		HCS Two-La	ane_	Highway Re	port	
Proj	ject Information					
Anal	yst	Dylan Zerphey		Date		11/13/2025
Ager	псу	TPD		Analysis Year		Projected (Build) 2035 Condition
Juris	diction	Mount Joy Township		Time Analyzed		Weekday A.M. Peak Hour Westbound
Project Description		Pleasant Road from proposed western	proposed western driveway to proposed			U.S. Customary
		9	Segn	nent 1		
Veh	icle Inputs					
Segn	nent Type	Passing Constrained		Length, ft		1250
Lane	Width, ft	12		Shoulder Width, ft		1
Spee	ed Limit, mi/h	40		Access Point Density, pts/mi		0.0
Den	nand and Capacity	·				
Directional Demand Flow Rate, veh/h		75	75		d Flow Rate, veh/h	-
Peak Hour Factor		0.84		Total Trucks, %		15.00
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.04
Inte	ermediate Results					
Segn	nent Vertical Class	1		Free-Flow Speed,	mi/h	41.6
Spee	ed Slope Coefficient (m)	2.76347		Speed Power Coefficient (p)		0.41674
PF SI	lope Coefficient (m)	-1.50227		PF Power Coefficient (p)		0.68531
In Pa	ssing Lane Effective Length?	No		Follower Density, followers/mi/ln		0.4
%lm	provement to Percent Followers	0.0		%Improvement to Speed		0.0
Sub	segment Data					
#	Segment Type	Length, ft	Rac	lius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1250	1-		-	41.6
Veh	icle Results					
Aver	age Speed, mi/h	41.6		Percent Followers	%	22.5
Segn	ment Travel Time, minutes	0.34	0.34		sity, followers/mi/ln	0.4
Vehic	cle LOS	А				

