TRAFFIC IMPACT STUDY

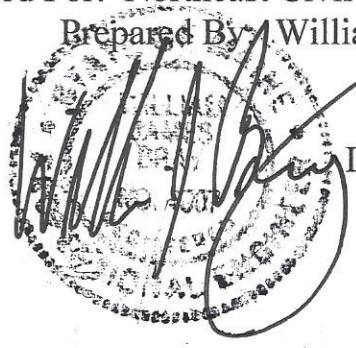
FOR

PROPOSED

Franklin Land Associates, LLC
9,100 sf. Variety Store

Prepared For: Northeast Civil Solutions, LLC

Prepared By: William J. Bray, P.E.



December, 2015

INTRODUCTION

Franklin Land Associates, LLC is proposing a 9,100 square foot variety store on Eastern Avenue (State Route 17) in the City of Augusta, Maine. The site is a 2.37 acre parcel of land located on Eastern Avenue just west of the signalized intersection of State Route 17 and Cony Road.

The proposed variety store will be accessed through a proposed driveway entrance located near the easterly property line of the proposed site. Eastern Avenue, fronting the proposed project site, is approximately 44 plus feet wide with a single travel lane in each direction; 5-foot paved shoulders along both edges of pavement, and the transitional end section of a left-turn lane onto Cony Road.

The purpose of this study is to examine existing traffic conditions in the general vicinity of the proposed project, estimate the total number of site trips generated by the project, and make a determination as to whether the existing transportation system can safely accommodate the added traffic demand generated by the project.

EXISTING CONDITIONS

Existing Traffic: A manual turning movement count was conducted at the signalized intersection of State Route 17 and Cony Road on Wednesday, October 28, 2015 to determine existing PM "peak" roadway traffic volumes. All vehicular traffic entering the intersection was recorded in 15-minute intervals between the hours of 3:00 and 6:00 PM (A copy of the field data summary sheet is attached). From a summary of the data, it was determined that the peak hour occurs between 4:15 and 5:15 PM.

Traffic data collected during the month of October requires an adjustment to reflect "peak" travel conditions during the summer months. MaineDOT provides factors for adjusting traffic data collected during other periods of time. MaineDOT utilizes highway classifications of I, II, or III for all State and Local roadways. Group I roadways are defined as urban roadways, or those roads that typically see commuter traffic and experience little fluctuation from week to week throughout the year. Group II roadways or arterial roads are those that see a combination of commuter and recreational traffic and; therefore, experience moderate fluctuations during the year. Group III roads or recreational roadways are typically used for recreational purposes and experience significant seasonal fluctuations. MaineDOT has designated State Route 17 (Eastern Avenue) a Group I roadway, which requires the traffic data collected to be adjusted by a factor of approximately 1.08. Figure 1 illustratively depicts the estimated 2015 PM design hour traffic condition for the study intersection.

Existing Safety Trends: The Maine Department of Transportation's (MaineDOT) Accident Records Section provided the latest three-year (2012 through 2014) crash data for the section of Eastern Avenue between Cony Road and Mayfair Street, a distance of approximately 0.80 miles. Their report is summarized as follows and attached as an appendix to the report:

2012 -2014 Traffic Accident Summary

Location	Total Crashes	Critical Rate Factor
1. Eastern Road @ Cony Road	0.86	0.71
2. Eastern Avenue @ Lambard Road	3	0.74
3. Eastern Avenue @ Mayfair Road	1	0.24
4. Eastern Avenue btw. Cony Road and Lambard Road	8	0.57
5. Eastern Avenue btw. Lambard Road and Penley Street	12	1.03
6. Eastern Avenue btw. Porter Street and Mayfair Street	1	0.16

The MaineDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:

- ***8 or more accidents***
- ***A Critical Rate Factor greater than 1.00***

As the data presented in the table shows, the section of Eastern Avenue between Lambard Road and Penley Street meets MaineDOT's criteria as a high crash location. A total of 12 crashes with a Critical Rate Factor (CRF) of 1.03 were reported for the noted section of Eastern Road. A more in-depth review (preparation of detailed vehicle collision diagrams) was prepared to determine if a clear pattern of accident is occurring (Copies of the Collision Diagrams are attached as an appendix to the report). Seven of the twelve reported crashes occurred at or very near the Dear River service station at 216 Eastern Avenue yet, only two of the collisions were similar patterns. The remaining 5 vehicles crashes occurred throughout the identified road segment at different locations and for varying reasons.

SITE TRAFFIC

Site Trip Generation: An estimate of trip generation for the proposed 9,100 square foot "variety" store was developed based upon recent data collected at three similar stores in New Hampshire and Maine, a methodology approved by MaineDOT when applicable ITE data isn't available.

Manual traffic counts were conducted at: (1) the Dollar General Store, Nashua, New Hampshire; (2) Family Dollar Store, Waterboro, Maine and; (3) Family Dollar Store, Portland, Maine. All vehicle trips entering and exiting each of the three stores were recorded in 15-minute intervals between the hours of 3:00 and 6:00 PM. The following tables summarize the collected data for each location:

Existing Dollar General Store
Vehicle Trip Generation
Nashua, New Hampshire
(7,560 sf store)

Time Period	Entering Trips	Existing Trips	Total Trips
3.00pm to 3:15pm	3	10	13
3:15pm to 3:30pm	7	7	14
3:30pm to 3:45pm	8	6	14
3:45pm to 4:00pm	10	11	21
4:00pm to 4:15pm	8	9	17
4:15pm to 4:30pm	7	10	17
4:30pm to 4:45pm	6	6	12
4:45pm to 5:00pm	8	7	15
5:00pm to 5:15pm	4	6	10
5:15pm to 5:30pm	6	8	14
5:30pm to 5:45pm	5	7	12
5:45pm to 6:00pm	5	6	11
Peak Hour: 3:30pm to 4:30pm	**33**	**36**	**69**

Trip Rate Nashua, NH Store = 69 trips ÷ 7,560/1,000 = 9.13 trips/1,000 sf

Existing Family Dollar Store

Vehicle Trip Generation
Waterboro, Maine
(8,750 sf store)

Time Period	Entering Trips	Existing Trips	Total Trips
3.00pm to 3:15pm	3	1	4
3:15pm to 3:30pm	0	2	2
3:30pm to 3:45pm	1	3	4
3:45pm to 4:00pm	5	3	8
4:00pm to 4:15pm	2	1	3
4:15pm to 4:30pm	2	0	2
4:30pm to 4:45pm	6	0	6
4:45pm to 5:00pm	4	1	5
5:00pm to 5:15pm	7	5	12
5:15pm to 5:30pm	7	5	12
5:30pm to 5:45pm	9	3	12
5:45pm to 6:00pm	7	2	9
Peak Hour: 5:00pm to 6:00pm	**30**	**15**	**45**

Trip Rate Waterboro Store = 45 trips ÷ 8,750/1,000 = 5.14 trips/1,000 sf

Existing Family Dollar Store
Vehicle Trip Generation
Portland, Maine
(8,000 sf)

Time Period	Entering Trips	Existing Trips	Total Trips
3.00pm to 3:15pm	5	1	6
3:15pm to 3:30pm	4	0	4
3:30pm to 3:45pm	0	7	7
3:45pm to 4:00pm	9	2	11
4:00pm to 4:15pm	2	5	7
4:15pm to 4:30pm	11	3	14
4:30pm to 4:45pm	7	0	7
4:45pm to 5:00pm	2	12	14
5:00pm to 5:15pm	0	3	3
5:15pm to 5:30pm	13	4	17
5:30pm to 5:45pm	15	7	22
5:45pm to 6:00pm	10	0	10
Peak Hour: 4:45pm to 5:45pm	**30**	**26**	**56**

Trip Rate Portland Store = 56 trips ÷ 8,000/1,000 = 7.00 trips/1,000 sf

Based upon a summary of the data collected at the three variety store sites, an average of 7.09 trips per 1,000 square feet of floor area are generated during the PM peak hour time period. Accordingly, the proposed 9,100 square foot "variety" store can be expected to generate a total of 65 vehicle trips in the evening peak hour.

