APPENDIX K

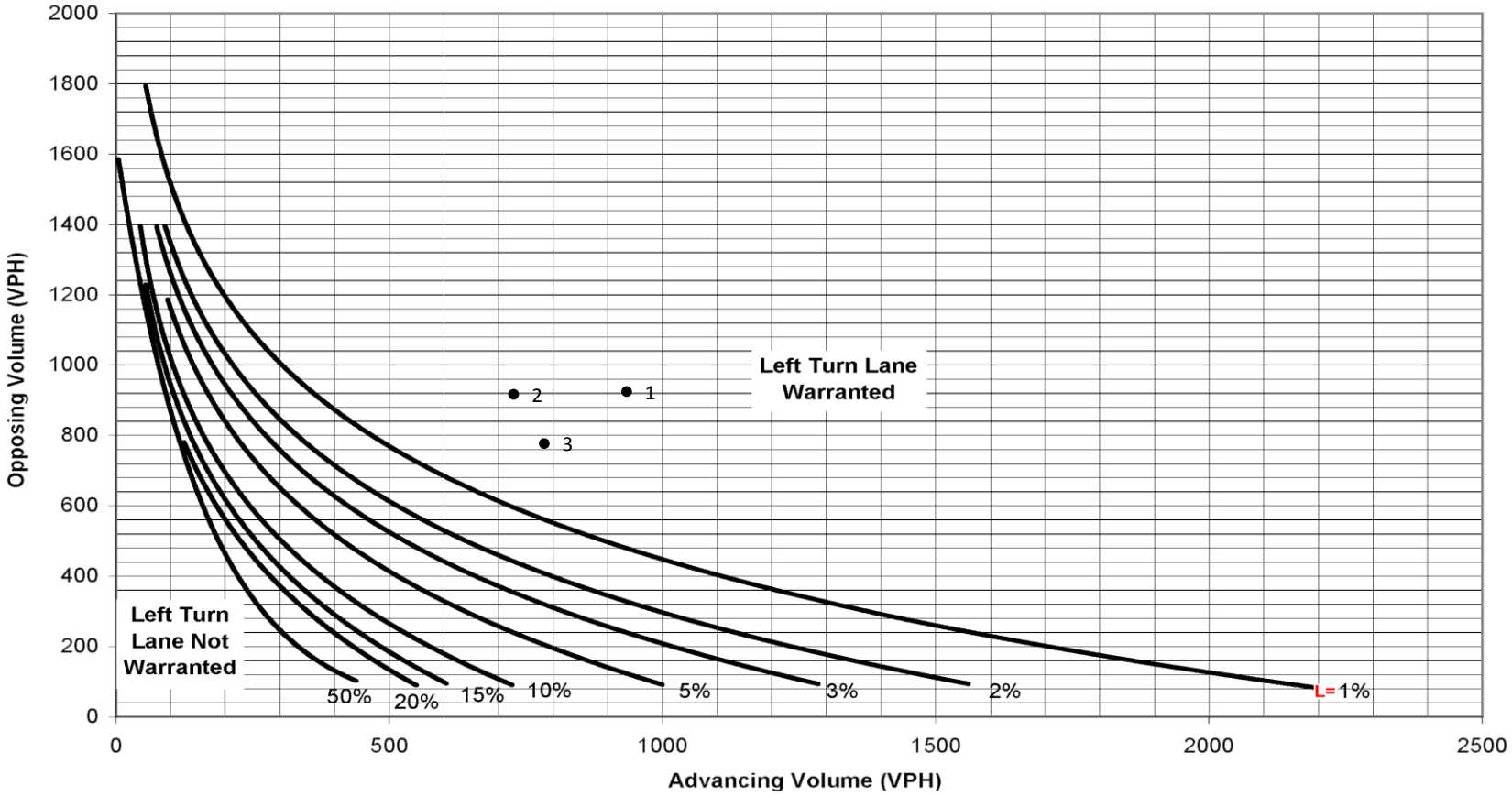
AUXILIARY TURN LANE WARRANT INFORMATION

N. Broad Street and Callowhill Street

Northbound Left-Turn onto Callowhill Street

Figure 8. Warrant for left turn lanes on four-lane, divided highways (unsignalized and signalized intersections)