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```
TWO-LANE HIGHWAY SEGMENT ANALYSIS
File Name:
                                       Node 2 WB AM 2035.xuf
Analyst:
                                       Dylan Zerphey
Agency:
                                       TPD
Jurisdiction:
                                       Mount Joy Township
Date:
                                       11/13/2025
                                       Projected (Build) 2035 Condition
Analysis Year:
Time Analyzed:
                                       Weekday A.M. Peak Hour Westbound
Project Description:
                                       Roadway Link Analysis (Mt Pleasant Road from proposed western driveway to proposed eastern driveway)
Units:
                                       U.S. Customary
                                        Facility LOS and Performance Measures
Facility Length
                                                                               0.24
Facility VMT
                                                                                                   veh-mi/AP
                                                                               4
Facility VHD
                                                                               0.00
                                                                                                   veh-h/p
Facility Average Follower Density, FD
                                                                                                   followers/mi/ln
                                                                               0.4
Facility Average Speed Limit
                                                                               40
                                                                                                   mi/h
Facility Level of Service, LOS
                                                                               Α
                                                       Segment 1_
                                            LOS and Performance Measures
Coded Segment Type
                                                                               Passing Constrained
Analyzed Segment Type
                                                                               Passing Constrained
Actual Segment Length, L
                                                                                                   ft
                                                                               1250
Segment Length Used in Calculation
                                                                               0.25
                                                                                                   шi
Demand Flow Rate in Analysis Direction, vd
                                                                               75
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
Capacity, cap
                                                                               1700
                                                                                                   veh/h
Free-Flow Speed, FFS
                                                                               41.6
                                                                                                   mi/h
                                                                               41.6
Speed, S
                                                                                                   mi/h
Percent Followers, PF
                                                                               22.5
                                                                                                   %
Follower Density, FD
                                                                               0.4
                                                                                                   followers/mi/ln
Level of Service, LOS
                                                                               Α
                      _Step 1: Identify Facility Study Boundaries and Corresponding Segmentation_
Segment Type
                                                                               Passing Constrained
Vertical Class
                                                                               1
Minimum Segment Length
                                                                               0.25
                                                                                                   шi
Maximum Segment Length
                                                                                                   шi
                                                                               3.00
                            Step 2: Determine Demand Flow Rates, Capacity, and d/c Ratio
Demand Volume in Analysis Direction, Vd
                                                                                                   veh/h
Demand Volume in Opposing Direction, Vo
                                                                                                   veh/h
Peak Hour Factor, PHF
                                                                               0.84
Demand Flow Rate in Analysis Direction, vd
                                                                               75
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
d/c Ratio
                                                                               0.04
                               Step 3: Determine the Vertical Alignment Classification
Segment Length, L
                                                                                                   ft
                                                                               1250
Segment Percent Grade
                                                                                                   %
                                                                               -2.00
Vertical Class
                                                                               1
                                        Step 4: Determine the Free-Flow Speed
Posted Speed Limit, Sp
                                                                               40
                                                                                                   mi/h
Base Free-Flow Speed, BFFS
                                                                               45.6
                                                                                                   mi/h
Coeff. Value from Exhibit 15-12, a0
                                                                               0.00000
```

Coeff. Value from Exhibit 15-12, a1

Coeff. Value from Exhibit 15-12, a4  Coeff. Value from Exhibit 15-12, a5  Coeff. for Heavy Vehicle Adjustment, a  Percentage of Heavy Vehicles, %HV  Lane Width, LW  Shoulder Width, SW  Adjustment for Lane and Shoulder Width, fLS  Access-Point Density, APD  Adjustment for Access-Point Density. fA  O.00000  %  15.00  %  1 ft  Adjustment for Lane and Shoulder Width, fLS  0.0 access points/mi  Adjustment for Access-Point Density. fA	Coeff. Value from Exhibit 15-12, a3	0.00000	
Coeff. for Heavy Vehicle Adjustment, a 0.03330  Percentage of Heavy Vehicles, %HV 15.00 %  Lane Width, LW 12 ft  Shoulder Width, SW 1 ft  Adjustment for Lane and Shoulder Width, fLS 3.5 mi/h  Access-Point Density, APD 0.0 access points/mi	Coeff. Value from Exhibit 15-12, a4	0.00000	
Percentage of Heavy Vehicles, %HV 15.00 % Lane Width, LW 12 ft Shoulder Width, SW 1 ft Adjustment for Lane and Shoulder Width, fLS 3.5 mi/h Access-Point Density, APD 0.0 access points/mi	Coeff. Value from Exhibit 15-12, a5	0.00000	
Lane Width, LW 12 ft Shoulder Width, SW 1 ft Adjustment for Lane and Shoulder Width, fLS 3.5 mi/h Access-Point Density, APD 0.0 access points/mi	Coeff. for Heavy Vehicle Adjustment, a	0.03330	
Shoulder Width, SW 1 ft Adjustment for Lane and Shoulder Width, fLS 3.5 mi/h Access-Point Density, APD 0.0 access points/mi	Percentage of Heavy Vehicles, %HV	15.00	%
Adjustment for Lane and Shoulder Width, fLS  Access-Point Density, APD  3.5  mi/h  access points/mi	Lane Width, LW	12	ft
Access-Point Density, APD 0.0 access points/mi	Shoulder Width, SW	1	ft
	Adjustment for Lane and Shoulder Width, fLS	3.5	mi/h
Adjustment for Access-Point Density, fA 0.0 mi/h	Access-Point Density, APD	0.0	access points/mi
7. a just amente 101 7. a constat y 17.	Adjustment for Access-Point Density, fA	0.0	mi/h
Free-Flow Speed, FFS 41.6 mi/h	Free-Flow Speed, FFS	41.6	mi/h

\_\_\_\_\_Step 5: Estimate the Average Speed\_\_\_\_\_\_Note: If the demand flow rate is less than 100 veh/h, the average speed is equal to FFS and Step 5 can be skipped. Demand Flow Rate in Analysis Direction, vd 75 veh/h Free-Flow Speed, FFS 41.6 mi/h Average Speed, S 41.6 mi/h

\_\_\_\_\_\_Step 6: Estimate the Percent Followers\_\_\_\_\_

Segment Type	Passing Constrained		
Vertical Class	1		
Free-Flow Speed, FFS	41.6	mi/h	
Demand Flow Rate in Analysis Direction, vd	75	veh/h	
Demand Flow Rate in Opposing Direction, vo	1500	veh/h	
Directional Capacity, cap	1700	veh/h	
Segment Length, L	0.25	mi	
Percentage of Heavy Vehicles	15.00	%	
Step 6a: Calculate Percent Followers at Capacity			
Coeff. Value for Equation 15-18 or 15-19, b0	37.68080		
Coeff. Value for Equation 15-18 or 15-19, b1	3.05089		
Coeff. Value for Equation 15-18 or 15-19, b2	-7.90866		
·			
Coeff. Value for Equation 15-18 or 15-19, b3	-0.94321		
Coeff. Value for Equation 15-18 or 15-19, b4	13.64266		
Coeff. Value for Equation 15-18 or 15-19, b5	-0.00050		
Coeff. Value for Equation 15-18 or 15-19, b6	-0.05500		
Coeff. Value for Equation 15-18 or 15-19, b7	7.13758		
Percent Followers at Capacity Flow Rate, PFcap	88.5	%	
Step 6b: Calculate Percent Followers at 25% of Capacity			
Coeff. Value for Equation 15-20 or 15-21, c0	18.01780		
Coeff. Value for Equation 15-20 or 15-21, c1	10.00000		
Coeff. Value for Equation 15-20 or 15-21, c2	-21.60000		
Coeff. Value for Equation 15-20 or 15-21, c3	-0.97853		