Vehicle Trip Distribution: This report utilizes a site trip distribution pattern of 55% entering trips and 45% exiting trips, which replicates the average distribution patterns found at the three "variety" store sites. Based upon these projected trip distribution patterns, **36** of the **65** total trips generated in the evening peak hour will enter and **29** trips will exit the proposed "variety" store during the same time period.

Vehicle Trip Composition: Based upon national survey data, retail stores generate a high percentage of trips already on the roadway system generally referred to as "pass-by" trips. This report has assumed a modest estimate of 30% of the trips generated by the proposed store are, in fact, "pass-by" trips, with the remaining trips classified as "new" or primary trips. Accordingly, the proposed project can be expected to generate a total of **20** "pass-by" trips and **45** primary trips.

Vehicle Trip Assignment: A trip assignment model that generally mirrors existing travel patterns found at the Study Intersection was applied in determining the directional distribution of the site traffic. The following directional distribution percentages were used in assigning the site generated trips to the roadway system:

Pass-By Trips
- State Route 17 Eastbound = 55%
- State Route 17 Westbound = 45%

Primary Trips
- State Route 17 East = 34%
- State Route 17 West = 36%
- Cony Road North = 21%
- Cony Road South = 09%

The attached Figure 2 illustratively presents the assignment of the site trips to the existing roadway system.

FUTURE TRAFFIC

Other Development Traffic: Traffic generated by projects that have been approved by the Local Planning Board and/or the Maine Department of Transportation, yet are not open, must be included in the estimate of pre-development traffic. The City's Engineering Office has advised that there are no projects whose trips will impact either study intersection.

2016 Pre-Development Traffic: The Traffic Impact Study has been prepared based upon a projected build-out year of 2016. An annual growth rate of 1% has been applied to the 2015 design hour traffic values to very conservatively estimate "peak" travel conditions for 2016. Figure 3 presents the estimated 2016 Pre-Development traffic forecasts for the study intersection.

2016 Post-Development Traffic: Estimated 2016 Pre-Development traffic forecast prepared for the study intersection, as depicted on Figure 3, were combined with the site traffic projections highlighted on Figure 2 to create a forecast of 2016 Post-Development traffic conditions for the weekday evening peak hour. Figure 4 is a line diagram that presents the estimated 2016 Post-Development traffic condition for the study intersection and the site driveway intersection at Eastern Avenue.

MOBILITY ANALYSIS

Capacity analysis of the study intersection and site entrance intersection was performed utilizing the Synchro and SimTraffic computer models. Levels of Service rankings are similar to the academic grade system, where an "A" is very good with little delay and "F" represents very poor conditions.

The following table summarizes the relationship between delay and Level of Service for a signalized intersection:

Level of Service Criteria for Signalized Intersections

Level of Service	Total Control Delay (sec/veh)
A	Up to 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	Greater than 80.0

The results of the operational analysis completed for the Eastern Avenue/Cony Road signalized intersection is presented in the following table:

Signalized Intersection Level of Service Summary
State Route 17 @ Cony Road
(2016 Pre- and Post-Development Travel Conditions)

	2016 Pre-Development		2016 Post-Development	
	PM Peak Hour		PM Peak Hour	
Approach	Delay (sec.)	LOS	Delay (sec.)	LOS
1. Eastern Avenue Eastbound Approach	11 sec.	B	11 sec.	B
2. Eastern Avenue Westbound Approach	9 sec.	A	10 sec.	A
3. Cony Road Southbound Approach	17 sec.	B	17 sec.	B
4. Cony Road Northbound Approach	16 sec.	B	16 sec.	B
5. Overall Intersection	12 sec.	B	12 sec.	B

The results of the signalized analysis of the 2016 pre and post-development travel conditions demonstrates that the proposed variety store project has virtually no measureable impact on intersection traffic operations. The signalized intersection is expected to operate at a very high Level of Service B in both the 2016 pre and post-development travel condition.

The following table summarizes the relationship between delay and Level of Service for an unsignalized intersection:

Level of Service Criteria for Unsignalized Intersections

Level of Service	Total Control Delay (sec/veh)
A	Up to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

A capacity analysis was completed for the site driveway intersection at Eastern Road based upon forecast 2016 Post-development traffic conditions during the evening peak hour. The results of the analysis are presented in the following table:

Table 1
Eastern Avenue/Site Entrance Driveway Intersection
Traffic Operations Summary

	Overall LOS	Main Street EB LOS	Main Street WB LOS	Site Entrance LOS
2016 Post-Dev. Weekday PM Volumes	A	A	A	A

The result of the analyses shows that all approaches of driveway entrance operate at an acceptable level of service (Level of Service A).

VEHICLE SIGHT DISTANCE

The Maine Department of Transportation's Highway Entrance and Driveway Rules, require the following sight distances for a non-mobility roadway:

Sight Distance Standards

Speed Limit	Sight Distance
25 mph	200 feet
30	250
35	305
40	360
45	425
50	495
55	570

Eastern Avenue (State Route 17) is currently posted at 35mph, which requires an unobstructed sightline of 305 feet. Sightline measurements were recorded for the proposed entrance "*looking*" in both directions from the driveway entrance. An unobstructed sightline in excess of 800 feet was determined for both directions of travel on Eastern Avenue, well in excess of the minimum standard for a speed limit of 35mph.

AUXILIARY LANE WARRANT ANALYSIS

The Maine Department of Transportation has published a warrant for auxiliary left-turn lanes in their December 2004 Highway Design Manual. The warrants are predicated upon the volume of two-way traffic traveling on the designated highway and the volume of left-turning vehicles. Figure 8-19 from MaineDOT's referenced design manual was used in conducting the analysis (A copy of the chart with the superimposed traffic values is

attached as an appendix to the report). The forecast 2016 post-development volumes, presented on Figure 5, were used to complete the assessment. The values used in the analysis are noted as follows:

Va = 448
Vo = 537
Lt % = 4.9%

The analysis concludes that an exclusive left-turn entry lane on the westbound approach of Eastern Avenue (State Route 17), at the proposed site entrance, is warranted based upon the forecast 2016 Post-Development traffic assignment.

SUMMARY

1. A total of 65 vehicle trips will be generated by the proposed "variety" store during the PM peak hour, with 36 trips entering and the remaining 29 trips exiting the site.

