B.F. Sisk Dam Safety of Dam Modification Project Environmental Impact Statement / Environmental Impact Report

Appendix G2: Traffic and Transportation Appendix

U.S. Department of the Interior
Bureau of Reclamation
Sacramento, California

April 2019

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Table 1. Level of Service Characteristics

LOS	Traffic Condition
A	Free flow conditions; Low volumes; high operating speeds; uninterrupted flow; no restriction on maneuverability; drivers maintain desired speeds; little or no delays.
B	Stable flow conditions; operating speeds beginning to be restricted.
C	Stable flow but speed and maneuverability restricted by higher traffic volumes; satisfactory operating speed for urban conditions; delays at signals.
D	Approaching unstable flow; low speeds; major delays at signals; little freedom to maneuver.
E	Lower operating speeds; volume at or near capacity; unstable flow; major delays and stoppages.
F	Forced flow conditions; low speeds; volumes below capacity, may be zero; stoppages for long periods because of downstream congestion.

Source: Transportation Research Board 2016

Table 2. Level of Service Criteria for Freeways

LOS	Density (passenger cars/mile/lane)
A	≤ 11
B	11 - 18
C	18 - 26
D	26 - 35
E	35 - 45
F	> 45

Source: Transportation Research Board 2016

Table 3. Level of Service Criteria for Two-Lane Highways in Class I

LOS	Percent Time-Spent-Following
A	≤ 35
B	> 35 -50
C	> 50 - 65
D	> 65 - 80
E	> 80

Source: Transportation Research Board 2016
Note: LOS F applies whenever the flow rate exceeds the segment capacity.

Table 4. Level of Service Criteria for Unsignalized Intersections

LOS	Control Delay (sec/veh)
A	≤ 10
B	10 - 15
C	15 - 25
D	25 - 35
E	35 - 50
F	> 50

Source: Transportation Research Board 2016

Table 5. Level of Service Criteria for Signalized Intersections

LOS	Control Delay (sec/veh)
A	≤ 10
B	10 - 20
C	20 - 35
D	35 - 55
E	55 - 80
F	> 80

Source: Transportation Research Board 2016

Table 6. Level of Service Criteria for Roadways – Merced County

#	Area	Facility	Interchanges	Intersections	Flow	Lanes	Median	Level of Service (Average Annual Daily Traffic)				
								A	B	C	D	E
1	Urban	Freeway	< 2 miles apart	-	-	4	N/A	22,000	36,000	52,000	67,000	76,500
2	Urban	Expressway	-	-	-	4	Divided	-	-	21,400	31,100	32,900
3	Urban	Highway	-	-	Uninterrupted	2	Undivided	2,000	7,000	13,800	19,600	27,000
4	Urban	Highway	-	< 2/mile	-	2	Undivided	-	4,200	13,800	16,400	16,900
5	Urban	Highway	-	< 4.5/mile	-	2	Undivided	-	1,900	11,200	15,400	16,300
6	Urban	Collector	-	-	-	2	Undivided	-	-	4,800	10,000	12,600
7	Urban	Highway	-	< 4.5/mile	-	4	Undivided	-	3,500	23,200	29,100	30,600
8	Urban	Arterial	-	-	-	4	Undivided	-	-	15,600	27,800	29,400
9	Urban	Highway	-	< 2/mile	-	4	Undivided	3,500	20,900	24,600	25,700	-
10	Urban	Collector	-	-	-	4	Undivided	-	-	9,800	19,200	22,800
11	Urban	Highway	-	< 2/mile	-	2	Undivided	-	4,000	13,100	15,500	16,300
12	Urban	Arterial	-	-	-	2	Undivided	-	-	7,000	13,600	14,600
13	Transition	Freeway	-	-	-	4	-	23,500	38,700	52,500	62,200	69,100
14	Transition	Collector	-	-	-	2	Undivided	-	-	4,400	9,400	12,000
15	Rural	Freeway	-	-	-	6	-	33,100	54,300	73,900	87,400	97,200
16	Rural	Freeway	-	-	-	4	-	21,300	35,300	47,900	56,600	63,000
17	Rural	Non-Freeway	-	-	Uninterrupted	4	Divided	17,500	28,600	40,800	52,400	58,300
18	Rural	Non-Freeway	-	-	Isolated Stops	4	-	-	2,900	17,400	23,000	25,200
19	Rural	Non-Freeway	-	-	Uninterrupted	2	Undivided	2,600	5,300	8,600	13,800	22,300
20	Rural	Non-Freeway	-	-	Isolated Stops	2	Undivided	-	1,900	8,000	10,700	12,100
21	Suburban	Non-Freeway	-	-	Interrupted	4	Divided	-	5,300	25,200	29,400	31,200
22	Suburban	Highway	-	-	Uninterrupted	2	Undivided	2,500	7,200	12,700	17,300	23,500
23	Suburban	Arterial	-	-	Interrupted	2	Undivided	-	2,200	11,000	13,900	14,900
24	Suburban	Collector	-	-	-	2	Undivided	-	-	1,900	7,600	10,100

Source: *Merced County 2013.*

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HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	Existing (2016)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2050	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1416
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.1
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	Existing (2016)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2150	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1485
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	23.1
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	Existing (2016)
Jurisdiction	CDM Smith	Time Period Analyzed	AM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1700	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1174
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.1
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	Existing (2016)
Jurisdiction	CDM Smith	Time Period Analyzed	PM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1100	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	760
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.7
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	Existing (2016)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	550	veh/h
Opposing direction volume, Vo	350	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.917	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	644	pc/h	434	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	42.2	mi/h
Percent Free Flow Speed, PFFS	80.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	625 pc/h	410 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.6 %	
Adjustment for no-passing zones, fnp	32.9	
Percent time-spent-following, PTSFd	77.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	531	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1870	veh-mi
Peak 15-min total travel time, TT15	12.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.2	mi/h
Percent time-spent-following, PTSFd (from above)	77.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	625.0
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.20
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	Existing (2016)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	650	veh/h
Opposing direction volume, Vo	300	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.893	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	761	pc/h	382	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSd	41.5	mi/h
Percent Free Flow Speed, PFFS	78.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	739 pc/h	351 pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.8 %	
Adjustment for no-passing zones, fnp	28.0	
Percent time-spent-following, PTSFd	80.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	628	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2210	veh-mi
Peak 15-min total travel time, TT15	15.1	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.5	mi/h
Percent time-spent-following, PTSFd (from above)	80.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	738.6
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.29
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

