Orth - Rodgers & Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

Addendum to the TRAFFIC IMPACT STUDY

Proposed Residential Project on Railway Road

Proposed Residential Development
Sussex County, Delaware

Prepared for
Linder & Company, Inc.

Prepared by
Orth-Rodgers & Associates, Inc.
November 16, 2005

OR&A Job No. 2004_238

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INTRODUCTION

Orth-Rodgers & Associates, Inc. (ORA) has re-analyzed the 2015 full build scenario (a.m., p.m., and Saturday peak hours) for this project due to a change in the proposed land use. Linder & Company, Inc. has purchased an additional 50.19 acres (Tax parcel 1-34-12-74.00), formerly Evans Farm, adjacent to the Bethany Bay Project. This newly acquired land is on the northwest corner of Old Mill Road (Rd 249) and Railway Road (Rd 350). With this additional land the number of proposed residential condominiums has increased from 480 units to 600 units. A comparison of the previous and existing land use is included in Table I. In the original traffic impact study, submitted to DelDOT on July 29, 2005, the site entrance was located at the end point of Railway Road (Rd 350) and therefore had no access driveway to analyze. With this additional land acquired an additional site driveway will be constructed somewhere on Railway Road (Rd 350) north of Old Mill Road (Rd 349). Since an updated site plan is not yet available this addendum has assumed fifty percent utilizing the end point of Railway Road (Rd 350) with the other fifty percent utilizing the new site driveway along Railway Road (Rd 350) north of Old Mill Road (Rd 349). **All figures and tables in this addendum replace the figures/tables in the July 29, 2005 traffic impact study.**

Table IA. Proposed land use

Land Use	ITE-Code	Quantity
Previous land use - Condos	230	480 Units
Current land use – Condos	230	600 Units

TRIP GENERATION and DISTRIBUTION

Trip Generation

Trip generation rates for the site were obtained directly from the data found in the Institute of Transportation Engineers' Trip Generation, *7th Edition*. Specifically, data for residential condominium/townhouse (land use 230) was used.

The traffic volumes projected to be generated for the development are outlined in Table II for the a.m., p.m., and Saturday peaks. Due to the nature of the site, items such as pass-by trips and internal trip capture do not apply. The trip generation calculations can be found in Appendix A.

Table VIA.

Pettinaro Project - Peak Hour Trip Generation

Proposed Land Use	ITE Code	A.M. Peak Hour			P.M. Peak Hour			Saturday Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
600 Condominiums	230	37	180	217	175	86	261	117	100	217
TOTALS		**37**	**180**	**217**	**175**	**86**	**261**	**117**	**100**	**217**

Trip Distribution

The distribution of the site-generated traffic was based on the type of land use and the existing traffic patterns in the study area in relation to the proposed site access points. This distribution was used to assign the site-generated traffic to the roadway network for the a.m., p.m., and Saturday peaks. In general, this report assumes:

- 15 percent of the site traffic will enter/exit westbound on Old Mill Road,
- 20 percent will enter/exit westbound via Delaware Route 26,
- 25 percent will enter/exit via Delaware Route 17,
- 20 percent will enter/exit eastbound via Delaware route 26,
- 10 percent will enter/exit via Cedar Avenue,
- 5 percent will enter/exit northbound via Central Avenue,
- 5 percent will be gained/lost to Food Lion/Casapulla's shopping center.

The proposed trip distribution for this site is shown in Figure 60A.

By applying the proposed trip distribution percentages to the trip generation data, we developed the peak hour traffic volumes for the site. The projected site traffic for the a.m., p.m., and Saturday peak hours are shown in Figures 61A, 62A, and 63A.