2. The MaineDOT's most recent three-year traffic crash report (2012 through 2014) shows that the section of Eastern Avenue between Lambard Road and Penley Street very marginally meets their criteria as a high crash location. A total of 12 collisions were reported for the intersection and the calculated Critical Rate Factor is 1.03. An in-depth study of the vehicles crashes reported for the noted section of Eastern Avenue was completed and the review did not identify a clear pattern of vehicle collisions occurring throughout the roadway segment.

3. The results of the capacity analysis completed for both the 2016 pre and post-development travel conditions demonstrates that the proposed project has virtually no impact on traffic operations at the Eastern Avenue/Cony Road signalized intersection. The intersection presently operates at an acceptable Level of Service (LOS B) under 2016 Pre-Development traffic loadings and that same level of service will be maintained under 2016 Post-Development travel conditions.

4. The proposed Eastern Avenue/Site Driveway intersection will operate at Level of Service A conditions with the projected 2016 traffic loadings.

5. Sightline measurements recorded at the centerline of the proposed driveway entrance with Eastern Avenue exceed the required standard for a posted speed limit of 35mph, which reflects the current posted speed limit of Eastern Avenue (State Route 17).

6. Based upon a projected maximum left-turn volume to the site of 22 vehicles per hour and an opposing through volume of 537 vehicles per hour traveling east on Eastern Avenue, a left-turn storage lane is warranted.

Turn by Turn Traffic Data Services

P.O. Box 1203
Westbrook, Maine 04098

August: Route 17 & Cony Road
Wednesday October 28, 2015
Cloudy and Sprinkles at times
Count By: Dawn-Marie Fahey

File Name : Augusta Route 17 & Cony 102815
Site Code : 11111112
Start Date : 10/28/2015
Page No : 5

	Cony Road From North					Route 17 From East					Cony Road From South					Route 17 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	**16**	18	26	0	60	**47**	**93**	3	0	**143**	2	19	10	0	31	8	85	25	0	118	**352**
04:30 PM	16	11	29	0	56	26	67	3	0	96	**3**							**32**			
04:45 PM	**10**	**28**	**34**	**0**	**72**	21	70	**6**	0	97	2	18	**18**	0	**38**	16	97	23	0	136	343
05:00 PM	13	24	27	0	64	29	60	0	0	89	3	**20**	9	0	32	**23**	**104**			**157**	342
Total Volume	55	81	116	0	252	123	290	12	0	425	10	74	50	0	134	61	374	110	0	545	1356
% App. Total	21.8	32.1	46	0		28.9	68.2	2.8	0		7.5	55.2	37.3	0		11.2	68.6	20.2	0		
PHF	.859	.723	.853	.000	.875	.654	.780	.500	.000	.743	.833	.925	.694	.000	.882	.663	.899	.859	.000	.868	.963

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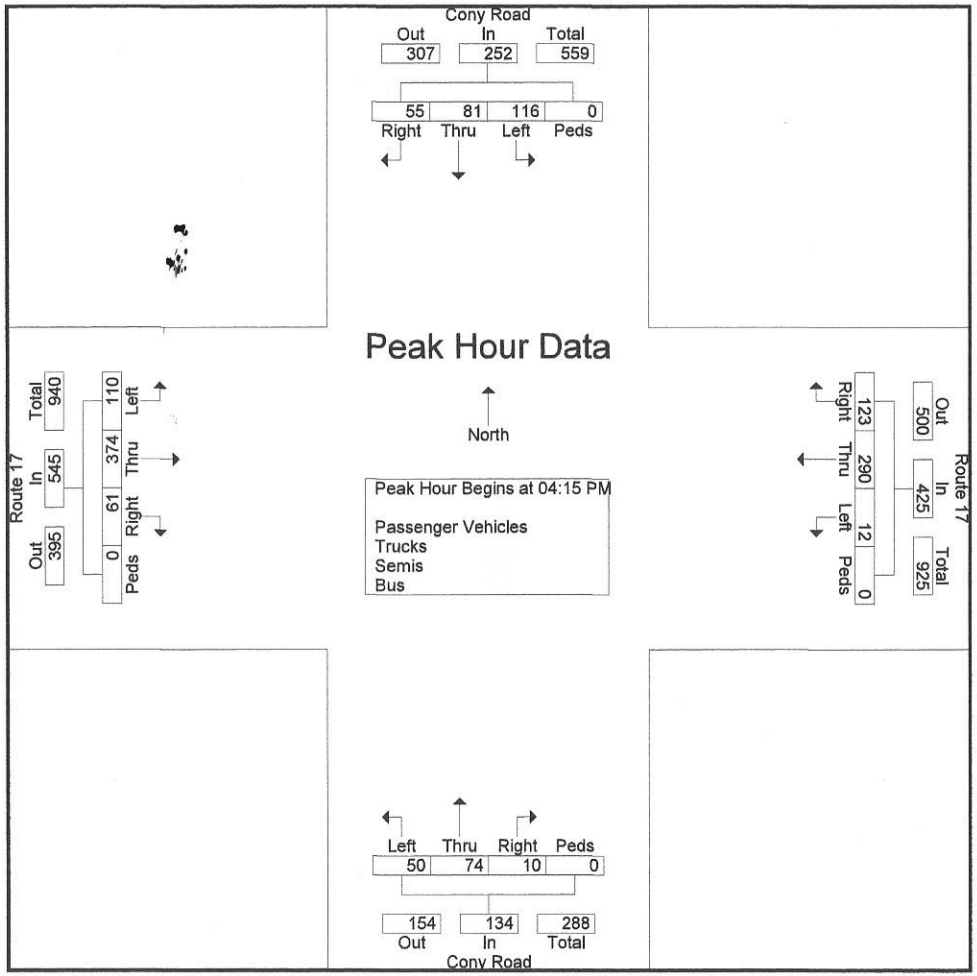



Augusta
CONY ST
26707
FAIRVIEW AV
DAVENPORT ST
26497
26505
26501
CUSHING ST
PENLEY ST
27971
26495
MAYFAIR ST
26496
27970
26471
MAYFLOWER RD
PORTER ST
26464
SECOND AV
26463
26482
WINDSOR AV
26485
26480
26481
26488
26476
HUTCHINSON DR
COLONY RD
26478
26479
26451
GLENRIDGE DR
26490
28220
26489
LAMBARD RD
EASTERN AV
61794
65016
26491
CONY RD
27969
27968

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ Crash Summary I ☑ Section Detail ☑ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Rte 17 from Cony Rd to Mayfair St in Augusta

REPORT PARAMETERS

Year 2012, Start Month 1 through Year 2014 End Month: 12

Route: **0017X**	Start Node: **27969**	Start Offset: **0**	☐ **Exclude First Node**
	End Node: **26495**	End Offset: **0**	☐ **Exclude Last Node**