Coeff. Value for Equation 15-20 or 15-21, c4	12.05214		
Coeff. Value for Equation 15-20 or 15-21, c5	-0.00750		
Coeff. Value for Equation 15-20 or 15-21, c6	-0.06700		
Coeff. Value for Equation 15-20 or 15-21, c7	11.60410		
Percent Followers of 25% of Capacity Flow Rate, PF25cap	56.7	%	
Step 6c: Calculate the Slope Coefficient			
Coeff. Value for Equation 15-22, d1	-0.29764		
Coeff. Value for Equation 15-22, d2	-0.71917		
Slope Coefficient, m			
Slope Coefficient, m	-1.50227		
Step 6d: Calculate the Power Coefficient			
Coeff. Value for Equation 15-23, e0	0.81165		
Coeff. Value for Equation 15-23, e1	0.37920		
Coeff. Value for Equation 15-23, e2	-0.49524		
Coeff. Value for Equation 15-23, e3	-2.11289		
Coeff. Value for Equation 15-23, e4	2.41146		
Power Coefficient, p	0.68531		
Step 6e: Calculate Percent Followers for the Segment			
Percent Followers, PF	22.5	%	
•			

Percent Followers, PF	22.5	%
Demand Flow Rate in Analysis Direction, vd	75	veh/h
Average Speed, with consideration of horizontal curves, S	41.6	mi/h
Follower Density, FD	0.4	followers/mi/ln
Step 9: Determine Potential Adjustment	to Follower Density	
Effective Length of Upstream Passing Lane	1.00	mi
Distance Downstream from Start of Passing Lane Segment	0.24	mi
PF for Upstream Passing Lane Seg., PF	0.0	%
PF for Analysis Segment, PF	22.5	%
Length of Passing Lane Segment, PassLaneLength	0.00	mi
Flow Rate Entering for Analysis Segment	75	veh/h
% Improve to PF, %ImprovePF	0.0	%
% Improve to the Average Speed, %ImproveS	0.0	%
Adjusted Average Speed for Analysis Segment, S	41.6	mi/h
Adjusted Follower Density, FDadj	0.4	followers/mi/ln
Step 10: Determine L	os	
Posted Speed Limit, Sp	40	mi/h
Follower Density, FD	0.4	followers/mi/ln
Level of Service, LOS	Α	

This Two-Lane Highway text report was created in HCS™ Highways Version 2025 on 11/13/2025 10:01:36

		HCS Two-La	ne l	Highway Re	port	
Proj	ect Information					
Analy	yst	Dylan Zerphey		Date		11/13/2025
Ager	ncy	TPD		Analysis Year		Projected (Build) 2035 Condition
Juriso	diction	Mount Joy Township		Time Analyzed		Weekday A.M. Peak Hour Eastbound
Project Description		Roadway Link Analysis Pleasant Road from proposed western driveway to proposed eastern driveway)	proposed western driveway to proposed			U.S. Customary
		S	egn	nent 1		
Veh	icle Inputs					
Segn	nent Type	Passing Constrained		Length, ft		1250
Lane	Width, ft	12		Shoulder Width, ft		1
Spee	d Limit, mi/h	40		Access Point Density, pts/mi		0.0
Den	nand and Capacity					
Directional Demand Flow Rate, veh/h		80		Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.84	0.84			25.00
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.05
Inte	rmediate Results					
Segn	nent Vertical Class	1		Free-Flow Speed,	mi/h	41.3
Spee	d Slope Coefficient (m)	2.74542		Speed Power Coefficient (p)		0.41674
PF SI	ope Coefficient (m)	-1.50123	-1.50123		ent (p)	0.68539
In Pa	ssing Lane Effective Length?	No		Follower Density, followers/mi/ln		0.5
%lm <sub>l</sub>	provement to Percent Followers	0.0		%Improvement to Speed		0.0
Sub	segment Data					
#	Segment Type	Length, ft	Rad	lius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1250	-		-	41.3
Veh	icle Results					
Aver	age Speed, mi/h	41.3		Percent Followers,	, %	23.3
Segn	nent Travel Time, minutes	0.34		Adj. Follower Density, followers/mi/ln		0.5
Vehic	cle LOS	A				

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TWO-LANE HIGHWAY SEGMENT ANALYSIS
File Name:
                                       Node 2 EB AM 2035.xuf
                                       Dylan Zerphey
Analyst:
Agency:
                                       TPD
Jurisdiction:
                                       Mount Joy Township
Date:
                                       11/13/2025
                                       Projected (Build) 2035 Condition
Analysis Year:
Time Analyzed:
                                       Weekday A.M. Peak Hour Eastbound
Project Description:
                                       Roadway Link Analysis (Mt Pleasant Road from proposed western driveway to proposed eastern driveway)
Units:
                                       U.S. Customary
                                        Facility LOS and Performance Measures
Facility Length
                                                                               0.24
Facility VMT
                                                                                                   veh-mi/AP
                                                                               4
Facility VHD
                                                                               0.00
                                                                                                   veh-h/p
Facility Average Follower Density, FD
                                                                                                   followers/mi/ln
                                                                               0.5
Facility Average Speed Limit
                                                                               40
                                                                                                   mi/h
Facility Level of Service, LOS
                                                                               Α
                                                       Segment 1_
                                            LOS and Performance Measures
Coded Segment Type
                                                                               Passing Constrained
Analyzed Segment Type
                                                                               Passing Constrained
Actual Segment Length, L
                                                                                                   ft
                                                                               1250
Segment Length Used in Calculation
                                                                               0.25
                                                                                                   шi
Demand Flow Rate in Analysis Direction, vd
                                                                               80
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
Capacity, cap
                                                                               1700
                                                                                                   veh/h
Free-Flow Speed, FFS
                                                                               41.3
                                                                                                   mi/h
                                                                               41.3
Speed, S
                                                                                                   mi/h
Percent Followers, PF
                                                                               23.3
                                                                                                   %
Follower Density, FD
                                                                               0.5
                                                                                                   followers/mi/ln
Level of Service, LOS
                                                                               Α
                      _Step 1: Identify Facility Study Boundaries and Corresponding Segmentation_
Segment Type
                                                                               Passing Constrained
Vertical Class
                                                                               1
Minimum Segment Length
                                                                               0.25
                                                                                                   шi
Maximum Segment Length
                                                                                                   шi
                                                                               3.00
                            Step 2: Determine Demand Flow Rates, Capacity, and d/c Ratio
Demand Volume in Analysis Direction, Vd
                                                                                                   veh/h
Demand Volume in Opposing Direction, Vo
                                                                                                   veh/h
Peak Hour Factor, PHF
                                                                               0.84
Demand Flow Rate in Analysis Direction, vd
                                                                               80
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
d/c Ratio
                                                                               0.05
                               Step 3: Determine the Vertical Alignment Classification
Segment Length, L
                                                                                                   ft
                                                                               1250
Segment Percent Grade
                                                                               2.00
                                                                                                   %
Vertical Class
                                                                               1
                                        Step 4: Determine the Free-Flow Speed
Posted Speed Limit, Sp
                                                                               40
                                                                                                   mi/h
Base Free-Flow Speed, BFFS
                                                                               45.6
                                                                                                   mi/h
Coeff. Value from Exhibit 15-12, a0
                                                                               0.00000
```