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FIGURE 60A

Pettinaro Project On Railway Road Proposed Trip Distribution

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE

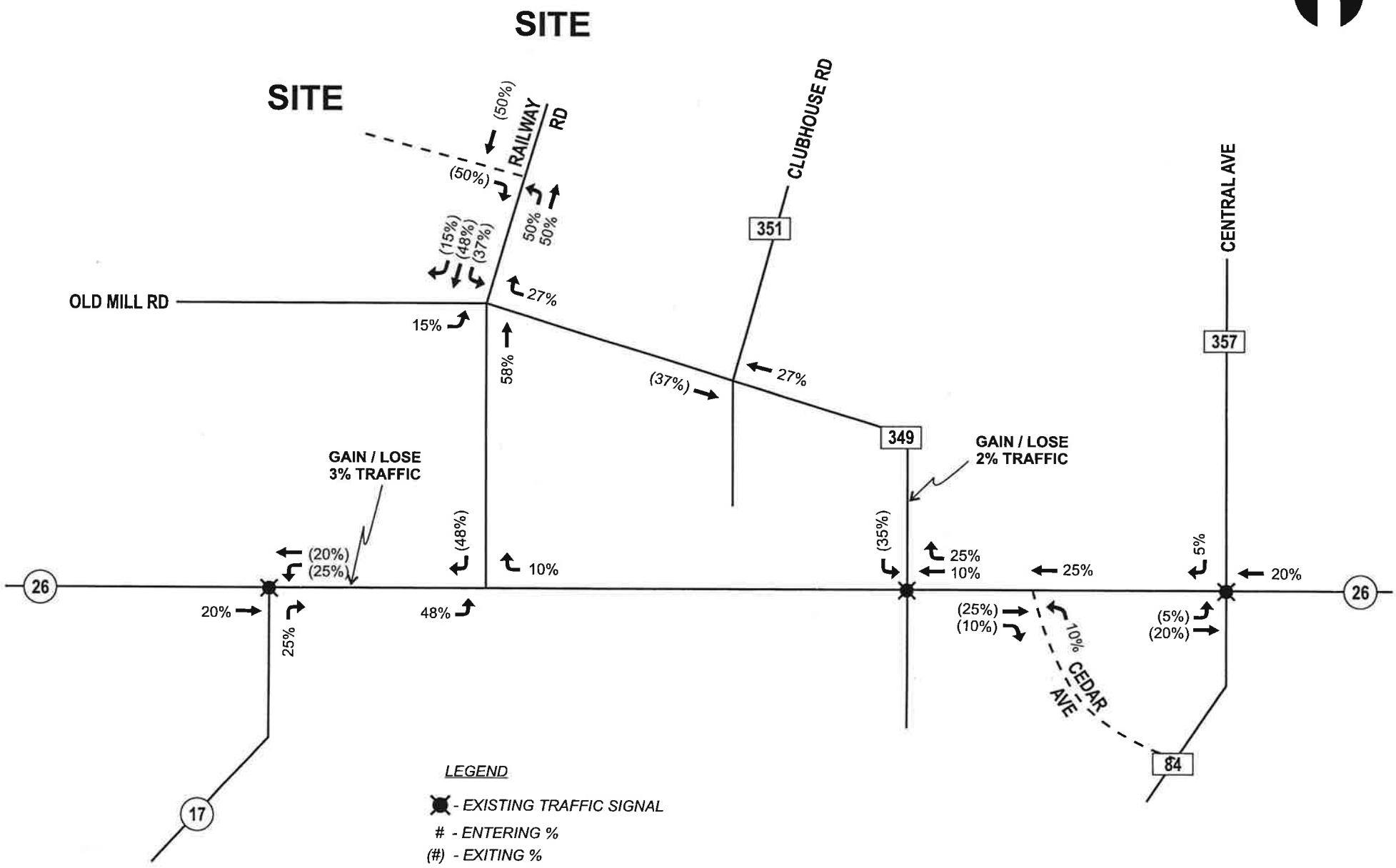

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FIGURE 61A

AM Peak Hour Site Traffic From Pettinaro Project On Railway Road

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE

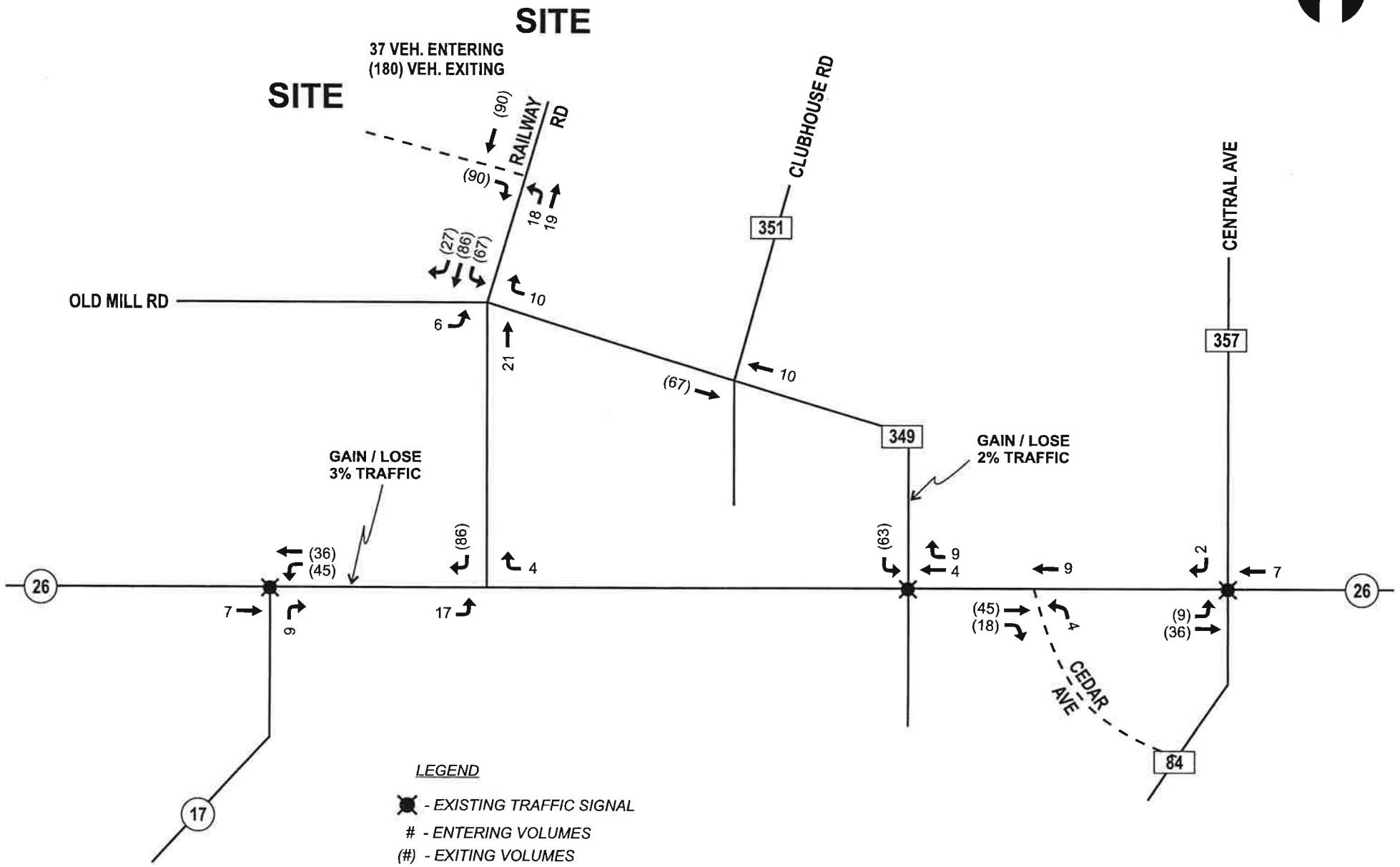

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FIGURE 62A

PM Peak Hour Site Traffic From Pettinaro Project On Railway Road

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE

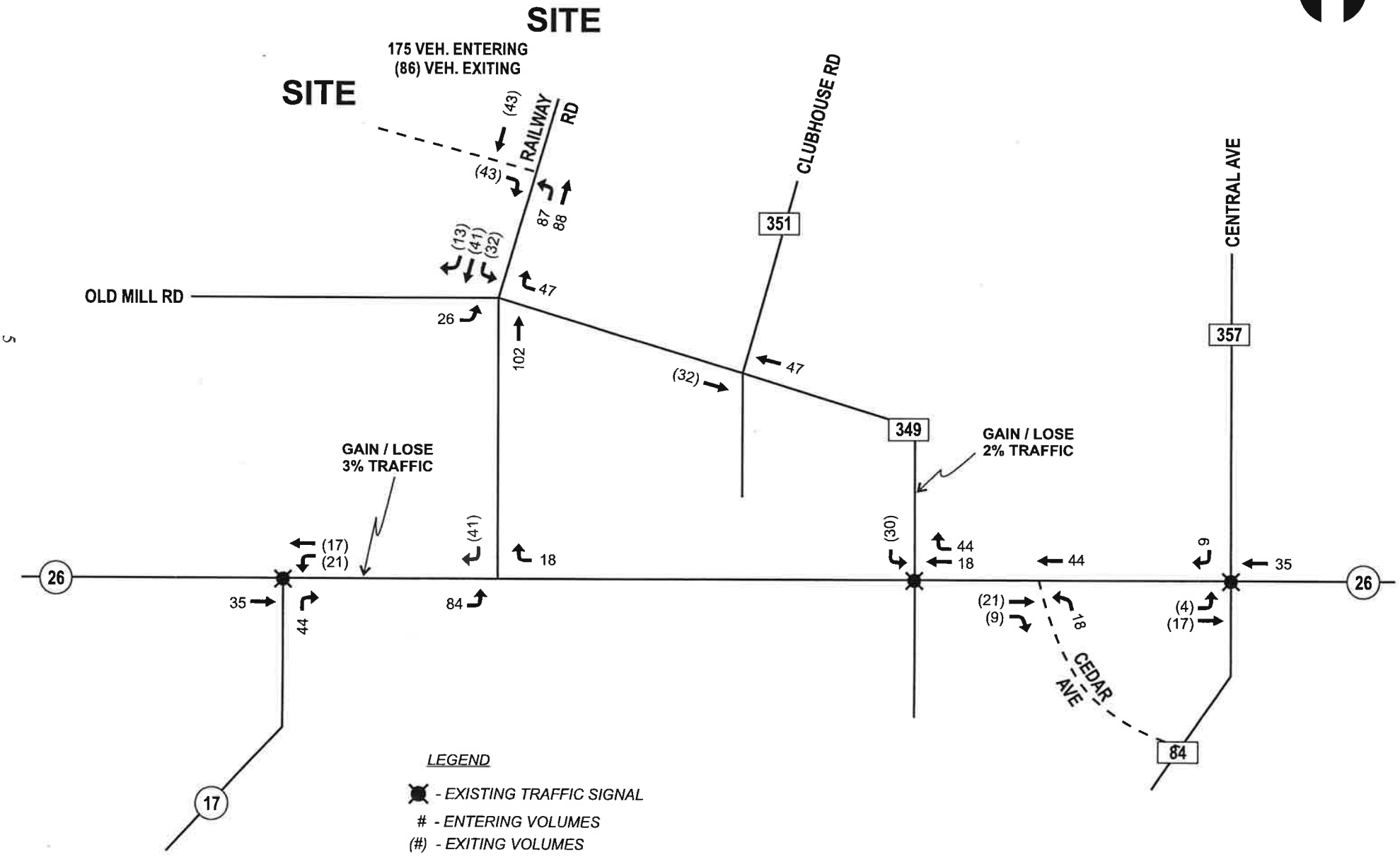

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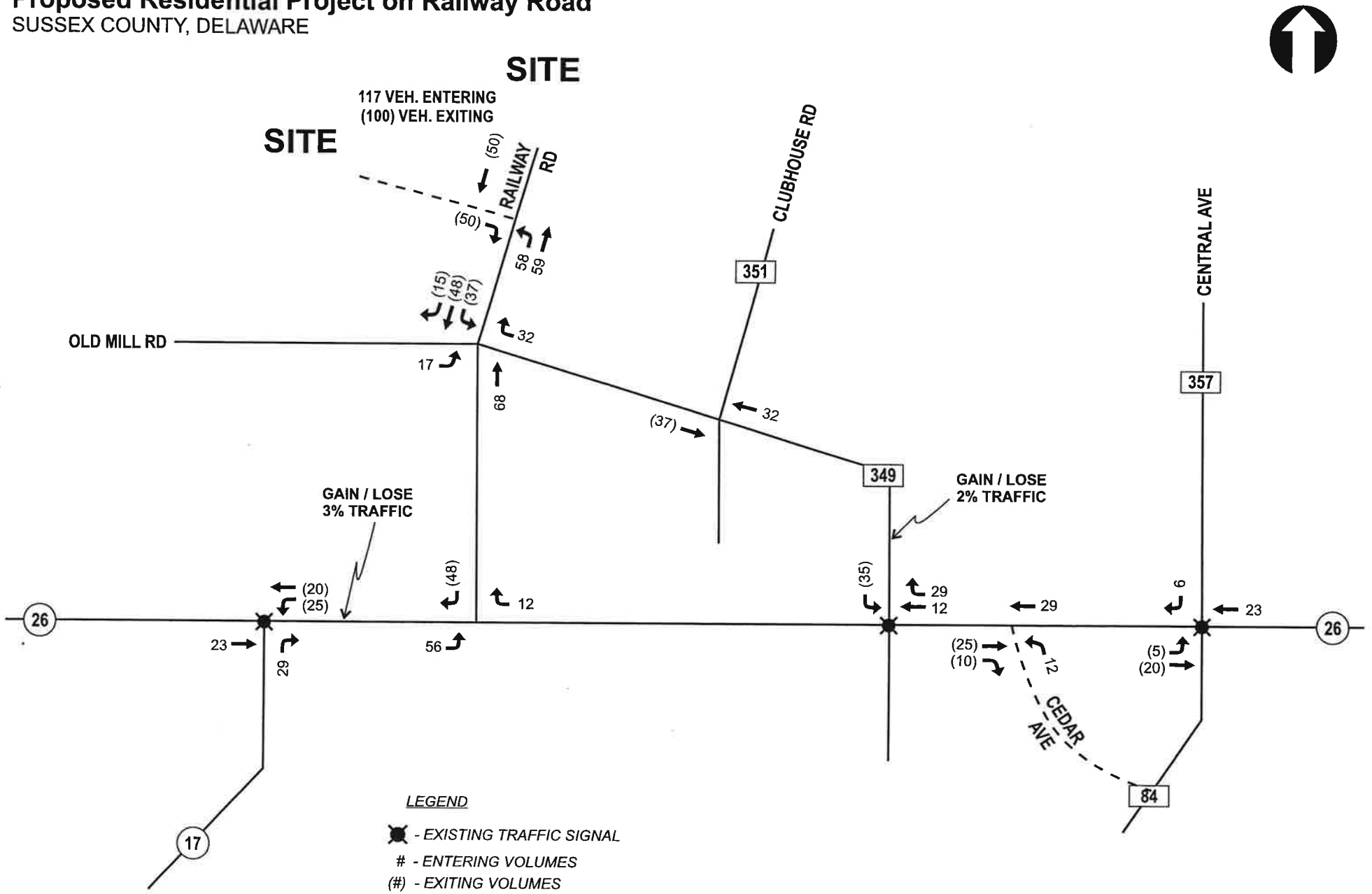
FIGURE 63A

Saturday Peak Hour Site Traffic From Pettinaro Project On Railway Road

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE



FUTURE TRAFFIC WITH THE PROPOSED SITE

With the anticipated site generated traffic identified, the full build traffic volumes were developed by adding the site traffic (Figures 61A, 62A, and 63A of this addendum) to the projected no build traffic volumes (Figures 57, 58, and 59 of the July 29, 2005 report). The results are shown in the following figures:

Figure 64A	2015 AM peak hour full build traffic volumes
Figure 65A	2015 PM peak hour full build traffic volumes
Figure 66A	2015 Saturday peak hour full build traffic volumes