Crash Summary I

Nodes															
Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
27969	0017X - 39.52	Int of CONY RD EASTERN AV	9	12	0	0	0	7	5	58.3	4.632	0.86	1.20	0.00
												Statewide Crash Rate:	0.67	
26489	0017X - 39.90	Int of EASTERN AV, LAMBARD RD	2	3	0	0	0	0	3	0.0	3.484	0.29	0.39	0.00
												Statewide Crash Rate:	0.14	
A27970	0017X - 40.19	Int of EASTERN AV PENLEY ST	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
P26496	0017X - 40.20	Int of EASTERN AV PORTER ST	2	0	0	0	0	0	0	0.0	3.577	0.00	0.39	0.00
												Statewide Crash Rate:	0.14	
26495	0017X - 40.32	Int of EASTERN AV, MAYFAIR ST	2	1	0	0	0	1	0	100.0	3.752	0.09	0.38	0.00
												Statewide Crash Rate:	0.14	
Study Years:	3.00	**NODE TOTALS:**		16	0	0	0	8	8	50.0	15.445	0.35	0.50	0.70

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
26489	27969	3129357	0 - 0.38	0017X - 39.52	0.38	2	8	0	0	0	0	8	0.0	0.01277	208.87	367.75	0.00
Int of EASTERN AV, LAMBARD RD				ST RTE 17											Statewide Crash Rate: 196.36		
26489	27970	203845	0 - 0.29	0017X - 39.90	0.29	2	12	0	0	1	1	10	16.7	0.01002	399.38	387.96	1.03
Int of EASTERN AV, LAMBARD RD				ST RTE 17											Statewide Crash Rate: 196.36		
26496	27970	3122397	0 - 0.01	0017X - 40.19	0.01	2	0	0	0	0	0	0	0.0	0.00035	0.00	833.40	0.00
Int of EASTERN AV PORTER ST				ST RTE 17											Statewide Crash Rate: 196.36		
26495	26496	3108346	0 - 0.12	0017X - 40.20	0.12	2	1	0	0	0	0	1	0.0	0.00428	77.87	475.96	0.00
Int of EASTERN AV, MAYFAIR ST				ST RTE 17											Statewide Crash Rate: 196.36		
Study Years: 3.00				**Section Totals:**	0.80		21	0	0	1	1	19	9.5	0.02742	255.32	316.15	0.81
				Grand Totals:	0.80		37	0	0	1	9	27	27.0	0.02742	449.85	447.74	1.00

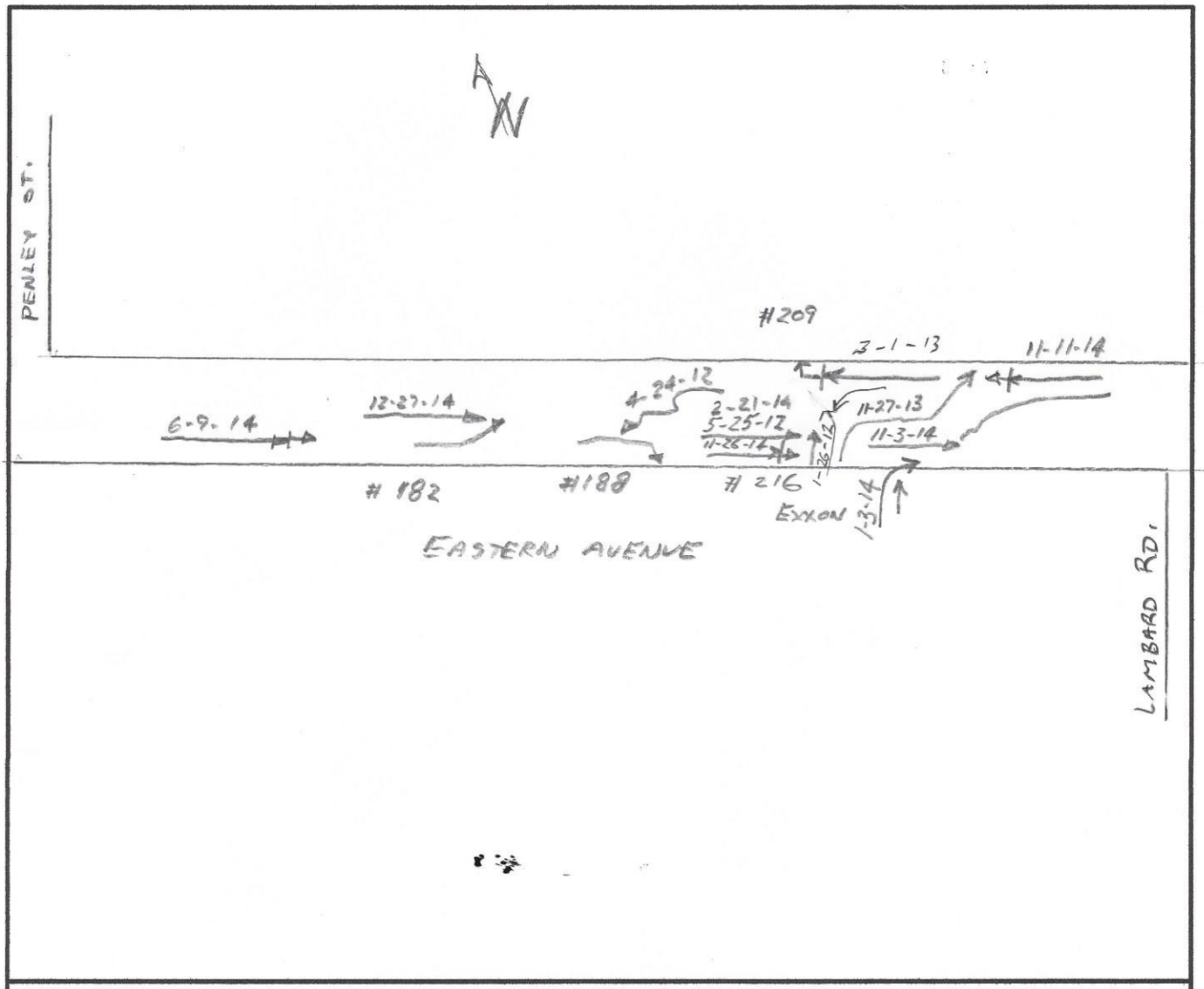
COLLISION DIAGRAM

SHEET 1 OF 2

LOCATION EASTERN AVENUE, BTW. LAMBARD RD. & PENLEY ST.

TOWN AUGUSTA NODE NO(S) 26489 TO 27970

YEARS REVIEWED 2012-2014 DATE PREPARED 1-6-2016



CRITICAL RATE FACTOR _____ EQUIV. PROP. DAMAGE ACC/YEAR _____ ACC/MEV _____

LIGHT
1. DAWN (MORNING) 2. DAYLIGHT 3. DUSK (EVENING)
4. DARK (ST. LIGHTS ON) 5. DARK (NO ST. LIGHTS) 6. DARK (ST. LIGHTS OFF)
7. OTHER

ROAD SURFACE
1. DRY 2. WET 3. SNOW/SLUSH-SANDED
4. ICE/PACKED SNOW-SANDED 5. MUDDY 6. DEBRIS
7. OILY 8. SNOW/SLUSH-NOT SANDED 9. ICE-PKD. SNOW-NOT SANDED
10. OTHER

