

TRANSPORTATION IMPACT STUDY FOR Arborview

**Owner :
Nelson Wingert et al.**

**Applicant/Developer:
1849 Development, LLC
611 Gettysburg Pike
Suite 101
Mechanicsburg, PA 17055
REP: Don Farinelli**

**Site Location:
Gettysburg Pike
Upper Allen Township,
Cumberland County, Pennsylvania**

**February 28, 2018
Revised April 9, 2018**

Prepared by:



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FORWARD

This report provides a traffic impact analysis for proposed residential facilities in Upper Allen Township. The report is organized into 3 sections.

- I. Executive Summary - A brief 4 page summary of the study, results, and recommendations. Also included within the executive summary is a tabular summary of estimated intersection capacity level-of-service, delay, and volume-to-capacity ratios.
- II. Traffic Impact Study – A stand-alone text document describing in more detail elements of analysis.
- III. Appendix A – Supporting documents including; Existing Volume/LOS Figures, Trip Distribution Percentage and Volumes Figures, Opening Year Conditions Figures, Horizon Year Conditions Figures, Site Photos, Existing Data, Traffic Count Data Sheets, Growth Rates and Volume Worksheets, and Trip Generation Data Sheets, Turn Lane Analysis, and Correspondence.

REVISION NOTES

April 09, 2018 – Revisions per Township Memo dated March 19, 2018.

- Include capacity analysis for design horizon year 2030.
- Updates to figures 4 and 5A.

February 28, 2018 – The initial study to be submitted to Upper Allen Township for review as part of the subdivision and land development application process.

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Executive Summary

EXECUTIVE SUMMARY

ALPHA Consulting Engineers Inc. has prepared a traffic impact study for 1849 Development, LLC to estimate traffic impacts related to proposed residential facilities. As part of the study, this executive summary is provided as a brief, concise, project overview.

1849 Development, LLC is proposing to construct residential facilities on approximately 15 acres of land located along Gettysburg Pike in Upper Allen Township. Development will include the construction of 22 single family detached residential units along with the construction of approximately 1,330 linear feet of public street. The proposed development site is bounded by Gettysburg Pike on the east, the 'Arborfield' residential development on the south, and the 'Meadowview' residential development on the west. Vehicular access to the facility is proposed via a full movement site driveway along Gettysburg Pike near the eastern limits of the property and a extension of Coventry Drive into the site.

The new development is estimated to generate approximately 258 new vehicle trips on an average weekday. The trip generation estimate includes approximately 20 vehicle trips during the morning or AM peak hour of the street and approximately 24 vehicle trips during the evening or PM peak hour of the street.

Traffic analysis was conducted at the following offsite intersections for traffic conditions occurring during the current 2018 year along with future scenarios under the 2020 opening year and 2030 horizon year:

- Fisher Road – Gettysburg Pike, un-signalized intersection.

Traffic analysis for future development scenarios was conducted under the 2020 opening year and 2030 horizon year at the following proposed site driveway intersection:

- Site Driveway 1 – Gettysburg Pike, un-signalized intersection.

Analysis indicates that the proposed site driveway intersection will operate at acceptable levels as describe under Township criteria for all build scenarios. Acceptable levels for urban areas are considered a level of service (LOS) 'D' or better.

During the AM peak hour, the intersection of Fisher Road and Gettysburg Pike currently operates at an acceptable LOS 'A' and is estimated to continue to operate at LOS 'A' under the 2020 and 2030 design years both with and without the development.

During the PM peak hour, the intersection of Fisher Road and Gettysburg Pike currently operates at an acceptable LOS 'A' and is estimated to continue to operate at LOS 'A' under the 2020 and 2030 design years both with and without the development.

Average intersection delay is estimated to increase by less than 10 seconds for the peak hours with the addition of the site generated traffic. The development generated traffic is not estimated to impact the offsite intersection at levels that would require mitigation/improvements.

Queue lengths (95th percentile) along Gettysburg Pike at the southbound approach to the intersection with Fisher are estimated to continue to be less than the distance to the proposed full movement driveway. Average queue lengths will not impact normal turning movements at the site driveway.

Right and left turn lane warrant analysis were conducted for the proposed site driveway intersection with Gettysburg Pike. Neither right nor left turn lanes are warranted at the entrance of this development.

In summary, offsite improvements are not recommended as the additional traffic generated by the proposed development will not impact the study intersections at levels that would normally require mitigation.

Site access is recommended to be constructed as follows:

- Construct full movement driveway onto Gettysburg Pike, 34 feet in width per township specifications. A 'stop' sign shall be provided for the exiting movement.
- Construct secondary access via the extension of Coventry Drive, 34 feet in width per township specifications. A 'stop' sign shall be provided for the Coventry Drive approach to the site driveway.

TABLE 1
LEVELS OF SERVICE [DELAY] SUMMARY
SIGNALIZED AND UN-SIGNALIZED INTERSECTIONS

Intersection	Move ment	AM PEAK HOUR STREET						
		2018 Baseline	2020 Opening Year			2030 Horizon Year		
			Base No-Build	Projected Build	Mitigation Build	Base No-Build	Projected Build	Mitigation Build
Fisher Road - Gettysburg Pike UN-SIGNALIZED	ILOS	A [5]	A [5]	A [5]		A [5]	A [5]	
Site Driveway 1 (Full Movement) - Gettysburg Pike UN-SIGNALIZED	ILOS			A [1]			A [1]	

Intersection	Move ment	PM PEAK HOUR STREET						
		2018 Baseline	2020 Opening Year			2030 Horizon Year		
			Base No-Build	Projected Build	Mitigation Build	Base No-Build	Projected Build	Mitigation Build
Fisher Road - Gettysburg Pike UN-SIGNALIZED	ILOS	A [3]	A [3]	A [3]		A [3]	A [3]	
Site Driveway 1 (Full Movement) - Gettysburg Pike UN-SIGNALIZED	ILOS			A [1]			A [1]	

Base = No-Build (without proposed development) scenario for design year conditions

Projected = Build (with proposed development) scenario for design year conditions


ILOS = Overall Intersection Level of Service  = Mitigation not required.

TABLE 1a
LEVELS OF SERVICE (V/C RATIO) [DELAY] SUMMARY BY MOVEMENT
UN-SIGNALIZED INTERSECTIONS

Intersection	Approach / Movement		AM PEAK HOUR STREET				PM PEAK HOUR STREET			
			2020 Opening Year		2030 Horizon Year		2020 Opening Year		2030 Horizon Year	
			No-Build	Build	No-Build	Build	No-Build	Build	No-Build	Build
Fisher Road - Gettysburg Pike UN-SIGNALIZED TWSC	EB	Approach	B [14]	B [14]	C [15.6]	C [15.6]	B [11.1]	B [11.1]	B [11.6]	B [11.6]
		EBL	C [15.3] (0.32)	C [15.3] (0.32)	C [17.2] (0.39)	C [17.2] (0.38)	B [12.1] (0.13)	B [12.1] (0.13)	B [12.7] (0.16)	B [12.7] (0.15)
		EBR	A [8.7] (0.04)	A [8.7] (0.04)	A [8.7] (0.04)	A [8.8] (0.04)	A [9.3] (0.05)	A [9.3] (0.05)	A [9.4] (0.05)	A [9.4] (0.05)
	NB	Approach	[1.2]	[1.2]	[1.2]	[1.2]	[1.7]	[1.7]	[1.7]	[1.7]
		NBL	A [8.4] (0.04)	A [8.4] (0.04)	A [8.4] (0.04)	A [8.5] (0.05)	A [8.7] (0.04)	A [8.7] (0.04)	A [8.7] (0.04)	A [8.7] (0.04)
		NBT	A [0]	A [0]	A [0]	A [0]	A [0]	A [0]	A [0]	A [0]
	SB	Approach	[0]	[0]	[0]	[0]	[0]	[0]	[0]	[0]
		SBT	-	-	-	-	-	-	-	-
		SBR	-	-	-	-	-	-	-	-

Values shown as provided on the HCM 2010 Worksheet for un-signalized intersections
- indicates estimated operation with no delay L.A. = Limited Access scenario

TABLE 1a
LEVELS OF SERVICE (V/C RATIO) [DELAY] SUMMARY BY MOVEMENT
UN-SIGNALIZED INTERSECTIONS

Intersection	Approach / Movement		AM PEAK HOUR STREET				PM PEAK HOUR STREET			
			2020 Opening Year		2030 Horizon Year		2020 Opening Year		2030 Horizon Year	
			No-Build	Build	No-Build	Build	No-Build	Build	No-Build	Build
Site Driveway 1 (Full Movement) - Gettysburg Pike UN-SIGNALIZED TWSC	EB	Approach	NA	B [12.1]	NA	B [12.7]	NA	B [12.2]	NA	B [13.5]
		EBL/R	NA	B [12.1] (0.04)	NA	B [12.7] (0.04)	NA	B [12.2] (0.03)	NA	B [13.5] (0.03)
	NB	Approach	NA	[0]	NA	[0]	NA	[0.1]	NA	[0.1]
		NBL	NA	A [8.4] (0.01)	NA	A [8.4] (0.01)	NA	A [9.0] (0.01)	NA	A [9.1] (0.01)
		NBT	NA	A [0]	NA	A [0]	NA	A [0]	NA	A [0]
	SB	Approach	NA	[0]	NA	[0]	NA	[0]	NA	[0]
		SBT	NA	-	NA	-	NA	-	NA	-
		SBT	NA	-	NA	-	NA	-	NA	-

Values shown as provided on the HCM 2010 Worksheet for un-signalized intersections

- indicates estimated operation with no delay L.A. = Limited Access scenario

Traffic Impact Study

INTRODUCTION

This report provides a traffic impact analysis for proposed residential facilities located in Upper Allen Township, Cumberland County, Pennsylvania. The analysis presented follows standard traffic engineering practice as defined for travel impacts associated with proposed land use developments, and follows the guidelines presented in the Institute of Transportation Engineers (ITE) publication 'Transportation Impact Analyses for Site Development'. General formatting is based on Pennsylvania Department of Transportation's (PennDOT) publication 'Policies and Procedures for Transportation Impact Studies' dated January 28, 2009 and last revised November 25, 2013.

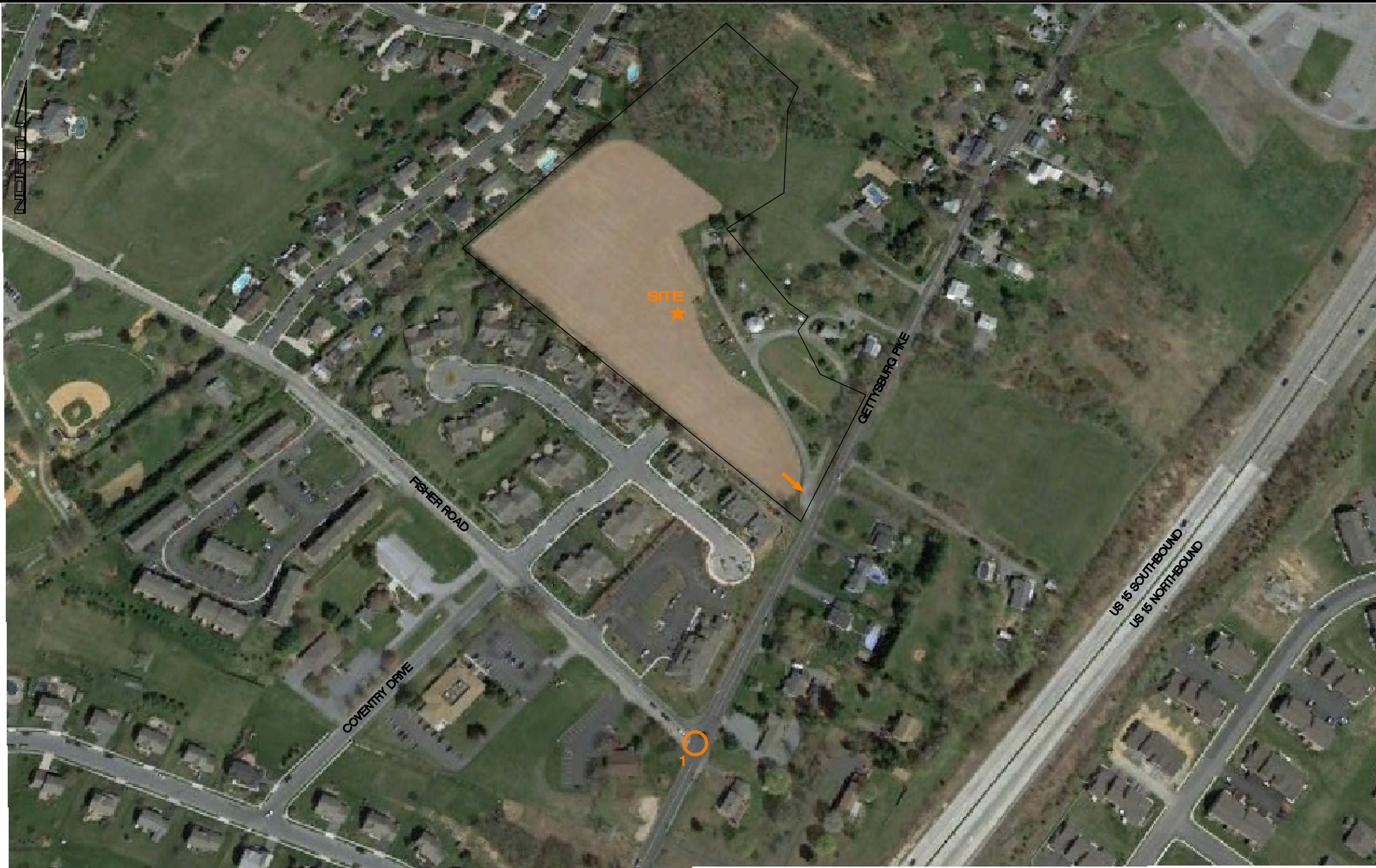
Requirement: Transportation Impact Studies (TIS) also referred to as traffic impact studies or reports are required for land developments by the Township when certain quantitative criteria or thresholds as defined under §220-11.F [SALDO] are met. The proposed land development meets the quantitative criteria under this section of the Township's ordinance. A TIS is therefore required by the Township. Transportation Impact Studies may be required by PennDOT as part of any application for Highway Occupancy Permits (HOP). An HOP as administered by PennDOT under Section 420 of the Act of June 1, 1945 (P.L. 1242, No. 428), known as the "State Highway Law" is required for access to and occupancy of state highways. As part of the noted facility construction, the property owner is not requesting access to any State Route. Therefore, neither a HOP nor TIS will be required by PennDOT for this proposed land development.



Scope: Per discussion with Township representatives, the scope of this report includes an analysis of the following area intersections as shown on **Figure 1**:

- *Fisher Road – Gettysburg Pike, un-signalized intersection,*
- *Site Driveway 1 – Gettysburg Pike, un-signalized intersection.*

Elements of the report were agreed to be the following: Data collection shall be performed during mid-week morning (6:00 to 9:00 AM), and evening (3:00 to 7:00 PM) hours while public school is in session; Turn movement data shall be collected at the adjacent intersection; No turn movement data is collected at the site driveways as the site driveways do not exist; Trip generation shall be based on data available within the manual, *Trip Generation*, Tenth Edition, 2017, an Institute of Transportation Engineers (ITE) Informational Report; Distribution and assignment of trips are to be based on existing data collected at the adjoining intersections (i.e. directional percentage); The opening year shall be 2020 and the horizon year shall be 2030; Growth rates shall 0.87% based on current published data from PennDOT; queue analysis shall be included for the Fisher Road intersection with Gettysburg Pike and any other study intersection that will require mitigation;

Location: The subject site is a 15-acre tract of land located along the west side of Gettysburg Pike approximately 550 feet north of Fisher Road in Upper Allen Township, Cumberland County, Pennsylvania as shown on **Figure 1a**. The site is currently undeveloped as shown on **Figure 1b**. The analysis herein only applies to the facility as shown on **Figure 2**.



-  PROPOSED STUDY INTERSECTIONS:
1 FISHER ROAD - GETTYSBURG PIKE
-  SITE DRIVEWAYS

DESIGN :	MEA
DRAWN :	MEA
CHECKED :	X.X.
DATE :	02-28-2018



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TRANSPORTATION IMPACT STUDY

STUDY AREA - FIGURE 1

ARBORVIEW

UPPER ALLEN TOWNSHIP, CUMBERLAND COUNTY, PENNSYLVANIA

PROJECT NO.	317565
SURVEY BOOK :	Z:\Surveyor\Year\Project.txt
SCALE :	1"=200'
DWG FILE :	F:\317565.dwg D:\Plans\PROP\TIS\00_TIS_LOC.dwg
SHEET	7



NORTH

GETTYSBURG PIKE

SITE

DESIGN : MEA
DRAWN : MEA
CHECKED : X.X.
DATE : 02-28-2018

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TRANSPORTATION IMPACT STUDY

AERIAL - FIGURE 1a

ARBORVIEW

UPPER ALLEN TOWNSHIP, CUMBERLAND COUNTY, PENNSYLVANIA

PROJECT NO.
317565
SURVEY BOOK :
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SCALE : 1" = 100'
DWG : 317565.dwg
FILE : 00_TIS_LOC.dwg

SHEET 8

DESIGN : MEA
DRAWN : MEA
CHECKED : X.X.
DATE : 02-28-2018

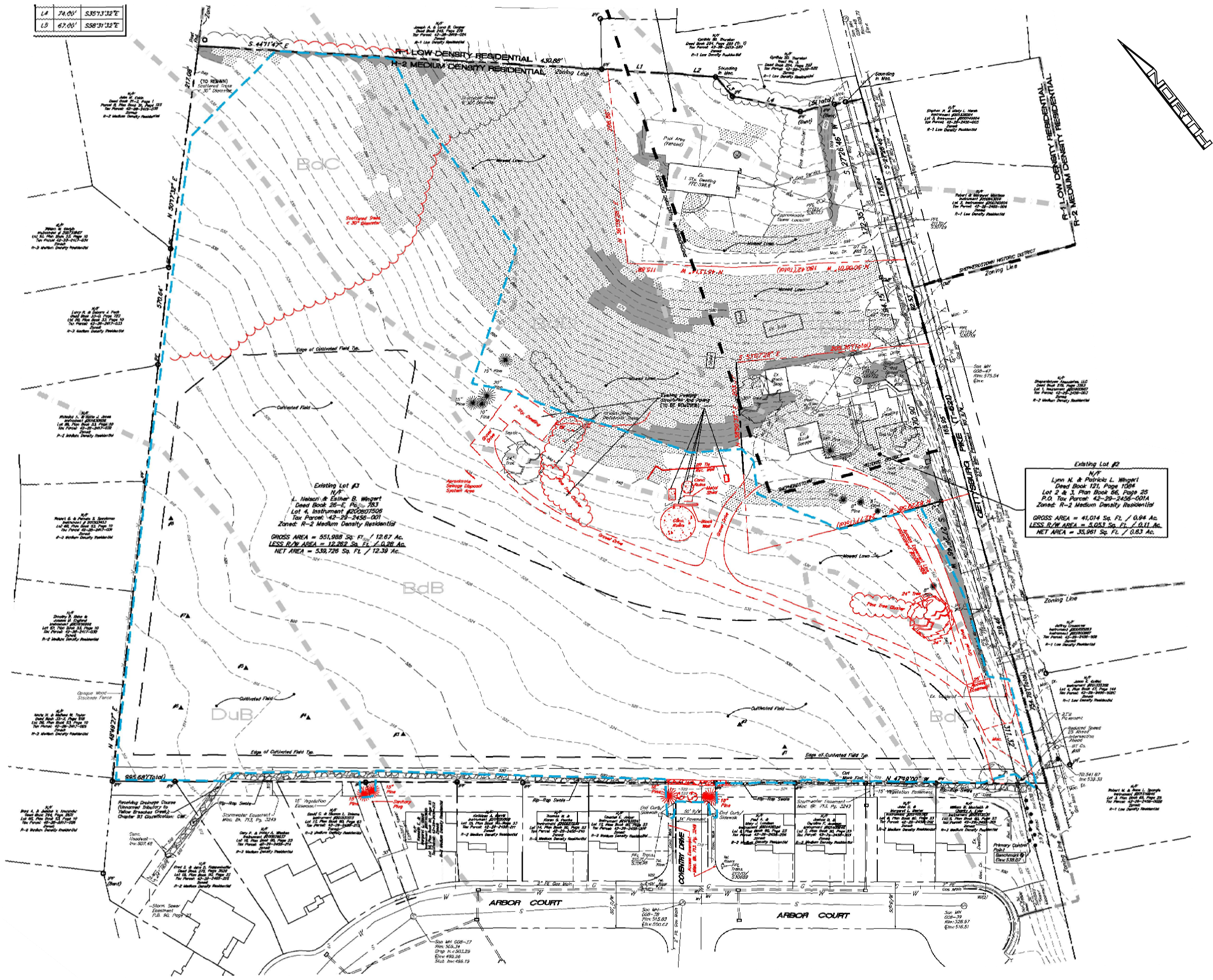
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TRANSPORTATION IMPACT ASSESSMENT
EXISTING FEATURES PLAN - FIGURE 1b

ARBORVIEW

UPPER ALLEN TOWNSHIP, CUMBERLAND COUNTY, PENNSYLVANIA

PROJECT NO.
317565
SURVEY BOOK :
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SCALE: 1" = 50'
DWG: D:\Projects\HQP\1b\1b.dwg
FILE: 00_115_102.dwg
SHEET 9



DESIGN : MEA
DRAWN : MEA
CHECKED : X.X.
DATE : 02-28-2018

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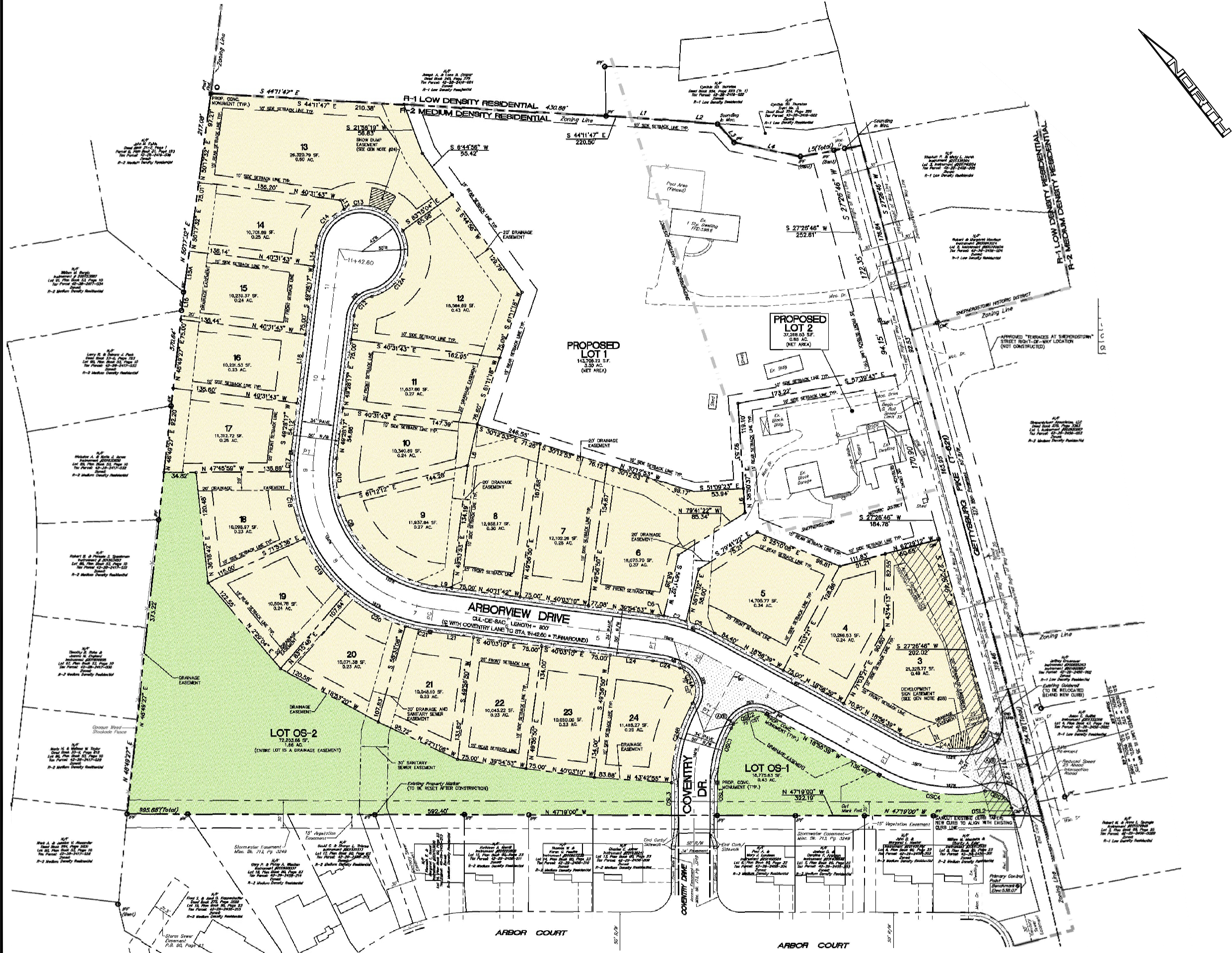
TRANSPORTATION IMPACT ASSESSMENT

SITE PLAN - FIGURE 2

ARBORVIEW

UPPER ALLEN TOWNSHIP, CUMBERLAND COUNTY, PENNSYLVANIA

PROJECT NO.
317565
SURVEY BOOK :
Z:\Surveyor\Year\Project.txt
SCALE: 1" = 50'
DWG: D:\Projects\317565\317565.dwg
FILE: 00_115_L02.dwg
SHEET 10



LAND USE CONTEXT

“Pennsylvania and New Jersey Departments of Transportation have partnered in the development of the ‘Smart Transportation Guide Book’ (March 2008) to guide the development of non-limited access roads as context sensitive.” To achieve the objectives of the Guide Book, land use context must be determined in order to provide appropriate roadway design. Land use context for the proposed development and the immediate surrounding area is predominately ‘Suburban Corridor’. The area is characterized predominantly by a mix of commercial uses with single family residential homes lying further to the east and west along the Gettysburg Pike corridor. This context coincides with Upper Allen Township’s current zoning of the site being ‘Highway Commercial’. The land use context may be referred to throughout this report in the comparison and selection of appropriate design criteria.

