2023 Skagit County Road Segment & Intersection Concurrency

INTRODUCTION

In conformance with Growth Management, RCW 36.70A, Skagit County Code 14.28.110 "Annual Concurrency Assessment" requires that the County Engineer annually produce this report to update the status of County Road concurrency. The following is produced to meet said requirement.

REQUIREMENTS

The concurrency assessment requires that "*The County Engineer must evaluate the high traffic County road segments (any County road segment on which there are at least 8,000 average daily trips) and high traffic County road intersections (any County road intersection into which the total approach volume is at least 7,000 average daily trips and the approach volume from all of the minor legs totals at least 1,000 average daily trips) using a Highway Capacity Manual type method (as selected by the County Engineer) to determine whether these road segments and intersections comply with the level of service standards adopted in the Comprehensive Plan.*" The Levels of Service (LOS) are described as follows in Skagit County's Comprehensive Plan.

Policy 8A-2.1 Level of Service Standards – The Level of Service (LOS) standard for County roads is C. LOS D is acceptable for all road segments that:

a) Have Annualized Average Daily Traffic (AADT) greater than 7,000 vehicles; and

b) Are NOT federally functionally classified as a Local Access Road; and

c) Are designated as a County Freight and Goods Transportation Systems Route (FGTS).

The LOS standard for County Road intersections is LOS D.

LEVEL OF SERVICE DATA

Road Segments

The methodology used to acquire the LOS of County Road segments is outlined in Appendix C (Transportation Element Technical Appendix) of the Skagit County Comprehensive Plan.

> *"The Skagit County Public Works Traffic Engineering Unit has selected an LOS study volume unit threshold of 7,000 AADT. This threshold is an indicator that a road segment may be approaching the LOS C/D threshold and should be studied in depth."*

Table 1 shows the current County roads that meet the criteria for further study and the current LOS as determined using the Transportation Research Board's Highway Capacity Manual and Highway Capacity Software developed for this use by the University of Florida. Also shown is the projected 5-year LOS. This projected LOS was determined using a 2 percent yearly growth factor for each road segment. Projects along these roadways that are scheduled to be completed within this 5-year period were not significant enough to include as separate items. As one can see from Table 1, all the criteria for LOS concurrency have been met.

While all road segments in Table 1 meet County LOS standards, the segments of Cook Road adjacent to the Sedro-Woolley city limits (milepost 4.6 – 5.62) show the potential to exceed the LOS D to LOS E threshold by year 2028. Skagit County Public Works will be focusing on these segments and traffic volumes in the coming years. Studies for these segments are included as Appendix C.