Coeff. Value from Exhibit 15-12, a1

Coeff. Value from Exhibit 15-12, a3	0.0000	
Coeff. Value from Exhibit 15-12, a4	0.00000	
Coeff. Value from Exhibit 15-12, a5	0.00000	
Coeff. for Heavy Vehicle Adjustment, a	0.03330	
Percentage of Heavy Vehicles, %HV	25.00	%
Lane Width, LW	12	ft
Shoulder Width, SW	1	ft
Adjustment for Lane and Shoulder Width, fLS	3.5	mi/h
Access-Point Density, APD	0.0	access points/mi
Adjustment for Access-Point Density, fA	0.0	mi/h
Free-Flow Speed, FFS	41.3	mi/h

\_\_\_\_\_Step 5: Estimate the Average Speed\_\_\_\_\_\_Note: If the demand flow rate is less than 100 veh/h, the average speed is equal to FFS and Step 5 can be skipped. Demand Flow Rate in Analysis Direction, vd 80 veh/h Free-Flow Speed, FFS 41.3 mi/h Average Speed, S 41.3 mi/h

\_\_\_\_\_Step 6: Estimate the Percent Followers\_\_\_\_\_

Segment Type	Passing Const	rained
Vertical Class	1	
Free-Flow Speed, FFS	41.3	mi/h
Demand Flow Rate in Analysis Direction, vd	80	veh/h
Demand Flow Rate in Opposing Direction, vo	1500	veh/h
Directional Capacity, cap	1700	veh/h
Segment Length, L	0.25	mi
Percentage of Heavy Vehicles	25.00	%
Step 6a: Calculate Percent Followers at Capacity		
Coeff. Value for Equation 15-18 or 15-19, b0	37.68080	
Coeff. Value for Equation 15-18 or 15-19, b1	3.05089	
Coeff. Value for Equation 15-18 or 15-19, b2	-7.90866	
Coeff. Value for Equation 15-18 or 15-19, b3	-0.94321	
Coeff. Value for Equation 15-18 or 15-19, b4	13.64266	
Coeff. Value for Equation 15-18 or 15-19, b5	-0.00050	
Coeff. Value for Equation 15-18 or 15-19, b6	-0.05500	
Coeff. Value for Equation 15-18 or 15-19, b7	7.13758	
Percent Followers at Capacity Flow Rate, PFcap		%
refrent rollowers at capacity flow Rate, Freap	88.5	/6
Step 6b: Calculate Percent Followers at 25% of Capacity		
Coeff. Value for Equation 15-20 or 15-21, c0	18.01780	
Coeff. Value for Equation 15-20 or 15-21, c1	10.00000	
Coeff. Value for Equation 15-20 or 15-21, c2	-21.60000	
Coeff. Value for Equation 15-20 or 15-21, c3	-0.97853	
Coeff. Value for Equation 15-20 or 15-21, c4	12.05214	
Coeff. Value for Equation 15-20 or 15-21, c5	-0.00750	
Coeff. Value for Equation 15-20 or 15-21, c6	-0.06700	
Coeff. Value for Equation 15-20 or 15-21, c7	11.60410	
Percent Followers of 25% of Capacity Flow Rate, PF25cap	56.6	%
Step 6c: Calculate the Slope Coefficient		
Coeff. Value for Equation 15-22, d1	-0.29764	
Coeff. Value for Equation 15-22, d2	-0.71917	
Slope Coefficient, m	-1.50123	
Step 6d: Calculate the Power Coefficient		
Coeff. Value for Equation 15-23, e0	0.81165	
Coeff. Value for Equation 15-23, e1	0.37920	
Coeff. Value for Equation 15-23, e2	-0.49524	
Coeff. Value for Equation 15-23, e2	-2.11289	
Coeff. Value for Equation 15-23, es	2.41146	
Power Coefficient, p	0.68539	
rower coerricient, p	6.000.00	
Step 6e: Calculate Percent Followers for the Segment		
Percent Followers, PF	23.3	%

Step 8: Estimate Follower Den	sity	
Percent Followers, PF	23.3	%
Demand Flow Rate in Analysis Direction, vd	80	veh/h
Average Speed, with consideration of horizontal curves, S	41.3	mi/h
Follower Density, FD	0.5	followers/mi/ln
Step 9: Determine Potential Adjustment to	Follower Density	
Effective Length of Upstream Passing Lane	1.00	mi
Distance Downstream from Start of Passing Lane Segment	0.24	mi
PF for Upstream Passing Lane Seg., PF	0.0	%
PF for Analysis Segment, PF	23.3	%
Length of Passing Lane Segment, PassLaneLength	0.00	mi
Flow Rate Entering for Analysis Segment	80	veh/h
% Improve to PF, %ImprovePF	0.0	%
% Improve to the Average Speed, %ImproveS	0.0	%
Adjusted Average Speed for Analysis Segment, S	41.3	mi/h
Adjusted Follower Density, FDadj	0.5	followers/mi/ln
		. 022010. 57 11.27 21.
Step 10: Determine LOS		
Posted Speed Limit, Sp	40	mi/h
Follower Density, FD	0.5	followers/mi/ln
Level of Service, LOS	Α	
Climbing LanesShould Climbing Lanes be considered?	No	
Upgrade traffic flow rate exceeds 200 veh/h?	No	
Upgrade truck flow rate exceeds 20 veh/h?	No	
LOS E or LOS F exists	No	
A reduction of two or more LOS?	No	
A 10 mi/h or greater speed reduction is expected for a truck?	No	
Initial speed	41.3	mi/h
Grade	2.00	%
SUT a	-16.7955	
SUT b	1.9054	
SUT c	1.3678	
SUT additional length	0.76	mi
SUT truck speed	41.3	mi/h
SUT truck speed reduction	0.0	mi/h
Intermediate TT a	-9.1199	•
Intermediate TT b	6.63672	
Intermediate TT c	-2.51232	
Intermediate TT additional length	1.17	mi
Intermediate TT speed	41.3	mi/h
Intermediate TT speed reduction	0.0	mi/h
Interstate TT a	-16.7174	•
Interstate TT b	3.6304	
Interstate TT c	0.3713	
Interstate TT additional length	1.77	mi
Interstate TT speed	41.3	mi/h
Interstate TT speed reduction	0.0	mi/h
		···-, ··