EXISTING ROADWAY NETWORK

The existing roadway network affected by the proposed development as agreed upon with the Upper Allen Township consists of the Gettysburg Pike corridor immediately adjacent to the site and the previously noted study intersections. The Gettysburg Pike corridor falls within PennDOT’s designated urbanized area boundary. Existing lane configurations and intersection controls are illustrated in **Figure 3**. Photographs of the intersection and approaches are provide in the appendix / tabbed section of the study.

- Corridors

Gettysburg Pike

Gettysburg Pike is classified as an ‘Urban Collector’, and falls under Traffic Pattern Group 5 (TPG-5) as designated by PennDOT. Upper Allen Township has classified Gettysburg Pike as a ‘Community Arterial’ north of the intersection with South Market Street and as a “Community Collector’ for sections of the roadway located south of the intersection with South Market Street. Traffic flows in a north/south direction for the section of the roadway adjacent to the site with an Annual Average Daily Traffic approaching 4,600 vehicles. The speed limit is posted at 35mph for sections of the road located north of and south of the intersection with Fisher Road. The noted speed limit is within the range recommended for the land use context. The alignment approaching the site from the north is straight having grades that vary from approximately 5 to 1 percent, providing greater than minimum sight distances for turning movements. The alignment approaching the site from the south is slightly curvilinear having grades that vary from 10 to 1percent, also providing greater than minimum sight distances for turning movements. The wearing surface is bituminous and is in good shape. Lane widths average 10 to 12 feet over the length of the roadway. Shoulders are essentially nonexistent. Uses along the adjacent Gettysburg Pike corridor consist of primarily residential uses with some commercial, service, and agricultural uses.

- Intersections

Fisher Road – Gettysburg Pike, un-signalized intersection:

This is a stop controlled 3-leg intersection with the eastbound (Fisher Road) approach controlled. The eastbound approach consist of two exclusive turn lanes approximately 12 feet in width. The northbound approach consists of a single lane approximately 11

feet in width. The southbound approach consists of an exclusive right turn lane along with a separate through lane both being approximately 10 feet in width. Speed limits are posted as 25 MPH for Fisher Road and 35 MPH for the Gettysburg Pike approaches. Curb is provided along the northern side of the eastbound approach and along the west side of the southbound approach. Sidewalks are not located at the intersection. Sidewalks are located along the northern side of Fisher Road beginning approximately 150 feet west of the intersection. Intersection capacity currently operates at a LOS A for all peak hours.

- Multimodal Transportation

Capital Area Transit (CAT) does not currently operate any transit routes along Gettysburg Pike in front of the proposed development site. The nearest transit route is (bus route 120) the Winding Hill Express. This route connects the Winding Hills Road Park-n-ride to the Capitol Complex in Harrisburg. This route also has direct connection to the Harrisburg Transit Center which houses the Amtrak Station, Capitol Trailways and Greyhound Bus terminals. Connecting routes provide access to Harrisburg International Airport. For bicyclist, bike racks are provided on CAT's busses and bike racks are provided at some of the Park-n-rides. Nearest Park-n-ride site is located at the intersection of East Winding Hill Road and Orchard Boulevard (1 mile from site). Connecting routes, Park-n-ride sites, and time tables for route 120 are included within the 'Existing Conditions' tabbed section of the appendix.

Rabbittransit operates a route between Gettysburg and Harrisburg along the adjacent US 15 corridor. The only direct connection is located at the Harrisburg Transit Center.

EXISTING TRAFFIC VOLUMES AND ANALYSIS

Manual traffic counts were conducted on February 28, 2018 during the weekday (6:00 to 9:00 AM) morning and (3:00 to 7:00 PM) evening periods to obtain peak hour data. Data was collected using 'Jamar Technologies, Inc' model TDC-12 hand held recorders. Peak hours and volumes for the individual intersections are illustrated in **Table 2**. Turn movement vehicle volume data is included in the appendix. Existing condition traffic volumes for the weekday AM, and weekday PM peak hours are illustrated and included in the appendix as part of **Figure 3**. **Table 1** as included within the executive summary details the average LOS and control delay for each intersection. Each LOS is illustrated and included in the appendix as part of **Figure 3**.

TABLE 2
Peak Hour and Volume

Intersection	Peak Hour			
	AM (Volume)	PM (Volume)		
South Market Street (SR0014)- Gettysburg Pike	7:15 – 8:15 (582)	5:00 – 6:00 (603)		

SEASONAL ADJUSTMENT AND GROWTH FACTORS

PennDOT publishes forward-looking growth projections for a one-year period in a one-page document entitled “Growth Factors for August 2017 to July 2018”. For purposes of this analysis, the published value is 0.87% for urban non-interstate highways in Cumberland County. While the land use context is ‘Suburban’ the study area falls within PennDOT’s urban boundary. This factor was applied to arrive at the 2020 base volumes for the design opening year. Traffic volume worksheets are included in a separate tabbed section of the appendix detailing future volumes anticipated per movement, per intersection.

NO-BUILD FUTURE TRAFFIC VOLUMES

Baseline year is 2018 to coincide with the previously noted data collection. Opening year is assumed to be 2020 based on the anticipated development schedule. Opening year - base condition (no-build) traffic volumes for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 5a**. Opening year - base condition (no-build) LOS for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 5e**. **Table 1** details the LOS for each intersection within the study area.

Upper Allen Township’s ordinance requires the design horizon year to be 10 years beyond the opening year or 2030. Design horizon year - base condition (no-build) traffic volumes for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 6a**. Design horizon year- base condition (no-build) LOS for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 6e**. **Table 1** details the LOS for each intersection within the study area.

PROJECT DESCRIPTION

1849 Development, LLC is proposing to construct new residential units on approximately 15 acres of land located along Gettysburg Pike in Upper Allen Township. The site is undeveloped, currently used for agricultural purposes as shown on **Figures 1a and 1b**. Proposed facilities will include 22 residential lots, approximately 1,330 linear feet of new public streets, associated driveways, stormwater facilities, lawns, etc. A conceptual sketch plan is attached as **Figure 2**. The public streets will include a paved section 34 feet in width, concrete sidewalks 4 feet in width, all within a 50 feet wide right-of-way. Sidewalks will connect to the sidewalk system along Coventry Drive. The proposed development is consistent with the zoning. Construction is anticipated to start in 2018 and be completed in the same year to achieve a use prior to 2020. The streets are intended to be dedicated to the municipality.

PROPOSE SITE ACCESS

Vehicular access to the facility is proposed via a full movement site entrance along Gettysburg Pike near the eastern limits of the property. This access point will be located approximately 520 feet from the intersection with Fisher Road. Secondary access is proposed via the extension of Coventry Drive. Site driveways are classified as low-volume driveways. Proposed access is shown on **Figure 2**.

TRIP GENERATION

The trip generation equations for the proposed development were obtained from the manual, *Trip Generation*, Tenth Edition, 2017, an Institute of Transportation Engineers (ITE) Informational Report. For this analysis, Land Use Code 210 (Single Family Detached Housing), was used to calculate the average number of vehicular trips the development is estimated to generate during the weekday, weekday AM peak, weekday PM peak, and weekday generator peak periods. Peak hour trips calculated are representative of volume that occurs only during the peak hour of the generator and or adjacent street traffic. **Table 3a** shows the equations and directional percentages for the analyzed time periods. **Table 3b** list the estimated trips generated by the proposed development at full build out. Trip generation data sheets are included in a separate tabbed section of the appendix.

TABLE 3a
ITE TRIP GENERATION EQUATIONS

Land Use Description	ITE #	Time Period	Equations	Independent Variable (X)	Entering %	Exiting %
Single Family Detached Housing	210	Weekday	$LN(T) = 0.92LN(X)+2.71$	(22) Units	50%	50%
		AM Peak Hour of Adj Street	$T = 0.71(X)+4.80$		25%	75%
		PM Peak Hour of Adj Street	$LN(T) = 0.96LN(X)+0.20$		63%	37%
		AM Peak Hour of Generator	$LN(T) = 0.91LN(X)+0.20$		26%	74%
		PM Peak Hour of Generator	$LN(T) = 0.94LN(X)+0.34$		64%	36%

T = number of site-generated vehicular trips

M= Measured Trip Rate

AR = Trip Generation Rate, No equation provided.

SNA = Split Not Available

TABLE 3b
TRIP GENERATION
PROPOSED DEVELOPMENT – FULL BUILD OUT

Time Period	New Trips		
	Total		
	Total	Enter	Exit
Weekday	258	129	129
Weekday AM Adj.	20	5	15
Weekday PM Adj.	24	15	9
Weekday AM Gen.	20	5	15
Weekday PM Gen.	26	17	9

The proposed development is expected to generate approximately 258 vehicle trips on an average weekday while school is in session. The trip generation estimate includes approximately 20 vehicle trips during the morning or AM peak hour of the adjacent street and approximately 24 vehicle trips during the PM peak hour of the adjacent street.

TRIP DISTRIBUTION

The distribution and assignment of site-generated trips was based upon an analysis of the following: (1) existing traffic patterns and distributions within the study area; (2) the available routes for travel; and (3) the proposed site driveway location and configuration.

Additional trips were added to the distribution for conservative modeling of northbound trips from and southbound trips to the adjacent 'Arborfield' development. Travel patterns and distributions of site-specific traffic are illustrated in the appendix as part of **Figure 4**. The resulting assignment is shown in **Tables 4a and 4b**.

TABLE 4a
TRIP ASSIGNMENT (% of development generated vehicles at intersection)

Time Period	Site Driveway 1 – Gettysburg Pike				Fisher Road – Gettysburg Pike					
	Enter		Exit		Enter			Exit		
	NBL	SBR	EBL	EBR	NBL	NBT	SBR	EBL	EBR	SBT
AM	38%	62%	81%	19%	0%	38%	0%	0%	0%	19%
PM	21%	79%	66%	34%	0%	21%	0%	0%	0%	34%

TABLE 4a
TRIP ASSIGNMENT (% of development generated vehicles at intersection)

Time Period		Site Driveway 1 – Gettysburg Pike						Fisher Road – Gettysburg Pike			
		Enter			Exit			Enter		Exit	
		NBL	SBT	SBR	EBL	EBR	NBT	NBT	SBR	EBL	SBT
AM	ARBORVIEW	2	0	3	12	3	0	2	0	0	3
	ARBORFIELD	0	-1	1	5	0	-5	0	-1	-5	0
	TOTAL	2	-1	17	17	3	-5	0	-1	-5	0
PM	ARBORVIEW	3	0	12	6	3	0	3	0	0	3
	ARBORFIELD	0	-6	6	3	0	-3	0	-6	-3	0
	TOTAL	3	-6	18	9	3	-3	0	-6	-3	3

BUILD FUTURE TRAFFIC VOLUMES (OPENING YEAR)

The site-generated trips for the proposed development were added to the 2020 opening year - base condition (no-build) to calculate 2020 opening year - projected (full build out) conditions. Projected condition traffic volumes for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 5c**. Opening year - projected condition (build) LOS for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 5g**. **Table 1** details the LOS for each Intersection within the study area.

BUILD FUTURE TRAFFIC VOLUMES (DESIGN HORIZON YEAR)

The site-generated trips for the proposed development were added to the 2030 horizon year - base condition (no-build) to calculate 2030 horizon year - projected (full build out) conditions. Projected condition traffic volumes for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 6c**. Horizon year - projected condition (build) LOS for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 6g**. **Table 1** details the LOS for each intersection within the study area.

CAPACITY ANALYSIS

Level of Service (LOS) generally describes operational characteristics in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort and convenience and safety. Six Levels of Service are defined for each type of traffic facility, ranging from A to F. Level of Service "A" indicates free flow; Level of Service "B" indicates stable flow; Level of Service "C" indicates stable, but inhibited flow; Level of Service "D" indicates high density, restricted stable flow; Level of Service "E" indicates operation at or near capacity; Level of Service "F" is indicative of flow breakdown. Levels of Service criteria are also quantified in terms of average control delay as illustrated in **Table 5** per vehicle for a one-hour period. PennDOT policy sets acceptable LOS for intersections as overall intersection LOS C in rural areas and overall intersection LOS D in urban areas. Individual municipalities may have defined differing values for acceptable LOS by ordinance.

TABLE 5
Control Delay per Levels Of Service

Level-of-Service	Control Delay Per Vehicle (Seconds)	
	Signalized Intersections	Un-Signalized Intersections
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Signalized and un-signalized intersection capacity analysis was conducted utilizing SYNCRO 8 Software. HCM data sheets are included in a separately tabbed section of the appendix. Capacity analysis is conducted per methodologies and procedures outlined in the Transportation Research Board publication HCM 2010.

As previously stated above opening year and design horizon year- projected conditions (build) LOS for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figures 5g and 6g**, respectively. For comparison, existing LOS for the weekday AM and PM peak hours are illustrated and included in the appendix as part of **Figure 3**. Levels of Service (LOS) for intersections within the study area have been summarized in **Table 1**. The summaries have been prepared outlining existing 2018 baseline conditions, opening year 2020 base (no-build) and projected (build) conditions, and horizon year 2030 base (no-build) and projected (build) conditions. 'Baseline' refers to the existing development scenario represented by the measured traffic volumes listed in the *Existing traffic volumes and analysis* section of this report. 'No-Build' refers to a development scenario whereby traffic growth on the adjacent street is the only additional development. 'Build' refers to a development scenario that consists of the addition of the residential development and related driveway construction. During the future 2020 and 2030 design years the following two study intersections are estimated to operate at varying levels of service dependent upon a specific peak hour.

- **Fisher Road & Gettysburg Pike** – During both the AM and PM peak hour this intersection currently operates at an acceptable LOS 'A'. Average intersection delay is estimated to increase negligibly over the 2-year design period without the development. With the addition of the development average intersection delay is estimated to increase by less than 1 second.
- **Site Driveway 1 & Gettysburg Pike** - During the both the AM and PM peak hours this intersection is estimated to operate at LOS 'A' under the opening 2020 design year with the development. Average intersection delay is estimated to be negligible being 1 second or less with the development. All movements are estimated to operate at LOS 'C' or better for all build scenarios.

TURN LANE WARRANT ANALYSIS

Volumes of right turning traffic into the site are estimated to be below the minimum thresholds required for warranting a right turn lane. Volumes of left turning traffic into the site are estimated at less than 2% of the advancing volume. The advancing traffic volumes are estimated to be below the minimum thresholds required for warranting a left turn lane. Turn lane warrant analysis worksheets for the 2020 build scenario are included in a separately tabbed section of the appendix.

TURN RESTRICTION WARRANT ANALYSIS

Turn restriction warrants were evaluated per 67 PA Code § 212.111 for the proposed site driveway intersection. None of the six warrants were met for the build development scenarios.

QUEUE ANALYSIS

Queue lengths were calculated utilizing SYNCRO 8 Software. Calculated 95th% queue lengths for each movement at each intersection are indicated in **Table 6a** for the peak hours. Queuing analysis indicates that all design scenario queue lengths either fall within the available storage lengths or do not extend no-build scenario queue lengths by a car length (20 feet). Queue lengths at the southbound approach to the intersection with Fisher Road are estimated to continue to be less than the distance to the proposed full movement driveway.

TABLE 6a
CACULATED 95TH % QUEUE LENGTHS

Intersection	Move ment	Storage Length	AM Peak Hour					PM Peak Hour				
			2017	2020		2030		2018	2020		2030	
			No- Build	No- Build	Build	No- Build	Build	No- Build	No- Build	Build	No- Build	Build
Fisher Road - Gettysburg Pike	EBL	210	28	28	28	36	36	10	10	10	12	10
	EBR	470	2	2	2	2	2	2	2	2	4	4
	NBL/T	500+	2	2	2	4	4	2	2	2	2	2
	SBT	*500	0	0	0	0	0	0	0	0	0	0
	SBR	170	0	0	0	0	0	0	0	0	0	0
Site Driveway 1 - Gettysburg Pike	EBL/R	100+	NA	NA	2	NA	2	NA	NA	2	NA	2
	NBL/T	500	NA	NA	0	NA	0	NA	NA	0	NA	0
	SBT/R	500+	NA	NA	0	NA	0	NA	NA	0	NA	0

Lengths are in feet.

☐ = Length greater than storage length.

* Distance to SD1

SIGHT DISTANCE ANALYSIS

A sight distance analysis was performed for the site driveway intersections. In general, recommended safe sight distances depend upon the posted speed limit, roadway grades, and the number of travel lanes. The measured existing sight distances were compared to PennDOT's safe stopping sight distance (SSSD) standard as calculated by the following equation:

$$SSSD = 1.47VT + V^2/[30(f \pm g)]$$

SSSD = safe stopping sight distance (acceptable sight distance)

V = Velocity of Vehicle (posted)

T = Perception Reaction Time of Driver (2.5 seconds)

f = Coefficient of Friction for Wet Pavements (average of 0.30)

g = Percent of Roadway Grade Divided by 100

PennDOT's safe stopping sight distance standards both exceed the stopping sight distance requirements as specified in A Policy on Geometric Design of Highways and Streets, of the American Association of State Highway and Transportation Officials (AASHTO), Chapter III, "Elements of Design," 2004. The existing sight distances at the site driveways were measured and compared to the minimum sight distance standards as specified in Title 67 of the PA Code, Chapter 441, "Access to and Occupancy of Highways by Driveways and Local Roads," August, 1996. **Table 7** shows the measured and calculated sight distances at the site driveways for vehicles entering and exiting the site.

TABLE 7
SIGHT DISTANCE ANALYSIS FOR GETTYSBURG PIKE –
SITE DRIVEWAY 1 UN-SIGNALIZED INTERSECTION

	<i>Direction</i>	Speed (mph)	Grade (%)	<i>Sight Distances (feet)</i>		
				Calculated MIN	Measured	Desirable
<i>Exiting Right Turns</i>	<i>To the left</i>	35	-5	269	370	NA
<i>Exiting Left Turns</i>	<i>To the right</i>	35	+5	233	1,069	NA
<i>Entering Left Turns</i>	<i>From Behind</i>	35	+5	233	1,049	NA
<i>Entering Left turns</i>	<i>Opposing</i>	35	-5	269	943	NA

RECOMMENDED IMPROVEMENTS

Offsite improvements are not recommended as the additional traffic generated by the proposed development will not impact the study intersections at levels that would normally require mitigation.

Site access is recommended to be constructed as follows:

- Construct full movement driveway onto Gettysburg Pike, 34 feet in width per township specifications. A 'stop' sign shall be provided for the exiting movement.
- Construct secondary access via the extension of Coventry Drive, 34 feet in width per township specifications. A 'stop' sign shall be provided for the Coventry Drive approach to the site driveway.

Appendices

Figures

Included

- ☒ Figure 3: Existing Volume/LOS
- ☐ Figure 3a: Existing Signal Plan (if applicable)
- ☒ Figure 4: Trip Distribution Percentage and Volumes

Opening Year Conditions:

- ☒ Figure 5a: Opening Year Traffic Volumes without Development (AM, PM, Site Peak)
- ☐ Figure 5b: Opening Year Traffic Volume without Development & with Committed Development
- ☒ Figure 5c: Opening Year Traffic Volumes with Development
- ☐ Figure 5d: Opening Year Traffic Volumes with Development & Committed Development
- ☒ Figure 5e: Opening Year Levels of Service without Development
- ☐ Figure 5f: Opening Year Levels of Service without Development & with Committed Development
- ☒ Figure 5g: Opening Year Levels of Service with Development
- ☐ Figure 5h: Opening Year Levels of Service with Development & Committed Development
- ☐ Figure 5i: Opening Year Levels of Service with Development & Recommended Mitigation
- ☐ Figure 5j: Opening Year Levels of Service with Development, Committed Development, & Recommended Mitigation

Design Horizon Year Conditions:

- ☒ Figure 6a: Design Horizon Year Traffic Volumes without Development (AM, PM, Site Peak)
- ☐ Figure 6b: Design Horizon Year Traffic Volumes without Development & with Committed Development
- ☒ Figure 6c: Design Horizon Year Traffic Volumes with Development
- ☐ Figure 6d: Design Horizon Year Traffic Volumes with Development & Committed Development
- ☒ Figure 6e: Design Horizon Year Levels of Service without Development
- ☐ Figure 6f: Design Horizon Year Levels of Service without Development & with Committed Development
- ☒ Figure 6g: Design Horizon Year Levels of Service with Development
- ☐ Figure 6h: Design Horizon Year Levels of Service with Development & Committed Development
- ☐ Figure 6i: Design Horizon Year Levels of Service with Development & Recommended Mitigation
- ☐ Figure 6j: Design Horizon Year Levels of Service with Development, Committed Development, & Recommended Mitigation

Misc.

