C (0.77)	F (1.25)
2010 With Development (Case 3) With Improvement Option-3 ⁹	N/A	N/A	N/A	C (0.62)	B (0.77)	D (0.95)

⁵ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

⁶ McCormick Taylor used one shared left/through/right lane on the westbound approach as the existing condition while TIS used one shared left/through and one right-turn lane.

⁷ The Improvement Option-1 includes a separate left-turn lane on the westbound approach.

⁸ The DelDOT improvements, State Contract No. 21-112-10, include a separate left-turn lane and a separate right-turn lane on the eastbound approach, and a separate left-turn lane and a separate right-turn lane on the westbound approach.

⁹ The Improvement Option-3 includes converting the eastbound right-turn lane to a shared through/right-turn lane and adding a second eastbound receiving lane on Delaware Route 26 in addition to the DelDOT improvements, State Contract No. 21-112-10.

Table 4 - Continued
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ¹⁰	LOS per TIS			LOS per McCormick Taylor ¹¹		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 26 & West Avenue						
2010 With Development and Millville by the Sea Development (Case 4)	F (1.13)	F (1.54)	F (1.91)	F (1.10)	F (1.53)	F (1.86)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-1 ¹²	F (1.09)	F (1.01)	F (1.23)	F (1.10)	E (0.98)	F (1.33)
2010 With Development and Millville by the Sea Development (Case 4) With DelDOT Improvements ¹³	N/A	N/A	N/A	F (1.08)	E (0.96)	F (1.28)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-2 ¹⁴	E (0.98)	D (0.94)	F (1.16)	N/A	N/A	N/A
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-3 ¹⁵	N/A	N/A	N/A	C (0.72)	C (0.93)	F (1.13)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-4 ¹⁶	N/A	N/A	N/A	C (0.72)	B (0.60)	C (0.91)

¹⁰ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

¹¹ McCormick Taylor used one shared left/through/right lane on the westbound approach as the existing condition while TIS used one shared left/through and one right-turn lane.

¹² The Improvement Option-1 includes a separate left-turn lane on the westbound approach.

¹³ The DelDOT improvements, State Contract No. 21-112-10, include a separate left-turn lane and a separate right-turn lane on the eastbound approach, and a separate left-turn lane and a separate right-turn lane on the westbound approach.

¹⁴ The Improvement Option-2 includes a separate left-turn lane on the westbound approach and converting from the existing split phase operation to one phase operation for the northbound and southbound approaches.

¹⁵ The Improvement Option-3 includes converting the eastbound right-turn lane to a shared through/right-turn lane and adding a second eastbound receiving lane on Delaware Route 26 in addition to the DelDOT improvements, State Contract No. 21-112-10.

¹⁶ The Improvement Option-4 includes converting the eastbound and westbound right-turn lanes to a shared through/right-turn lane and adding a second eastbound and westbound receiving lane on Delaware Route 26 in addition to the DelDOT improvements, State Contract No. 21-112-10.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ¹⁷ Two-Way Stop Control (T intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Parker House Road & Beaver Dam Road (North)						
2005 Existing (Case 1)						
Westbound Beaver Dam Road	B (10.1)	B (10.4)	B (10.6)	B (10.1)	B (10.4)	B (10.6)
Southbound Parker House Road – Left	A (7.6)	A (7.5)	A (7.6)	A (7.6)	A (7.5)	A (7.6)
2010 Without Development (Case 2)						
Westbound Beaver Dam Road	N/A	N/A	N/A	B (13.9)	C (20.0)	C (16.7)
Southbound Parker House Road – Left	N/A	N/A	N/A	A (8.4)	A (8.0)	A (8.2)
2010 Without Development (Case 2) With DelDOT Improvements ¹⁸						
Westbound Beaver Dam Road	B (14.4)	C (17.7)	C (17.3)	B (11.9)	C (16.6)	B (14.8)
Southbound Parker House Road – Left	A (9.0)	A (8.0)	A (8.3)	A (8.4)	A (8.0)	A (8.2)
2010 With Development (Case 3)						
Westbound Beaver Dam Road	N/A	N/A	N/A	C (15.5)	C (24.9)	D (26.2)
Southbound Parker House Road – Left	N/A	N/A	N/A	A (8.5)	A (8.1)	A (8.4)
2010 With Development (Case 3) With DelDOT Improvements ¹⁸						
Westbound Beaver Dam Road	B (13.0)	C (19.9)	C (19.5)	B (12.7)	C (18.4)	C (18.4)
Southbound Parker House Road – Left	A (8.5)	A (8.2)	A (8.4)	A (8.5)	A (8.1)	A (8.4)
2010 With Development and Millville by the Sea Development (Case 4)						
Westbound Beaver Dam Road	N/A	N/A	N/A	C (20.0)	F (80.7)	F (90.9)
Southbound Parker House Road – Left	N/A	N/A	N/A	A (8.9)	A (8.4)	A (8.7)
2010 With Development and Millville by the Sea Development (Case 4) With DelDOT Improvements ¹⁸						
Westbound Beaver Dam Road	B (14.4)	E (39.9)	E (36.7)	B (13.9)	D (32.3)	D (31.8)
Southbound Parker House Road – Left	A (9.0)	A (8.5)	A (8.8)	A (8.9)	A (8.4)	A (8.7)