This Two-Lane Highway text report was created in HCS™ Highways Version 2025 on 11/13/2025 10:06:13

		HCS Two-L	Lane	Highway Re	port	
Proj	ect Information					
Anal	yst	Dylan Zerphey		Date		11/13/2025
Ager	ncy	TPD		Analysis Year		Projected (Build) 2035 Condition
Juris	diction	Mount Joy Townshi	ip	Time Analyzed		Weekday P.M. Peak Hour Eastbound
Project Description		Pleasant Road from proposed western	driveway to proposed			U.S. Customary
			Segn	nent 1		
Veh	icle Inputs					
Segn	nent Type	Passing Constrained	d	Length, ft		1250
Lane	Width, ft	12		Shoulder Width, ft		1
Spee	d Limit, mi/h	40	40		sity, pts/mi	0.0
Den	nand and Capacity	•				•
Direc	tional Demand Flow Rate, veh/h	104		Opposing Demand Flow Rate, veh/h		-
Peak	Hour Factor	0.91	0.91			8.00
Segn	nent Capacity, veh/h	1700		Demand/Capacity (D/C)		0.06
Inte	rmediate Results					
Segn	nent Vertical Class	1		Free-Flow Speed,	mi/h	41.8
Spee	d Slope Coefficient (m)	2.77610		Speed Power Coefficient (p)		0.41674
PF SI	ope Coefficient (m)	-1.50296	-1.50296		ent (p)	0.68525
In Pa	ssing Lane Effective Length?	No	No		followers/mi/ln	0.7
%lm	provement to Percent Followers	0.0	0.0		Speed	0.0
Sub	segment Data	•		·		
#	Segment Type	Length, ft	Rad	lius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1250	-		-	41.5
Veh	icle Results					
Aver	age Speed, mi/h	41.5		Percent Followers	, %	27.4
Segn	nent Travel Time, minutes	0.34	0.34		sity, followers/mi/ln	0.7
Vehi	cle LOS	А				

HCS<sup>™</sup> Highways Version 2025 Node 2 EB PM 2035.xuf

```
TWO-LANE HIGHWAY SEGMENT ANALYSIS
File Name:
                                       Node 1 EB PM 2035.xuf
Analyst:
                                       Dylan Zerphey
Agency:
                                       TPD
Jurisdiction:
                                       Mount Joy Township
Date:
                                       11/13/2025
                                       Projected (Build) 2035 Condition
Analysis Year:
Time Analyzed:
                                       Weekday P.M. Peak Hour Eastbound
Project Description:
                                       Roadway Link Analysis (Mt Pleasant Road from Cloverleaf Road to proposed western driveway)
Units:
                                       U.S. Customary
                                        Facility LOS and Performance Measures
Facility Length
                                                                               0.23
Facility VMT
                                                                                                   veh-mi/AP
                                                                               6
Facility VHD
                                                                                                   veh-h/p
                                                                               0.00
Facility Average Follower Density, FD
                                                                               0.7
                                                                                                   followers/mi/ln
Facility Average Speed Limit
                                                                               40
                                                                                                   mi/h
Facility Level of Service, LOS
                                                                               Α
                                                       Segment 1_
                                            LOS and Performance Measures
Coded Segment Type
                                                                               Passing Constrained
Analyzed Segment Type
                                                                               Passing Constrained
Actual Segment Length, L
                                                                                                   ft
                                                                               1235
Segment Length Used in Calculation
                                                                               0.25
                                                                                                   шi
Demand Flow Rate in Analysis Direction, vd
                                                                               107
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
Capacity, cap
                                                                               1700
                                                                                                   veh/h
Free-Flow Speed, FFS
                                                                               41.8
                                                                                                   mi/h
                                                                               41.5
Speed, S
                                                                                                   mi/h
Percent Followers, PF
                                                                               27.7
                                                                                                   %
Follower Density, FD
                                                                               0.7
                                                                                                   followers/mi/ln
Level of Service, LOS
                                                                               Α
                      _Step 1: Identify Facility Study Boundaries and Corresponding Segmentation_
Segment Type
                                                                               Passing Constrained
Vertical Class
                                                                               1
Minimum Segment Length
                                                                               0.25
                                                                                                   шi
Maximum Segment Length
                                                                                                   шi
                                                                               3.00
                            Step 2: Determine Demand Flow Rates, Capacity, and d/c Ratio
Demand Volume in Analysis Direction, Vd
                                                                                                   veh/h
Demand Volume in Opposing Direction, Vo
                                                                                                   veh/h
Peak Hour Factor, PHF
                                                                               0.91
Demand Flow Rate in Analysis Direction, vd
                                                                               107
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
d/c Ratio
                                                                               0.06
                               Step 3: Determine the Vertical Alignment Classification
Segment Length, L
                                                                                                   ft
                                                                               1235
Segment Percent Grade
                                                                               0.00
                                                                                                   %
Vertical Class
                                                                               1
                                        Step 4: Determine the Free-Flow Speed
Posted Speed Limit, Sp
                                                                               40
                                                                                                   mi/h
Base Free-Flow Speed, BFFS
                                                                               45.6
                                                                                                   mi/h
Coeff. Value from Exhibit 15-12, a0
                                                                               0.00000
```