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Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	Existing (2016)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	350	veh/h
Opposing direction volume, Vo	550	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.917		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	434	pc/h	644	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	43.0	mi/h
Percent Free Flow Speed, PFFS	81.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	410 pc/h	625 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.1 %	
Adjustment for no-passing zones, fnp	33.0	
Percent time-spent-following, PTSFd	59.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	338	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1190	veh-mi
Peak 15-min total travel time, TT15	7.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.0	mi/h
Percent time-spent-following, PTSFd (from above)	59.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	397.7
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.97
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	Existing (2016)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	300	veh/h
Opposing direction volume, Vo	650	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.893		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	382	pc/h	761	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	42.8	mi/h
Percent Free Flow Speed, PFFS	81.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	739 pc/h
Base percent time-spent-following,(note-4) BPTSFd	43.8 %	
Adjustment for no-passing zones, fnp	28.1	
Percent time-spent-following, PTSFd	52.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	290	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1020	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.8	mi/h
Percent time-spent-following, PTSFd (from above)	52.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	340.9
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.89
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2101	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1452
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.6
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2200	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1520
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	23.7
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020
Jurisdiction	CDM Smith	Time Period Analyzed	AM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1750	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1209
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.51
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.6
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020
Jurisdiction	CDM Smith	Time Period Analyzed	PM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1100	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	760
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.7
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	550	veh/h
Opposing direction volume, Vo	350	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.917	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	644	pc/h	434	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	42.2	mi/h
Percent Free Flow Speed, PFFS	80.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	625 pc/h	410 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.6 %	
Adjustment for no-passing zones, fnp	32.9	
Percent time-spent-following, PTSFd	77.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	531	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1870	veh-mi
Peak 15-min total travel time, TT15	12.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.2	mi/h
Percent time-spent-following, PTSFd (from above)	77.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	625.0
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.20
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	650	veh/h
Opposing direction volume, Vo	300	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.893	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	761	pc/h	382	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSd	41.5	mi/h
Percent Free Flow Speed, PFFS	78.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	739 pc/h	351 pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.8 %	
Adjustment for no-passing zones, fnp	28.0	
Percent time-spent-following, PTSFd	80.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	628	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2210	veh-mi
Peak 15-min total travel time, TT15	15.1	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.5	mi/h
Percent time-spent-following, PTSFd (from above)	80.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	738.6
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.29
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	350	veh/h
Opposing direction volume, Vo	550	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.917		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	434	pc/h	644	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	43.0	mi/h
Percent Free Flow Speed, PFFS	81.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	410 pc/h	625 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.1 %	
Adjustment for no-passing zones, fnp	33.0	
Percent time-spent-following, PTSFd	59.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	338	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1190	veh-mi
Peak 15-min total travel time, TT15	7.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	43.0	mi/h
Percent time-spent-following, PTSFd (from above)	59.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	397.7
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.97
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	300	veh/h
Opposing direction volume, Vo	650	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.893		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	382	pc/h	761	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	42.8	mi/h
Percent Free Flow Speed, PFFS	81.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	739 pc/h
Base percent time-spent-following,(note-4) BPTSFd	43.8 %	
Adjustment for no-passing zones, fnp	28.1	
Percent time-spent-following, PTSFd	52.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	290	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1020	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.8	mi/h
Percent time-spent-following, PTSFd (from above)	52.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	340.9
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.89
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2101	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1452
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.6
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2101	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1452
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.6
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	AM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1751	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1210
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.51
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.6
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1201	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	747
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2008	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1249
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	20.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1601	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	996
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	950	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	591
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.5
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	201	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	125
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.05
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	2.0
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1916	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1192
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.51
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.2
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1601	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	996
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.0
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+ReservoirRestriction
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	650	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	404
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.17
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	6.5
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020+ReservoirRestriction Alt
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	551	veh/h
Opposing direction volume, Vo	351	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.917	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	645	pc/h	435	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	42.2	mi/h
Percent Free Flow Speed, PFFS	80.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	626 pc/h	411 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.7 %	
Adjustment for no-passing zones, fnp	32.8	
Percent time-spent-following, PTSFd	77.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	532	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1873	veh-mi
Peak 15-min total travel time, TT15	12.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.2	mi/h
Percent time-spent-following, PTSFd (from above)	77.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	626.1
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.20
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020+ReservoirRestriction Alt
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	654	veh/h
Opposing direction volume, Vo	300	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.893	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	765	pc/h	382	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSd	41.4	mi/h
Percent Free Flow Speed, PFFS	78.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	743 pc/h	351 pc/h
Base percent time-spent-following,(note-4) BPTSFd	62.0 %	
Adjustment for no-passing zones, fnp	27.9	
Percent time-spent-following, PTSFd	80.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	632	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2224	veh-mi
Peak 15-min total travel time, TT15	15.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.4	mi/h
Percent time-spent-following, PTSFd (from above)	80.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	743.2
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.29
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020+ReservoirRestriction
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	351	veh/h
Opposing direction volume, Vo	551	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.917		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	435	pc/h	645	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	42.9	mi/h
Percent Free Flow Speed, PFFS	81.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	411 pc/h	626 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.2 %	
Adjustment for no-passing zones, fnp	33.0	
Percent time-spent-following, PTSFd	60.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	339	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1193	veh-mi
Peak 15-min total travel time, TT15	7.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.9	mi/h
Percent time-spent-following, PTSFd (from above)	60.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	398.9
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.97
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020+ReservoirRestriction
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	300	veh/h
Opposing direction volume, Vo	654	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.893		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	382	pc/h	765	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	42.7	mi/h
Percent Free Flow Speed, PFFS	81.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	743 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.6 %	
Adjustment for no-passing zones, fnp	28.0	
Percent time-spent-following, PTSFd	53.6 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	290	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1020	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.7	mi/h
Percent time-spent-following, PTSFd (from above)	53.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	340.9
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.89
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2104	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1454
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.6
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2200	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1520
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	23.7
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1754	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1212
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.6
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1122	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	775
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.9
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1206	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	750
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2044	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1272
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.55
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	20.4
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1606	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	999
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	950	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	591
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.5
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	210	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	130
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	2.1
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1966	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1223
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.53
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.7
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1610	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1002
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.1
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(w/ ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	650	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	404
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.17
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	6.5
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020+CrestRaise w/ Shear Key
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	554	veh/h
Opposing direction volume, Vo	354	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.917	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	648	pc/h	439	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	42.2	mi/h
Percent Free Flow Speed, PFFS	79.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	630 pc/h	402 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.8 %	
Adjustment for no-passing zones, fnp	33.0	
Percent time-spent-following, PTSFd	76.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	535	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1884	veh-mi
Peak 15-min total travel time, TT15	12.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.2	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	629.5
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.21
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7: Two-Lane Highways Release 7.4

