McCormick Taylor
Engineers & Planners Since 1946

March 10, 2008

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. 61 – Proposed Residential Project on Railway Road

Dear Mr. Sammons,

McCormick Taylor has completed its review of the Traffic Impact Study (TIS) for the proposed residential project on Railway Road prepared by Orth Rodgers & Associates, Inc. (ORA) dated July 29, 2005 and November 16, 2005 (addendum). This review was assigned as Task Number 61. Orth-Rodgers prepared the report in a manner generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*.

On October 9, 2007, the developer and its traffic engineer, ORA, met with DelDOT to discuss the status of the project. At that meeting, the developer stated that the proposed development would be scaled back from 600 condominiums to 204 condominiums. As such, the TIS and McCormick Taylor's review that follows (originally completed in 2006) were based on development details that are now outdated. The proposed development as evaluated by the TIS and McCormick Taylor is described in a later paragraph. The development as it is now proposed would consist of 204 units of condominiums on approximately 50 acres, and it would have only one access point on Old Mill Road (Sussex Road 349). Although the development as evaluated and the development as it is now proposed are different, we believe our recommendations, based on a review of the TIS as submitted, are still valid.

For the 2015 build scenario, the traffic volumes generated by the development as evaluated in the TIS and this review letter would be higher than the volumes generated by the development as it is now proposed. As such, the delay and X-critical values shown in this letter are higher than we would now expect, and some levels of service (LOS) are worse than we would now expect, but the recommended improvements described below would still be needed.

In addition, while we did not specifically evaluate the Old Mill Road access point, we do not expect any LOS deficiencies at this point.

As evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum) and McCormick Taylor's review, the development of the Residential Project on Railway Road (Sussex Road 350), in Sussex County, Delaware was to include 600 units of condominiums on approximately 175 acres. The number of proposed residential condominiums had increased from 480 units to 600 units due to the developer acquiring 50.19 additional acres. This development is

proposed for the north side of Railway Road in Sussex County adjacent to the existing Bethany Bay development. One unsignalized access was proposed along Railway Road, and a second access point would have been located at the current terminus of Railway Road. Construction is expected to be complete by 2015.

DelDOT currently has two relevant projects within the study area. The first project is *SR 26, Detour Routes* (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. These improvements are assumed to be in place for all future cases of our analysis.

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

The following intersections exhibit level of service deficiencies without the implementation of physical roadway and/or traffic control improvements:

Intersection	***Situation For Which Deficiency Occurs***
Delaware Route 26 and Delaware Route 17	2015 Saturday with and without development
Delaware Route 26 and Railway Road	2015 PM and Saturday with and without development
Delaware Route 26 and Old Mill Road	2015 PM and Saturday with and without development
Delaware Route 26 and Central Avenue (Sussex Road 84)	2015 PM and Saturday with and without development

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 conditions, at some of the intersections along Delaware Route 26 are beyond what is already planned for the *SR 26, Atlantic Avenue, from Clarksville to Assawoman Canal* project. These additional capacity improvements will likely be infeasible based on physical limitations, right-of-way constraints, and public opposition.

Should the County choose to approve the proposed development, the following items should be incorporated into the site design and reflected on the record plan. 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, Detour Routes* (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 Railway Road along the site frontage in order to meet DelDOT's local road standards. These standards include two eleven-foot travel lanes and two five-foot shoulders. 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 improve Old Mill Road along the site frontage in order to meet DelDOT's local road standards. These standards include two eleven-foot travel lanes and two five-foot shoulders. 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.