- ☒ Site Photographs
- ☒ Existing Conditions (sketches, Transit Data, etc.)
- ☒ Turning Movement Counts, 24 Hour Volumes
- ☒ Growth Rate and Volume Worksheets
- ☒ Trip Generation Worksheets
- ☒ HCM Worksheets
- ☐ Gap Analysis
- ☐ Delay Analysis
- ☐ Traffic Signal Warrant Analysis
- ☒ Turn Lane Analysis
- ☒ Correspondence

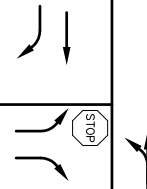
Figure 3






SITE

GETTYSBURG PIKE

FISHER ROAD



-  = Channelized Island
-  = Signal-Controlled Approach
-  = Stop-Controlled Approach

= AM Peak Hour Data
[#] = PM Peak Hour Data

SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

ARBORVIEW

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FIGURE 3 SHEET 1 OF 3

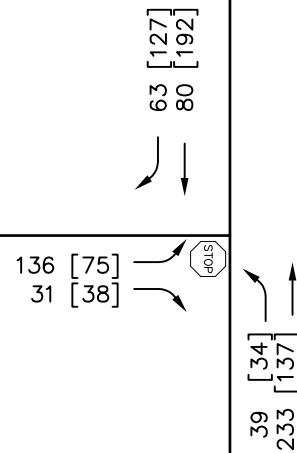
EXISTING LANE CONFIGURATION
AND INTERSECTION CONTROL



SITE

GETTYSBURG PIKE

FISHER ROAD



- = Channelized Island
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- = Stop-Controlled Approach

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FIGURE 3 SHEET 2 OF 3

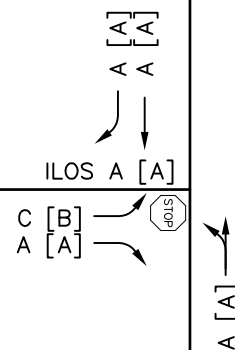
2018 BASELINE CONDITIONS
PEAK HOUR TRAFFIC VOLUMES






SITE

GETTYSBURG PIKE

FISHER ROAD



-  = Channelized Island
-  = Signal-Controlled Approach
-  = Stop-Controlled Approach

= AM Peak Hour Data
[#] = PM Peak Hour Data

SD : Site Driveway
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Schematic Drawing : Not To Scale

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FIGURE 3 SHEET 3 OF 3

2018 BASELINE CONDITIONS
PEAK HOUR LOS

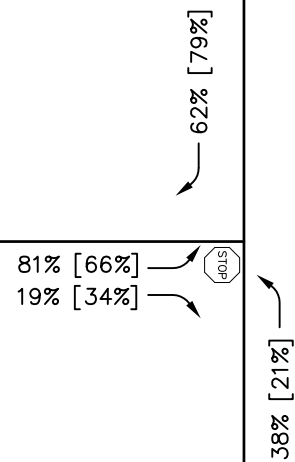
Figure 4






SITE

GETTYSBURG PIKE

FISHER ROAD



-  = Channelized Island
-  = Signal-Controlled Approach
-  = Stop-Controlled Approach

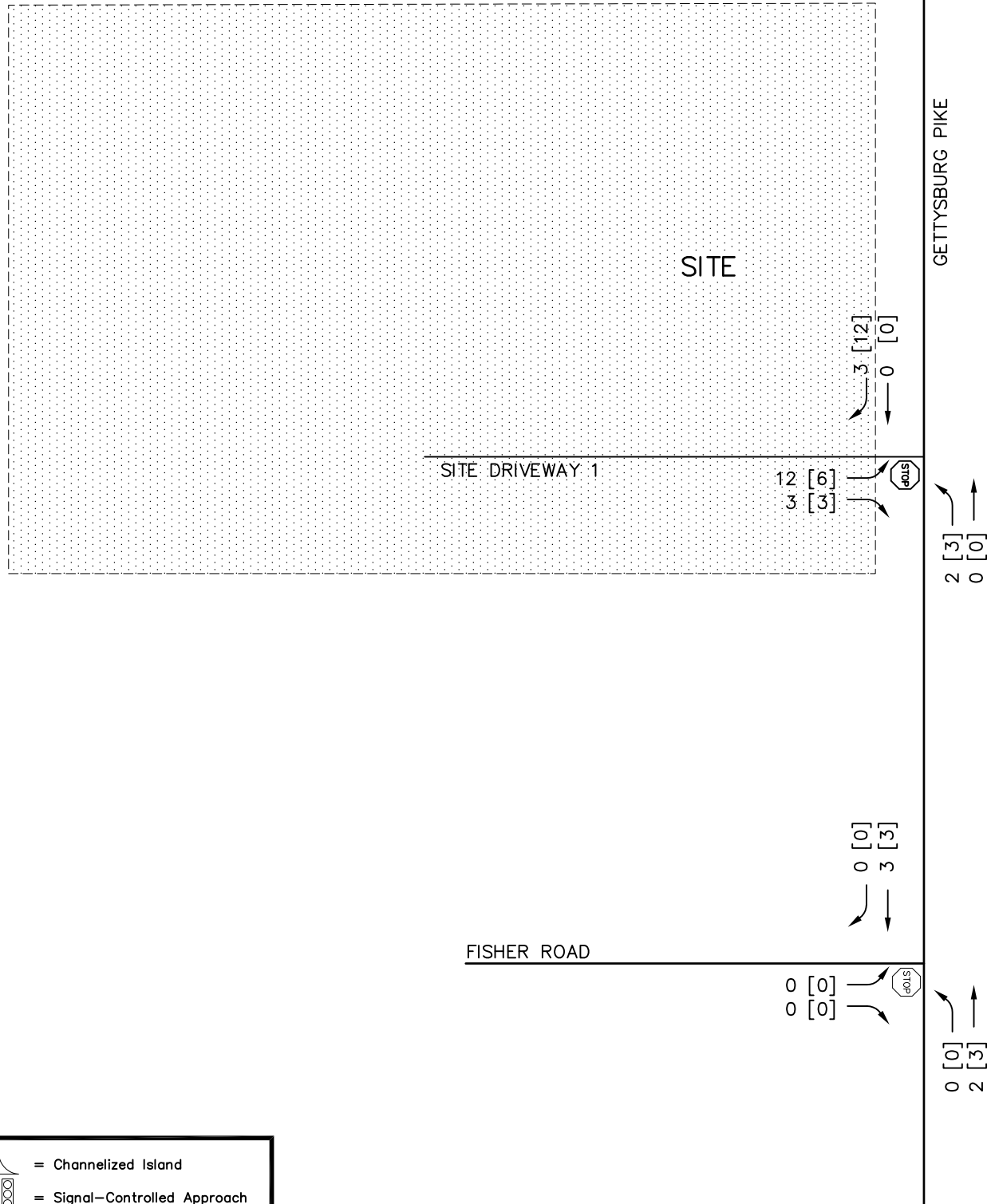
= AM Peak Hour Data
[#] = PM Peak Hour Data




SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

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FIGURE 4 SHEET 1 OF 4
EXISTING DISTRIBUTION PERCENTAGE



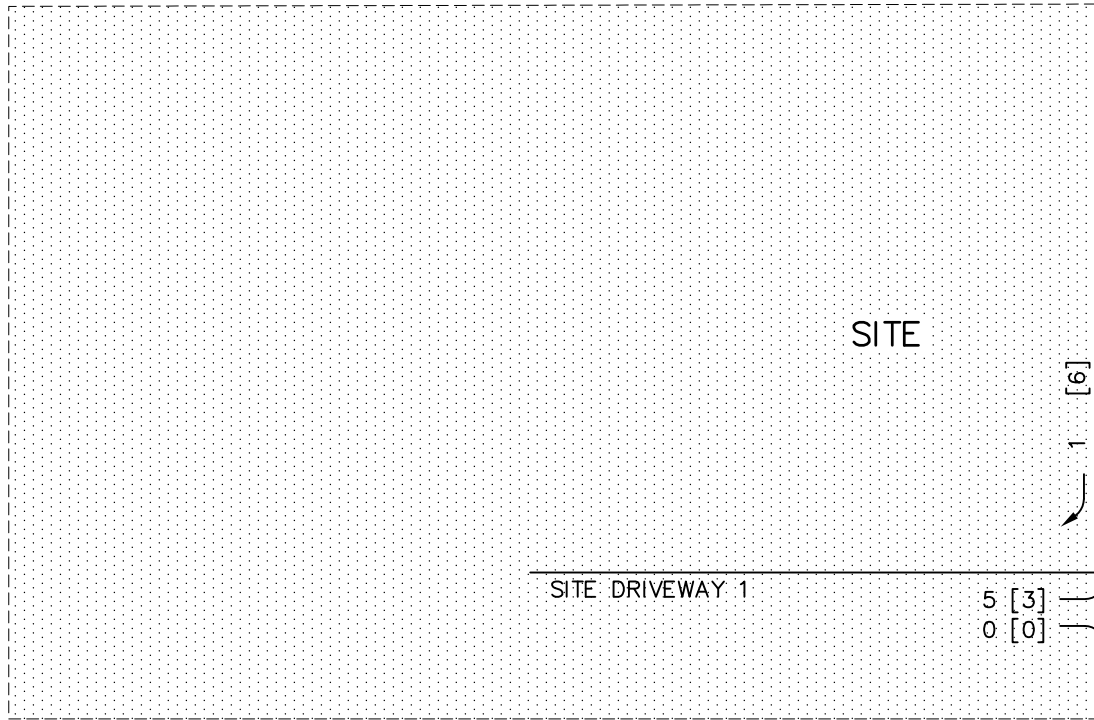
 = Channelized Island
 = Signal-Controlled Approach
 = Stop-Controlled Approach
= AM Peak Hour Data
[#] = PM Peak Hour Data
SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

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FIGURE 4 SHEET 2 OF 4

2020 & 2030 BUILD PROJECTED CONDITIONS
DISTRIBUTION/ASSIGN. NEW TRIPS



SITE DRIVEWAY 1

$$\begin{array}{c} \overline{1} \quad \overline{[6]} \\ \hline \overline{-1} \quad \overline{[-6]} \end{array}$$
$$\begin{bmatrix} 5 \\ 0 \end{bmatrix} \begin{bmatrix} 3 \\ 0 \end{bmatrix}$$
$$\begin{array}{c} \nearrow \\ 0 \quad [0] \\ \leftarrow \\ -5 \quad [-3] \end{array}$$
$$\begin{array}{c} \rightarrow \\ \rightarrow \end{array} \begin{array}{c} 0 \\ -1 \end{array} \begin{array}{c} [0] \\ [-6] \end{array}$$

FISHER ROAD

$$\begin{array}{r} -5 \quad [-3 \\ 0 \quad [0 \end{array}$$

= AM Peak Hour Data
[#] = PM Peak Hour Data

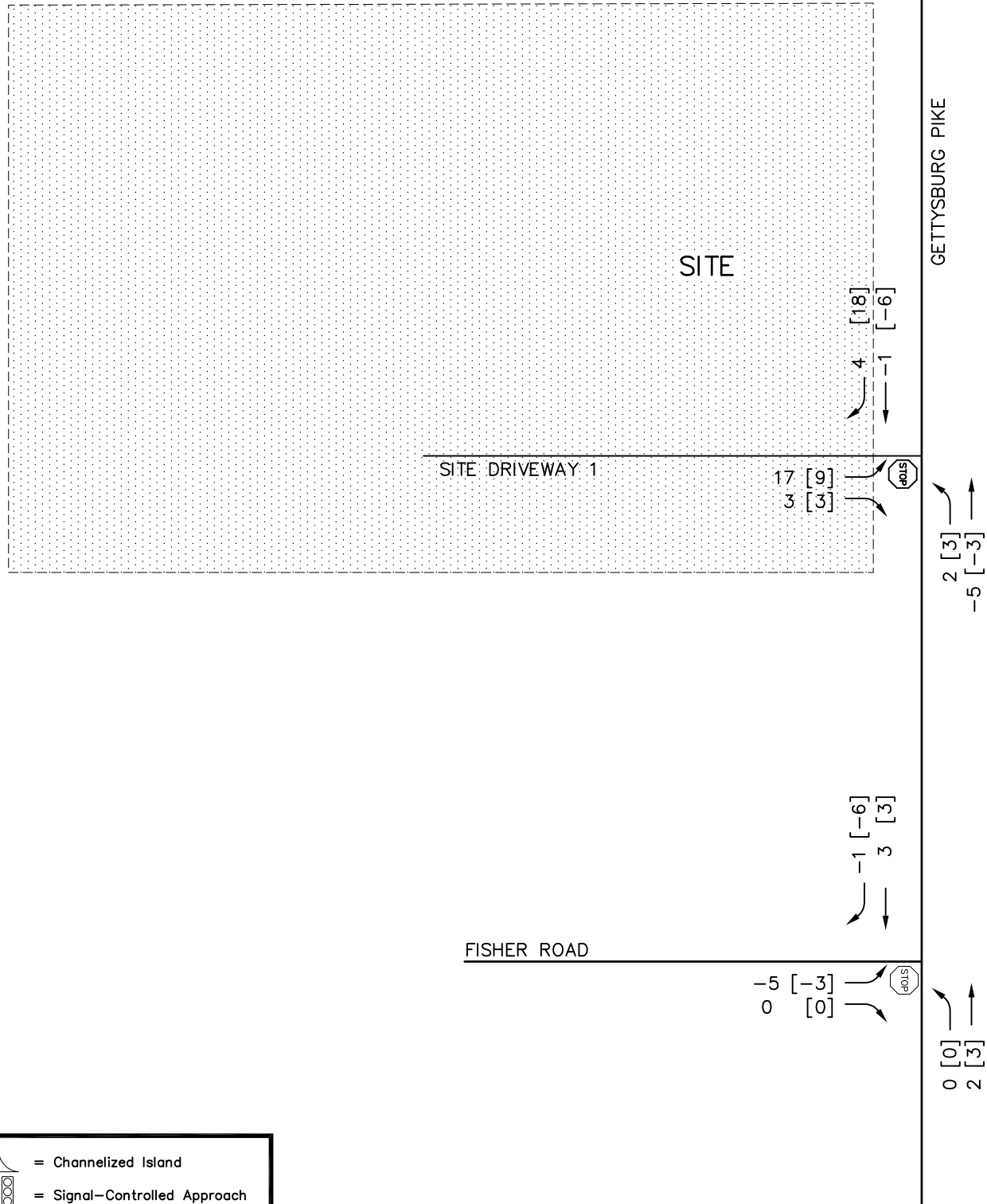
SD : Site Driveway
 ILOS : Intersection Level of Service
 Schematic Drawing : Not To Scale




ARBORVIEW

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FIGURE 4 SHEET 3 OF 4

[illegible]



 = Channelized Island
 = Signal-Controlled Approach
 = Stop-Controlled Approach
= AM Peak Hour Data
[#] = PM Peak Hour Data
SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

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FIGURE 4 SHEET 4 OF 4

2020 & 2030 BUILD PROJECTED CONDITIONS
DISTRIBUTION/ASSIGN. TOTAL TRIPS

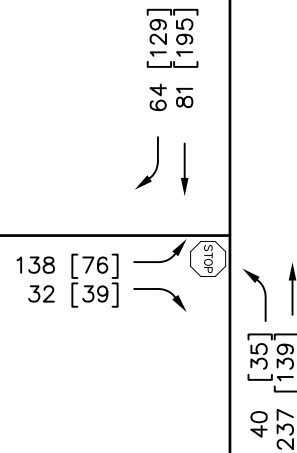
Figure 5a-5g



SITE

GETTYSBURG PIKE

FISHER ROAD



- = Channelized Island
- = Signal-Controlled Approach
- = Stop-Controlled Approach

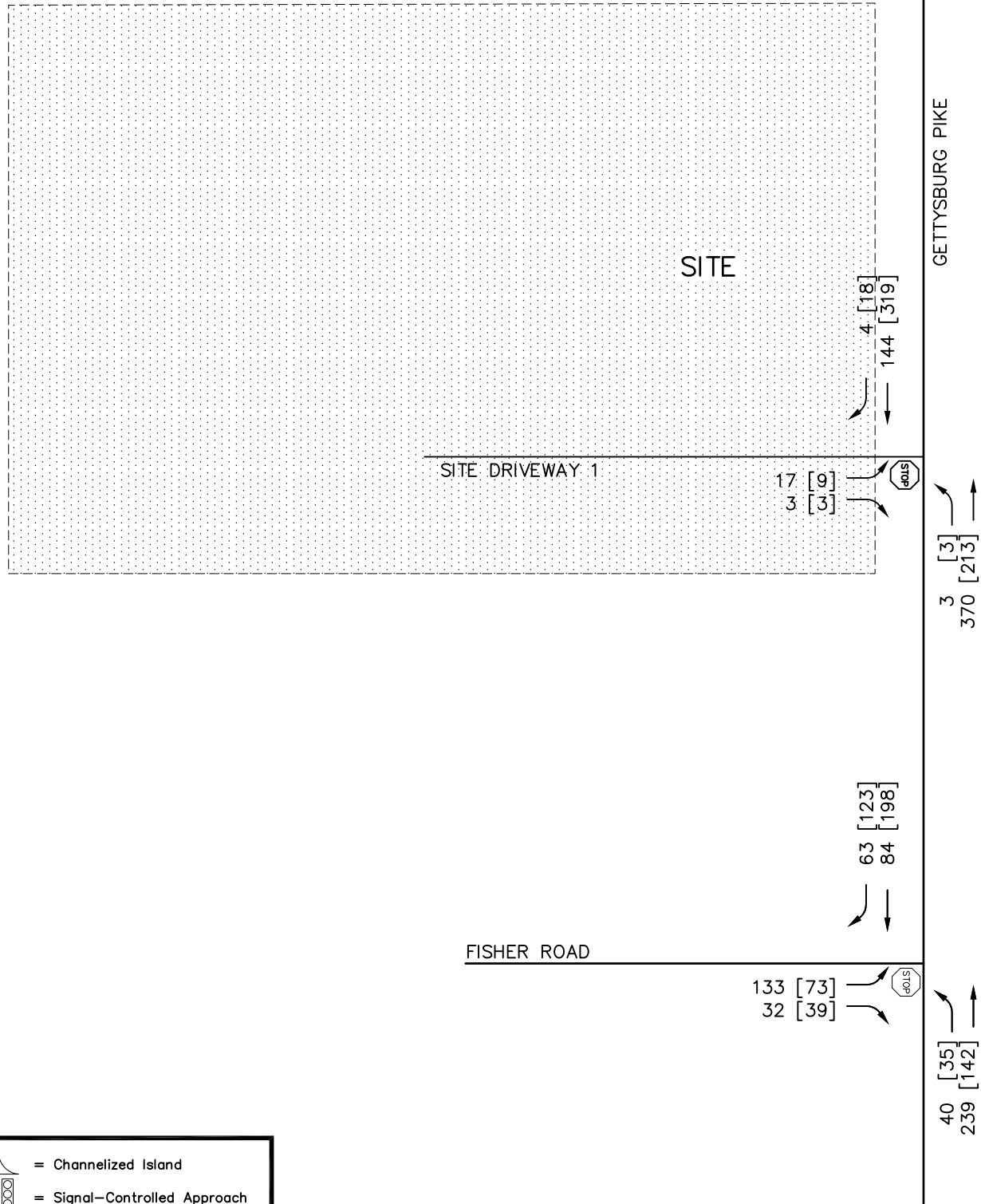
= AM Peak Hour Data
[#] = PM Peak Hour Data




SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

ARBORVIEW

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FIGURE 5A SHEET 1 OF 1
2020 OPENING YEAR – BASE CONDITIONS
PEAK HOUR TRAFFIC VOLUMES



-  = Channelized Island
-  = Signal-Controlled Approach
-  = Stop-Controlled Approach
- # = AM Peak Hour Data
- [#] = PM Peak Hour Data
- SD : Site Driveway
- ILOS : Intersection Level of Service
- Schematic Drawing : Not To Scale

ARBORVIEW



FIGURE 5C SHEET 1 OF 1

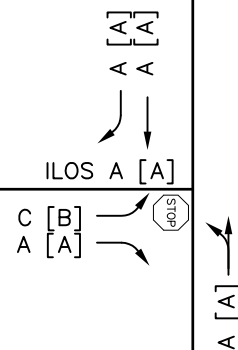
2020 OPENING YEAR – PROJECTED CONDITIONS
AM PEAK HOUR TRAFFIC VOLUMES






SITE

GETTYSBURG PIKE

FISHER ROAD



-  = Channelized Island
-  = Signal-Controlled Approach
-  = Stop-Controlled Approach

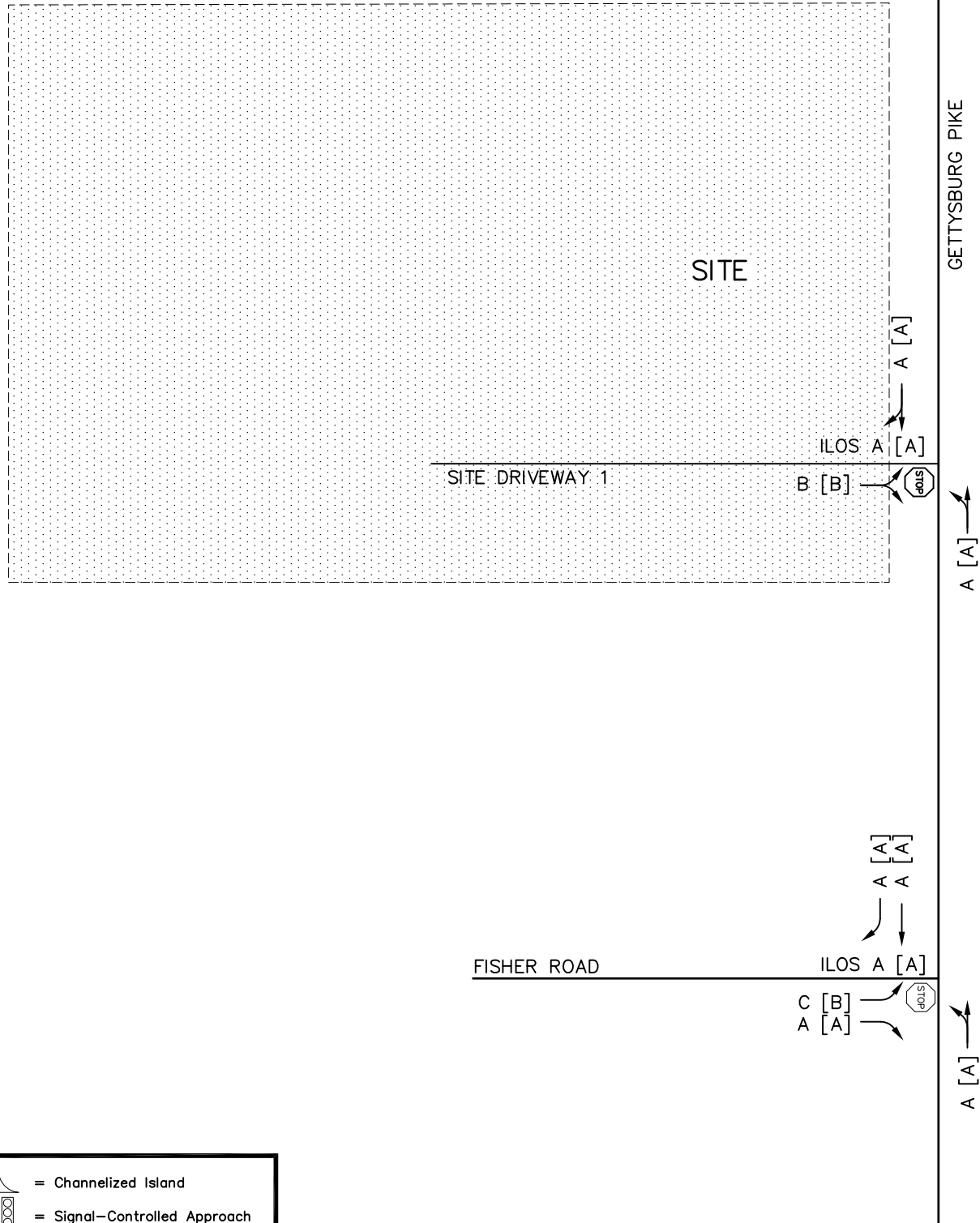
= AM Peak Hour Data
[#] = PM Peak Hour Data




SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

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FIGURE 5E SHEET 1 OF 1
2020 OPENING YEAR – BASE CONDITIONS
PEAK HOUR LOS



 = Channelized Island
 = Signal-Controlled Approach
 = Stop-Controlled Approach
= AM Peak Hour Data
[#] = PM Peak Hour Data
SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