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020+CrestRaise w/o Shear Key
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	672	veh/h
Opposing direction volume, Vo	300	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.893	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	786	pc/h	382	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSd	41.3	mi/h
Percent Free Flow Speed, PFFS	78.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	764 pc/h	351 pc/h
Base percent time-spent-following,(note-4) BPTSFd	62.9 %	
Adjustment for no-passing zones, fnp	27.2	
Percent time-spent-following, PTSFd	81.5 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	649	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2285	veh-mi
Peak 15-min total travel time, TT15	15.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.3	mi/h
Percent time-spent-following, PTSFd (from above)	81.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	763.6
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.30
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020+CrestRaise(w/ ShearKey)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	354	veh/h
Opposing direction volume, Vo	554	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.917		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	439	pc/h	648	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	42.9	mi/h
Percent Free Flow Speed, PFFS	81.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	402 pc/h	630 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.3 %	
Adjustment for no-passing zones, fnp	33.1	
Percent time-spent-following, PTSFd	59.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	342	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1204	veh-mi
Peak 15-min total travel time, TT15	8.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	402.3
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.98
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020+CrestRaise(w/ ShearKey)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	300	veh/h
Opposing direction volume, Vo	672	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.893		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	382	pc/h	786	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	42.6	mi/h
Percent Free Flow Speed, PFFS	80.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	764 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.6 %	
Adjustment for no-passing zones, fnp	27.3	
Percent time-spent-following, PTSFd	53.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	290	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1020	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.6	mi/h
Percent time-spent-following, PTSFd (from above)	53.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	340.9
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.89
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2104	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1454
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.6
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Northbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.18
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	64.2
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2200	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1520
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2342
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2342
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	64.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	23.7
Total Ramp Density Adjustment	0.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	64.2		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM
Project Description	B.F. Sisk Dam Safety of Dams Modification Project Southbound I-5 S of SR 152		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	65.0
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1754	Heavy Vehicle Adjustment Factor (f_{HV})	0.770
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1212
Total Trucks, %	29.85	Capacity (c), pc/h/ln	2350
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2350
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	65.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.6
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	65.0		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1206	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	750
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2034	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1266
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	20.3
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1606	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	999
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.0
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of I-5		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.77
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.4
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	950	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	591
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2324
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2324
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.5
Total Ramp Density Adjustment	2.6	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.4		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	210	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	130
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	2.1
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Eastbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1950	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1213
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.5
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	AM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1610	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	1002
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.1
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

HCS7 Basic Freeway Report

Project Information

Analyst	SHC	Date	7/12/2018
Agency	CDM Smith	Analysis Year	2020+CrestRaise(wo ShearKey)
Jurisdiction	CDM Smith	Time Period Analyzed	PM Peak
Project Description	B.F. Sisk Dam Safety of Dams Modification Project - Westbound SR 152 W of SR 33		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	65.0	Total Ramp Density (TRD), ramps/mi	0.87
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	62.1
Right-Side Lateral Clearance, ft	9		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	650	Heavy Vehicle Adjustment Factor (f_{HV})	0.855
Peak Hour Factor (PHF)	0.94	Flow Rate (v_p), pc/h/ln	404
Total Trucks, %	17.00	Capacity (c), pc/h/ln	2321
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2321
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.17
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	6.5
Total Ramp Density Adjustment	2.9	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	62.1		

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020+CrestRaise(wo ShearKey)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	554	veh/h
Opposing direction volume, Vo	354	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.917	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	648	pc/h	439	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	42.2	mi/h
Percent Free Flow Speed, PFFS	79.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	630 pc/h	402 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.8 %	
Adjustment for no-passing zones, fnp	33.0	
Percent time-spent-following, PTSFd	76.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	535	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1884	veh-mi
Peak 15-min total travel time, TT15	12.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.2	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	629.5
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.21
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Northbound
From/To	SR 152/I-5
Jurisdiction	
Analysis Year	2020+CrestRaise (wo ShearKey)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	60	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	666	veh/h
Opposing direction volume, Vo	300	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.893	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	779	pc/h	382	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSd	41.3	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.971
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	757 pc/h	351 pc/h
Base percent time-spent-following,(note-4) BPTSFd	62.6 %	
Adjustment for no-passing zones, fnp	27.4	
Percent time-spent-following, PTSFd	81.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	643	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2264	veh-mi
Peak 15-min total travel time, TT15	15.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.3	mi/h
Percent time-spent-following, PTSFd (from above)	81.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	756.8
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	12.30
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	AM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020+CrestRaise(wo ShearKey)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	354	veh/h
Opposing direction volume, Vo	554	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.917		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	439	pc/h	648	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	42.9	mi/h
Percent Free Flow Speed, PFFS	81.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	402 pc/h	630 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.3 %	
Adjustment for no-passing zones, fnp	33.1	
Percent time-spent-following, PTSFd	59.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	342	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1204	veh-mi
Peak 15-min total travel time, TT15	8.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	402.3
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.98
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	SHC
Agency/Co.	CDM Smith
Date Performed	7/12/2018
Analysis Time Period	PM Peak
Highway	SR 33 Southbound
From/To	I-5/SR 152
Jurisdiction	
Analysis Year	2020+CrestRaise(wo ShearKey)
Description	B.F. Sisk Dam Safety of Dams M