5. The following bicycle and pedestrian improvements should be included:

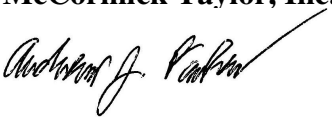
    a. A minimum of a ten-foot wide multi-use path (with a minimum of a five-foot buffer from the roadway) that meets current AASHTO and ADA standards should be included along the site frontages on both Old Mill Road and Railway Road. This multi-use path should connect to the shoulders at the end limits of the site frontages.
    b. Internal sidewalks to promote walking as a viable transportation alternative should be constructed within the development. These internal sidewalks should connect to the frontage multi-use path.
    c. Internal roadways that provide access any adjacent development(s) should include sidewalks that lead into the other development(s) to allow for safe pedestrian travel.
    d. An additional pedestrian access point to internal streets and sidewalks should be provided along Railway Road near the northern limit of the site frontage.

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 the TIS are attached. Please contact me at (302) 738-0203 or through e-mail at ajparker@MTmail.biz if you have any questions concerning this review.

Sincerely,

McCormick Taylor, Inc.



Andrew J. Parker, P.E., PTOE
Project Manager

Enclosure

General Information

Report date: July 29, 2005 and November 16, 2005 (Addendum)
Prepared by: Orth Rodgers & Associates, Inc.
Prepared for: Linder & Company, Inc.
Tax parcel: 1-34-8.00-42.00, 1-34-12.00-74.00
Generally consistent with DelDOT's *Rules and Regulations for Subdivision Streets*: Yes

Project Description and Background

Description: As evaluated in the TIS and McCormick Taylor's review, the proposed development would consist of 600 units of residential condominiums. The development is now proposed as 204 condominiums.
Location: Proposed development to be located north of Delaware Route 26, directly west of Railway Road (Sussex Road 350) and adjacent to the existing Bethany Bay development
Amount of land to be developed: approximately 175 acres (updated to approximately 50 acres)
Land use approval(s) needed: subdivision approval, currently AR-1 (Agricultural Residential) and GR-1 (General Residential), rezoning to MR-2 Residential Planned Community desired
Proposed completion date: 2015
Proposed access locations: As evaluated in the TIS, there would be one unsignalized access point on Railway Road and another access point at the existing terminus of Railway Road. The development as it is now proposed would have only one access point on Old Mill Road (Sussex Road 349).

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 Railway Road Property is located within Investment Level 3.

Description of 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, such as Route 13. 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:
The Proposed Railway Road Property falls within Investment Level 3. Since the proposed location of this development is near (and in some cases, adjacent) to existing residential areas, this property would adhere to Livable Delaware guidelines.

Comprehensive Plans

Sussex County Comprehensive Plan: Existing land use of the proposed development is designated as being in an area designated as forest and agricultural. Future land use designates this area as being located within an 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.

Proposed Development's Compatibility with Comprehensive Plans: This proposed development will likely be compatible with Sussex County's Comprehensive Plan. The developer is proposing a rezoning to Residential Planned Community, which the Developing District generally supports.

Transportation Analysis Zones (TAZ) where development would be located: 612

TAZ Boundaries:

Current employment estimate for TAZ:
0 jobs in 2005
Future employment estimate for TAZ:
0 jobs in 2030
Current population estimate for TAZ:
565 people in 2005
Future population estimate for TAZ:
783 people in 2030
Current household estimate for TAZ:
252 houses in 2005
Future household estimate for TAZ:
369 houses in 2030
Relevant committed developments in the TAZ: Bay Forest Club, Bethany Bay
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 (FY 2008 – FY 2013)

DelDOT currently has two relevant projects within the study area. The first project is *SR 26, Detour Routes* (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. These improvements are assumed to be in place for all future cases of our analysis.