Coeff. Value from Exhibit 15-12, a1

Coeff. Value from Exhibit 15-12, a3 Coeff. Value from Exhibit 15-12, a4 Coeff. Value from Exhibit 15-12, a5 Coeff. for Heavy Vehicle Adjustment, a Percentage of Heavy Vehicles, %HV Lane Width, LW Shoulder Width, SW Adjustment for Lane and Shoulder Width, fLS	0.00000 0.00000 0.00000 0.03330 8.00 12 1	% ft ft mi/h
Access-Point Density, APD Adjustment for Access-Point Density, fA	0.0 0.0	access points/mi mi/h
Free-Flow Speed, FFS	41.8	mi/h
Step 5: Estimate the Average Speed		
Vertical Class	1	
Free-Flow Speed, FFS Demand Flow Rate in Analysis Direction, vd	41.8 107	mi/h veh/h
Demand Flow Rate in Opposing Direction, vo	1500	veh/h
Segment Length, L	0.25	mi
Percentage of Heavy Vehicles	8.00	%
Step 5a: Calculate the Slope Coefficient		
Coeff. for Speed-Flow Slope Model, b0	0.05580	
Coeff. for Speed-Flow Slope Model, b1 Coeff. for Speed-Flow Slope Model, b2	0.05420 0.32780	
Coeff. for b3 Segment Length Coeff. Model, c0	0.10290	
Coeff. for b3 Segment Length Coeff. Model, c1	0.00000	
Coeff. for b3 Segment Length Coeff. Model, c2	0.00000	
Coeff. for Speed Flow Slope Model, c3	0.00000	
Coeff. for Speed-Flow Slope Model, b3 Coeff. for b4 Heavy Vehicle Percentage Coeff. Model, d0	0.10290 0.00000	
Coeff. for b4 Heavy Vehicle Percentage Coeff. Model, d1	0.00000	
Coeff. for b4 Heavy Vehicle Percentage Coeff. Model, d2	0.00000	
Coeff. for b4 Heavy Vehicle Percentage Coeff. Model, d3	0.00000	
Coeff. for Speed-Flow Slope Model, b4 Coeff. for Speed-Flow Slope Model, b5	0.00000 0.00000	
Slope Coefficient, m	2.77610	
Step 5b: Calculate the Slope Coefficient		
Coeff. for Speed-Flow Slope Model, f0	0.67576	
Coeff. for Speed-Flow Slope Model, f1	0.00000	
Coeff. for Speed-Flow Slope Model, f2	0.00000	
Coeff. for Speed-Flow Slope Model, f3 Coeff. for Speed-Flow Slope Model, f4	0.12060 -0.35919	
Coeff. for Speed-Flow Slope Model, f5	0.00000	
Coeff. for Speed-Flow Slope Model, f6	0.00000	
Coeff. for Speed-Flow Slope Model, f7	0.00000	
Coeff. for Speed-Flow Slope Model, f8 Power Coefficient, p	0.00000 0.41674	
	37.207.	
Step 5c: Calculate Average Speed for the Segment Average Speed, S	41.5	mi/h
Average Speed, S	41.5	111111111111111111111111111111111111111
Average Speed, with consideration of horizontal curves, S	41.5	mi/h
Step 6: Estimate the Percent Follower Segment Type	rs Passing Constrain	 ed
Vertical Class	1	
Free-Flow Speed, FFS	41.8	mi/h
Demand Flow Rate in Analysis Direction, vd Demand Flow Rate in Opposing Direction, vo	107 1500	veh/h veh/h
Directional Capacity, cap	1700	ven/n veh/h
Segment Length, L	0.25	mi
Percentage of Heavy Vehicles	8.00	%
Step 6a: Calculate Percent Followers at Capacity		
Coeff. Value for Equation 15-18 or 15-19, b0	37.68080	
Coeff. Value for Equation 15-18 or 15-19, b1	3.05089	

Coeff. Value for Equation 15-18 or 15-19, b2 Coeff. Value for Equation 15-18 or 15-19, b3 Coeff. Value for Equation 15-18 or 15-19, b4 Coeff. Value for Equation 15-18 or 15-19, b5 Coeff. Value for Equation 15-18 or 15-19, b6 Coeff. Value for Equation 15-18 or 15-19, b7 Percent Followers at Capacity Flow Rate, PFcap	-7.90866 -0.94321 13.64266 -0.00050 -0.05500 7.13758 88.6	%
Step 6b: Calculate Percent Followers at 25% of Capacity		
Coeff. Value for Equation 15-20 or 15-21, c0 Coeff. Value for Equation 15-20 or 15-21, c1	18.01780 10.00000	
Coeff. Value for Equation 15-20 or 15-21, c2	-21.60000	
Coeff. Value for Equation 15-20 or 15-21, c3	-0.97853	
Coeff. Value for Equation 15-20 or 15-21, c4	12.05214	
Coeff. Value for Equation 15-20 or 15-21, c5 Coeff. Value for Equation 15-20 or 15-21, c6	-0.00750 -0.06700	
Coeff. Value for Equation 15-20 or 15-21, co	11.60410	
Percent Followers of 25% of Capacity Flow Rate, PF25cap	56.7	%
Step 6c: Calculate the Slope Coefficient	0.20764	
Coeff. Value for Equation 15-22, d1 Coeff. Value for Equation 15-22, d2	-0.29764 -0.71917	
Slope Coefficient, m	-1.50296	
Step 6d: Calculate the Power Coefficient	0.01165	
Coeff. Value for Equation 15-23, e0 Coeff. Value for Equation 15-23, e1	0.81165 0.37920	
Coeff. Value for Equation 15-23, e2	-0.49524	
Coeff. Value for Equation 15-23, e3	-2.11289	
Coeff. Value for Equation 15-23, e4	2.41146	
Power Coefficient, p	0.68525	
Step 6e: Calculate Percent Followers for the Segment Percent Followers, PF	27.7	%
Step 7: Estimate Additional Performance Measur	re for Passing Lane	
Step 8: Estimate Follower Dens Percent Followers, PF	27.7	
Demand Flow Rate in Analysis Direction, vd	107	veh/h
Average Speed, with consideration of horizontal curves, S	41.5	mi/h
Follower Density, FD	0.7	followers/mi/ln
Step 9: Determine Potential Adjustment to F		
Effective Length of Upstream Passing Lane Distance Downstream from Start of Passing Lane Segment	1.00 0.23	mi mi
PF for Upstream Passing Lane Seg., PF	0.0	%
PF for Analysis Segment, PF	27.7	%
Length of Passing Lane Segment, PassLaneLength	0.00	mi
Flow Rate Entering for Analysis Segment % Improve to PF, %ImprovePF	107 0.0	veh/h %
% Improve to the Average Speed, %ImproveS	0.0	%
Adjusted Average Speed for Analysis Segment, S	41.5	mi/h
Adjusted Follower Density, FDadj	0.7	followers/mi/ln
Step 10: Determine LOS Posted Speed Limit, Sp		
FOSTEO 30880 1 1001 . 30	40	
	40	mi/h followers/mi/ln
Follower Density, FD Level of Service, LOS	40 0.7 A	mi/h followers/mi/ln