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FIGURE 5G SHEET 1 OF 1

2020 OPENING YEAR - PROJECTED CONDITIONS
PEAK HOUR LOS

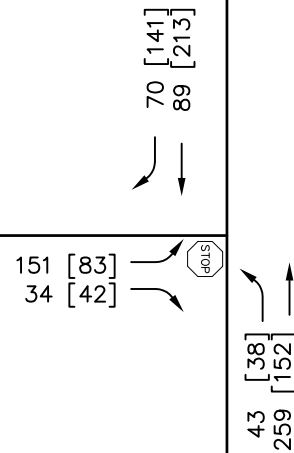
Figure 6a-6g



SITE

GETTYSBURG PIKE

FISHER ROAD



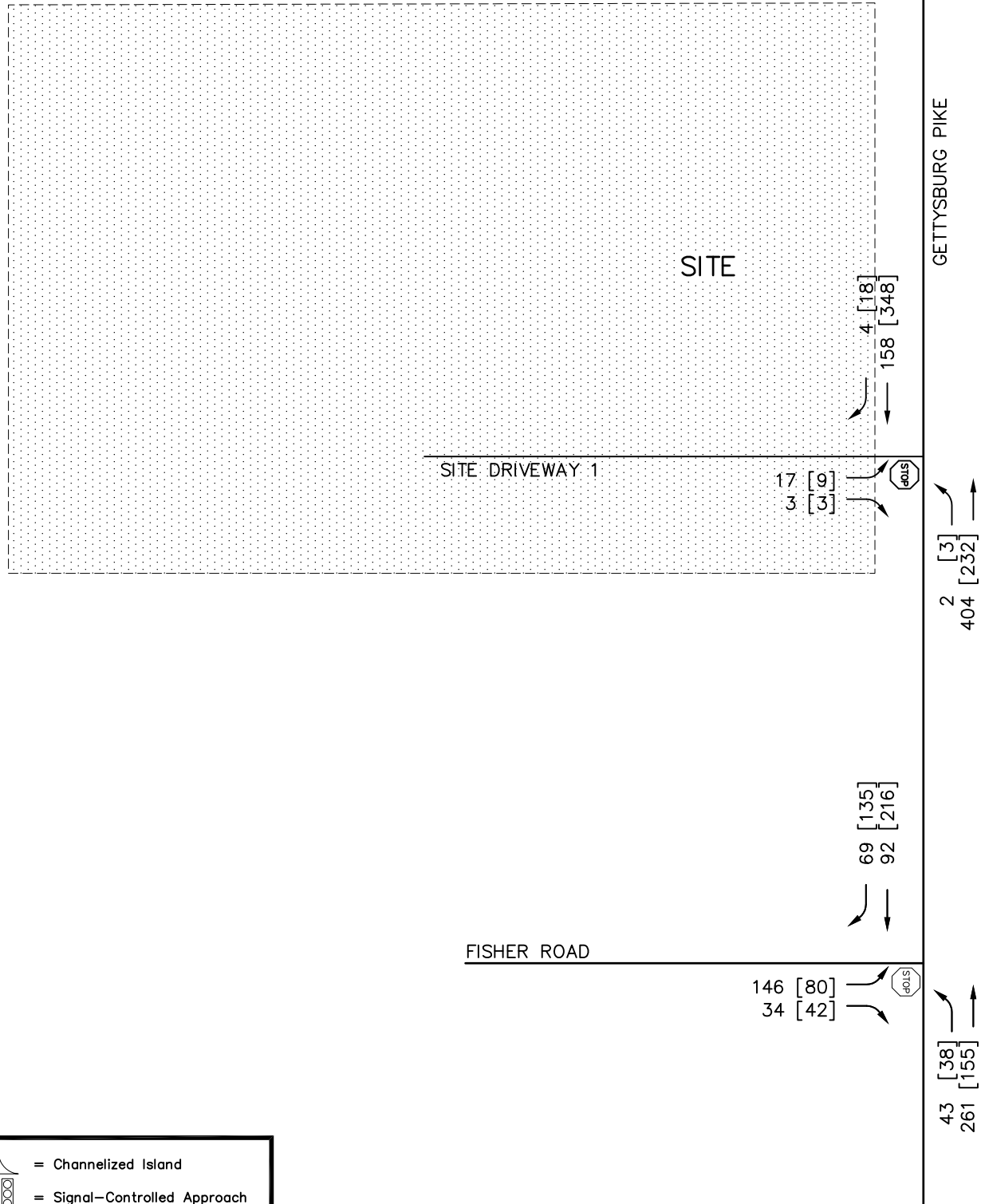
- = Channelized Island
- = Signal-Controlled Approach
- = Stop-Controlled Approach

= AM Peak Hour Data
[#] = PM Peak Hour Data

SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

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FIGURE 6A SHEET 1 OF 1
2030 HORIZON YEAR - BASE CONDITIONS
PEAK HOUR TRAFFIC VOLUMES



- = Channelized Island
- = Signal-Controlled Approach
- = Stop-Controlled Approach

= AM Peak Hour Data
[#] = PM Peak Hour Data

SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

ARBORVIEW

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FIGURE 6C SHEET 1 OF 2

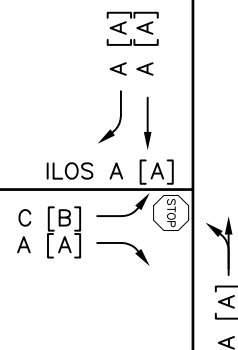
2030 HORIZON YEAR – BUILD CONDITIONS
PEAK HOUR TRAFFIC VOLUMES






SITE

GETTYSBURG PIKE

FISHER ROAD



-  = Channelized Island
-  = Signal-Controlled Approach
-  = Stop-Controlled Approach

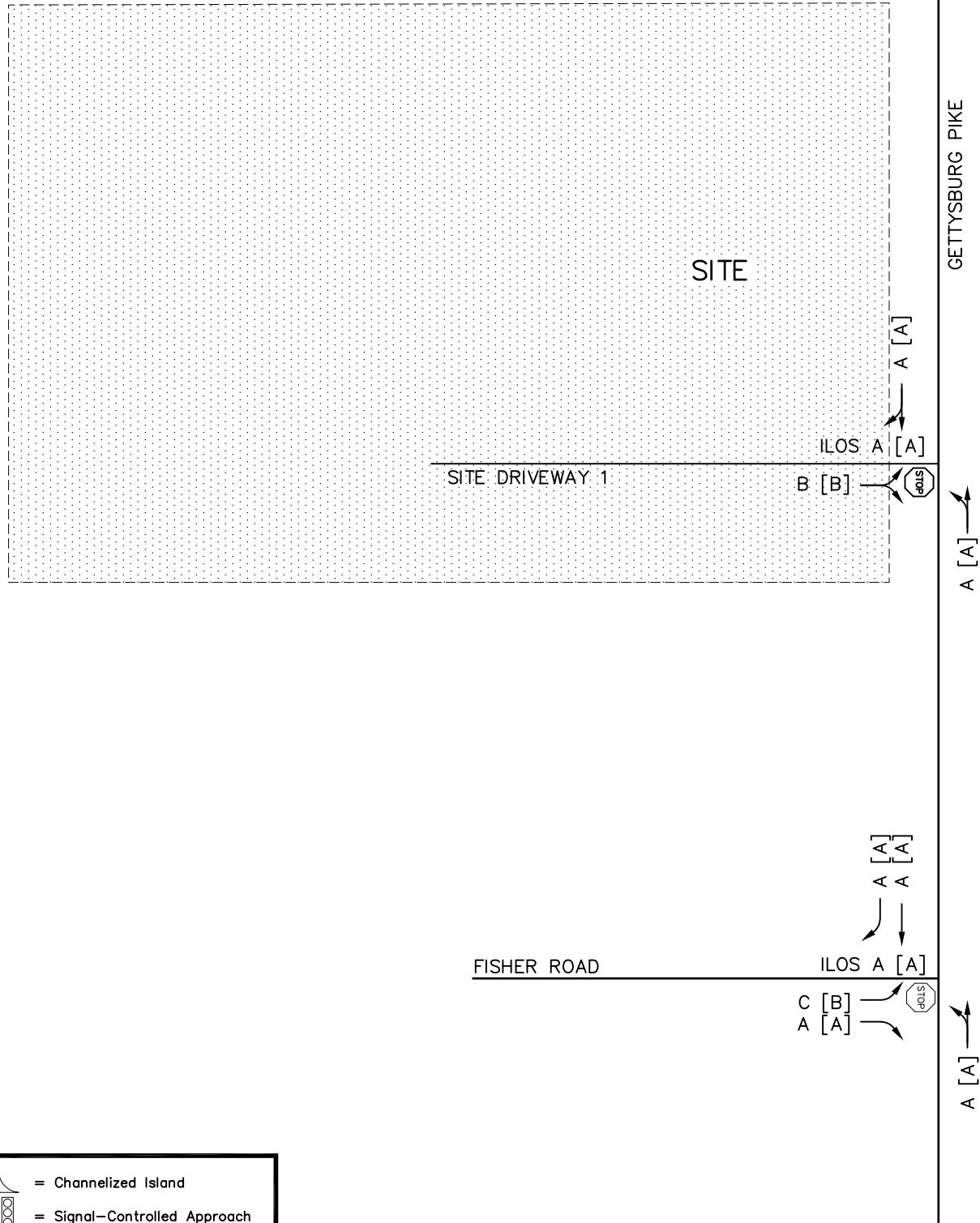
= AM Peak Hour Data
[#] = PM Peak Hour Data




SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

ARBORVIEW

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FIGURE 6E SHEET 1 OF 1
2030 HORIZON YEAR – BASE CONDITIONS
PEAK HOUR LOS



 = Channelized Island
 = Signal-Controlled Approach
 = Stop-Controlled Approach
= AM Peak Hour Data
[#] = PM Peak Hour Data
SD : Site Driveway
ILOS : Intersection Level of Service
Schematic Drawing : Not To Scale

ARBORVIEW

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FIGURE 6G SHEET 1 OF 2
2030 HORIZON YEAR – BUILD CONDITIONS
PEAK HOUR LOS

Site Photographs

*Fisher Road -
Gettysburg Pike*



Eastbound on Fisher Road – Approaching intersection



Eastbound on Fisher Road – Approaching intersection



Westbound on Fisher Road – Departing intersection



Northbound on Gettysburg Pike – Approaching intersection



Northbound on Gettysburg Pike – Departing intersection



Southbound on Gettysburg Pike – Approaching intersection



Southbound on Gettysburg Pike – Departing intersection



Southbound on Gettysburg Pike – Departing intersection

*Site Driveway 1 -
Gettysburg Pike*



Eastbound on Site Driveway – Approaching intersection



Westbound on Site Driveway – Departing intersection



Westbound on Site Driveway – Departing intersection – Existing Driveways



Northbound on Gettysburg Pike – Approaching intersection



Northbound on Gettysburg Pike – Departing intersection



Northbound on Gettysburg Pike – Departing intersection



Southbound on Gettysburg Pike – Approaching intersection



Southbound on Gettysburg Pike – Approaching intersection



Southbound on Gettysburg Pike – Departing intersection

Existing Conditions

SITE NO: 28368	
County	CUMBERLAND (21)
Route	D013
Segment	0100
Dir	B
Current Avg Daily Traffic	4597
Current Avg Daily Truck Volume	92
K Factor	11
D Factor	60
T Factor	1
Truck Percent	2
Base Traffic Year	2014
Traffic Pattern Group	URBAN - MINOR ARTERIALS, COLLECTORS, LOCAL ROADS



Manual Turn Movement Data



Arborview

Fisher Road - Gettysburg Pike AM

Weather: 30 Clear

Serial # 1626

By: Julie K.

Upper Allen Twp., Cumberland Co., PA

File Name : 317565 AM

Site Code : 01

Start Date : 2/27/2018

Page No : 1

Groups Printed- Passenger Veh - Heavy Veh - Bus

	Fisher Road From West					Gettysburg Pike From South					Gettysburg Pike From North					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00	10	0	2	0	12	1	9	0	0	10	0	12	3	0	15	37
06:15	11	0	3	0	14	4	14	0	0	18	0	7	2	0	9	41
06:30	14	0	4	0	18	1	20	0	0	21	0	14	9	0	23	62
06:45	30	0	4	0	34	7	33	0	0	40	0	10	10	0	20	94
Total	65	0	13	0	78	13	76	0	0	89	0	43	24	0	67	234
07:00	29	0	4	0	33	3	58	0	0	61	0	10	12	0	22	116
07:15	37	0	4	0	41	6	44	0	0	50	0	17	10	0	27	118
07:30	38	0	15	0	53	11	81	0	0	92	0	20	18	0	38	183
07:45	33	0	9	0	42	15	63	0	0	78	0	20	21	0	41	161
Total	137	0	32	0	169	35	246	0	0	281	0	67	61	0	128	578
08:00	28	0	3	0	31	7	45	0	0	52	0	23	14	0	37	120
08:15	20	0	2	0	22	6	35	0	0	41	0	21	17	0	38	101
08:30	10	0	6	0	16	9	25	0	0	34	0	27	8	0	35	85
08:45	27	0	13	0	40	12	42	0	0	54	0	28	16	0	44	138
Total	85	0	24	0	109	34	147	0	0	181	0	99	55	0	154	444
Grand Total	287	0	69	0	356	82	469	0	0	551	0	209	140	0	349	1256
Apprch %	80.6	0	19.4	0		14.9	85.1	0	0		0	59.9	40.1	0		
Total %	22.9	0	5.5	0	28.3	6.5	37.3	0	0	43.9	0	16.6	11.1	0	27.8	
Passenger Veh	285	0	67	0	352	81	464	0	0	545	0	202	138	0	340	1237
% Passenger Veh	99.3	0	97.1	0	98.9	98.8	98.9	0	0	98.9	0	96.7	98.6	0	97.4	98.5
Heavy Veh	0	0	1	0	1	1	0	0	0	1	0	2	0	0	2	4
% Heavy Veh	0	0	1.4	0	0.3	1.2	0	0	0	0.2	0	1	0	0	0.6	0.3
Bus	2	0	1	0	3	0	5	0	0	5	0	5	2	0	7	15
% Bus	0.7	0	1.4	0	0.8	0	1.1	0	0	0.9	0	2.4	1.4	0	2	1.2



Arborview

Fisher Road - Gettysburg Pike AM

Weather: 30 Clear

Serial # 1626

By: Julie K.

Upper Allen Twp., Cumberland Co., PA

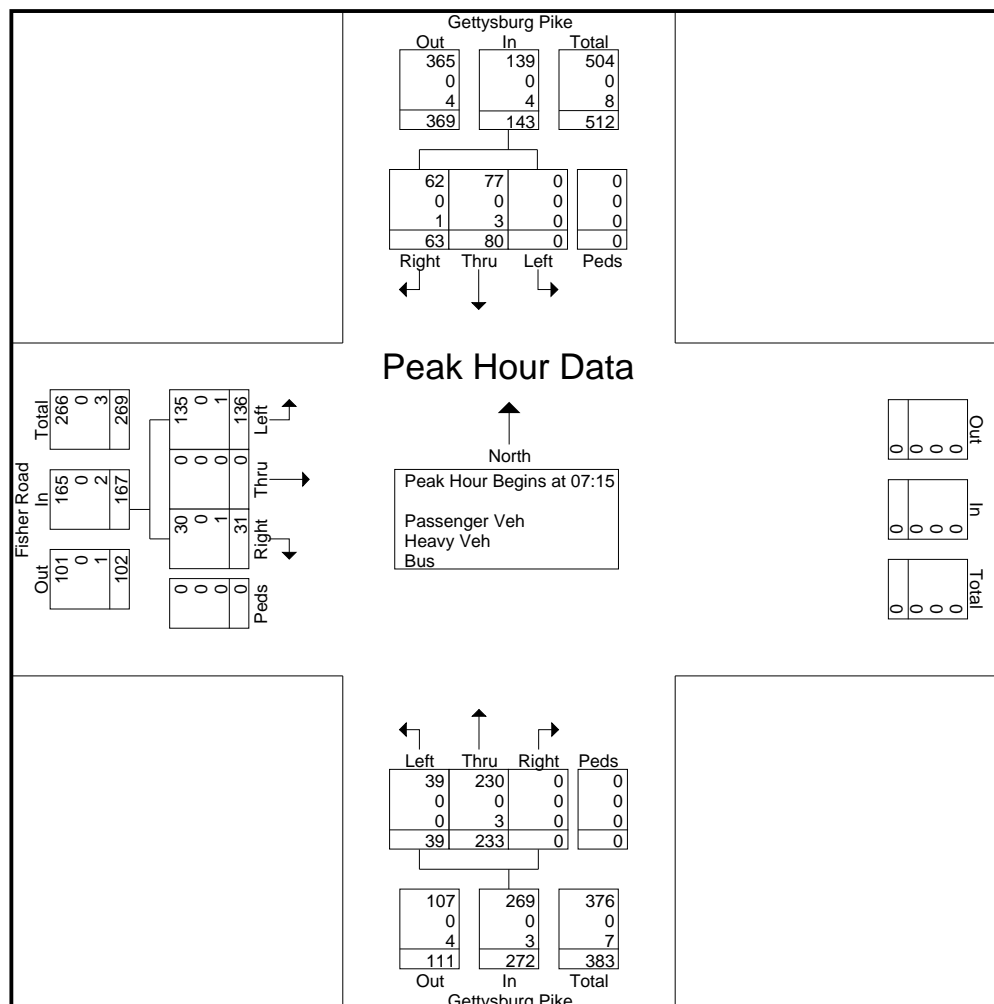
File Name : 317565 AM

Site Code : 01

Start Date : 2/27/2018

Page No : 2

	Fisher Road From West					Gettysburg Pike From South					Gettysburg Pike From North					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:00:00 AM to 8:45:00 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 7:15:00 AM																
7:15:00 AM	37	0	4	0	41	6	44	0	0	50	0	17	10	0	27	118
7:30:00 AM	38	0	15	0	53	11	81	0	0	92	0	20	18	0	38	183
7:45:00 AM	33	0	9	0	42	15	63	0	0	78	0	20	21	0	41	161
8:00:00 AM	28	0	3	0	31	7	45	0	0	52	0	23	14	0	37	120
Total Volume	136	0	31	0	167	39	233	0	0	272	0	80	63	0	143	582
% App. Total	81.4	0	18.6	0		14.3	85.7	0	0		0	55.9	44.1	0		
PHF	.895	.000	.517	.000	.788	.650	.719	.000	.000	.739	.000	.870	.750	.000	.872	.795
Passenger Veh	135	0	30	0	165	39	230	0	0	269	0	77	62	0	139	573
% Passenger Veh	99.3	0	96.8	0	98.8	100	98.7	0	0	98.9	0	96.3	98.4	0	97.2	98.5
Heavy Veh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Veh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bus	1	0	1	0	2	0	3	0	0	3	0	3	1	0	4	9
% Bus	0.7	0	3.2	0	1.2	0	1.3	0	0	1.1	0	3.8	1.6	0	2.8	1.5





Arborview

Fisher Road - Gettysburg Pike PM

Weather: 50 Clear

Serial # 1626

By: Julie K.

Upper Allen Twp., Cumberland Co., PA

File Name : 317565 PM

Site Code : 01

Start Date : 2/27/2018

Page No : 1

Groups Printed- Passenger Veh - Heavy Veh - Bus

	Fisher Road From West					Gettysburg Pike From South					Gettysburg Pike From North					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
15:00	17	0	8	0	25	9	26	0	0	35	0	37	20	0	57	117
15:15	17	0	6	1	24	11	27	0	0	38	0	36	12	0	48	110
15:30	12	0	8	0	20	9	39	0	0	48	0	43	30	0	73	141
15:45	22	0	14	0	36	3	32	0	0	35	0	22	30	0	52	123
Total	68	0	36	1	105	32	124	0	0	156	0	138	92	0	230	491
16:00	18	0	10	0	28	10	19	0	0	29	0	47	23	0	70	127
16:15	11	0	9	0	20	6	36	0	0	42	0	51	25	0	76	138
16:30	25	0	8	0	33	5	32	0	0	37	0	58	27	0	85	155
16:45	18	0	12	0	30	6	22	0	0	28	0	44	24	0	68	126
Total	72	0	39	0	111	27	109	0	0	136	0	200	99	0	299	546
17:00	19	0	11	0	30	4	31	0	0	35	0	55	38	0	93	158
17:15	15	0	6	0	21	7	30	0	0	37	0	64	36	0	100	158
17:30	23	0	10	0	33	14	43	0	0	57	0	41	27	0	68	158
17:45	18	0	11	0	29	9	33	0	0	42	0	32	26	0	58	129
Total	75	0	38	0	113	34	137	0	0	171	0	192	127	0	319	603
18:00	16	0	3	0	19	5	23	0	0	28	0	31	15	0	46	93
18:15	19	0	4	0	23	6	31	0	0	37	0	33	23	0	56	116
18:30	19	0	6	0	25	5	33	0	0	38	0	29	14	0	43	106
18:45	31	0	7	0	38	4	28	0	0	32	0	20	18	0	38	108
Total	85	0	20	0	105	20	115	0	0	135	0	113	70	0	183	423
Grand Total	300	0	133	1	434	113	485	0	0	598	0	643	388	0	1031	2063
Apprch %	69.1	0	30.6	0.2		18.9	81.1	0	0		0	62.4	37.6	0		
Total %	14.5	0	6.4	0	21	5.5	23.5	0	0	29	0	31.2	18.8	0	50	
Passenger Veh	300	0	131	1	432	113	482	0	0	595	0	642	387	0	1029	2056
% Passenger Veh	100	0	98.5	100	99.5	100	99.4	0	0	99.5	0	99.8	99.7	0	99.8	99.7
Heavy Veh	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Heavy Veh	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0
Bus	0	0	2	0	2	0	2	0	0	2	0	1	1	0	2	6
% Bus	0	0	1.5	0	0.5	0	0.4	0	0	0.3	0	0.2	0.3	0	0.2	0.3



Arborview

Fisher Road - Gettysburg Pike PM

Weather: 50 Clear

Serial # 1626

By: Julie K.

Upper Allen Twp., Cumberland Co., PA

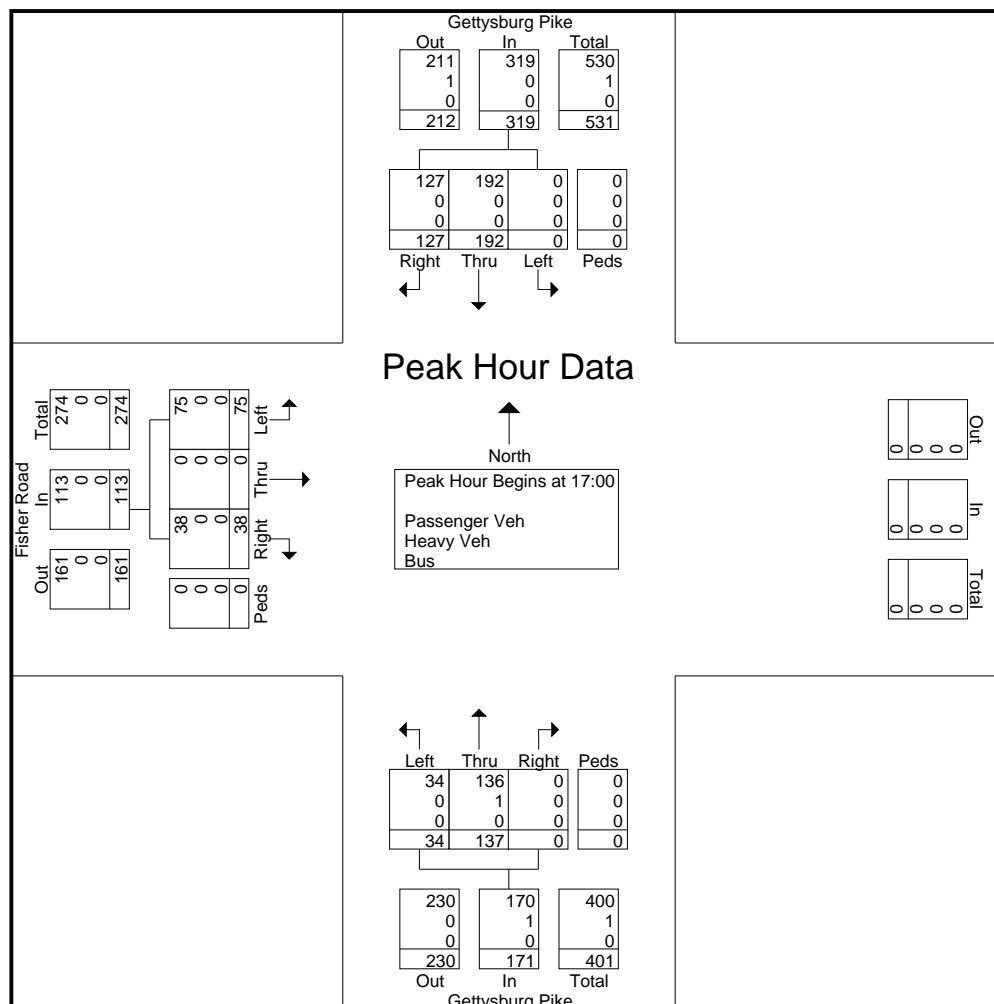
File Name : 317565 PM

Site Code : 01

Start Date : 2/27/2018

Page No : 2

	Fisher Road From West					Gettysburg Pike From South					Gettysburg Pike From North					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 3:00:00 PM to 6:45:00 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 5:00:00 PM																
5:00:00 PM	19	0	11	0	30	4	31	0	0	35	0	55	38	0	93	158
5:15:00 PM	15	0	6	0	21	7	30	0	0	37	0	64	36	0	100	158
5:30:00 PM	23	0	10	0	33	14	43	0	0	57	0	41	27	0	68	158
5:45:00 PM	18	0	11	0	29	9	33	0	0	42	0	32	26	0	58	129
Total Volume	75	0	38	0	113	34	137	0	0	171	0	192	127	0	319	603
% App. Total	66.4	0	33.6	0		19.9	80.1	0	0		0	60.2	39.8	0		
PHF	.815	.000	.864	.000	.856	.607	.797	.000	.000	.750	.000	.750	.836	.000	.798	.954
Passenger Veh	75	0	38	0	113	34	136	0	0	170	0	192	127	0	319	602
% Passenger Veh	100	0	100	0	100	100	99.3	0	0	99.4	0	100	100	0	100	99.8
Heavy Veh	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Heavy Veh	0	0	0	0	0	0	0.7	0	0	0.6	0	0	0	0	0	0.2
Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Growth Rate & Volume Worksheets