(L = % Left Turns in Advancing Volume)



1. Friday PM (4-6PM) Peak Hour - 934 approaching volume, 924 opposing volume, 15.6% left turns - MET
2. Friday Evening (7-10PM) Peak Hour - 727 approaching volume, 916 opposing volume, 23.5% left turns - MET
3. Saturday Evening (6-9PM) Peak Hour - 783 approaching volume, 776 opposing volume, 22.2% left turns - MET

Left-Turn Lane Warrant Analysis

Four-Lane Divided Highways

Based on PennDOT Publication 46 (January 2013 Edition), Section 11.16

PROJECT INFORMATION

Project Number:	TOIN.A.008
Intersection:	N. Broad Street and Callowhill Street
Movement:	Northbound Left-Turn onto Callowhill Street
Analysis Period:	Projected Conditions - Friday PM (4-6PM) Peak Hour
Analyst:	BMP

INPUTS

	Volume	Truck %	Terrain Type	T	PCE Volume
Advancing Volume (V_A) =	925	2%	Level	1.01	934
Opposing Volume (V_O) =	915	2%	Level	1.01	924
Number of Left Turns =	145	2%	Level	1.01	146
Speed Limit =	25		Type of Control:	Signalized	
Proportion of Left Turns =	16%		Cycle Length:	90	sec.

STORAGE LENGTH CALCULATION

Turn Demand Volume:	High	
Table 1 Condition:	A	
Avg # of veh/cycle:	4	
Storage Length:	175	feet

RESULTS

A left-turn lane is warranted. The required storage length is 175 feet.

Left-Turn Lane Warrant Analysis

Four-Lane Divided Highways

Based on PennDOT Publication 46 (January 2013 Edition), Section 11.16

PROJECT INFORMATION

Project Number:	TOIN.A.008
Intersection:	N. Broad Street and Callowhill Street
Movement:	Northbound Left-Turn onto Callowhill Street
Analysis Period:	Projected Conditions - Friday Evening (7-10PM) Peak Hour
Analyst:	BMP

INPUTS

	Volume	Truck %	Terrain Type	T	PCE Volume
Advancing Volume (V_A) =	720	2%	Level	1.01	727
Opposing Volume (V_O) =	907	2%	Level	1.01	916
Number of Left Turns =	169	2%	Level	1.01	171
Speed Limit =	35		Type of Control:	Signalized	
Proportion of Left Turns =	24%		Cycle Length:	90	sec.

STORAGE LENGTH CALCULATION

Turn Demand Volume:	High	
Table 1 Condition:	A	
Avg # of veh/cycle:	4	
Storage Length:	175	feet

RESULTS

A left-turn lane is warranted. The required storage length is 175 feet.

Left-Turn Lane Warrant Analysis

Four-Lane Divided Highways

Based on PennDOT Publication 46 (January 2013 Edition), Section 11.16

PROJECT INFORMATION

Project Number:	TOIN.A.008
Intersection:	N. Broad Street and Callowhill Street
Movement:	Northbound Left-Turn onto Callowhill Street
Analysis Period:	Projected Conditions - Saturday Evening (6-9PM) Peak Hour
Analyst:	BMP

INPUTS

	Volume	Truck %	Terrain Type	T	PCE Volume
Advancing Volume (V_A) =	775	2%	Level	1.01	783
Opposing Volume (V_O) =	768	2%	Level	1.01	776
Number of Left Turns =	172	2%	Level	1.01	174
Speed Limit =	25		Type of Control:	Signalized	
Proportion of Left Turns =	22%		Cycle Length:	90	sec.

