

ATTACHMENT 2.4

HCM 2010 Version
Existing Freeway Mainline Analysis Worksheets

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8631	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1914	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.1	x f _p)	
D = v _p / S	29.9	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6331	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1170	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	16.7	pc/mi/ln	S
LOS	B		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7085	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1309	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.9	x f _p)	
D = v _p / S	18.7	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8382	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1859	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.0	x f _p)	
D = v _p / S	28.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8593	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1905	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.2	x f _p)	
D = v _p / S	29.7	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4976	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1366	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	69.7	mph	x f _p)
D = v _p / S	19.6	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7422	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
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})	2037	pc/h/ln	
x f _p)			
S	61.9	mph	
D = v _p / S	32.9	pc/mi/ln	
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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5019	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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})	1837	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.3	x f _p)	
D = v _p / S	28.1	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2862	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
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	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	785 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	11.2 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	2896	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	795	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	11.4	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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5197	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width		ft	
Rt-Side Lat. Clearance		ft	
Number of Lanes, N	4		
Total Ramp Density, TRD		ramps/mi	
FFS (measured)	70.0	mph	
Base free-flow Speed, BFFS		mph	
			f _{LW}
			mph
			f _{LC}
			mph
			TRD Adjustment
			mph
			FFS
			70.0
			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	
	1426	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	69.4	mph	x f _p)
D = v _p / S	20.5	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7750	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2127	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	60.0	x f _p)	
D = v _p / S	35.4	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5242	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1918	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.0	x f _p)	
D = v _p / S	30.0	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2802	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	769	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	11.0	S	mph
LOS	A	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	3024	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	830 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	S	mph
D = v _p / S	11.9 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4918	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1091	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	15.6	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4987	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1106	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	15.8	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3326	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	922	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	13.2	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3305	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
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})	916	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	13.1	pc/mi/ln	S
LOS	B		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2117	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	782	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	11.2	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13021	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	3609	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	2.7	x f _p)	
D = v _p / S	1345.7	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8455	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2344	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	54.8	x f _p)	
D = v _p / S	42.8	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8400	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2328	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	55.2	x f _p)	
D = v _p / S	42.1	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	7192	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1993	pc/h/ln	
x f _p)			
S	62.7	mph	
D = v _p / S	31.8	pc/mi/ln	
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5380	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1988	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	62.8	x f _p)	
D = v _p / S	31.7	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9569	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2122	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	60.1	x f _p)	
D = v _p / S	35.3	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11296	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	75.0	FFS	75.0
Base free-flow Speed, BFFS	mph		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})	2505	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	49.9	x f _p)	
D = v _p / S	50.2	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11048	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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})	2041	pc/h/ln	
x f _p)			
S	61.8	mph	
D = v _p / S	33.0	pc/mi/ln	
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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10961	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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})	2025	pc/h/ln	
x f _p)			
S	62.1	mph	
D = v _p / S	32.6	pc/mi/ln	
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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5129	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1422	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.4	x f _p)	
D = v _p / S	20.5	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7478	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1658	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	67.6	x f _p)	
D = v _p / S	24.5	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6825	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1513	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.9	x f _p)	
D = v _p / S	22.0	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6117	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1356	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.7	x f _p)	
D = v _p / S	19.4	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4657	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1704	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	67.1	x f _p)	
D = v _p / S	25.4	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2377	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
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	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	652	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	9.3	pc/mi/ln	S
LOS	A		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description *City of Newport Beach LUE Amendment TIA (JN08911)*

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs

Volume, V	2687	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	2
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs

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	FFS	70.0
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

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})	737 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	10.5 pc/mi/ln	S	mph
LOS	A	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary

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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6426	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1764	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	66.3	x f _p)	
D = v _p / S	26.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6482	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2372	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	54.1	x f _p)	
D = v _p / S	43.9	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3658	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
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})	1004	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	14.3	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs			
Volume, V	3740	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1026	pc/h/ln	
x f _p)			
S	70.0	mph	
D = v _p / S	14.7	pc/mi/ln	
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6976	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1547	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	68.6	mph	x f _p)
D = v _p / S	22.5	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7187	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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} x f _p)	1594 pc/h/ln	Design LOS	
S	68.2 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	23.4 pc/mi/ln	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4712	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1306	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.9	x f _p)	
D = v _p / S	18.7	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3018	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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} x f _p)	1115 pc/h/ln	Design LOS	
S	70.0 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	15.9 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10593	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2936	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	35.0	x f _p)	
D = v _p / S	83.8	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7069	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1959	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.3	x f _p)	
D = v _p / S	30.9	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7023	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
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})	1947	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.5	x f _p)	
D = v _p / S	30.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	6013	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1667	pc/h/ln	
x f _p)			
S	67.5	mph	
D = v _p / S	24.7	pc/mi/ln	
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4498	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1662 pc/h/ln	Design LOS	
S	67.5 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	24.6 pc/mi/ln	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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			

ATTACHMENT 2.5

HCS 2010 Version
Existing Freeway Ramp Analysis Worksheets

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 10090 Ramp Volume, V _R 2313 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10090	0.92	Level	4	0	0.980	1.00	11187
Ramp	2313	0.92	Level	4	0	0.980	1.00	2564
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = 0.260 using Equation (Exhibit 13-7)
 V₁₂ = 4224 pc/h
 V₃ or V_{av34} 2363 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	
	V _F	8950	Exhibit 13-8 9600 No
	V _{FO} = V _F - V _R	6386	Exhibit 13-8 9600 No
		V _R	2564 Exhibit 13-10 4200 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	4224	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 9.1 (pc/mi/ln)
 LOS = A (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_S = 0.594 (Exhibit 13-12)
 S_R = 53.4 mph (Exhibit 13-12)
 S₀ = 71.5 mph (Exhibit 13-12)
 S = 61.6 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 1400 Deceleration Lane Length L _D Freeway Volume, V _F 7777 Ramp Volume, V _R 474 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7777	0.92	Level	4	0	0.980	1.00	8622
Ramp	474	0.92	Level	4	0	0.980	1.00	526
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1279 pc/h V ₃ or V _{av34} = 2421 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2448 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6648	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2974	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 7.7 (pc/mi/ln) LOS = A (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.133 (Exhibit 13-11) S _R = 66.3 mph (Exhibit 13-11) S ₀ = 65.2 mph (Exhibit 13-11) S = 65.7 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 SB		Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp	
Date Performed	05/07/2014	Jurisdiction	Caltrans		Analysis Time Period	AM Peak Hour	Analysis Year	Existing	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 5					Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 2					<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D 1389					L _{down} = 1250 ft			
V _u = veh/h	Freeway Volume, V _F 6726					V _D = 232 veh/h			
	Ramp Volume, V _R 2690								
	Freeway Free-Flow Speed, S _{FF} 70.0								
	Ramp Free-Flow Speed, S _{FR} 50.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6726	0.92	Level	4	0	0.980	1.00	7457	
Ramp	2690	0.92	Level	4	0	0.980	1.00	2982	
UpStream									
DownStream	232	0.92	Level	4	0	0.980	1.00	257	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3758 pc/h V ₃ or V _{av34} 1104 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5966	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	2984	Exhibit 13-8	9600	No
					V _R	2982	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3758	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 7.6 (pc/mi/ln) LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.501 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 56.0 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 76.4 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 62.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1250 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 2690 veh/h	Freeway Volume, V _F	4533	V _D = veh/h
	Ramp Volume, V _R	232	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4533	0.92	Level	4	0	0.980	1.00	5026
Ramp	232	0.92	Level	4	0	0.980	1.00	257
UpStream	2690	0.90	Level	0	0	1.000	1.00	2989
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.186 using Equation (Exhibit 13-6)

P_{FM} = 0.186 using Equation (Exhibit 13-6)

V₁₂ = 728 pc/h

V₃ or V_{av34} = 1596 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 1568 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4178	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1825	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 18.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.330 (Exhibit 13-11)

S_R = 60.8 mph (Exhibit 13-11)

S₀ = 67.6 mph (Exhibit 13-11)

S = 64.4 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D		L _{down} = 1115 ft
V _u = veh/h	Freeway Volume, V _F	4533	V _D = 538 veh/h
	Ramp Volume, V _R	232	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4533	0.92	Level	4	0	0.980	1.00	5026
Ramp	232	0.92	Level	4	0	0.980	1.00	257
UpStream								
DownStream	538	0.90	Level	0	0	1.000	1.00	598

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.186 using Equation (Exhibit 13-6) V ₁₂ = 728 pc/h V ₃ or V _{av34} = 1596 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1568 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.186 using Equation (Exhibit 13-6) V ₁₂ = 728 pc/h V ₃ or V _{av34} = 1596 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1568 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}	4178	Exhibit 13-8	No

Capacity Checks

	Actual	Capacity	LOS F?
V _F		Exhibit 13-8	
V _{FO} = V _F - V _R		Exhibit 13-8	
V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	1825	Exhibit 13-8	4600:All
			No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 18.0 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 18.0 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.330 (Exhibit 13-11)
S _R = 60.8 mph (Exhibit 13-11)
S ₀ = 67.6 mph (Exhibit 13-11)
S = 64.4 mph (Exhibit 13-13)

Speed Determination

D _s = (Exhibit 13-12)
S _R = mph (Exhibit 13-12)
S ₀ = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1115 ft V _u = 232 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 100 Deceleration Lane Length L _D Freeway Volume, V _F 4723 Ramp Volume, V _R 538 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4723	0.92	Level	4	0	0.980	1.00	5236
Ramp	538	0.92	Level	4	0	0.980	1.00	596
UpStream	232	0.90	Level	0	0	1.000	1.00	258
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.209 using Equation (Exhibit 13-6)
 V₁₂ = 854 pc/h
 V₃ or V_{av34} = 1615 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1634 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4681	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2230	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 17.1 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.288 (Exhibit 13-11)
 S_R = 61.9 mph (Exhibit 13-11)
 S₀ = 67.4 mph (Exhibit 13-11)
 S = 64.7 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1360 ft V _u = 1781 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 1500 Deceleration Lane Length L _D 1500 Freeway Volume, V _F 6601 Ramp Volume, V _R 484 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6601	0.92	Level	4	0	0.980	1.00	7318
Ramp	484	0.92	Level	4	0	0.980	1.00	537
UpStream	1781	0.90	Level	0	0	1.000	1.00	1979
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.151 using Equation (Exhibit 13-6) V ₁₂ = 805 pc/h V ₃ or V _{av34} = 2269 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2137 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?
V _{FO}	5880	Exhibit 13-8	No
		V _F	Exhibit 13-8
		V _{FO} = V _F - V _R	Exhibit 13-8
		V _R	Exhibit 13-10

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V _{R12}	2674	Exhibit 13-8	4600:All No
		V ₁₂	Exhibit 13-8

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 16.7 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.258 (Exhibit 13-11) S _R = 62.8 mph (Exhibit 13-11) S ₀ = 66.0 mph (Exhibit 13-11) S = 64.5 mph (Exhibit 13-13)	D _s = S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 8382 Ramp Volume, V _R 1781 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1360 ft V _D = 484 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8382	0.92	Level	4	0	0.980	1.00	9293
Ramp	1781	0.92	Level	4	0	0.980	1.00	1975
UpStream								
DownStream	484	0.92	Level	4	0	0.980	1.00	537

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4356 pc/h V ₃ or V _{av34} 1539 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8	9600	
V _{FO}		Exhibit 13-8	9600	No
			9600	No
			2100	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?

Level of Service Determination (if not F)	Level of Service Determination (if not F)
-------------------------------------------	-------------------------------------------

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 28.2 (pc/mi/ln) LOS = D (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.541 (Exhibit 13-12) S _R = 54.9 mph (Exhibit 13-12) S ₀ = 74.7 mph (Exhibit 13-12) S = 61.6 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1035 ft V _u = 432 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 0 Deceleration Lane Length L _D 0 Freeway Volume, V _F 7182 Ramp Volume, V _R 1200 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7182	0.92	Level	4	0	0.980	1.00	7963
Ramp	1200	0.92	Level	4	0	0.980	1.00	1330
UpStream	432	0.92	Level	4	0	0.980	1.00	479
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1190 pc/h V ₃ or V _{av34} = 2252 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2277 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7024	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3607	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.6 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.345 (Exhibit 13-11) S _R = 60.3 mph (Exhibit 13-11) S ₀ = 65.7 mph (Exhibit 13-11) S = 62.8 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1245 ft V _u = 1843 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 6750 Ramp Volume, V _R 432 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6750	0.92	Level	4	0	0.980	1.00	7484
Ramp	432	0.92	Level	4	0	0.980	1.00	479
UpStream	1843	0.92	Level	4	0	0.980	1.00	2043
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.158 using Equation (Exhibit 13-6)
 V₁₂ = 863 pc/h
 V₃ or V_{av34} = 2300 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2185 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5943	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2664	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 24.3 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.360 (Exhibit 13-11) S _R = 59.9 mph (Exhibit 13-11) S ₀ = 65.9 mph (Exhibit 13-11) S = 63.1 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 NB		Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp	
Date Performed	05/07/2014	Jurisdiction	Caltrans		Analysis Time Period	AM Peak Hour	Analysis Year	Existing	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 5					Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 2					<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D 425					L _{down} = 1245 ft			
V _u = veh/h	Freeway Volume, V _F 8593					V _D = 432 veh/h			
	Ramp Volume, V _R 1843								
	Freeway Free-Flow Speed, S _{FF} 70.0								
	Ramp Free-Flow Speed, S _{FR} 40.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8593	0.92	Level	4	0	0.980	1.00	9527	
Ramp	1843	0.92	Level	4	0	0.980	1.00	2043	
UpStream									
DownStream	432	0.90	Level	0	0	1.000	1.00	480	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3494 pc/h V ₃ or V _{av34} 2064 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7622	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	5579	Exhibit 13-8	9600	No
					V _R	2043	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3494	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 22.8 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.547 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 54.7 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 72.6 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 63.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2013)

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	175	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	2862	$V_D =$ veh/h
	Ramp Volume, V_R	139	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2862	0.92	Level	2	0	0.990	1.00	3142
Ramp	139	0.92	Level	2	0	0.990	1.00	153
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v_{12}	Estimation of v_{12}
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.436 using Equation (Exhibit 13-7) $V_{12} =$ 1456 pc/h V_3 or V_{av34} 843 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
		Exhibit 13-8		
V_{FO}				
		V_F	3142	Exhibit 13-8 9600 No
		$V_{FO} = V_F - V_R$	2989	Exhibit 13-8 9600 No
		V_R	153	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	1456	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 15.2 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_S =$ 0.507 (Exhibit 13-12) $S_R =$ 55.8 mph (Exhibit 13-12) $S_0 =$ 76.8 mph (Exhibit 13-12) $S =$ 65.4 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">275</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2723</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">173</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	275	Deceleration Lane Length L _D		Freeway Volume, V _F	2723	Ramp Volume, V _R	173	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	275																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	2723																	
Ramp Volume, V _R	173																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2723	0.92	Level	2	0	0.990	1.00	2989
Ramp	173	0.92	Level	2	0	0.990	1.00	190
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.194 using Equation (Exhibit 13-6)
 V₁₂ = 580 pc/h
 V₃ or V_{av34} = 1204 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1195 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	3179	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1385	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 14.5 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.315 (Exhibit 13-11) S _R = 61.2 mph (Exhibit 13-11) S ₀ = 68.6 mph (Exhibit 13-11) S = 65.1 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	0	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	2896	V _D = veh/h
	Ramp Volume, V _R	263	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2896	0.92	Level	2	0	0.990	1.00	3179
Ramp	263	0.92	Level	2	0	0.990	1.00	289
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 1549 pc/h V ₃ or V _{av34} 815 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
		Exhibit 13-8		
V _{FO}				
		V _F	3179	Exhibit 13-8 9600 No
		V _{FO} = V _F - V _R	2890	Exhibit 13-8 9600 No
		V _R	289	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	1549	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 17.6 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination

M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.519 (Exhibit 13-12) S _R = 55.5 mph (Exhibit 13-12) S ₀ = 76.8 mph (Exhibit 13-12) S = 64.7 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 140 Freeway Volume, V _F 2802 Ramp Volume, V _R 556 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2802	0.92	Level	2	0	0.990	1.00	3076
Ramp	556	0.92	Level	2	0	0.990	1.00	610
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = 0.436 using Equation (Exhibit 13-7)
 V₁₂ = 1685 pc/h
 V₃ or V_{av34} 695 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	
	V _F	3076	Exhibit 13-8 9600 No
	V _{FO} = V _F - V _R	2466	Exhibit 13-8 9600 No
		V _R	610 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	1685	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 17.5 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_S = 0.548 (Exhibit 13-12)
 S_R = 54.7 mph (Exhibit 13-12)
 S₀ = 76.8 mph (Exhibit 13-12)
 S = 62.8 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">245</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2530</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">272</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	245	Deceleration Lane Length L _D		Freeway Volume, V _F	2530	Ramp Volume, V _R	272	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	245																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	2530																	
Ramp Volume, V _R	272																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2530	0.92	Level	2	0	0.990	1.00	2777
Ramp	272	0.92	Level	2	0	0.990	1.00	299
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.249 using Equation (Exhibit 13-6) V ₁₂ = 691 pc/h V ₃ or V _{av34} = 1043 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1110 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.249 using Equation (Exhibit 13-6) V ₁₂ = 691 pc/h V ₃ or V _{av34} = 1043 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1110 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}	3076	Exhibit 13-8	No

Capacity Checks

	Actual	Capacity	LOS F?
V _F		Exhibit 13-8	
V _{FO} = V _F - V _R		Exhibit 13-8	
V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	1409	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 14.8 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 14.8 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.317 (Exhibit 13-11) S _R = 61.1 mph (Exhibit 13-11) S ₀ = 68.8 mph (Exhibit 13-11) S = 65.1 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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Speed Determination

M _S = 0.317 (Exhibit 13-11) S _R = 61.1 mph (Exhibit 13-11) S ₀ = 68.8 mph (Exhibit 13-11) S = 65.1 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1250 Freeway Volume, V _F 3024 Ramp Volume, V _R 494 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3024	0.92	Level	2	0	0.990	1.00	3320
Ramp	494	0.92	Level	2	0	0.990	1.00	542
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = 0.436 using Equation (Exhibit 13-7)
 V₁₂ = 1753 pc/h
 V₃ or V_{av34} 783 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	
	V _F	3320	Exhibit 13-8 9600 No
	V _{FO} = V _F - V _R	2778	Exhibit 13-8 9600 No
		V _R	542 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	1753	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 8.1 (pc/mi/ln)
 LOS = A (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_S = 0.542 (Exhibit 13-12)
 S_R = 54.8 mph (Exhibit 13-12)
 S₀ = 76.8 mph (Exhibit 13-12)
 S = 63.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	1250	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	2501	$L_{down} =$ ft
	Ramp Volume, V_R	523	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2501	0.92	Level	2	0	0.990	1.00	2746
Ramp	523	0.92	Level	2	0	0.990	1.00	574
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	
$L_{EQ} =$	0.146 using Equation (Exhibit 13-6)
$P_{FM} =$	401 pc/h
$V_{12} =$	1172 pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, $V_{12a} =$	1098 pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	
$L_{EQ} =$	using Equation (Exhibit 13-7)
$P_{FD} =$	pc/h
$V_{12} =$	pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3320	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}	1672	Exhibit 13-8	4600:All
			No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	
$D_R =$	10.4 (pc/mi/ln)
LOS =	B (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$	(pc/mi/ln)
LOS =	(Exhibit 13-2)

Speed Determination

$M_S =$	0.267 (Exhibit 13-11)
$S_R =$	62.5 mph (Exhibit 13-11)
$S_0 =$	68.8 mph (Exhibit 13-11)
$S =$	65.5 mph (Exhibit 13-13)

Speed Determination

$D_s =$	(Exhibit 13-12)
$S_R =$	mph (Exhibit 13-12)
$S_0 =$	mph (Exhibit 13-12)
$S =$	mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 2847 Ramp Volume, V _R 346 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2847	0.92	Level	2	0	0.990	1.00	3126
Ramp	346	0.92	Level	2	0	0.990	1.00	380
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = 0.436 using Equation (Exhibit 13-7)
 V₁₂ = 1577 pc/h
 V₃ or V_{av34} 774 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	
	V _F	3126	Exhibit 13-8 9600 No
	V _{FO} = V _F - V _R	2746	Exhibit 13-8 9600 No
		V _R	380 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	1577	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 17.8 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_S = 0.527 (Exhibit 13-12)
 S_R = 55.2 mph (Exhibit 13-12)
 S₀ = 76.8 mph (Exhibit 13-12)
 S = 64.2 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	IA	Freeway/Dir of Travel	I-405 SB							
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp							
Date Performed	05/07/2014	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	Existing							
Project Description City of Newport Beach LUE Amendment TIA (JN08911)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							
$L_{up} =$ ft	Ramp Number of Lanes, N	2	$L_{down} =$ ft							
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$ veh/h							
	Deceleration Lane Length L_D	1500								
	Freeway Volume, V_F	11296								
	Ramp Volume, V_R	1154								
	Freeway Free-Flow Speed, S_{FF}	70.0								
	Ramp Free-Flow Speed, S_{FR}	40.0								
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$		
Freeway	11296	0.92	Level	4	0	0.980	1.00	12524		
Ramp	1154	0.92	Level	4	0	0.980	1.00	1279		
UpStream										
DownStream										
Merge Areas					Diverge Areas					
Estimation of v_{12}					Estimation of v_{12}					
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.260 using Equation (Exhibit 13-7)				
$V_{12} =$	pc/h				$V_{12} =$	3552 pc/h				
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	3234 pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	4620 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V_{FO}		Exhibit 13-8			V_F	10020	Exhibit 13-8		9600	Yes
					$V_{FO} = V_F - V_R$	8741	Exhibit 13-8		9600	No
					V_R	1279	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V_{R12}		Exhibit 13-8			V_{12}	3552	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$					
$D_R =$ (pc/mi/ln)					$D_R =$ 12.5 (pc/mi/ln)					
LOS = (Exhibit 13-2)					LOS = F (Exhibit 13-2)					
Speed Determination					Speed Determination					
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.478 (Exhibit 13-12)					
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 56.6 mph (Exhibit 13-12)					
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 70.2 mph (Exhibit 13-12)					
$S =$ mph (Exhibit 13-13)					$S =$ 63.2 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	1400	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	10142	$L_{down} =$ ft
	Ramp Volume, V_R	906	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	10142	0.92	Level	4	0	0.980	1.00	11244
Ramp	906	0.92	Level	4	0	0.980	1.00	1004
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ $P_{FM} =$ 0.209 using Equation (Exhibit 13-6) $V_{12} =$ 1827 pc/h V_3 or V_{av34} 3458 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 3497 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	9748	Exhibit 13-8	Yes	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	4501	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 19.4 (pc/mi/ln) LOS = F (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.408 (Exhibit 13-11) $S_R =$ 58.6 mph (Exhibit 13-11) $S_0 =$ 61.5 mph (Exhibit 13-11) $S =$ 60.1 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1389 Freeway Volume, V _F 9007 Ramp Volume, V _R 1777 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 50.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1250 ft V _D = 622 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9007	0.92	Level	4	0	0.980	1.00	9986
Ramp	1777	0.92	Level	4	0	0.980	1.00	1970
UpStream								
DownStream	622	0.92	Level	4	0	0.980	1.00	690

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3535 pc/h V ₃ or V _{av34} 2227 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8	9600	
V _{FO}		Exhibit 13-8	9600	No
			9600	No
			4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
V _{R12}	Exhibit 13-8		V ₁₂	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 5.7 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.410 (Exhibit 13-12) S _R = 58.5 mph (Exhibit 13-12) S ₀ = 72.0 mph (Exhibit 13-12) S = 65.3 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1250 ft V _u = 1777 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 260 Deceleration Lane Length L _D 260 Freeway Volume, V _F 7520 Ramp Volume, V _R 622 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7520	0.92	Level	4	0	0.980	1.00	8337
Ramp	622	0.92	Level	4	0	0.980	1.00	690
UpStream	1777	0.90	Level	0	0	1.000	1.00	1974
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.132 using Equation (Exhibit 13-6)
 V₁₂ = 784 pc/h
 V₃ or V_{av34} = 2588 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2384 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6651	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3074	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.5 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.390 (Exhibit 13-11) S _R = 59.1 mph (Exhibit 13-11) S ₀ = 65.4 mph (Exhibit 13-11) S = 62.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D		L _{down} = 1115 ft
V _u = veh/h	Freeway Volume, V _F	7520	V _D = 1068 veh/h
	Ramp Volume, V _R	622	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7520	0.92	Level	4	0	0.980	1.00	8337
Ramp	622	0.92	Level	4	0	0.980	1.00	690
UpStream								
DownStream	1068	0.90	Level	0	0	1.000	1.00	1187

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.132 using Equation (Exhibit 13-6)
 V₁₂ = 784 pc/h
 V₃ or V_{av34} = 2588 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2384 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6651	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3074	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 27.5 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.390 (Exhibit 13-11)
 S_R = 59.1 mph (Exhibit 13-11)
 S₀ = 65.4 mph (Exhibit 13-11)
 S = 62.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1115 ft V _u = 622 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 100 Deceleration Lane Length L _D Freeway Volume, V _F 8024 Ramp Volume, V _R 1068 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8024	0.92	Level	4	0	0.980	1.00	8896
Ramp	1068	0.92	Level	4	0	0.980	1.00	1184
UpStream	622	0.90	Level	0	0	1.000	1.00	691
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1337 pc/h V ₃ or V _{av34} = 2529 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2558 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7580	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3742	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 28.7 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.416 (Exhibit 13-11) S _R = 58.4 mph (Exhibit 13-11) S ₀ = 64.9 mph (Exhibit 13-11) S = 61.5 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1360 ft V _u = 706 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 1500 Deceleration Lane Length L _D 1500 Freeway Volume, V _F 6119 Ramp Volume, V _R 1359 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6119	0.92	Level	4	0	0.980	1.00	6784
Ramp	1359	0.92	Level	4	0	0.980	1.00	1507
UpStream	706	0.90	Level	0	0	1.000	1.00	784
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.029 using Equation (Exhibit 13-6)
 V₁₂ = 146 pc/h
 V₃ or V_{av34} = 2403 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1981 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6460	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3488	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 22.6 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.329 (Exhibit 13-11)
 S_R = 60.8 mph (Exhibit 13-11)
 S₀ = 66.5 mph (Exhibit 13-11)
 S = 63.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 NB		Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp	
Date Performed	05/07/2014	Jurisdiction	Caltrans		Analysis Time Period	PM Peak Hour	Analysis Year	Existing	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 5					Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1					<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D 1500					L _{down} = 1360 ft			
V _u = veh/h	Freeway Volume, V _F 6825					V _D = 1359 veh/h			
	Ramp Volume, V _R 706								
	Freeway Free-Flow Speed, S _{FF} 70.0								
	Ramp Free-Flow Speed, S _{FR} 40.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6825	0.92	Level	4	0	0.980	1.00	7567	
Ramp	706	0.92	Level	4	0	0.980	1.00	783	
UpStream									
DownStream	1359	0.92	Level	4	0	0.980	1.00	1507	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3081 pc/h V ₃ or V _{av34} 1486 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6054	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	5271	Exhibit 13-8	9600	No
					V _R	783	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3081	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 17.2 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.433 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	57.9 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	74.9 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	65.1 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	0	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1035 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 716 veh/h	Freeway Volume, V _F	5805	V _D = veh/h
	Ramp Volume, V _R	1020	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5805	0.92	Level	4	0	0.980	1.00	6436
Ramp	1020	0.92	Level	4	0	0.980	1.00	1131
UpStream	716	0.92	Level	4	0	0.980	1.00	794
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} =
 P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1022 pc/h

V₃ or V_{av34} = 1935 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 1956 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6023	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3087	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 19.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.286 (Exhibit 13-11)

S_R = 62.0 mph (Exhibit 13-11)

S₀ = 66.5 mph (Exhibit 13-11)

S = 64.1 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 5089 Ramp Volume, V _R 716 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1035 ft V _D = 1020 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5089	0.92	Level	4	0	0.980	1.00	5642
Ramp	716	0.92	Level	4	0	0.980	1.00	794
UpStream								
DownStream	1020	0.92	Level	4	0	0.980	1.00	1131

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.119 using Equation (Exhibit 13-6)
 V₁₂ = 508 pc/h
 V₃ or V_{av34} = 1890 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1715 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5082	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2509	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.0 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.352 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = 67.2 mph (Exhibit 13-11)
 S = 63.5 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1245 ft V _u = 1028 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 5089 Ramp Volume, V _R 716 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5089	0.92	Level	4	0	0.980	1.00	5642
Ramp	716	0.92	Level	4	0	0.980	1.00	794
UpStream	1028	0.92	Level	4	0	0.980	1.00	1140
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.119 using Equation (Exhibit 13-6)
 V₁₂ = 508 pc/h
 V₃ or V_{av34} = 1890 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1715 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5082	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2509	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.0 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.352 (Exhibit 13-11) S _R = 60.1 mph (Exhibit 13-11) S ₀ = 67.2 mph (Exhibit 13-11) S = 63.5 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 425 Freeway Volume, V _F 6117 Ramp Volume, V _R 1028 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1245 ft V _D = 716 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6117	0.92	Level	4	0	0.980	1.00	6782
Ramp	1028	0.92	Level	4	0	0.980	1.00	1140
UpStream								
DownStream	716	0.90	Level	0	0	1.000	1.00	796

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2342 pc/h V ₃ or V _{av34} 1711 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?		
V _{FO}		V _F	5765	Exhibit 13-8	9600	No
		V _{FO} = V _F - V _R	4625	Exhibit 13-8	9600	No
		V _R	1140	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?