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.88	
Shoulder width	15.0	ft	% Trucks and buses	30	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	62	%
Up/down	-	%	Access point density	9	/mi

Analysis direction volume, Vd	300	veh/h
Opposing direction volume, Vo	666	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.893		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	382	pc/h	779	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.3	mi/h
Free-flow speed, FFSd	52.8	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	42.7	mi/h
Percent Free Flow Speed, PFFS	80.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.971	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	757 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.0 %	
Adjustment for no-passing zones, fnp	27.5	
Percent time-spent-following, PTSFd	52.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	290	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1020	veh-mi
Peak 15-min total travel time, TT15	6.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.7	mi/h
Percent time-spent-following, PTSFd (from above)	52.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	340.9
Effective width of outside lane, We	42.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	11.89
Bicycle LOS	F

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	203	2	2	1590	2	2
Future Vol, veh/h	203	2	2	1590	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	Free	-	Yield
Storage Length	-	400	520	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	17	0	0	17	0	0
Mvmt Flow	221	2	2	1728	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	221	0	916	111
Stage 1	-	-	-	-	221	-
Stage 2	-	-	-	-	695	-
Critical Hdwy	-	-	4.1	-	6.25	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	2.2	-	3.65	3.3
Pot Cap-1 Maneuver	-	-	1360	-	309	927
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	432	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1360	-	309	927
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	309	927	-	-	1360	-
HCM Lane V/C Ratio	0.007	0.002	-	-	0.002	-
HCM Control Delay (s)	16.7	8.9	-	-	7.7	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	0	0	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	199	6	11	1589	0	1	0	1	0	0	0
Future Vol, veh/h	0	199	6	11	1589	0	1	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	240	-	-	230	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	17	17	17	17	2	17	2	17	2	2	2
Mvmt Flow	0	216	7	12	1727	0	1	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1727	0	0	223	0	0	1108	1971	112	1859	1974	864
Stage 1	-	-	-	-	-	-	220	220	-	1751	1751	-
Stage 2	-	-	-	-	-	-	888	1751	-	108	223	-
Critical Hdwy	4.14	-	-	4.44	-	-	7.84	6.54	7.24	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.84	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.84	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.37	-	-	3.67	4.02	3.47	3.52	4.02	3.32
Pot Cap-1 Maneuver	362	-	-	1241	-	-	147	62	874	45	61	297
Stage 1	-	-	-	-	-	-	721	720	-	89	138	-
Stage 2	-	-	-	-	-	-	276	138	-	886	718	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	362	-	-	1241	-	-	146	61	874	45	60	297
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	61	-	45	60	-
Stage 1	-	-	-	-	-	-	721	720	-	89	137	-
Stage 2	-	-	-	-	-	-	273	137	-	885	718	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.1	19.5	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	146	874	1241	-	-	362	-	-	-	-
HCM Lane V/C Ratio	0.007	0.001	0.01	-	-	-	-	-	-	-
HCM Control Delay (s)	29.8	9.1	7.9	-	-	0	-	-	0	0
HCM Lane LOS	D	A	A	-	-	A	-	-	A	A
HCM 95th %tile Q(veh)	0	0	0	-	-	0	-	-	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1883	10	10	652	10	10
Future Vol, veh/h	1883	10	10	652	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	Yield	-	Free	-	Yield
Storage Length	-	400	520	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	17	0	0	17	0	0
Mvmt Flow	2047	11	11	709	11	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2047	0	2353	1024
Stage 1	-	-	-	-	2047	-
Stage 2	-	-	-	-	306	-
Critical Hdwy	-	-	4.1	-	6.25	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	2.2	-	3.65	3.3
Pot Cap-1 Maneuver	-	-	279	-	44	236
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	279	-	42	236
Mov Cap-2 Maneuver	-	-	-	-	42	-
Stage 1	-	-	-	-	84	-
Stage 2	-	-	-	-	689	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	69.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	42	236	-	-	279	-
HCM Lane V/C Ratio	0.259	0.046	-	-	0.039	-
HCM Control Delay (s)	118.4	21	-	-	18.4	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	1891	2	3	647	0	5	0	9	0	0	0
Future Vol, veh/h	0	1891	2	3	647	0	5	0	9	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	240	-	-	230	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	17	17	17	17	2	17	2	17	2	2	2
Mvmt Flow	0	2055	2	3	703	0	5	0	10	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	703	0	0	2057	0	0	2414	2765	1029	1737	2766	352
Stage 1	-	-	-	-	-	-	2056	2056	-	709	709	-
Stage 2	-	-	-	-	-	-	358	709	-	1028	2057	-
Critical Hdwy	4.14	-	-	4.44	-	-	7.84	6.54	7.24	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.84	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.84	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.37	-	-	3.67	4.02	3.47	3.52	4.02	3.32
Pot Cap-1 Maneuver	890	-	-	219	-	-	14	19	207	56	19	644
Stage 1	-	-	-	-	-	-	47	97	-	391	435	-
Stage 2	-	-	-	-	-	-	593	435	-	251	96	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	890	-	-	219	-	-	14	19	207	53	19	644
Mov Cap-2 Maneuver	-	-	-	-	-	-	14	19	-	53	19	-
Stage 1	-	-	-	-	-	-	47	97	-	391	429	-
Stage 2	-	-	-	-	-	-	585	429	-	239	96	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0	0.1	149.7	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	14	207	219	-	-	890	-	-	-	-
HCM Lane V/C Ratio	0.388	0.047	0.015	-	-	-	-	-	-	-
HCM Control Delay (s)	$ 377.2	23.3	21.7	-	-	0	-	-	0	0
HCM Lane LOS	F	C	C	-	-	A	-	-	A	A
HCM 95th %tile Q(veh)	1	0.1	0	-	-	0	-	-	-	-