Table 1 – Road Segments

2023 Skagit County Roads with Over 7,000 ADT														
Road #	Road Name	FFC	Truck Rt	Beg MP	End MP	Length	2023 ADT	2024 ADT	2025 ADT	2026 ADT	2027 ADT	2028 ADT	2023 LOS	2028 LOS
63000	COOK ROAD	07	T2	1.750	1.800	0.050	16111	16433	16762	17097	17439	17788	These two segments are in WSDOT ROW	
63000	COOK ROAD	07	T2	1.800	1.860	0.060	16111	16433	16762	17097	17439	17788		
63000	COOK ROAD	07	T2	1.860	1.970	0.110	15101	15403	15711	16025	16346	16673	C	D
63000	COOK ROAD	07	T2	1.970	3.080	1.110	15101	15403	15711	16025	16346	16673		
63000	COOK ROAD	07	T2	3.080	3.360	0.280	15101	15403	15711	16025	16346	16673		
63000	COOK ROAD	07	T2	3.360	3.820	0.460	14040	14321	14607	14899	15197	15501	D	D
63000	COOK ROAD	07	T2	3.820	4.100	0.280	14040	14321	14607	14899	15197	15501		
63000	COOK ROAD	07	T2	4.100	4.320	0.220	14040	14321	14607	14899	15197	15501		
63000	COOK ROAD	07	T2	4.320	4.600	0.280	14040	14321	14607	14899	15197	15501		
63000	COOK ROAD	07	T2	4.600	5.000	0.400	14215	14499	14789	15085	15387	15695	D	E
63000	COOK ROAD	07	T2	5.000	5.260	0.260	14215	14499	14789	15085	15387	15695		
63000	COOK ROAD	07	T2	5.260	5.320	0.060	14215	14499	14789	15085	15387	15695		
63000	COOK ROAD	07	T2	5.320	5.390	0.070	14215	14499	14789	15085	15387	15695		
63000	COOK ROAD	16	T2	5.390	5.510	0.120	14215	14499	14789	15085	15387	15695		
63000	COOK ROAD	16	T2	5.510	5.620	0.110	14215	14499	14789	15085	15387	15695		
71500	SOUTH LAVENTURE ROAD	14	Non	0.000	0.063	0.063	8214	8378	8546	8717	8891	9069	D	D
71500	SOUTH LAVENTURE ROAD	14	Non	0.063	0.274	0.211	8214	8378	8546	8717	8891	9069		
71500	SOUTH LAVENTURE ROAD	14	Non	0.545	0.553	0.008	8284	8450	8619	8791	8967	9146	D	D
71500	SOUTH LAVENTURE ROAD	14	Non	0.553	0.701	0.148	8284	8450	8619	8791	8967	9146		
71500	SOUTH LAVENTURE ROAD	14	Non	0.701	0.715	0.014	8284	8450	8619	8791	8967	9146		
71500	SOUTH LAVENTURE ROAD	14	Non	0.715	0.730	0.015	8284	8450	8619	8791	8967	9146		
71500	SOUTH LAVENTURE ROAD	14	Non	0.730	0.773	0.043	8284	8450	8619	8791	8967	9146		
80090	PIONEER HIGHWAY	07	T3	0.000	0.883	0.883	9819	10015	10216	10420	10628	10841	C	C
80090	PIONEER HIGHWAY	07	T3	0.883	1.418	0.535	9850	10047	10248	10453	10662	10875		
80090	PIONEER HIGHWAY	07	T3	1.418	1.748	0.330	9699	9893	10091	10293	10499	10708		
80090	PIONEER HIGHWAY	07	T3	1.748	3.065	1.317	9699	9893	10091	10293	10499	10708		
80090	PIONEER HIGHWAY	07	T3	3.065	3.089	0.024	11166	11389	11617	11849	12086	12328	D	D

Road Intersections

As with Road Segment LOS, Intersection LOS methodology is outlined in the Transportation Element Technical Appendix (TETA) Appendix C of the Comprehensive Plan. Intersection LOS, according to the Highway Capacity Manual, cannot be determined at stop-controlled intersections. The individual stop-controlled leg LOS can be determined, but the overall intersection LOS cannot be determined. However, the overall LOS can be determined at signalized intersections like the one on which Skagit County is collecting data and studying.

Table 2 shows the intersection on which Skagit County is collecting LOS data on a regular basis.

Table 2 – Intersections

Intersection Name	Intersection Type	NB Approach LOS	SB Approach LOS	EB Approach LOS	WB Approach LOS	Overall LOS
2023						
Cook Road / Old Hwy 99 N	Signalized	C	C	B	C	C
2028						
Cook Road / Old Hwy 99 N	Signalized	C	C	C	C	C

The full PM Peak Hour Highway Capacity reports on the intersection of Cook Road and Old Hwy 99 N for the current year and 5-year estimate are included in this Assessment as Appendix A and Appendix B respectively. This 5-year projected LOS was determined using a 2 percent yearly growth factor for each approach volume. This is by far the busiest intersection under Skagit County jurisdiction. The turn movement study used for this assessment was conducted in June of 2023.

Please note that this intersection was studied during the Peak PM hour for the Highway Capacity report as per industry standards and Concurrency requirements. Per Highway Capacity Manual / Software, the PM Peak Hour currently meets LOS Standards. This is due to traffic flows being regulated and limited by the I-5 Northbound Off Ramp restricting flows on the west approach and by train traffic on the east through lane, as there are two to three peak hour trains that travel through the at-grade rail crossing limiting eastbound through traffic.

Based on the traffic flows being regulated from both the west and east approaches the LOS of this intersection has a lower LOS, when considering the circumstances on the approaches. However, our current traffic modeling tools do not take train activity into account.