	HCS Two	-Lane	Highway Re	eport	
Project Information					
Analyst	Dylan Zerphey		Date		11/13/2025
Agency	TPD		Analysis Year		Projected (Build) 2035 Condition
Jurisdiction	Mount Joy Town	ship	Time Analyzed		Weekday P.M. Peak Hour Westbound
Project Description	Pleasant Road fro proposed wester driveway to prop	Roadway Link Analysis (Mt Pleasant Road from proposed western driveway to proposed eastern driveway)			U.S. Customary
		Segn	nent 1		
Vehicle Inputs					
Segment Type	Passing Constrain	ned	Length, ft		1250
Lane Width, ft	12	12		ft	1
Speed Limit, mi/h	40	40		sity, pts/mi	0.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h	78	78		nd Flow Rate, veh/h	-
Peak Hour Factor	0.91	0.91			15.00
Segment Capacity, veh/h	1700	1700		y (D/C)	0.05
Intermediate Results			-		
Segment Vertical Class	1		Free-Flow Speed,	mi/h	41.6
Speed Slope Coefficient (m)	2.76347	2.76347		efficient (p)	0.41674
PF Slope Coefficient (m)	-1.50227	-1.50227		ent (p)	0.68531
In Passing Lane Effective Length?	No	No		followers/mi/ln	0.4
%Improvement to Percent Followers	0.0	0.0		o Speed	0.0
Subsegment Data					
# Segment Type	Length, ft	Rad	lius, ft	Superelevation, %	Average Speed, mi/h
1 Tangent	1250	-		-	41.6
Vehicle Results					
Average Speed, mi/h	41.6		Percent Followers	5, %	23.0
Segment Travel Time, minutes	0.34	0.34		nsity, followers/mi/ln	0.4
Vehicle LOS	А				