Trip Generation

Trip generation for the proposed development was computed using comparable land uses and equations contained in Trip Generation, Seventh 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:

- Residential Condominiums (ITE Land Use Code 230)

Table 1. Proposed Residential Property on Railway Road – Trip Generation

Land Use	AM Peak Hour			PM Peak Hour			Saturday Mid-Day		
	In	Out	Total	In	Out	Total	In	Out	Total
600 Residential Condominium Units	37	180	217	175	86	261	117	100	217

Overview of TIS

Intersections examined:

1) Old Mill Road & Railway Road
2) Old Mill Road & Clubhouse Road (Sussex Road 351)
3) Delaware Route 26 & Delaware Route 17
4) Delaware Route 26 & Railway Road
5) Delaware Route 26 & Old Mill Road
6) Delaware Route 26 & Central Avenue (Sussex Road 84/357)

Conditions examined:

1) 2004 existing conditions
2) 2015 without Railway Road Development
3) 2015 with Railway Road Development

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

Committed developments considered:

- Silver Woods (ITE Land Use Code 210) – 400 single-family detached homes
- Bethany Meadows (ITE Land Use Code 210) – 2 single-family detached homes
- Waterside (ITE Land Use Codes 210, 230) – 13 single-family detached homes and 8 townhouses
- Southampton (ITE Land Use Codes 210, 230, 151) – 2 single-family detached homes, 21 townhouses and 132 mini-storage units
- Bear Trap Dunes (ITE Land Use Codes 210, 230, 820) – 49 single-family detached homes, 55 townhouses/condos and 20,000 square feet of retail
- Wedgefield/Avon Park (ITE Land Use Codes 210, 230) – 100 single-family homes,

- Bay Forest Club (ITE Land Use Code 210, 230) – 475 single-family detached homes, 326 townhouses/condominiums
- Forest Landing (ITE Land Use Code 210) – 444 single-family detached homes
- Fairway Village (ITE Land Use Code 210) – 312 single-family detached homes
- Windmill Property (ITE Land Use Code 230) – 106 townhouses
- Doves Landing (ITE Land Use Codes 210, 220, 230, 820) – 140 single-family detached homes, 120 apartments, 142 townhouses and 147,500 square feet of retail
- Barrington Park (ITE Land Use Codes 210, 230) – 150 single-family detached homes, 300 condominiums
- Millville Town Center (ITE Land Use Codes 230, 820) – 68 townhouses and 106,500 square feet of retail
- Bethany Bay (ITE Land Use Code 230) – 100 condominiums

Intersection Descriptions

1) Old Mill Road & Railway Road

Type of Control: All way stop controlled intersection
Northbound approach: (Railway Road) one shared left/through/right lane
Southbound approach: (Railway Road) one shared left/through/right lane
Eastbound approach: (Old Mill Road) one shared left/through/right lane
Westbound approach: (Old Mill Road) one shared left/through/right lane

2) Old Mill Road & Clubhouse Road

Type of Control: All-way stop controlled unsignalized intersection
Northbound approach: (Clubhouse Road) one shared left/through/right lane
Southbound approach: (Clubhouse Road) one shared left/through/right lane
Eastbound approach: (Old Mill Road) one shared left/through/right lane
Westbound approach: (Old Mill Road) one shared left/through/right lane

3) Delaware Route 26 & Delaware Route 17:

Type of Control three-way signalized intersection
Northbound approach: (Delaware Route 17) exclusive left-turn lane, channelized right-turn lane (yield condition)
Eastbound approach: (Delaware Route 26) one shared through/right-turn lane
Westbound approach: (Delaware Route 26) exclusive left-turn lane, one through lane

4) Delaware Route 26 & Railway Road

Type of Control: three-way unsignalized intersection
Southbound approach: (Railway Road) one stop controlled shared left/right lane
Eastbound approach: (Delaware Route 26) one shared left/through lane
Westbound approach: (Delaware Route 26) one shared through/right lane

5) Delaware Route 26 & Old Mill Road

Type of Control: four-way signalized intersection
Northbound approach: (Old Mill Road) under construction, one shared left/through lane, one right-turn lane

Southbound approach: (Old Mill Road) one exclusive left-turn lane, one shared through/right lane
Eastbound approach: (Delaware Route 26) one exclusive left-turn lane, one shared through/right lane
Westbound approach: (Delaware Route 26) one shared left/through turn lane, one exclusive right-turn lane