Skagit County has secured a $10.2 million grant to improve the Cook Road / Interstate 5 interchange and the adjacent Cook Road / Old Hwy 99 N intersection. This project is in the Design phase is scheduled to be undertaken with Washington State Department of Transportation cooperation in 2026 and should significantly improve mobility and LOS at this location.

SUMMARY

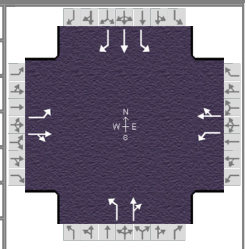
As of December 31, 2023, all Skagit County Road segments and signalized intersections meet the current LOS standards as adopted in the Comprehensive Plan of Skagit County. Therefore, all Skagit County Road segments and intersections are concurrent.

Skagit County Public Works has used the Highway Capacity Manual, Seventh Edition of 2022 and its associated software to determine all Level of Service calculations in this report.

HCS7 Signalized Intersection Results Summary

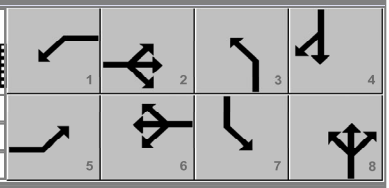
Appendix A

General Information				Intersection Information	
Agency	Skagit County Public Works			Duration, h	1.000
Analyst	Given Kutz	Analysis Date	Jun 6, 2023	Area Type	Other
Jurisdiction		Time Period	15:45 - 16:45	PHF	1.00
Urban Street	Cook Road	Analysis Year	2023	Analysis Period	1> 3:45
Intersection	Old Hwy 99 N	File Name	Cook-Old99.xus		
Project Description	2023				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	125	466	96	45	507	58	90	211	165	59	84	132

Signal Information			
Cycle, s	68.3	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.9	1.7	27.4	3.4	0.7	16.2
Yellow	4.0	0.0	4.0	4.0	0.0	4.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	2.0	3.0
Phase Duration, s	8.6	33.1	6.9	31.4	8.1	20.9	7.4	20.2
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	4.8	24.7	3.0	24.8	4.7	15.7	4.4	5.9
Green Extension Time (g_e), s	0.1	2.4	0.0	2.4	0.1	1.0	0.1	1.1
Phase Call Probability	0.91	1.00	0.58	1.00	0.82	1.00	0.68	1.00
Max Out Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

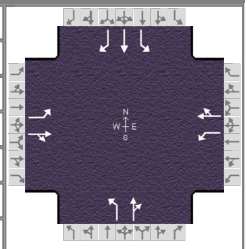
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	125	562		45	565		90	354		59	84	99
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1537		1753	1581		1725	1688		1668	1752	1427
Queue Service Time (g_s), s	2.8	22.7		1.0	22.8		2.7	13.7		2.4	2.6	3.9
Cycle Queue Clearance Time (g_c), s	2.8	22.7		1.0	22.8		2.7	13.7		2.4	2.6	3.9
Green Ratio (*g/C*)	0.47	0.43		0.45	0.40		0.30	0.25		0.05	0.24	0.24
Capacity (*c*), veh/h	278	656		236	636		466	418		83	416	339
Volume-to-Capacity Ratio (*X*)	0.450	0.857		0.191	0.888		0.193	0.846		0.710	0.202	0.292
Back of Queue (*Q*), ft/ln (50 th percentile)	25.4	187.8		9.1	196.4		25.8	137.6		27.4	27.5	31.3
Back of Queue (*Q*), veh/ln (50 th percentile)	1.0	7.2		0.4	7.6		1.0	5.3		1.0	1.0	1.2
Queue Storage Ratio (*RQ*) (50 th percentile)	0.13	0.19		0.05	0.20		0.13	0.14		0.14	0.03	0.31
Uniform Delay (d_1), s/veh	14.9	17.8		14.9	19.1		17.9	24.6		32.1	21.0	21.5
Incremental Delay (d_2), s/veh	0.4	1.3		0.1	1.8		0.1	1.9		4.2	0.1	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	15.3	19.1		15.1	20.9		18.0	26.5		36.4	21.1	21.6
Level of Service (LOS)	B	B		B	C		B	C		D	C	C
Approach Delay, s/veh / LOS	18.4	B		20.4	C		24.7	C		25.0	C	
Intersection Delay, s/veh / LOS	21.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.30	B	2.11	B	2.11	B
Bicycle LOS Score / LOS	1.62	B	1.49	A	1.22	A	0.89	A