Growth Factors for August 2017 to July 2018				
County	Urban Interstate	Rural Interstate	Urban Non-Interstate	Rural Non-Interstate
ADAMS	*	*	1.06	0.76
ALLEGHENY	0.92	2.18	0.00	0.39
ARMSTRONG	0.93	*	0.00	0.40
BEAVER	0.87	1.98	0.00	0.36
BEDFORD	*	2.14	*	0.46
BERKS	1.23	2.44	0.33	0.60
BLAIR	0.88	1.94	0.00	0.38
BRADFORD	1.22	*	0.14	0.52
BUCKS	1.42	2.34	0.67	0.62
BUTLER	1.84	2.76	0.78	0.77
CAMBRIA	0.47	*	0.00	0.21
CAMERON	*	*	*	0.18
CARBON	1.40	2.61	0.46	0.65
CENTRE	1.59	2.56	0.78	0.71
CHESTER	1.80	3.04	0.65	0.83
CLARION	1.03	2.04	0.05	0.43
CLEARFIELD	1.05	2.10	0.08	0.45
CLINTON	1.03	2.30	0.00	0.49
COLUMBIA	1.26	2.31	0.43	0.57
CRAWFORD	1.02	2.01	0.16	0.45
CUMBERLAND	1.63	2.57	0.87	0.72
DAUPHIN	1.42	*	0.54	0.66
DELAWARE	1.06	*	0.00	*
ELK	*	*	0.00	0.32
ERIE	1.07	2.16	0.06	0.46
FAYETTE	0.91	*	0.00	0.41
FOREST	*	*	*	0.68
FRANKLIN	1.42	2.58	0.60	0.68
FULTON	*	2.14	*	0.54
GREENE	1.29	2.63	0.03	0.59
HUNTINGDON	*	1.99	0.00	0.41
INDIANA	1.28	*	0.24	0.55
JEFFERSON	*	2.14	0.04	0.45
JUNIATA	*	*	*	0.59
LACKAWANNA	0.92	2.31	0.00	0.45
LANCASTER	1.86	2.68	1.21	0.82
LAWRENCE	0.88	2.11	0.00	0.39
LEBANON	1.37	2.50	0.52	0.64
LEHIGH	1.64	2.88	0.55	0.75
LUZERNE	0.84	2.17	0.00	0.42
LYCOMING	1.09	2.19	0.11	0.48
MCKEAN	0.73	*	0.00	0.35
MERCER	0.77	2.00	0.00	0.36
MIFFLIN	0.87	*	0.00	0.40
MONROE	1.50	2.49	0.81	0.70
MONTGOMERY	1.26	*	0.41	0.59
MONTOUR	1.59	2.66	0.41	0.68
NORTHAMPTON	1.39	2.56	0.54	0.66
NORTHUMBERLAND	0.91	2.12	0.00	0.43
PERRY	*	*	1.05	0.67
PHILADELPHIA	0.81	*	0.00	*
PIKE	2.26	2.87	1.72	1.00
POTTER	*	*	*	0.49
SCHUYLKILL	0.71	1.94	0.00	0.36
SNYDER	1.28	*	0.48	0.59
SOMERSET	0.73	1.78	0.00	0.35
SULLIVAN	*	*	*	0.45
SUSQUEHANNA	1.22	2.27	0.40	0.56
TIOGA	*	*	*	0.52
UNION	1.63	2.48	0.95	0.72
VENANGO	0.73	1.73	0.00	0.31
WARREN	*	*	0.00	0.39
WASHINGTON	1.38	2.63	0.23	0.61
WAYNE	*	2.26	0.29	0.54
WESTMORELAND	1.03	2.11	0.00	0.44
WYOMING	*	*	0.00	0.45
YORK	1.45	2.57	0.67	0.69

* = Functional Class Doesn't Exist in County

Questions? Please contact Andrew O'Neill at the Bureau of Planning and Research, 717-346-3250 or andoneill@pa.gov

NOTE: The projected growth factors are derived using historical VMT (Vehicle Miles Traveled) data (1994 to 2016), as well as Woods and Poole demographic and economic data. The factors should be compounded when calculating future values. The factors should not be used to project traffic beyond a 20-year period. Please be aware that these factors are estimates, and unforeseen events (opening of shopping centers, fast food franchises, gas stations, etc) could cause growth to change over time.

Future Volume Work Sheet:

Arborview

Upper Allen Township, Cumberland Co., PA

317565

1

Study Year: 2018
 Growth Rate: 0.87
 Time Period: Weekday AM Peak Hour of the Street
 Intersection: Fisher Road - Gettysburg Pike

		Fisher Road EB			WB			Gettysburg Pike NB			Gettysburg Pike SB		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Study Year	2018	136		31				39	233			80	63
Opening Year	2020	138	0	32	0	0	0	40	237	0	0	81	64
Design Horizon Year	2030	151	0	34	0	0	0	43	259	0	0	89	70
Development Generation		-5							2			3	-1
With Development	2020	133	0	32	0	0	0	40	239	0	0	84	63
With Development	2030	146	0	34	0	0	0	43	261	0	0	92	69

Study Year: 2018
 Growth Rate: 0.87
 Time Period: Weekday PM Peak Hour of the Street
 Intersection: Fisher Road - Gettysburg Pike

		Fisher Road EB			WB			Gettysburg Pike NB			Gettysburg Pike SB		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Study Year	2018	75		38				34	137			192	127
Opening Year	2020	76	0	39	0	0	0	35	139	0	0	195	129
Design Horizon Year	2030	83	0	42	0	0	0	38	152	0	0	213	141
Development Generation		-3							3			3	-6
With Development	2020	73	0	39	0	0	0	35	142	0	0	198	123
With Development	2030	80	0	42	0	0	0	38	155	0	0	216	135

Study Year: 2018
 Growth Rate: 0.87
 Time Period: Weekday AM Peak Hour of the Street
 Intersection: Site Driveway - Gettysburg Pike

		Site Driveway EB			WB			Gettysburg Pike NB			Gettysburg Pike SB		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Study Year	2018								369			143	
Opening Year	2020	0	0	0	0	0	0	0	375	0	0	145	0
Design Horizon Year	2030	0	0	0	0	0	0	0	409	0	0	159	0
Development Generation		17		3				2	-5			-1	4
With Development	2020	17	0	3	0	0	0	2	370	0	0	144	4
With Development	2030	17	0	3	0	0	0	2	404	0	0	158	4

Study Year: 2018
 Growth Rate: 0.87
 Time Period: Weekday PM Peak Hour of the Street
 Intersection: Site Driveway - Gettysburg Pike

		Site Driveway EB			WB			Gettysburg Pike NB			Gettysburg Pike SB		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Study Year	2018								212			319	
Opening Year	2020	0	0	0	0	0	0	0	216	0	0	325	0
Design Horizon Year	2030	0	0	0	0	0	0	0	235	0	0	354	0
Development Generation		9		3				3	-3			-6	18
With Development	2020	9	0	3	0	0	0	3	213	0	0	319	18
With Development	2030	9	0	3	0	0	0	3	232	0	0	348	18

Trip Generation Worksheets

Single-Family Detached Housing (210)

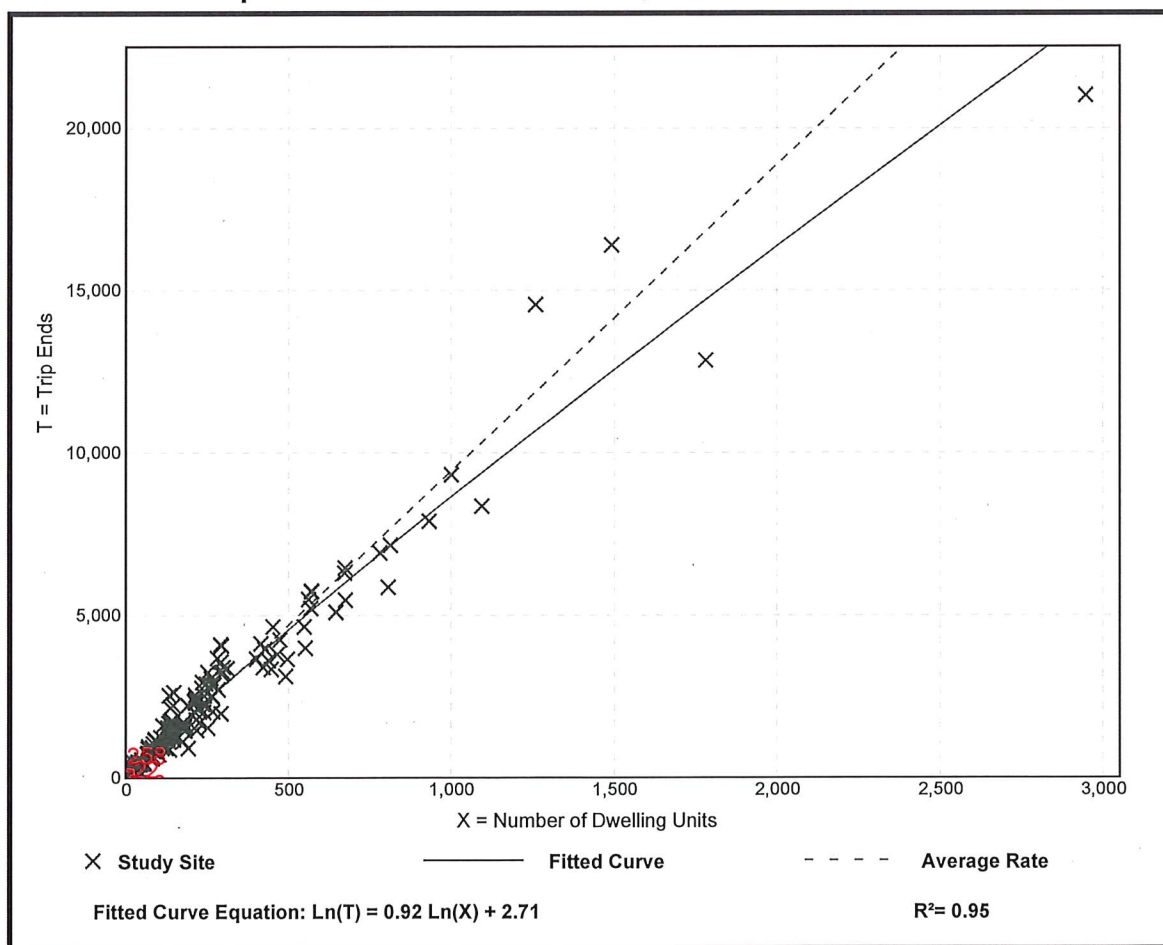
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



Trip Generation Manual, 10th Edition • Institute of Transportation Engineers

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 173

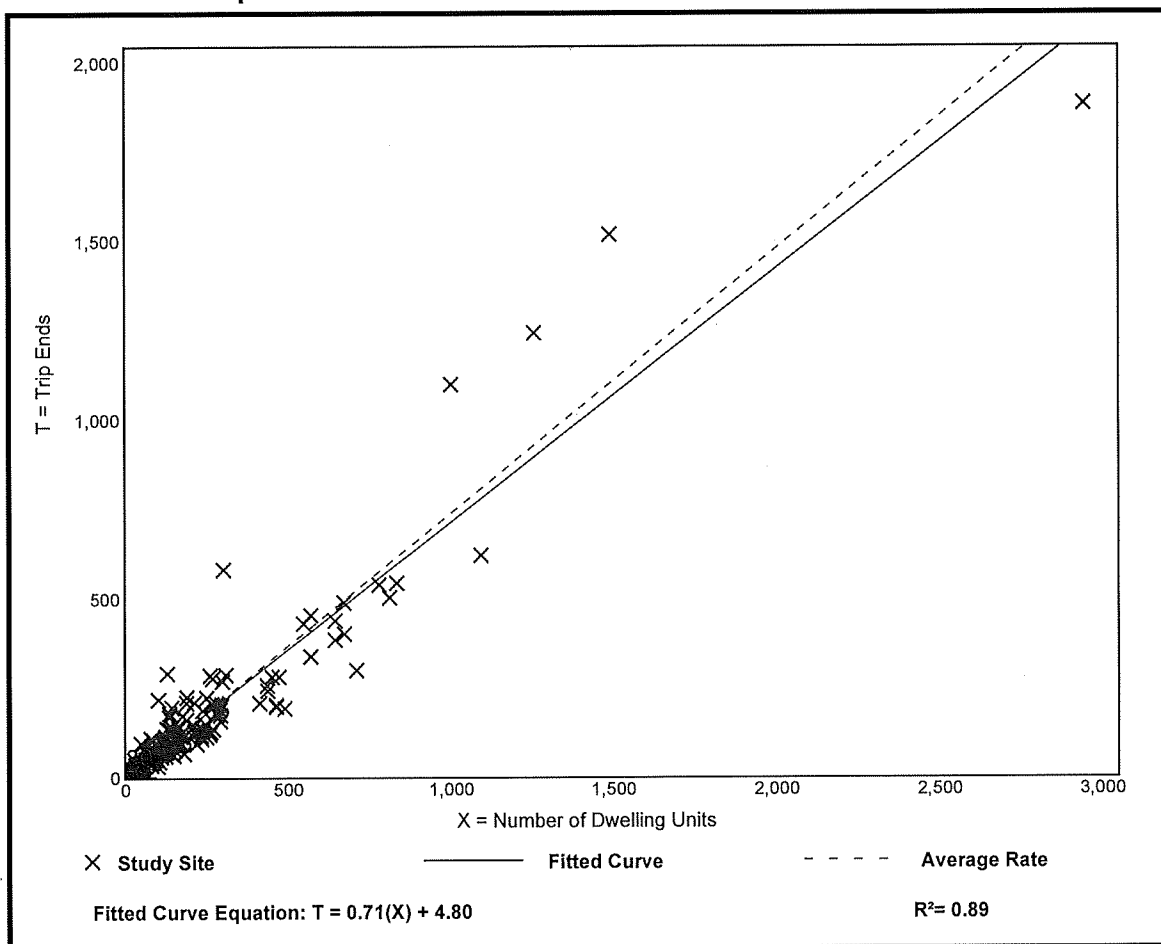
Avg. Num. of Dwelling Units: 219

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



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Single-Family Detached Housing (210)

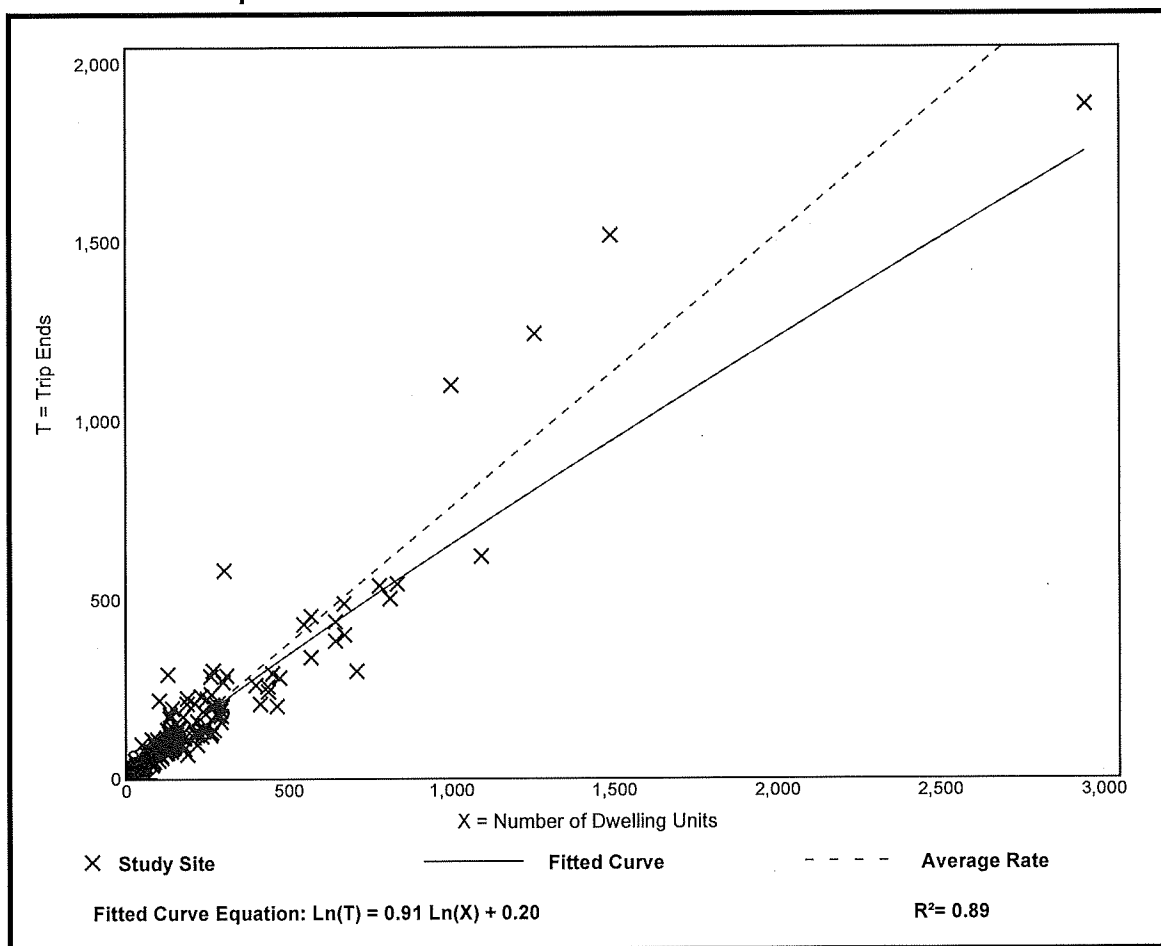
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 157
Avg. Num. of Dwelling Units: 231
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.76	0.36 - 2.27	0.26

Data Plot and Equation



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Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 190

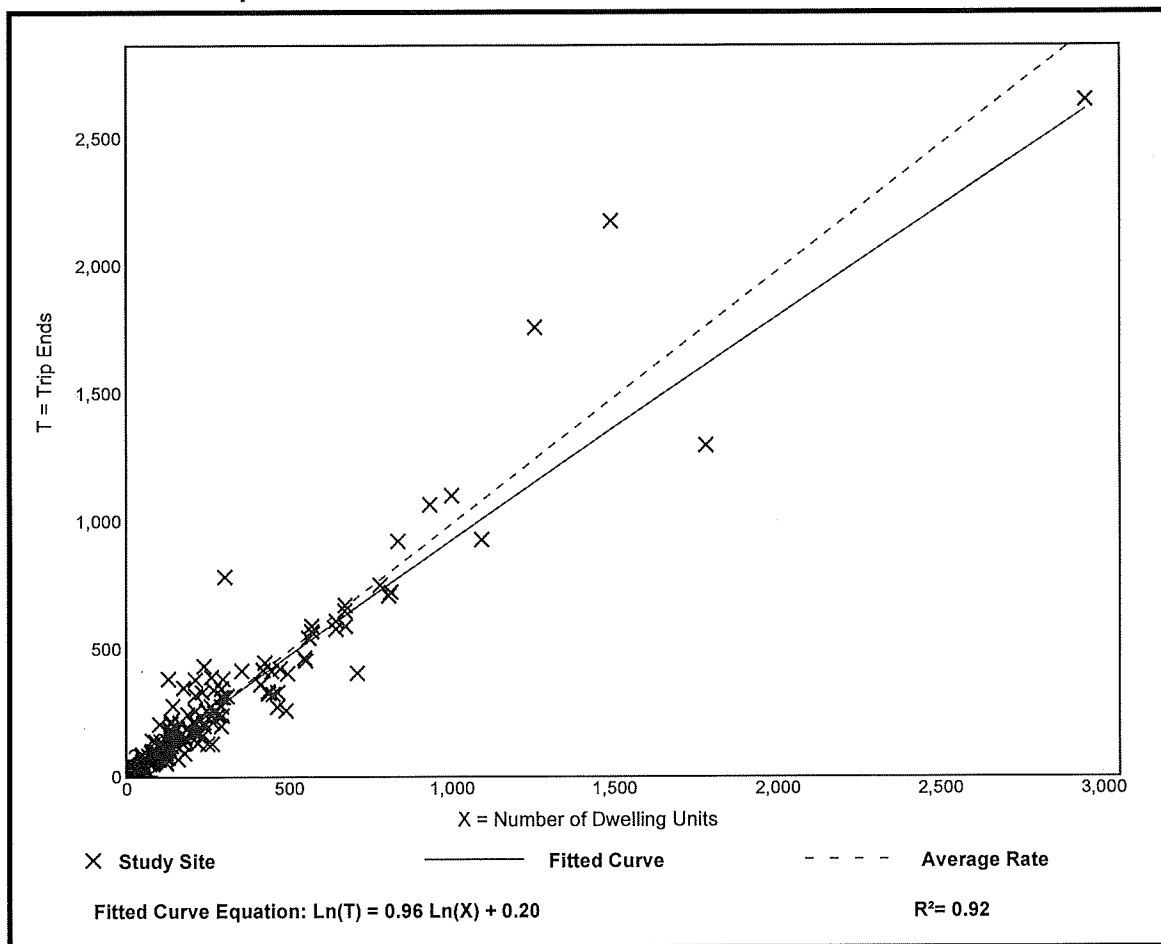
Avg. Num. of Dwelling Units: 242

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



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Single-Family Detached Housing (210)

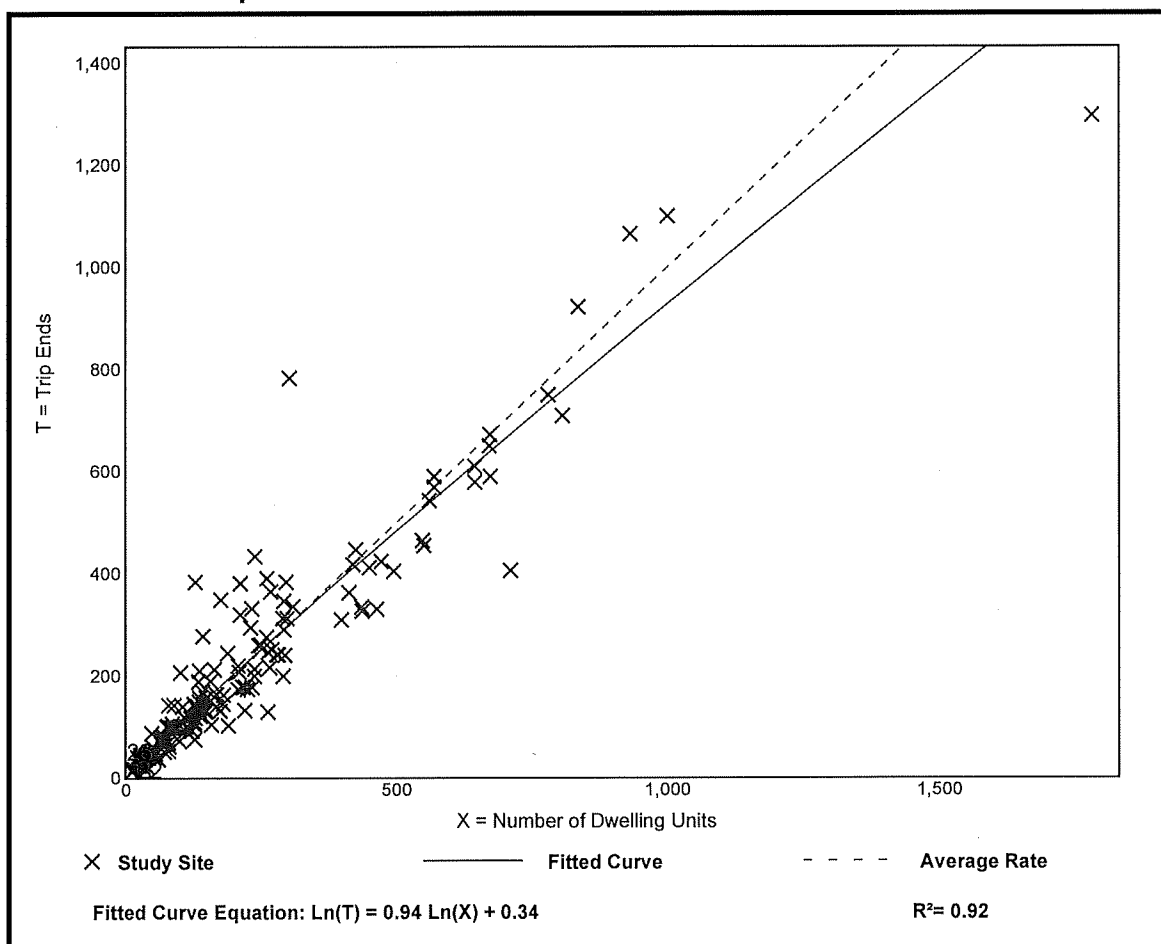
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 165
Avg. Num. of Dwelling Units: 217
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
1.00	0.49 - 2.98	0.31