	Actual	Max Desirable	Violation?	
				V ₁₂

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 12.9 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.466 (Exhibit 13-12) S _R = 57.0 mph (Exhibit 13-12) S ₀ = 74.0 mph (Exhibit 13-12) S = 66.0 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	3	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	290	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	2033	$L_{down} =$ ft
	Ramp Volume, V_R	344	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2033	0.92	Level	2	0	0.990	1.00	2232
Ramp	344	0.92	Level	2	0	0.990	1.00	378
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.586 using Equation (Exhibit 13-6)

$P_{FM} =$ 1307 pc/h

$V_{12} =$ 925 pc/h (Equation 13-14 or 13-17)

V_3 or V_{av34} 925 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1307 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ pc/h

$V_{12} =$ pc/h (Equation 13-14 or 13-17)

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	2610	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1685	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 16.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.319 (Exhibit 13-11)

$S_R =$ 61.1 mph (Exhibit 13-11)

$S_0 =$ 68.5 mph (Exhibit 13-11)

$S =$ 63.5 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	175	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	2377	$V_D =$ veh/h
	Ramp Volume, V_R	268	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2377	0.92	Level	2	0	0.990	1.00	2610
Ramp	268	0.92	Level	2	0	0.990	1.00	294
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)				
$V_{12} =$	pc/h	$V_{12} =$	1304 pc/h				
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	653 pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	2610	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	2316	Exhibit 13-8	9600	No
				V_R	294	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	1304	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 13.9 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = B (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.519 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 55.5 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 76.8 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 64.4 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 2687 Ramp Volume, V _R 516 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2687	0.92	Level	2	0	0.990	1.00	2950
Ramp	516	0.92	Level	2	0	0.990	1.00	566
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	2950	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	2384	Exhibit 13-8	9600	No
				V _R	566	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	1605	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	18.1 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	B (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.544 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	54.8 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	76.8 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	63.0 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	165	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	2171	$L_{down} =$ ft
	Ramp Volume, V_R	211	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2171	0.92	Level	2	0	0.990	1.00	2383
Ramp	211	0.92	Level	2	0	0.990	1.00	232
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.189 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.189 using Equation (Exhibit 13-6)

$V_{12} =$ 450 pc/h

V_3 or $V_{av34} =$ 966 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 953 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	2615	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1185	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 13.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.324 (Exhibit 13-11)

$S_R =$ 60.9 mph (Exhibit 13-11)

$S_0 =$ 69.2 mph (Exhibit 13-11)

$S =$ 65.2 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 140 Freeway Volume, V _F 3658 Ramp Volume, V _R 117 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3658	0.92	Level	2	0	0.990	1.00	4016
Ramp	117	0.92	Level	2	0	0.990	1.00	128
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4016	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	3888	Exhibit 13-8	9600	No
				V _R	128	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	1823	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R = (pc/mi/ln)		D _R = 18.7 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = B (Exhibit 13-2)	

Speed Determination		Speed Determination	
M _S = (Exhibit 13-11)		D _S = 0.505 (Exhibit 13-12)	
S _R = mph (Exhibit 13-11)		S _R = 55.9 mph (Exhibit 13-12)	
S ₀ = mph (Exhibit 13-11)		S ₀ = 76.4 mph (Exhibit 13-12)	
S = mph (Exhibit 13-13)		S = 65.5 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 245 Deceleration Lane Length L _D 245 Freeway Volume, V _F 3549 Ramp Volume, V _R 109 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3549	0.92	Level	2	0	0.990	1.00	3896
Ramp	109	0.92	Level	2	0	0.990	1.00	120
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.203 using Equation (Exhibit 13-6) V ₁₂ = 790 pc/h V ₃ or V _{av34} = 1553 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1558 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4016	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1678	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 17.0 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.322 (Exhibit 13-11) S _R = 61.0 mph (Exhibit 13-11) S ₀ = 67.6 mph (Exhibit 13-11) S = 64.7 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1250 Freeway Volume, V _F 3740 Ramp Volume, V _R 191 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3740	0.92	Level	2	0	0.990	1.00	4106
Ramp	191	0.92	Level	2	0	0.990	1.00	210
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 1909 pc/h V ₃ or V _{av34} 1098 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)			

Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4106	Exhibit 13-8	9600	No
			V _{FO} = V _F - V _R	3896	Exhibit 13-8	9600	No		
			V _R	210	Exhibit 13-10	2000	No		

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	1909	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.4 (pc/mi/ln) LOS = A (Exhibit 13-2)	

Speed Determination		Speed Determination	
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)		D _S = 0.512 (Exhibit 13-12) S _R = 55.7 mph (Exhibit 13-12) S ₀ = 76.4 mph (Exhibit 13-12) S = 65.1 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	1250	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3566	$L_{down} =$ ft
	Ramp Volume, V_R	174	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3566	0.92	Level	2	0	0.990	1.00	3915
Ramp	174	0.92	Level	2	0	0.990	1.00	191
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ $P_{FM} =$ 0.194 using Equation (Exhibit 13-6) $V_{12} =$ 759 pc/h V_3 or V_{av34} 1578 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 1566 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4106	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1757	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 11.3 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.269 (Exhibit 13-11) $S_R =$ 62.5 mph (Exhibit 13-11) $S_0 =$ 67.6 mph (Exhibit 13-11) $S =$ 65.3 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 3773 Ramp Volume, V _R 207 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3773	0.92	Level	2	0	0.990	1.00	4142
Ramp	207	0.92	Level	2	0	0.990	1.00	227
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = 0.436 using Equation (Exhibit 13-7)
 V₁₂ = 1934 pc/h
 V₃ or V_{av34} 1104 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	
	V _F	4142	Exhibit 13-8 9600 No
	V _{FO} = V _F - V _R	3915	Exhibit 13-8 9600 No
		V _R	227 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	1934	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 20.9 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_S = 0.513 (Exhibit 13-12)
 S_R = 55.6 mph (Exhibit 13-12)
 S₀ = 76.4 mph (Exhibit 13-12)
 S = 65.0 mph (Exhibit 13-13)

APPENDIX 3.3

HCM 2010 Version
2006 General Plan Freeway Mainline Analysis Worksheets

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10361	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	2297 pc/h/ln	Design LOS	
S	56.0 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	41.0 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13302	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	75.0	FFS	75.0
Base free-flow Speed, BFFS	mph		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})	2458	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	51.5	x f _p)	
D = v _p / S	47.8	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	12323	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	7	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1952	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.4	x f _p)	
D = v _p / S	30.8	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10656	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	7	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1688	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	67.2	x f _p)	
D = v _p / S	25.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8828	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1958	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.3	x f _p)	
D = v _p / S	30.9	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11864	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2192	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	58.6	x f _p)	
D = v _p / S	37.4	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	12640	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2336	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	55.0	x f _p)	
D = v _p / S	42.4	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13101	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2421	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	52.7	mph	x f _p)
D = v _p / S	45.9	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6631	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
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})	1820	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	65.5	mph	x f _p)
D = v _p / S	27.8	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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8322	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	2284 pc/h/ln	Design LOS	
S	56.4 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	40.5 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7204	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1977	Design LOS	
S	63.0	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	31.4	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4291	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Rolling
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	942	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	13.5	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<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
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1154	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	16.5	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5949	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1633	Design LOS	
S	67.8	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	24.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8660	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	2377 pc/h/ln	Design LOS	
S	53.9 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	44.1 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4514	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	991	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	14.2	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	4484	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	1231 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	17.6 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5317	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	982	pc/h/ln	
x f _p)			
S	70.0	mph	v _p = (V or DDHV) / (PHF x N x f _{HV})
D = v _p / S	14.0	pc/mi/ln	x f _p)
LOS	B		S
			D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3709	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1028	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	14.7	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	3337	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	925 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	13.2 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2561	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	946	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	13.5	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13835	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2556	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	48.7	x f _p)	
D = v _p / S	52.5	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9569	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2652	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	45.5	x f _p)	
D = v _p / S	58.2	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9384	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2601	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	47.2	x f _p)	
D = v _p / S	55.1	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6254	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	2311 pc/h/ln	Design LOS	
S	55.7 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	41.5 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10950	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2428	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	52.5	x f _p)	
D = v _p / S	46.2	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11136	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	75.0	FFS	75.0
Base free-flow Speed, BFFS	mph		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})	2058	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	62.6	x f _p)	
D = v _p / S	32.9	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11502	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	7	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1822	Design LOS	
S	65.5	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	27.8	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11392	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	7	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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} x f _p)	1804 pc/h/ln	Design LOS	
S	65.8 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	27.4 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6579	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1459	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.2	x f _p)	
D = v _p / S	21.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11431	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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} x f _p)	2112 pc/h/ln	Design LOS	
S	60.4 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	35.0 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10459	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1933	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.8	x f _p)	
D = v _p / S	30.3	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5638	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1547	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.6	x f _p)	
D = v _p / S	22.5	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7793	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2139	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	59.8	x f _p)	
D = v _p / S	35.8	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6706	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
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} x f _p)	1841 pc/h/ln	Design LOS	
S	65.2 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	28.2 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	4137	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1135 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	16.2 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8222	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	2257 pc/h/ln	Design LOS	
S	57.0 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	39.6 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5085	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1116 pc/h/ln	Design LOS	
S	70.0 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	15.9 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	4905	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1346	pc/h/ln	
x f _p)			
S	69.8	mph	
D = v _p / S	19.3	pc/mi/ln	
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	IA		Highway/Direction of Travel	SR-55 SB	
Agency or Company	Urban Crossroads, Inc.		From/To	Dyer Rd. to MacArthur Blvd.	
Date Performed	05/07/2014		Jurisdiction	Caltrans	
Analysis Time Period	PM Peak Hour		Analysis Year	2006 General Plan	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)					
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data	
Flow Inputs					
Volume, V	8392	veh/h	Peak-Hour Factor, PHF	0.92	
AADT		veh/day	%Trucks and Buses, P _T	4	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustments					
f _p	1.00		E _R	1.2	
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}	mph	
Number of Lanes, N	6		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})	1551	pc/h/ln	Design LOS		
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln	
S	68.6	mph	x f _p)		
D = v _p / S	22.6	pc/mi/ln	S	mph	
LOS	C		D = v _p / S	pc/mi/ln	
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8273	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	1529	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.7	x f _p)	
D = v _p / S	22.2	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5294	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1467 pc/h/ln	Design LOS	
S	69.2 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	21.2 pc/mi/ln	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5430	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width		ft	
Rt-Side Lat. Clearance		ft	
Number of Lanes, N	4		
Total Ramp Density, TRD		ramps/mi	
FFS (measured)	70.0	mph	
Base free-flow Speed, BFFS		mph	
			f _{LW}
			mph
			f _{LC}
			mph
			TRD Adjustment
			mph
			FFS
			70.0
			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	
	1505	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	68.9	mph	x f _p)
D = v _p / S	21.8	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			

Flow Inputs			
Volume, V	4811	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1333	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.8	x f _p)	
D = v _p / S	19.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3619	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		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)	1337 pc/h/ln	Design LOS	
S	69.8 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	19.2 pc/mi/ln	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11536	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2558	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	48.6	mph	x f _p)
D = v _p / S	52.6	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11083	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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})	2048	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	61.7	mph	x f _p)
D = v _p / S	33.2	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	02/19/2014	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7376	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2044	pc/h/ln	
x f _p)			
S	61.7	mph	
D = v _p / S	33.1	pc/mi/ln	
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7628	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
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	FFS	70.0
Base free-flow Speed, BFFS	mph		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})	2114	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	60.3	x f _p)	
D = v _p / S	35.1	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs

Volume, V	6745	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs

Calc Speed Adj and FFS

Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0		mph
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

Design (N)

Operational (LOS)		Design (N)	
Design LOS		Design LOS	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1870 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
x f _p)		x f _p)	
S	64.8 mph	S	mph
D = v _p / S	28.9 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4912	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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})	1815	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.6	x f _p)	
D = v _p / S	27.7	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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			

APPENDIX 3.4

HCM 2010 Version
2006 General Plan Freeway Ramp Analysis Worksheets

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 10844 Ramp Volume, V _R 1941 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10844	0.92	Level	4	0	0.980	1.00	12023
Ramp	1941	0.92	Level	4	0	0.980	1.00	2152
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4093 pc/h V ₃ or V _{av34} 2763 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = 4219 pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8	9600	
V _{FO}		Exhibit 13-8	9600	Yes
			9600	No
			4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
V _{R12}	Exhibit 13-8		V ₁₂	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.0 (pc/mi/ln) LOS = F (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.557 (Exhibit 13-12) S _R = 54.4 mph (Exhibit 13-12) S ₀ = 70.2 mph (Exhibit 13-12) S = 62.3 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: center;">1400</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: center;">9461</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: center;">592</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: center;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: center;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	2	Acceleration Lane Length, L _A	1400	Deceleration Lane Length L _D		Freeway Volume, V _F	9461	Ramp Volume, V _R	592	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	2																	
Acceleration Lane Length, L _A	1400																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	9461																	
Ramp Volume, V _R	592																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9461	0.92	Level	4	0	0.980	1.00	10489
Ramp	592	0.92	Level	4	0	0.980	1.00	656
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

	$V_{12} = V_F (P_{FM})$
L _{EQ} =	(Equation 13-6 or 13-7)
P _{FM} =	0.209 using Equation (Exhibit 13-6)
V ₁₂ =	1670 pc/h
V ₃ or V _{av34}	3159 pc/h (Equation 13-14 or 13-17)
Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V _{12a} =	3195 pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L _{EQ} =	(Equation 13-12 or 13-13)
P _{FD} =	using Equation (Exhibit 13-7)
V ₁₂ =	pc/h
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}	8645	Exhibit 13-8	No

Capacity Checks

	Actual	Capacity	LOS F?
V _F		Exhibit 13-8	
V _{FO} = V _F - V _R		Exhibit 13-8	
V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	3851	Exhibit 13-8	4600:All
			No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

	$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
D _R =	14.5 (pc/mi/ln)
LOS =	B (Exhibit 13-2)

Level of Service Determination (if not F)

	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D _R =	(pc/mi/ln)
LOS =	(Exhibit 13-2)

Speed Determination

M _S =	0.240 (Exhibit 13-11)
S _R =	63.3 mph (Exhibit 13-11)
S ₀ =	62.9 mph (Exhibit 13-11)
S =	63.1 mph (Exhibit 13-13)

Speed Determination

D _s =	(Exhibit 13-12)
S _R =	mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1389 Freeway Volume, V _F 8419 Ramp Volume, V _R 2510 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 50.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1250 ft V _D = 299 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8419	0.92	Level	4	0	0.980	1.00	9334
Ramp	2510	0.92	Level	4	0	0.980	1.00	2783
UpStream								
DownStream	299	0.92	Level	4	0	0.980	1.00	331

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4001 pc/h V ₃ or V _{av34} 1733 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?		
V _{FO}		V _F	7468	Exhibit 13-8	9600	No
		V _{FO} = V _F - V _R	4685	Exhibit 13-8	9600	No
		V _R	2783	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?

	Actual	Max Desirable	Violation?	
				V ₁₂

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.7 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.483 (Exhibit 13-12) S _R = 56.5 mph (Exhibit 13-12) S ₀ = 73.9 mph (Exhibit 13-12) S = 63.4 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1250 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 2510 veh/h	Freeway Volume, V _F	6940	V _D = veh/h
	Ramp Volume, V _R	299	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6940	0.92	Level	4	0	0.980	1.00	7694
Ramp	299	0.92	Level	4	0	0.980	1.00	331
UpStream	2510	0.92	Level	0	0	1.000	1.00	2728
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.176 using Equation (Exhibit 13-6)
 V₁₂ = 971 pc/h
 V₃ or V_{av34} = 2265 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2200 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5833	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2531	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.4 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.354 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = 65.9 mph (Exhibit 13-11)
 S = 63.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D		L _{down} = 1115 ft
V _u = veh/h	Freeway Volume, V _F	6940	V _D = 753 veh/h
	Ramp Volume, V _R	299	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6940	0.92	Level	4	0	0.980	1.00	7694
Ramp	299	0.92	Level	4	0	0.980	1.00	331
UpStream								
DownStream	753	0.92	Level	0	0	1.000	1.00	818

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.176 using Equation (Exhibit 13-6)
 V₁₂ = 971 pc/h
 V₃ or V_{av34} = 2265 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2200 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5833	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2531	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.4 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.354 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = 65.9 mph (Exhibit 13-11)
 S = 63.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1115 ft V _u = 299 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 100 Deceleration Lane Length L _D Freeway Volume, V _F 7145 Ramp Volume, V _R 753 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7145	0.92	Level	4	0	0.980	1.00	7922
Ramp	753	0.92	Level	4	0	0.980	1.00	835
UpStream	299	0.92	Level	0	0	1.000	1.00	325
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1184 pc/h V ₃ or V _{av34} = 2240 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2266 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6500	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3101	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.8 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.338 (Exhibit 13-11) S _R = 60.5 mph (Exhibit 13-11) S ₀ = 65.7 mph (Exhibit 13-11) S = 63.1 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1360 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 1980 veh/h	Freeway Volume, V _F	8990	V _D = veh/h
	Ramp Volume, V _R	520	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8990	0.92	Level	4	0	0.980	1.00	9967
Ramp	520	0.92	Level	4	0	0.980	1.00	577
UpStream	1980	0.92	Level	0	0	1.000	1.00	2152
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.146 using Equation (Exhibit 13-6)
 V₁₂ = 1088 pc/h
 V₃ or V_{av34} = 3189 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2986 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8044	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3563	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.6 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.339 (Exhibit 13-11)
 S_R = 60.5 mph (Exhibit 13-11)
 S₀ = 63.7 mph (Exhibit 13-11)
 S = 62.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 10304 Ramp Volume, V _R 1980 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1360 ft V _D = 520 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10304	0.92	Level	4	0	0.980	1.00	11424
Ramp	1980	0.92	Level	4	0	0.980	1.00	2195
UpStream								
DownStream	520	0.92	Level	4	0	0.980	1.00	577

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 5223 pc/h V ₃ or V _{av34} 1958 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	9140	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	6945	Exhibit 13-8	9600	No
				V _R	2195	Exhibit 13-10	2100	Yes

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	5223	Exhibit 13-8	4400:All	Yes

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 35.7 (pc/mi/ln) LOS = F (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.561 (Exhibit 13-12) S _R = 54.3 mph (Exhibit 13-12) S ₀ = 73.1 mph (Exhibit 13-12) S = 61.0 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	0	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1035 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 510 veh/h	Freeway Volume, V _F	8675	V _D = veh/h
	Ramp Volume, V _R	1140	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8675	0.92	Level	4	0	0.980	1.00	9618
Ramp	1140	0.92	Level	4	0	0.980	1.00	1264
UpStream	510	0.92	Level	4	0	0.980	1.00	565
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.209 using Equation (Exhibit 13-6)

P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1488 pc/h

V₃ or V_{av34} = 2815 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2847 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8382	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	4111	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D _R = 27.6 (pc/mi/ln)	D _R = (pc/mi/ln)
LOS = C (Exhibit 13-2)	LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M _S = 0.439 (Exhibit 13-11)	D _s = (Exhibit 13-12)
S _R = 57.7 mph (Exhibit 13-11)	S _R = mph (Exhibit 13-12)
S ₀ = 64.1 mph (Exhibit 13-11)	S ₀ = mph (Exhibit 13-12)
S = 60.8 mph (Exhibit 13-13)	S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A 275 Deceleration Lane Length L_D Freeway Volume, V_F 8559 Ramp Volume, V_R 510 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 1035 ft $V_D =$ 1140 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	8559	0.92	Level	4	0	0.980	1.00	9489
Ramp	510	0.92	Level	4	0	0.980	1.00	565
UpStream								
DownStream	1140	0.92	Level	4	0	0.980	1.00	1264

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $L_{EQ} =$
 $P_{FM} =$ 0.147 using Equation (Exhibit 13-6)
 $V_{12} =$ 1029 pc/h
 V_3 or V_{av34} 2980 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No
 If Yes, $V_{12a} =$ 2795 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $L_{EQ} =$
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	7554	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	3360	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 29.7 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.417 (Exhibit 13-11) $S_R =$ 58.3 mph (Exhibit 13-11) $S_0 =$ 64.3 mph (Exhibit 13-11) $S =$ 61.5 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	275	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1245 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 2448 veh/h	Freeway Volume, V _F	8559	V _D = veh/h
	Ramp Volume, V _R	510	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8559	0.92	Level	4	0	0.980	1.00	9489
Ramp	510	0.92	Level	4	0	0.980	1.00	565
UpStream	2448	0.92	Level	4	0	0.980	1.00	2714
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.147 using Equation (Exhibit 13-6)

P_{FM} = 0.147 using Equation (Exhibit 13-6)

V₁₂ = 1029 pc/h

V₃ or V_{av34} = 2980 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2795 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7554	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3360	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 29.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.417 (Exhibit 13-11)

S_R = 58.3 mph (Exhibit 13-11)

S₀ = 64.3 mph (Exhibit 13-11)

S = 61.5 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 425 Freeway Volume, V _F 10680 Ramp Volume, V _R 2448 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1245 ft V _D = 510 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10680	0.92	Level	4	0	0.980	1.00	11841
Ramp	2448	0.92	Level	4	0	0.980	1.00	2714
UpStream								
DownStream	510	0.92	Level	0	0	1.000	1.00	554

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4471 pc/h V ₃ or V _{av34} 2501 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8		
V _{FO}	V _F	9473	Exhibit 13-8 9600	No
	V _{FO} = V _F - V _R	6759	Exhibit 13-8 9600	No
	V _R	2714	Exhibit 13-10 4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V ₁₂	4471	Exhibit 13-8 4400:All	Yes

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 31.2 (pc/mi/ln) LOS = D (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.607 (Exhibit 13-12) S _R = 53.0 mph (Exhibit 13-12) S ₀ = 70.9 mph (Exhibit 13-12) S = 61.2 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	290	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	4161	$L_{down} =$ ft
	Ramp Volume, V_R	130	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4161	0.92	Level	2	0	0.990	1.00	4568
Ramp	130	0.92	Level	2	0	0.990	1.00	143
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.200 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.200 using Equation (Exhibit 13-6)