6) Delaware Route 26 & Central Avenue

Type of Control: four-way signalized intersection
Northbound approach: (Central Avenue) one shared left/through/right lane
Southbound approach: (Central Avenue) one shared left/through lane and an exclusive right-turn lane
Eastbound approach: (Delaware Route 26) one exclusive left-turn lane, one shared through/right lane
Westbound approach: (Delaware Route 26) one exclusive left-turn lane, one shared through/right lane

Transit, Pedestrian, and Bicycle Facilities

Existing transit service: There are no known existing transit facilities in the project area.

Planned transit service: There are no planned expansions of DelDOT service in the area.

Existing bicycle and pedestrian facilities: The *Delaware Kent and Sussex Counties Bicycle Touring Map* designates all roadways within the project area as having above average cycling conditions with the exception of the section of Central Avenue just south of Delaware Route 26. This portion is rated as having below average bicycling conditions.

Planned bicycle and pedestrian facilities: No planned bicycle or pedestrian facilities are currently known to exist for the area.

Previous Comments

All comments from DelDOT's Scoping Letter and Preliminary TIS (PTIS) Review were addressed in the Final TIS submission. However, there were no HCS printouts to reference. In addition, it appears that although the submitter included the HCS files for the original FTIS, there are no files to reference for the addendum, which makes it impossible to determine if the enclosed LOS tables are correct and to compare McCormick Taylor's HCS with Orth Rodgers HCS.

General HCS Analysis Comments

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

1) McCormick Taylor used a minimum peak hour factor of 0.92 in all cases. The TIS used 0.88 for some intersections.
2) The level of service results in the TIS are not consistent with DelDOT level of service criteria, which utilizes both the HCS reported level of service and the X-critical value. The levels of service shown in this review letter (both "per TIS" and "per McCormick Taylor" review are consistent with DelDOT level of service criteria as noted in the *Rules & Regulations for Subdivision Street*s.
3) Although the submitter included the HCS files for the original FTIS, there are no files to reference for the addendum, which makes it impossible to determine if the enclosed LOS tables are correct and to compare McCormick Taylor's HCS with Orth Rodgers HCS.
4) The TIS used HCS version 4.1e for their analysis, McCormick Taylor used 4.1f for their analysis.