¹⁷ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

¹⁸ The DelDOT improvements, State Contact No. 21-112-04, include a separate right-turn lane on the westbound approach and a separate right-turn lane on the northbound approach.

Table 5 - Continued
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ¹⁹ Two-Way Stop Control (T intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Parker House Road & Beaver Dam Road (South)						
2005 Existing (Case 1)						
Eastbound Beaver Dam Road	B (10.5)	B (10.4)	B (10.7)	B (10.5)	B (10.4)	B (10.7)
Northbound Parker House Road – Left	A (7.5)	A (7.7)	A (7.6)	A (7.5)	A (7.7)	A (7.6)
2010 Without Development (Case 2)						
Eastbound Beaver Dam Road	N/A	N/A	N/A	C (16.6)	C (17.0)	C (20.7)
Northbound Parker House Road – Left	N/A	N/A	N/A	A (7.7)	A (8.5)	A (8.4)
2010 Without Development (Case 2) With DelDOT Improvements ²⁰						
Eastbound Beaver Dam Road	C (15.8)	B (14.4)	C (16.9)	B (15.0)	B (13.8)	C (16.4)
Northbound Parker House Road – Left	A (7.8)	A (8.6)	A (8.5)	A (7.7)	A (8.5)	A (8.4)
2010 With Development (Case 3)						
Eastbound Beaver Dam Road	N/A	N/A	N/A	C (18.8)	C (20.3)	D (26.0)
Northbound Parker House Road – Left	N/A	N/A	N/A	A (7.9)	A (8.6)	A (8.5)
2010 With Development (Case 3) With DelDOT Improvements ²⁰						
Eastbound Beaver Dam Road	C (17.2)	C (16.2)	C (19.5)	C (16.1)	C (15.4)	C (18.7)
Northbound Parker House Road – Left	A (7.9)	A (8.7)	A (8.6)	A (7.9)	A (8.6)	A (8.5)
2010 With Development and Millville by the Sea Development (Case 4)						
Eastbound Beaver Dam Road	N/A	N/A	N/A	D (34.7)	E (42.2)	F (79.9)
Northbound Parker House Road – Left	N/A	N/A	N/A	A (8.0)	A (9.1)	A (9.0)
2010 With Development and Millville by the Sea Development (Case 4) With DelDOT Improvements ²⁰						
Eastbound Beaver Dam Road	D (27.1)	C (21.9)	D (32.0)	C (23.6)	C (19.8)	D (29.7)
Northbound Parker House Road – Left	A (8.1)	A (9.3)	A (9.1)	A (8.0)	A (9.1)	A (9.0)

¹⁹ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

²⁰ The DelDOT improvements, State Contact No. 21-112-04, include a separate right-turn lane on the southbound approach.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ²¹ Two-Way Stop Control (T intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Muddy Neck Road / Kent Avenue & Double Bridge Road						
2005 Existing (Case 1)						
Westbound Kent Avenue – Left	A (7.6)	A (7.7)	A (8.2)	A (7.6)	A (7.7)	A (8.2)
Northbound Double Bridge Road	B (10.1)	A (9.8)	B (12.4)	B (10.1)	A (9.8)	B (13.0)
2010 Without Development (Case 2)						
Westbound Kent Avenue – Left	A (8.1)	A (8.2)	A (9.0)	A (8.1)	A (8.2)	A (9.0)
Northbound Double Bridge Road	B (13.8)	B (11.8)	C (19.6)	B (13.8)	B (11.8)	C (19.6)
2010 With Development (Case 3)						
Westbound Kent Avenue – Left	A (8.4)	A (8.5)	A (9.3)	A (8.4)	A (8.5)	A (9.3)
Northbound Double Bridge Road	C (16.0)	C (15.3)	D (30.1)	C (16.0)	C (15.3)	D (30.1)
2010 With Development and Millville by the Sea Development (Case 4)						
Westbound Kent Avenue – Left	A (8.8)	A (8.9)	A (9.9)	A (8.8)	A (8.9)	A (9.9)
Northbound Double Bridge Road	C (21.0)	C (20.3)	F (55.7)	C (21.0)	C (20.3)	F (56.8)
2010 With Development and Millville by the Sea Development (Case 4) <i>With Improvement Option</i> ²²						
Westbound Kent Avenue – Left	A (8.8)	A (8.9)	B (10.1)	A (8.8)	A (8.9)	A (9.9)
Northbound Double Bridge Road	C (18.4)	C (16.8)	D (28.9)	C (18.4)	C (16.8)	D (26.5)