APPARENT CONTRIBUTING FACTORS - HUMAN
1. NO IMPROPER ACTION 2. FAIL TO YLD. RIGHT OF WAY 3. ILLEGAL UNSAFE SPEED
4. FOLLOW TOO CLOSE 5. DISREGARD TRAFFIC CONTROL DEVICE
6. DRIVING LEFT OF CENTER-NO PASSING 7. IMPROPER PASS-OVERTAKING
8. IMP. UNSAFE LANE CHANGE 9. IMP. PARKING START/STOP 10. IMPROPER TURN
11. UNSAFE BACKING 12. NO SIGNAL OR IMP. SIGNAL 13. IMPEDING TRAFFIC
14. DRIVER INATTENTION-DISTRACTION 15. DRIVER INEXPERIENCE
16. PEDEST. VIOLATION ERROR 17. PHYSICAL IMPAIRMENT 18. VISION OBSCURED-WINDSHIELD GLASS
19. VISION OBSCURED-SUN/HEADLIGHTS
20. OTHER VISION OBSCUREMENT 30. OTHER HUMAN VIOLATION FACTOR
31. HIT AND RUN 51. UNKNOWN

- VEHICULAR
41. DEFECTIVE BRAKES 42. DEFECTIVE TIRE/FAILURE 43. DEFECTIVE LIGHTS
44. DEFECTIVE SUSPENSION OR FACTOR 45. DEFECTIVE STEERING 50. OTHER VEHICLE DEFECT
51. UNKNOWN

SYMBOLS

ANGLE		PEDESTRIAN	P	FATAL ACCIDENT	●
BACKING		REAR END			
FIXED OBJECT	□	SIDE SWIPE		VEHICLE (MOVING)	
HEAD ON		TURNING MOVE		BICYCLE	B
OVERTURN	○	CHANGE LANE		ANIMAL	A
PARKED VEHICLE	▨	OUT OF CONTROL		SLED	S

WEATHER
C = CLEAR F = FOG R = RAIN
SL = SLEET S = SNOW CL = CLOUDY
XW = CROSS WINDS

INJURIES
K = FATAL B = NON-INCAPACITATING
A = INCAPACITATING C = POSSIBLE INJURY

S:/SHEETS/COLLISION DIAGRAM.DWG

COLLISION DIAGRAM

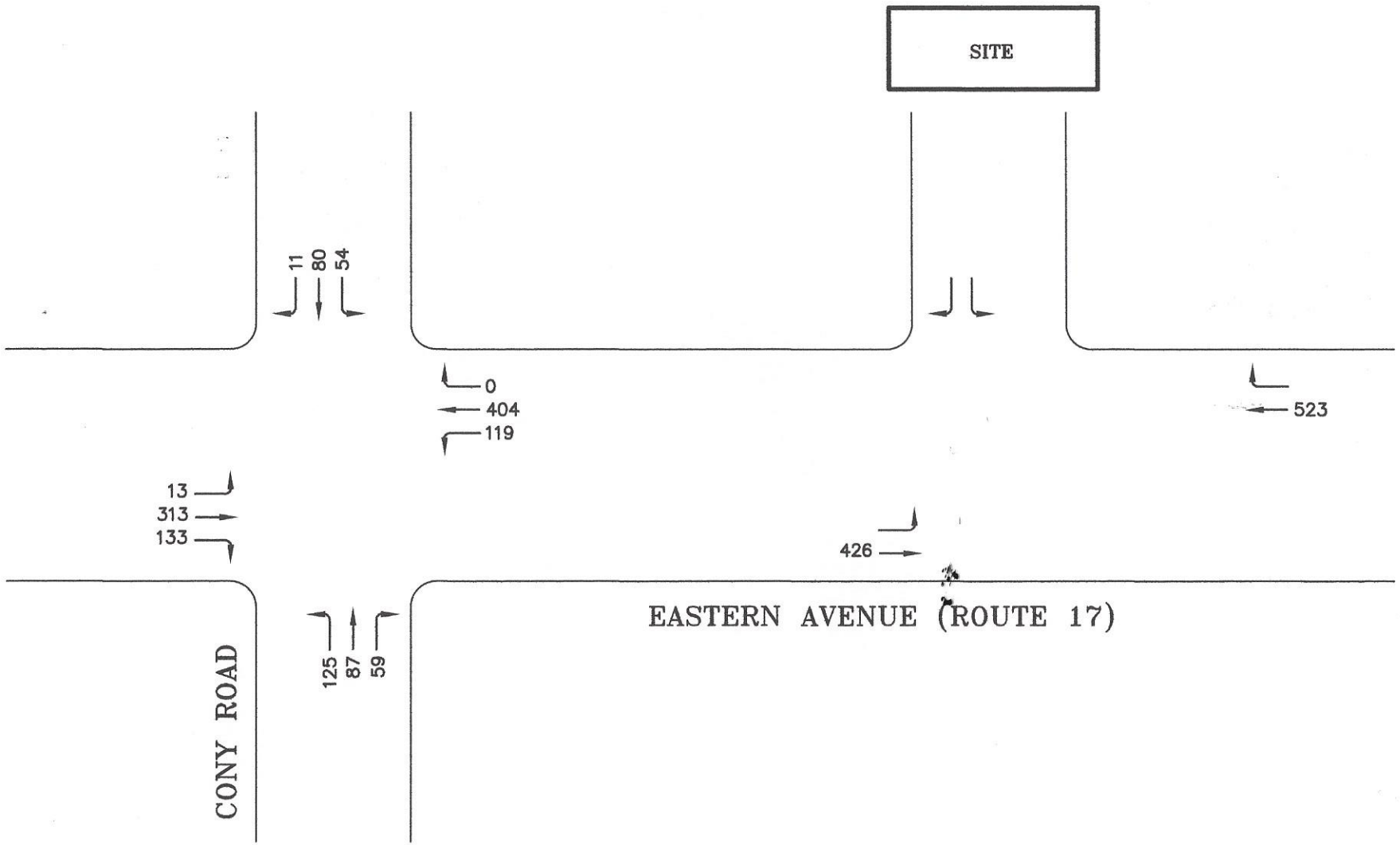
SHEET ___ OF ___

LOCATION EASTERN AVENUE, BTW. LAMBARD RD & DENLEY ST.