$V_{12} =$ 913 pc/h

V_3 or $V_{av34} =$ 1827 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1827 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4711	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1970	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ 19.0 (pc/mi/ln)	$D_R =$ (pc/mi/ln)
LOS = B (Exhibit 13-2)	LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.326 (Exhibit 13-11)	$D_s =$ (Exhibit 13-12)
$S_R =$ 60.9 mph (Exhibit 13-11)	$S_R =$ mph (Exhibit 13-12)
$S_0 =$ 66.9 mph (Exhibit 13-11)	$S_0 =$ mph (Exhibit 13-12)
$S =$ 64.2 mph (Exhibit 13-13)	$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	175	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4291	V _D = veh/h
	Ramp Volume, V _R	317	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4291	0.92	Level	2	0	0.990	1.00	4711
Ramp	317	0.92	Level	2	0	0.990	1.00	348
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4711	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4363	Exhibit 13-8	9600	No
				V _R	348	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2250	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	22.0 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	C (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.524 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	55.3 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	75.9 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	64.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4204	$V_D =$ veh/h
	Ramp Volume, V_R	450	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4204	0.92	Level	2	0	0.990	1.00	4615
Ramp	450	0.92	Level	2	0	0.990	1.00	494
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
$L_{EQ} =$ using Equation (Exhibit 13-6)				$L_{EQ} =$ 0.436 using Equation (Exhibit 13-7)			
$P_{FM} =$ pc/h				$P_{FD} =$ 2291 pc/h			
$V_{12} =$ pc/h (Equation 13-14 or 13-17)				$V_{12} =$ 1162 pc/h (Equation 13-14 or 13-17)			
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	4615	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	4121	Exhibit 13-8	9600	No
				V_R	494	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2291	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)	$D_R =$ 24.0 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = C (Exhibit 13-2)

Speed Determination	Speed Determination
$M_S =$ (Exhibit 13-11)	$D_S =$ 0.537 (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-11)	$S_R =$ 55.0 mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-11)	$S_0 =$ 76.2 mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)	$S =$ 63.9 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	165	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3754	$L_{down} =$ ft
	Ramp Volume, V_R	230	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3754	0.92	Level	2	0	0.990	1.00	4121
Ramp	230	0.92	Level	2	0	0.990	1.00	252
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.186 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.186 using Equation (Exhibit 13-6)

$V_{12} =$ 768 pc/h

V_3 or V_{av34} 1676 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1648 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4373	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1900	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 19.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.337 (Exhibit 13-11)

$S_R =$ 60.6 mph (Exhibit 13-11)

$S_0 =$ 67.4 mph (Exhibit 13-11)

$S =$ 64.2 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	1AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	245	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3674	$L_{down} =$ ft
	Ramp Volume, V_R	840	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3674	0.92	Level	2	0	0.990	1.00	4033
Ramp	840	0.92	Level	2	0	0.990	1.00	922
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.103 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.103 using Equation (Exhibit 13-6)

$V_{12} =$ 323 pc/h

V_3 or V_{av34} 1411 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1258 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4068	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2180	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ 20.5 (pc/mi/ln)	$D_R =$ (pc/mi/ln)
LOS = C (Exhibit 13-2)	LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.336 (Exhibit 13-11)	$D_s =$ (Exhibit 13-12)
$S_R =$ 60.6 mph (Exhibit 13-11)	$S_R =$ mph (Exhibit 13-12)
$S_0 =$ 68.4 mph (Exhibit 13-11)	$S_0 =$ mph (Exhibit 13-12)
$S =$ 64.0 mph (Exhibit 13-13)	$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	1250	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4484	$V_D =$ veh/h
	Ramp Volume, V_R	810	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4484	0.92	Level	2	0	0.990	1.00	4923
Ramp	810	0.92	Level	2	0	0.990	1.00	889
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$L_{EQ} =$	$V_{12} =$	$L_{EQ} =$	$V_{12} =$
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)	$P_{FD} =$	2648 pc/h	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)
$V_{12} =$	pc/h	$V_{12} =$	1137 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	2648 pc/h	$V_{12} =$	1137 pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1137 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1137 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1137 pc/h (Equation 13-14 or 13-17)
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	4923	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	4034	Exhibit 13-8	9600	No
				V_R	889	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2648	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 15.8 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = B (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.573 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 54.0 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 76.3 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 62.4 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	1250	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3964	$L_{down} =$ ft
	Ramp Volume, V_R	520	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3964	0.92	Level	2	0	0.990	1.00	4352
Ramp	520	0.92	Level	2	0	0.990	1.00	571
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.146 using Equation (Exhibit 13-6) $P_{FM} =$ 637 pc/h $V_{12} =$ 1857 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 1857 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 1740 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4923	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2311	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 15.4 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.285 (Exhibit 13-11) $S_R =$ 62.0 mph (Exhibit 13-11) $S_0 =$ 67.1 mph (Exhibit 13-11) $S =$ 64.6 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4464	$V_D =$ veh/h
	Ramp Volume, V_R	500	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4464	0.92	Level	2	0	0.990	1.00	4901
Ramp	500	0.92	Level	2	0	0.990	1.00	549
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v_{12}	Estimation of v_{12}
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ 0.436 using Equation (Exhibit 13-7) $P_{FD} =$ 2446 pc/h $V_{12} =$ 1227 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}	V_F	Exhibit 13-8	9600
	$V_{FO} = V_F - V_R$		2000
	V_R		No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 25.3 (pc/mi/ln) LOS = C (Exhibit 13-2)
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Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_s =$ 0.542 (Exhibit 13-12) $S_R =$ 54.8 mph (Exhibit 13-12) $S_0 =$ 75.9 mph (Exhibit 13-12) $S =$ 63.7 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 9078 Ramp Volume, V _R 1033 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9078	0.92	Level	4	0	0.980	1.00	10065
Ramp	1033	0.92	Level	4	0	0.980	1.00	1145
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2941 pc/h V ₃ or V _{av34} 2555 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3220 pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
		Exhibit 13-8					Exhibit 13-8		
V _{FO}		Exhibit 13-8			V _F	8052	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	6907	Exhibit 13-8	9600	No
					V _R	1145	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	2941	Exhibit 13-8	4400:All

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 0.4 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.466 (Exhibit 13-12) S _R = 57.0 mph (Exhibit 13-12) S ₀ = 71.3 mph (Exhibit 13-12) S = 64.8 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">2</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">1400</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">8361</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">1153</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	2	Acceleration Lane Length, L _A	1400	Deceleration Lane Length L _D		Freeway Volume, V _F	8361	Ramp Volume, V _R	1153	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	2																	
Acceleration Lane Length, L _A	1400																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	8361																	
Ramp Volume, V _R	1153																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8361	0.92	Level	4	0	0.980	1.00	9270
Ramp	1153	0.92	Level	4	0	0.980	1.00	1278
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1415 pc/h V ₃ or V _{av34} = 2677 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2708 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8048	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3986	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 15.3 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.267 (Exhibit 13-11) S _R = 62.5 mph (Exhibit 13-11) S ₀ = 64.5 mph (Exhibit 13-11) S = 63.5 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1389 Freeway Volume, V _F 7858 Ramp Volume, V _R 1916 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 50.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1250 ft V _D = 800 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7858	0.92	Level	4	0	0.980	1.00	8712
Ramp	1916	0.92	Level	4	0	0.980	1.00	2124
UpStream								
DownStream	800	0.92	Level	4	0	0.980	1.00	887

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3384 pc/h V ₃ or V _{av34} 1793 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	6970	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4846	Exhibit 13-8	9600	No
				V _R	2124	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	3384	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 4.4 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.424 (Exhibit 13-12) S _R = 58.1 mph (Exhibit 13-12) S ₀ = 73.7 mph (Exhibit 13-12) S = 65.2 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1250 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 1916 veh/h	Freeway Volume, V _F	6428	V _D = veh/h
	Ramp Volume, V _R	800	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6428	0.92	Level	4	0	0.980	1.00	7127
Ramp	800	0.92	Level	4	0	0.980	1.00	887
UpStream	1916	0.92	Level	0	0	1.000	1.00	2083
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.107 using Equation (Exhibit 13-6)
 V₁₂ = 556 pc/h
 V₃ or V_{av34} = 2323 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2081 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6090	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2968	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 26.6 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.381 (Exhibit 13-11)
 S_R = 59.3 mph (Exhibit 13-11)
 S₀ = 66.2 mph (Exhibit 13-11)
 S = 62.7 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	100	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1115 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 800 veh/h	Freeway Volume, V _F	6974	V _D = veh/h
	Ramp Volume, V _R	1330	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6974	0.92	Level	4	0	0.980	1.00	7732
Ramp	1330	0.92	Level	4	0	0.980	1.00	1475
UpStream	800	0.92	Level	0	0	1.000	1.00	870
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.209 using Equation (Exhibit 13-6)

P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1156 pc/h

V₃ or V_{av34} = 2186 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2211 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7004	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3686	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.1 (pc/mi/ln)

LOS = D (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.407 (Exhibit 13-11)

S_R = 58.6 mph (Exhibit 13-11)

S₀ = 65.8 mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1360 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 941 veh/h	Freeway Volume, V _F	8458	V _D = veh/h
	Ramp Volume, V _R	1610	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8458	0.92	Level	4	0	0.980	1.00	9377
Ramp	1610	0.92	Level	4	0	0.980	1.00	1785
UpStream	941	0.92	Level	0	0	1.000	1.00	1023
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ <p>(Equation 13-6 or 13-7)</p> <p>L_{EQ} = -0.005 using Equation (Exhibit 13-6)</p> <p>P_{FM} = -36 pc/h</p> <p>V₁₂ = 3456 pc/h (Equation 13-14 or 13-17)</p> <p>Is V₃ or V_{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is V₃ or V_{av34} > 1.5 * V₁₂/2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, V_{12a} = 2750 pc/h (Equation 13-16, 13-18, or 13-19)</p>	$V_{12} = V_R + (V_F - V_R)P_{FD}$ <p>(Equation 13-12 or 13-13)</p> <p>L_{EQ} = using Equation (Exhibit 13-7)</p> <p>P_{FD} = pc/h</p> <p>V₁₂ = pc/h (Equation 13-14 or 13-17)</p> <p>Is V₃ or V_{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is V₃ or V_{av34} > 1.5 * V₁₂/2 <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)</p>
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8662	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	4535	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ <p>D_R = 30.6 (pc/mi/ln)</p> <p>LOS = D (Exhibit 13-2)</p>	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ <p>D_R = (pc/mi/ln)</p> <p>LOS = (Exhibit 13-2)</p>
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Speed Determination

Speed Determination

<p>M_S = 0.565 (Exhibit 13-11)</p> <p>S_R = 54.2 mph (Exhibit 13-11)</p> <p>S₀ = 64.4 mph (Exhibit 13-11)</p> <p>S = 58.6 mph (Exhibit 13-13)</p>	<p>D_s = (Exhibit 13-12)</p> <p>S_R = mph (Exhibit 13-12)</p> <p>S₀ = mph (Exhibit 13-12)</p> <p>S = mph (Exhibit 13-13)</p>
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 NB						
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp						
Date Performed	05/07/2014	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan						
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off						
$L_{up} =$ ft	Ramp Number of Lanes, N	1	$L_{down} =$	1360 ft					
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$	1610 veh/h					
	Deceleration Lane Length L_D	1500							
	Freeway Volume, V_F	9319							
	Ramp Volume, V_R	941							
	Freeway Free-Flow Speed, S_{FF}	70.0							
	Ramp Free-Flow Speed, S_{FR}	40.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	9319	0.92	Level	4	0	0.980	1.00	10332	
Ramp	941	0.92	Level	4	0	0.980	1.00	1043	
UpStream									
DownStream	1610	0.92	Level	4	0	0.980	1.00	1785	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$	(Equation 13-6 or 13-7)			$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$	(Equation 13-12 or 13-13)		
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.436	using Equation (Exhibit 13-7)		
$V_{12} =$	pc/h				$V_{12} =$	4192 pc/h			
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	2037 pc/h (Equation 13-14 or 13-17)			
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	8266	Exhibit 13-8	9600	No
					$V_{FO} = V_F - V_R$	7223	Exhibit 13-8	9600	No
					V_R	1043	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	4192	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 26.8 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.457 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 57.2 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 72.7 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 63.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1035 ft V _u = 740 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 0 Deceleration Lane Length L _D Freeway Volume, V _F 7799 Ramp Volume, V _R 1000 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7799	0.92	Level	4	0	0.980	1.00	8647
Ramp	1000	0.92	Level	4	0	0.980	1.00	1109
UpStream	740	0.92	Level	4	0	0.980	1.00	820
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1285 pc/h V ₃ or V _{av34} = 2431 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2458 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7256	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3567	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.4 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.339 (Exhibit 13-11) S _R = 60.5 mph (Exhibit 13-11) S ₀ = 65.2 mph (Exhibit 13-11) S = 62.8 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 7196 Ramp Volume, V _R 740 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1035 ft V _D = 1000 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7196	0.92	Level	4	0	0.980	1.00	7978
Ramp	740	0.92	Level	4	0	0.980	1.00	820
UpStream								
DownStream	1000	0.92	Level	4	0	0.980	1.00	1109

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.115 using Equation (Exhibit 13-6)
 V₁₂ = 658 pc/h
 V₃ or V_{av34} = 2523 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2282 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6525	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3102	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 27.6 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.391 (Exhibit 13-11)
 S_R = 59.0 mph (Exhibit 13-11)
 S₀ = 65.6 mph (Exhibit 13-11)
 S = 62.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	275	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1245 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 1396 veh/h	Freeway Volume, V _F	7196	V _D = veh/h
	Ramp Volume, V _R	740	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7196	0.92	Level	4	0	0.980	1.00	7978
Ramp	740	0.92	Level	4	0	0.980	1.00	820
UpStream	1396	0.92	Level	4	0	0.980	1.00	1548
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.115 using Equation (Exhibit 13-6)
 V₁₂ = 658 pc/h
 V₃ or V_{av34} = 2523 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2282 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6525	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3102	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 27.6 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.391 (Exhibit 13-11)
 S_R = 59.0 mph (Exhibit 13-11)
 S₀ = 65.6 mph (Exhibit 13-11)
 S = 62.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 425 Freeway Volume, V _F 8526 Ramp Volume, V _R 1396 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1245 ft V _D = 740 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8526	0.92	Level	4	0	0.980	1.00	9453
Ramp	1396	0.92	Level	4	0	0.980	1.00	1548
UpStream								
DownStream	740	0.92	Level	0	0	1.000	1.00	804

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3112 pc/h V ₃ or V _{av34} 2225 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	7563	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	6015	Exhibit 13-8	9600	No
				V _R	1548	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	3112	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 19.5 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.502 (Exhibit 13-12) S _R = 55.9 mph (Exhibit 13-12) S ₀ = 72.0 mph (Exhibit 13-12) S = 64.4 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr><td>Freeway Number of Lanes, N</td><td style="text-align: right;">4</td></tr> <tr><td>Ramp Number of Lanes, N</td><td style="text-align: right;">1</td></tr> <tr><td>Acceleration Lane Length, L_A</td><td style="text-align: right;">290</td></tr> <tr><td>Deceleration Lane Length L_D</td><td></td></tr> <tr><td>Freeway Volume, V_F</td><td style="text-align: right;">3447</td></tr> <tr><td>Ramp Volume, V_R</td><td style="text-align: right;">449</td></tr> <tr><td>Freeway Free-Flow Speed, S_{FF}</td><td style="text-align: right;">70.0</td></tr> <tr><td>Ramp Free-Flow Speed, S_{FR}</td><td style="text-align: right;">40.0</td></tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	290	Deceleration Lane Length L _D		Freeway Volume, V _F	3447	Ramp Volume, V _R	449	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	290																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	3447																	
Ramp Volume, V _R	449																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3447	0.92	Level	2	0	0.990	1.00	3784
Ramp	449	0.92	Level	2	0	0.990	1.00	493
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.156 using Equation (Exhibit 13-6)
 V₁₂ = 591 pc/h
 V₃ or V_{av34} = 1596 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1513 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4277	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2006	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 19.1 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.327 (Exhibit 13-11)
 S_R = 60.8 mph (Exhibit 13-11)
 S₀ = 67.7 mph (Exhibit 13-11)
 S = 64.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	175	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	3896	V _D = veh/h
	Ramp Volume, V _R	541	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3896	0.92	Level	2	0	0.990	1.00	4277
Ramp	541	0.92	Level	2	0	0.990	1.00	594
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v ₁₂				Estimation of v ₁₂			
L _{EQ} =		V ₁₂ = V _F (P _{FM})		L _{EQ} =		V ₁₂ = V _R + (V _F - V _R)P _{FD}	
		(Equation 13-6 or 13-7)				(Equation 13-12 or 13-13)	
P _{FM} =		using Equation (Exhibit 13-6)		P _{FD} =		0.436 using Equation (Exhibit 13-7)	
V ₁₂ =		pc/h		V ₁₂ =		2014 pc/h	
V ₃ or V _{av34}		pc/h (Equation 13-14 or 13-17)		V ₃ or V _{av34}		918 pc/h (Equation 13-14 or 13-17)	
Is V ₃ or V _{av34} > 2,700 pc/h?		<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V ₃ or V _{av34} > 2,700 pc/h?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2		<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, V _{12a} =		pc/h (Equation 13-16, 13-18, or 13-19)		If Yes, V _{12a} =		pc/h (Equation 13-16, 13-18, or 13-19)	

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	3850	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	3256	Exhibit 13-8	9600	No
				V _R	594	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2014	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R = (pc/mi/ln)		D _R = 20.0 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = B (Exhibit 13-2)	

Speed Determination		Speed Determination	
M _S = (Exhibit 13-11)		D _S = 0.546 (Exhibit 13-12)	
S _R = mph (Exhibit 13-11)		S _R = 54.7 mph (Exhibit 13-12)	
S ₀ = mph (Exhibit 13-11)		S ₀ = 76.8 mph (Exhibit 13-12)	
S = mph (Exhibit 13-13)		S = 63.4 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	275	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3355	$L_{down} =$ ft
	Ramp Volume, V_R	782	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3355	0.92	Level	2	0	0.990	1.00	3683
Ramp	782	0.92	Level	2	0	0.990	1.00	858
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.187 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.187 using Equation (Exhibit 13-6)

$V_{12} =$ 538 pc/h

V_3 or V_{av34} 1167 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1149 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ (Equation 13-12 or 13-13)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3731	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2007	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 19.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.328 (Exhibit 13-11)

$S_R =$ 60.8 mph (Exhibit 13-11)

$S_0 =$ 68.7 mph (Exhibit 13-11)

$S =$ 64.2 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4137	$V_D =$ veh/h
	Ramp Volume, V_R	570	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4137	0.92	Level	2	0	0.990	1.00	4542
Ramp	570	0.92	Level	2	0	0.990	1.00	626
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)		$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)					
$L_{EQ} =$	using Equation (Exhibit 13-6)	$L_{EQ} =$	0.436 using Equation (Exhibit 13-7)				
$P_{FM} =$	pc/h	$P_{FD} =$	2333 pc/h				
$V_{12} =$	pc/h (Equation 13-14 or 13-17)	$V_{12} =$	1104 pc/h (Equation 13-14 or 13-17)				
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1104 pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	4542	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	3916	Exhibit 13-8	9600	No
				V_R	626	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2333	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 24.3 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.549 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 54.6 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 76.4 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 63.4 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	245	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	4595	$L_{down} =$ ft
	Ramp Volume, V_R	490	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4595	0.92	Level	2	0	0.990	1.00	5045
Ramp	490	0.92	Level	2	0	0.990	1.00	538
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.151 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.151 using Equation (Exhibit 13-6)

$V_{12} =$ 593 pc/h

V_3 or V_{av34} 1671 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1574 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4474	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2112	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 20.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.334 (Exhibit 13-11)

$S_R =$ 60.7 mph (Exhibit 13-11)

$S_0 =$ 67.5 mph (Exhibit 13-11)

$S =$ 64.1 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	1250	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4905	V _D = veh/h
	Ramp Volume, V _R	310	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4905	0.92	Level	2	0	0.990	1.00	5385
Ramp	310	0.92	Level	2	0	0.990	1.00	340
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	5385	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	5045	Exhibit 13-8	9600	No
				V _R	340	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2540	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	14.8 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	B (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.524 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	55.3 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	75.1 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	64.3 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	1250	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	4735	$L_{down} =$ ft
	Ramp Volume, V_R	170	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4735	0.92	Level	2	0	0.990	1.00	5198
Ramp	170	0.92	Level	2	0	0.990	1.00	187
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.194 using Equation (Exhibit 13-6)

$P_{FM} =$ 1011 pc/h

$V_{12} =$ 2093 pc/h (Equation 13-14 or 13-17)

V_3 or V_{av34} 2093 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 2079 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ pc/h

$V_{12} =$ pc/h (Equation 13-14 or 13-17)

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	5385	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2266	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 15.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.284 (Exhibit 13-11)

$S_R =$ 62.1 mph (Exhibit 13-11)

$S_0 =$ 66.2 mph (Exhibit 13-11)

$S =$ 64.4 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2006 General Plan

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4990	$V_D =$ veh/h
	Ramp Volume, V_R	255	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4990	0.92	Level	2	0	0.990	1.00	5478
Ramp	255	0.92	Level	2	0	0.990	1.00	280
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$L_{EQ} =$	$V_{12} =$	$L_{EQ} =$	$V_{12} =$
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)	$P_{FD} =$	2546 pc/h	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)
$V_{12} =$	pc/h	$V_{12} =$	1466 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	2546 pc/h	$V_{12} =$	1466 pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1466 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1466 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1466 pc/h (Equation 13-14 or 13-17)
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	5478	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	5198	Exhibit 13-8	9600	No
				V_R	280	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2546	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 26.1 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.518 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 55.5 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 75.0 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 64.5 mph (Exhibit 13-13)	

APPENDIX 4.4

HCM 2010 Version
General Plan LUE Amendment (Proposed Project)
Freeway Mainline Analysis Worksheets

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	10396	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	2305 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	55.8 mph	x f _p)	
D = v _p / S	41.3 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13294	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	75.0
FFS (measured)	75.0		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})	2456	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	51.5	x f _p)	
D = v _p / S	47.7	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	12367	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	7	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1959	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.3	x f _p)	
D = v _p / S	30.9	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8883	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	70.0 mph		
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1970 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.1 mph	x f _p)	
D = v _p / S	31.2 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB				
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.				
Date Performed	05/07/2014	Jurisdiction	Caltrans				
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment				
Project Description City of Newport Beach LUE Amendment TIA (JN08911)							
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data			
Flow Inputs							
Volume, V	11921	veh/h	Peak-Hour Factor, PHF	0.92			
AADT		veh/day	%Trucks and Buses, P _T	4			
Peak-Hr Prop. of AADT, K			%RVs, P _R	0			
Peak-Hr Direction Prop, D			General Terrain:	Level			
DDHV = AADT x K x D		veh/h	Grade % Length	mi			
				Up/Down %			
Calculate Flow Adjustments							
f _p	1.00		E _R	1.2			
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980			
Speed Inputs				Calc Speed Adj and FFS			
Lane Width		ft	f _{LW}		mph		
Rt-Side Lat. Clearance		ft	f _{LC}		mph		
Number of Lanes, N	6		TRD Adjustment		mph		
Total Ramp Density, TRD		ramps/mi	FFS	70.0	mph		
FFS (measured)	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} x f _p)	2203	pc/h/ln	<u>Design LOS</u>				
S	58.3	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		pc/h/ln		
D = v _p / S	37.8	pc/mi/ln	S		mph		
LOS	E		D = v _p / S		pc/mi/ln		
				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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs			
Volume, V	4191	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs	Calc Speed Adj and FFS		
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1150	pc/h/ln
S	70.0	mph
D = v _p / S	16.4	pc/mi/ln
LOS	B	
	Required Number of Lanes, N	

Glossary	Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13
v _p - Flow rate	FFS - Free-flow speed	f _{LW} - Exhibit 11-8
LOS - Level of service	BFFS - Base free-flow speed	f _{LC} - Exhibit 11-9
DDHV - Directional design hour volume		f _p - Page 11-18
		TRD - Page 11-11
		LOS, S, FFS, v _p - Exhibits 11-2, 11-3

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5972	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1639	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	67.8	x f _p)	
D = v _p / S	24.2	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8658	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2376	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	54.0	mph	x f _p)
D = v _p / S	44.0	pc/mi/ln	S
LOS	E		D = v _p / S
			pc/mi/ln
			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	IA		Highway/Direction of Travel	SR-73 NB			
Agency or Company	Urban Crossroads, Inc.		From/To	s/o Jamboree Rd.			
Date Performed	05/07/2014		Jurisdiction	Caltrans			
Analysis Time Period	AM Peak Hour		Analysis Year	General Plan LUE Amendment			
Project Description City of Newport Beach LUE Amendment TIA (JN08911)							
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data			
Flow Inputs							
Volume, V	7442	veh/h	Peak-Hour Factor, PHF	0.92			
AADT		veh/day	%Trucks and Buses, P _T	2			
Peak-Hr Prop. of AADT, K			%RVs, P _R	0			
Peak-Hr Direction Prop, D			General Terrain:	Level			
DDHV = AADT x K x D		veh/h	Grade % Length	mi			
			Up/Down %				
Calculate Flow Adjustments							
f _p	1.00		E _R	1.2			
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990			
Speed Inputs			Calc Speed Adj and FFS				
Lane Width		ft	f _{LW}	mph			
Rt-Side Lat. Clearance		ft	f _{LC}	mph			
Number of Lanes, N	4		TRD Adjustment	mph			
Total Ramp Density, TRD		ramps/mi	FFS	70.0	mph		
FFS (measured)	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})	2043	pc/h/ln	Design LOS				
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})				
S	61.8	mph	x f _p)				
D = v _p / S	33.1	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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs				
Volume, V	4413	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	2
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments				
f _p	1.00		E _R	1.2
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