HCS<sup>™</sup> Highways Version 2025 Node 2 WB PM 2035.xuf

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TWO-LANE HIGHWAY SEGMENT ANALYSIS
File Name:
                                       Node 2 WB PM 2035.xuf
Analyst:
                                       Dylan Zerphey
Agency:
                                       TPD
Jurisdiction:
                                       Mount Joy Township
Date:
                                       11/13/2025
                                       Projected (Build) 2035 Condition
Analysis Year:
Time Analyzed:
                                       Weekday P.M. Peak Hour Westbound
Project Description:
                                       Roadway Link Analysis (Mt Pleasant Road from proposed western driveway to proposed eastern driveway)
Units:
                                       U.S. Customary
                                        Facility LOS and Performance Measures
Facility Length
                                                                               0.24
Facility VMT
                                                                                                   veh-mi/AP
                                                                               4
Facility VHD
                                                                               0.00
                                                                                                   veh-h/p
Facility Average Follower Density, FD
                                                                                                   followers/mi/ln
                                                                               0.4
Facility Average Speed Limit
                                                                               40
                                                                                                   mi/h
Facility Level of Service, LOS
                                                                               Α
                                                       Segment 1_
                                            LOS and Performance Measures
Coded Segment Type
                                                                               Passing Constrained
Analyzed Segment Type
                                                                               Passing Constrained
Actual Segment Length, L
                                                                                                   ft
                                                                               1250
Segment Length Used in Calculation
                                                                               0.25
                                                                                                   шi
Demand Flow Rate in Analysis Direction, vd
                                                                               78
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
Capacity, cap
                                                                               1700
                                                                                                   veh/h
Free-Flow Speed, FFS
                                                                               41.6
                                                                                                   mi/h
                                                                               41.6
Speed, S
                                                                                                   mi/h
Percent Followers, PF
                                                                               23.0
                                                                                                   %
Follower Density, FD
                                                                               0.4
                                                                                                   followers/mi/ln
Level of Service, LOS
                                                                               Α
                      _Step 1: Identify Facility Study Boundaries and Corresponding Segmentation_
Segment Type
                                                                               Passing Constrained
Vertical Class
                                                                               1
Minimum Segment Length
                                                                               0.25
                                                                                                   шi
Maximum Segment Length
                                                                                                   шi
                                                                               3.00
                            Step 2: Determine Demand Flow Rates, Capacity, and d/c Ratio
Demand Volume in Analysis Direction, Vd
                                                                                                   veh/h
Demand Volume in Opposing Direction, Vo
                                                                                                   veh/h
Peak Hour Factor, PHF
                                                                               0.91
Demand Flow Rate in Analysis Direction, vd
                                                                               78
                                                                                                   veh/h
Demand Flow Rate in Opposing Direction, vo
                                                                               1500
                                                                                                   veh/h
d/c Ratio
                                                                               0.05
                               Step 3: Determine the Vertical Alignment Classification
Segment Length, L
                                                                                                   ft
                                                                               1250
Segment Percent Grade
                                                                                                   %
                                                                               -2.00
Vertical Class
                                                                               1
                                        Step 4: Determine the Free-Flow Speed
Posted Speed Limit, Sp
                                                                               40
                                                                                                   mi/h
Base Free-Flow Speed, BFFS
                                                                               45.6
                                                                                                   mi/h
Coeff. Value from Exhibit 15-12, a0
                                                                               0.00000
```

Coeff. Value from Exhibit 15-12, a1

Coeff. Value from Exhibit 15-12, a3	0.00000	
Coeff. Value from Exhibit 15-12, a4	0.00000	
Coeff. Value from Exhibit 15-12, a5	0.00000	
Coeff. for Heavy Vehicle Adjustment, a	0.03330	
Percentage of Heavy Vehicles, %HV	15.00	%
Lane Width, LW	12	ft
Shoulder Width, SW	1	ft
Adjustment for Lane and Shoulder Width, fLS	3.5	mi/h
Access-Point Density, APD	0.0	access points/mi
Adjustment for Access-Point Density, fA	0.0	mi/h
Free-Flow Speed, FFS	41.6	mi/h

\_\_\_\_\_Step 5: Estimate the Average Speed\_\_\_\_\_\_Note: If the demand flow rate is less than 100 veh/h, the average speed is equal to FFS and Step 5 can be skipped. Demand Flow Rate in Analysis Direction, vd 78 veh/h Free-Flow Speed, FFS 41.6 mi/h Average Speed, S 41.6 mi/h

\_\_\_\_\_Step 6: Estimate the Percent Followers\_\_\_\_\_

Segment Type	Passing Constrained	
Vertical Class	1	
Free-Flow Speed, FFS	41.6	mi/h
Demand Flow Rate in Analysis Direction, vd	78	veh/h
Demand Flow Rate in Opposing Direction, vo	1500	veh/h
Directional Capacity, cap	1700	veh/h
Segment Length, L	0.25	mi
Percentage of Heavy Vehicles	15.00	<u>-</u> %
Step 6a: Calculate Percent Followers at Capacity		
Coeff. Value for Equation 15-18 or 15-19, b0	37.68080	
Coeff. Value for Equation 15-18 or 15-19, b1	3.05089	
Coeff. Value for Equation 15-18 or 15-19, b2	-7.90866	
Coeff. Value for Equation 15-18 or 15-19, b3	-0.94321	
Coeff. Value for Equation 15-18 or 15-19, b4	13.64266	
Coeff. Value for Equation 15-18 or 15-19, b5	-0.00050	
Coeff. Value for Equation 15-18 or 15-19, b6	-0.05500	
Coeff. Value for Equation 15-18 or 15-19, b7	7.13758	
Percent Followers at Capacity Flow Rate, PFcap	88.5	%
refrence for towers at capacity from Race, Freap	00.5	76
Step 6b: Calculate Percent Followers at 25% of Capacity		
Coeff. Value for Equation 15-20 or 15-21, c0	18.01780	
· · · · · · · · · · · · · · · · · · ·		
Coeff. Value for Equation 15-20 or 15-21, c1	10.00000	
Coeff. Value for Equation 15-20 or 15-21, c2	-21.60000	
Coeff. Value for Equation 15-20 or 15-21, c3	-0.97853	
Coeff. Value for Equation 15-20 or 15-21, c4	12.05214	
Coeff. Value for Equation 15-20 or 15-21, c5	-0.00750	
Coeff. Value for Equation 15-20 or 15-21, c6	-0.06700	
Coeff. Value for Equation 15-20 or 15-21, c7	11.60410	9/
Percent Followers of 25% of Capacity Flow Rate, PF25cap	56.7	%
Step 6c: Calculate the Slope Coefficient		
Coeff. Value for Equation 15-22, d1	-0.29764	
Coeff. Value for Equation 15-22, d2	-0.71917	
Slope Coefficient, m	-1.50227	
Stope coefficient, iii	1.50227	
Step 6d: Calculate the Power Coefficient		
Coeff. Value for Equation 15-23, e0	0.81165	
Coeff. Value for Equation 15-23, e1	0.37920	
Coeff. Value for Equation 15-23, e2	-0.49524	
Coeff. Value for Equation 15-23, e3	-2.11289	
Coeff. Value for Equation 15-23, e4	2.41146	
Power Coefficient, p	0.68531	
	0.00551	
Step 6e: Calculate Percent Followers for the Segment		
Percent Followers, PF	23.0	%
. c. cene i offonei sy i i	23.0	70

Step 8: Estimate Follower	Density	
Percent Followers, PF	23.0	%
Demand Flow Rate in Analysis Direction, vd	78	veh/h
Average Speed, with consideration of horizontal curves, S	41.6	mi/h
Follower Density, FD	0.4	followers/mi/ln
Step 9: Determine Potential Adjustment	to Follower Density	
Effective Length of Upstream Passing Lane	1.00	mi
Distance Downstream from Start of Passing Lane Segment	0.24	mi
PF for Upstream Passing Lane Seg., PF	0.0	%
PF for Analysis Segment, PF	23.0	%
Length of Passing Lane Segment, PassLaneLength	0.00	mi
Flow Rate Entering for Analysis Segment	78	veh/h
% Improve to PF, %ImprovePF	0.0	%
% Improve to the Average Speed, %ImproveS	0.0	%
Adjusted Average Speed for Analysis Segment, S	41.6	mi/h
Adjusted Follower Density, FDadj	0.4	followers/mi/ln
Step 10: Determine L	0S	
Posted Speed Limit, Sp	40	mi/h
Follower Density, FD	0.4	followers/mi/ln
Level of Service, LOS	Α	

This Two-Lane Highway text report was created in HCS™ Highways Version 2025 on 11/13/2025 10:03:54