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FIGURE 64A

2015 AM Peak Hour Full Build Traffic Volumes

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE

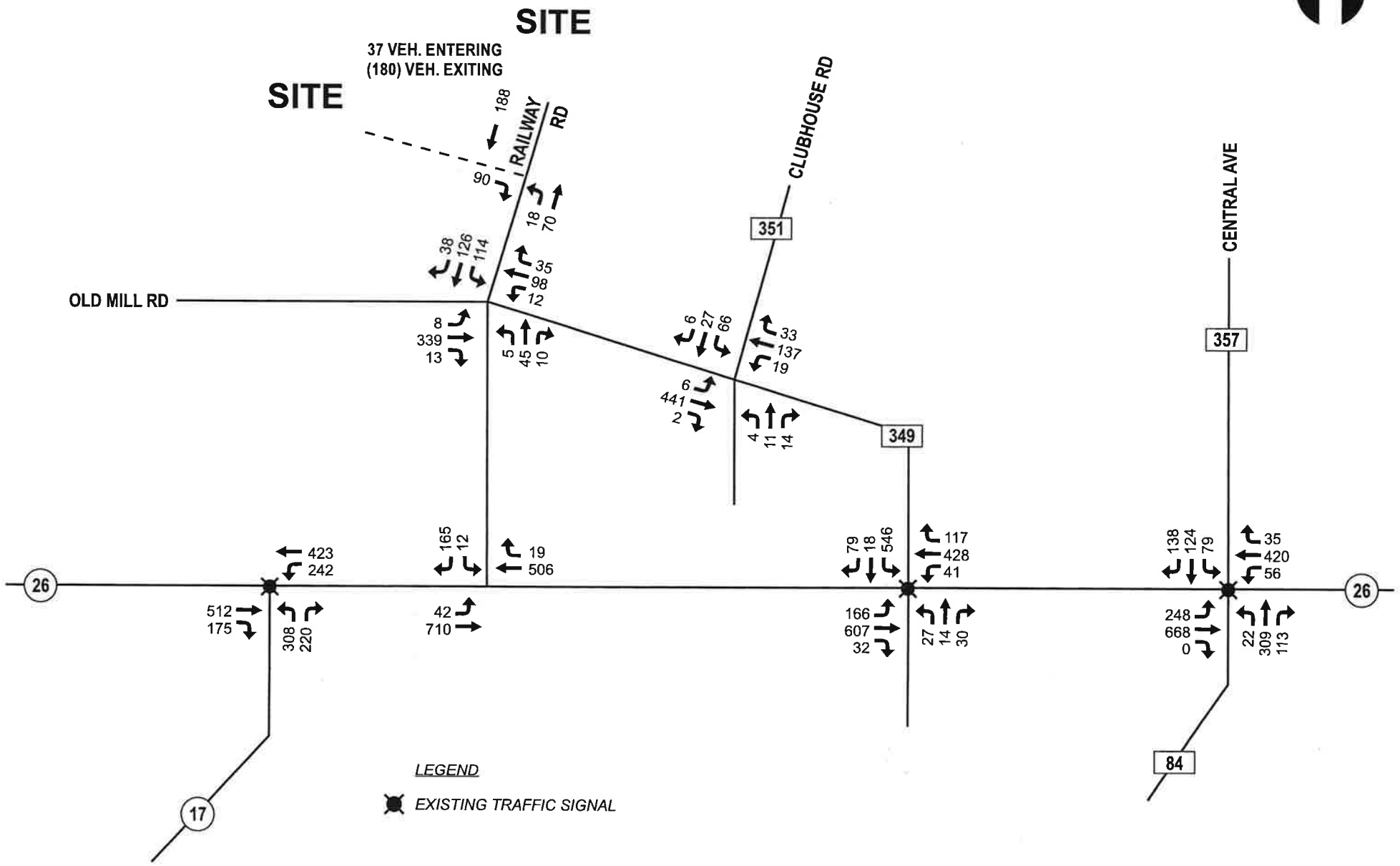

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FIGURE 65A

2015 PM Peak Hour Full Build Traffic Volumes

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE

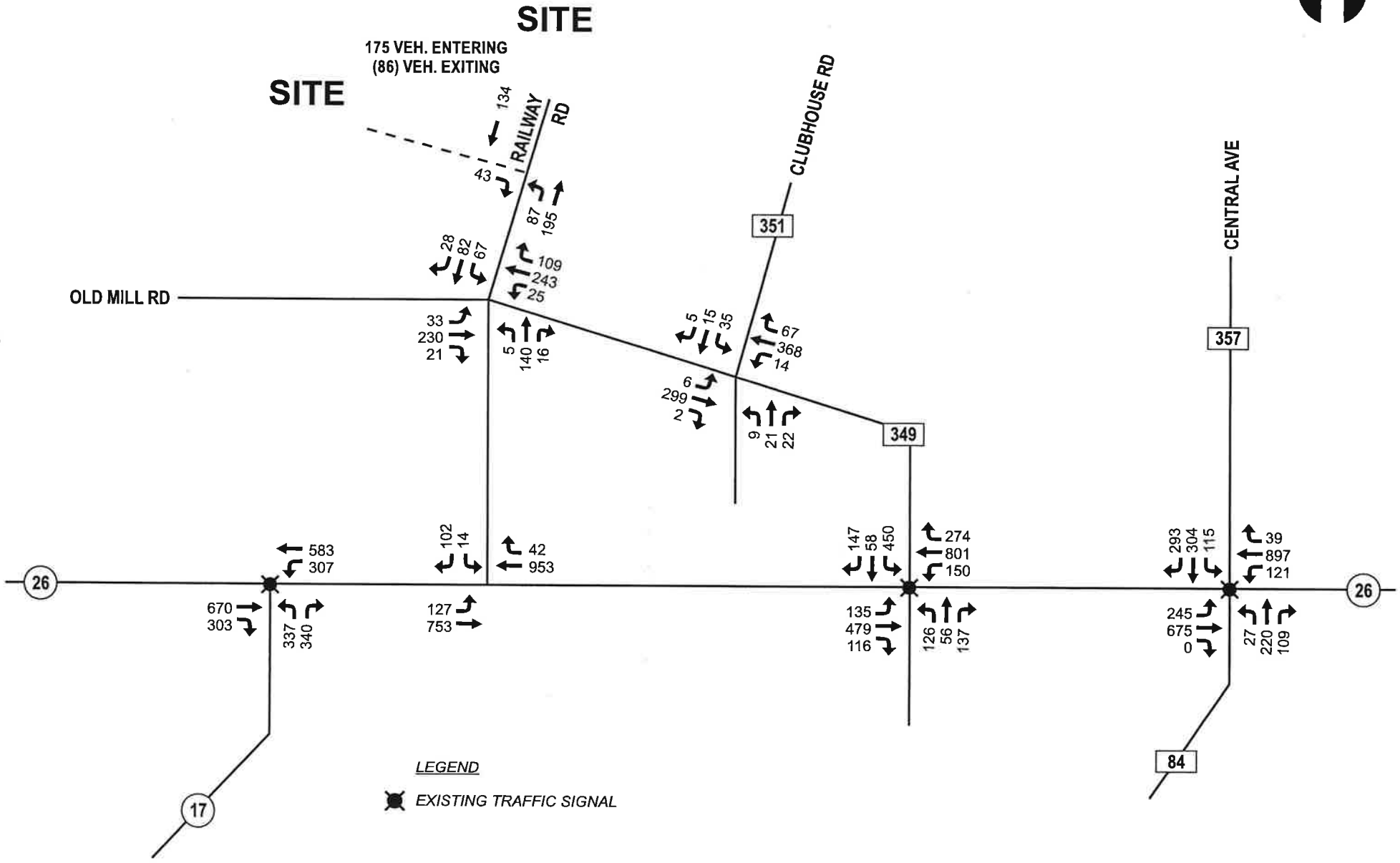

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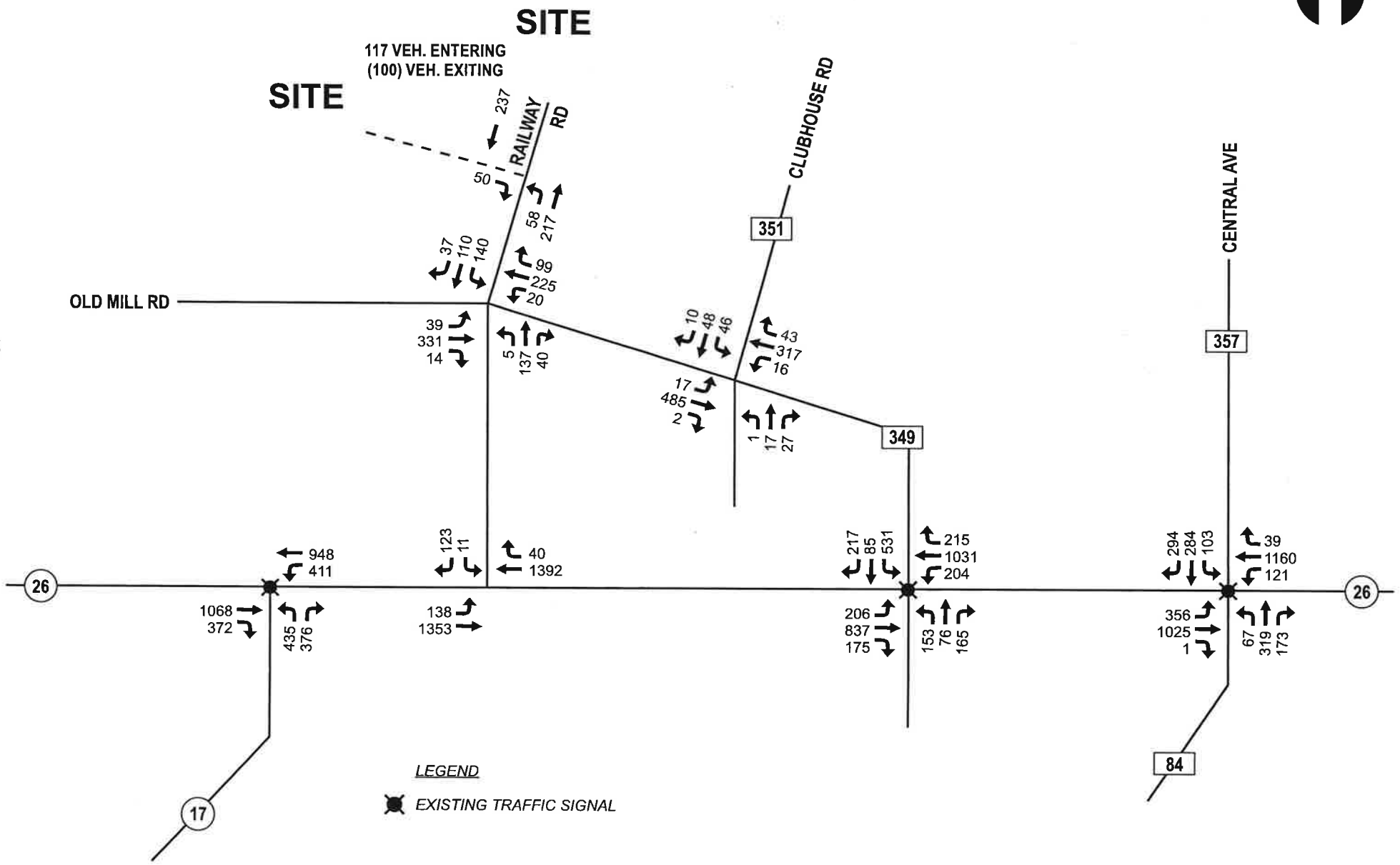
FIGURE 66A

2015 Saturday Peak Hour Full Build Traffic Volumes

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE



CAPACITY ANALYSIS

A volume/capacity analysis has been done for each of the study intersections and the proposed driveway locations for the site. The analysis was conducted using Highway Capacity Software, Release 4.1e (HCS). As part of this addendum the following scenario was re-analyzed:

- Future - 2015 full build a.m., p.m., and Saturday peak hours

It should be noted that the HCS results for the existing and future no build scenarios have not changed from what was previously included in the original TIS submission.

At the request of the Department, peak hour factors and heavy vehicles were defined by lane group. The existing signals along Delaware Route 26 are fully actuated traffic signals. The signal timing and phasing used in this analysis were based on the actual operation of the signals as noted in the field. For future conditions, certain intersection timing plans were modified to accommodate planned improvements while others were optimized within the parameters of the existing timing plans. Specifically in the future scenarios, the westbound advance phase green time of Delaware Route 26 approaching Delaware Route 17 was extended beyond the fixed ten seconds.

The results of this analysis are defined in terms of average delay. This delay is used as a measure of the driver's expectation for given conditions. Because operating at or near capacity is usually tolerable to most drivers, a descriptive concept has been developed for intersections called level of service. Levels of service range from 'A' to 'F' and are based on delay in seconds for each movement. A more detailed level of service description is summarized in Table VIIA for unsignalized intersections and Table VIIIA for signalized intersections. The existing and future levels of service for the report are summarized for comparison purposes in Table IXA. The HCS computer disk is included in Appendix B.