Data Plot and Equation



Trip Generation Manual, 10th Edition • Institute of Transportation Engineers












HCM Worksheets

2018 Baseline Scenario AM Peak Hour

Lanes, Volumes, Timings

1: Gettysburg Pike & Fisher Road

2018 Baseline
(Baseline Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	136	31	39	233	80	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1717	1521	0	1806	1722	1493
Flt Permitted	0.950			0.993		
Satd. Flow (perm)	1717	1521	0	1806	1722	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%
Adj. Flow (vph)	170	39	49	291	100	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	170	39	0	340	100	79
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road

2018 Baseline
(Baseline Scenario) AM Peak Hour Street












Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	136	31	39	233	80	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	3	2	2	4	2
Mvmt Flow	170	39	49	291	100	79
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	489	100	100	0	-	0
Stage 1	100	-	-	-	-	-
Stage 2	389	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	557	1020	1110	-	-	-
Stage 1	1027	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	527	1020	1110	-	-	-
Mov Cap-2 Maneuver	527	-	-	-	-	-
Stage 1	1027	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.9	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1110	-	527	1020	-	-
HCM Lane V/C Ratio	0.044	-	0.323	0.038	-	-
HCM Control Delay (s)	8.4	0	15.1	8.7	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	0.1	-	-

2020 Opening Year No Build Scenario AM Peak Hour

Lanes, Volumes, Timings

1: Gettysburg Pike & Fisher Road

2020 Opening Year
(No-Build Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	138	32	40	237	81	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1717	1521	0	1806	1722	1493
Flt Permitted	0.950			0.993		
Satd. Flow (perm)	1717	1521	0	1806	1722	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%
Adj. Flow (vph)	173	40	50	296	101	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	172	40	0	346	101	80
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road












2020 Opening Year
(No-Build Scenario) AM Peak Hour Street

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	138	32	40	237	81	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	3	2	2	4	2
Mvmt Flow	172	40	50	296	101	80
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	497	101	101	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	550	1019	1109	-	-	-
Stage 1	1025	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	520	1019	1109	-	-	-
Mov Cap-2 Maneuver	520	-	-	-	-	-
Stage 1	1025	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1109	-	520	1019	-	-
HCM Lane V/C Ratio	0.045	-	0.332	0.039	-	-
HCM Control Delay (s)	8.4	0	15.3	8.7	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	0.1	-	-

2020 Opening Year Build Scenario AM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2020 Opening Year
(Build Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	133	32	40	239	84	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1717	1521	0	1806	1722	1493
Flt Permitted	0.950			0.993		
Satd. Flow (perm)	1717	1521	0	1806	1722	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%
Adj. Flow (vph)	166	40	50	299	105	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	166	40	0	349	105	79
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road










2020 Opening Year
(Build Scenario) AM Peak Hour Street

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	133	32	40	239	84	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	3	2	2	4	2
Mvmt Flow	166	40	50	299	105	79
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	504	105	105	0	-	0
Stage 1	105	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	544	1014	1106	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	515	1014	1106	-	-	-
Mov Cap-2 Maneuver	515	-	-	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1106	-	515	1014	-	-
HCM Lane V/C Ratio	0.045	-	0.323	0.039	-	-
HCM Control Delay (s)	8.4	0	15.3	8.7	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	0.1	-	-

Lanes, Volumes, Timings

2: Gettysburg Pike & Site Driveway

2020 Opening Year
(Build Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	17	3	2	370	144	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10
Grade (%)	5%			3%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.981				0.997	
Flt Protected	0.959					
Satd. Flow (prot)	1709	0	0	1712	1726	0
Flt Permitted	0.959					
Satd. Flow (perm)	1709	0	0	1712	1726	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	446			637	4124	
Travel Time (s)	12.2			12.4	80.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Adj. Flow (vph)	18	3	2	402	157	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	404	161	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.03	1.03	1.11	1.11	1.07	1.07
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
2: Gettysburg Pike & Site Driveway












2020 Opening Year
(Build Scenario) AM Peak Hour Street

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	17	3	2	370	144	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	5	-	-	3	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	4	2
Mvmt Flow	18	3	2	402	157	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	566	159	161	0	-	0
Stage 1	159	-	-	-	-	-
Stage 2	407	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	493	945	1058	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	492	945	1058	-	-	-
Mov Cap-2 Maneuver	492	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.1	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1058	-	530	-	-	
HCM Lane V/C Ratio	0.002	-	0.041	-	-	
HCM Control Delay (s)	8.4	0	12.1	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

2030 Opening Year No Build Scenario AM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2030 Horizon Year
(No-Build Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	151	34	43	259	89	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1717	1521	0	1806	1722	1493
Flt Permitted	0.950			0.993		
Satd. Flow (perm)	1717	1521	0	1806	1722	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%
Adj. Flow (vph)	189	43	54	324	111	88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	189	42	0	378	111	88
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road












2030 Horizon Year
(No-Build Scenario) AM Peak Hour Street

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	151	34	43	259	89	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	3	2	2	4	2
Mvmt Flow	189	42	54	324	111	88
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	542	111	111	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	431	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	512	1006	1100	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	481	1006	1100	-	-	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.6	1.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1100	-	481	1006	-	-
HCM Lane V/C Ratio	0.049	-	0.392	0.042	-	-
HCM Control Delay (s)	8.4	0	17.2	8.7	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	1.8	0.1	-	-

2030 Opening Year Build Scenario AM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2030 Horizon Year
(Build Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	146	34	43	261	92	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.993		
Satd. Flow (prot)	1717	1521	0	1806	1722	1493
Flt Permitted	0.950			0.993		
Satd. Flow (perm)	1717	1521	0	1806	1722	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%
Adj. Flow (vph)	183	43	54	326	115	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	182	42	0	380	115	86
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road










2030 Horizon Year
(Build Scenario) AM Peak Hour Street

Intersection						
Int Delay, s/veh	4.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	146	34	43	261	92	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	3	2	2	4	2
Mvmt Flow	182	42	54	326	115	86
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	549	115	115	0	-	0
Stage 1	115	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	506	1001	1097	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	476	1001	1097	-	-	-
Mov Cap-2 Maneuver	476	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.6	1.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1097	-	476	1001	-	-
HCM Lane V/C Ratio	0.049	-	0.383	0.042	-	-
HCM Control Delay (s)	8.5	0	17.2	8.8	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	1.8	0.1	-	-

Lanes, Volumes, Timings

2: Gettysburg Pike & Site Driveway

2030 Horizon Year
(Build Scenario) AM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	17	3	2	404	158	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10
Grade (%)	5%			3%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.981				0.997	
Flt Protected	0.959					
Satd. Flow (prot)	1709	0	0	1712	1726	0
Flt Permitted	0.959					
Satd. Flow (perm)	1709	0	0	1712	1726	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	446			637	4124	
Travel Time (s)	12.2			12.4	80.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Adj. Flow (vph)	18	3	2	439	172	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	441	176	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.03	1.03	1.11	1.11	1.07	1.07
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
2: Gettysburg Pike & Site Driveway












2030 Horizon Year
(Build Scenario) AM Peak Hour Street

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	17	3	2	404	158	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	5	-	-	3	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	4	2
Mvmt Flow	18	3	2	439	172	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	617	174	176	0	-	0
Stage 1	174	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	455	927	1046	-	-	-
Stage 1	915	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	454	927	1046	-	-	-
Mov Cap-2 Maneuver	454	-	-	-	-	-
Stage 1	915	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1046	-	492	-	-	
HCM Lane V/C Ratio	0.002	-	0.044	-	-	
HCM Control Delay (s)	8.4	0	12.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

2018 Baseline Scenario PM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2018 Baseline
(Baseline Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	75	38	34	137	192	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1717	1536	0	1800	1756	1493
Flt Permitted	0.950			0.990		
Satd. Flow (perm)	1717	1536	0	1800	1756	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	40	36	144	202	134
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	40	0	180	202	134
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road












2018 Baseline
(Baseline Scenario) PM Peak Hour Street

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	75	38	34	137	192	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	79	40	36	144	202	134
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	418	202	202	0	-	0
Stage 1	202	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	623	893	1024	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	599	893	1024	-	-	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11	1.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1024	-	599	893	-	-
HCM Lane V/C Ratio	0.035	-	0.132	0.045	-	-
HCM Control Delay (s)	8.6	0	11.9	9.2	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.1	-	-

2020 Opening Year No Build Scenario PM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2020 Opening Year
(No-Build Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	76	39	35	139	195	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1717	1536	0	1800	1756	1493
Flt Permitted	0.950			0.990		
Satd. Flow (perm)	1717	1536	0	1800	1756	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	41	37	146	205	136
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	41	0	183	205	136
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road












2020 Opening Year
(No-Build Scenario) PM Peak Hour Street

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	76	39	35	139	195	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	41	37	146	205	136
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	425	205	205	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	616	890	1022	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	876	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	592	890	1022	-	-	-
Mov Cap-2 Maneuver	592	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	842	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.1	1.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1022	-	592	890	-	-
HCM Lane V/C Ratio	0.036	-	0.135	0.046	-	-
HCM Control Delay (s)	8.7	0	12	9.2	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.1	-	-

2020 Opening Year Build Scenario PM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2020 Opening Year
(Build Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	73	39	35	142	198	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1717	1536	0	1800	1756	1493
Flt Permitted	0.950			0.990		
Satd. Flow (perm)	1717	1536	0	1800	1756	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	77	41	37	149	208	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	41	0	186	208	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road










2020 Opening Year
(Build Scenario) PM Peak Hour Street

Intersection							
Int Delay, s/veh	2.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Vol, veh/h	73	39	35	142	198	123	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	210	0	-	-	-	170	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	6	-	-	-2	-2	-	
Peak Hour Factor	95	95	95	95	95	95	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	77	41	37	149	208	129	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	431	208	208	0	-	0	
Stage 1	208	-	-	-	-	-	
Stage 2	223	-	-	-	-	-	
Critical Hdwy	7.1	6.2	4.3	-	-	-	
Critical Hdwy Stg 1	7.1	-	-	-	-	-	
Critical Hdwy Stg 2	6.62	-	-	-	-	-	
Follow-up Hdwy	3	3.1	3	-	-	-	
Pot Cap-1 Maneuver	610	887	1019	-	-	-	
Stage 1	867	-	-	-	-	-	
Stage 2	873	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	586	887	1019	-	-	-	
Mov Cap-2 Maneuver	586	-	-	-	-	-	
Stage 1	867	-	-	-	-	-	
Stage 2	838	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	11.1	1.7		0			
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1019	-	586	887	-	-	
HCM Lane V/C Ratio	0.036	-	0.131	0.046	-	-	
HCM Control Delay (s)	8.7	0	12.1	9.3	-	-	
HCM Lane LOS	A	A	B	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.5	0.1	-	-	

Lanes, Volumes, Timings

2: Gettysburg Pike & Site Driveway

2020 Opening Year
(Build Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	9	3	3	213	319	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10
Grade (%)	5%			3%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969				0.993	
Flt Protected	0.963			0.999		
Satd. Flow (prot)	1695	0	0	1711	1752	0
Flt Permitted	0.963			0.999		
Satd. Flow (perm)	1695	0	0	1711	1752	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	446			637	4124	
Travel Time (s)	12.2			12.4	80.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	3	3	232	347	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	235	367	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.03	1.03	1.11	1.11	1.07	1.07
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
2: Gettysburg Pike & Site Driveway

2020 Opening Year
(Build Scenario) PM Peak Hour Street












Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	9	3	3	213	319	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	5	-	-	3	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	3	3	232	347	20
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	595	357	366	0	-	0
Stage 1	357	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	471	729	899	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	469	729	899	-	-	-
Mov Cap-2 Maneuver	469	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.2	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	899	-	515	-	-	
HCM Lane V/C Ratio	0.004	-	0.025	-	-	
HCM Control Delay (s)	9	0	12.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

2030 Opening Year No Build Scenario PM Peak Hour

Lanes, Volumes, Timings

1: Gettysburg Pike & Fisher Road

2030 Horizon Year
(No-Build Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	83	42	38	152	213	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1717	1536	0	1800	1756	1493
Flt Permitted	0.950			0.990		
Satd. Flow (perm)	1717	1536	0	1800	1756	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	44	40	160	224	148
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	44	0	200	224	148
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road












2030 Horizon Year
(No-Build Scenario) PM Peak Hour Street

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	83	42	38	152	213	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	44	40	160	224	148
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	464	224	224	0	-	0
Stage 1	224	-	-	-	-	-
Stage 2	240	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	579	868	1007	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	554	868	1007	-	-	-
Mov Cap-2 Maneuver	554	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	1.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1007	-	554	868	-	-
HCM Lane V/C Ratio	0.04	-	0.158	0.051	-	-
HCM Control Delay (s)	8.7	0	12.7	9.4	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.2	-	-

2030 Opening Year Build Scenario PM Peak Hour

Lanes, Volumes, Timings
1: Gettysburg Pike & Fisher Road

2030 Horizon Year
(Build Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	42	38	155	216	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	10	10
Grade (%)	6%			-2%	-2%	
Storage Length (ft)	210	0	0			170
Storage Lanes	1	1	0			1
Taper Length (ft)	200		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950			0.990		
Satd. Flow (prot)	1717	1536	0	1800	1756	1493
Flt Permitted	0.950			0.990		
Satd. Flow (perm)	1717	1536	0	1800	1756	1493
Link Speed (mph)	25			35	35	
Link Distance (ft)	571			711	637	
Travel Time (s)	15.6			13.9	12.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	44	40	163	227	142
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	44	0	203	227	142
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.03	1.03	1.08	1.08
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
1: Gettysburg Pike & Fisher Road










2030 Horizon Year
(Build Scenario) PM Peak Hour Street

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	80	42	38	155	216	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	210	0	-	-	-	170
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	6	-	-	-2	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	44	40	163	227	142
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	470	227	227	0	-	0
Stage 1	227	-	-	-	-	-
Stage 2	243	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.62	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	574	865	1004	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	848	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	549	865	1004	-	-	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	811	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	1.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1004	-	549	865	-	-
HCM Lane V/C Ratio	0.04	-	0.153	0.051	-	-
HCM Control Delay (s)	8.7	0	12.7	9.4	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.2	-	-

Lanes, Volumes, Timings

2: Gettysburg Pike & Site Driveway

2030 Horizon Year
(Build Scenario) PM Peak Hour Street

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	9	3	3	292	348	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	10	10	10
Grade (%)	5%			3%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969				0.993	
Flt Protected	0.963					
Satd. Flow (prot)	1695	0	0	1712	1752	0
Flt Permitted	0.963					
Satd. Flow (perm)	1695	0	0	1712	1752	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	446			637	4124	
Travel Time (s)	12.2			12.4	80.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	3	3	317	378	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	320	398	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.03	1.03	1.11	1.11	1.07	1.07
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	29.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM 2010 TWSC
2: Gettysburg Pike & Site Driveway

2030 Horizon Year
(Build Scenario) PM Peak Hour Street

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	9	3	3	292	348	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	5	-	-	3	-3	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	3	3	317	378	20
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	712	388	398	0	-	0
Stage 1	388	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.3	-	-	-
Critical Hdwy Stg 1	7.1	-	-	-	-	-
Critical Hdwy Stg 2	6.42	-	-	-	-	-
Follow-up Hdwy	3	3.1	3	-	-	-
Pot Cap-1 Maneuver	391	700	877	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	389	700	877	-	-	-
Mov Cap-2 Maneuver	389	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	765	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	877	-	438	-	-	
HCM Lane V/C Ratio	0.004	-	0.03	-	-	
HCM Control Delay (s)	9.1	0	13.5	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Turn Lane Warrant Worksheets

Right Turn Lane
2020 Opening Year Build Scenario

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: Upper Allen Twp County: Cumberland County PennDOT Engineering District: 8	Analysis Date: 2/28/2018 Conducted By: MEA Checked By: Agency/Company Name: ALPHA CEI
Intersection & Approach Description: Proposed Site Driveway 1/ Gettysburg Pike - Southbound Advancing	
Analysis Period: 2020 Build Design Hour: AM Peak Hour Intersection Control: Unsignalized Posted Speed Limit (MPH): 35 Type of Terrain: Rolling	Number of Approach Lanes: 1 Undivided or Divided Highway: Undivided <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes		0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes		0.0%	N/A
Advancing Volume: N/A Opposing Volume: N/A Left Turn Volume: N/A % Left Turns in Advancing Volume: N/A					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	144	4.0%	153
	Right	-	4	0.0%	4
Advancing Volume: 157 Right Turn Volume: 4					

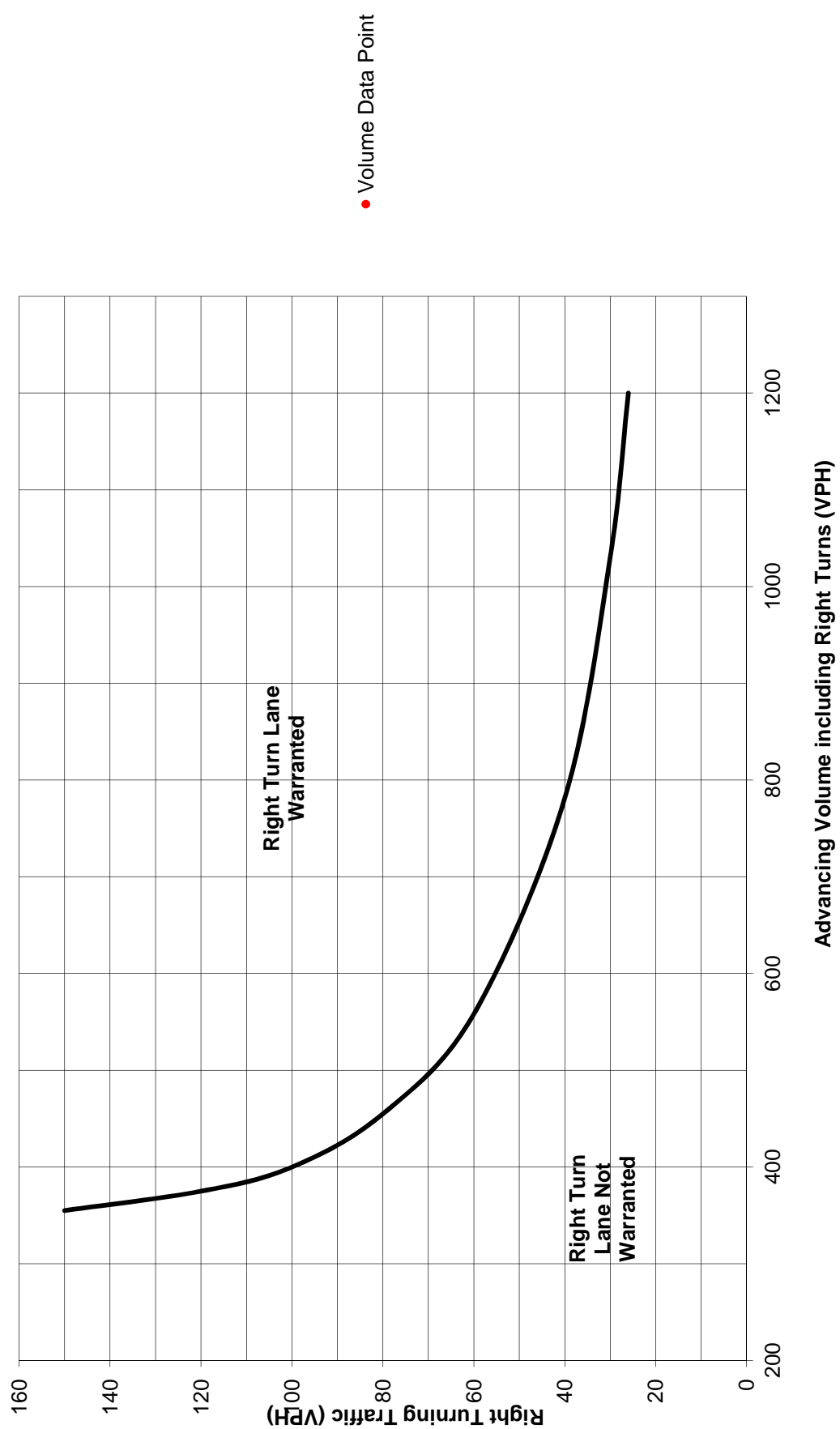
TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: N/A Warrant Met?: N/A	Applicable Warrant Figure: Figure 9 Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control: Unsignalized Design Hour Volume of Turning Lane: 4 Cycles Per Hour (Assumed): 60 Cycles Per Hour (If Known): 0	Average # of Vehicles/Cycle: N/A																																								
PennDOT Publication 46, Exhibit 11-6																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="3" style="width: 20%;">Type of Traffic Control</th> <th colspan="6">Speed (MPH)</th> </tr> <tr> <th colspan="2">25-35</th> <th colspan="2" rowspan="2">40-45</th> <th colspan="2" rowspan="2">50-60</th> </tr> <tr> <th colspan="6">Turn Demand Volume</th> </tr> <tr> <th></th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> </tr> <tr> <td>Signalized</td> <td>A</td> <td>A</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> </tr> <tr> <td>Unsignalized</td> <td>A</td> <td>A</td> <td>C</td> <td>B</td> <td>B or C</td> <td>B</td> </tr> </table>		Type of Traffic Control	Speed (MPH)						25-35		40-45		50-60		Turn Demand Volume							High	Low	High	Low	High	Low	Signalized	A	A	B or C	B or C	B or C	B or C	Unsignalized	A	A	C	B	B or C	B
Type of Traffic Control	Speed (MPH)																																								
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	Turn Demand Volume																																								
	High	Low	High	Low	High	Low																																			
Signalized	A	A	B or C	B or C	B or C	B or C																																			
Unsignalized	A	A	C	B	B or C	B																																			
Right Turn Lane Storage Length, Condition A: N/A Feet Condition B: N/A Feet Condition C: N/A Feet Required Right Turn Lane Storage Length: N/A Feet Additional Findings: N/A																																									
Additional Comments / Justifications: <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>																																									

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Upper Allen Twp"/> County: <input type="text" value="Cumberland County"/> PennDOT Engineering District: <input type="text" value="8"/>	Analysis Date: <input type="text" value="2/28/2018"/> Conducted By: <input type="text" value="MEA"/> Checked By: <input type="text" value=""/> Agency/Company Name: <input type="text" value="ALPHA CEI"/>
Intersection & Approach Description: <input type="text" value="Proposed Site Driveway 1 / Gettysburg Pike - Southbound Advancing"/>	
Analysis Period: <input type="text" value="2020 Build"/> Design Hour: <input type="text" value="PM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Rolling"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 1px solid red; padding: 2px; display: inline-block;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes		0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes		0.0%	N/A
Advancing Volume: <input type="text" value="N/A"/> Opposing Volume: <input type="text" value="N/A"/> Left Turn Volume: <input type="text" value="N/A"/> % Left Turns in Advancing Volume: <input type="text" value="N/A"/>					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	319	2.0%	329
	Right	-	18	0.0%	18
Advancing Volume: <input type="text" value="347"/> Right Turn Volume: <input type="text" value="18"/>					