²¹ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

²² The Improvement Option includes a separate right-turn lane on the northbound approach.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ²³	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 26 & Kent Avenue						
2005 Existing (Case 1)	A (0.39)	A (0.33)	B (0.73)	A (0.36)	A (0.33)	B (0.70)
2010 Without Development (Case 2)	D (0.81)	A (0.67)	F (1.15)	A (0.72)	A (0.68)	F (1.03)
2010 Without Development (Case 2) With Improvement Option-1 ²⁴	N/A	N/A	C (0.92)	A (0.45)	A (0.68)	C (0.93)
2010 With Development (Case 3)	D (0.82)	A (0.67)	F (1.16)	A (0.74)	A (0.68)	F (1.05)
2010 With Development (Case 3) With Improvement Option-1 ²⁴	N/A	N/A	C (0.92)	A (0.47)	A (0.68)	C (0.93)
2010 With Development and Millville by the Sea Development (Case 4)	F (1.02)	B (0.87)	F (1.34)	C (0.91)	B (0.87)	F (1.32)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-1 ²⁴	A (0.57)	A (0.87)	F (1.10)	A (0.56)	B (0.87)	F (1.11)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-2 ²⁵	N/A	N/A	N/A	A (0.56)	A (0.48)	B (0.90)

²³ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

²⁴ The Improvement Option-1 includes converting a right-turn lane to a shared through/right lane on the eastbound approach and adding a second eastbound receiving lane on Delaware Route 26.

²⁵ The Improvement Option-2 includes converting a right-turn lane to a shared through/right lane on the eastbound approach, adding a second through lane on the westbound approach and adding a second eastbound and westbound receiving lane on Delaware Route 26.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ²⁶	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 1 & Delaware Route 26						
2005 Existing (Case 1)	C (0.41)	C (0.53)	E (0.81)	C (0.40)	C (0.41)	D (0.90)
2010 Without Development (Case 2)	E (0.99)	E (0.97)	F (2.18)	C (0.74)	D (0.81)	F (1.79)
2010 Without Development (Case 2) With Improvement Option-1 ²⁷	C (0.64)	D (0.91)	F (1.23)	N/A	N/A	N/A
2010 With Development (Case 3)	F (1.03)	F (1.02)	F (2.28)	C (0.77)	D (0.84)	F (1.81)
2010 With Development (Case 3) With Improvement Option-1 ²⁷	C (0.66)	D (0.94)	F (1.24)	N/A	N/A	N/A
2010 With Development (Case 3) With Improvement Option-2 ²⁸	N/A	N/A	N/A	C (0.44)	D (0.70)	D (0.92)

²⁶ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

²⁷ The Improvement Option-1 includes converting a through lane to a shared left/through lane on the eastbound approach and converting from the existing concurrent phase operation to split phase operation for the eastbound and westbound approaches.

²⁸ The Improvement Option-2 includes a second left-turn lane on the eastbound approach, a second through lane on the westbound approach, a second left-turn lane on the northbound approach and a second westbound receiving lane on Delaware Route 26.

Table 8 - Continued
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ²⁹	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 1 & Delaware Route 26						
2010 With Development and Millville by the Sea Development (Case 4)	F (1.42)	F (1.64)	F (3.25)	D (0.93)	F (1.09)	F (2.23)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-1 ³⁰	C (0.76)	F (1.19)	F (1.33)	N/A	N/A	N/A
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-3 ³¹	N/A	N/A	N/A	C (0.90)	D (0.94)	F (1.71)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-4 ³²	N/A	N/A	N/A	C (0.56)	D (0.60)	D (0.86)

²⁹ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

³⁰ The Improvement Option-1 includes converting a through lane to a shared left/through lane on the eastbound approach and converting from the existing concurrent phase operation to split phase operation for the eastbound and westbound approaches.

³¹ The Improvement Option-3 includes a second through lane on the westbound approach, a second left-turn lane on the northbound approach, and a second westbound receiving lane on Delaware Route 26.

³² The Improvement Option-4 includes a second left-turn lane on the eastbound approach, a second through lane on the westbound approach, a second left-turn lane and a third through lane on the northbound approach, a third through lane and a second right-turn lane on the southbound approach, and a second westbound receiving lane on Delaware Route 26.