2015 Full Build Analysis

Due to anticipated growth, it is expected that traffic will increase over time and in general vehicular delays will increase from what they are today. As part of this analysis, proposed improvements were developed for intersections that showed levels of service of 'E' or worse, with an overall goal of achieve levels of service 'D' or better. Assuming upgrades are implemented, as stated in the 2015 no build scenario (DelDOT's Route 26 improvements, Millville Town Center improvements, and Bay Forest improvements), certain intersections will still operate with poor levels of service when the development is completed. The weekday a.m. peak hour shows that all six intersections continue to have acceptable levels of service while the weekday p.m. peak hour shows that three of the six intersections have unacceptable levels of service. The intersections that have unacceptable levels of service during the p.m. peak hour are:

- ✓ Delaware Route 26 and Delaware Route 17 – This intersection has acceptable levels of service for the no build scenario, with the overall (x-critical) v/c ratio at 0.94. DelDOT's definition of acceptable levels of service for signalized intersections must meet the criteria of overall level of service 'D' or better with an x-critical of 0.95 or lower. Since the no build scenario shows an x-critical of 0.94, any additional traffic added to this intersection in the full build analysis will push the x-critical over the acceptable 0.95. So even though the full build analysis shows an acceptable overall level of service 'D', DelDOT deems this intersection as having unacceptable levels of service with its 0.97 x-critical.

- ✓ Delaware Route 26 and Railway Road – continues to have unacceptable levels of service as found in the no build analysis,
- ✓ Delaware Route 26 and Old Mill Road – continues to have unacceptable levels of service as found in the no build analysis.

The intersections that have unacceptable levels of service during the summer Saturday peak hour are:

- ✓ Delaware Route 26 and Delaware Route 17,
- ✓ Delaware Route 26 and Railway Road,
- ✓ Delaware Route 26 and Old Mill Road, and
- ✓ Delaware Route 26 and Central Avenue.

In order to reduce the impact of the proposed site, the following recommendations were identified for locations needing improvements or found to have poor or potentially poor levels of service:

Railway Road and Site Driveway - A site driveway is proposed north of Old Mill Road (Rd 349) as part of the additional land acquired. This site driveway is in addition to the other entrance proposed for this site, which is at the endpoint of Railway Road. Since there is no site plan showing the layout of the condominiums, this report has assumed that fifty-percent of the traffic will utilize this new proposed site entrance. This proposed unsignalized site driveway (t-intersection) would operate at a level of service 'b' or better during the peak periods with a minimal driveway design of one exiting lane and one receiving lane with a stop sign traffic control for the site driveway. This driveway shall be constructed according to the Standards and Regulations for Access to State Highways, published by the Delaware Department of Transportation.

Delaware Route 26 and Delaware Route 17 - Under existing conditions, this intersection has acceptable levels of service for all three-peak periods. In the future no build and full build scenarios, this intersection has unacceptable levels of service. DelDOT's Delaware Route 26 Improvement Project has recognized the need to improve intersections along this route, which was already incorporated at this intersection. However, specifically the Saturday peak hour shows significant delays for both the no build and full build scenario due to high volume caused by beach traffic. The need for improvement at this location is mainly related to regional traffic patterns. Any improvement at this intersection would go well beyond the scope of the proposed residential project on Railway Road, therefore no improvements are recommended.

Delaware Route 26 and Railway Road – Under existing conditions, this intersection has acceptable levels of service for all three-peak periods. For the future scenarios (2015 no build and full build), this intersection has unacceptable levels of service for both the weekday p.m. peak and summer Saturday peak periods. These delays are due to unacceptable gaps in traffic for side-street movements to enter onto Delaware Route 26. DelDOT's Delaware Route 26 Improvement Project shows that this intersection will have an eastbound Delaware Route 26 by-pass lane with Railway Road being slightly re-aligned with Delaware Route 26. As a result of this proposed development, improvements should also include widening the southbound approach of Railway Road so it will have a separate left and right-turn lane. Even though this improvement will not gain acceptable levels of service, the delays are significantly decreased.

Delaware Route 26 and Old Mill Road (Rd 349) - Under existing conditions, this intersection has acceptable levels of service for all three-peak periods. For the future scenarios (2015 no build and full build), this intersection has unacceptable levels of service for both the weekday p.m. peak

and summer Saturday peak periods. Between DelDOT's Delaware Route 26 Improvement Project and the Millville Town Center improvements this intersection will have an additional eastbound Delaware Route 26 right-turn lane, westbound Delaware Route 26 left-turn lane, northbound Millville Town Center driveway left-turn lane, through lane, and right turn lane, while southbound Old Mill Road will change lane assignments to have a separate left-turn lane and a shared through/right lane. With these improvements, this intersection will continue to have unacceptable levels of service. Any additional improvement at this intersection would go beyond the scope of the proposed residential project on Railway Road, therefore no improvements are recommended as part of this project.

Delaware Route 26 and Central Avenue (Rd 84/Rd 357) - Under existing conditions, this intersection has acceptable levels of service for all three-peak periods. For the future scenarios (2015 no build and full build), this intersection has unacceptable levels of service for the summer Saturday peak periods. Between DelDOT's Delaware Route 26 Improvement Project and the Bay Forest improvements this intersection will have a westbound Delaware Route 26 separate left-turn lane, through lane, and right-turn lane and a northbound/southbound Central Avenue separate left, through, and right turn lanes. With these improvements, this intersection will continue to have unacceptable levels of service for the Saturday peak hour. Any additional improvement at this intersection would go beyond the ability of any one developer, therefore no improvements are recommended.

The 2015 Full Build levels of service with the DelDOT roadway improvements are shown in Figures 73A, 74A, and 75A.

TABLE VIIA

LEVEL OF SERVICE AND EXPECTED DELAY
FOR UNSIGNALIZED INTERSECTIONS (TWO-WAY STOP CONTROLLED)

LEVEL OF SERVICE	EXPECTED TRAFFIC DELAY	AVERAGE TOTAL DELAY PER VEHICLE (sec)
a	Little or no delay	0 to 10.0
b	Short traffic delays	10.1 to 15.0
c	Average traffic delays	15.1 to 25.0
d	Long traffic delays	25.1 to 35.0
e	Very long traffic delays	35.1 to 50.0
f	Volumes exceed capacity	Over 50.0

Source: Transportation Research Board, 2000 Highway Capacity Manual, published by the Transportation Research Board, Washington, D.C.

TABLE VIIIA

LEVEL OF SERVICE
FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	DESCRIPTION	AVERAGE CONTROL DELAY PER VEHICLE (sec/veh)
A	Very short delay, good progression, most vehicles do not stop at intersection.	0 to 10.0
B	Generally good signal progression and/or short cycle length, more vehicles stop at intersection than Level of Service A.	10.1 to 20.0
C	Fair progression and/or longer cycle length, significant number of vehicles stop at intersection.	20.1 to 35.0
D	Congestion becomes noticeable, individual cycle failures, longer delays from unfavorable progression, long cycle length, or high volume/ capacity ratio, most vehicles stop at intersection.	35.1 to 55.0
E	Usually considered limit of acceptable delay indication of poor progression, long cycle length, or high volume/ capacity ratio, frequent individual cycle failures.	55.1 to 80.0
F	Could be considered excessive delay in some areas, frequently and indication of saturation, or very long cycle lengths with minimal side street green time. Capacity is not necessarily exceeded under this level of service.	Over 80.0

Source: Transportation Research Board, 2000 Highway Capacity Manual, published by the Transportation Research Board, Washington, D.C.

Table IXA
Level of Service Comparisons

Railway Road & Site Driveway - Unsignalized

	AM Peak		***PM Peak***		***SATURDAY Peak***	
Movement/ Approach	2015 Full Build		2015 Full Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left	a	10.0	a	9.3	b	10.0
EB Right						
EB Overall	a	10.0	a	9.3	b	10.0
NB Left	a	7.7	a	7.7	a	7.9
NB Thru						

Table IXA (continued)
Level of Service Comparisons

Old Mill Road (Road 349) & Railway Road - Unsignalized

AM PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left						
EB Thru	a	8.0	b	12.1	c	16.0
EB Right						
EB Overall	a	8.0	b	12.1	c	16.0
WB Left						
WB Thru	a	7.7	a	8.9	b	10.4
WB Right						
WB Overall	a	7.7	a	8.9	b	10.4
NB Left						
NB Thru	a	7.8	a	8.8	b	10.0
NB Right						
NB Overall	a	7.8	a	8.8	b	10.0
SB Left						
SB Thru	a	7.8	a	9.3	b	13.4
SB Right						
SB Overall	a	7.8	a	9.3	b	13.4
Overall	a	7.9	b	10.8	b	13.8

PM PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left						
EB Thru	a	7.8	b	10.6	b	14.8
EB Right						
EB Overall	a	7.8	b	10.6	b	14.8
WB Left						
WB Thru	a	8.1	b	11.9	c	19.0
WB Right						
WB Overall	a	8.1	b	11.9	c	19.0
NB Left						
NB Thru	a	7.6	a	9.1	b	12.6
NB Right						
NB Overall	a	7.6	a	9.1	b	12.6
SB Left						
SB Thru	a	8.0	a	9.6	b	13.1
SB Right						
SB Overall	a	8.0	a	9.6	b	13.1
Overall	a	7.9	b	10.9	c	15.7

SATURDAY PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left						
EB Thru	a	9.4	c	18.6	e	39.9
EB Right						
EB Overall	a	9.4	c	18.6	e	39.9
WB Left						
WB Thru	a	9.1	c	15.5	d	30.0
WB Right						
WB Overall	a	9.1	c	15.5	d	30.0
NB Left						
NB Thru	a	8.5	b	11.4	c	17.4
NB Right						
NB Overall	a	8.5	b	11.4	c	17.4
SB Left						
SB Thru	a	9.2	b	13.2	c	24.6
SB Right						
SB Overall	a	9.2	b	13.2	c	24.6
Overall	a	9.1	c	15.8	d	30.0

Table IXA (continued)
Level of Service Comparisons

Old Mill Road (Road 349) & Clubhouse Road (Road 351) - Unsignalized

AM PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left						
EB Thru	a	8.7	b	13.3	c	16.3
EB Right						
EB Overall	a	8.7	b	13.3	c	16.3
WB Left						
WB Thru	a	8.3	a	9.5	a	9.9
WB Right						
WB Overall	a	8.3	a	9.5	a	9.9
NB Left						
NB Thru	a	7.7	a	8.6	a	8.9
NB Right						
NB Overall	a	7.7	a	8.6	a	8.9
SB Left						
SB Thru	a	8.7	a	9.7	b	10.0
SB Right						
SB Overall	a	8.7	a	9.7	b	10.0
Overall	a	8.5	b	11.6	b	13.6

PM PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left						
EB Thru	a	8.1	b	11.0	b	11.9
EB Right						
EB Overall	a	8.1	b	11.0	b	11.9
WB Left						
WB Thru	a	8.5	b	12.6	b	14.5
WB Right						
WB Overall	a	8.5	b	12.6	b	14.5
NB Left						
NB Thru	a	7.8	a	9.0	a	9.3
NB Right						
NB Overall	a	7.8	a	9.0	a	9.3
SB Left						
SB Thru	a	8.1	a	9.4	a	9.7
SB Right						
SB Overall	a	8.1	a	9.4	a	9.7
Overall	a	8.3	b	11.5	b	12.9