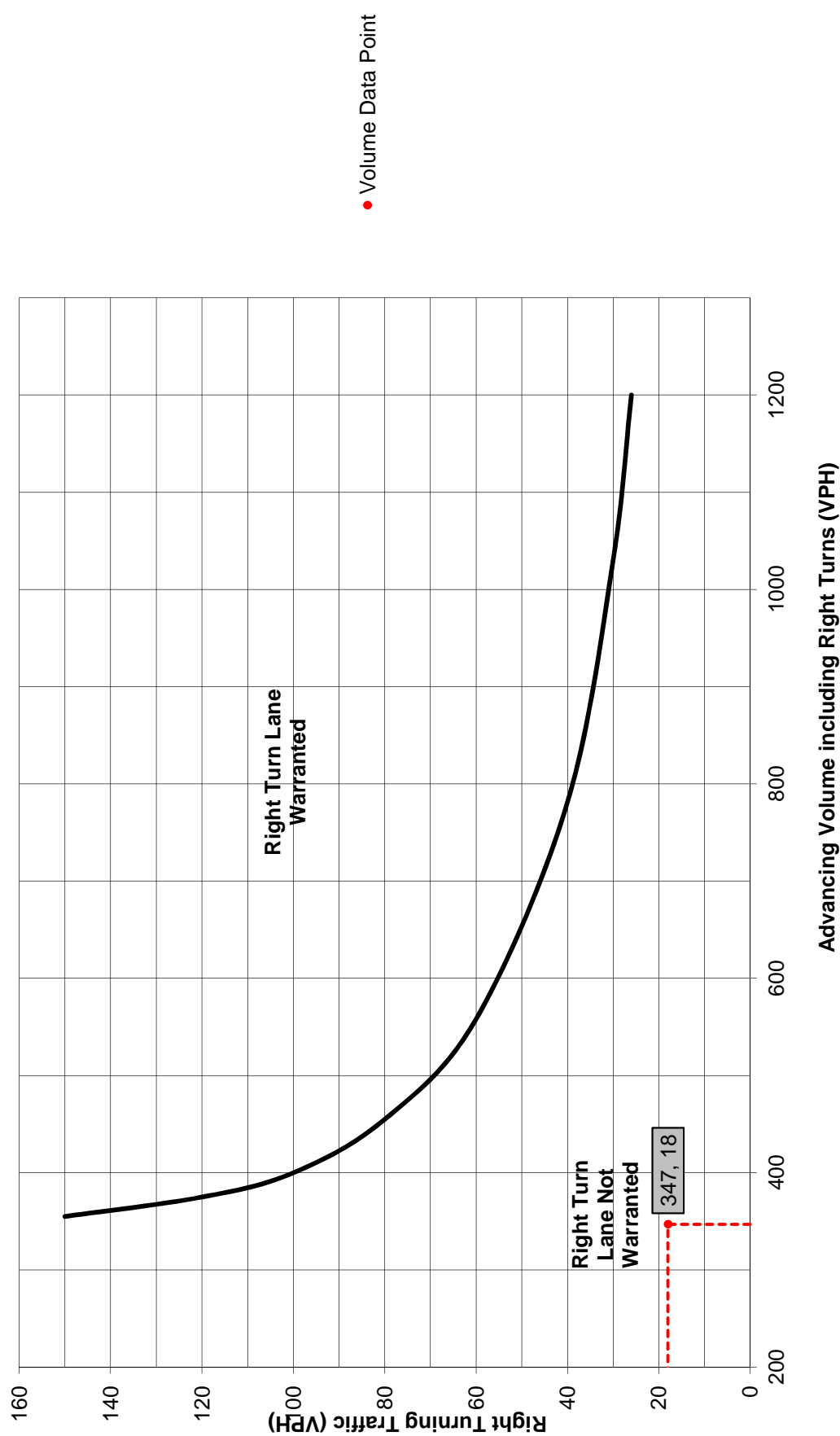
TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/> Warrant Met?: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 9"/> Warrant Met?: <input type="text" value="No"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="18"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value="0"/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>																																								
PennDOT Publication 46, Exhibit 11-6																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="3">Type of Traffic Control</th> <th colspan="6">Speed (MPH)</th> </tr> <tr> <th colspan="2">25-35</th> <th colspan="2">40-45</th> <th colspan="2">50-60</th> </tr> <tr> <th colspan="6" style="text-align: center;">Turn Demand Volume</th> </tr> <tr> <td></td> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> </tr> <tr> <td>Signalized</td> <td>A</td> <td>A</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> </tr> <tr> <td>Unsignalized</td> <td>A</td> <td>A</td> <td>C</td> <td>B</td> <td>B or C</td> <td>B</td> </tr> </table>		Type of Traffic Control	Speed (MPH)						25-35		40-45		50-60		Turn Demand Volume							High	Low	High	Low	High	Low	Signalized	A	A	B or C	B or C	B or C	B or C	Unsignalized	A	A	C	B	B or C	B
Type of Traffic Control	Speed (MPH)																																								
	25-35		40-45		50-60																																				
	Turn Demand Volume																																								
	High	Low	High	Low	High	Low																																			
Signalized	A	A	B or C	B or C	B or C	B or C																																			
Unsignalized	A	A	C	B	B or C	B																																			
Right Turn Lane Storage Length, Condition A: <input type="text" value="N/A"/> Feet Condition B: <input type="text" value="N/A"/> Feet Condition C: <input type="text" value="N/A"/> Feet Required Right Turn Lane Storage Length: <input type="text" value="N/A"/> Feet Additional Findings: <input type="text" value="N/A"/>																																									
Additional Comments / Justifications: <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>																																									

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Right Turn Lane
2030 Opening Year Build Scenario

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: Upper Allen Twp County: Cumberland County PennDOT Engineering District: 8	Analysis Date: 2/28/2018 Conducted By: MEA Checked By: Agency/Company Name: ALPHA CEI
Intersection & Approach Description: Proposed Site Driveway 1/ Gettysburg Pike - Southbound Advancing	
Analysis Period: 2030 Build Design Hour: AM Peak Hour Intersection Control: Unsignalized Posted Speed Limit (MPH): 35 Type of Terrain: Rolling	Number of Approach Lanes: 1 Undivided or Divided Highway: Undivided <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: Right Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes		0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes		0.0%	N/A
Advancing Volume: N/A Opposing Volume: N/A Left Turn Volume: N/A % Left Turns in Advancing Volume: N/A					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	158	4.0%	168
	Right	-	4	0.0%	4
Advancing Volume: 172 Right Turn Volume: 4					

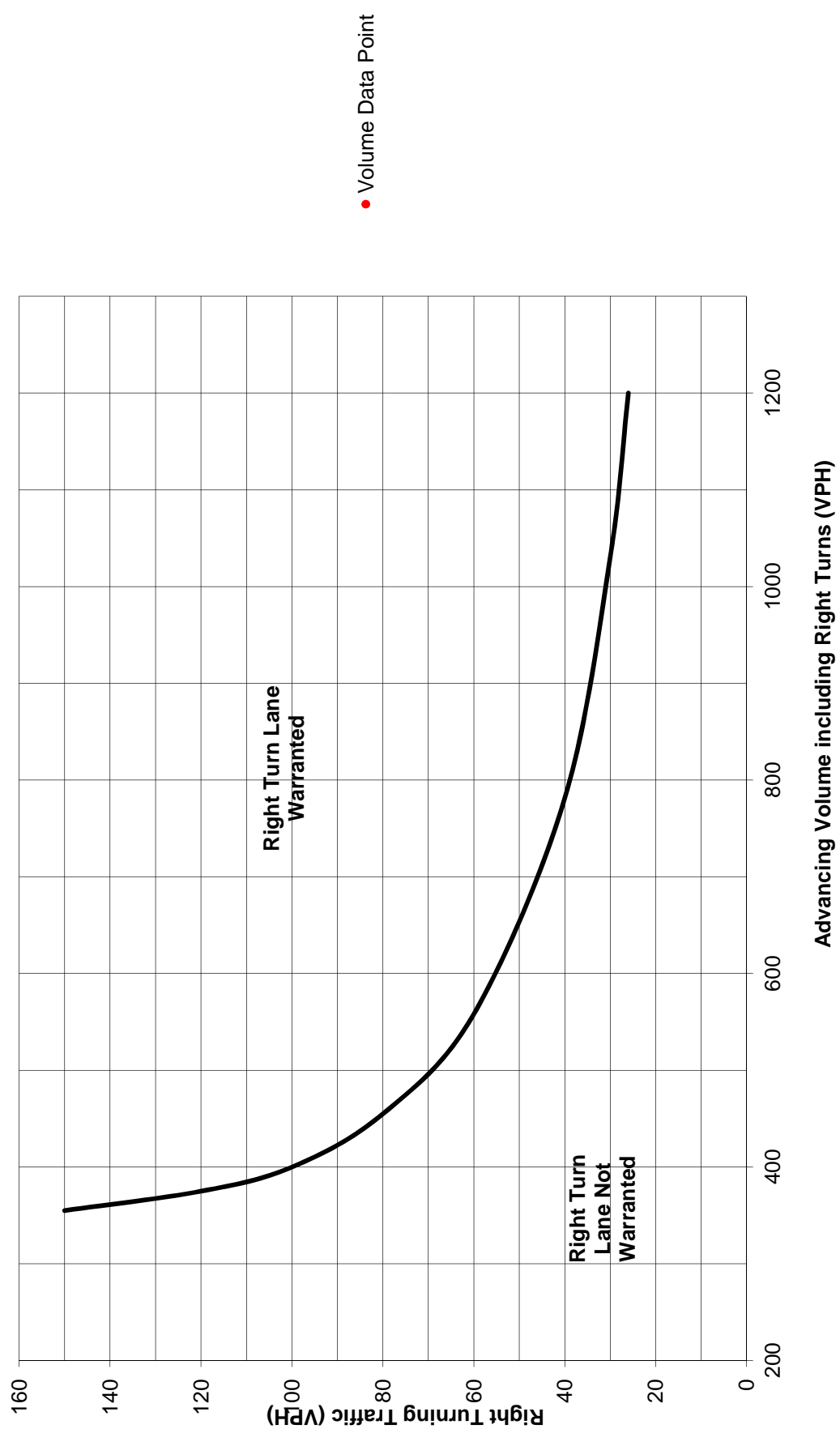
TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: N/A Warrant Met?: N/A	Applicable Warrant Figure: Figure 9 Warrant Met?: No

TURN LANE LENGTH CALCULATIONS

Intersection Control: Unsignalized Design Hour Volume of Turning Lane: 4 Cycles Per Hour (Assumed): 60 Cycles Per Hour (If Known): 0	Average # of Vehicles/Cycle: N/A																																								
PennDOT Publication 46, Exhibit 11-6																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="3" style="width: 20%;">Type of Traffic Control</th> <th colspan="6">Speed (MPH)</th> </tr> <tr> <th colspan="2">25-35</th> <th colspan="2" rowspan="2">40-45</th> <th colspan="2" rowspan="2">50-60</th> </tr> <tr> <th colspan="6">Turn Demand Volume</th> </tr> <tr> <th></th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> <th>High</th> <th>Low</th> </tr> <tr> <td>Signalized</td> <td>A</td> <td>A</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> <td>B or C</td> </tr> <tr> <td>Unsignalized</td> <td>A</td> <td>A</td> <td>C</td> <td>B</td> <td>B or C</td> <td>B</td> </tr> </table>		Type of Traffic Control	Speed (MPH)						25-35		40-45		50-60		Turn Demand Volume							High	Low	High	Low	High	Low	Signalized	A	A	B or C	B or C	B or C	B or C	Unsignalized	A	A	C	B	B or C	B
Type of Traffic Control	Speed (MPH)																																								
	25-35		40-45		50-60																																				
	Turn Demand Volume																																								
	High	Low	High	Low	High	Low																																			
Signalized	A	A	B or C	B or C	B or C	B or C																																			
Unsignalized	A	A	C	B	B or C	B																																			
Right Turn Lane Storage Length, Condition A: N/A Feet Condition B: N/A Feet Condition C: N/A Feet Required Right Turn Lane Storage Length: N/A Feet																																									
Additional Findings: N/A																																									
Additional Comments / Justifications: <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>																																									

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: <input type="text" value="Upper Allen Twp"/> County: <input type="text" value="Cumberland County"/> PennDOT Engineering District: <input type="text" value="8"/>	Analysis Date: <input type="text" value="2/28/2018"/> Conducted By: <input type="text" value="MEA"/> Checked By: <input type="text"/> Agency/Company Name: <input type="text" value="ALPHA CEI"/>
Intersection & Approach Description: <input type="text" value="Proposed Site Driveway 1 / Gettysburg Pike - Southbound Advancing"/>	
Analysis Period: <input type="text" value="2030 Build"/> Design Hour: <input type="text" value="PM Peak Hour"/> Intersection Control: <input type="text" value="Unsignalized"/> Posted Speed Limit (MPH): <input type="text" value="35"/> Type of Terrain: <input type="text" value="Rolling"/>	Number of Approach Lanes: <input type="text" value="1"/> Undivided or Divided Highway: <input type="text" value="Undivided"/> <div style="border: 1px solid red; padding: 2px; display: inline-block;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: <input type="text" value="Right Turn Lane"/>

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes		0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes	0	0.0%	N/A
Opposing	Left	Yes	0	0.0%	N/A
	Through	-		0.0%	N/A
	Right	Yes		0.0%	N/A

Advancing Volume:
 Opposing Volume:
 Left Turn Volume:
 % Left Turns in Advancing Volume:

Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No	0	0.0%	N/A
	Through	-	348	2.0%	359
	Right	-	18	0.0%	18

Advancing Volume:
 Right Turn Volume:

TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: <input type="text" value="N/A"/>	Applicable Warrant Figure: <input type="text" value="Figure 9"/>
Warrant Met?: <input type="text" value="N/A"/>	Warrant Met?: <input type="text" value="No"/>

TURN LANE LENGTH CALCULATIONS

Intersection Control: <input type="text" value="Unsignalized"/> Design Hour Volume of Turning Lane: <input type="text" value="18"/> Cycles Per Hour (Assumed): <input type="text" value="60"/> Cycles Per Hour (If Known): <input type="text" value="0"/>	Average # of Vehicles/Cycle: <input type="text" value="N/A"/>
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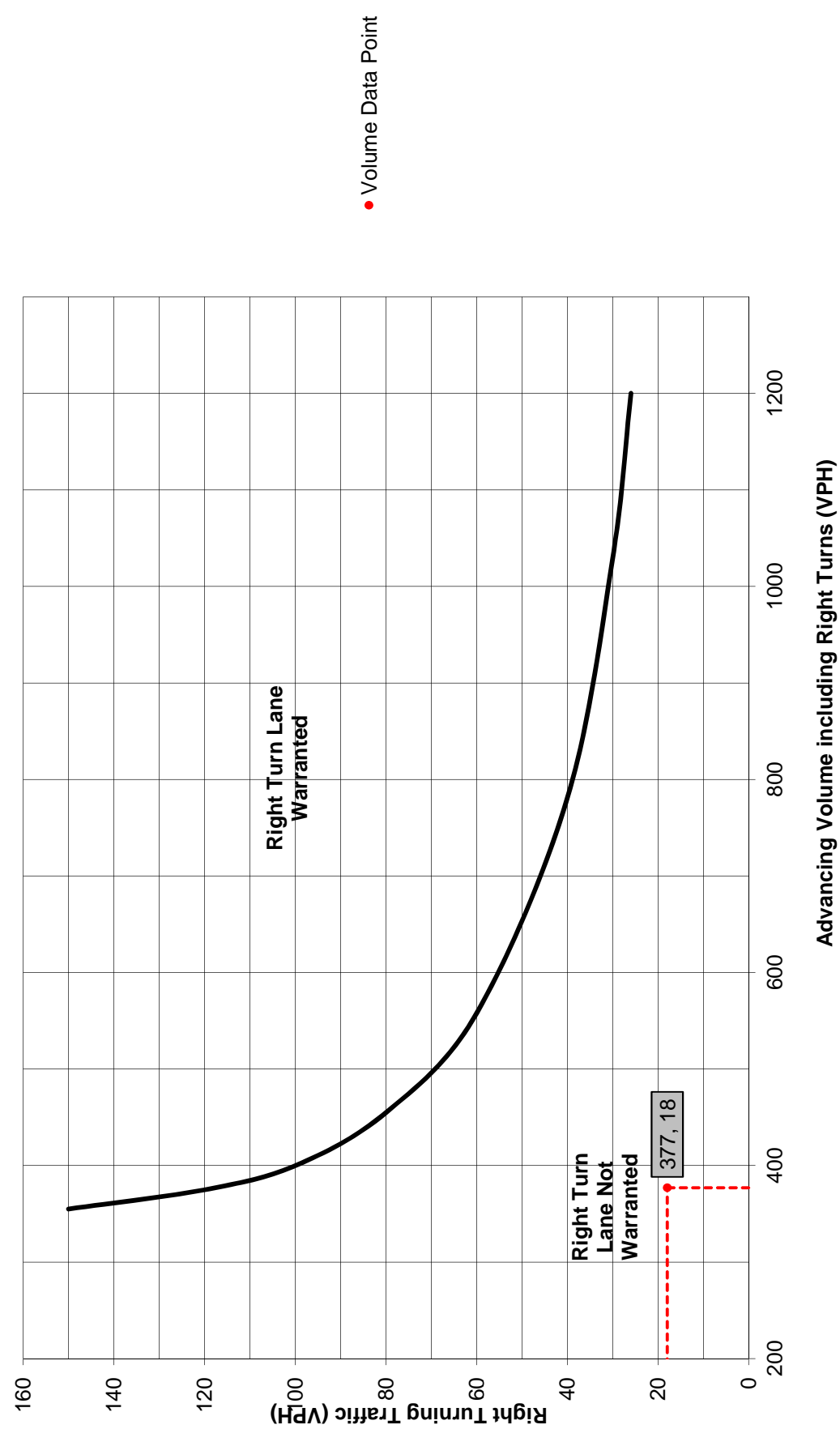
PennDOT Publication 46, Exhibit 11-6						
Type of Traffic Control	Speed (MPH)					
	25-35		40-45		50-60	
	Turn Demand Volume					
	High	Low	High	Low	High	Low
Signalized	A	A	B or C	B or C	B or C	B or C
Unsignalized	A	A	C	B	B or C	B

Right Turn Lane Storage Length, Condition A:	<input type="text" value="N/A"/>	Feet
Condition B:	<input type="text" value="N/A"/>	Feet
Condition C:	<input type="text" value="N/A"/>	Feet
Required Right Turn Lane Storage Length:	<input type="text" value="N/A"/>	Feet

Additional Findings:

Additional Comments / Justifications:

Figure 9. Warrant for right turn lanes on two-lane roadways
(40 mph or lower speeds, unsignalized and signalized intersections)



Left Turn Lane 2020 Opening Year Build Scenario

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: Upper Allen Twp County: Cumberland County PennDOT Engineering District: 8	Analysis Date: 2/28/2018 Conducted By: MEA Checked By: Agency/Company Name: ALPHA CEI
Intersection & Approach Description: Proposed Site Driveway 1 / Gettysburg Pike - Northbound Advancing	
Analysis Period: 2020 Build Design Hour: AM Peak Hour Intersection Control: Unsignalized Posted Speed Limit (MPH): 35 Type of Terrain: Rolling	Number of Approach Lanes: 1 Undivided or Divided Highway: Undivided <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	2	0.0%	2
	Through	-	370	2.0%	382
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	144	4.0%	153
	Right	Yes	4	0.0%	4
Advancing Volume: 384 Opposing Volume: 157 Left Turn Volume: 2 % Left Turns in Advancing Volume: 0.52%					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No		0.0%	N/A
	Through	-		0.0%	N/A
	Right	-		0.0%	N/A
Advancing Volume: N/A Right Turn Volume: N/A					

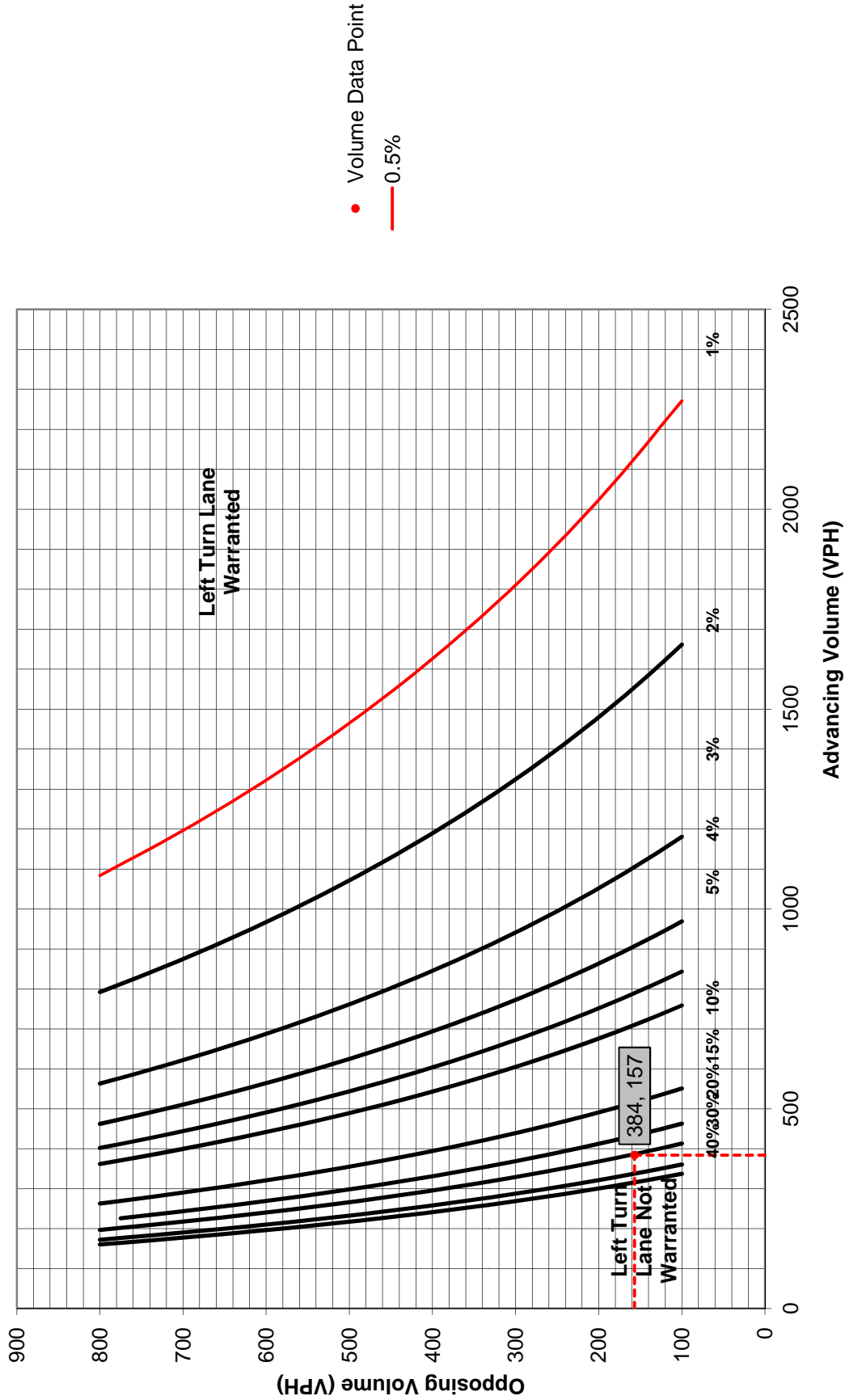
TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: Figure 1 Warrant Met?: No	Applicable Warrant Figure: N/A Warrant Met?: N/A

TURN LANE LENGTH CALCULATIONS

Intersection Control: Unsignalized Design Hour Volume of Turning Lane: 2 Cycles Per Hour (Assumed): 60 Cycles Per Hour (If Known): 0	Average # of Vehicles/Cycle: N/A																																								
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Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: Upper Allen Twp County: Cumberland County PennDOT Engineering District: 8	Analysis Date: 2/28/2018 Conducted By: MEA Checked By: Agency/Company Name: ALPHA CEI
Intersection & Approach Description: Proposed Site Driveway 1 / Gettysburg Pike - Northbound Advancing	
Analysis Period: 2020 Build Design Hour: PM Peak Hour Intersection Control: Unsignalized Posted Speed Limit (MPH): 35 Type of Terrain: Rolling	Number of Approach Lanes: 1 Undivided or Divided Highway: Undivided <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	3	0.0%	3
	Through	-	213	2.0%	220
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	319	2.0%	329
	Right	Yes	18	0.0%	18
Advancing Volume: 223 Opposing Volume: 347 Left Turn Volume: 3 % Left Turns in Advancing Volume: 1.35%					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No		0.0%	N/A
	Through	-		0.0%	N/A
	Right	-		0.0%	N/A
Advancing Volume: N/A Right Turn Volume: N/A					