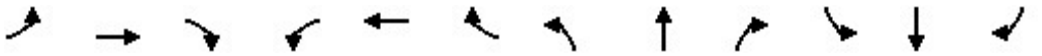
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	203	2	4	1582	2	4
Future Volume (veh/h)	203	2	4	1582	2	4
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1648	1900	1337	1648	1900	1337
Adj Flow Rate, veh/h	221	0	4	1720	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	17	0	38	17	0	38
Cap, veh/h	2714		7	4111	5	
Arrive On Green	0.87	0.00	0.01	0.91	0.00	0.00
Sat Flow, veh/h	3214	1610	1273	4648	1810	1133
Grp Volume(v), veh/h	221	0	4	1720	2	0
Grp Sat Flow(s),veh/h/ln	1566	1610	1273	1500	1810	1133
Q Serve(g_s), s	1.1	0.0	0.3	5.7	0.1	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.3	5.7	0.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2714		7	4111	5	
V/C Ratio(X)	0.08		0.60	0.42	0.41	
Avail Cap(c_a), veh/h	2714		136	4111	210	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	1.0	0.0	53.5	0.6	53.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	64.4	0.3	47.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.1	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.1	0.0	117.9	1.0	100.7	0.0
LnGrp LOS	A		F	A	F	
Approach Vol, veh/h	221	A		1724	2	A
Approach Delay, s/veh	1.1			1.2	100.7	
Approach LOS	A			A	F	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	4.8	5.1	97.9	103.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	11.5	82.5	98.5
Max Q Clear Time (g_c+I1), s	2.1	2.3	3.1	7.7
Green Ext Time (p_c), s	0.0	0.0	1.3	18.9

Intersection Summary	
HCM 6th Ctrl Delay	1.3
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBT] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	201	6	15	1585	0	1	0	5	0	0	0
Future Volume (veh/h)	0	201	6	15	1585	0	1	0	5	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1633	1633	1366	1648	1648	1870	1870	818	1870	1870	1870
Adj Flow Rate, veh/h	0	218	7	16	1723	0	1	0	5	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	18	18	36	17	17	2	2	73	2	2	2
Cap, veh/h	2	2607	83	23	2846	0	78	0	5	0	14	12
Arrive On Green	0.00	0.85	0.85	0.02	0.91	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Sat Flow, veh/h	1781	3069	98	1301	3214	0	1417	0	693	0	1870	1585
Grp Volume(v), veh/h	0	110	115	16	1723	0	1	0	5	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1552	1616	1301	1566	0	1418	0	693	0	1870	1585
Q Serve(g_s), s	0.0	1.2	1.2	1.3	12.0	0.0	0.1	0.0	0.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.2	1.2	1.3	12.0	0.0	0.1	0.0	0.8	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	2	1318	1372	23	2846	0	78	0	5	0	14	12
V/C Ratio(X)	0.00	0.08	0.08	0.70	0.61	0.00	0.01	0.00	0.95	0.00	0.00	0.00
Avail Cap(c_a), veh/h	124	1318	1372	91	2846	0	166	0	48	0	130	110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.3	1.3	52.6	1.0	0.0	53.1	0.0	53.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	31.5	1.0	0.0	0.1	0.0	165.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.6	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.4	1.4	84.1	2.0	0.0	53.1	0.0	218.4	0.0	0.0	0.0
LnGrp LOS	A	A	A	F	A	A	D	A	F	A	A	A
Approach Vol, veh/h		225			1739			6			0	
Approach Delay, s/veh		1.4			2.7			190.9			0.0	
Approach LOS		A			A			F				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	102.4		5.3	6.4	96.0		5.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	91.5		7.5	7.5	91.5		7.5				
Max Q Clear Time (g_c+I1), s	0.0	14.0		2.8	3.3	3.2		0.0				
Green Ext Time (p_c), s	0.0	20.7		0.0	0.0	1.1		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		3.1
HCM 6th LOS		A

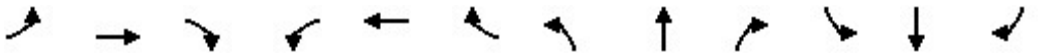
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1883	10	10	642	10	16
Future Volume (veh/h)	1883	10	10	642	10	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1648	1900	1900	1648	1900	1900
Adj Flow Rate, veh/h	2047	0	11	698	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	17	0	0	17	0	0
Cap, veh/h	2680		23	4086	23	
Arrive On Green	0.86	0.00	0.01	0.91	0.01	0.00
Sat Flow, veh/h	3214	1610	1810	4648	1810	1610
Grp Volume(v), veh/h	2047	0	11	698	11	0
Grp Sat Flow(s),veh/h/ln	1566	1610	1810	1500	1810	1610
Q Serve(g_s), s	31.0	0.0	0.7	1.9	0.7	0.0
Cycle Q Clear(g_c), s	31.0	0.0	0.7	1.9	0.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2680		23	4086	23	
V/C Ratio(X)	0.76		0.47	0.17	0.47	
Avail Cap(c_a), veh/h	2680		119	4086	119	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.4	0.0	55.9	0.6	55.9	0.0
Incr Delay (d2), s/veh	2.1	0.0	14.0	0.1	14.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.4	0.0	0.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.6	0.0	69.9	0.7	69.9	0.0
LnGrp LOS	A		E	A	E	
Approach Vol, veh/h	2047	A		709	11	A
Approach Delay, s/veh	5.6			1.7	69.9	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	3	4		8
Phs Duration (G+Y+Rc), s	6.0	6.0	102.0		108.0
Change Period (Y+Rc), s	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	7.5	91.5		103.5
Max Q Clear Time (g_c+I1), s	2.7	2.7	33.0		3.9
Green Ext Time (p_c), s	0.0	0.0	27.7		4.8