SATURDAY PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build	
	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left						
EB Thru	a	9.9	c	20.3	d	25.3
EB Right						
EB Overall	a	9.9	c	20.3	d	25.3
WB Left						
WB Thru	a	9.0	b	13.8	c	15.5
WB Right						
WB Overall	a	9.0	b	13.8	c	15.5
NB Left						
NB Thru	a	8.2	a	9.7	a	9.9
NB Right						
NB Overall	a	8.2	a	9.7	a	9.9
SB Left						
SB Thru	a	9.0	b	10.9	b	11.2
SB Right						
SB Overall	a	9.0	b	10.9	b	11.2
Overall	a	9.3	c	16.5	c	19.7

Table IXA (continued)
Level of Service Comparisons

Delaware Route 26 & Delaware Route 17 (Roxana Road) - Signalized

AM PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Thru	B	10.3	0.49	D	38.8	0.92	D	40.5	0.93
EB Right									
EB Overall	B	10.3	-	D	38.8	-	D	40.5	-
WB Left	A	3.2	0.09	B	13.7	0.58	B	19.0	0.72
WB Thru	A	2.4	0.16	A	8.1	0.36	A	8.3	0.40
WB Overall	A	2.6	-	A	10.0	-	B	12.2	-
NB Left	D	42.2	0.63	D	53.6	0.88	D	53.6	0.88
NB Right	B	18.4	0.14	B	19.1	0.40	B	19.3	0.42
NB Overall	C	29.9	-	D	39.6	-	D	39.3	-
Overall (X critical)	B	11.3	0.46	C	29.6	0.93	C	30.2	0.94

PM PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build^		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Thru	B	11.9	0.48	D	45.7	0.95	D	46.9	0.96
EB Right									
EB Overall	B	11.9	-	D	45.7	-	D	46.9	-
WB Left	A	4.2	0.13	E	75.8	0.95	D	51.9	0.95
WB Thru	A	3.8	0.30	B	10.5	0.48	A	8.9	0.48
WB Overall	A	3.8	-	C	32.4	-	C	23.7	-
NB Left	D	49.2	0.78	F	105.5	1.00	F	154.3	1.14
NB Right	B	16.2	0.17	D	48.7	0.70	E	61.2	0.84
NB Overall	D	37.6	-	E	78.9	-	F	107.5	-
Overall (X critical)	B	13.7	0.50	D	49.7	0.94	D	54.9	0.97

SATURDAY PEAK

Movement/ Approach	2004 Existing			2015 No Build^			2015 Full Build^		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Thru	D	44.2	0.98	F	199.8	1.37	F	209.6	1.39
EB Right									
EB Overall	D	44.2	-	F	199.8	-	F	209.6	-
WB Left	A	7.9	0.34	F	222.3	1.37	F	268.9	1.48
WB Thru	A	5.4	0.53	B	11.3	0.70	B	11.8	0.72
WB Overall	A	5.8	-	E	73.8	-	F	90.2	-
NB Left	D	48.8	0.80	F	382.3	1.68	F	382.3	1.68
NB Right	B	15.8	0.20	E	68.3	0.88	F	83.9	0.96
NB Overall	D	37.1	-	F	243.1	-	F	244.0	-
Overall (X critical)	C	27.0	0.89	F	161.9	1.75	F	172.0	1.96

^ - Green time was added for the WB advance phase

Table IXA (continued)
Level of Service Comparisons

Delaware Route 26 & Railway Road - Unsignalized

AM PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build		2015 Full Build with improvements^	
	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left	a	8.0	a	8.6	a	8.7	a	8.7
EB Thru			-	-	-	-	-	-
SB Left	b	11.9	c	16.7	c	18.8	d	31.7
SB Right							c	15.5
SB Overall	b	11.9	c	16.7	c	18.8	c	16.6

PM PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build		2015 Full Build with improvements^	
	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left	a	8.7	b	10.8	b	12.0	b	12.0
EB Thru			-	-	-	-	-	-
SB Left	c	15.3	e	42.5	f	73.3	f	124.4
SB Right							d	27.8
SB Overall	c	15.3	e	42.5	f	73.3	e	39.3

SATURDAY PEAK

Movement/ Approach	2004 Existing		2015 No Build		2015 Full Build		2015 Full Build with improvements^	
	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
EB Left	a	10.0	b	14.6	c	16.6	c	16.6
EB Thru			-	-	-	-	-	-
SB Left	d	27.8	f	454.0	f	768.3	f	*
SB Right							f	81.2
SB Overall	d	27.8	f	454.0	f	768.3	f	172.2

Notes: f(*) denotes delay > 999 sec.
^ - Improvements include installation of additional southbound lane on Railway Road to have a separate left and right turn lanes.

Table IXA (continued)
Level of Service Comparisons

Delaware Route 26 & Old Mill Road (Road 349) - Signalized

AM PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Left	B	11.2	0.10	D	52.7	0.78	E	73.7	0.88
EB Thru	B	14.2	0.48	D	44.3	0.89	D	53.7	0.94
EB Right				B	12.5	0.04	B	13.6	0.04
EB Overall	B	13.9	-	D	44.8	-	E	56.2	-
WB Left	B	15.7	0.01	C	29.6	0.34	C	33.2	0.42
WB Thru	B	19.0	0.40	D	39.3	0.76	D	44.8	0.81
WB Right	A	4.2	0.06	A	3.8	0.10	A	3.9	0.11
WB Overall	B	16.3	-	C	31.9	-	D	35.8	-
NB Left	D	40.6	0.08	E	55.6	0.28	E	55.6	0.28
NB Thru				D	54.2	0.14	D	54.2	0.14
NB Right				E	56.8	0.36	E	56.8	0.36
NB Overall	D	40.6	-	E	55.9	-	E	55.9	-
SB Left	D	37.3	0.69	D	54.4	0.90	E	64.1	0.96
SB Thru				C	27.4	0.19	C	25.6	0.18
SB Right	C	24.3	0.11						
SB Overall	D	35.1	-	D	49.8	-	E	58.2	-
Overall (X critical)	C	20.9	0.51	D	43.0	0.86	D	51.1	0.91

PM PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Left	B	11.4	0.14	F	110.8	0.97	F	110.8	0.97
EB Thru	B	18.5	0.51	C	34.4	0.65	C	34.4	0.65
EB Right				B	17.4	0.15	B	17.4	0.15
EB Overall	B	17.7	-	D	45.8	-	D	45.8	-
WB Left	B	10.3	0.09	C	23.4	0.50	C	23.4	0.50
WB Thru	C	20.3	0.61	F	93.0	1.07	F	101.3	1.09
WB Right	A	4.4	0.10	A	6.4	0.22	A	6.7	0.26
WB Overall	B	16.9	-	E	67.0	-	E	70.7	-
NB Left	D	48.0	0.56	F	97.5	0.84	F	97.5	0.85
NB Thru				E	65.1	0.36	E	65.1	0.36
NB Right				F	148.0	1.02	F	148.0	1.02
NB Overall	D	48.0	-	F	113.5	-	F	113.5	-
SB Left	D	44.4	0.76	F	124.4	1.08	F	151.4	1.16
SB Thru				D	51.0	0.55	D	51.0	0.55
SB Right	C	26.7	0.13						
SB Overall	D	41.1	-	F	100.3	-	F	119.9	-
Overall (X critical)	C	23.7	0.64	E	74.2	1.04	F	80.2	1.06

SATURDAY PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Left	B	19.6	0.44	F	106.9	0.98	F	106.9	0.98
EB Thru	C	20.0	0.74	F	80.2	1.03	F	80.2	1.03
EB Right				B	18.2	0.23	B	18.2	0.23
EB Overall	B	20.0	-	E	75.8	-	E	75.8	-
WB Left	B	17.1	0.17	F	109.4	0.99	F	109.4	0.99
WB Thru	D	39.9	0.91	F	182.8	1.30	F	189.5	1.31
WB Right	A	4.8	0.11	A	7.5	0.18	A	7.7	0.21
WB Overall	C	33.9	-	F	148.5	-	F	150.7	-
NB Left	D	49.7	0.62	F	203.6	1.19	F	203.6	1.19
NB Thru				E	71.5	0.56	E	71.5	0.56
NB Right				F	303.0	1.43	F	303.0	1.43
NB Overall	D	49.7	-	F	219.5	-	F	219.5	-
SB Left	D	51.0	0.85	F	303.0	1.51	F	349.5	1.62
SB Thru				F	108.2	1.00	F	108.2	1.00
SB Right	C	26.4	0.27						
SB Overall	D	44.0	-	F	229.3	-	F	262.0	-
Overall (X critical)	C	31.7	0.87	F	150.6	1.14	F	159.3	1.16

Table IXA (continued)
Level of Service Comparisons

Delaware Route 26 & Central Avenue (Road 84) - Signalized

AM PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Left	A	6.9	0.29	C	22.0	0.68	C	24.2	0.71
EB Thru	A	7.2	0.33	B	12.7	0.65	B	13.6	0.69
EB Right									
EB Overall	A	7.1	-	B	15.2	-	B	16.5	-
WB Left	B	10.2	0.08	B	12.4	0.20	B	12.6	0.22
WB Thru	B	12.1	0.36	B	14.9	0.50	B	15.1	0.51
WB Right				B	11.1	0.05	B	11.1	0.05
WB Overall	B	11.9	-	B	14.4	-	B	14.5	-
NB Left	C	23.3	0.44	C	24.9	0.08	C	24.9	0.08
NB Thru				D	35.4	0.72	D	35.4	0.72
NB Right				C	26.7	0.30	C	26.7	0.30
NB Overall	C	23.3	-	C	32.6	-	C	32.6	-
SB Left	C	25.3	0.56	C	34.1	0.58	C	34.1	0.58
SB Thru				C	26.8	0.31	C	26.8	0.31
SB Right				C	20.3	0.27	C	20.3	0.27
SB Overall	C	25.3	-	C	25.9	-	C	25.9	-
Overall (X critical)	B	13.8	0.48	C	20.3	0.67	C	20.7	0.70

PM PEAK

Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Left	B	10.7	0.39	E	68.1	0.90	F	88.6	0.96
EB Thru	A	9.8	0.36	A	9.8	0.52	A	9.6	0.53
EB Right									
EB Overall	B	10.1	-	C	25.8	-	C	31.1	-
WB Left	B	13.9	0.19	B	17.2	0.32	B	16.8	0.33
WB Thru	B	18.5	0.62	C	34.5	0.86	D	36.5	0.89
WB Right				B	14.1	0.05	B	13.6	0.05
WB Overall	B	17.8	-	C	31.6	-	C	33.3	-
NB Left	B	18.5	0.30	E	57.7	0.47	E	64.0	0.54
NB Thru				E	58.8	0.65	E	60.6	0.68
NB Right				D	52.0	0.38	D	52.9	0.39
NB Overall	B	18.5	-	E	56.6	-	E	58.5	-
SB Left	C	24.5	0.67	F	120.9	0.95	F	143.3	1.01
SB Thru				F	81.6	0.90	F	88.1	0.92
SB Right				F	93.6	0.94	F	111.8	1.00
SB Overall	C	24.5	-	F	92.8	-	F	106.7	-
Overall (X critical)	B	16.8	0.68	D	47.5	0.90	D	53.0	0.92