Table 2
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Unsignalized Intersection [1] **All-Way Stop Control**	**LOS per TIS**			**LOS per McCormick Taylor**		
Old Mill Road and Railway Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2004 Existing (Case 1)						
Eastbound Old Mill Road	A (8.0)	A (7.8)	A (9.4)	A (8.0)	A (7.8)	A (9.4)
Westbound Old Mill Road	A (7.7)	A (8.1)	A (9.1)	A (7.7)	A (8.1)	A (9.1)
Northbound Railway Road	A (7.8)	A (7.6)	A (8.5)	A (7.8)	A (7.6)	A (8.5)
Southbound Railway Road	A (7.8)	A (8.0)	A (9.2)	A (7.8)	A (8.0)	A (9.2)
Overall Intersection Delay	A (7.9)	A (7.9)	A (9.1)	A (7.9)	A (7.9)	A (9.1)
2015 Without Development (Case 2)						
Eastbound Old Mill Road	B (12.1)	B (10.6)	C (18.6)	B (11.7)	B (10.6)	C (17.0)
Westbound Old Mill Road	A (8.9)	B (11.9)	C (15.5)	A (8.8)	B (11.6)	B (14.5)
Northbound Railway Road	A (8.8)	A (9.1)	B (11.4)	A (8.8)	A (9.1)	B (11.0)
Southbound Railway Road	A (9.3)	A (9.6)	B (13.2)	A (9.3)	A (9.5)	B (12.7)
Overall Intersection Delay	B (10.8)	B (10.9)	C (15.8)	B (10.5)	B (10.8)	B (14.7)
2015 With Development (Case 3)						
Eastbound Old Mill Road	C (16.0)	B (14.8)	E (39.9)	C (15.1)	B (14.5)	D (31.9)
Westbound Old Mill Road	B (10.4)	C (19.0)	D (30.0)	B (10.3)	C (17.6)	D (25.0)
Northbound Railway Road	B (10.0)	B (12.6)	C (17.4)	A (9.8)	B (12.3)	C (16.0)
Southbound Railway Road	B (13.4)	B (13.1)	C (24.6)	B (13.3)	B (12.7)	C (22.4)
Overall Intersection Delay	B (13.8)	C (15.7)	D (30.0)	B (13.3)	C (15.0)	D (25.2)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[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 3
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Unsignalized Intersection [2] All-Way Stop Control	**LOS per TIS**			**LOS per McCormick Taylor**		
Old Mill Road and Club House Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2004 Existing (Case 1)						
Eastbound Old Mill Road	A (8.7)	A (8.1)	A (9.9)	A (8.7)	A (8.1)	A (9.9)
Westbound Old Mill Road	A (8.3)	A (8.5)	A (9.0)	A (8.3)	A (8.5)	A (9.0)
Northbound Club House Road	A (7.7)	A (7.8)	A (8.2)	A (7.7)	A (7.8)	A (8.2)
Southbound Club House Road	A (8.7)	A (8.1)	A (9.0)	A (8.7)	A (8.1)	A (9.0)
Overall Intersection Delay	A (8.5)	A (8.3)	A (9.3)	A (8.5)	A (8.3)	A (9.3)
2015 Without Development (Case 2)						
Eastbound Old Mill Road	B (13.3)	B (11.0)	C (20.3)	B (12.6)	B (10.8)	C (18.6)
Westbound Old Mill Road	A (9.5)	B (12.6)	B (13.8)	A (9.3)	B (12.6)	B (13.5)
Northbound Club House Road	A (8.6)	A (9.0)	A (9.7)	A (8.5)	A (9.0)	A (9.6)
Southbound Club House Road	A (9.7)	A (9.4)	B (10.9)	A (9.6)	A (9.4)	B (10.7)
Overall Intersection Delay	B (11.6)	B (11.5)	C (16.5)	B (11.2)	B (11.5)	C (15.5)
2015 With Development (Case 3)						
Eastbound Old Mill Road	C (16.3)	B (11.9)	D (25.3)	C (15.1)	B (11.7)	C (22.5)
Westbound Old Mill Road	A (9.9)	B (14.5)	C (15.5)	A (9.7)	B (14.4)	C (15.1)
Northbound Club House Road	A (8.9)	A (9.3)	A (9.9)	A (8.8)	A (9.3)	A (9.8)
Southbound Club House Road	B (10.0)	A (9.7)	B (11.2)	A (9.9)	A (9.7)	B (11.0)
Overall Intersection Delay	B (13.6)	B (12.9)	C (19.7)	B (12.9)	B (12.8)	C (18.1)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[2] 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 4
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Signalized Intersection [3]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 26 and Delaware Route 17	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2004 Existing (Case 1)	B (0.46)	B (0.50)	C (0.89)	B (0.49)	B (0.54)	B (0.78)
2015 Without Development (Case 2) [4]	C (0.93)	D (0.94)	F (1.75)	B (0.72)	C (0.90)	F (1.20)
2015 With Development (Case 3) [4]	C (0.94)	E (0.97)	F (1.96)	C (0.71)	D (0.90)	F (1.26)
2015 With Development (Case 3) *with Improvement Options* [5, 6]	NA	NA	NA	C (0.65)	C (0.75)	D (0.92)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[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] McCormick Taylor's analysis for Cases 2 and 3 include committed improvements for the Route 26 Planning Study. This includes an exclusive eastbound right-turn lane along Route 26 that the TIS did not have in their analysis. It is likely that these improvements were not committed at the time of analysis.
[5] Improvement option includes converting the eastbound right-turn lane into a shared through/right lane along with a second receiving lane on Route 26, and a second northbound left-turn lane along Route 17 along with a second receiving lane on Route 26.
[6] The TIS did not recommend improvements for this intersection citing that DelDOT's Route 26 Improvement Project will address the future unacceptable levels of service.