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	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} x f _p)	1211	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	mph
D = v _p / S	17.3	pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6355	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	70.0		
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} x f _p)	1174 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	mph
D = v _p / S	16.8 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	5339	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	987	Design LOS	
x f _p)	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	14.1	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3404	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	943	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	13.5	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3341	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	926 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	mph
D = v _p / S	13.2 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA		Highway/Direction of Travel	SR-55 SB			
Agency or Company	Urban Crossroads, Inc.		From/To	22nd St./Victoria Av. to End			
Date Performed	05/07/2014		Jurisdiction	Caltrans			
Analysis Time Period	AM Peak Hour		Analysis Year	General Plan LUE Amendment			
Project Description City of Newport Beach LUE Amendment TIA (JN08911)							
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data			
Flow Inputs							
Volume, V	2553	veh/h	Peak-Hour Factor, PHF	0.92			
AADT		veh/day	%Trucks and Buses, P _T	4			
Peak-Hr Prop. of AADT, K			%RVs, P _R	0			
Peak-Hr Direction Prop, D			General Terrain:	Level			
DDHV = AADT x K x D		veh/h	Grade % Length	mi			
			Up/Down %				
Calculate Flow Adjustments							
f _p	1.00		E _R	1.2			
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980			
Speed Inputs			Calc Speed Adj and FFS				
Lane Width		ft	f _{LW}	mph			
Rt-Side Lat. Clearance		ft	f _{LC}	mph			
Number of Lanes, N	3		TRD Adjustment	mph			
Total Ramp Density, TRD		ramps/mi	FFS	70.0	mph		
FFS (measured)	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})	943	pc/h/ln	Design LOS				
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln			
S	70.0	mph	x f _p)	mph			
D = v _p / S	13.5	pc/mi/ln	S	pc/mi/ln			
LOS	B		D = v _p / S	pc/mi/ln			
			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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	14054	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	3116 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	27.4 mph	S	mph
D = v _p / S	113.7 pc/mi/ln	D = v _p / S	pc/mi/ln
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
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13849	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2559	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	48.6	mph	x f _p)
D = v _p / S	52.7	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9619	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	2666 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	45.1 mph	x f _p)	
D = v _p / S	59.2 pc/mi/ln	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9398	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2605	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	47.1	mph	x f _p)
D = v _p / S	55.3	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8346	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	2313 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	55.6 mph	S	mph
D = v _p / S	41.6 pc/mi/ln	D = v _p / S	pc/mi/ln
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			

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs

Volume, V	6283	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

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)	2322 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	55.4 mph	S	mph
D = v _p / S	41.9 pc/mi/ln	D = v _p / S	pc/mi/ln
LOS	E	Required Number of Lanes, N	

Glossary

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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	11015	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	2442 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	52.1 mph	x f _p)	
D = v _p / S	46.9 pc/mi/ln	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	11239	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	75.0
FFS (measured)	75.0	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})	2077	pc/h/ln	
x f _p)			
S	62.2	mph	
D = v _p / S	33.4	pc/mi/ln	
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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	11507	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	7	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1823	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.5	x f _p)	
D = v _p / S	27.8	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	11452	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	7	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1814	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.6	x f _p)	
D = v _p / S	27.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	12066	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2230	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	57.7	mph	x f _p)
D = v _p / S	38.7	pc/mi/ln	S
LOS	E		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11447	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2115	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	60.3	x f _p)	
D = v _p / S	35.1	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	10511	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	1942 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.6 mph	x f _p)	
D = v _p / S	30.5 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	5647	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1550	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	68.6	mph	x f _p)
D = v _p / S	22.6	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7812	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2144	pc/h/ln	
x f _p)			
S	59.7	mph	v _p = (V or DDHV) / (PHF x N x f _{HV})
D = v _p / S	35.9	pc/mi/ln	x f _p)
LOS	E		S
			D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6720	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1844	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	65.2	mph	x f _p)
D = v _p / S	28.3	pc/mi/ln	S
LOS	D		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3857	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	847 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	12.1 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs			
Volume, V	4107	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1127 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	mph
D = v _p / S	16.1 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7677	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2107	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	60.5	mph	x f _p)
D = v _p / S	34.9	pc/mi/ln	S
LOS	D		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10363	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2844	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	38.6	mph	x f _p)
D = v _p / S	73.6	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8244	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2263	pc/h/ln	Design LOS
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	56.9	mph	x f _p)
D = v _p / S	39.8	pc/mi/ln	S
LOS	E		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5003	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1098	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	15.7	pc/mi/ln	S
LOS	B		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs			
Volume, V	4915	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	1349 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.7 mph	S	mph
D = v _p / S	19.3 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8391	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1551 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	68.6 mph	S	mph
D = v _p / S	22.6 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8314	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1536	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	68.7	mph	x f _p)
D = v _p / S	22.4	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5505	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1526	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	68.8	mph	x f _p)
D = v _p / S	22.2	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4867	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1349 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	69.7 mph	S	mph
D = v _p / S	19.3 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs

Volume, V	3671	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	3	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	70.0 mph		
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1357 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.7 mph	S	mph
D = v _p / S	19.5 pc/mi/ln	D = v _p / S	pc/mi/ln
LOS	C	Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11570	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	2566 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	48.4 mph	S	mph
D = v _p / S	53.1 pc/mi/ln	D = v _p / S	pc/mi/ln
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
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11068	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
Up/Down %			
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2045	pc/h/ln	Design LOS
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	61.7	mph	x f _p)
D = v _p / S	33.1	pc/mi/ln	S
LOS	D		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7384	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2047	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	61.7	x f _p)	
D = v _p / S	33.2	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB	From/To	SR-73 to Mesa Dr.	Jurisdiction	Caltrans	
Agency or Company	Urban Crossroads, Inc.	Analysis Year	General Plan LUE Amendment	Date Performed	05/07/2014	Project Description	City of Newport Beach LUE Amendment TIA (JN08911)	
Analysis Time Period	PM Peak Hour	<input checked="" type="checkbox"/> Oper.(LOS) <input type="checkbox"/> Des.(N) <input type="checkbox"/> Planning Data						
Flow Inputs								
Volume, V	7672	veh/h	Peak-Hour Factor, PHF	0.92	AADT	veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade %	Length	mi	Up/Down %		
Calculate Flow Adjustments								
f _p	1.00	E _R	1.2	E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980	
Speed Inputs				Calc Speed Adj and FFS				
Lane Width		ft	f _{LW}		mph	f _{LC}		
Rt-Side Lat. Clearance		ft	TRD Adjustment		mph	FFS	70.0	
Number of Lanes, N	4		FFS (measured)	70.0	mph	Base free-flow Speed, BFFS	mph	
Total Ramp Density, TRD		ramps/mi						
LOS and Performance Measures				Design (N)				
Operational (LOS)				Design (N)				
v _p = (V or DDHV) / (PHF x N x f _{HV})	2126	pc/h/ln	Design LOS		v _p = (V or DDHV) / (PHF x N x f _{HV})			
S	60.1	mph	x f _p)		S			
D = v _p / S	35.4	pc/mi/ln	D = v _p / S		pc/mi/ln			
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		f _{LC} - Exhibit 11-9		
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13		TRD - Page 11-11				
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18		LOS, S, FFS, v _p - Exhibits 11-2, 11-3				
LOS - Level of service	BFFS - Base free-flow speed							
DDHV - Directional design hour volume								

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6759	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1873 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	64.7 mph	S	mph
D = v _p / S	28.9 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs

Volume, V	4929	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	3	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	70.0 mph		
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

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})	1822 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.5 mph	x f _p)	
D = v _p / S	27.8 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume
 S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3
 f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

APPENDIX 4.5

HCM 2010 Version
General Plan LUE Amendment (Proposed Project)
Freeway Ramp Analysis Worksheets

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 10838 Ramp Volume, V _R 1945 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10838	0.92	Level	4	0	0.980	1.00	12016
Ramp	1945	0.92	Level	4	0	0.980	1.00	2156
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4095 pc/h V ₃ or V _{av34} 2759 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = 4213 pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8		
V _{FO}		Exhibit 13-8		
	V _F	9613	Exhibit 13-8	9600 Yes
	V _{FO} = V _F - V _R	7457	Exhibit 13-8	9600 No
	V _R	2156	Exhibit 13-10	4200 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V ₁₂	4095	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
-------------------------------------------	-------------------------------------------

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.0 (pc/mi/ln) LOS = F (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.557 (Exhibit 13-12) S _R = 54.4 mph (Exhibit 13-12) S ₀ = 70.2 mph (Exhibit 13-12) S = 62.3 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	1400	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
	Freeway Volume, V_F	9430	
$L_{up} =$ ft	Ramp Volume, V_R	603	$L_{down} =$ ft
	Freeway Free-Flow Speed, S_{FF}	70.0	
$V_u =$ veh/h	Ramp Free-Flow Speed, S_{FR}	40.0	$V_D =$ veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	9430	0.92	Level	4	0	0.980	1.00	10455
Ramp	603	0.92	Level	4	0	0.980	1.00	669
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.209 using Equation (Exhibit 13-6) $P_{FM} =$ 1663 pc/h $V_{12} =$ 3146 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 3146 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 3182 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	8624	Exhibit 13-8	No		V_F	Exhibit 13-8	
					$V_{FO} = V_F - V_R$	Exhibit 13-8	
					V_R	Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	3851	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 14.5 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.240 (Exhibit 13-11) $S_R =$ 63.3 mph (Exhibit 13-11) $S_0 =$ 63.0 mph (Exhibit 13-11) $S =$ 63.1 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 SB		Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp	
Date Performed	05/07/2014	Jurisdiction	Caltrans		Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Ramp Number of Lanes, N	2	Acceleration Lane Length, L _A		L _{down} =	1250 ft
L _{up} =	ft	Deceleration Lane Length L _D	1389	Freeway Volume, V _F	8449	Freeway Free-Flow Speed, S _{FF}	70.0	V _D =	291 veh/h
V _u =	veh/h	Ramp Volume, V _R	2523	Ramp Free-Flow Speed, S _{FR}	50.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8449	0.92	Level	4	0	0.980	1.00	9367	
Ramp	2523	0.92	Level	4	0	0.980	1.00	2797	
UpStream									
DownStream	291	0.92	Level	4	0	0.980	1.00	323	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4018 pc/h V ₃ or V _{av34} 1738 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7494	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	4697	Exhibit 13-8	9600	No
					V _R	2797	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	4018	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.8 (pc/mi/ln) LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.485 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.4 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	73.9 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	63.4 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1250 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 2523 veh/h	Freeway Volume, V _F	6952	V _D = veh/h
	Ramp Volume, V _R	291	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6952	0.92	Level	4	0	0.980	1.00	7708
Ramp	291	0.92	Level	4	0	0.980	1.00	323
UpStream	2523	0.92	Level	0	0	1.000	1.00	2742
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.177 using Equation (Exhibit 13-6)
 V₁₂ = 978 pc/h
 V₃ or V_{av34} = 2267 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2204 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5835	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2527	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.4 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.354 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = 65.8 mph (Exhibit 13-11)
 S = 63.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 260 Deceleration Lane Length L _D 260 Freeway Volume, V _F 6952 Ramp Volume, V _R 291 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1115 ft V _D = 798 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6952	0.92	Level	4	0	0.980	1.00	7708
Ramp	291	0.92	Level	4	0	0.980	1.00	323
UpStream								
DownStream	798	0.92	Level	0	0	1.000	1.00	867

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.177 using Equation (Exhibit 13-6)
 V₁₂ = 978 pc/h
 V₃ or V_{av34} = 2267 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2204 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5835	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2527	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.4 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.354 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = 65.8 mph (Exhibit 13-11)
 S = 63.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	100	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1115 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 291 veh/h	Freeway Volume, V _F	7151	V _D = veh/h
	Ramp Volume, V _R	798	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7151	0.92	Level	4	0	0.980	1.00	7928
Ramp	798	0.92	Level	4	0	0.980	1.00	885
UpStream	291	0.92	Level	0	0	1.000	1.00	316
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.209 using Equation (Exhibit 13-6)

P_{FM} = 1185 pc/h

V₁₂ = 2242 pc/h (Equation 13-14 or 13-17)

V₃ or V_{av34} = 2242 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2267 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = pc/h

V₁₂ = pc/h (Equation 13-14 or 13-17)

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6554	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3152	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D _R = 24.2 (pc/mi/ln)	D _R = (pc/mi/ln)
LOS = C (Exhibit 13-2)	LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M _S = 0.343 (Exhibit 13-11)	D _s = (Exhibit 13-12)
S _R = 60.4 mph (Exhibit 13-11)	S _R = mph (Exhibit 13-12)
S ₀ = 65.7 mph (Exhibit 13-11)	S ₀ = mph (Exhibit 13-12)
S = 63.0 mph (Exhibit 13-13)	S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1360 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 2001 veh/h	Freeway Volume, V _F	8980	V _D = veh/h
	Ramp Volume, V _R	551	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8980	0.92	Level	4	0	0.980	1.00	9956
Ramp	551	0.92	Level	4	0	0.980	1.00	611
UpStream	2001	0.92	Level	0	0	1.000	1.00	2175
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

L_{EQ} =

P_{FM} = 0.141 using Equation (Exhibit 13-6)

V₁₂ = 1054 pc/h

V₃ or V_{av34} = 3201 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2982 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

L_{EQ} =

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8067	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3593	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 23.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.343 (Exhibit 13-11)

S_R = 60.4 mph (Exhibit 13-11)

S₀ = 63.7 mph (Exhibit 13-11)

S = 62.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	IA	Freeway/Dir of Travel	I-405 NB							
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp							
Date Performed	05/07/2014	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment							
Project Description City of Newport Beach LUE Amendment TIA (JN08911)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off							
$L_{up} =$ ft	Ramp Number of Lanes, N	1	$L_{down} =$	1360 ft						
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$	551 veh/h						
	Deceleration Lane Length L_D	1500								
	Freeway Volume, V_F	10377								
	Ramp Volume, V_R	2001								
	Freeway Free-Flow Speed, S_{FF}	70.0								
	Ramp Free-Flow Speed, S_{FR}	40.0								
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$		
Freeway	10377	0.92	Level	4	0	0.980	1.00	11505		
Ramp	2001	0.92	Level	4	0	0.980	1.00	2218		
UpStream										
DownStream	551	0.92	Level	4	0	0.980	1.00	611		
Merge Areas					Diverge Areas					
Estimation of v_{12}					Estimation of v_{12}					
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.436 using Equation (Exhibit 13-7)				
$V_{12} =$	pc/h				$V_{12} =$	5264 pc/h				
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	1970 pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V_{FO}		Exhibit 13-8			V_F	9204	Exhibit 13-8		9600	No
					$V_{FO} = V_F - V_R$	6986	Exhibit 13-8		9600	No
					V_R	2218	Exhibit 13-10		2100	Yes
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V_{R12}		Exhibit 13-8			V_{12}	5264	Exhibit 13-8		4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$					
$D_R =$ (pc/mi/ln)					$D_R =$ 36.0 (pc/mi/ln)					
LOS = (Exhibit 13-2)					LOS = F (Exhibit 13-2)					
Speed Determination					Speed Determination					
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.563 (Exhibit 13-12)					
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 54.2 mph (Exhibit 13-12)					
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 73.0 mph (Exhibit 13-12)					
$S =$ mph (Exhibit 13-13)					$S =$ 61.0 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1035 ft V _u = 536 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 0 Deceleration Lane Length L _D 0 Freeway Volume, V _F 8988 Ramp Volume, V _R 1121 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8988	0.92	Level	4	0	0.980	1.00	9965
Ramp	1121	0.92	Level	4	0	0.980	1.00	1243
UpStream	536	0.92	Level	4	0	0.980	1.00	594
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1560 pc/h V ₃ or V _{av34} = 2952 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2986 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?
V _{FO}	8708	Exhibit 13-8	No
		V _F	Exhibit 13-8
		V _{FO} = V _F - V _R	Exhibit 13-8
		V _R	Exhibit 13-10

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V _{R12}	4229	Exhibit 13-8	4600:All No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 28.5 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.469 (Exhibit 13-11) S _R = 56.9 mph (Exhibit 13-11) S ₀ = 63.7 mph (Exhibit 13-11) S = 60.2 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: right;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">275</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">8551</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">536</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">30.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	275	Deceleration Lane Length L_D		Freeway Volume, V_F	8551	Ramp Volume, V_R	536	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 1035 ft $V_D =$ 1121 veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	275																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	8551																	
Ramp Volume, V_R	536																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	30.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	8551	0.92	Level	4	0	0.980	1.00	9480
Ramp	536	0.92	Level	4	0	0.980	1.00	594
UpStream								
DownStream	1121	0.92	Level	4	0	0.980	1.00	1243

Merge Areas	Diverge Areas
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Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.144 using Equation (Exhibit 13-6) $V_{12} =$ 1002 pc/h V_3 or V_{av34} 2989 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 2792 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	7574	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	3386	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 29.9 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

$M_S =$ 0.420 (Exhibit 13-11) $S_R =$ 58.2 mph (Exhibit 13-11) $S_0 =$ 64.3 mph (Exhibit 13-11) $S =$ 61.4 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	275	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1245 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 2449 veh/h	Freeway Volume, V _F	8551	V _D = veh/h
	Ramp Volume, V _R	536	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8551	0.92	Level	4	0	0.980	1.00	9480
Ramp	536	0.92	Level	4	0	0.980	1.00	594
UpStream	2449	0.92	Level	4	0	0.980	1.00	2715
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

L_{EQ} =

P_{FM} = 0.144 using Equation (Exhibit 13-6)

V₁₂ = 1002 pc/h

V₃ or V_{av34} = 2989 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2792 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

L_{EQ} =

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7574	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3386	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 29.9 (pc/mi/ln)

LOS = D (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.420 (Exhibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S₀ = 64.3 mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 425 Freeway Volume, V _F 10623 Ramp Volume, V _R 2449 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1245 ft V _D = 536 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10623	0.92	Level	4	0	0.980	1.00	11778
Ramp	2449	0.92	Level	4	0	0.980	1.00	2715
UpStream								
DownStream	536	0.92	Level	0	0	1.000	1.00	583

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4459 pc/h V ₃ or V _{av34} 2482 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8		
V _{FO}	V _F	9423	Exhibit 13-8 9600	No
	V _{FO} = V _F - V _R	6708	Exhibit 13-8 9600	No
	V _R	2715	Exhibit 13-10 4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V ₁₂	4459	Exhibit 13-8 4400:All	Yes

Level of Service Determination (if not F)	Level of Service Determination (if not F)
-------------------------------------------	-------------------------------------------

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 31.1 (pc/mi/ln) LOS = D (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.607 (Exhibit 13-12) S _R = 53.0 mph (Exhibit 13-12) S ₀ = 71.0 mph (Exhibit 13-12) S = 61.2 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">290</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">4159</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">130</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	290	Deceleration Lane Length L _D		Freeway Volume, V _F	4159	Ramp Volume, V _R	130	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	290																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	4159																	
Ramp Volume, V _R	130																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4159	0.92	Level	2	0	0.990	1.00	4566
Ramp	130	0.92	Level	2	0	0.990	1.00	143
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.200 using Equation (Exhibit 13-6)
 V₁₂ = 913 pc/h
 V₃ or V_{av34} = 1826 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1826 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4709	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1969	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 18.9 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.326 (Exhibit 13-11)
 S_R = 60.9 mph (Exhibit 13-11)
 S₀ = 66.9 mph (Exhibit 13-11)
 S = 64.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	175	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4289	V _D = veh/h
	Ramp Volume, V _R	318	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4289	0.92	Level	2	0	0.990	1.00	4709
Ramp	318	0.92	Level	2	0	0.990	1.00	349
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4239	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	3890	Exhibit 13-8	9600	No
				V _R	349	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2045	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	20.3 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	C (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.524 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	55.3 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	76.4 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	64.5 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 3971 Ramp Volume, V _R 220 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3971	0.92	Level	2	0	0.990	1.00	4359
Ramp	220	0.92	Level	2	0	0.990	1.00	242
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

L_{EQ} =
 P_{FM} = 0.188 using Equation (Exhibit 13-6)
 V₁₂ = 638 pc/h
 V₃ or V_{av34} = 1381 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1360 pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}	3643	Exhibit 13-8	No

Capacity Checks

	Actual	Capacity	LOS F?
V _F		Exhibit 13-8	
V _{FO} = V _F - V _R		Exhibit 13-8	
V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	1602	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 16.1 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.318 (Exhibit 13-11)
 S_R = 61.1 mph (Exhibit 13-11)
 S₀ = 68.1 mph (Exhibit 13-11)
 S = 64.8 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4191	$V_D =$ veh/h
	Ramp Volume, V_R	281	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4191	0.92	Level	2	0	0.990	1.00	4601
Ramp	281	0.92	Level	2	0	0.990	1.00	308
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$L_{EQ} =$	$V_{12} =$	$L_{EQ} =$	$V_{12} =$
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)	$P_{FD} =$	2180 pc/h	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)
$V_{12} =$	pc/h	$V_{12} =$	1210 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	2180 pc/h	$V_{12} =$	1210 pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1210 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1210 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1210 pc/h (Equation 13-14 or 13-17)
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	4601	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	4293	Exhibit 13-8	9600	No
				V_R	308	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2180	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 23.0 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.521 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 55.4 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 76.0 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 64.6 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	1AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	165	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3910	$L_{down} =$ ft
	Ramp Volume, V_R	231	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3910	0.92	Level	2	0	0.990	1.00	4292
Ramp	231	0.92	Level	2	0	0.990	1.00	254
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.186 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.186 using Equation (Exhibit 13-6)

$V_{12} =$ 799 pc/h

V_3 or V_{av34} 1746 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1716 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ (Equation 13-12 or 13-13)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4546	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1970	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ 19.7 (pc/mi/ln)	$D_R =$ (pc/mi/ln)
LOS = B (Exhibit 13-2)	LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.339 (Exhibit 13-11)	$D_s =$ (Exhibit 13-12)
$S_R =$ 60.5 mph (Exhibit 13-11)	$S_R =$ mph (Exhibit 13-12)
$S_0 =$ 67.2 mph (Exhibit 13-11)	$S_0 =$ mph (Exhibit 13-12)
$S =$ 64.1 mph (Exhibit 13-13)	$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	140	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4407	V _D = veh/h
	Ramp Volume, V _R	672	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4407	0.92	Level	2	0	0.990	1.00	4838
Ramp	672	0.92	Level	2	0	0.990	1.00	738
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =	using Equation (Exhibit 13-6)			L _{EQ} =	0.436 using Equation (Exhibit 13-7)		
P _{FM} =				P _{FD} =	2315 pc/h		
V ₁₂ =	pc/h			V ₁₂ =	1020 pc/h (Equation 13-14 or 13-17)		
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			V ₃ or V _{av34}	1020 pc/h (Equation 13-14 or 13-17)		
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)		

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4355	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	3617	Exhibit 13-8	9600	No
				V _R	738	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2315	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R = (pc/mi/ln)		D _R = 22.9 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
M _S = (Exhibit 13-11)		D _S = 0.559 (Exhibit 13-12)	
S _R = mph (Exhibit 13-11)		S _R = 54.3 mph (Exhibit 13-12)	
S ₀ = mph (Exhibit 13-11)		S ₀ = 76.7 mph (Exhibit 13-12)	
S = mph (Exhibit 13-13)		S = 62.9 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	245	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3705	$L_{down} =$ ft
	Ramp Volume, V_R	702	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3705	0.92	Level	2	0	0.990	1.00	4067
Ramp	702	0.92	Level	2	0	0.990	1.00	771
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.121 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.121 using Equation (Exhibit 13-6)

$V_{12} =$ 385 pc/h

V_3 or V_{av34} 1394 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1269 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3944	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2040	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 19.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.331 (Exhibit 13-11)

$S_R =$ 60.7 mph (Exhibit 13-11)

$S_0 =$ 68.4 mph (Exhibit 13-11)

$S =$ 64.2 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	1250	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4413	V _D = veh/h
	Ramp Volume, V _R	708	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4413	0.92	Level	2	0	0.990	1.00	4845
Ramp	708	0.92	Level	2	0	0.990	1.00	777
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4845	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4068	Exhibit 13-8	9600	No
				V _R	777	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2551	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	14.9 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	B (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.563 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	54.2 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	76.2 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	62.8 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">1250</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">3893</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">520</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">30.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	1250	Deceleration Lane Length L_D		Freeway Volume, V_F	3893	Ramp Volume, V_R	520	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	1250																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	3893																	
Ramp Volume, V_R	520																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	30.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3893	0.92	Level	2	0	0.990	1.00	4274
Ramp	520	0.92	Level	2	0	0.990	1.00	571
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $L_{EQ} =$ 0.146 using Equation (Exhibit 13-6)
 $P_{FM} =$ 0.146 using Equation (Exhibit 13-6)
 $V_{12} =$ 626 pc/h
 V_3 or V_{av34} 1824 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No
 If Yes, $V_{12a} =$ 1709 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $L_{EQ} =$ using Equation (Exhibit 13-7)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4845	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2280	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 15.2 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.284 (Exhibit 13-11) $S_R =$ 62.0 mph (Exhibit 13-11) $S_0 =$ 67.2 mph (Exhibit 13-11) $S =$ 64.7 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	0	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4393	V _D = veh/h
	Ramp Volume, V _R	500	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4393	0.92	Level	2	0	0.990	1.00	4823
Ramp	500	0.92	Level	2	0	0.990	1.00	549
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v₁₂ $V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	Estimation of v₁₂ $V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2412 pc/h V ₃ or V _{av34} 1205 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				
	Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		
	V _F	4823	Exhibit 13-8	9600
	V _{FO} = V _F - V _R	4274	Exhibit 13-8	9600
	V _R	549	Exhibit 13-10	2000

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	2412	Exhibit 13-8	4400:All

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 25.0 (pc/mi/ln) LOS = C (Exhibit 13-2)

