

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Eastbound		
Agency or Company	AECOM		From/To Between Ints. 302 and 303		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	2689	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	2		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1746	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	66.5	mph	S		
D = v _p / S	26.2	pc/mi/ln	D = v _p / S		
LOS	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

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Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3390	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	2		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	2259	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			pc/h/ln		
S	57.0	mph	S		
D = v _p / S	39.6	pc/mi/ln	D = v _p / S		
LOS	E		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

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Agency or Company	AECOM		From/To Between Ints. 303 and 304		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	2302	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	997	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	70.0	mph	S		
D = v _p / S	14.2	pc/mi/ln	D = v _p / S		
LOS	B		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

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Agency or Company	AECOM		From/To Between Ints. 303 and 304		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	2898	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1287	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	69.9	mph	S		
D = v _p / S	18.4	pc/mi/ln	D = v _p / S		
LOS	C		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

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Agency or Company	AECOM		From/To Between Ints. 304 and 307		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4204	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	10	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}	mph	
Number of Lanes, N	4		f _{LC}	mph	
Total Ramp Density, TRD		ramps/mi	TRD Adjustment	mph	
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1365	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	69.7	mph	S		
D = v _p / S	19.6	pc/mi/ln	D = v _p / S		
LOS	C		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
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Date Performed	9/11/2014		Jurisdiction		
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Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4686	veh/h	Peak-Hour Factor, PHF	0.94	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	4		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1561	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	68.5	mph	S		
D = v _p / S	22.8	pc/mi/ln	D = v _p / S		
LOS	C		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

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<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	2309	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	2		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1491	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	69.0	mph	S		
D = v _p / S	21.6	pc/mi/ln	D = v _p / S		
LOS	C		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
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<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4736	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	2		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	3097	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			pc/h/ln		
S	28.3	mph	S		
D = v _p / S	109.6	pc/mi/ln	D = v _p / S		
LOS	F		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
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Flow Inputs					
Volume, V	1994	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
v _p	858	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	70.0	mph	S		
D = v _p / S	12.3	pc/mi/ln	D = v _p / S		
LOS	B		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
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<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4225	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1842	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	65.2	mph	S		
D = v _p / S	28.2	pc/mi/ln	D = v _p / S		
LOS	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Westbound		
Agency or Company	AECOM		From/To Between Ints. 304 and 305		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	1798	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	790	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			x f _p)		
S	70.0	mph	S		
D = v _p / S	11.3	pc/mi/ln	D = v _p / S		
LOS	B		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Westbound		
Agency or Company	AECOM		From/To Between Ints. 304 and 305		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3865	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1685	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			pc/h/ln		
S	67.3	mph	S		
D = v _p / S	25.0	pc/mi/ln	D = v _p / S		
LOS	C		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Westbound		
Agency or Company	AECOM		From/To Between 304 and 305 Merges		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	1994	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	876	pc/h/ln	Design LOS		
S	70.0	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		
D = v _p / S	12.5	pc/mi/ln	S		
LOS	B		D = v _p / S		
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Westbound		
Agency or Company	AECOM		From/To Between 304 and 305 Merges		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	4225	veh/h	Peak-Hour Factor, PHF	0.97	
AADT		veh/day	%Trucks and Buses, P _T	13	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	3		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.67	ramps/mi	TRD Adjustment	5.0	mph
FFS (measured)		mph	FFS	70.4	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1842	pc/h/ln	Design LOS		
S	65.2	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		
D = v _p / S	28.2	pc/mi/ln	S		
LOS	D		D = v _p / S		
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Westbound		
Agency or Company	AECOM		From/To Between Ints. 307 and 305		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	A.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	3206	veh/h	Peak-Hour Factor, PHF	0.91	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	4		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.83	ramps/mi	TRD Adjustment	5.3	mph
FFS (measured)		mph	FFS	70.1	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	1103	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			pc/h/ln		
S	70.0	mph	S		
D = v _p / S	15.8	pc/mi/ln	D = v _p / S		
LOS	B		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					

BASIC FREEWAY SEGMENTS WORKSHEET					
General Information			Site Information		
Analyst	JRE		Highway/Direction of Travel I-80 Westbound		
Agency or Company	AECOM		From/To Between Ints. 307 and 305		
Date Performed	9/11/2014		Jurisdiction		
Analysis Time Period	P.M. Peak Hour		Analysis Year Alt B1 Ph II 2045		
Project Description Interstate 80 Reconstruction					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	6672	veh/h	Peak-Hour Factor, PHF	0.96	
AADT		veh/day	%Trucks and Buses, P _T	12	
Peak-Hr Prop. of AADT, K			%RVs, P _R	1	
Peak-Hr Direction Prop, D			General Terrain:	Rolling	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	0.95		E _R	2.0	
E _T	2.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f _{LW}	0.0	mph
Number of Lanes, N	4		f _{LC}	0.0	mph
Total Ramp Density, TRD	1.83	ramps/mi	TRD Adjustment	5.3	mph
FFS (measured)		mph	FFS	70.1	mph
Base free-flow Speed, BFFS	75.4	mph			
LOS and Performance Measures			Design (N)		
<u>Operational (LOS)</u>			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS		
	2176	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})		
x f _p)			pc/h/ln		
S	59.0	mph	S		
D = v _p / S	36.9	pc/mi/ln	D = v _p / S		
LOS	E		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8	
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18	TRD - Page 11-11	
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3		
DDHV - Directional design hour volume					