HCS7 Signalized Intersection Results Summary

Appendix B

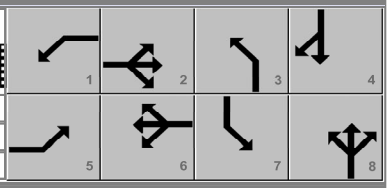
General Information				Intersection Information	
Agency	Skagit County Public Works			Duration, h	1.000
Analyst	Given Kutz	Analysis Date	Jun 6, 2023	Area Type	Other
Jurisdiction		Time Period	15:45 - 16:45	PHF	1.00
Urban Street	Cook Road	Analysis Year	2028	Analysis Period	1> 3:45
Intersection	Old Hwy 99 N	File Name	2027 Cook-Old99.xus		
Project Description	2023				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	138	515	106	50	560	64	99	233	182	65	93	146

Signal Information			
Cycle, s	85.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.5	2.2	36.7	4.3	0.9	21.5						
Yellow	4.0	0.0	4.0	4.0	0.0	4.0						
Red	0.0	0.0	0.0	0.0	0.0	0.0						



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	2.0	3.0
Phase Duration, s	9.7	42.9	7.5	40.7	9.2	26.4	8.3	25.5
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	5.7	33.5	3.3	33.7	5.6	21.1	5.3	7.5
Green Extension Time (g_e), s	0.2	2.7	0.0	2.7	0.1	1.1	0.1	1.2
Phase Call Probability	0.96	1.00	0.70	1.00	0.90	1.00	0.79	1.00
Max Out Probability	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	138	621		50	624		99	393		65	93	113
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1537		1753	1581		1725	1687		1668	1752	1427
Queue Service Time (g_s), s	3.7	31.5		1.3	31.7		3.6	19.1		3.3	3.6	5.5
Cycle Queue Clearance Time (g_c), s	3.7	31.5		1.3	31.7		3.6	19.1		3.3	3.6	5.5
Green Ratio (*g/C*)	0.50	0.46		0.48	0.43		0.32	0.26		0.05	0.25	0.25
Capacity (*c*), veh/h	246	704		208	683		460	446		84	444	361
Volume-to-Capacity Ratio (*X*)	0.560	0.883		0.240	0.914		0.215	0.882		0.775	0.210	0.313
Back of Queue (*Q*), ft/ln (50 th percentile)	35.6	297.9		12.8	314.6		36.5	211.7		39.2	39.1	46.1
Back of Queue (*Q*), veh/ln (50 th percentile)	1.4	11.4		0.5	12.2		1.4	8.1		1.5	1.4	1.8
Queue Storage Ratio (*RQ*) (50 th percentile)	0.18	0.30		0.06	0.31		0.18	0.21		0.20	0.04	0.46
Uniform Delay (d_1), s/veh	18.8	21.1		18.4	22.8		21.4	30.2		40.2	25.2	25.9
Incremental Delay (d_2), s/veh	0.7	5.9		0.2	7.7		0.1	5.8		5.8	0.1	0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	19.5	27.0		18.6	30.6		21.5	36.0		46.0	25.3	26.1
Level of Service (LOS)	B	C		B	C		C	D		D	C	C
Approach Delay, s/veh / LOS	25.7	C		29.7	C		33.1	C		30.6	C	
Intersection Delay, s/veh / LOS	29.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.12	B	2.31	B	2.11	B	2.12	B
Bicycle LOS Score / LOS	1.74	B	1.60	B	1.30	A	0.93	A

Begin Appendix C

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 Cook Road - MP 1.86-3.36	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	7920
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	16.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	691	Opposing Demand Flow Rate, veh/h	606
Peak Hour Factor	0.90	Total Trucks, %	8.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.41