Speed Determination	Speed Determination
M _S = (Exhibit 13-11)	D _S = 0.542 (Exhibit 13-12)
S _R = mph (Exhibit 13-11)	S _R = 54.8 mph (Exhibit 13-12)
S ₀ = mph (Exhibit 13-11)	S ₀ = 76.0 mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 63.7 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	IA	Freeway/Dir of Travel	I-405 SB							
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp							
Date Performed	05/07/2014	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment							
Project Description City of Newport Beach LUE Amendment TIA (JN08911)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off							
$L_{up} =$ ft	Ramp Number of Lanes, N	2	$L_{down} =$ ft							
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$ veh/h							
	Deceleration Lane Length L_D	1500								
	Freeway Volume, V_F	9162								
	Ramp Volume, V_R	1059								
	Freeway Free-Flow Speed, S_{FF}	70.0								
	Ramp Free-Flow Speed, S_{FR}	40.0								
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$		
Freeway	9162	0.92	Level	4	0	0.980	1.00	10158		
Ramp	1059	0.92	Level	4	0	0.980	1.00	1174		
UpStream										
DownStream										
Merge Areas					Diverge Areas					
Estimation of v_{12}					Estimation of v_{12}					
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.260 using Equation (Exhibit 13-7)				
$V_{12} =$	pc/h				$V_{12} =$	2982 pc/h				
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	2572 pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	3250 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V_{FO}		Exhibit 13-8			V_F	8127	Exhibit 13-8		9600	No
					$V_{FO} = V_F - V_R$	6953	Exhibit 13-8		9600	No
					V_R	1174	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V_{R12}		Exhibit 13-8			V_{12}	2982	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$					
$D_R =$ (pc/mi/ln)					$D_R =$ 0.7 (pc/mi/ln)					
LOS = (Exhibit 13-2)					LOS = A (Exhibit 13-2)					
Speed Determination					Speed Determination					
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.469 (Exhibit 13-12)					
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 56.9 mph (Exhibit 13-12)					
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 71.2 mph (Exhibit 13-12)					
$S =$ mph (Exhibit 13-13)					$S =$ 64.7 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: center;">1400</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: center;">8355</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: center;">1150</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: center;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: center;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	2	Acceleration Lane Length, L _A	1400	Deceleration Lane Length L _D		Freeway Volume, V _F	8355	Ramp Volume, V _R	1150	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	2																	
Acceleration Lane Length, L _A	1400																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	8355																	
Ramp Volume, V _R	1150																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8355	0.92	Level	4	0	0.980	1.00	9263
Ramp	1150	0.92	Level	4	0	0.980	1.00	1275
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1413 pc/h V ₃ or V _{av34} = 2675 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2705 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8038	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3980	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 15.2 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.266 (Exhibit 13-11) S _R = 62.6 mph (Exhibit 13-11) S ₀ = 64.5 mph (Exhibit 13-11) S = 63.5 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1389 Freeway Volume, V _F 7861 Ramp Volume, V _R 1922 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 50.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1250 ft V _D = 795 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7861	0.92	Level	4	0	0.980	1.00	8715
Ramp	1922	0.92	Level	4	0	0.980	1.00	2131
UpStream								
DownStream	795	0.92	Level	4	0	0.980	1.00	881

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3390 pc/h V ₃ or V _{av34} 1791 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	6972	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4841	Exhibit 13-8	9600	No
				V _R	2131	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	3390	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 4.4 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.425 (Exhibit 13-12) S _R = 58.1 mph (Exhibit 13-12) S ₀ = 73.7 mph (Exhibit 13-12) S = 65.2 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1250 ft V _u = 1922 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 260 Deceleration Lane Length L _D Freeway Volume, V _F 6482 Ramp Volume, V _R 795 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6482	0.92	Level	4	0	0.980	1.00	7187
Ramp	795	0.92	Level	4	0	0.980	1.00	881
UpStream	1922	0.92	Level	0	0	1.000	1.00	2089
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.108 using Equation (Exhibit 13-6)
 V₁₂ = 565 pc/h
 V₃ or V_{av34} = 2341 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2098 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6128	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2979	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 26.7 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.382 (Exhibit 13-11) S _R = 59.3 mph (Exhibit 13-11) S ₀ = 66.1 mph (Exhibit 13-11) S = 62.6 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	260	<input type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	6482	$L_{down} =$ 1115 ft
	Ramp Volume, V_R	795	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ 1386 veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	6482	0.92	Level	4	0	0.980	1.00	7187
Ramp	795	0.92	Level	4	0	0.980	1.00	881
UpStream								
DownStream	1386	0.92	Level	0	0	1.000	1.00	1507

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

(Equation 13-6 or 13-7)

$L_{EQ} =$ _____

$P_{FM} =$ 0.108 using Equation (Exhibit 13-6)

$V_{12} =$ 565 pc/h

V_3 or $V_{av34} =$ 2341 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 2098 pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

(Equation 13-12 or 13-13)

$L_{EQ} =$ _____

$P_{FD} =$ _____ using Equation (Exhibit 13-7)

$V_{12} =$ _____ pc/h

V_3 or $V_{av34} =$ _____ pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ _____ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}	6128	Exhibit 13-8	No

Capacity Checks

	Actual	Capacity	LOS F?
V_F		Exhibit 13-8	
$V_{FO} = V_F - V_R$		Exhibit 13-8	
V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}	2979	Exhibit 13-8	4600:All
			No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}		Exhibit 13-8	

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

$D_R =$ 26.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

$M_S =$ 0.382 (Exhibit 13-11)

$S_R =$ 59.3 mph (Exhibit 13-11)

$S_0 =$ 66.1 mph (Exhibit 13-11)

$S =$ 62.6 mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	100	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1115 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 795 veh/h	Freeway Volume, V _F	7025	V _D = veh/h
	Ramp Volume, V _R	1386	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7025	0.92	Level	4	0	0.980	1.00	7789
Ramp	1386	0.92	Level	4	0	0.980	1.00	1537
UpStream	795	0.92	Level	0	0	1.000	1.00	864
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.209 using Equation (Exhibit 13-6)

P_{FM} = 1164 pc/h

V₁₂ = 2203 pc/h (Equation 13-14 or 13-17)

V₃ or V_{av34} = 2203 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2228 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = pc/h

V₁₂ = pc/h (Equation 13-14 or 13-17)

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7107	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3765	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.420 (Exhibit 13-11)

S_R = 58.2 mph (Exhibit 13-11)

S₀ = 65.8 mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1360 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 945 veh/h	Freeway Volume, V _F	8446	V _D = veh/h
	Ramp Volume, V _R	1685	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8446	0.92	Level	4	0	0.980	1.00	9364
Ramp	1685	0.92	Level	4	0	0.980	1.00	1868
UpStream	945	0.92	Level	0	0	1.000	1.00	1027
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
$V_{12} = V_F (P_{FM})$ <p>(Equation 13-6 or 13-7)</p> <p>L_{EQ} = -0.016 using Equation (Exhibit 13-6)</p> <p>P_{FM} = -107 pc/h</p> <p>V₁₂ = 3485 pc/h (Equation 13-14 or 13-17)</p> <p>Is V₃ or V_{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is V₃ or V_{av34} > 1.5 * V₁₂/2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, V_{12a} = 2745 pc/h (Equation 13-16, 13-18, or 13-19)</p>	$V_{12} = V_R + (V_F - V_R)P_{FD}$ <p>(Equation 13-12 or 13-13)</p> <p>L_{EQ} = using Equation (Exhibit 13-7)</p> <p>P_{FD} = pc/h</p> <p>V₁₂ = pc/h (Equation 13-14 or 13-17)</p> <p>Is V₃ or V_{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is V₃ or V_{av34} > 1.5 * V₁₂/2 <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)</p>

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8732	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	4613	Exhibit 13-8	4600:All	Yes	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
-------------------------------------------	-------------------------------------------

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ <p>D_R = 31.2 (pc/mi/ln)</p> <p>LOS = D (Exhibit 13-2)</p>	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ <p>D_R = (pc/mi/ln)</p> <p>LOS = (Exhibit 13-2)</p>
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Speed Determination	Speed Determination
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M _S = 0.594 (Exhibit 13-11)	D _s = (Exhibit 13-12)
S _R = 53.4 mph (Exhibit 13-11)	S _R = mph (Exhibit 13-12)
S ₀ = 64.4 mph (Exhibit 13-11)	S ₀ = mph (Exhibit 13-12)
S = 58.1 mph (Exhibit 13-13)	S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 NB						
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp						
Date Performed	05/07/2014	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment						
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off						
$L_{up} =$ ft	Ramp Number of Lanes, N	1	$L_{down} =$	1360 ft					
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$	1685 veh/h					
	Deceleration Lane Length L_D	1500							
	Freeway Volume, V_F	9332							
	Ramp Volume, V_R	945							
	Freeway Free-Flow Speed, S_{FF}	70.0							
	Ramp Free-Flow Speed, S_{FR}	40.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	9332	0.92	Level	4	0	0.980	1.00	10346	
Ramp	945	0.92	Level	4	0	0.980	1.00	1048	
UpStream									
DownStream	1685	0.92	Level	4	0	0.980	1.00	1868	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$	(Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$	(Equation 13-12 or 13-13)				
$P_{FM} =$	using Equation	(Exhibit 13-6)	$P_{FD} =$	0.436 using Equation	(Exhibit 13-7)				
$V_{12} =$	pc/h		$V_{12} =$	4200 pc/h					
V_3 or V_{av34}	pc/h	(Equation 13-14 or 13-17)	V_3 or V_{av34}	2038 pc/h	(Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, $V_{12a} =$	pc/h	(Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h	(Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	8277	Exhibit 13-8	9600	No
					$V_{FO} = V_F - V_R$	7229	Exhibit 13-8	9600	No
					V_R	1048	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8			V_{12}	4200	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 26.9 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.457 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 57.2 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 72.7 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 63.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	0	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1035 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 752 veh/h	Freeway Volume, V _F	7809	V _D = veh/h
	Ramp Volume, V _R	999	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7809	0.92	Level	4	0	0.980	1.00	8658
Ramp	999	0.92	Level	4	0	0.980	1.00	1108
UpStream	752	0.92	Level	4	0	0.980	1.00	834
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.209 using Equation (Exhibit 13-6)

P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1287 pc/h

V₃ or V_{av34} = 2435 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2463 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7266	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3571	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D _R = 23.4 (pc/mi/ln)	D _R = (pc/mi/ln)
LOS = C (Exhibit 13-2)	LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M _S = 0.340 (Exhibit 13-11)	D _s = (Exhibit 13-12)
S _R = 60.5 mph (Exhibit 13-11)	S _R = mph (Exhibit 13-12)
S ₀ = 65.2 mph (Exhibit 13-11)	S ₀ = mph (Exhibit 13-12)
S = 62.8 mph (Exhibit 13-13)	S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 7196 Ramp Volume, V _R 752 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1035 ft V _D = 999 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7196	0.92	Level	4	0	0.980	1.00	7978
Ramp	752	0.92	Level	4	0	0.980	1.00	834
UpStream								
DownStream	999	0.92	Level	4	0	0.980	1.00	1108

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = 0.114 using Equation (Exhibit 13-6) V ₁₂ = 648 pc/h V ₃ or V _{av34} = 2528 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2282 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6539	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3116	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.7 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.392 (Exhibit 13-11) S _R = 59.0 mph (Exhibit 13-11) S ₀ = 65.6 mph (Exhibit 13-11) S = 62.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1245 ft V _u = 1421 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D Freeway Volume, V _F 7196 Ramp Volume, V _R 752 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7196	0.92	Level	4	0	0.980	1.00	7978
Ramp	752	0.92	Level	4	0	0.980	1.00	834
UpStream	1421	0.92	Level	4	0	0.980	1.00	1575
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.114 using Equation (Exhibit 13-6)
 V₁₂ = 648 pc/h
 V₃ or V_{av34} = 2528 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2282 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6539	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3116	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.7 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.392 (Exhibit 13-11) S _R = 59.0 mph (Exhibit 13-11) S ₀ = 65.6 mph (Exhibit 13-11) S = 62.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 425 Freeway Volume, V _F 8569 Ramp Volume, V _R 1421 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1245 ft V _D = 752 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8569	0.92	Level	4	0	0.980	1.00	9500
Ramp	1421	0.92	Level	4	0	0.980	1.00	1575
UpStream								
DownStream	752	0.92	Level	0	0	1.000	1.00	817

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3141 pc/h V ₃ or V _{av34} 2229 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	7600	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	6025	Exhibit 13-8	9600	No
				V _R	1575	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	3141	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 19.7 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.505 (Exhibit 13-12) S _R = 55.9 mph (Exhibit 13-12) S ₀ = 72.0 mph (Exhibit 13-12) S = 64.3 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">290</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">3408</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">449</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	290	Deceleration Lane Length L _D		Freeway Volume, V _F	3408	Ramp Volume, V _R	449	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	290																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	3408																	
Ramp Volume, V _R	449																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3408	0.92	Level	2	0	0.990	1.00	3741
Ramp	449	0.92	Level	2	0	0.990	1.00	493
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.156 using Equation (Exhibit 13-6) V ₁₂ = 584 pc/h V ₃ or V _{av34} = 1578 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1496 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4234	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1989	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 18.9 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.326 (Exhibit 13-11) S _R = 60.9 mph (Exhibit 13-11) S ₀ = 67.8 mph (Exhibit 13-11) S = 64.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 175 Freeway Volume, V _F 3857 Ramp Volume, V _R 480 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3857	0.92	Level	2	0	0.990	1.00	4234
Ramp	480	0.92	Level	2	0	0.990	1.00	527
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	3811	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	3284	Exhibit 13-8	9600	No
				V _R	527	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	1959	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	19.5 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	B (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.540 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	54.9 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	76.8 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	63.7 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>275</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>3377</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>730</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>40.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	275	Deceleration Lane Length L _D		Freeway Volume, V _F	3377	Ramp Volume, V _R	730	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	275																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	3377																	
Ramp Volume, V _R	730																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3377	0.92	Level	2	0	0.990	1.00	3707
Ramp	730	0.92	Level	2	0	0.990	1.00	801
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = 0.118 using Equation (Exhibit 13-6) P _{FM} = 340 pc/h V ₁₂ = 1276 pc/h (Equation 13-14 or 13-17) V ₃ or V _{av34} Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1156 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = using Equation (Exhibit 13-7) P _{FD} = pc/h V ₁₂ = pc/h (Equation 13-14 or 13-17) V ₃ or V _{av34} Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	3693	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1957	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 18.6 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.327 (Exhibit 13-11) S _R = 60.9 mph (Exhibit 13-11) S ₀ = 68.7 mph (Exhibit 13-11) S = 64.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4107	$V_D =$ veh/h
	Ramp Volume, V_R	560	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4107	0.92	Level	2	0	0.990	1.00	4509
Ramp	560	0.92	Level	2	0	0.990	1.00	615
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}		Estimation of v_{12}	
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ 0.436 using Equation (Exhibit 13-7) $P_{FD} =$ $V_{12} =$ 2313 pc/h V_3 or V_{av34} 1098 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)		

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8	
	V_F	4509	Exhibit 13-8 9600 No
	$V_{FO} = V_F - V_R$	3894	Exhibit 13-8 9600 No
	V_R	615	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	2313	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 24.1 (pc/mi/ln) LOS = C (Exhibit 13-2)
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Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_S =$ 0.548 (Exhibit 13-12) $S_R =$ 54.6 mph (Exhibit 13-12) $S_0 =$ 76.4 mph (Exhibit 13-12) $S =$ 63.4 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 165 Deceleration Lane Length L _D 165 Freeway Volume, V _F 3547 Ramp Volume, V _R 350 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft		L _{down} = ft
V _u = veh/h		V _D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3547	0.92	Level	2	0	0.990	1.00	3894
Ramp	350	0.92	Level	2	0	0.990	1.00	384
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.170 using Equation (Exhibit 13-6) V ₁₂ = 661 pc/h V ₃ or V _{av34} = 1616 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 1557 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4278	Exhibit 13-8	No				
				V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1941	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 19.4 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.338 (Exhibit 13-11) S _R = 60.5 mph (Exhibit 13-11) S ₀ = 67.6 mph (Exhibit 13-11) S = 64.2 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	140	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	5003	V _D = veh/h
	Ramp Volume, V _R	180	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5003	0.92	Level	2	0	0.990	1.00	5492
Ramp	180	0.92	Level	2	0	0.990	1.00	198
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4943	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4745	Exhibit 13-8	9600	No
				V _R	198	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2267	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	22.5 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	C (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.511 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	55.7 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	75.5 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	64.9 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1250 Freeway Volume, V _F 4915 Ramp Volume, V _R 282 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4915	0.92	Level	2	0	0.990	1.00	5396
Ramp	282	0.92	Level	2	0	0.990	1.00	310
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v₁₂ $V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	Estimation of v₁₂ $V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2527 pc/h V ₃ or V _{av34} 1434 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				
	Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		
	V _F	5396	Exhibit 13-8	9600 No
	V _{FO} = V _F - V _R	5086	Exhibit 13-8	9600 No
				V _R 310 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	2527	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 14.7 (pc/mi/ln) LOS = B (Exhibit 13-2)

Speed Determination	Speed Determination
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.521 (Exhibit 13-12) S _R = 55.4 mph (Exhibit 13-12) S ₀ = 75.1 mph (Exhibit 13-12) S = 64.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: center;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: center;">1250</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: center;">4745</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: center;">170</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: center;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: center;">30.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	1250	Deceleration Lane Length L _D		Freeway Volume, V _F	4745	Ramp Volume, V _R	170	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	1250																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	4745																	
Ramp Volume, V _R	170																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	30.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4745	0.92	Level	2	0	0.990	1.00	5209
Ramp	170	0.92	Level	2	0	0.990	1.00	187
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.194 using Equation (Exhibit 13-6) V ₁₂ = 1013 pc/h V ₃ or V _{av34} = 2098 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2083 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Capacity Checks	Capacity Checks
-----------------	-----------------

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5396	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
------------------------------------	--------------------------------------

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2270	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
-------------------------------------------	-------------------------------------------

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 15.3 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
----------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------

Speed Determination	Speed Determination
---------------------	---------------------

M _S = 0.284 (Exhibit 13-11) S _R = 62.1 mph (Exhibit 13-11) S ₀ = 66.2 mph (Exhibit 13-11) S = 64.4 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	5022	$V_D =$ veh/h
	Ramp Volume, V_R	277	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5022	0.92	Level	2	0	0.990	1.00	5513
Ramp	277	0.92	Level	2	0	0.990	1.00	304
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v_{12}	Estimation of v_{12}
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ 0.436 using Equation (Exhibit 13-7) $P_{FD} =$ 2575 pc/h $V_{12} =$ 1469 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}	V_F	Exhibit 13-8	No
	$V_{FO} = V_F - V_R$	9600	No
	V_R	2000	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
------------------------------------	--------------------------------------

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V_{12}	2575	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 26.4 (pc/mi/ln) LOS = C (Exhibit 13-2)
------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------

Speed Determination



















$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_S =$ 0.520 (Exhibit 13-12) $S_R =$ 55.4 mph (Exhibit 13-12) $S_0 =$ 75.0 mph (Exhibit 13-12) $S =$ 64.4 mph (Exhibit 13-13)
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APPENDIX 4.7

HCM 2010 Version
State Highway Freeway Ramp Intersections
Operations Analysis Worksheets

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 46: SR-73 NB Off Ramp/SR-73 NB On Ramp & Bison Ave

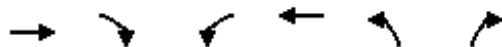
5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	1477	0	0	136	234	200	0	356	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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			
Adj Sat Flow, veh/h/ln	186.3	186.3	0.0	0.0	186.3	186.3	186.3	0.0	186.3			
Adj Flow Rate, veh/h	43	1555	0	0	143	246	211	0	375			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	76	1888	0	0	1471	654	918	0	743			
Arrive On Green	0.09	1.00	0.00	0.00	0.42	0.42	0.27	0.00	0.27			
Sat Flow, veh/h	1774	3632	0	0	3632	1574	3442	0	2787			
Grp Volume(v), veh/h	43	1555	0	0	143	246	211	0	375			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1770	1574	1721	0	1393			
Q Serve(g_s), s	1.4	0.0	0.0	0.0	1.5	6.5	2.9	0.0	6.8			
Cycle Q Clear(g_c), s	1.4	0.0	0.0	0.0	1.5	6.5	2.9	0.0	6.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	76	1888	0	0	1471	654	918	0	743			
V/C Ratio(X)	0.57	0.82	0.00	0.00	0.10	0.38	0.23	0.00	0.50			
Avail Cap(c_a), veh/h	169	1888	0	0	1471	654	918	0	743			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.65	0.65	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	0.0	0.0	0.0	10.7	12.1	17.2	0.0	18.6			
Incr Delay (d2), s/veh	4.3	2.8	0.0	0.0	0.1	1.6	0.6	0.0	2.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	0.7	0.0	0.0	0.7	3.1	1.4	0.0	2.9			
LnGrp Delay(d),s/veh	31.2	2.8	0.0	0.0	10.8	13.8	17.8	0.0	21.1			
LnGrp LOS	C	A			B	B	B		C			
Approach Vol, veh/h		1598			389			586				
Approach Delay, s/veh		3.6			12.7			19.9				
Approach LOS		A			B			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		38.0			7.1	30.9				
Change Period (Y+Rc), s		6.0		6.0			4.5	6.0				
Max Green Setting (Gmax), s		16.0		32.0			5.7	21.8				
Max Q Clear Time (g_c+I1), s		8.8		2.0			3.4	8.5				
Green Ext Time (p_c), s		1.4		16.8			0.0	9.6				
Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 47: SR-73 SB On Ramp/SR-73 SB Off Ramp & Bison Ave 5/12/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑↑		↑
Volume (veh/h)	0	445	53	16	320	0	0	0	0	1073	0	409
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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
Adj Sat Flow, veh/h/ln	0.0	186.3	193.7	186.3	186.3	0.0				186.3	0.0	193.7
Adj Flow Rate, veh/h	0	468	56	17	337	0				1129	0	0
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1249	577	71	1599	0				1289	0	617
Arrive On Green	0.00	0.35	0.35	0.02	0.45	0.00				0.37	0.00	0.00
Sat Flow, veh/h	0	3632	1635	3442	3632	0				3442	0	1647
Grp Volume(v), veh/h	0	468	56	17	337	0				1129	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1635	1721	1770	0				1721	0	1647
Q Serve(g_s), s	0.0	5.7	1.3	0.3	3.3	0.0				17.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.7	1.3	0.3	3.3	0.0				17.6	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1249	577	71	1599	0				1289	0	617
V/C Ratio(X)	0.00	0.37	0.10	0.24	0.21	0.00				0.88	0.00	0.00
Avail Cap(c_a), veh/h	0	1249	577	299	1599	0				1435	0	687
HCM Platoon Ratio	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	0.99	0.99	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	13.9	12.5	27.7	9.6	0.0				16.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.3	1.7	0.3	0.0				5.9	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
%ile BackOfQ(50%),veh/ln	0.0	2.9	0.6	0.1	1.7	0.0				9.4	0.0	0.0
LnGrp Delay(d),s/veh	0.0	14.8	12.8	29.4	9.9	0.0				22.7	0.0	0.0
LnGrp LOS		B	B	C	A					C		
Approach Vol, veh/h		524			354						1129	
Approach Delay, s/veh		14.5			10.8						22.7	
Approach LOS		B			B						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			5.7	28.7		25.6		34.4				
Change Period (Y+Rc), s			4.5	6.0		4.0		6.0				
Max Green Setting (Gmax), s			5.0	16.5		24.0		26.0				
Max Q Clear Time (g_c+I1), s			2.3	7.7		19.6		5.3				
Green Ext Time (p_c), s			0.0	3.3		2.0		5.0				
Intersection Summary												
HCM 2010 Ctrl Delay			18.5									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 53: SR-73 NB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖↗	↑↑	↖↗	↗
Volume (veh/h)	704	56	216	1052	436	58
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	741	59	227	1107	459	61
Adj No. of Lanes	2	1	2	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1609	744	313	2317	563	259
Arrive On Green	0.45	0.45	0.09	0.65	0.16	0.16
Sat Flow, veh/h	3632	1638	3442	3632	3442	1583
Grp Volume(v), veh/h	741	59	227	1107	459	61
Grp Sat Flow(s),veh/h/ln	1770	1638	1721	1770	1721	1583
Q Serve(g_s), s	7.9	1.1	3.5	8.6	7.1	1.8
Cycle Q Clear(g_c), s	7.9	1.1	3.5	8.6	7.1	1.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1609	744	313	2317	563	259
V/C Ratio(X)	0.46	0.08	0.73	0.48	0.82	0.24
Avail Cap(c_a), veh/h	1609	744	313	2317	563	259
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.3	8.5	24.3	4.8	22.2	20.0
Incr Delay (d2), s/veh	0.9	0.2	7.1	0.7	9.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.5	2.0	4.4	4.0	0.8
LnGrp Delay(d),s/veh	11.2	8.7	31.5	5.5	31.2	20.5
LnGrp LOS	B	A	C	A	C	C
Approach Vol, veh/h	800			1334	520	
Approach Delay, s/veh	11.0			9.9	30.0	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.0	11.0	31.0				42.0
Change Period (Y+Rc), s		4.0	6.0	6.0				* 6
Max Green Setting (Gmax), s		9.0	5.0	25.0				* 36
Max Q Clear Time (g_c+I1), s		9.1	5.5	9.9				10.6
Green Ext Time (p_c), s		0.0	0.0	7.2				9.0

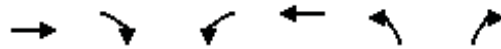
Intersection Summary

HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.












HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 54: SR-73 SB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑↑	↖↖	↗		
Volume (veh/h)	654	126	47	1441	33	106		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	688	133	49	1517	35	112		
Adj No. of Lanes	2	1	2	3	2	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1126	520	219	2496	1001	461		
Arrive On Green	0.32	0.32	0.13	0.98	0.29	0.29		
Sat Flow, veh/h	3632	1634	3442	5253	3442	1583		
Grp Volume(v), veh/h	688	133	49	1517	35	112		
Grp Sat Flow(s),veh/h/ln	1770	1634	1721	1695	1721	1583		
Q Serve(g_s), s	9.0	3.3	0.7	0.7	0.4	3.0		
Cycle Q Clear(g_c), s	9.0	3.3	0.7	0.7	0.4	3.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1126	520	219	2496	1001	461		
V/C Ratio(X)	0.61	0.26	0.22	0.61	0.03	0.24		
Avail Cap(c_a), veh/h	1126	520	219	2496	1001	461		
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.80	0.80	1.00	1.00		
Uniform Delay (d), s/veh	15.9	13.9	22.8	0.3	14.0	14.9		
Incr Delay (d2), s/veh	2.5	1.2	0.2	0.9	0.1	1.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.8	1.6	0.3	0.3	0.2	1.4		
LnGrp Delay(d),s/veh	18.3	15.1	22.9	1.2	14.0	16.1		
LnGrp LOS	B	B	C	A	B	B		
Approach Vol, veh/h	821			1566	147			
Approach Delay, s/veh	17.8			1.8	15.6			
Approach LOS	B			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		22.0	9.5	23.5				33.0
Change Period (Y+Rc), s		6.0	6.0	* 6				6.0
Max Green Setting (Gmax), s		16.0	3.5	* 17.5				27.0
Max Q Clear Time (g_c+I1), s		5.0	2.7	11.0				2.7
Green Ext Time (p_c), s		0.2	0.6	1.7				7.4
Intersection Summary								
HCM 2010 Ctrl Delay			7.8					
HCM 2010 LOS			A					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								













HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 62: Newport Coast Dr & SR-73 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	250	96	717	523	0	569		
Number	3	18	2	12	1	6		
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		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	0.0	186.3		
Adj Flow Rate, veh/h	263	101	755	0	0	599		
Adj No. of Lanes	2	1	2	1	0	2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	0	2		
Cap, veh/h	492	226	1778	795	0	1778		
Arrive On Green	0.14	0.14	0.50	0.00	0.00	0.50		
Sat Flow, veh/h	3442	1583	3632	1583	0	3725		
Grp Volume(v), veh/h	263	101	755	0	0	599		
Grp Sat Flow(s),veh/h/ln	1721	1583	1770	1583	0	1770		
Q Serve(g_s), s	2.4	2.0	4.6	0.0	0.0	3.4		
Cycle Q Clear(g_c), s	2.4	2.0	4.6	0.0	0.0	3.4		
Prop In Lane	1.00	1.00		1.00	0.00			
Lane Grp Cap(c), veh/h	492	226	1778	795	0	1778		
V/C Ratio(X)	0.53	0.45	0.42	0.00	0.00	0.34		
Avail Cap(c_a), veh/h	1627	749	1778	795	0	1778		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	13.5	13.3	5.3	0.0	0.0	5.0		
Incr Delay (d2), s/veh	0.3	0.5	0.7	0.0	0.0	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.2	0.9	2.4	0.0	0.0	1.8		
LnGrp Delay(d),s/veh	13.8	13.8	6.1	0.0	0.0	5.6		
LnGrp LOS	B	B	A			A		
Approach Vol, veh/h	364		755			599		
Approach Delay, s/veh	13.8		6.1			5.6		
Approach LOS	B		A			A		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		34.2				34.2		10.8
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		17.0				17.0		16.0
Max Q Clear Time (g_c+I1), s		6.6				5.4		4.4
Green Ext Time (p_c), s		4.1				4.3		0.5
Intersection Summary								
HCM 2010 Ctrl Delay			7.5					
HCM 2010 LOS			A					





















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 69: MacArthur Blvd & I-405 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	793	559	1895	310	174	1008		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	862	608	2060	337	189	1096		
Adj No. of Lanes	2	1	4	2	2	4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1426	656	2346	1013	282	2346		
Arrive On Green	0.41	0.41	0.37	0.37	0.37	0.37		
Sat Flow, veh/h	3442	1583	6669	2768	281	6669		
Grp Volume(v), veh/h	862	608	2060	337	189	1096		
Grp Sat Flow(s),veh/h/ln	1721	1583	1602	1384	141	1602		
Q Serve(g_s), s	10.7	19.9	16.4	4.8	3.6	7.1		
Cycle Q Clear(g_c), s	10.7	19.9	16.4	4.8	20.0	7.1		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	1426	656	2346	1013	282	2346		
V/C Ratio(X)	0.60	0.93	0.88	0.33	0.67	0.47		
Avail Cap(c_a), veh/h	1449	667	2346	1013	282	2346		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.45	0.45	1.00	1.00		
Uniform Delay (d), s/veh	12.5	15.2	16.2	12.5	27.1	13.2		
Incr Delay (d2), s/veh	0.7	19.0	2.4	0.4	12.0	0.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.2	12.1	7.5	1.9	1.9	3.2		
LnGrp Delay(d),s/veh	13.2	34.2	18.6	12.9	39.1	13.9		
LnGrp LOS	B	C	B	B	D	B		
Approach Vol, veh/h	1470		2397			1285		
Approach Delay, s/veh	21.9		17.8			17.6		
Approach LOS	C		B			B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		26.4				26.4		28.6
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		20.0				20.0		23.0
Max Q Clear Time (g_c+I1), s		18.4				22.0		21.9
Green Ext Time (p_c), s		1.6				0.0		0.7
Intersection Summary								
HCM 2010 Ctrl Delay			18.9					
HCM 2010 LOS			B					



















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 70: MacArthur Blvd & Airport Entrance/I-405 SB Ramps

5/12/2014



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1126	134	1053	0	1152	332	142	1385	274
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln				186.3	190.0	186.3	0.0	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h				1224	146	0	0	1252	361	154	1505	298
Adj No. of Lanes				2	1	1	0	4	1	2	4	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	0	2	2	2	2	0
Cap, veh/h				1248	689	574	0	1362	332	688	3124	785
Arrive On Green				0.36	0.36	0.00	0.00	0.21	0.21	0.20	0.49	0.49
Sat Flow, veh/h				3442	1900	1583	0	6669	1565	3442	6408	1610
Grp Volume(v), veh/h				1224	146	0	0	1252	361	154	1505	298
Grp Sat Flow(s),veh/h/ln				1721	1900	1583	0	1602	1565	1721	1602	1610
Q Serve(g_s), s				28.1	4.2	0.0	0.0	15.3	17.0	3.0	12.6	9.3
Cycle Q Clear(g_c), s				28.1	4.2	0.0	0.0	15.3	17.0	3.0	12.6	9.3
Prop In Lane				1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1248	689	574	0	1362	333	688	3124	785
V/C Ratio(X)				0.98	0.21	0.00	0.00	0.92	1.09	0.22	0.48	0.38
Avail Cap(c_a), veh/h				1248	689	574	0	1362	333	688	3124	785
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh				25.2	17.6	0.0	0.0	30.8	31.5	26.8	13.7	12.9
Incr Delay (d2), s/veh				21.0	0.2	0.0	0.0	11.5	74.2	0.6	0.4	1.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.9	2.3	0.0	0.0	7.9	14.2	1.5	5.6	4.4
LnGrp Delay(d),s/veh				46.2	17.8	0.0	0.0	42.3	105.7	27.4	14.2	14.1
LnGrp LOS				D	B			D	F	C	B	B
Approach Vol, veh/h					1370			1613			1957	
Approach Delay, s/veh					43.2			56.5			15.2	
Approach LOS					D			E			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	22.0	23.0				45.0		35.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	16.0	17.0				39.0		29.0				
Max Q Clear Time (g_c+I1), s	5.0	19.0				14.6		30.1				
Green Ext Time (p_c), s	0.3	0.0				21.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				36.4								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 80: Jamboree Rd & I-405 NB On Ramp/I-405 NB Ramps

5/12/2014























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1186	0	657	0	2019	432	0	2014	1200
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				186.3	0.0	186.3	0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h				1248	0	0	0	2125	0	0	2120	0
Adj No. of Lanes				3	0	1	0	3	1	0	4	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	2	0	2	2
Cap, veh/h				1334	0	422	0	2712	844	0	3418	844
Arrive On Green				0.27	0.00	0.00	0.00	0.53	0.00	0.00	0.53	0.00
Sat Flow, veh/h				5003	0	1583	0	5253	1583	0	6669	1583
Grp Volume(v), veh/h				1248	0	0	0	2125	0	0	2120	0
Grp Sat Flow(s),veh/h/ln				1668	0	1583	0	1695	1583	0	1602	1583
Q Serve(g_s), s				14.6	0.0	0.0	0.0	20.1	0.0	0.0	13.8	0.0
Cycle Q Clear(g_c), s				14.6	0.0	0.0	0.0	20.1	0.0	0.0	13.8	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1334	0	422	0	2712	844	0	3418	844
V/C Ratio(X)				0.94	0.00	0.00	0.00	0.78	0.00	0.00	0.62	0.00
Avail Cap(c_a), veh/h				1334	0	422	0	2712	844	0	3418	844
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				21.5	0.0	0.0	0.0	11.2	0.0	0.0	9.8	0.0
Incr Delay (d2), s/veh				12.3	0.0	0.0	0.0	0.2	0.0	0.0	0.9	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
%ile BackOfQ(50%),veh/ln				8.2	0.0	0.0	0.0	9.3	0.0	0.0	6.2	0.0
LnGrp Delay(d),s/veh				33.8	0.0	0.0	0.0	11.4	0.0	0.0	10.6	0.0
LnGrp LOS				C				B			B	
Approach Vol, veh/h					1248			2125			2120	
Approach Delay, s/veh					33.8			11.4			10.6	
Approach LOS					C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		38.0				38.0		22.0				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		32.0				32.0		16.0				
Max Q Clear Time (g_c+I1), s		22.1				15.8		16.6				
Green Ext Time (p_c), s		9.7				15.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				16.2								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 81: Jamboree Rd & I-405 SB Ramps 5/12/2014













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1206	0	1484	0	0	0	0	813	538	0	2968	232
Number	7	4	14				5	2	12	3	8	18
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	0.0	186.3				0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h	1231	0	1514				0	830	0	0	3029	0
Adj No. of Lanes	2	0	3				0	3	2	0	4	1
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	1286	0	0				0	0	0	0	3210	793
Arrive On Green	0.37	0.00	0.00				0.00	0.00	0.00	0.00	0.50	0.00
Sat Flow, veh/h	3442	1231						0		0	6669	1583
Grp Volume(v), veh/h	1231	45.1						0.0		0	3029	0
Grp Sat Flow(s),veh/h/ln	1721	D								0	1602	1583
Q Serve(g_s), s	33.4									0.0	42.8	0.0
Cycle Q Clear(g_c), s	33.4									0.0	42.8	0.0
Prop In Lane	1.00									0.00		1.00
Lane Grp Cap(c), veh/h	1286									0	3210	793
V/C Ratio(X)	0.96									0.00	0.94	0.00
Avail Cap(c_a), veh/h	1295									0	3215	794
HCM Platoon Ratio	1.00									1.00	1.00	1.00
Upstream Filter(I)	1.00									0.00	0.60	0.00
Uniform Delay (d), s/veh	29.2									0.0	22.6	0.0
Incr Delay (d2), s/veh	15.8									0.0	4.4	0.0
Initial Q Delay(d3),s/veh	0.0									0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6									0.0	19.7	0.0
LnGrp Delay(d),s/veh	45.1									0.0	27.0	0.0
LnGrp LOS	D										C	
Approach Vol, veh/h											3029	
Approach Delay, s/veh											27.0	
Approach LOS											C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs							7	8				
Phs Duration (G+Y+Rc), s							41.8	53.9				
Change Period (Y+Rc), s							6.0	6.0				
Max Green Setting (Gmax), s							36.0	48.0				
Max Q Clear Time (g_c+I1), s							35.4	44.8				
Green Ext Time (p_c), s							0.4	3.1				
Intersection Summary												
HCM 2010 Ctrl Delay			32.2									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 46: SR-73 NB Off Ramp/SR-73 NB On Ramp & Bison Ave

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 		 			
Volume (veh/h)	30	459	0	0	648	680	98	0	19	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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			
Adj Sat Flow, veh/h/ln	186.3	186.3	0.0	0.0	186.3	186.3	186.3	0.0	186.3			
Adj Flow Rate, veh/h	32	483	0	0	682	716	103	0	20			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	61	1888	0	0	1500	667	918	0	743			
Arrive On Green	0.03	0.53	0.00	0.00	0.42	0.42	0.27	0.00	0.27			
Sat Flow, veh/h	1774	3632	0	0	3632	1574	3442	0	2787			
Grp Volume(v), veh/h	32	483	0	0	682	716	103	0	20			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1770	1574	1721	0	1393			
Q Serve(g_s), s	1.1	4.4	0.0	0.0	8.3	25.4	1.4	0.0	0.3			
Cycle Q Clear(g_c), s	1.1	4.4	0.0	0.0	8.3	25.4	1.4	0.0	0.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	61	1888	0	0	1500	667	918	0	743			
V/C Ratio(X)	0.52	0.26	0.00	0.00	0.45	1.07	0.11	0.00	0.03			
Avail Cap(c_a), veh/h	148	1888	0	0	1500	667	918	0	743			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.80	0.80	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.5	7.6	0.0	0.0	12.3	17.3	16.6	0.0	16.2			
Incr Delay (d2), s/veh	5.5	0.3	0.0	0.0	1.0	56.1	0.2	0.0	0.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.6	2.2	0.0	0.0	4.2	21.3	0.7	0.0	0.1			
LnGrp Delay(d),s/veh	33.9	7.8	0.0	0.0	13.3	73.4	16.9	0.0	16.3			
LnGrp LOS	C	A			B	F	B		B			
Approach Vol, veh/h		515			1398			123				
Approach Delay, s/veh		9.5			44.1			16.8				
Approach LOS		A			D			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		38.0			6.6	31.4				
Change Period (Y+Rc), s		6.0		6.0			4.5	6.0				
Max Green Setting (Gmax), s		16.0		32.0			5.0	22.5				
Max Q Clear Time (g_c+I1), s		3.4		6.4			3.1	27.4				
Green Ext Time (p_c), s		0.3		12.3			0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				33.7								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 47: SR-73 SB On Ramp/SR-73 SB Off Ramp & Bison Ave 5/12/2014

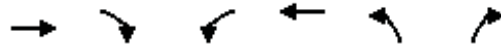
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑↑		↑
Volume (veh/h)	0	203	119	225	521	0	0	0	0	286	0	265
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	193.7	186.3	186.3	0.0				186.3	0.0	193.7
Adj Flow Rate, veh/h	0	214	125	237	548	0				301	0	0
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1492	690	399	2300	0				344	0	165
Arrive On Green	0.00	0.42	0.42	0.12	0.65	0.00				0.10	0.00	0.00
Sat Flow, veh/h	0	3632	1637	3442	3632	0				3442	0	1647
Grp Volume(v), veh/h	0	214	125	237	548	0				301	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1637	1721	1770	0				1721	0	1647
Q Serve(g_s), s	0.0	1.5	1.9	2.6	2.6	0.0				3.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.5	1.9	2.6	2.6	0.0				3.5	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1492	690	399	2300	0				344	0	165
V/C Ratio(X)	0.00	0.14	0.18	0.59	0.24	0.00				0.87	0.00	0.00
Avail Cap(c_a), veh/h	0	1492	690	430	2300	0				344	0	165
HCM Platoon Ratio	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	0.94	0.94	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	7.1	7.2	16.8	2.9	0.0				17.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.6	1.8	0.2	0.0				21.3	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
%ile BackOfQ(50%),veh/ln	0.0	0.8	1.0	1.3	1.3	0.0				2.6	0.0	0.0
LnGrp Delay(d),s/veh	0.0	7.3	7.8	18.6	3.1	0.0				39.0	0.0	0.0
LnGrp LOS		A	A	B	A					D		
Approach Vol, veh/h		339			785						301	
Approach Delay, s/veh		7.5			7.8						39.0	
Approach LOS		A			A						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.1	22.9		8.0		32.0				
Change Period (Y+Rc), s			4.5	6.0		4.0		6.0				
Max Green Setting (Gmax), s			5.0	16.5		4.0		26.0				
Max Q Clear Time (g_c+I1), s			4.6	3.9		5.5		4.6				
Green Ext Time (p_c), s			0.0	4.1		0.0		5.1				
Intersection Summary												
HCM 2010 Ctrl Delay			14.3									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 53: SR-73 NB Ramps & Bonita Canyon Dr 5/12/2014

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↖↗	↑↑	↖↗	↑		
Volume (veh/h)	1395	35	74	986	156	35		
Number	4	14	3	8	5	12		
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		
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	1468	37	78	1038	164	37		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	2028	940	218	2638	250	115		
Arrive On Green	0.57	0.57	0.06	0.75	0.07	0.07		
Sat Flow, veh/h	3632	1639	3442	3632	3442	1583		
Grp Volume(v), veh/h	1468	37	78	1038	164	37		
Grp Sat Flow(s),veh/h/ln	1770	1639	1721	1770	1721	1583		
Q Serve(g_s), s	16.6	0.5	1.2	5.8	2.6	1.2		
Cycle Q Clear(g_c), s	16.6	0.5	1.2	5.8	2.6	1.2		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	2028	940	218	2638	250	115		
V/C Ratio(X)	0.72	0.04	0.36	0.39	0.66	0.32		
Avail Cap(c_a), veh/h	2028	940	313	2638	250	115		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.43	0.43	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	8.6	5.1	24.7	2.5	24.8	24.2		
Incr Delay (d2), s/veh	1.0	0.0	0.4	0.4	6.0	1.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.2	0.3	0.6	2.9	1.4	0.6		
LnGrp Delay(d),s/veh	9.6	5.2	25.1	3.0	30.9	25.8		
LnGrp LOS	A	A	C	A	C	C		
Approach Vol, veh/h	1505			1116	201			
Approach Delay, s/veh	9.5			4.5	29.9			
Approach LOS	A			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.0	9.5	37.5				47.0
Change Period (Y+Rc), s		4.0	6.0	6.0				* 6
Max Green Setting (Gmax), s		4.0	5.0	30.0				* 41
Max Q Clear Time (g_c+I1), s		4.6	3.2	18.6				7.8
Green Ext Time (p_c), s		0.0	0.0	8.0				15.5
Intersection Summary								
HCM 2010 Ctrl Delay			9.0					
HCM 2010 LOS			A					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								







HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 54: SR-73 SB Ramps & Bonita Canyon Dr

5/12/2014















Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↵	↑↑↑	↵	↑		
Volume (veh/h)	1244	477	101	1041	82	186		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	1309	502	106	1096	86	196		
Adj No. of Lanes	2	1	2	3	2	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1327	613	201	2712	918	422		
Arrive On Green	0.38	0.38	0.06	0.53	0.27	0.27		
Sat Flow, veh/h	3632	1636	3442	5253	3442	1583		
Grp Volume(v), veh/h	1309	502	106	1096	86	196		
Grp Sat Flow(s),veh/h/ln	1770	1636	1721	1695	1721	1583		
Q Serve(g_s), s	22.0	16.6	1.8	7.7	1.1	6.2		
Cycle Q Clear(g_c), s	22.0	16.6	1.8	7.7	1.1	6.2		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1327	613	201	2712	918	422		
V/C Ratio(X)	0.99	0.82	0.53	0.40	0.09	0.46		
Avail Cap(c_a), veh/h	1327	613	201	2712	918	422		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.92	0.92	1.00	1.00		
Uniform Delay (d), s/veh	18.6	16.9	27.4	8.3	16.5	18.4		
Incr Delay (d2), s/veh	21.6	11.6	1.2	0.4	0.2	3.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	14.5	9.4	0.9	3.7	0.6	3.1		
LnGrp Delay(d),s/veh	40.2	28.5	28.7	8.7	16.7	22.1		
LnGrp LOS	D	C	C	A	B	C		
Approach Vol, veh/h	1811			1202	282			
Approach Delay, s/veh	37.0			10.5	20.4			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		22.0	9.5	28.5				38.0
Change Period (Y+Rc), s		6.0	6.0	* 6				6.0
Max Green Setting (Gmax), s		16.0	3.5	* 22.5				32.0
Max Q Clear Time (g_c+I1), s		8.2	3.8	24.0				9.7
Green Ext Time (p_c), s		0.3	0.0	0.0				4.9
Intersection Summary								
HCM 2010 Ctrl Delay			25.9					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 62: Newport Coast Dr & SR-73 NB Ramps 5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	↙↘	↘	↕↕	↙		↕↕		
Volume (veh/h)	172	35	692	174	0	603		
Number	3	18	2	12	1	6		
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		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	0.0	186.3		
Adj Flow Rate, veh/h	181	37	728	0	0	635		
Adj No. of Lanes	2	1	2	1	0	2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	0	2		
Cap, veh/h	448	206	1805	807	0	1805		
Arrive On Green	0.13	0.13	0.51	0.00	0.00	0.51		
Sat Flow, veh/h	3442	1583	3632	1583	0	3725		
Grp Volume(v), veh/h	181	37	728	0	0	635		
Grp Sat Flow(s),veh/h/ln	1721	1583	1770	1583	0	1770		
Q Serve(g_s), s	1.6	0.7	4.2	0.0	0.0	3.6		
Cycle Q Clear(g_c), s	1.6	0.7	4.2	0.0	0.0	3.6		
Prop In Lane	1.00	1.00		1.00	0.00			
Lane Grp Cap(c), veh/h	448	206	1805	807	0	1805		
V/C Ratio(X)	0.40	0.18	0.40	0.00	0.00	0.35		
Avail Cap(c_a), veh/h	1652	760	1805	807	0	1805		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	13.3	12.9	5.0	0.0	0.0	4.9		
Incr Delay (d2), s/veh	0.2	0.2	0.7	0.0	0.0	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	0.8	0.3	2.2	0.0	0.0	1.8		
LnGrp Delay(d),s/veh	13.5	13.1	5.7	0.0	0.0	5.4		
LnGrp LOS	B	B	A			A		
Approach Vol, veh/h	218		728			635		
Approach Delay, s/veh	13.5		5.7			5.4		
Approach LOS	B		A			A		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		34.7				34.7		10.3
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		17.0				17.0		16.0
Max Q Clear Time (g_c+I1), s		6.2				5.6		3.6
Green Ext Time (p_c), s		4.2				4.3		0.3
Intersection Summary								
HCM 2010 Ctrl Delay			6.7					
HCM 2010 LOS			A					





















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 69: MacArthur Blvd & I-405 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	357	255	1915	758	601	1468		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	388	277	2082	824	653	1596		
Adj No. of Lanes	2	1	4	2	2	4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	862	397	2815	1217	401	2815		
Arrive On Green	0.25	0.25	0.44	0.44	0.44	0.44		
Sat Flow, veh/h	3442	1583	6669	2771	169	6669		
Grp Volume(v), veh/h	388	277	2082	824	653	1596		
Grp Sat Flow(s),veh/h/ln	1721	1583	1602	1385	84	1602		
Q Serve(g_s), s	3.7	6.1	10.4	9.2	6.6	7.2		
Cycle Q Clear(g_c), s	3.7	6.1	10.4	9.2	17.0	7.2		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	862	397	2815	1217	401	2815		
V/C Ratio(X)	0.45	0.70	0.74	0.68	1.63	0.57		
Avail Cap(c_a), veh/h	1423	655	2815	1217	401	2815		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.42	0.42	1.00	1.00		
Uniform Delay (d), s/veh	12.2	13.2	9.0	8.7	19.1	8.1		
Incr Delay (d2), s/veh	0.4	2.2	0.8	1.3	294.5	0.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.8	2.9	4.6	3.7	18.4	3.3		
LnGrp Delay(d),s/veh	12.6	15.4	9.8	10.0	313.6	8.9		
LnGrp LOS	B	B	A	A	F	A		
Approach Vol, veh/h	665		2906			2249		
Approach Delay, s/veh	13.8		9.8			97.4		
Approach LOS	B		A			F		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		29.3				29.3		15.7
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		17.0				17.0		16.0
Max Q Clear Time (g_c+I1), s		12.4				19.0		8.1
Green Ext Time (p_c), s		4.6				0.0		1.6
Intersection Summary								
HCM 2010 Ctrl Delay			44.1					
HCM 2010 LOS			D					



















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 70: MacArthur Blvd & Airport Entrance/I-405 SB Ramps

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	537	76	541	0	2132	474	432	1210	183
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln				186.3	190.0	186.3	0.0	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h				584	83	0	0	2317	515	470	1315	199
Adj No. of Lanes				2	1	1	0	4	1	2	4	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	0	2	2	2	2	0
Cap, veh/h				667	368	307	0	2422	594	694	4198	1056
Arrive On Green				0.19	0.19	0.00	0.00	0.38	0.38	0.20	0.66	0.66
Sat Flow, veh/h				3442	1900	1583	0	6669	1573	3442	6408	1611
Grp Volume(v), veh/h				584	83	0	0	2317	515	470	1315	199
Grp Sat Flow(s),veh/h/ln				1721	1900	1583	0	1602	1573	1721	1602	1611
Q Serve(g_s), s				13.1	2.9	0.0	0.0	28.0	24.0	10.0	7.1	3.9
Cycle Q Clear(g_c), s				13.1	2.9	0.0	0.0	28.0	24.0	10.0	7.1	3.9
Prop In Lane				1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				667	368	307	0	2422	594	694	4198	1056
V/C Ratio(X)				0.88	0.23	0.00	0.00	0.96	0.87	0.68	0.31	0.19
Avail Cap(c_a), veh/h				694	383	319	0	2422	594	694	4198	1056
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh				31.1	27.0	0.0	0.0	24.1	22.8	29.3	5.9	5.4
Incr Delay (d2), s/veh				11.8	0.3	0.0	0.0	10.6	15.6	4.4	0.2	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				7.3	1.6	0.0	0.0	14.0	12.9	5.2	3.2	1.8
LnGrp Delay(d),s/veh				42.9	27.3	0.0	0.0	34.7	38.4	33.7	6.1	5.7
LnGrp LOS				D	C			C	D	C	A	A
Approach Vol, veh/h					667			2832			1984	
Approach Delay, s/veh					41.0			35.4			12.6	
Approach LOS					D			D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	22.0	36.6				58.6		21.4				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	16.0	30.0				52.0		16.0				
Max Q Clear Time (g_c+I1), s	12.0	30.0				9.1		15.1				
Green Ext Time (p_c), s	0.7	0.0				40.2		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				27.8								
HCM 2010 LOS				C								



