STORAGE LENGTH CALCULATION

Turn Demand Volume:	High	
Table 1 Condition:	A	
Avg # of veh/cycle:	4	
Storage Length:	175	feet

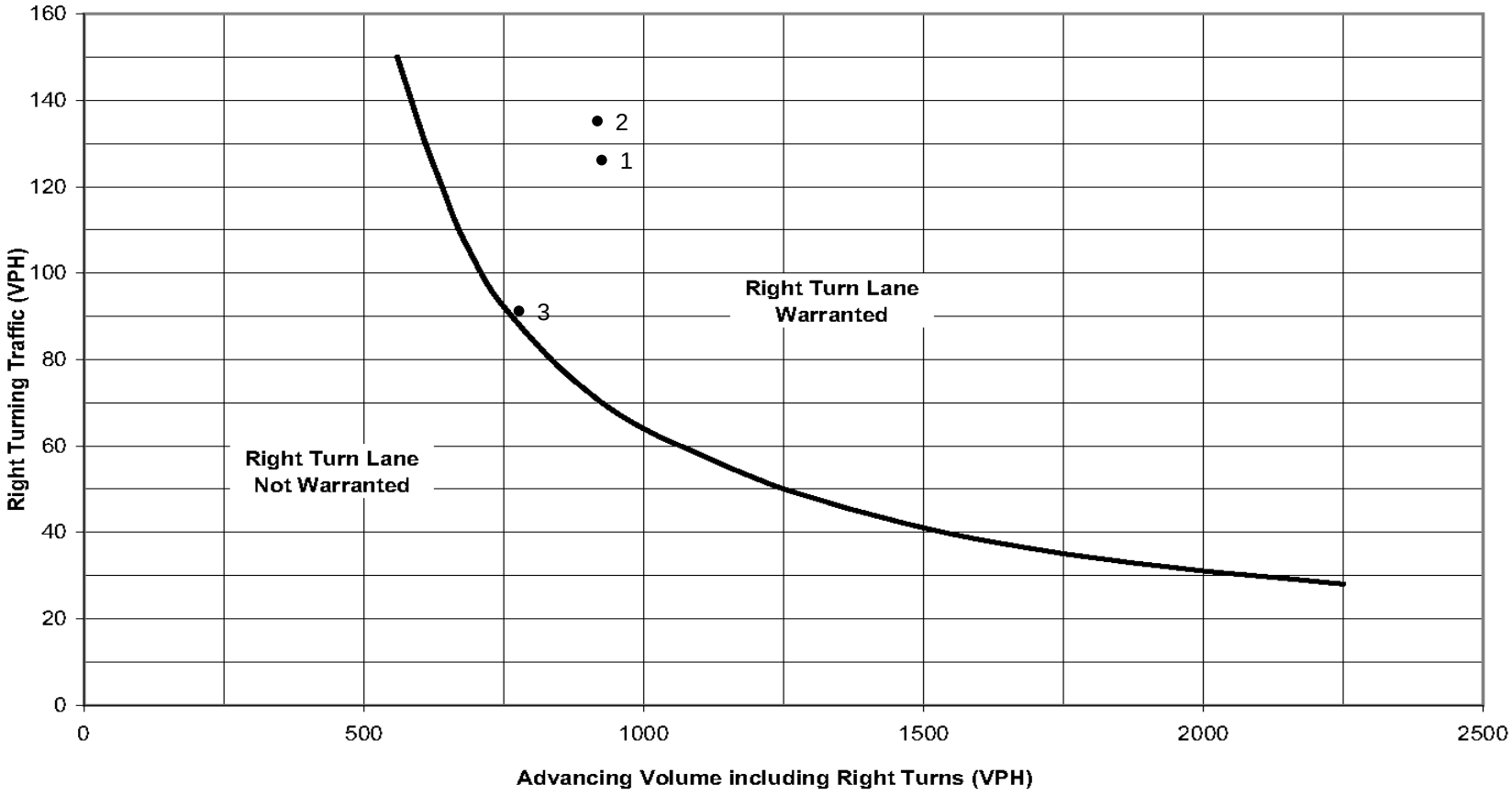
RESULTS

A left-turn lane is warranted. The required storage length is 175 feet.