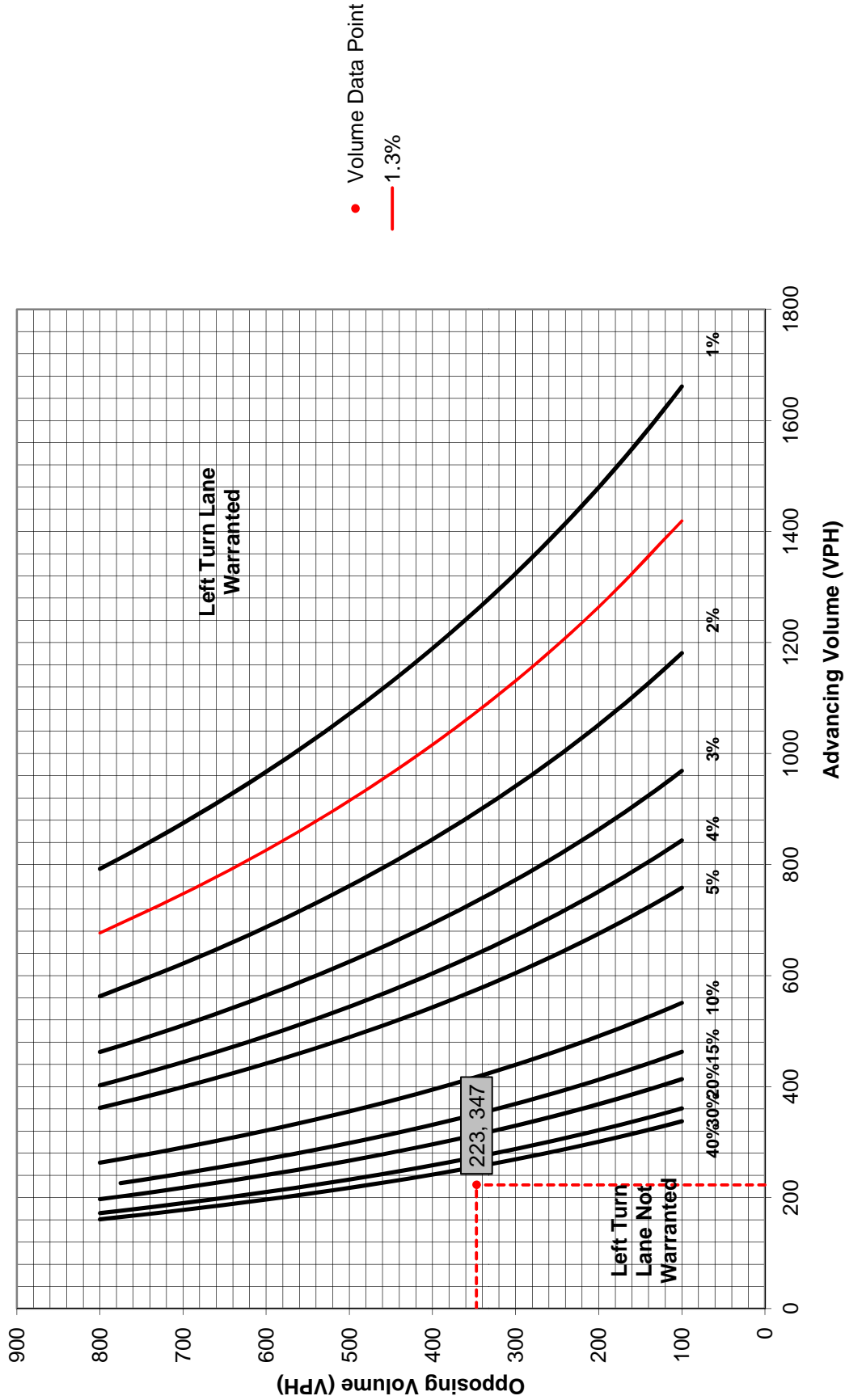
TURN LANE WARRANT FINDINGS

Left Turn Lane Warrant Findings	Right Turn Lane Warrant Findings
Applicable Warrant Figure: Figure 1 Warrant Met?: No	Applicable Warrant Figure: N/A Warrant Met?: N/A

TURN LANE LENGTH CALCULATIONS

Intersection Control: Unsignalized Design Hour Volume of Turning Lane: 3 Cycles Per Hour (Assumed): 60 Cycles Per Hour (If Known): 0	Average # of Vehicles/Cycle: N/A																																								
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Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Left Turn Lane 2030 Opening Year Build Scenario

Turn Lane Warrant and Length Analysis Workbook

STUDY LOCATION AND ANALYSIS INFORMATION

Municipality: Upper Allen Twp County: Cumberland County PennDOT Engineering District: 8	Analysis Date: 2/28/2018 Conducted By: MEA Checked By: Agency/Company Name: ALPHA CEI
Intersection & Approach Description: Proposed Site Driveway 1 / Gettysburg Pike - Northbound Advancing	
Analysis Period: 2030 Build Design Hour: AM Peak Hour Intersection Control: Unsignalized Posted Speed Limit (MPH): 35 Type of Terrain: Rolling	Number of Approach Lanes: 1 Undivided or Divided Highway: Undivided <div style="border: 1px solid red; padding: 2px; display: inline-block; color: red;">Type of Analysis</div> Left or Right-Turn Lane Analysis?: Left Turn Lane

VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	2	0.0%	2
	Through	-	404	2.0%	417
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	158	4.0%	168
	Right	Yes	4	0.0%	4
Advancing Volume: 419 Opposing Volume: 172 Left Turn Volume: 2					
% Left Turns in Advancing Volume: 0.48%					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No		0.0%	N/A
	Through	-		0.0%	N/A
	Right	-		0.0%	N/A
Advancing Volume: N/A Right Turn Volume: N/A					

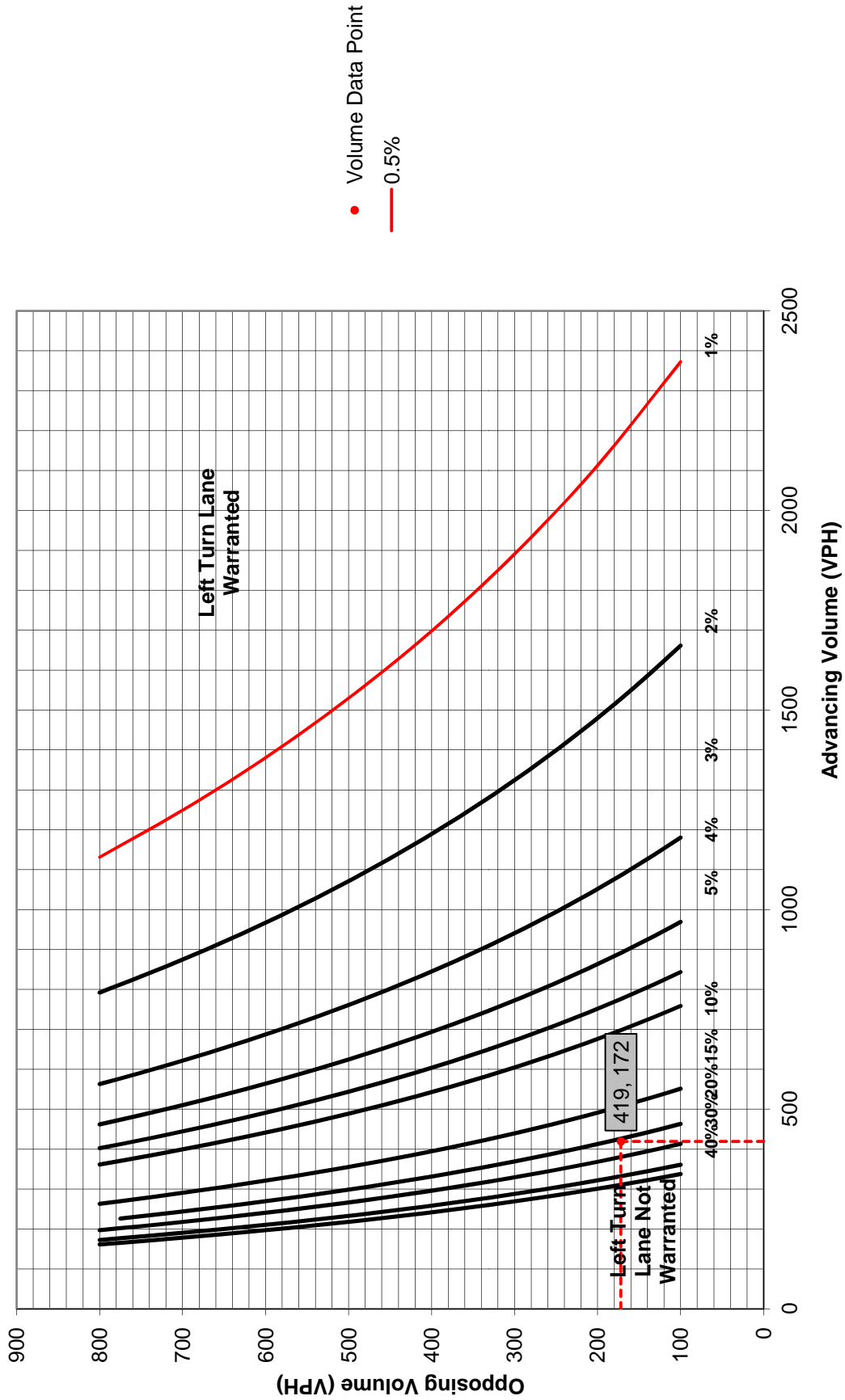
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Applicable Warrant Figure: Figure 1 Warrant Met?: No	Applicable Warrant Figure: N/A Warrant Met?: N/A

TURN LANE LENGTH CALCULATIONS

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Figure 1. Warrant for left turn lanes on two-lane roadways
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Turn Lane Warrant and Length Analysis Workbook

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VOLUME CALCULATIONS

Left Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	Yes	3	0.0%	3
	Through	-	292	2.0%	301
	Right	Yes	0	0.0%	0
Opposing	Left	Yes	0	0.0%	0
	Through	-	348	2.0%	359
	Right	Yes	18	0.0%	18
Advancing Volume: 304 Opposing Volume: 377 Left Turn Volume: 3 % Left Turns in Advancing Volume: 0.99%					
Right Turn Lane Volume Calculations					
Movement		Include?	Volume	% Trucks	PCEV
Advancing	Left	No		0.0%	N/A
	Through	-		0.0%	N/A
	Right	-		0.0%	N/A
Advancing Volume: N/A Right Turn Volume: N/A					

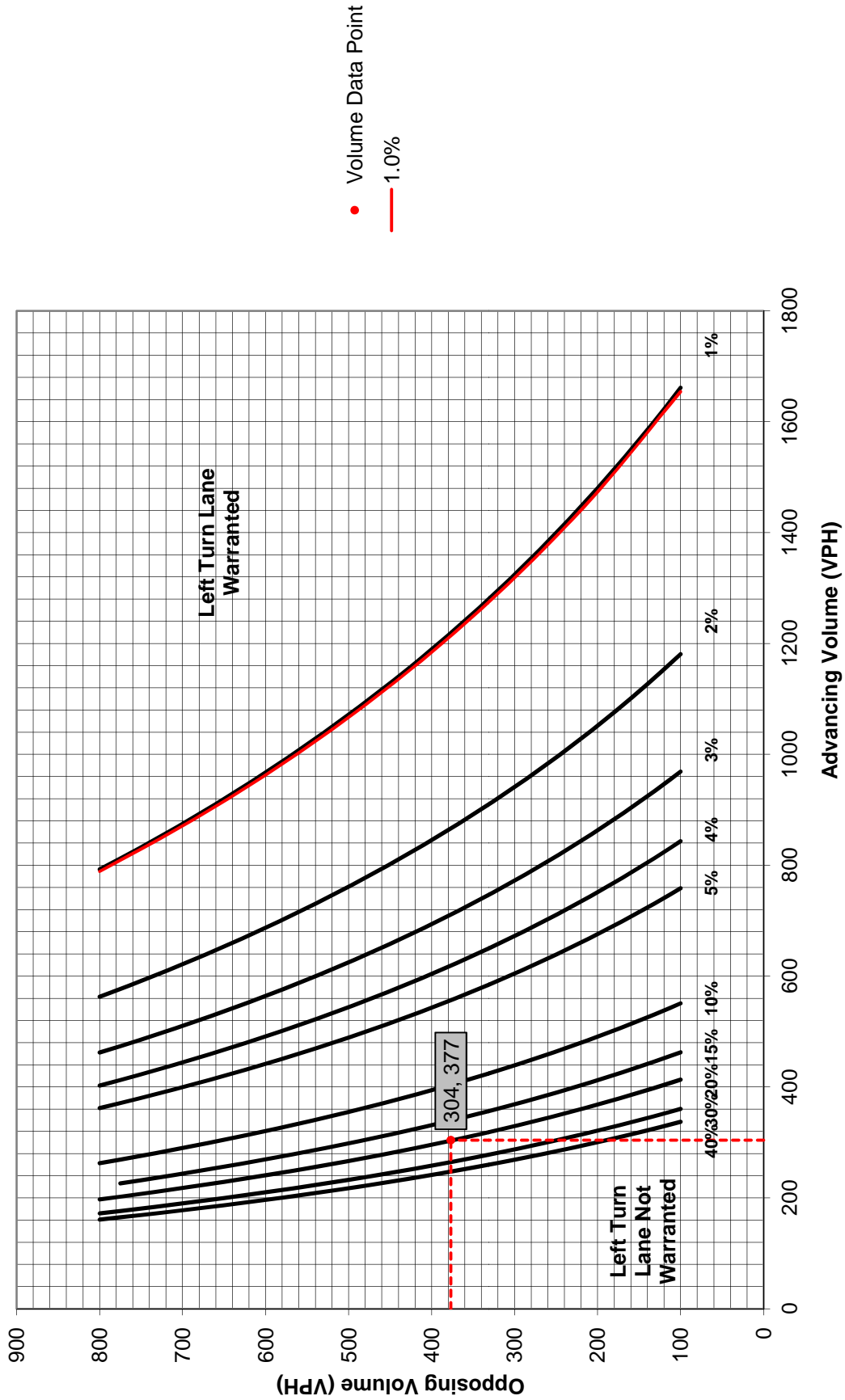
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Figure 1. Warrant for left turn lanes on two-lane roadways
(speeds to 35 mph, unsignalized and signalized intersections)
(L = % Left Turns in Advancing Volume)



Correspondence

Mark Allen

From: Mark Allen
Sent: Tuesday, February 20, 2018 10:10 AM
To: 'Jennifer Boyer'
Cc: 'Wheeler, Jason'
Subject: Arborview TIS Scope
Attachments: 2-7-18 Exhibit 11x17 (1).pdf

Jennifer Boyer
Community Development Director/Planner

Upper Allen Township

Jennifer,

ALPHA Consulting Engineers is preparing an application on behalf of the developer to create 22 single family lots along the northern side of Gettysburg Pike just east of Fisher Road in Upper Allen Township. Please see attached (very preliminary) concept plan. We have prepared a TIS scope (included below) for TPD's/Township Traffic Engineer review, comment, and concurrence.

Thank You.

Mark Allen PLS, PE

ALPHA CONSULTING ENGINEERS, INC.

115 LIMEKILN ROAD P.O. BOX 'G'
NEW CUMBERLAND, PA. 17070
OFFICE 717-770-2500
FAX 717-770-2400
mallen@alphacei.com

Proposed TIS Scope

A. Study Area

The study area will include the proposed site driveway along Gettysburg Pike, and the adjacent un-signalized intersection of Gettysburg Pike and Fisher Road.

B. Study Periods

The study shall include traffic analysis for the following time periods that occur while school is in session-

- AM Peak Hour of the adjacent street
- PM Peak Hour of the adjacent street

A current year analysis (2018) along with future opening year (2020) analysis will be provided. Future year analysis shall be based on current published PennDOT growth rate values for Cumberland County.

C. Data Collection

Vehicular traffic volume data will be collected while school is in session via:

- Manual Turn Movement Counts at the adjacent un-signalized intersection of Gettysburg Pike and Fisher Road during the following time periods to establish peak traffic hours:
 - Weekday AM Peak 6:00AM – 9:00AM
 - Weekday PM Peak 3:00PM – 7:00PM

D. Trip Generation

Traffic generated by the proposed development shall be estimated per current published Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition, Land Use Code 210, Single Family Detached Housing using 22 units as the independent variable.

E. Assignment

Generated traffic shall be assigned to the study area based on the current traffic distribution along Gettysburg Pike

F. Included Analysis

- a) Capacity Analysis per 2010 HCM using Synchro 8, all study area intersections, Substituting Pennsylvania Suburban Context default values for:
 - Un- Signalized Intersections:
 - Base Critical Headways –
 - Base Follow up Headways
- b) Queue Analysis using 95th percentile queues from Synchro methodology , for all intersections.
- c) Turn Lane Warrant Analysis per PennDOT Pub 46, Chapter 11, Site Driveways Only, The lengths of any proposed turn lanes will be sized in accordance with Pub 46, Chapter 11. The need for lengthening any existing turn lanes will be determined in accordance with the Queue Analysis.
- d) Sight Distance Analysis per PA Code 67 CH 441, Site Driveways Only.



Memo

DATE: March 19, 2018

TO: Upper Allen Township Planning Commission
Wayne Willey, Chair

FROM: Jennifer M. Boyer, AICP
Community Development Director/Planner

Zachary R. Gulden, MPA
Planning Technician

RE: Plan Name: Arborview
Plan Type: Preliminary / Final Subdivision / Land Development
UAT File No.: 18-03-01
Property Parcel ID: 42-29-2456-001 & 001A
Property Address: 418 Gettysburg Pike
Zoning District: Medium-Density Residential (R-2)

The Applicant's proposal is to subdivide Lots 1, 2, and 3 into 26 separate Lots. The proposed project is for the development of 22 single-family detached homes, which will be located on Lots 3 through 24. Two private open spaces lots will be provided within the development. The existing single-family homes on Lots 1 and 2 will remain. The total tract acreage is 14.8, with 12.7 acres being developed. The development will create an additional 1,307 linear feet of new public streets on Arborview Drive and Coventry Drive. The development will be served with public water and sewer. The proposed use of the subject property is consistent with the Upper Allen Township Zoning Ordinance and Comprehensive Plan.

The Applicant is requesting the following deferrals:

1. Defer the requirements of Section 220-15.B (11) to reconstruct existing streets abutting the subdivision / land development to the widths specified in the Township of Upper Allen Subdivision and land Development Ordinance.

Staff Comment: The existing ROW on Gettysburg Pike is 36 feet with a 23 foot-wide cartway. Collector roads are required to be 60 feet wide with 24 foot-wide cartways. Given the additional ROW from the Applicant, as well as dedicated ROW from residents on the other side, Gettysburg Pike will increase to 60 feet of ROW. The existing cartway would remain. Staff could support the deferral of the road widening until such time as deemed necessary.

shade trees shall be added to the plan in accordance with Section 220-26.B(1) of the Codified Ordinances of Upper Allen Township.

3. Section 220-10.B(2)(c) of codified ordinances requires pipe sizes and location of valves to be shown for the proposed water distribution system.

TRAFFIC IMPACT STUDY

TPD concurs with the recommendations and conclusions outlined in the TIS submission; it should be noted that the above comments are not anticipated to impact the recommendations or conclusions in the study and the Applicant and/or Township may consider a waiver of the 10-year horizon analysis.

4. Future traffic projections should consider a ten-year growth period beyond the construction of the proposed development. Therefore, assuming an opening year of 2020, the future analysis year should be 2030. If the Applicant is not proposing to analyze a 10-year horizon, a modification may be discussed with the Township, in accordance with Section 220-11.F(2)(c)(2).
5. There appears to be typographical errors on page 15 in reference to total trips generated by the site. In addition, Figures 4 (trip distribution %'s) and 5A must be reviewed and verified for consistency with the volume development worksheet.
6. The minimum length of a vertical curve shall be 100 feet in accordance with Section 220-15.D(2)(c). While the curves less than 100 feet meet the required K values, the length should be increased or else a modification to this section should be requested.
7. All proposed public areas should be designed in accordance with applicable federal and state standards. Plans should be constructed to comply with the following standards in accordance with Section 220-16.B(1):
 - a. PennDOT Design Manual 2, Chapter 6
 - b. PennDOT Standards for Roadway Construction, Publication 72M, RC-67M.
 - c. U.S. Access Board, Public Right of Way Accessibility Guidelines (PROWAG) and ADA Accessibility Guidelines for Buildings and Facilities (ADAAG).
8. A crossing/ADA ramp shall be provided on the Coventry Drive approach to Arborview Drive.
9. A detail for an Alternate 4A Curb Ramp was provided on Sheet 12 of 15. The Applicant should verify whether or not this detail is appropriate for each of the proposed curb ramps. In addition, the proposed curb ramp at the Gettysburg Pike intersection should be realigned to provide a crossing of Arborview Drive that runs parallel to the Gettysburg Pike.



April 9, 2018

Jennifer M. Boyer, AICP, Community Development Director/Planner
Upper Allen Township
100 Gettysburg Pike
Mechanicsburg, PA 17055

RE: Arborview Preliminary / Final Subdivision & Land Development Plan
Your File No. 18-03-01

Dear Jennifer,

Please find below in **bold type** our responses to the written review comments received for the above referenced project.

Township Memo from Jennifer Boyer and Zachary Gulden, dated March 19, 2018

1. Section 220-15.E(5) states that intersections along collector streets shall be at least 800 feet apart. The proposed intersection of Arborview Drive and Fisher Road are less than 600 feet apart. Since a modification of this section has not been requested, please describe why the new road cannot be positioned at the 800-foot distance. Is there any way to align Arborview Drive with the proposed intersection north of the site for the proposed Terraces at Shepherdstown development?

A modification is now requested; please see the enclosed Township form for more information

2. Section 220-28.C states that properties within 1,000 feet of a municipal historic district may be subject to additional requirements/restrictions, including buffer zones and screening, as may be imposed by the governing body. The Applicant should discuss how the new development will not negatively impact the continued protection/preservation of the Shepherdstown Historic District.

All proposed construction is located outside of the historic district. All proposed development is located well downhill of the historic district, so it will not visually or spatially be part of the village cluster. There are existing trees to remain that will shield proposed lot #2.

SUBDIVISION, LAND DEVELOPMENT & ZONING

1. Gettysburg Pike is a collector roadway. The cartway edge at the intersection with Gettysburg Pike shall be 50 feet in accordance with Section 220-15.E(7) of the Codified Ordinances of Upper Allen Township.

The curb radii have been increased to 50 feet; please see sheet #3.

2. The Stormwater Management Buffer and Screening information on Sheet 6 indicates that a type 3 buffer yard requires 1 shade tree per 100 linear feet. The requirement for shade trees in a type 3 buffer yard is 1 tree per 30 linear feet; therefore, additional shade trees shall be added to the plan in accordance with Section 220-26.B(1) of the Codified Ordinances of Upper Allen Township.

On sheet #5, the text has been changed from 100 feet to 30 feet, calculations have been revised, and additional trees are now shown.

3. Section 220-10.B(2)(c) of codified ordinances requires pipe sizes and location of valves to be shown for the proposed water distribution system.

Water main pipe sizes and valves are now shown on sheet #4.

TRAFFIC IMPACT STUDY

TPD concurs with the recommendations and conclusions outlined in the TIS submission; it should be noted that the above comments are not anticipated to impact the recommendations or conclusions in the study and the Applicant and/or Township may consider a waiver of the 10- year horizon analysis.

4. Future traffic projections should consider a ten-year growth period beyond the construction of the proposed development. Therefore, assuming an opening year of 2020, the future analysis year should be 2030. If the Applicant is not proposing to analyze a 10-year horizon, a modification may be discussed with the Township, in accordance with Section 220-11.F(2)(c)(2).

A revised study is enclosed with the ten-year growth projections.

5. There appears to be typographical errors on page 15 in reference to total trips generated by the site. In addition, Figures 4 (trip distribution %'s) and 5A must be reviewed and verified for consistency with the volume development worksheet.

The errors have been corrected in the enclosed revised study.

6. The minimum length of a vertical curve shall be 100 feet in accordance with Section 220-15.D(2)(c). While the curves less than 100 feet meet the required K values, the length should be increased or else a modification to this section should be requested.

A modification is now requested with this resubmission; please see the enclosed Township form.

7. All proposed public areas should be designed in accordance with applicable federal and state standards. Plans should be constructed to comply with the following standards in accordance with Section 220-16.B(1):

- a. PennDOT Design Manual 2, Chapter 6
- b. PennDOT Standards for Roadway Construction, Publication 721M, RC-67M.
- c. U.S. Access Board, Public Right of Way Accessibility Guidelines (PROWAG) and ADA Accessibility Guidelines for Buildings and Facilities (ADAAG).

ADA ramps are provided at locations that meet the above criteria.

Upper Allen Township

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This concludes our responses. Please contact me or Tom Scully with any further comments. Thank you.

Very Truly Yours,

JKY

John K. Murphy, P.E., P.L.S.