SATURDAY PEAK

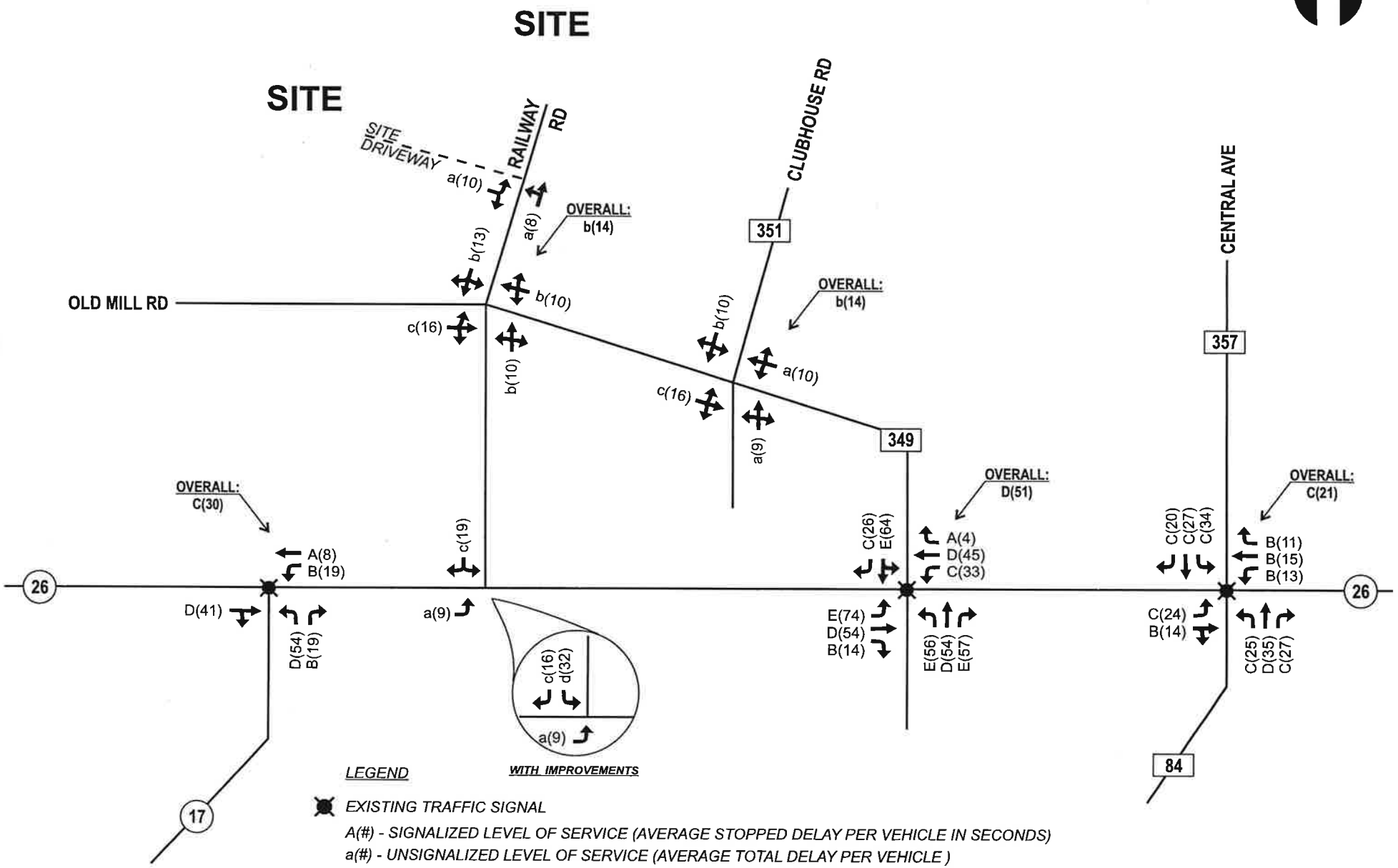
Movement/ Approach	2004 Existing			2015 No Build			2015 Full Build		
	LOS	DELAY	V/C	LOS	DELAY	V/C	LOS	DELAY	V/C
EB Left	D	48.0	0.86	F	127.1	1.09	F	131.9	1.10
EB Thru	B	11.2	0.57	C	20.5	0.82	C	21.6	0.84
EB Right									
EB Overall	C	20.4	-	D	48.7	-	D	50.7	-
WB Left	B	15.3	0.23	E	65.0	0.84	F	86.5	0.92
WB Thru	D	42.2	0.94	F	204.3	1.35	F	216.2	1.38
WB Right				C	20.4	0.06	C	20.4	0.06
WB Overall	D	39.6	-	F	185.0	-	F	197.9	-
NB Left	D	38.9	0.76	E	77.9	0.73	E	77.9	0.73
NB Thru				E	74.4	0.87	E	74.4	0.87
NB Right				D	53.7	0.55	D	53.7	0.55
NB Overall	D	38.9	-	E	68.4	-	E	68.4	-
SB Left	D	54.4	0.89	F	338.2	1.49	F	338.2	1.49
SB Thru				E	63.4	0.76	E	63.4	0.76
SB Right				C	30.0	0.46	C	30.2	0.47
SB Overall	D	54.4	-	F	91.0	-	F	90.5	-
Overall (X critical)	C	34.3	0.94	F	103.8	1.50	F	108.7	1.56