TOWN AUGUSTA NODE NO(S) 26489 to 27970

YEARS REVIEWED 2012 - 2014 DATE PREPARED 1-6-2016

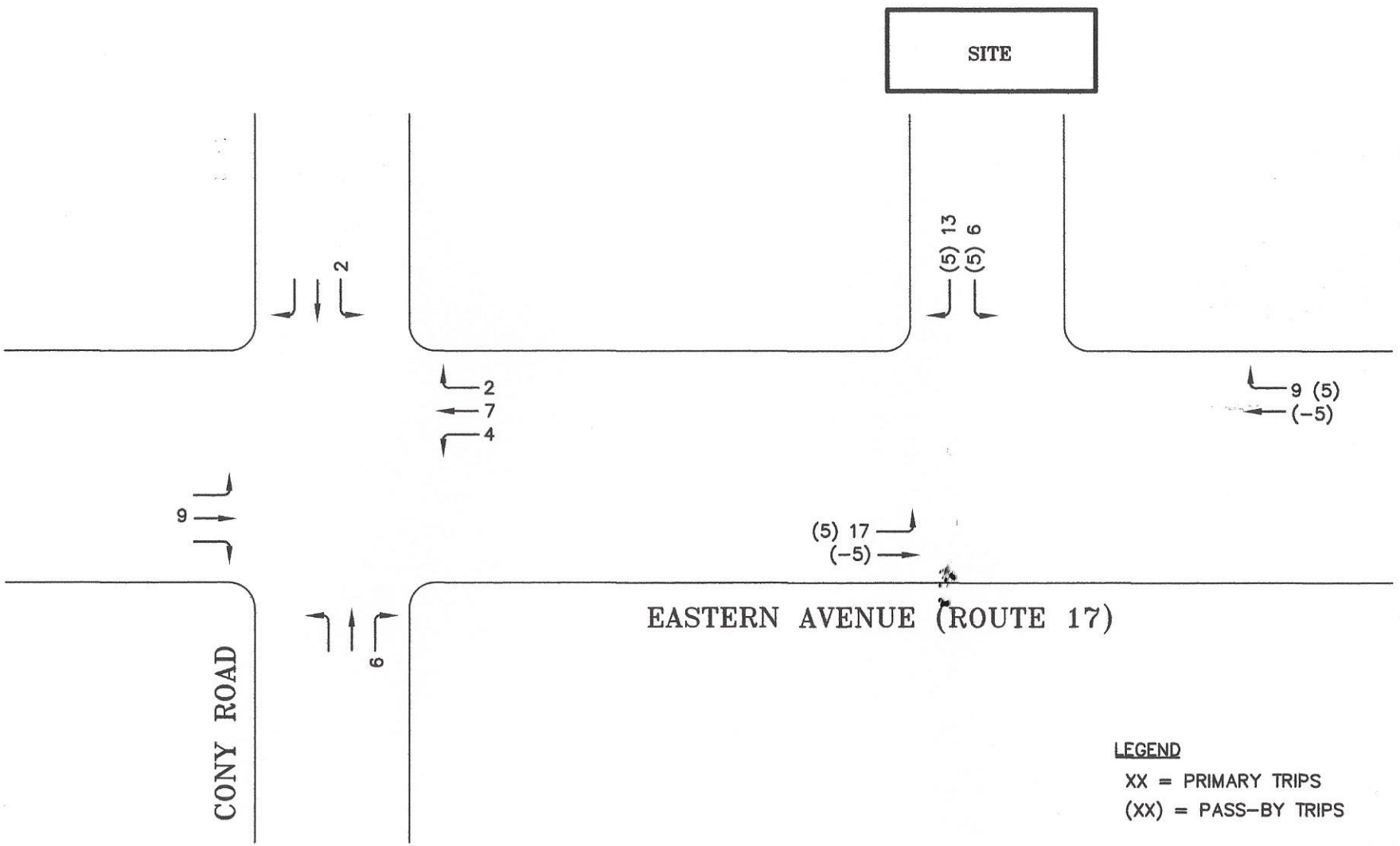
REPORT NO.	DATE	TIME	INJURIES K	A	B	C	LIGHT	ROAD SURFACE	ACF	OTHER
14002-549 AC	6-9-14	15:05					2	1	4	
14002-1192 AC	12-27-14	12:35					2	1	7	
12002-361 AC	4-24-12	22:50					4	1	8	
13002-232-AC	3-1-13	8:45					2	2	4	
12002-435-AC	5-25-12	14:47					2	1	2	
13002-1060-AC	11-27-13	20:05			1		4	4	OVER STEERING	
14002-239-AC	2-21-14	15:26					2	4	2	
M002-975-AC	11-3-14	12:42					4	3	ROAD CONDITIONS	
14002-1009-AC	11-11-14	16:13					2	1	4	
14002-1056-AC	11-26-14	15:34					4	3	4	
12002-81-AC	1-26-12	7:30				1	2	1	10	
14002-19-AC	1-3-14	11:32					2	3	Left Scene	



2015 DESIGN HOUR TRAFFIC
PM PEAK HOUR
FIGURE 1

E:\LAND PROJECTS\34000\34450.2 AUGUSTA - ENGINEERING\PLANSET\34450-TRAFFIC FIGURES.DWG

Project Name and Location: PROPOSED RETAIL STORE, AUGUSTA, MAINE	TRAFFIC SOLUTIONS
DATE: NOVEMBER, 2015 — FIGURE: 1	235 BANCROFT STREET, PORTLAND, MAINE 04102-1730



SITE TRAFFIC ASSIGNMENTS
PM PEAK HOUR
FIGURE 2

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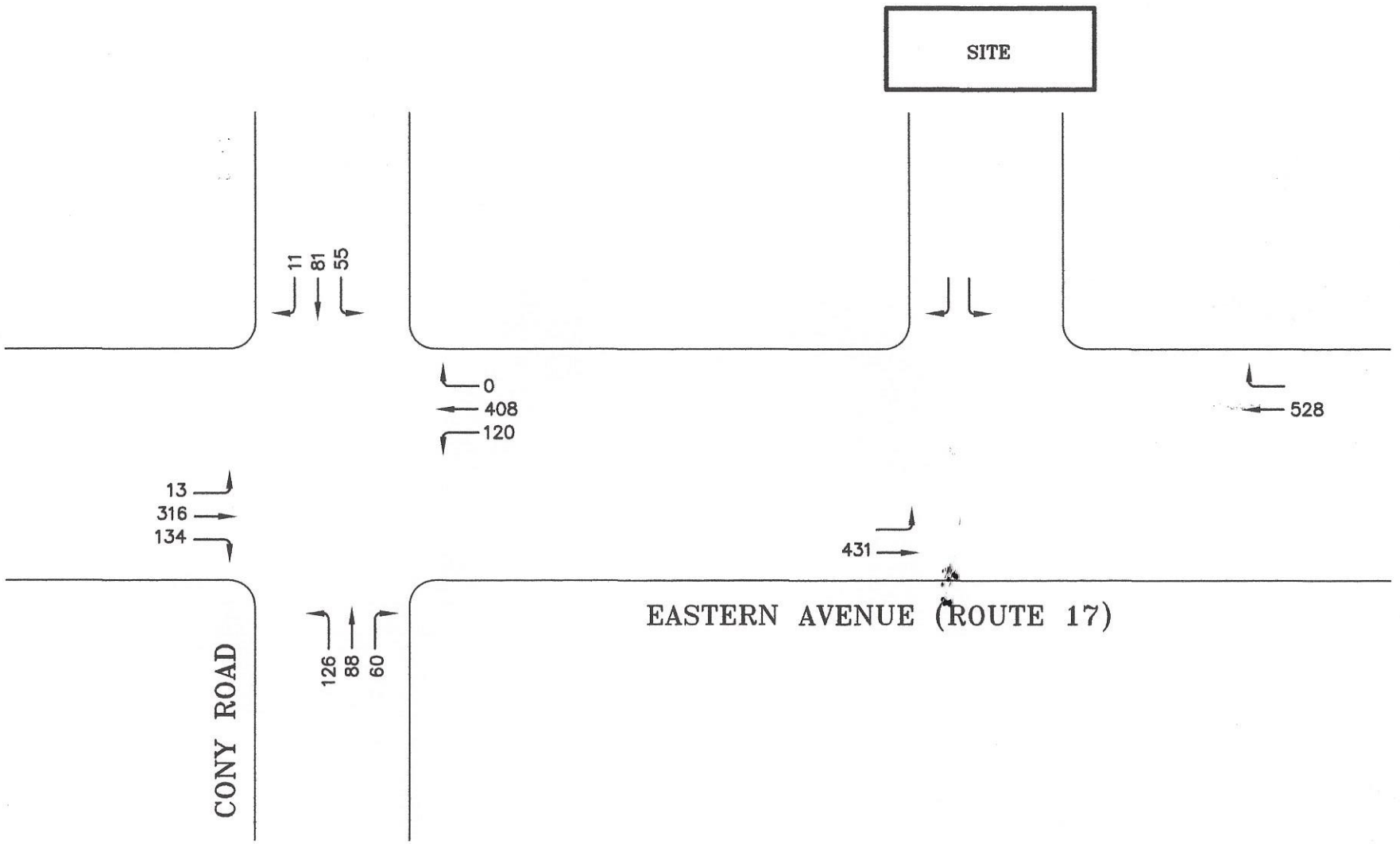
PROPOSED RETAIL STORE AUGUSTA, MAINE	TRAFFIC SOLUTIONS 235 BANCROFT STREET, PORTLAND, MAINE 04102-1750
DATE: NOVEMBER, 2015	FIGURE: 2