Table 5
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Unsignalized Intersection [7] **One-Way Stop Control**	**LOS per TIS** [8]			**LOS per McCormick Taylor**		
Delaware Route 26 and Railway Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2004 Existing (Case 1)						
Eastbound Route 26 - Left	A (8.0)	A (8.7)	A (10.0)	A (8.0)	A (8.7)	A (10.0)
Southbound Railway Road	B (11.9)	C (15.3)	D (27.8)	B (11.9)	C (15.3)	D (27.8)
2015 Without Development (Case 2) [9]						
Eastbound Route 26 - Left	A (8.6)	B (10.8)	B (14.6)	A (8.7)	B (10.9)	B (14.5)
Southbound Railway Road	C (16.7)	E (42.5)	F (454.0)	C (16.7)	E (41.4)	F (389.6)
2015 With Development (Case 3) [9]						
Eastbound Route 26 - Left	A (8.7)	B (12.0)	C (16.6)	A (8.8)	B (12.1)	C (16.4)
Southbound Railway Road	C (18.8)	F (73.3)	F (768.3)	C (18.7)	F (68.4)	F (768.3)
2015 With Development (Case 3) *with Improvement Options* [10]						
Eastbound Route 26 - Left	A (8.7)	B (12.0)	C (16.6)	A (8.8)	B (12.1)	C (16.4)
Southbound Railway Road - Right	C (16.6)	E (39.3)	F (172.2)	C (15.1)	D (25.7)	F (75.0)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[7] 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.
[8] The TIS and McCormick Taylor had differing truck percentages in their analysis. It appears that the TIS dropped or raised their truck percentages occasionally without a logical pattern.
[9] McCormick Taylor's analysis for Cases 2 and 3 include committed improvements for the Route 26 Planning Study. This includes an exclusive westbound right-turn lane along Route 26 that the TIS did not have in their analysis. It is likely that these improvements were not committed at the time of analysis.
[10] Orth Rodgers' improvement option includes an exclusive southbound left-turn lane. McCormick Taylor's improvement option includes restricting southbound left-turning traffic from Railway Road onto Route 26. Traffic wishing to travel west on Route 26 should travel southwest on Old Mill Road and use the signal at Route 26 instead.

Table 6
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Signalized Intersection [11]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 26 and Old Mill Road	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2004 Existing (Case 1) [12, 13]	C (0.51)	C (0.64)	C (0.87)	C (0.48)	C (0.57)	D (0.79)
2015 Without Development (Case 2) [14]	D (0.86)	F (1.04)	F (1.14)	D (0.86)	F (1.06)	F (1.31)
2015 With Development (Case 3) [13]	D (0.91)	F (1.06)	F (1.16)	D (0.91)	F (1.09)	F (1.33)
2015 With Development (Case 3) *with Improvement Option 1* [15]	NA	NA	NA	D (0.70)	D (0.93)	F (1.15)
2015 With Development (Case 3) *with Improvement Option 2* [16]	NA	NA	NA	C (0.50)	C (0.71)	D (0.87)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[11] 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.
[12] McCormick Taylor used the more recent lane configuration for analysis, which was observed in the field during the field view. This lane configuration includes a separate left, through and right-turn lane along northbound Old Mill Road, and an exclusive right-turn lane along eastbound Route 26. These improvements were likely not in place at the time of Orth Rodgers' field view.
[13] McCormick Taylor used the signal timings dated 8-18-05 for this intersection. They included the new lane configuration as well as indicating that it is a coordinated signal. Orth Rodgers used old signal timings from 3-4-03.
[14] McCormick Taylor's analysis for Cases 2 and 3 include committed improvements for the Route 26 Planning Study. This includes an exclusive southbound right-turn lane along Old Mill Road that the TIS did not have in their analysis. It is likely that these improvements were not committed at the time of analysis.
[15] Improvement option 1 consists of adding an additional southbound left-turn lane on Old Mill Road and a corresponding receiving lane on eastbound Route 26.
[16] Improvement option 2 includes converting the eastbound right-turn lane to a shared through/right lane along Route 26, reconfiguring the southbound Old Mill Road approach to a dual left-turn lane and a through/right-turn lane, and adding an additional westbound through lane along Route 26.