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.7
Speed Slope Coefficient	3.29417	Speed Power Coefficient	0.46928
PF Slope Coefficient	-1.29854	PF Power Coefficient	0.75896
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	7920	-	-	50.1

Vehicle Results

Average Speed, mi/h	50.1	Percent Followers, %	62.5
Segment Travel Time, minutes	1.79	Followers Density, followers/mi/ln	8.6
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2028
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 Cook Road - MP 1.86-3.36	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	7920
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	16.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	763	Opposing Demand Flow Rate, veh/h	669
Peak Hour Factor	0.90	Total Trucks, %	8.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.45

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.7
Speed Slope Coefficient	3.30718	Speed Power Coefficient	0.46266
PF Slope Coefficient	-1.30477	PF Power Coefficient	0.75654
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	7920	-	-	50.0

Vehicle Results

Average Speed, mi/h	50.0	Percent Followers, %	65.5
Segment Travel Time, minutes	1.80	Followers Density, followers/mi/ln	10.0
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 Cook Road - MP 3.36-4.6	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	6547
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	12.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	839	Opposing Demand Flow Rate, veh/h	688
Peak Hour Factor	0.90	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.49

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	53.7
Speed Slope Coefficient	3.35532	Speed Power Coefficient	0.46082
PF Slope Coefficient	-1.30219	PF Power Coefficient	0.76525
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	11.2
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6547	-	-	50.8

Vehicle Results

Average Speed, mi/h	50.8	Percent Followers, %	68.0
Segment Travel Time, minutes	1.46	Followers Density, followers/mi/ln	11.2
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2028
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 Cook Road - MP 3.36-4.6	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	6547
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	12.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	927	Opposing Demand Flow Rate, veh/h	759
Peak Hour Factor	0.90	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.55

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	53.7
Speed Slope Coefficient	3.36903	Speed Power Coefficient	0.45438
PF Slope Coefficient	-1.30801	PF Power Coefficient	0.76271
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6547	-	-	50.7

Vehicle Results

Average Speed, mi/h	50.7	Percent Followers, %	70.9
Segment Travel Time, minutes	1.47	Followers Density, followers/mi/ln	13.0
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 Cook Road - MP 4.60-5.62	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5386
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	18.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	911	Opposing Demand Flow Rate, veh/h	681
Peak Hour Factor	0.90	Total Trucks, %	7.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.54

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.3
Speed Slope Coefficient	3.26222	Speed Power Coefficient	0.46146
PF Slope Coefficient	-1.31263	PF Power Coefficient	0.76407
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5386	-	-	49.3

Vehicle Results

Average Speed, mi/h	49.3	Percent Followers, %	70.6
Segment Travel Time, minutes	1.24	Followers Density, followers/mi/ln	13.0
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2028
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 Cook Road - MP 4.60-5.62	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	5386
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	18.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	1006	Opposing Demand Flow Rate, veh/h	752
Peak Hour Factor	0.90	Total Trucks, %	7.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.59

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	52.3
Speed Slope Coefficient	3.27599	Speed Power Coefficient	0.45495
PF Slope Coefficient	-1.31886	PF Power Coefficient	0.76155
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	15.0
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5386	-	-	49.1

Vehicle Results

Average Speed, mi/h	49.1	Percent Followers, %	73.4
Segment Travel Time, minutes	1.25	Followers Density, followers/mi/ln	15.0
Vehicle LOS	E		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 Pioneer Hwy County Line to Fir Island Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	16183
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	616	Opposing Demand Flow Rate, veh/h	427
Peak Hour Factor	0.90	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.7
Speed Slope Coefficient	3.43692	Speed Power Coefficient	0.49259
PF Slope Coefficient	-1.27837	PF Power Coefficient	0.75700
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	16183	-	-	53.3

Vehicle Results

Average Speed, mi/h	53.3	Percent Followers, %	58.7
Segment Travel Time, minutes	3.45	Followers Density, followers/mi/ln	6.8
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 Pioneer Hwy County Line to Fir Island Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	16183
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	50	Access Point Density, pts/mi	4.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	680	Opposing Demand Flow Rate, veh/h	471
Peak Hour Factor	0.90	Total Trucks, %	7.10
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.40