2016 PRE DEVELOPMENT TRAFFIC
PM PEAK HOUR
FIGURE 3

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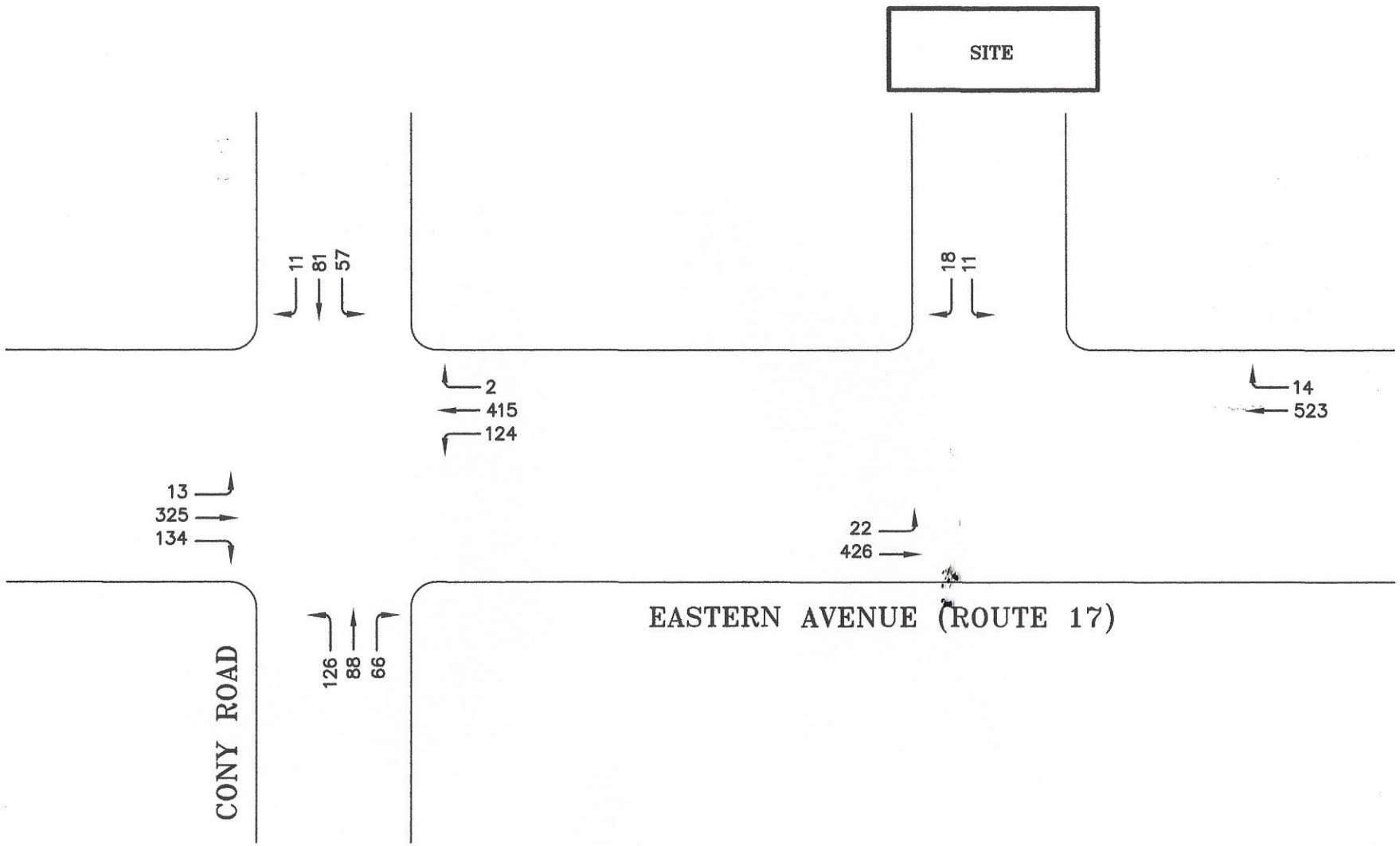
Project Name and Location: PROPOSED RETAIL STORE, AUGUSTA, MAINE	TRAFFIC SOLUTIONS
DATE: NOVEMBER, 2015 — FIGURE: 3	235 BANCROFT STREET, PORTLAND, MAINE 04102-1730



2016 POST DEVELOPMENT TRAFFIC
PM PEAK HOUR
FIGURE 4

E:\LAND PROJECTS\34000\34450.2 AUGUSTA - ENGINEERING\PLANSET\34450-TRAFFIC FIGURES.DWG

Project Name and Location: PROPOSED RETAIL STORE, AUGUSTA, MAINE	TRAFFIC SOLUTIONS
DATE: NOVEMBER, 2015 — FIGURE: 4	235 BANCROFT STREET, PORTLAND, MAINE 04102-1730

Summary of All Intervals

Run Number	1	2	3	4	6	Avg
Start Time	4:25	4:25	4:25	4:25	4:25	4:25
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	65	65	65	65	65	65
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1530	1518	1492	1527	1523	1518
Vehs Exited	1525	1513	1500	1524	1530	1517
Starting Vehs	29	20	24	24	24	24
Ending Vehs	34	25	16	27	17	24
Travel Distance (mi)	520	516	501	518	515	514
Travel Time (hr)	25.2	24.5	23.7	24.9	24.4	24.6
Total Delay (hr)	6.8	6.3	6.1	6.6	6.2	6.4
Total Stops	952	937	928	923	927	932
Fuel Used (gal)	19.6	19.3	18.9	19.3	19.2	19.3

Interval #0 Information Seeding

Start Time	4:25
End Time	4:30
Total Time (min)	5

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	6	Avg
Vehs Entered	1530	1518	1492	1527	1523	1518
Vehs Exited	1525	1513	1500	1524	1530	1517
Starting Vehs	29	20	24	24	24	24
Ending Vehs	34	25	16	27	17	24
Travel Distance (mi)	520	516	501	518	515	514
Travel Time (hr)	25.2	24.5	23.7	24.9	24.4	24.6
Total Delay (hr)	6.8	6.3	6.1	6.6	6.2	6.4
Total Stops	952	937	928	923	927	932
Fuel Used (gal)	19.6	19.3	18.9	19.3	19.2	19.3