Table 7
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Signalized Intersection [17]	**LOS per TIS**			**LOS per McCormick Taylor**		
Delaware Route 26 and Central Avenue	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2004 Existing (Case 1) [18, 19]	B (0.48)	B (0.68)	D (0.94)	C (0.50)	C (0.54)	E (0.97)
2015 Without Development (Case 2) [19]	C (0.67)	D (0.90)	F (1.50)	D (0.85)	E (1.09)	F (2.19)
2015 With Development (Case 3) [19]	C (0.70)	D (0.92)	F (1.56)	D (0.88)	F (1.16)	F (2.57)
2015 With Development (Case 3) *with Improvement Option 1* [20]	NA	NA	NA	D (0.84)	D (0.94)	F (1.19)
2015 With Development (Case 3) *with Improvement Option 2* [21]	NA	NA	NA	C (0.65)	C (0.78)	D (0.95)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[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] McCormick Taylor used the more recent lane configuration for analysis, which was observed in the field during the field view. This lane configuration includes a separate right-turn lane along southbound Central Avenue. These improvements were likely not in place at the time of Orth Rodgers' field view.
[19] For the Existing Case and Cases 2 and 3 Orth Rodgers used concurrent phasing and did not coordinate the signal. McCormick Taylor kept it as split phasing and coordinated the signal as consisted with DelDOT's most recent signal timing plan. In addition, as consistent with the Route 26 Mainline improvement plans, McCormick Taylor assumed committed improvements that included an exclusive left and right turning lanes for northbound Central Avenue, a southbound left turn lane on southbound Central Avenue and a westbound right turn lane on Route 26.
[20] Improvement option 1 includes an additional eastbound left-turn lane on Route 26 and subsequent receiving lane on northbound Central Avenue. The phasing for the northbound and southbound movements was changed to concurrent phasing.
[21] Improvement option 2 consists of adding an additional eastbound through lane on Route 26, and converting the westbound right-lane into a shared through/right-turn lane, along with subsequent receiving lanes on both directions. The phasing for the northbound and southbound movements was changed to concurrent phasing.

Table 8
PEAK HOUR LEVELS OF SERVICE (LOS)
based on Traffic Impact Study for Proposed Residential Project on Railway Road
Report dated November 2005
Prepared by Orth-Rodgers Associates, Inc.

Unsignalized Intersection [22] **One-Way Stop Control**	**LOS per TIS**			**LOS per McCormick Taylor**		
Railway Road and Site Access	Weekday AM	Weekday PM	Saturday Mid-Day	Weekday AM	Weekday PM	Saturday Mid-Day
2015 With Development (Case 3)						
Eastbound Site Access	A (10.0)	A (9.3)	B (10.0)	A (9.9)	A (9.2)	B (10.0)
Northbound Railway Road - Left	A (7.7)	A (7.7)	A (7.9)	A (7.7)	A (7.7)	A (7.9)

Note: Case 3 HCS analyses by the TIS and McCormick Taylor are based on outdated proposed development of 600 condominiums, as evaluated by the TIS dated July 29, 2005 and November 16, 2005 (addendum).

[22] 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.