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 80: Jamboree Rd & I-405 NB On Ramp/I-405 NB Ramps

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	642	0	386	0	3147	716	0	1820	1020
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				186.3	0.0	186.3	0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h				676	0	0	0	3313	0	0	1916	0
Adj No. of Lanes				3	0	1	0	3	1	0	4	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	2	0	2	2
Cap, veh/h				849	0	269	0	3431	1068	0	4323	1068
Arrive On Green				0.17	0.00	0.00	0.00	0.67	0.00	0.00	0.67	0.00
Sat Flow, veh/h				5003	0	1583	0	5253	1583	0	6669	1583
Grp Volume(v), veh/h				676	0	0	0	3313	0	0	1916	0
Grp Sat Flow(s),veh/h/ln				1668	0	1583	0	1695	1583	0	1602	1583
Q Serve(g_s), s				10.0	0.0	0.0	0.0	46.9	0.0	0.0	10.7	0.0
Cycle Q Clear(g_c), s				10.0	0.0	0.0	0.0	46.9	0.0	0.0	10.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				849	0	269	0	3431	1068	0	4323	1068
V/C Ratio(X)				0.80	0.00	0.00	0.00	0.97	0.00	0.00	0.44	0.00
Avail Cap(c_a), veh/h				1039	0	329	0	3431	1068	0	4323	1068
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				30.7	0.0	0.0	0.0	11.7	0.0	0.0	5.8	0.0
Incr Delay (d2), s/veh				3.6	0.0	0.0	0.0	1.2	0.0	0.0	0.3	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
%ile BackOfQ(50%),veh/ln				4.9	0.0	0.0	0.0	21.9	0.0	0.0	4.8	0.0
LnGrp Delay(d),s/veh				34.3	0.0	0.0	0.0	12.9	0.0	0.0	6.1	0.0
LnGrp LOS				C				B			A	
Approach Vol, veh/h					676			3313			1916	
Approach Delay, s/veh					34.3			12.9			6.1	
Approach LOS					C			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		60.9				60.9		19.1				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		52.0				52.0		16.0				
Max Q Clear Time (g_c+I1), s		48.9				12.7		12.0				
Green Ext Time (p_c), s		3.1				39.0		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				13.2								
HCM 2010 LOS				B								























HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 81: Jamboree Rd & I-405 SB Ramps

5/12/2014













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1158	0	619	0	0	0	0	1989	1068	0	1840	622
Number	7	4	14				5	2	12	3	8	18
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	0.0	186.3				0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h	1182	0	632				0	2030	0	0	1878	0
Adj No. of Lanes	2	0	3				0	3	2	0	4	1
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	1404	0	0				0	0	0	0	2576	636
Arrive On Green	0.41	0.00	0.00				0.00	0.00	0.00	0.00	0.40	0.00
Sat Flow, veh/h	3442	1182						0		0	6669	1583
Grp Volume(v), veh/h	1182	19.7						0.0		0	1878	0
Grp Sat Flow(s),veh/h/ln	1721	B								0	1602	1583
Q Serve(g_s), s	19.5									0.0	15.6	0.0
Cycle Q Clear(g_c), s	19.5									0.0	15.6	0.0
Prop In Lane	1.00									0.00		1.00
Lane Grp Cap(c), veh/h	1404									0	2576	636
V/C Ratio(X)	0.84									0.00	0.73	0.00
Avail Cap(c_a), veh/h	1854									0	2843	702
HCM Platoon Ratio	1.00									1.00	1.00	1.00
Upstream Filter(I)	1.00									0.00	0.84	0.00
Uniform Delay (d), s/veh	16.9									0.0	16.0	0.0
Incr Delay (d2), s/veh	2.8									0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0									0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7									0.0	7.0	0.0
LnGrp Delay(d),s/veh	19.7									0.0	16.7	0.0
LnGrp LOS	B										B	
Approach Vol, veh/h											1878	
Approach Delay, s/veh											16.7	
Approach LOS											B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs							7	8				
Phs Duration (G+Y+Rc), s							31.7	31.4				
Change Period (Y+Rc), s							6.0	6.0				
Max Green Setting (Gmax), s							34.0	28.0				
Max Q Clear Time (g_c+I1), s							21.5	17.6				
Green Ext Time (p_c), s							4.2	7.7				
Intersection Summary												
HCM 2010 Ctrl Delay			17.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 46: SR-73 NB Off Ramp/SR-73 NB On Ramp & Bison Ave

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 		 			
Volume (veh/h)	42	1878	0	0	243	428	207	0	472	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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			
Adj Sat Flow, veh/h/ln	186.3	186.3	0.0	0.0	186.3	186.3	186.3	0.0	186.3			
Adj Flow Rate, veh/h	44	1977	0	0	256	451	218	0	497			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	73	2124	0	0	1751	779	787	0	637			
Arrive On Green	0.04	0.60	0.00	0.00	0.49	0.49	0.23	0.00	0.23			
Sat Flow, veh/h	1774	3632	0	0	3632	1575	3442	0	2787			
Grp Volume(v), veh/h	44	1977	0	0	256	451	218	0	497			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1770	1575	1721	0	1393			
Q Serve(g_s), s	1.7	35.4	0.0	0.0	2.8	14.2	3.7	0.0	11.7			
Cycle Q Clear(g_c), s	1.7	35.4	0.0	0.0	2.8	14.2	3.7	0.0	11.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	73	2124	0	0	1751	779	787	0	637			
V/C Ratio(X)	0.60	0.93	0.00	0.00	0.15	0.58	0.28	0.00	0.78			
Avail Cap(c_a), veh/h	152	2124	0	0	1751	779	787	0	637			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.41	0.41	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.0	12.7	0.0	0.0	9.6	12.5	22.2	0.0	25.3			
Incr Delay (d2), s/veh	3.3	4.2	0.0	0.0	0.2	3.1	0.9	0.0	9.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.9	18.3	0.0	0.0	1.4	6.8	1.8	0.0	5.3			
LnGrp Delay(d),s/veh	36.3	16.9	0.0	0.0	9.8	15.6	23.1	0.0	34.5			
LnGrp LOS	D	B			A	B	C		C			
Approach Vol, veh/h		2021			707			715				
Approach Delay, s/veh		17.3			13.5			31.1				
Approach LOS		B			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		48.0			7.4	40.6				
Change Period (Y+Rc), s		6.0		6.0			4.5	6.0				
Max Green Setting (Gmax), s		16.0		42.0			6.0	31.5				
Max Q Clear Time (g_c+I1), s		13.7		37.4			3.7	16.2				
Green Ext Time (p_c), s		0.7		4.3			0.0	13.3				
Intersection Summary												
HCM 2010 Ctrl Delay			19.4									
HCM 2010 LOS			B									

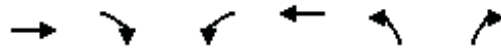
HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 47: SR-73 SB On Ramp/SR-73 SB Off Ramp & Bison Ave 5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑↑		↑
Volume (veh/h)	0	607	96	34	417	0	0	0	0	1323	0	403
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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
Adj Sat Flow, veh/h/ln	0.0	186.3	193.7	186.3	186.3	0.0				186.3	0.0	193.7
Adj Flow Rate, veh/h	0	639	101	36	439	0				1393	0	0
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1135	524	129	1534	0				1377	0	659
Arrive On Green	0.00	0.32	0.32	0.04	0.43	0.00				0.40	0.00	0.00
Sat Flow, veh/h	0	3632	1634	3442	3632	0				3442	0	1647
Grp Volume(v), veh/h	0	639	101	36	439	0				1393	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1634	1721	1770	0				1721	0	1647
Q Serve(g_s), s	0.0	9.0	2.7	0.6	4.8	0.0				24.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.0	2.7	0.6	4.8	0.0				24.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1135	524	129	1534	0				1377	0	659
V/C Ratio(X)	0.00	0.56	0.19	0.28	0.29	0.00				1.01	0.00	0.00
Avail Cap(c_a), veh/h	0	1135	524	287	1534	0				1377	0	659
HCM Platoon Ratio	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	0.99	0.99	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	16.9	14.8	28.1	11.0	0.0				18.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.0	0.8	1.1	0.5	0.0				27.2	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
%ile BackOfQ(50%),veh/ln	0.0	4.7	1.3	0.3	2.4	0.0				16.5	0.0	0.0
LnGrp Delay(d),s/veh	0.0	18.9	15.6	29.2	11.5	0.0				45.2	0.0	0.0
LnGrp LOS		B	B	C	B					F		
Approach Vol, veh/h		740			475						1393	
Approach Delay, s/veh		18.5			12.8						45.2	
Approach LOS		B			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			6.8	25.2		28.0		32.0				
Change Period (Y+Rc), s			4.5	6.0		4.0		6.0				
Max Green Setting (Gmax), s			5.0	16.5		24.0		26.0				
Max Q Clear Time (g_c+I1), s			2.6	11.0		26.0		6.8				
Green Ext Time (p_c), s			0.0	3.1		0.0		6.9				
Intersection Summary												
HCM 2010 Ctrl Delay			31.7									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 53: SR-73 NB Ramps & Bonita Canyon Dr 5/13/2014

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↖↗	↑↑	↖↗	↑		
Volume (veh/h)	953	217	623	927	703	107		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	1003	228	656	976	740	113		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1227	567	724	2224	871	401		
Arrive On Green	0.35	0.35	0.21	0.63	0.25	0.25		
Sat Flow, veh/h	3632	1635	3442	3632	3442	1583		
Grp Volume(v), veh/h	1003	228	656	976	740	113		
Grp Sat Flow(s),veh/h/ln	1770	1635	1721	1770	1721	1583		
Q Serve(g_s), s	21.8	8.9	15.7	11.9	17.3	4.8		
Cycle Q Clear(g_c), s	21.8	8.9	15.7	11.9	17.3	4.8		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1227	567	724	2224	871	401		
V/C Ratio(X)	0.82	0.40	0.91	0.44	0.85	0.28		
Avail Cap(c_a), veh/h	1227	567	734	2224	1102	507		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.79	0.79	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	25.1	20.9	32.5	8.0	30.0	25.3		
Incr Delay (d2), s/veh	4.9	1.7	14.3	0.6	5.3	0.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	11.4	4.3	8.9	5.9	8.8	2.1		
LnGrp Delay(d),s/veh	30.0	22.6	46.8	8.7	35.2	25.7		
LnGrp LOS	C	C	D	A	D	C		
Approach Vol, veh/h	1231			1632	853			
Approach Delay, s/veh	28.6			24.0	34.0			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		25.3	23.7	40.9				64.7
Change Period (Y+Rc), s		4.0	6.0	6.0				* 6
Max Green Setting (Gmax), s		27.0	18.0	29.0				* 53
Max Q Clear Time (g_c+I1), s		19.3	17.7	23.8				13.9
Green Ext Time (p_c), s		2.1	0.1	3.7				11.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.8					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 54: SR-73 SB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖↗	↑↑↑	↖↗	↗
Volume (veh/h)	967	199	31	1636	114	203
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	1018	209	33	1722	120	214
Adj No. of Lanes	2	1	2	3	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1327	613	201	2712	918	422
Arrive On Green	0.38	0.38	0.06	0.53	0.27	0.27
Sat Flow, veh/h	3632	1636	3442	5253	3442	1583
Grp Volume(v), veh/h	1018	209	33	1722	120	214
Grp Sat Flow(s),veh/h/ln	1770	1636	1721	1695	1721	1583
Q Serve(g_s), s	15.1	5.5	0.5	14.3	1.6	6.9
Cycle Q Clear(g_c), s	15.1	5.5	0.5	14.3	1.6	6.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1327	613	201	2712	918	422
V/C Ratio(X)	0.77	0.34	0.16	0.63	0.13	0.51
Avail Cap(c_a), veh/h	1327	613	201	2712	918	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.80	0.80	1.00	1.00
Uniform Delay (d), s/veh	16.5	13.4	26.9	9.9	16.7	18.7
Incr Delay (d2), s/veh	4.3	1.5	0.1	0.9	0.3	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	2.7	0.3	6.8	0.8	3.5
LnGrp Delay(d),s/veh	20.7	14.9	27.0	10.8	17.0	23.0
LnGrp LOS	C	B	C	B	B	C
Approach Vol, veh/h	1227			1755	334	
Approach Delay, s/veh	19.8			11.1	20.8	
Approach LOS	B			B	C	












Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		22.0	9.5	28.5				38.0
Change Period (Y+Rc), s		6.0	6.0	* 6				6.0
Max Green Setting (Gmax), s		16.0	3.5	* 22.5				32.0
Max Q Clear Time (g_c+I1), s		8.9	2.5	17.1				16.3
Green Ext Time (p_c), s		0.4	0.7	2.3				7.2

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes
 * HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.













HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 62: Newport Coast Dr & SR-73 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	357	143	1137	520	0	693		
Number	3	18	2	12	1	6		
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		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	0.0	186.3		
Adj Flow Rate, veh/h	376	151	1197	0	0	729		
Adj No. of Lanes	2	1	2	1	0	2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	0	2		
Cap, veh/h	580	267	1904	852	0	1904		
Arrive On Green	0.17	0.17	0.54	0.00	0.00	0.54		
Sat Flow, veh/h	3442	1583	3632	1583	0	3725		
Grp Volume(v), veh/h	376	151	1197	0	0	729		
Grp Sat Flow(s),veh/h/ln	1721	1583	1770	1583	0	1770		
Q Serve(g_s), s	4.2	3.6	9.7	0.0	0.0	4.9		
Cycle Q Clear(g_c), s	4.2	3.6	9.7	0.0	0.0	4.9		
Prop In Lane	1.00	1.00		1.00	0.00			
Lane Grp Cap(c), veh/h	580	267	1904	852	0	1904		
V/C Ratio(X)	0.65	0.57	0.63	0.00	0.00	0.38		
Avail Cap(c_a), veh/h	1347	619	1904	852	0	1904		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	15.9	15.6	6.6	0.0	0.0	5.5		
Incr Delay (d2), s/veh	0.5	0.7	1.6	0.0	0.0	0.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.0	1.6	5.1	0.0	0.0	2.5		
LnGrp Delay(d),s/veh	16.3	16.3	8.2	0.0	0.0	6.1		
LnGrp LOS	B	B	A			A		
Approach Vol, veh/h	527		1197			729		
Approach Delay, s/veh	16.3		8.2			6.1		
Approach LOS	B		A			A		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		37.1				37.1		12.9
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		22.0				22.0		16.0
Max Q Clear Time (g_c+I1), s		11.7				6.9		6.2
Green Ext Time (p_c), s		5.8				7.4		0.7
Intersection Summary								
HCM 2010 Ctrl Delay			9.3					
HCM 2010 LOS			A					





















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 69: MacArthur Blvd & I-405 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	889	705	2009	358	162	1431		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	966	766	2184	389	176	1555		
Adj No. of Lanes	2	1	4	2	2	4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1672	769	2197	948	206	2197		
Arrive On Green	0.49	0.49	0.34	0.34	0.34	0.34		
Sat Flow, veh/h	3442	1583	6669	2766	236	6669		
Grp Volume(v), veh/h	966	766	2184	389	176	1555		
Grp Sat Flow(s),veh/h/ln	1721	1583	1602	1383	118	1602		
Q Serve(g_s), s	14.0	33.7	23.8	7.5	0.2	14.7		
Cycle Q Clear(g_c), s	14.0	33.7	23.8	7.5	24.0	14.7		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	1672	769	2197	948	206	2197		
V/C Ratio(X)	0.58	1.00	0.99	0.41	0.85	0.71		
Avail Cap(c_a), veh/h	1672	769	2197	948	206	2197		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.46	0.46	1.00	1.00		
Uniform Delay (d), s/veh	12.9	17.9	22.9	17.6	35.0	20.0		
Incr Delay (d2), s/veh	0.5	31.4	11.7	0.6	33.5	2.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.7	21.2	12.3	2.9	2.6	6.8		
LnGrp Delay(d),s/veh	13.4	49.3	34.6	18.2	68.5	21.9		
LnGrp LOS	B	D	C	B	E	C		
Approach Vol, veh/h	1732		2573			1731		
Approach Delay, s/veh	29.3		32.2			26.6		
Approach LOS	C		C			C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		30.0				30.0		40.0
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		24.0				24.0		34.0
Max Q Clear Time (g_c+I1), s		25.8				26.0		35.7
Green Ext Time (p_c), s		0.0				0.0		0.0
Intersection Summary								
HCM 2010 Ctrl Delay			29.7					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 70: MacArthur Blvd & Airport Entrance/I-405 SB Ramps

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	994	138	809	0	1499	432	160	1692	475
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln				186.3	190.0	186.3	0.0	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h				1080	150	0	0	1629	470	174	1839	516
Adj No. of Lanes				2	1	1	0	4	1	2	4	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	0	2	2	2	2	0
Cap, veh/h				1076	594	495	0	1682	412	688	3444	866
Arrive On Green				0.31	0.31	0.00	0.00	0.26	0.26	0.20	0.54	0.54
Sat Flow, veh/h				3442	1900	1583	0	6669	1568	3442	6408	1610
Grp Volume(v), veh/h				1080	150	0	0	1629	470	174	1839	516
Grp Sat Flow(s),veh/h/ln				1721	1900	1583	0	1602	1568	1721	1602	1610
Q Serve(g_s), s				25.0	4.7	0.0	0.0	20.1	21.0	3.4	14.9	17.4
Cycle Q Clear(g_c), s				25.0	4.7	0.0	0.0	20.1	21.0	3.4	14.9	17.4
Prop In Lane				1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1076	594	495	0	1682	412	688	3444	866
V/C Ratio(X)				1.00	0.25	0.00	0.00	0.97	1.14	0.25	0.53	0.60
Avail Cap(c_a), veh/h				1076	594	495	0	1682	412	688	3444	866
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	1.00	1.00	0.70	0.70	0.70
Uniform Delay (d), s/veh				27.5	20.5	0.0	0.0	29.2	29.5	27.0	12.0	12.6
Incr Delay (d2), s/veh				28.5	0.2	0.0	0.0	15.6	89.0	0.6	0.4	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.1	2.5	0.0	0.0	10.6	19.2	1.7	6.6	8.1
LnGrp Delay(d),s/veh				56.0	20.7	0.0	0.0	44.8	118.5	27.6	12.4	14.7
LnGrp LOS				F	C			D	F	C	B	B
Approach Vol, veh/h					1230			2099			2529	
Approach Delay, s/veh					51.7			61.3			13.9	
Approach LOS					D			E			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	22.0	27.0				49.0		31.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	16.0	21.0				43.0		25.0				
Max Q Clear Time (g_c+I1), s	5.4	23.0				19.4		27.0				
Green Ext Time (p_c), s	0.4	0.0				22.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				38.8								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 75: Von Karmen Ave & I-405 HOV Ramps 5/12/2014



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	312	62	956	124	276	41	282	369	9	1	8	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.99	1.00		0.97
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
Adj Sat Flow, veh/h/ln	190.0	190.0	190.0	190.0	190.0	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Adj Flow Rate, veh/h	328	65	1006	131	291	43	297	388	9	1	8	2
Adj No. of Lanes	0	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	0	0	2	0
Cap, veh/h	384	76	696	342	306	45	324	1394	439	2	395	122
Arrive On Green	0.25	0.25	0.25	0.19	0.19	0.19	0.18	0.27	0.27	0.00	0.08	0.08
Sat Flow, veh/h	1522	302	1615	1810	1619	239	1810	5085	1600	1810	5085	1563
Grp Volume(v), veh/h	393	0	1006	131	0	334	297	388	9	1	8	2
Grp Sat Flow(s),veh/h/ln	1824	0	1615	1810	0	1858	1810	1695	1600	1810	1695	1563
Q Serve(g_s), s	16.3	0.0	20.0	5.0	0.0	14.1	12.8	4.8	0.3	0.0	0.1	0.1
Cycle Q Clear(g_c), s	16.3	0.0	20.0	5.0	0.0	14.1	12.8	4.8	0.3	0.0	0.1	0.1
Prop In Lane	0.83		1.00	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	460	0	696	342	0	351	324	1394	439	2	395	122
V/C Ratio(X)	0.86	0.00	1.45	0.38	0.00	0.95	0.92	0.28	0.02	0.40	0.02	0.02
Avail Cap(c_a), veh/h	460	0	696	342	0	351	324	1762	554	114	1076	331
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)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	22.6	28.1	0.0	31.8	32.0	22.6	21.0	39.6	33.8	33.8
Incr Delay (d2), s/veh	14.6	0.0	208.6	0.7	0.0	35.4	29.8	0.5	0.1	80.9	0.1	0.2
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	10.1	0.0	51.5	2.6	0.0	10.7	9.0	2.3	0.2	0.1	0.1	0.0
LnGrp Delay(d),s/veh	42.9	0.0	231.2	28.8	0.0	67.2	61.8	23.1	21.1	120.5	33.9	34.0
LnGrp LOS	D		F	C		E	E	C	C	F	C	C
Approach Vol, veh/h		1399			465			694			11	
Approach Delay, s/veh		178.3			56.4			39.7			41.8	
Approach LOS		F			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	38.4		26.0	30.8	12.2		21.0				
Change Period (Y+Rc), s	4.5	6.0		6.0	6.0	*6		6.0				
Max Green Setting (Gmax), s	5.0	27.5		20.0	14.26	7.99999		15.0				
Max Q Clear Time (g_c+I1), s	2.0	6.8		22.0	14.8	2.1		16.1				
Green Ext Time (p_c), s	0.0	3.2		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			118.2									
HCM 2010 LOS			F									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 80: Jamboree Rd & I-405 NB On Ramp/I-405 NB Ramps

5/12/2014



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1515	0	933	0	2007	510	0	2265	1140
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				186.3	0.0	186.3	0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h				1595	0	0	0	2113	0	0	2384	0
Adj No. of Lanes				3	0	1	0	3	1	0	4	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	2	0	2	2
Cap, veh/h				1693	0	536	0	2425	755	0	3056	755
Arrive On Green				0.34	0.00	0.00	0.00	0.48	0.00	0.00	0.48	0.00
Sat Flow, veh/h				5003	0	1583	0	5253	1583	0	6669	1583
Grp Volume(v), veh/h				1595	0	0	0	2113	0	0	2384	0
Grp Sat Flow(s),veh/h/ln				1668	0	1583	0	1695	1583	0	1602	1583
Q Serve(g_s), s				20.1	0.0	0.0	0.0	24.2	0.0	0.0	20.1	0.0
Cycle Q Clear(g_c), s				20.1	0.0	0.0	0.0	24.2	0.0	0.0	20.1	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1693	0	536	0	2425	755	0	3056	755
V/C Ratio(X)				0.94	0.00	0.00	0.00	0.87	0.00	0.00	0.78	0.00
Avail Cap(c_a), veh/h				1693	0	536	0	2425	755	0	3056	755
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				20.9	0.0	0.0	0.0	15.2	0.0	0.0	14.2	0.0
Incr Delay (d2), s/veh				11.0	0.0	0.0	0.0	0.4	0.0	0.0	2.0	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
%ile BackOfQ(50%),veh/ln				10.9	0.0	0.0	0.0	11.3	0.0	0.0	9.2	0.0
LnGrp Delay(d),s/veh				31.9	0.0	0.0	0.0	15.7	0.0	0.0	16.2	0.0
LnGrp LOS				C				B			B	
Approach Vol, veh/h					1595			2113			2384	
Approach Delay, s/veh					31.9			15.7			16.2	
Approach LOS					C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		37.0				37.0		28.0				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		31.0				31.0		22.0				
Max Q Clear Time (g_c+I1), s		26.2				22.1		22.1				
Green Ext Time (p_c), s		4.8				8.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				20.1								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 81: Jamboree Rd & I-405 SB Ramps 5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	890	0	1620	0	0	0	0	1170	753	0	3467	299
Number	7	4	14				5	2	12	3	8	18
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	0.0	186.3				0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h	908	0	1653				0	1194	0	0	3538	0
Adj No. of Lanes	2	0	3				0	3	2	0	4	1
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	978	0	0				0	0	0	0	3726	921
Arrive On Green	0.28	0.00	0.00				0.00	0.00	0.00	0.00	0.58	0.00
Sat Flow, veh/h	3442	908						0		0	6669	1583
Grp Volume(v), veh/h	908	45.2						0.0		0	3538	0
Grp Sat Flow(s),veh/h/ln	1721	D								0	1602	1583
Q Serve(g_s), s	22.9									0.0	46.1	0.0
Cycle Q Clear(g_c), s	22.9									0.0	46.1	0.0
Prop In Lane	1.00									0.00		1.00
Lane Grp Cap(c), veh/h	978									0	3726	921
V/C Ratio(X)	0.93									0.00	0.95	0.00
Avail Cap(c_a), veh/h	1001									0	3728	921
HCM Platoon Ratio	1.00									1.00	1.00	1.00
Upstream Filter(I)	1.00									0.00	0.42	0.00
Uniform Delay (d), s/veh	31.1									0.0	17.5	0.0
Incr Delay (d2), s/veh	14.1									0.0	3.1	0.0
Initial Q Delay(d3),s/veh	0.0									0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8									0.0	20.9	0.0
LnGrp Delay(d),s/veh	45.2									0.0	20.6	0.0
LnGrp LOS	D										C	
Approach Vol, veh/h											3538	
Approach Delay, s/veh											20.6	
Approach LOS											C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs							7	8				
Phs Duration (G+Y+Rc), s							31.4	58.0				
Change Period (Y+Rc), s							6.0	6.0				
Max Green Setting (Gmax), s							26.0	52.0				
Max Q Clear Time (g_c+I1), s							24.9	48.1				
Green Ext Time (p_c), s							0.5	3.9				
Intersection Summary												
HCM 2010 Ctrl Delay			25.6									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 46: SR-73 NB Off Ramp/SR-73 NB On Ramp & Bison Ave