Intersection Summary	
HCM 6th Ctrl Delay	4.8
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBT] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1897	2	3	647	0	5	0	23	0	0	0
Future Volume (veh/h)	0	1897	2	3	647	0	5	0	23	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1648	1648	1648	1648	1648	1870	1870	1796	1870	1870	1870
Adj Flow Rate, veh/h	0	2062	2	3	703	0	5	0	25	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	17	17	17	17	17	2	2	7	2	2	2
Cap, veh/h	2	2709	3	6	2785	0	105	0	42	0	51	43
Arrive On Green	0.00	0.84	0.84	0.00	0.89	0.00	0.03	0.00	0.03	0.00	0.00	0.00
Sat Flow, veh/h	1781	3210	3	1570	3214	0	1417	0	1522	0	1870	1585
Grp Volume(v), veh/h	0	1006	1058	3	703	0	5	0	25	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1566	1647	1570	1566	0	1418	0	1522	0	1870	1585
Q Serve(g_s), s	0.0	30.3	30.4	0.2	3.5	0.0	0.4	0.0	1.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	30.3	30.4	0.2	3.5	0.0	0.4	0.0	1.8	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	2	1321	1391	6	2785	0	105	0	42	0	51	43
V/C Ratio(X)	0.00	0.76	0.76	0.48	0.25	0.00	0.05	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	123	1321	1391	109	2785	0	164	0	105	0	129	110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	3.7	3.7	53.9	0.9	0.0	51.5	0.0	52.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.2	4.0	47.7	0.2	0.0	0.2	0.0	13.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	3.6	0.2	0.1	0.0	0.1	0.0	0.8	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	7.9	7.7	101.5	1.1	0.0	51.6	0.0	65.1	0.0	0.0	0.0
LnGrp LOS	A	A	A	F	A	A	D	A	E	A	A	A
Approach Vol, veh/h		2064			706			30			0	
Approach Delay, s/veh		7.8			1.5			62.8			0.0	
Approach LOS		A			A			E				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	100.9		7.5	4.9	96.0		7.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	91.5		7.5	7.5	91.5		7.5				
Max Q Clear Time (g_c+I1), s	0.0	5.5		3.8	2.2	32.4		0.0				
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0	27.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		6.8
HCM 6th LOS		A

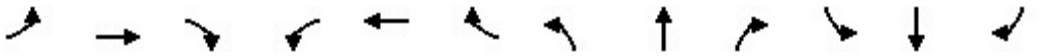
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	203	2	5	1578	2	13
Future Volume (veh/h)	203	2	5	1578	2	13
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1648	1900	1011	1648	1900	1559
Adj Flow Rate, veh/h	221	0	5	1715	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	17	0	60	17	0	23
Cap, veh/h	2711		6	4111	5	
Arrive On Green	0.87	0.00	0.01	0.91	0.00	0.00
Sat Flow, veh/h	3214	1610	963	4648	1810	1321
Grp Volume(v), veh/h	221	0	5	1715	2	0
Grp Sat Flow(s),veh/h/ln	1566	1610	963	1500	1810	1321
Q Serve(g_s), s	1.1	0.0	0.6	5.7	0.1	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.6	5.7	0.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2711		6	4111	5	
V/C Ratio(X)	0.08		0.81	0.42	0.41	
Avail Cap(c_a), veh/h	2711		103	4111	210	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	1.0	0.0	53.5	0.6	53.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	113.1	0.3	47.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.3	0.1	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.1	0.0	166.6	1.0	100.7	0.0
LnGrp LOS	A		F	A	F	
Approach Vol, veh/h	221	A		1720	2	A
Approach Delay, s/veh	1.1			1.4	100.7	
Approach LOS	A			A	F	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		4.8	5.2	97.8		103.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		12.5	11.5	82.5		98.5
Max Q Clear Time (g_c+I1), s		2.1	2.6	3.1		7.7
Green Ext Time (p_c), s		0.0	0.0	1.3		18.8

Intersection Summary	
HCM 6th Ctrl Delay	1.5
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBT] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	210	6	18	1582	0	1	0	26	0	0	0
Future Volume (veh/h)	0	210	6	18	1582	0	1	0	26	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1633	1633	1174	1648	1648	1870	1870	1485	1870	1870	1870
Adj Flow Rate, veh/h	0	228	7	20	1720	0	1	0	28	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	18	18	49	17	17	2	2	28	2	2	2
Cap, veh/h	2	2551	78	23	2792	0	103	0	34	0	50	42
Arrive On Green	0.00	0.83	0.83	0.02	0.89	0.00	0.03	0.00	0.03	0.00	0.00	0.00
Sat Flow, veh/h	1781	3074	94	1118	3214	0	1417	0	1259	0	1870	1585
Grp Volume(v), veh/h	0	115	120	20	1720	0	1	0	28	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1552	1616	1118	1566	0	1418	0	1259	0	1870	1585
Q Serve(g_s), s	0.0	1.5	1.5	2.0	14.6	0.0	0.1	0.0	2.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.5	1.5	2.0	14.6	0.0	0.1	0.0	2.4	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	2	1288	1342	23	2792	0	103	0	34	0	50	42
V/C Ratio(X)	0.00	0.09	0.09	0.86	0.62	0.00	0.01	0.00	0.83	0.00	0.00	0.00
Avail Cap(c_a), veh/h	121	1288	1342	76	2792	0	162	0	86	0	127	108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.7	1.7	53.8	1.4	0.0	52.3	0.0	53.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	55.2	1.0	0.0	0.0	0.0	38.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.9	0.4	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.9	1.9	109.0	2.5	0.0	52.3	0.0	91.7	0.0	0.0	0.0
LnGrp LOS	A	A	A	F	A	A	D	A	F	A	A	A
Approach Vol, veh/h		235			1740			29			0	
Approach Delay, s/veh		1.9			3.7			90.4			0.0	
Approach LOS		A			A			F				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	102.8		7.4	6.8	96.0		7.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	91.5		7.5	7.5	91.5		7.5				
Max Q Clear Time (g_c+I1), s	0.0	16.6		4.4	4.0	3.5		0.0				
Green Ext Time (p_c), s	0.0	20.5		0.0	0.0	1.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		4.7
HCM 6th LOS		A