FIGURE 73A

2015 AM Peak Hour Full Build Levels of Service

Proposed Residential Project on Railway Road

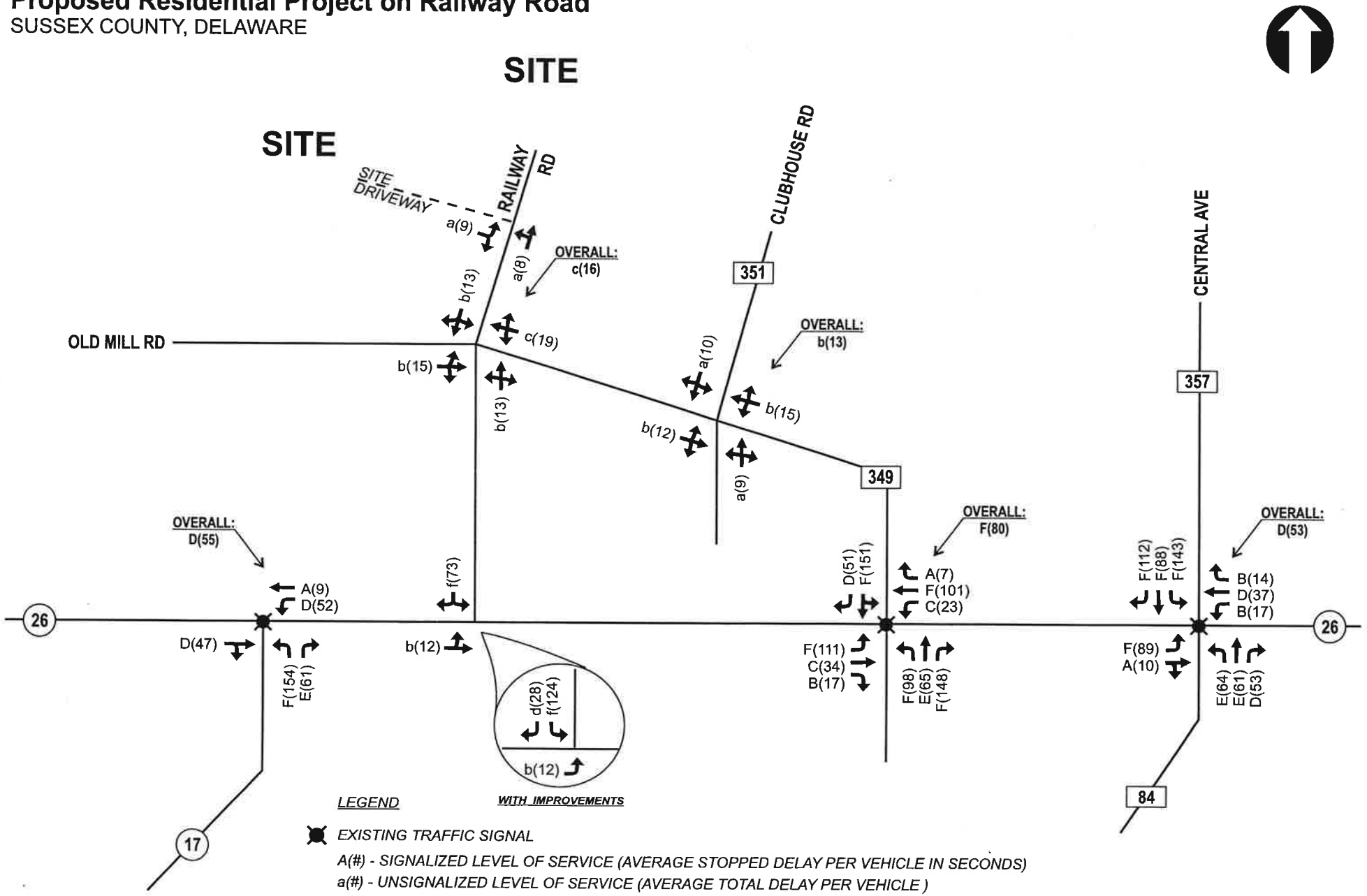
SUSSEX COUNTY, DELAWARE



2015 PM Peak Hour Full Build Levels of Service

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE



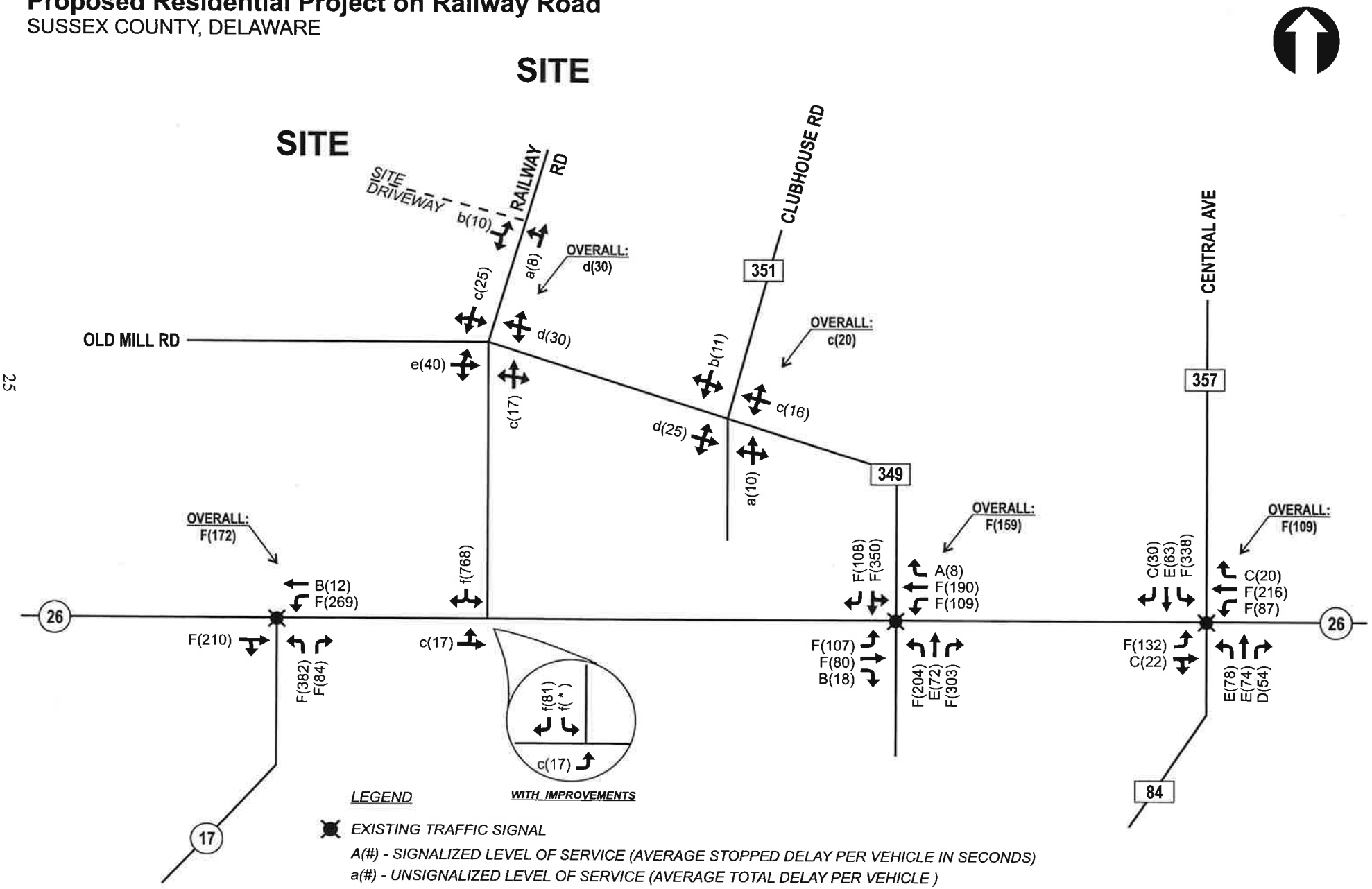
Orth - Rodgers & Associates, Inc.
TRANSPORTATION ENGINEERS and PLANNERS

FIGURE 75A

2015 Saturday Peak Hour Full Build Levels of Service

Proposed Residential Project on Railway Road

SUSSEX COUNTY, DELAWARE



RESULTS and RECOMMENDATIONS

Based on the analysis previously presented in this report and observations of existing conditions, the following improvements are recommended to accommodate the additional traffic that the proposed residential project on Railway Road will bring to the area.

Railway Road and Site Driveway - This assumes a t-intersection minimal driveway design with one-lane approaches and a stop sign for exiting traffic only. This driveway location yields a level of service 'b' or better for all peak periods. This driveway shall be constructed according to the Standards and Regulations for Access to State Highways, published by the Delaware Department of Transportation.

Old Mill Road (Rd 349) and Railway Road - No improvements anticipated.

Old Mill Road (Rd 349) and Clubhouse Road - No improvements anticipated.

Delaware Route 26 and Delaware Route 17 - Under existing conditions, this intersection has acceptable levels of service. In the future (2015 scenarios), specifically for the Saturday peak hour, this intersection has unacceptable levels of service with or without this proposed development. DelDOT's Delaware Route 26 Improvement Project has already enhanced this intersection, therefore no improvements are recommended.

Delaware Route 26 and Railway Road - Under existing conditions, this intersection has acceptable levels of service. Enhancements from the Delaware Route 26 Improvements Project include a by-pass lane for eastbound Delaware Route 26 traffic and the realignment of Railway Road intersecting with Delaware Route 26. Even with these improvements, the future p.m. and Saturday peak periods (2015 scenarios) have unacceptable levels of service with or without this proposed development. Additional recommendations include widening Railway Road so that the southbound approach can have a separate left and right turn lane. Although this improvement does not improve the intersection to acceptable levels of service, it does significantly decrease the delay. Due to the high number of committed developments and the fact that this intersection fails with or without the site, this improvement should be shared with other developers and should not be the sole responsibility of this project.

Delaware Route 26 and Old Mill Road (Rd 349) - Under existing conditions, this intersection has acceptable levels of service. In the 2015 future scenarios this intersection has numerous improvements from two different projects. From DelDOT's Delaware Route 26 Improvement Project, improvements include separate left, through, and right-turn lanes on both approaches of Delaware Route 26. From the Millville Town Center development the northbound approach will have a separate left, through, and right-turn lane while the southbound approach of Old Mill Road (Rd 349) will change lane assignments to have a separate left turn lane and shared through/right lane. With these improvements from both proposed projects, this intersection will have unacceptable levels of service for both the 2015 no build and 2015 full build scenarios. No additional improvements have been identified.

Delaware Route 26 and Central Avenue (Rd 84/Rd 357) - Under existing conditions, this intersection has acceptable levels of service. In the 2015 future scenarios this intersection has numerous improvements from two different projects. In order to increase capacity of the intersection, DelDOT as part of the Delaware Route 26 Improvement Project, is proposing several improvements. The improvements include the corridor wide upgrade of 11-foot lanes and

5-foot shoulders on Route 26 along with some additional improvements at this intersection. The following upgrades are planned:

- The northbound approach of Central Avenue will be widened to provide separate lanes for each movement.
- The southbound approach of Central Avenue will be widened to provide separate lanes for each movement.
- Both the eastbound and westbound approaches of Route 26 will include an exclusive left-turn lane and a shared straight/right-turn lane
- A redesigned traffic signal and timing plan will also be needed to accommodate these physical improvements.

The other project with proposed improvements is from the Bay Forest development. According to plans submitted to DelDOT, a channelized westbound right-turn lane on Delaware Route 26 is proposed.

It should be noted that even with these planned improvements, this intersection will have unacceptable levels of service for the Saturday peak period only for both the 2015 no build and 2015 full build scenarios. No additional improvements have been identified.

CONCLUSIONS

Orth-Rodgers & Associates, Inc. has conducted a traffic impact study for the proposed residential project on Railway Road. The purpose of the study was to determine the impact of developing a residential planned community near the town of Millville in the existing Bethany Bay development located on the north side of Railway Road (Rd 350), in Sussex County, Delaware. The development would consist of 600 condominiums.

Analysis of existing a.m., p.m., and Saturday summer conditions shows that all intersections within the study area are operating at acceptable levels of service.

Under the future conditions (2015), with the numerous approved committed developments, the volumes increase along with the delay at these locations. The major problem in this area is the high traffic volumes along Delaware Route 26, especially during the summer Saturday peak period, which is demonstrated by all of the intersections along Delaware Route 26 failing for both the 2015 no build and 2015 full build scenarios. DelDOT in their Delaware Route 26 Improvement Project has identified this traffic problem. Improvements have been recommended for all of the study intersections along Delaware Route 26, with some improvements completed while other improvements are yet to be done. Along with the Delaware Route 26 Improvement Project, there are improvements recommended from the Millville Town Center development (Delaware Route 26 and Old Mill Road) and from the Bay Forest development (Delaware Route 26 and Central Avenue). Unfortunately with all of these proposed improvements, intersections along Delaware Route 26 will have unacceptable levels of service for both the 2015 no build and 2015 full build scenarios.

In addition to the regional improvements being pursued by DelDOT, this report identifies other upgrades at certain intersections to improve future traffic conditions within the study area. It should be noted that this report shows a need for improvement even without the Proposed Residential Project on Railway Road. The additional improvements recommended as part of the Proposed Residential Project on Railway Road project are as follows:

Railway Road and Site Entrances - This driveway north of Old Mill Road (Rd 349) shall be constructed according to the Standards and Regulations for Access to State Highways, published by the Delaware Department of Transportation. This report assumes a t-intersection minimal driveway design with one-lane approaches and a stop sign for exiting traffic only. This proposed development would also have site access at the endpoint of Railway Road. There is technically no access driveway to analyze since trips originating and ending are not intersecting with Railway Road.

Delaware Route 26 and Railway Road - Recommendations include widening Railway Road to include a separate left and right turn lane on its approach to Delaware Route 26. Although this improvement does not improve the intersection to acceptable levels of service, it does significantly decrease the delay. Due to the high number of committed developments and the fact that this intersection fails with or without the proposed site, this improvement should be shared with other developers and should not be the sole responsibility of this project.

A more detailed listing of improvements for each intersection is noted in the Results and Recommendations section of this addendum.

Appendix A

Trip Generation Calculations

Residential Condominium/Townhouse
(230)

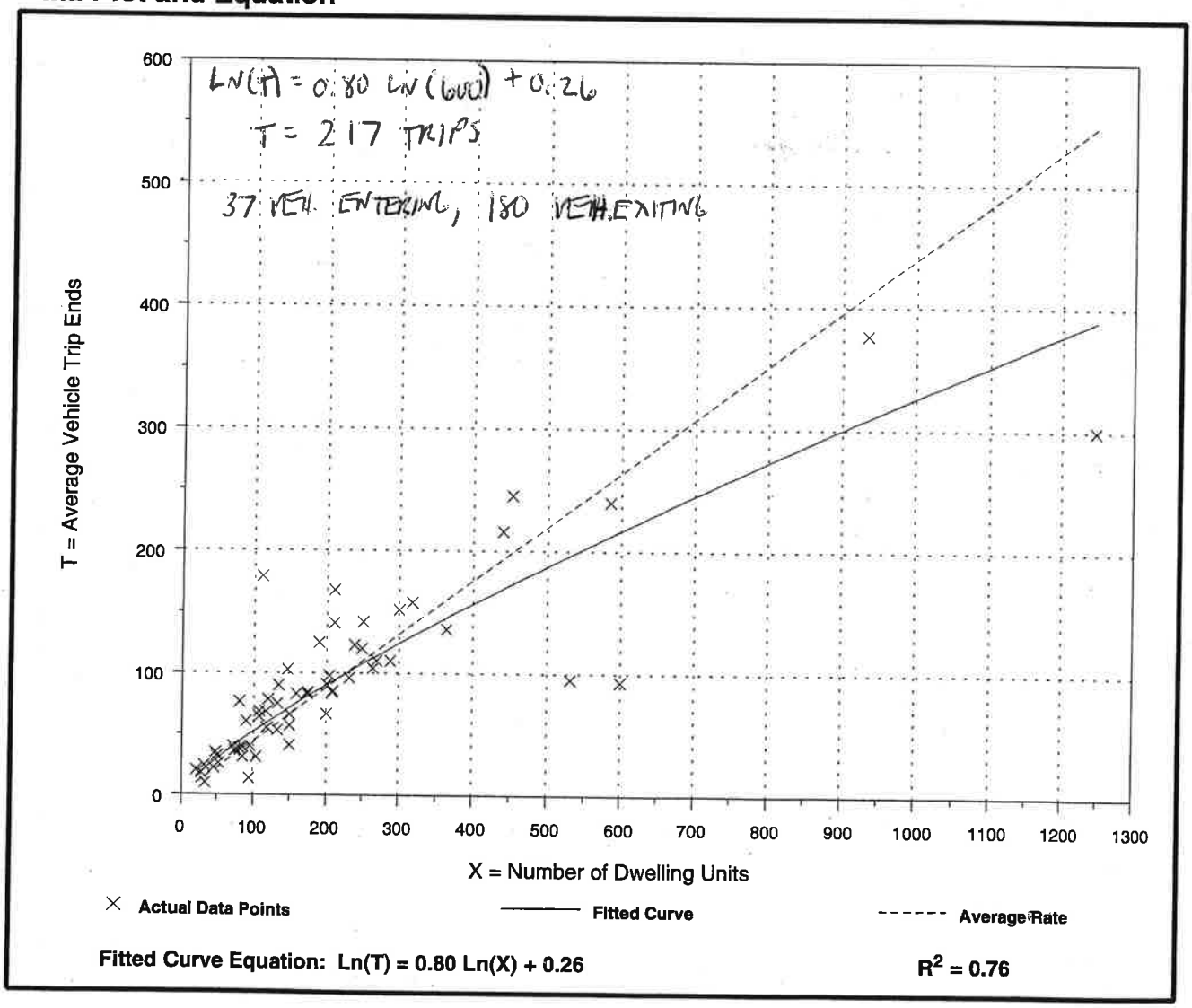
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 59
Avg. Number of Dwelling Units: 213
Directional Distribution: 17% entering, 83% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.61	0.69