3: Cony & Rte 17 Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.5	0.2	0.3	0.2
Total Del/Veh (s)	11.1	9.6	16.1	17.3	12.4

10: Rte 17 Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.4	0.0	0.1	0.2
Total Del/Veh (s)	0.7	2.2	6.9	1.9

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	14.6

Intersection: 3: Cony & Rte 17

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	147	224	44	222	140	206
Average Queue (ft)	61	97	9	99	64	101
95th Queue (ft)	114	171	34	174	115	165
Link Distance (ft)		583		1038	441	436
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225		100			
Storage Blk Time (%)	0	0		7		
Queuing Penalty (veh)	1	0		1		

Intersection: 10: Rte 17

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	100	106
Average Queue (ft)	14	37
95th Queue (ft)	57	71
Link Distance (ft)	583	118
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

Summary of All Intervals

Run Number	1	4	5	6	7	Avg
Start Time	4:25	4:25	4:25	4:25	4:25	4:25
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	65	65	65	65	65	65
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1434	1388	1347	1399	1417	1397
Vehs Exited	1432	1390	1352	1394	1431	1399
Starting Vehs	20	23	22	26	41	28
Ending Vehs	22	21	17	31	27	23
Travel Distance (mi)	511	497	481	499	507	499
Travel Time (hr)	23.4	23.0	22.5	22.8	23.3	23.0
Total Delay (hr)	5.5	5.6	5.6	5.4	5.6	5.5
Total Stops	803	792	782	768	788	786
Fuel Used (gal)	18.4	18.1	17.6	17.9	18.3	18.1

Interval #0 Information Seeding

Start Time	4:25
End Time	4:30
Total Time (min)	5

Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	4	5	6	7	Avg
Vehs Entered	1434	1388	1347	1399	1417	1397
Vehs Exited	1432	1390	1352	1394	1431	1399
Starting Vehs	20	23	22	26	41	28
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Travel Distance (mi)	511	497	481	499	507	499
Travel Time (hr)	23.4	23.0	22.5	22.8	23.3	23.0
Total Delay (hr)	5.5	5.6	5.6	5.4	5.6	5.5
Total Stops	803	792	782	768	788	786
Fuel Used (gal)	18.4	18.1	17.6	17.9	18.3	18.1

3: Cony & Rte 17 Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.5	0.2	0.3	0.2
Total Del/Veh (s)	10.9	8.9	15.8	16.5	11.8

10: Rte 17 Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.4	0.0	0.2
Total Del/Veh (s)	0.4	1.5	0.9

Total Network Performance

Denied Del/Veh (s)	0.4
Total Del/Veh (s)	13.7

Intersection: 3: Cony & Rte 17

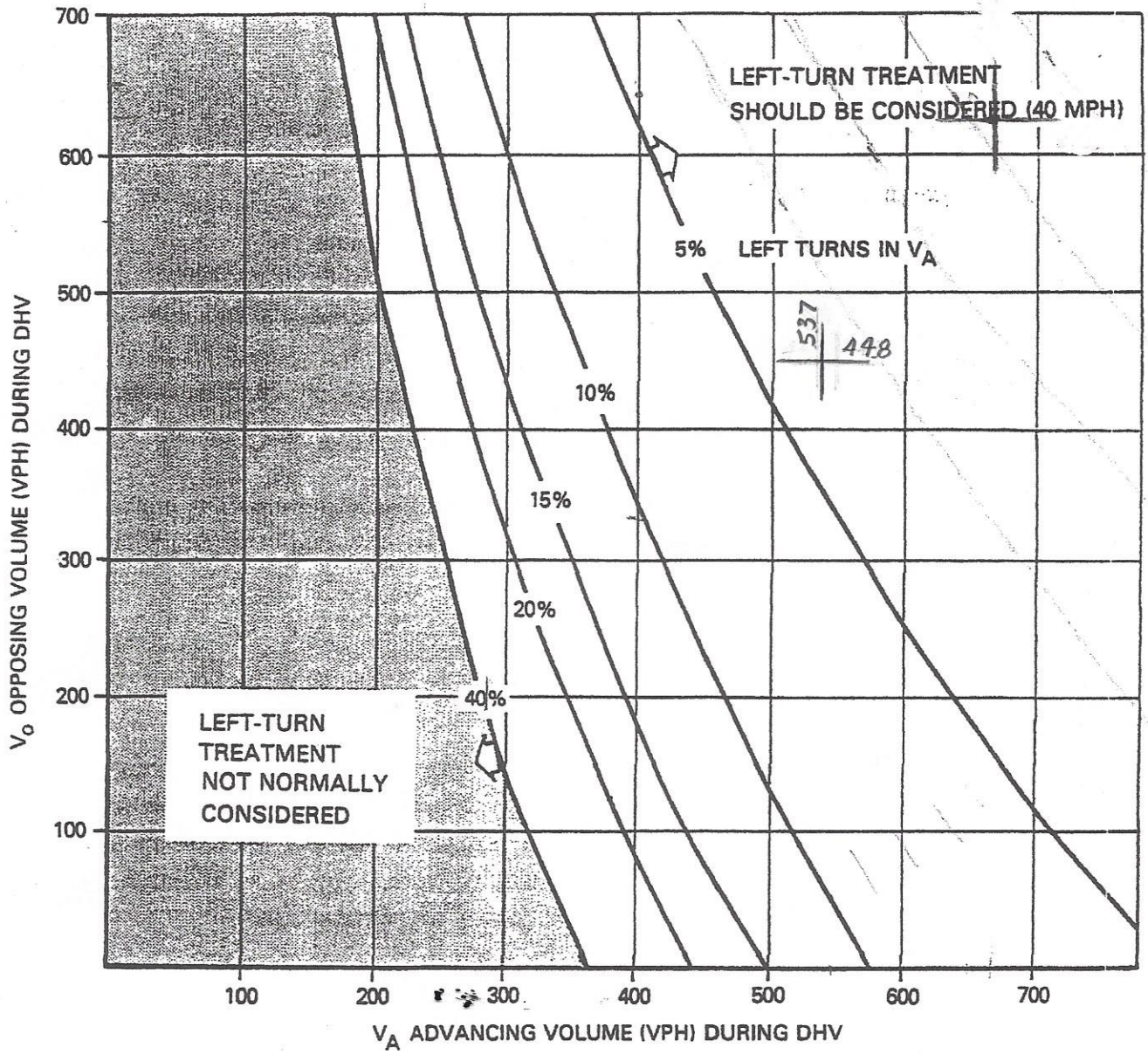
Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	LTR	LTR
Maximum Queue (ft)	130	204	72	215	127	192
Average Queue (ft)	55	96	10	98	61	93
95th Queue (ft)	101	167	42	168	107	155
Link Distance (ft)		590		1038	441	436
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	225		100			
Storage Blk Time (%)		0		5		
Queuing Penalty (veh)		0		1		

Intersection: 10: Rte 17

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1



Instructions:

1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.

4. Read V_A and V_O into the chart and locate the intersection of the two volumes.

5. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is warranted. If the point is to the left of the line, then a left-turn lane is not warranted based on traffic volumes.

VOLUME WARRANTS FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS (40 mph)

Figure 8-19