Table 9
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Unsignalized Intersection ³³ Two-Way Stop Control (T intersection)	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Jefferson Bridge Road & Kent Avenue						
2005 Existing (Case 1)						
Westbound Jefferson Bridge Road	A (9.8)	B (10.6)	D (28.0)	A (9.8)	B (10.6)	D (27.8)
Southbound Kent Avenue – Left	A (7.6)	A (7.4)	A (8.8)	A (7.6)	A (7.5)	A (8.8)
2010 Without Development (Case 2)						
Westbound Jefferson Bridge Road	B (12.5)	C (18.6)	F (328.8)	B (12.3)	C (17.4)	F (274.8)
Southbound Kent Avenue – Left	A (8.3)	A (7.8)	A (9.7)	A (8.3)	A (7.8)	A (9.7)
2010 With Development (Case 3)						
Westbound Jefferson Bridge Road	B (13.8)	D (26.5)	F (500.0)	B (13.5)	C (23.5)	F (447.9)
Southbound Kent Avenue – Left	A (8.5)	A (8.0)	A (10.0)	A (8.5)	A (8.0)	B (10.0)
2010 With Development and Millville by the Sea Development (Case 4)						
Westbound Jefferson Bridge Road	C (16.6)	F (85.2)	F (931.8)	C (16.0)	F (63.9)	F (851.1)
Southbound Kent Avenue – Left	A (8.9)	A (8.2)	B (10.5)	A (8.9)	A (8.2)	B (10.6)

Signalized Intersection ³³	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Jefferson Bridge Road & Kent Avenue						
2010 Without Development (Case 2)	N/A	N/A	N/A	B (0.39)	B (0.40)	C (0.78)
2010 With Development (Case 3)	N/A	N/A	C (0.90)	B (0.45)	B (0.47)	C (0.85)
2010 With Development and Millville by the Sea Development (Case 4)	B (0.70)	B (0.78)	E (0.96)	B (0.58)	C (0.63)	D (0.95)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option ³⁴	N/A	N/A	C (0.89)	N/A	N/A	N/A

³³ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

³⁴ The Improvement Option includes a separate right-turn lane on the northbound approach.

Table 10
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ³⁵	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 1 & Jefferson Bridge Road						
2005 Existing (Case 1)	B (0.28)	B (0.26)	F (0.87)	B (0.30)	A (0.26)	D (0.89)
2010 Without Development (Case 2)	B (0.37)	B (0.48)	F (1.08)	C (0.47)	B (0.45)	F (1.04)
2010 Without Development (Case 2) With Improvement Option-1 ³⁶	N/A	N/A	D (0.95)	N/A	N/A	N/A
2010 With Development (Case 3)	B (0.39)	B (0.48)	F (1.35)	C (0.50)	B (0.54)	F (1.14)
2010 With Development (Case 3) With Improvement Option-1 ³⁶	N/A	N/A	E (0.98)	N/A	N/A	N/A
2010 With Development (Case 3) With Improvement Option-2 ³⁷	N/A	N/A	N/A	C (0.49)	B (0.51)	D (0.92)

³⁵ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

³⁶ The Improvement Option-1 includes a separate right-turn lane on the westbound approach.

³⁷ The Improvement Option-2 includes a separate left-turn lane on the eastbound approach and a separate right-turn lane on the westbound approach.

Table 10 - Continued
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for The Berzins Property (AKA Canal Landing)
Report dated July 2006
Prepared by Davis, Bowen & Friedel, Inc.

Signalized Intersection ³⁸	LOS per TIS			LOS per McCormick Taylor		
	Weekday AM	Weekday PM	Saturday Mid	Weekday AM	Weekday PM	Saturday Mid
Delaware Route 1 & Jefferson Bridge Road						
2010 With Development and Millville by the Sea Development (Case 4)	B (0.48)	C (0.65)	F (2.03)	C (0.50)	C (0.76)	F (1.68)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-1 ³⁹	B (0.48)	C (0.64)	F (1.07)	N/A	N/A	N/A
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-3 ⁴⁰	N/A	N/A	N/A	C (0.49)	C (0.72)	E (0.98)
2010 With Development and Millville by the Sea Development (Case 4) With Improvement Option-4 ⁴¹	N/A	N/A	N/A	C (0.56)	C (0.48)	D (0.93)

³⁸ For unsignalized analyses, the numbers in parentheses following levels of service are average delay per vehicle, measured in seconds. For signalized analyses, those numbers are X-critical, a composite volume-to-capacity ratio.

³⁹ The Improvement Option-1 includes a separate right-turn lane on the westbound approach.

⁴⁰ The Improvement Option-3 includes a separate left-turn lane on the eastbound approach and a separate left-turn lane and a separate right-turn lane on the westbound approach.

⁴¹ The Improvement Option-4 includes a separate left-turn lane on eastbound approach, a separate left-turn lane and a separate right-turn lane on the westbound approach, a second left-turn lane on the northbound approach, and a second westbound receiving lane on Jefferson Bridge Road.