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.80\ Ln(X) + 0.26$

$R^2 = 0.76$

Residential Condominium/Townhouse
(230)

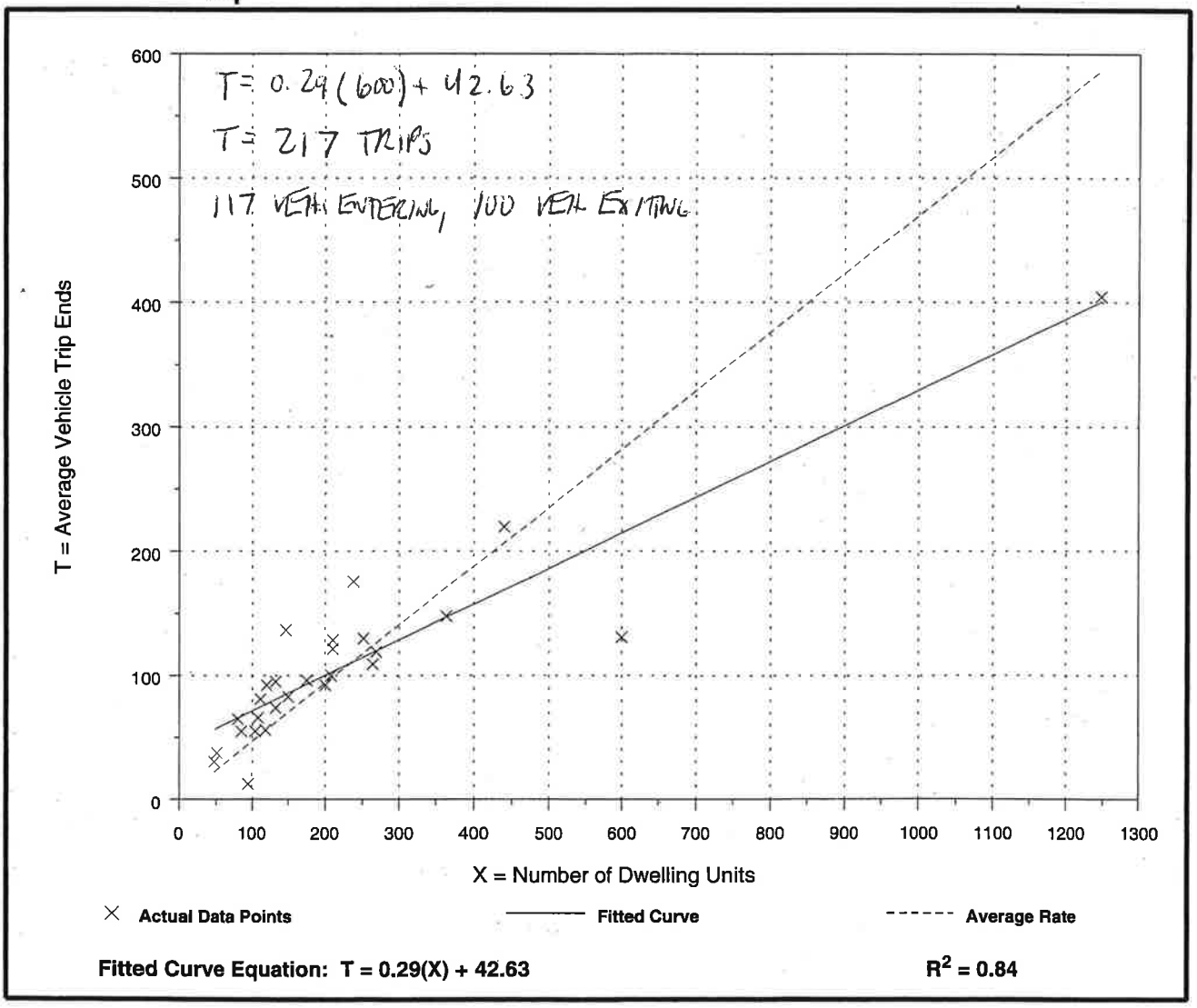
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Saturday,**
Peak Hour of Generator

Number of Studies: 27
Avg. Number of Dwelling Units: 228
Directional Distribution: 54% entering, 46% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.47	0.14 - 0.93	0.71

Data Plot and Equation



Fitted Curve Equation: T = 0.29(X) + 42.63

R^2 = 0.84

Appendix B

Highway Capacity Analysis (Computer Disk)

Appendix C

Correspondence

Linder & Company, Inc.

234 N James Street
Newport, DE 19804

September 9, 2005

Derrick Kennedy
Orth Rodgers Associates
230 S Broad Street
Philadelphia, PA 19102

Re: Bethany Bay Traffic Study for additional Units

Derrick:

Linder & Company Inc. purchased 50.19 acres adjacent to our Bethany Bay project. We were originally zoned 2 units per acre in 1989. Bay Forest, which is adjacent to our project, was recently approved 4 units per acre. It is our wish to have the 50 acres added to Bethany Bay. This would give Bethany Bay a total of 470 acres. We are currently approved for 550 units with central sewer. Upon application we will request the 50 acres be added and an additional 600 units be approved for the overall project. This would give the 470 acres for Bethany Bay a total density of 1,150 units.

I originally told you the proposed number on the bottom half was 480 units but that was before we purchased the farm next door. It is for this reason that I request we change that number to 600 units. This is up 120 units from the number I gave you in 2004.

Please note that the newly acquired property is on the corner of county road 349 and county road 350.

Please call me with any questions you may have.

Sincerely,

David H. Crowley

Bethany Bay	**Tax Number**	**1-34-8 parcel 42**
	Tax Number	**1-34-8 parcel 36**
Evans Farm	**Tax Number**	**1-34-12 Parcel 74**

Purchased by Linder

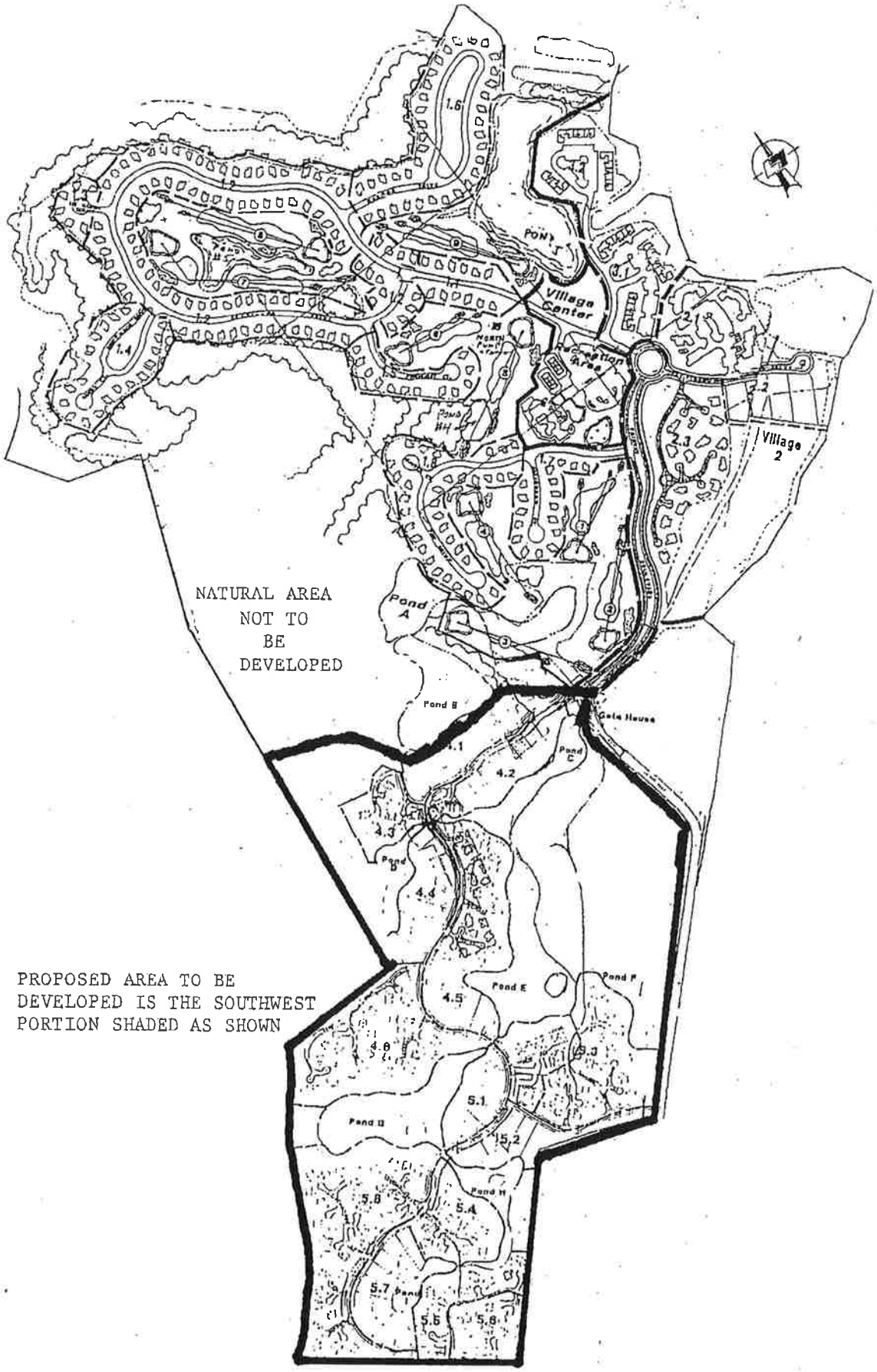

NATURAL AREA
NOT TO
BE
DEVELOPED
PROPOSED AREA TO BE
DEVELOPED IS THE SOUTHWEST
PORTION SHADED AS SHOWN
Village Center
Village 2
Pond A
Pond B
Pond C
Pond E
Pond F
Pond H
Gate House
1.6
1.4
1.1
4.2
4.3
4.4
4.5
4.6
5.1
5.2
5.3
5.4
5.5
5.6
5.7
5.8

EXHIBIT I