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.8
Speed Slope Coefficient	3.44870	Speed Power Coefficient	0.48604
PF Slope Coefficient	-1.28425	PF Power Coefficient	0.75490
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.9
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	16183	-	-	53.1

Vehicle Results

Average Speed, mi/h	53.1	Percent Followers, %	61.7
Segment Travel Time, minutes	3.46	Followers Density, followers/mi/ln	7.9
Vehicle LOS	C		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 Pioneer Hwy Fir Island Rd to I-5	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	739
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	35	Access Point Density, pts/mi	0.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	709	Opposing Demand Flow Rate, veh/h	615
Peak Hour Factor	0.85	Total Trucks, %	7.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.42

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	39.7
Speed Slope Coefficient	2.51396	Speed Power Coefficient	0.46821
PF Slope Coefficient	-1.41856	PF Power Coefficient	0.69822
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	12.7
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	739	-	-	37.7

Vehicle Results

Average Speed, mi/h	37.7	Percent Followers, %	67.2
Segment Travel Time, minutes	0.22	Followers Density, followers/mi/ln	12.7
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 Pioneer Hwy Fir Island Rd to I-5	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	739
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	35	Access Point Density, pts/mi	0.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	784	Opposing Demand Flow Rate, veh/h	679
Peak Hour Factor	0.85	Total Trucks, %	7.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.46

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	39.7
Speed Slope Coefficient	2.52691	Speed Power Coefficient	0.46169
PF Slope Coefficient	-1.42779	PF Power Coefficient	0.69626
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	14.6
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	739	-	-	37.5

Vehicle Results

Average Speed, mi/h	37.5	Percent Followers, %	70.0
Segment Travel Time, minutes	0.22	Followers Density, followers/mi/ln	14.6
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 South Laventure Rd South of E Blackburn	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1204
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	35	Access Point Density, pts/mi	0.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	676	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.75	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.40

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	39.6
Speed Slope Coefficient	2.65758	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.50433	PF Power Coefficient	0.67645
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	12.3
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1204	-	-	37.5

Vehicle Results

Average Speed, mi/h	37.5	Percent Followers, %	68.5
Segment Travel Time, minutes	0.36	Followers Density, followers/mi/ln	12.3
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 South Laventure Rd South of E Blackburn	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1204
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	35	Access Point Density, pts/mi	0.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	747	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.75	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.44

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	39.6
Speed Slope Coefficient	2.65758	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.50433	PF Power Coefficient	0.67645
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	14.1
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1204	-	-	37.4

Vehicle Results

Average Speed, mi/h	37.4	Percent Followers, %	70.9
Segment Travel Time, minutes	0.37	Followers Density, followers/mi/ln	14.1
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2023
Project Description	2023 South Laventure Rd East of Blodgett Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1447
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	35	Access Point Density, pts/mi	0.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	657	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.75	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.39

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	39.6
Speed Slope Coefficient	2.66000	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.49590	PF Power Coefficient	0.67858
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	11.8
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1447	-	-	37.6

Vehicle Results

Average Speed, mi/h	37.6	Percent Followers, %	67.5
Segment Travel Time, minutes	0.44	Followers Density, followers/mi/ln	11.8
Vehicle LOS	D		

HCS7 Two-Lane Highway Report

Project Information

Analyst	Given Kutz	Date	06/21/2024
Agency	SCPW	Analysis Year	2023
Jurisdiction	County	Time Period Analyzed	2028
Project Description	2028 South Laventure Rd East of Blodgett Rd	Unit	United States Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1447
Lane Width, ft	12	Shoulder Width, ft	6
Speed Limit, mi/h	35	Access Point Density, pts/mi	0.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	725	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.75	Total Trucks, %	7.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.43

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	39.6
Speed Slope Coefficient	2.66000	Speed Power Coefficient	0.41674
PF Slope Coefficient	-1.49590	PF Power Coefficient	0.67858
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	13.5
%Improved % Followers	0.0	% Improved Avg Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1447	-	-	37.5

Vehicle Results

Average Speed, mi/h	37.5	Percent Followers, %	70.0
Segment Travel Time, minutes	0.44	Followers Density, followers/mi/ln	13.5
Vehicle LOS	D		