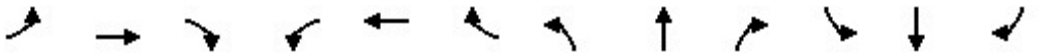
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1883	10	18	616	10	25
Future Volume (veh/h)	1883	10	18	616	10	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1648	1900	1900	1648	1900	1900
Adj Flow Rate, veh/h	2047	0	20	670	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	17	0	0	17	0	0
Cap, veh/h	2656		37	4086	23	
Arrive On Green	0.85	0.00	0.02	0.91	0.01	0.00
Sat Flow, veh/h	3214	1610	1810	4648	1810	1610
Grp Volume(v), veh/h	2047	0	20	670	11	0
Grp Sat Flow(s),veh/h/ln	1566	1610	1810	1500	1810	1610
Q Serve(g_s), s	32.7	0.0	1.2	1.8	0.7	0.0
Cycle Q Clear(g_c), s	32.7	0.0	1.2	1.8	0.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2656		37	4086	23	
V/C Ratio(X)	0.77		0.54	0.16	0.47	
Avail Cap(c_a), veh/h	2656		119	4086	119	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.8	0.0	55.3	0.6	55.9	0.0
Incr Delay (d2), s/veh	2.2	0.0	11.5	0.1	14.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.7	0.0	0.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.0	0.0	66.8	0.7	69.9	0.0
LnGrp LOS	A		E	A	E	
Approach Vol, veh/h	2047	A		690	11	A
Approach Delay, s/veh	6.0			2.6	69.9	
Approach LOS	A			A	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		6.0	6.8	101.2		108.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		7.5	7.5	91.5		103.5
Max Q Clear Time (g_c+I1), s		2.7	3.2	34.7		3.8
Green Ext Time (p_c), s		0.0	0.0	27.3		4.5

Intersection Summary	
HCM 6th Ctrl Delay	5.4
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBT] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1906	2	21	629	0	5	0	44	0	0	0
Future Volume (veh/h)	0	1906	2	21	629	0	5	0	44	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1648	1648	1870	1648	1648	1870	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	0	2072	2	23	684	0	5	0	48	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	17	17	2	17	17	2	2	3	2	2	2
Cap, veh/h	2	2624	3	41	2757	0	120	0	61	0	73	62
Arrive On Green	0.00	0.82	0.82	0.02	0.88	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	1781	3210	3	1781	3214	0	1417	0	1572	0	1870	1585
Grp Volume(v), veh/h	0	1010	1064	23	684	0	5	0	48	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1566	1648	1781	1566	0	1418	0	1572	0	1870	1585
Q Serve(g_s), s	0.0	37.2	37.2	1.4	3.7	0.0	0.4	0.0	3.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	37.2	37.2	1.4	3.7	0.0	0.4	0.0	3.4	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	2	1280	1347	41	2757	0	120	0	61	0	73	62
V/C Ratio(X)	0.00	0.79	0.79	0.57	0.25	0.00	0.04	0.00	0.78	0.00	0.00	0.00
Avail Cap(c_a), veh/h	119	1280	1347	119	2757	0	159	0	105	0	125	106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	5.3	5.3	54.1	1.0	0.0	51.9	0.0	53.3	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.0	4.8	11.8	0.2	0.0	0.1	0.0	19.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.6	6.8	0.7	0.1	0.0	0.1	0.0	1.7	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	10.3	10.0	65.9	1.2	0.0	52.0	0.0	72.4	0.0	0.0	0.0
LnGrp LOS	A	B	B	E	A	A	D	A	E	A	A	A
Approach Vol, veh/h		2074			707			53			0	
Approach Delay, s/veh		10.1			3.3			70.5			0.0	
Approach LOS		B			A			E				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	103.1		8.9	7.1	96.0		8.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	91.5		7.5	7.5	91.5		7.5				
Max Q Clear Time (g_c+I1), s	0.0	5.7		5.4	3.4	39.2		0.0				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	26.1		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			9.6									
HCM 6th LOS			A									

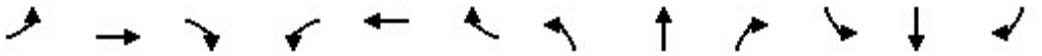
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	203	2	5	1578	2	15
Future Volume (veh/h)	203	2	5	1578	2	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1648	1900	1011	1648	1900	1604
Adj Flow Rate, veh/h	221	0	5	1715	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	17	0	60	17	0	20
Cap, veh/h	2711		6	4111	5	
Arrive On Green	0.87	0.00	0.01	0.91	0.00	0.00
Sat Flow, veh/h	3214	1610	963	4648	1810	1359
Grp Volume(v), veh/h	221	0	5	1715	2	0
Grp Sat Flow(s),veh/h/ln	1566	1610	963	1500	1810	1359
Q Serve(g_s), s	1.1	0.0	0.6	5.7	0.1	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.6	5.7	0.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2711		6	4111	5	
V/C Ratio(X)	0.08		0.81	0.42	0.41	
Avail Cap(c_a), veh/h	2711		103	4111	210	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	1.0	0.0	53.5	0.6	53.7	0.0
Incr Delay (d2), s/veh	0.1	0.0	113.1	0.3	47.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.3	0.1	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.1	0.0	166.6	1.0	100.7	0.0
LnGrp LOS	A		F	A	F	
Approach Vol, veh/h	221	A		1720	2	A
Approach Delay, s/veh	1.1			1.4	100.7	
Approach LOS	A			A	F	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		4.8	5.2	97.8		103.0
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		12.5	11.5	82.5		98.5
Max Q Clear Time (g_c+I1), s		2.1	2.6	3.1		7.7
Green Ext Time (p_c), s		0.0	0.0	1.3		18.8