N. Broad Street and Callowhill Street

Southbound Right-Turn onto Callowhill Street

Figure 11. Warrant for right turn lanes on four-lane roadways (40 mph or lower speeds, unsignalized and signalized intersections)



1. Friday PM (4-6PM) Peak Hour - 924 PCE approach total, 126 PCE right turns - MET
2. Friday Evening (7-10PM) Peak Hour - 916 PCE approach total, 135 PCE right turns - MET
3. Saturday Evening (6-9PM) Peak Hour - 776 PCE approach total, 91 PCE right turns - MET

Right-Turn Lane Warrant Analysis

Four-Lane Highways

Based on PennDOT Publication 46 (January 2013 Edition), Section 11.16

PROJECT INFORMATION

Project Number:	TOIN.A.008
Intersection:	N. Broad Street and Callowhill Street
Movement:	Southbound Right-Turn onto Callowhill Street
Analysis Period:	Projected Conditions - Friday PM (4-6PM) Peak Hour
Analyst:	BMP

INPUTS

	Volume	Truck %	Terrain Type	T	PCE Volume
Advancing Volume (V_A) =	915	2%	Level	1.01	924
Number of Right Turns =	125	2%	Level	1.01	126
Speed Limit =	25		Type of Control:	Signalized	
Proportion of Right Turns =	14%		Cycle Length:	90	sec.

STORAGE LENGTH CALCULATION

Turn Demand Volume:	High	
Table 1 Condition:	A	
Avg # of veh/cycle:	3	
Storage Length:	150	feet

RESULTS

A right-turn lane is warranted. The required storage length is 150 feet.

Right-Turn Lane Warrant Analysis

Four-Lane Highways

Based on PennDOT Publication 46 (January 2013 Edition), Section 11.16

PROJECT INFORMATION

Project Number:	TOIN.A.008
Intersection:	N. Broad Street and Callowhill Street
Movement:	Southbound Right-Turn onto Callowhill Street
Analysis Period:	Projected Conditions - Friday Evening (7-10PM) Peak Hour
Analyst:	BMP

INPUTS

	Volume	Truck %	Terrain Type	T	PCE Volume
Advancing Volume (V_A) =	907	2%	Level	1.01	916
Number of Right Turns =	134	2%	Level	1.01	135
Speed Limit =	25		Type of Control:	Signalized	
Proportion of Right Turns =	15%		Cycle Length:	90	sec.

STORAGE LENGTH CALCULATION

Turn Demand Volume:	High	
Table 1 Condition:	A	
Avg # of veh/cycle:	3	
Storage Length:	150	feet

RESULTS

A right-turn lane is warranted. The required storage length is 150 feet.

Right-Turn Lane Warrant Analysis

Four-Lane Highways

Based on PennDOT Publication 46 (January 2013 Edition), Section 11.16

PROJECT INFORMATION

Project Number:	TOIN.A.008
Intersection:	N. Broad Street and Callowhill Street
Movement:	Southbound Right-Turn onto Callowhill Street
Analysis Period:	Projected Conditions - Saturday Evening (6-9PM) Peak Hour
Analyst:	BMP

INPUTS

	Volume	Truck %	Terrain Type	T	PCE Volume
Advancing Volume (V_A) =	768	2%	Level	1.01	776
Number of Right Turns =	90	2%	Level	1.01	91
Speed Limit =	25		Type of Control:	Signalized	
Proportion of Right Turns =	12%		Cycle Length:	90	sec.

STORAGE LENGTH CALCULATION

Turn Demand Volume:	High	
Table 1 Condition:	A	
Avg # of veh/cycle:	2	
Storage Length:	100	feet

RESULTS

A right-turn lane is warranted. The required storage length is 100 feet.