Intersection Summary	
HCM 6th Ctrl Delay	1.5
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBT] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	212	6	18	1582	0	1	0	31	0	0	0
Future Volume (veh/h)	0	212	6	18	1582	0	1	0	31	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1633	1633	1174	1648	1648	1870	1870	1559	1870	1870	1870
Adj Flow Rate, veh/h	0	230	7	20	1720	0	1	0	34	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	18	18	49	17	17	2	2	23	2	2	2
Cap, veh/h	2	2544	77	23	2783	0	107	0	39	0	56	47
Arrive On Green	0.00	0.83	0.83	0.02	0.89	0.00	0.03	0.00	0.03	0.00	0.00	0.00
Sat Flow, veh/h	1781	3075	93	1118	3214	0	1417	0	1321	0	1870	1585
Grp Volume(v), veh/h	0	116	121	20	1720	0	1	0	34	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1552	1616	1118	1566	0	1418	0	1321	0	1870	1585
Q Serve(g_s), s	0.0	1.5	1.5	2.0	15.0	0.0	0.1	0.0	2.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.5	1.5	2.0	15.0	0.0	0.1	0.0	2.8	0.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	2	1284	1337	23	2783	0	107	0	39	0	56	47
V/C Ratio(X)	0.00	0.09	0.09	0.86	0.62	0.00	0.01	0.00	0.86	0.00	0.00	0.00
Avail Cap(c_a), veh/h	121	1284	1337	76	2783	0	161	0	90	0	127	107
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.8	1.8	54.0	1.5	0.0	52.1	0.0	53.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.1	55.4	1.0	0.0	0.0	0.0	38.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.9	0.4	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	1.9	1.9	109.4	2.6	0.0	52.1	0.0	91.9	0.0	0.0	0.0
LnGrp LOS	A	A	A	F	A	A	D	A	F	A	A	A
Approach Vol, veh/h		237			1740			35			0	
Approach Delay, s/veh		1.9			3.8			90.8			0.0	
Approach LOS		A			A			F				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	102.8		7.8	6.8	96.0		7.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	91.5		7.5	7.5	91.5		7.5				
Max Q Clear Time (g_c+I1), s	0.0	17.0		4.8	4.0	3.5		0.0				
Green Ext Time (p_c), s	0.0	20.5		0.0	0.0	1.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		5.1
HCM 6th LOS		A

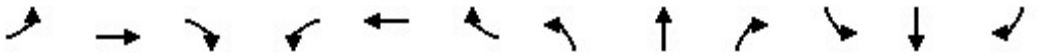
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1883	10	20	609	10	30
Future Volume (veh/h)	1883	10	20	609	10	30
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1648	1900	1900	1633	1900	1900
Adj Flow Rate, veh/h	2047	0	22	662	11	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	17	0	0	18	0	0
Cap, veh/h	2651		40	4049	23	
Arrive On Green	0.85	0.00	0.02	0.91	0.01	0.00
Sat Flow, veh/h	3214	1610	1810	4606	1810	1610
Grp Volume(v), veh/h	2047	0	22	662	11	0
Grp Sat Flow(s),veh/h/ln	1566	1610	1810	1486	1810	1610
Q Serve(g_s), s	33.0	0.0	1.4	1.8	0.7	0.0
Cycle Q Clear(g_c), s	33.0	0.0	1.4	1.8	0.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2651		40	4049	23	
V/C Ratio(X)	0.77		0.55	0.16	0.47	
Avail Cap(c_a), veh/h	2651		119	4049	119	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.9	0.0	55.2	0.6	55.9	0.0
Incr Delay (d2), s/veh	2.3	0.0	11.4	0.1	14.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.7	0.0	0.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.1	0.0	66.6	0.7	69.9	0.0
LnGrp LOS	A		E	A	E	
Approach Vol, veh/h	2047	A		684	11	A
Approach Delay, s/veh	6.1			2.8	69.9	
Approach LOS	A			A	E	

Timer - Assigned Phs	2	3	4		8
Phs Duration (G+Y+Rc), s	6.0	7.0	101.0		108.0
Change Period (Y+Rc), s	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.5	7.5	91.5		103.5
Max Q Clear Time (g_c+I1), s	2.7	3.4	35.0		3.8
Green Ext Time (p_c), s	0.0	0.0	27.3		4.5

Intersection Summary	
HCM 6th Ctrl Delay	5.5
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR, EBR, WBT] is excluded from calculations of the approach delay and intersection delay.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1911	2	26	624	0	5	0	55	0	0	0
Future Volume (veh/h)	0	1911	2	26	624	0	5	0	55	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1648	1648	1870	1648	1648	1870	1870	1856	1870	1870	1870
Adj Flow Rate, veh/h	0	2077	2	28	678	0	5	0	60	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	17	17	2	17	17	2	2	3	2	2	2
Cap, veh/h	2	2590	2	46	2731	0	132	0	76	0	90	77
Arrive On Green	0.00	0.81	0.81	0.03	0.87	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	1781	3210	3	1781	3214	0	1417	0	1572	0	1870	1585
Grp Volume(v), veh/h	0	1013	1066	28	678	0	5	0	60	0	0	0
Grp Sat Flow(s),veh/h/ln	1781	1566	1648	1781	1566	0	1418	0	1572	0	1870	1585
Q Serve(g_s), s	0.0	40.1	40.2	1.8	4.0	0.0	0.4	0.0	4.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	40.1	40.2	1.8	4.0	0.0	0.4	0.0	4.3	0.0	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	2	1263	1329	46	2731	0	132	0	76	0	90	77
V/C Ratio(X)	0.00	0.80	0.80	0.61	0.25	0.00	0.04	0.00	0.79	0.00	0.00	0.00
Avail Cap(c_a), veh/h	118	1263	1329	118	2731	0	157	0	104	0	124	105
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.0	6.0	54.7	1.2	0.0	51.5	0.0	53.4	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.4	5.2	12.3	0.2	0.0	0.1	0.0	23.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.9	8.3	0.9	0.1	0.0	0.1	0.0	2.2	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.4	11.2	66.9	1.4	0.0	51.7	0.0	77.2	0.0	0.0	0.0
LnGrp LOS	A	B	B	E	A	A	D	A	E	A	A	A
Approach Vol, veh/h		2079			706			65			0	
Approach Delay, s/veh		11.3			4.0			75.3			0.0	
Approach LOS		B			A			E				

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	103.4		10.0	7.4	96.0		10.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	91.5		7.5	7.5	91.5		7.5				
Max Q Clear Time (g_c+I1), s	0.0	6.0		6.3	3.8	42.2		0.0				
Green Ext Time (p_c), s	0.0	4.5		0.0	0.0	25.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		11.0	
HCM 6th LOS		B	