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	716	0	0	821	807	143	0	47	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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			
Adj Sat Flow, veh/h/ln	186.3	186.3	0.0	0.0	186.3	186.3	186.3	0.0	186.3			
Adj Flow Rate, veh/h	27	754	0	0	864	849	151	0	49			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	54	1888	0	0	1515	674	918	0	743			
Arrive On Green	0.03	0.53	0.00	0.00	0.43	0.43	0.27	0.00	0.27			
Sat Flow, veh/h	1774	3632	0	0	3632	1574	3442	0	2787			
Grp Volume(v), veh/h	27	754	0	0	864	849	151	0	49			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1770	1574	1721	0	1393			
Q Serve(g_s), s	0.9	7.6	0.0	0.0	11.1	25.7	2.0	0.0	0.8			
Cycle Q Clear(g_c), s	0.9	7.6	0.0	0.0	11.1	25.7	2.0	0.0	0.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	54	1888	0	0	1515	674	918	0	743			
V/C Ratio(X)	0.50	0.40	0.00	0.00	0.57	1.26	0.16	0.00	0.07			
Avail Cap(c_a), veh/h	148	1888	0	0	1515	674	918	0	743			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.84	0.84	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.7	8.3	0.0	0.0	13.0	17.2	16.9	0.0	16.4			
Incr Delay (d2), s/veh	6.1	0.5	0.0	0.0	1.6	128.7	0.4	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.5	3.8	0.0	0.0	5.7	35.1	1.0	0.0	0.3			
LnGrp Delay(d),s/veh	34.7	8.8	0.0	0.0	14.5	145.8	17.3	0.0	16.6			
LnGrp LOS	C	A			B	F	B		B			
Approach Vol, veh/h		781			1713			200				
Approach Delay, s/veh		9.7			79.6			17.1				
Approach LOS		A			E			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		38.0			6.3	31.7				
Change Period (Y+Rc), s		6.0		6.0			4.5	6.0				
Max Green Setting (Gmax), s		16.0		32.0			5.0	22.5				
Max Q Clear Time (g_c+I1), s		4.0		9.6			2.9	27.7				
Green Ext Time (p_c), s		0.5		15.6			0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			54.7									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 47: SR-73 SB On Ramp/SR-73 SB Off Ramp & Bison Ave 5/12/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑↑		↑
Volume (veh/h)	0	344	156	293	666	0	0	0	0	376	0	264
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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
Adj Sat Flow, veh/h/ln	0.0	186.3	193.7	186.3	186.3	0.0				186.3	0.0	193.7
Adj Flow Rate, veh/h	0	362	164	308	701	0				396	0	0
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1396	645	444	2207	0				529	0	253
Arrive On Green	0.00	0.39	0.39	0.13	0.62	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3632	1636	3442	3632	0				3442	0	1647
Grp Volume(v), veh/h	0	362	164	308	701	0				396	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1636	1721	1770	0				1721	0	1647
Q Serve(g_s), s	0.0	3.1	3.0	3.8	4.2	0.0				4.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.1	3.0	3.8	4.2	0.0				4.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1396	645	444	2207	0				529	0	253
V/C Ratio(X)	0.00	0.26	0.25	0.69	0.32	0.00				0.75	0.00	0.00
Avail Cap(c_a), veh/h	0	1396	645	498	2207	0				537	0	257
HCM Platoon Ratio	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	0.88	0.88	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.2	9.2	18.7	4.0	0.0				18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.9	3.2	0.3	0.0				5.7	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
%ile BackOfQ(50%),veh/ln	0.0	1.6	1.5	2.0	2.0	0.0				2.7	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.6	10.1	21.9	4.3	0.0				23.9	0.0	0.0
LnGrp LOS		A	B	C	A					C		
Approach Vol, veh/h		526			1009						396	
Approach Delay, s/veh		9.8			9.7						23.9	
Approach LOS		A			A						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.3	23.8		10.9		34.1				
Change Period (Y+Rc), s			4.5	6.0		4.0		6.0				
Max Green Setting (Gmax), s			6.5	17.0		7.0		28.0				
Max Q Clear Time (g_c+I1), s			5.8	5.1		6.9		6.2				
Green Ext Time (p_c), s			0.1	5.5		0.0		7.5				
Intersection Summary												
HCM 2010 Ctrl Delay			12.6									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 53: SR-73 NB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑↑	↑↑	↑
Volume (veh/h)	1390	122	368	1070	240	70
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	1463	128	387	1126	253	74
Adj No. of Lanes	2	1	2	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1737	804	491	2595	344	158
Arrive On Green	0.49	0.49	0.14	0.73	0.10	0.10
Sat Flow, veh/h	3632	1638	3442	3632	3442	1583
Grp Volume(v), veh/h	1463	128	387	1126	253	74
Grp Sat Flow(s),veh/h/ln	1770	1638	1721	1770	1721	1583
Q Serve(g_s), s	21.5	2.6	6.5	7.5	4.3	2.6
Cycle Q Clear(g_c), s	21.5	2.6	6.5	7.5	4.3	2.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1737	804	491	2595	344	158
V/C Ratio(X)	0.84	0.16	0.79	0.43	0.74	0.47
Avail Cap(c_a), veh/h	1737	804	516	2595	344	158
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.47	0.47	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	8.4	24.9	3.1	26.2	25.5
Incr Delay (d2), s/veh	2.5	0.2	6.9	0.5	8.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	1.2	3.5	3.6	2.4	1.2
LnGrp Delay(d),s/veh	15.8	8.6	31.7	3.7	34.2	27.6
LnGrp LOS	B	A	C	A	C	C
Approach Vol, veh/h	1591			1513	327	
Approach Delay, s/veh	15.2			10.8	32.7	
Approach LOS	B			B	C	

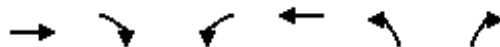
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.0	14.6	35.4				50.0
Change Period (Y+Rc), s		4.0	6.0	6.0				* 6
Max Green Setting (Gmax), s		6.0	9.0	29.0				* 44
Max Q Clear Time (g_c+I1), s		6.3	8.5	23.5				9.5
Green Ext Time (p_c), s		0.0	0.0	4.5				16.9

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 54: SR-73 SB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖↖	↑↑↑	↖↖	↗
Volume (veh/h)	1190	676	106	1217	227	314
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	1253	712	112	1281	239	331
Adj No. of Lanes	2	1	2	3	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1327	613	201	2712	918	422
Arrive On Green	0.38	0.38	0.08	0.71	0.27	0.27
Sat Flow, veh/h	3632	1636	3442	5253	3442	1583
Grp Volume(v), veh/h	1253	712	112	1281	239	331
Grp Sat Flow(s),veh/h/ln	1770	1636	1721	1695	1721	1583
Q Serve(g_s), s	20.6	22.5	1.9	6.6	3.3	11.6
Cycle Q Clear(g_c), s	20.6	22.5	1.9	6.6	3.3	11.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1327	613	201	2712	918	422
V/C Ratio(X)	0.94	1.16	0.56	0.47	0.26	0.78
Avail Cap(c_a), veh/h	1327	613	201	2712	918	422
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	18.1	18.8	26.9	5.0	17.3	20.4
Incr Delay (d2), s/veh	14.5	89.5	1.8	0.5	0.7	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.6	25.3	0.9	3.1	1.6	6.6
LnGrp Delay(d),s/veh	32.7	108.2	28.8	5.5	18.0	34.0
LnGrp LOS	C	F	C	A	B	C
Approach Vol, veh/h	1965			1393	570	
Approach Delay, s/veh	60.0			7.4	27.3	
Approach LOS	E			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		22.0	9.5	28.5				38.0
Change Period (Y+Rc), s		6.0	6.0	* 6				6.0
Max Green Setting (Gmax), s		16.0	3.5	* 22.5				32.0
Max Q Clear Time (g_c+I1), s		13.6	3.9	24.5				8.6
Green Ext Time (p_c), s		0.4	0.0	0.0				6.0

Intersection Summary












HCM 2010 Ctrl Delay	36.6
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.













HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 62: Newport Coast Dr & SR-73 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	221	34	1026	170	0	869		
Number	3	18	2	12	1	6		
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		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	0.0	186.3		
Adj Flow Rate, veh/h	233	36	1080	0	0	915		
Adj No. of Lanes	2	1	2	1	0	2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	0	2		
Cap, veh/h	471	217	1791	801	0	1791		
Arrive On Green	0.14	0.14	0.51	0.00	0.00	0.51		
Sat Flow, veh/h	3442	1583	3632	1583	0	3725		
Grp Volume(v), veh/h	233	36	1080	0	0	915		
Grp Sat Flow(s),veh/h/ln	1721	1583	1770	1583	0	1770		
Q Serve(g_s), s	2.1	0.7	7.3	0.0	0.0	5.8		
Cycle Q Clear(g_c), s	2.1	0.7	7.3	0.0	0.0	5.8		
Prop In Lane	1.00	1.00		1.00	0.00			
Lane Grp Cap(c), veh/h	471	217	1791	801	0	1791		
V/C Ratio(X)	0.50	0.17	0.60	0.00	0.00	0.51		
Avail Cap(c_a), veh/h	1639	754	1791	801	0	1791		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	13.4	12.8	5.9	0.0	0.0	5.5		
Incr Delay (d2), s/veh	0.3	0.1	1.5	0.0	0.0	1.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.0	0.3	3.8	0.0	0.0	3.1		
LnGrp Delay(d),s/veh	13.7	12.9	7.4	0.0	0.0	6.6		
LnGrp LOS	B	B	A			A		
Approach Vol, veh/h	269		1080			915		
Approach Delay, s/veh	13.6		7.4			6.6		
Approach LOS	B		A			A		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		34.4				34.4		10.6
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		17.0				17.0		16.0
Max Q Clear Time (g_c+I1), s		9.3				7.8		4.1
Green Ext Time (p_c), s		4.9				5.5		0.4
Intersection Summary								
HCM 2010 Ctrl Delay			7.8					
HCM 2010 LOS			A					





















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 69: MacArthur Blvd & I-405 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	518	336	2177	1115	495	2042		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	563	365	2366	1212	538	2220		
Adj No. of Lanes	2	1	4	2	2	4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	452	2964	1282	315	2964		
Arrive On Green	0.29	0.29	0.46	0.46	0.46	0.46		
Sat Flow, veh/h	3442	1583	6669	2772	85	6669		
Grp Volume(v), veh/h	563	365	2366	1212	538	2220		
Grp Sat Flow(s),veh/h/ln	1721	1583	1602	1386	42	1602		
Q Serve(g_s), s	6.6	10.2	15.0	19.9	7.0	13.6		
Cycle Q Clear(g_c), s	6.6	10.2	15.0	19.9	22.0	13.6		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	982	452	2964	1282	315	2964		
V/C Ratio(X)	0.57	0.81	0.80	0.95	1.71	0.75		
Avail Cap(c_a), veh/h	1158	533	2964	1282	315	2964		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00		
Uniform Delay (d), s/veh	14.5	15.8	10.9	12.2	23.6	10.5		
Incr Delay (d2), s/veh	0.5	7.8	0.2	2.0	331.2	1.8		
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	5.3	6.6	7.8	16.5	6.2		
LnGrp Delay(d),s/veh	15.1	23.6	11.1	14.2	354.8	12.3		
LnGrp LOS	B	C	B	B	F	B		
Approach Vol, veh/h	928		3578			2758		
Approach Delay, s/veh	18.4		12.2			79.1		
Approach LOS	B		B			E		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		30.4				30.4		19.6
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		22.0				22.0		16.0
Max Q Clear Time (g_c+I1), s		21.9				24.0		12.2
Green Ext Time (p_c), s		0.1				0.0		1.4
Intersection Summary								
HCM 2010 Ctrl Delay			38.4					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 70: MacArthur Blvd & Airport Entrance/I-405 SB Ramps

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	507	157	369	0	2890	676	477	1719	384
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln				186.3	190.0	186.3	0.0	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h				551	171	0	0	3141	735	518	1868	417
Adj No. of Lanes				2	1	1	0	4	1	2	4	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	0	2	2	2	2	0
Cap, veh/h				612	338	281	0	2848	700	612	4414	1110
Arrive On Green				0.18	0.18	0.00	0.00	0.44	0.44	0.18	0.69	0.69
Sat Flow, veh/h				3442	1900	1583	0	6669	1574	3442	6408	1611
Grp Volume(v), veh/h				551	171	0	0	3141	735	518	1868	417
Grp Sat Flow(s),veh/h/ln				1721	1900	1583	0	1602	1574	1721	1602	1611
Q Serve(g_s), s				14.1	7.3	0.0	0.0	40.0	40.0	13.1	11.5	9.8
Cycle Q Clear(g_c), s				14.1	7.3	0.0	0.0	40.0	40.0	13.1	11.5	9.8
Prop In Lane				1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				612	338	281	0	2848	700	612	4414	1110
V/C Ratio(X)				0.90	0.51	0.00	0.00	1.10	1.05	0.85	0.42	0.38
Avail Cap(c_a), veh/h				612	338	281	0	2848	700	612	4414	1110
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	1.00	1.00	0.64	0.64	0.64
Uniform Delay (d), s/veh				36.2	33.4	0.0	0.0	25.0	25.0	35.8	6.1	5.9
Incr Delay (d2), s/veh				16.4	1.2	0.0	0.0	52.3	48.0	9.2	0.2	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.1	4.0	0.0	0.0	27.9	26.6	7.0	5.1	4.5
LnGrp Delay(d),s/veh				52.7	34.7	0.0	0.0	77.3	73.0	45.0	6.3	6.5
LnGrp LOS				D	C			F	F	D	A	A
Approach Vol, veh/h					722			3876			2803	
Approach Delay, s/veh					48.4			76.5			13.5	
Approach LOS					D			E			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	22.0	46.0				68.0		22.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	16.0	40.0				62.0		16.0				
Max Q Clear Time (g_c+I1), s	15.1	42.0				13.5		16.1				
Green Ext Time (p_c), s	0.2	0.0				48.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				49.9								
HCM 2010 LOS				D								



















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 75: Von Karmen Ave & I-405 HOV Ramps

5/12/2014



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	238	174	12	136	2	793	100	97	35	234	291
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98
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
Adj Sat Flow, veh/h/ln	190.0	190.0	190.0	190.0	190.0	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Adj Flow Rate, veh/h	29	251	183	13	143	2	835	105	102	37	246	306
Adj No. of Lanes	0	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	0	0	2	0
Cap, veh/h	28	240	956	136	140	2	814	2880	911	53	678	211
Arrive On Green	0.14	0.14	0.14	0.08	0.08	0.08	0.45	0.57	0.57	0.03	0.13	0.13
Sat Flow, veh/h	196	1694	1615	1810	1869	26	1810	5085	1608	1810	5085	1585
Grp Volume(v), veh/h	280	0	183	13	0	145	835	105	102	37	246	306
Grp Sat Flow(s),veh/h/ln	1890	0	1615	1810	0	1895	1810	1695	1608	1810	1695	1585
Q Serve(g_s), s	17.0	0.0	0.0	0.8	0.0	9.0	54.0	1.1	3.5	2.4	5.3	16.0
Cycle Q Clear(g_c), s	17.0	0.0	0.0	0.8	0.0	9.0	54.0	1.1	3.5	2.4	5.3	16.0
Prop In Lane	0.10		1.00	1.00		0.01	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	0	956	136	0	142	814	2880	911	53	678	211
V/C Ratio(X)	1.05	0.00	0.19	0.10	0.00	1.02	1.03	0.04	0.11	0.69	0.36	1.45
Avail Cap(c_a), veh/h	268	0	956	136	0	142	814	2880	911	101	678	211
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)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	0.0	11.3	51.7	0.0	55.5	33.0	11.5	12.0	57.7	47.4	52.0
Incr Delay (d2), s/veh	67.4	0.0	0.1	0.3	0.0	80.9	38.2	0.0	0.2	14.8	1.5	226.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.9	0.0	2.8	0.4	0.0	7.9	35.6	0.5	1.6	1.4	2.6	20.3
LnGrp Delay(d),s/veh	118.9	0.0	11.4	52.0	0.0	136.6	71.2	11.5	12.3	72.5	48.9	278.2
LnGrp LOS	F		B	D		F	F	B	B	E	D	F
Approach Vol, veh/h		463			158			1042			589	
Approach Delay, s/veh		76.4			129.6			59.4			169.5	
Approach LOS		E			F			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	74.0		23.0	60.0	22.0		15.0				
Change Period (Y+Rc), s	4.5	6.0		6.0	6.0	* 6		6.0				
Max Green Setting (Gmax), s	6.7	64.8		17.0	54.0	* 16		9.0				
Max Q Clear Time (g_c+I1), s	4.4	5.5		19.0	56.0	18.0		11.0				
Green Ext Time (p_c), s	0.0	4.4		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			96.6									
HCM 2010 LOS			F									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 80: Jamboree Rd & I-405 NB On Ramp/I-405 NB Ramps

5/12/2014























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	987	0	409	0	3151	740	0	2203	1000
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				186.3	0.0	186.3	0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h				1039	0	0	0	3317	0	0	2319	0
Adj No. of Lanes				3	0	1	0	3	1	0	4	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	2	0	2	2
Cap, veh/h				1056	0	334	0	3334	1038	0	4201	1038
Arrive On Green				0.21	0.00	0.00	0.00	0.66	0.00	0.00	0.66	0.00
Sat Flow, veh/h				5003	0	1583	0	5253	1583	0	6669	1583
Grp Volume(v), veh/h				1039	0	0	0	3317	0	0	2319	0
Grp Sat Flow(s),veh/h/ln				1668	0	1583	0	1695	1583	0	1602	1583
Q Serve(g_s), s				18.6	0.0	0.0	0.0	58.2	0.0	0.0	17.6	0.0
Cycle Q Clear(g_c), s				18.6	0.0	0.0	0.0	58.2	0.0	0.0	17.6	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1056	0	334	0	3334	1038	0	4201	1038
V/C Ratio(X)				0.98	0.00	0.00	0.00	0.99	0.00	0.00	0.55	0.00
Avail Cap(c_a), veh/h				1056	0	334	0	3334	1038	0	4201	1038
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				35.3	0.0	0.0	0.0	15.4	0.0	0.0	8.4	0.0
Incr Delay (d2), s/veh				23.7	0.0	0.0	0.0	3.7	0.0	0.0	0.5	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
%ile BackOfQ(50%),veh/ln				10.9	0.0	0.0	0.0	27.9	0.0	0.0	7.9	0.0
LnGrp Delay(d),s/veh				59.1	0.0	0.0	0.0	19.0	0.0	0.0	8.9	0.0
LnGrp LOS				E				B			A	
Approach Vol, veh/h					1039			3317			2319	
Approach Delay, s/veh					59.1			19.0			8.9	
Approach LOS					E			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		65.0				65.0		25.0				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		59.0				59.0		19.0				
Max Q Clear Time (g_c+I1), s		60.2				19.6		20.6				
Green Ext Time (p_c), s		0.0				39.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				21.7								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 81: Jamboree Rd & I-405 SB Ramps 5/12/2014













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	933	0	983	0	0	0	0	2077	1330	0	2487	800
Number	7	4	14				5	2	12	3	8	18
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	0.0	186.3				0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h	952	0	1003				0	2119	0	0	2538	0
Adj No. of Lanes	2	0	3				0	3	2	0	4	1
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	1099	0	0				0	0	0	0	3260	805
Arrive On Green	0.32	0.00	0.00				0.00	0.00	0.00	0.00	0.51	0.00
Sat Flow, veh/h	3442	952						0		0	6669	1583
Grp Volume(v), veh/h	952	28.1						0.0		0	2538	0
Grp Sat Flow(s),veh/h/ln	1721	C								0	1602	1583
Q Serve(g_s), s	18.2									0.0	22.5	0.0
Cycle Q Clear(g_c), s	18.2									0.0	22.5	0.0
Prop In Lane	1.00									0.00		1.00
Lane Grp Cap(c), veh/h	1099									0	3260	805
V/C Ratio(X)	0.87									0.00	0.78	0.00
Avail Cap(c_a), veh/h	1283									0	3399	840
HCM Platoon Ratio	1.00									1.00	1.00	1.00
Upstream Filter(I)	1.00									0.00	0.67	0.00
Uniform Delay (d), s/veh	22.3									0.0	13.9	0.0
Incr Delay (d2), s/veh	5.8									0.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0									0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5									0.0	10.0	0.0
LnGrp Delay(d),s/veh	28.1									0.0	14.7	0.0
LnGrp LOS	C											B
Approach Vol, veh/h											2538	
Approach Delay, s/veh											14.7	
Approach LOS											B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs							7	8				
Phs Duration (G+Y+Rc), s							28.3	41.5				
Change Period (Y+Rc), s							6.0	6.0				
Max Green Setting (Gmax), s							26.0	37.0				
Max Q Clear Time (g_c+I1), s							20.2	24.5				
Green Ext Time (p_c), s							2.1	11.0				
Intersection Summary												
HCM 2010 Ctrl Delay			18.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 46: SR-73 NB Off Ramp/SR-73 NB On Ramp & Bison Ave

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 		 		 			
Volume (veh/h)	40	1855	0	0	253	430	207	0	465	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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			
Adj Sat Flow, veh/h/ln	186.3	186.3	0.0	0.0	186.3	186.3	186.3	0.0	186.3			
Adj Flow Rate, veh/h	42	1953	0	0	266	453	218	0	489			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	73	2015	0	0	1625	723	847	0	686			
Arrive On Green	0.04	0.57	0.00	0.00	0.46	0.46	0.25	0.00	0.25			
Sat Flow, veh/h	1774	3632	0	0	3632	1575	3442	0	2787			
Grp Volume(v), veh/h	42	1953	0	0	266	453	218	0	489			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1770	1575	1721	0	1393			
Q Serve(g_s), s	1.5	34.5	0.0	0.0	2.9	14.2	3.3	0.0	10.4			
Cycle Q Clear(g_c), s	1.5	34.5	0.0	0.0	2.9	14.2	3.3	0.0	10.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	73	2015	0	0	1625	723	847	0	686			
V/C Ratio(X)	0.58	0.97	0.00	0.00	0.16	0.63	0.26	0.00	0.71			
Avail Cap(c_a), veh/h	158	2015	0	0	1625	723	847	0	686			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.43	0.43	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.6	13.5	0.0	0.0	10.3	13.3	19.7	0.0	22.4			
Incr Delay (d2), s/veh	3.2	7.8	0.0	0.0	0.2	4.1	0.7	0.0	6.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.8	18.7	0.0	0.0	1.4	7.0	1.7	0.0	4.6			
LnGrp Delay(d),s/veh	33.8	21.3	0.0	0.0	10.5	17.4	20.5	0.0	28.6			
LnGrp LOS	C	C			B	B	C		C			
Approach Vol, veh/h		1995			719			707				
Approach Delay, s/veh		21.6			14.9			26.1				
Approach LOS		C			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		43.0			7.2	35.8				
Change Period (Y+Rc), s		6.0		6.0			4.5	6.0				
Max Green Setting (Gmax), s		16.0		37.0			5.8	26.7				
Max Q Clear Time (g_c+I1), s		12.4		36.5			3.5	16.2				
Green Ext Time (p_c), s		1.0		0.5			0.0	9.4				
Intersection Summary												
HCM 2010 Ctrl Delay				21.1								
HCM 2010 LOS				C								

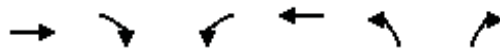
HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 47: SR-73 SB On Ramp/SR-73 SB Off Ramp & Bison Ave 5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑↑		↑
Volume (veh/h)	0	595	95	35	425	0	0	0	0	1305	0	405
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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
Adj Sat Flow, veh/h/ln	0.0	186.3	193.7	186.3	186.3	0.0				186.3	0.0	193.7
Adj Flow Rate, veh/h	0	626	100	37	447	0				1374	0	0
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1132	523	132	1534	0				1377	0	659
Arrive On Green	0.00	0.32	0.32	0.04	0.43	0.00				0.40	0.00	0.00
Sat Flow, veh/h	0	3632	1634	3442	3632	0				3442	0	1647
Grp Volume(v), veh/h	0	626	100	37	447	0				1374	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1634	1721	1770	0				1721	0	1647
Q Serve(g_s), s	0.0	8.8	2.7	0.6	4.9	0.0				23.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.8	2.7	0.6	4.9	0.0				23.9	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1132	523	132	1534	0				1377	0	659
V/C Ratio(X)	0.00	0.55	0.19	0.28	0.29	0.00				1.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1132	523	287	1534	0				1377	0	659
HCM Platoon Ratio	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	0.99	0.99	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	16.9	14.8	28.0	11.0	0.0				18.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.9	0.8	1.1	0.5	0.0				23.8	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
%ile BackOfQ(50%),veh/ln	0.0	4.6	1.3	0.3	2.5	0.0				15.8	0.0	0.0
LnGrp Delay(d),s/veh	0.0	18.8	15.6	29.2	11.5	0.0				41.7	0.0	0.0
LnGrp LOS		B	B	C	B					D		
Approach Vol, veh/h		726			484						1374	
Approach Delay, s/veh		18.4			12.9						41.7	
Approach LOS		B			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			6.8	25.2		28.0		32.0				
Change Period (Y+Rc), s			4.5	6.0		4.0		6.0				
Max Green Setting (Gmax), s			5.0	16.5		24.0		26.0				
Max Q Clear Time (g_c+I1), s			2.6	10.8		25.9		6.9				
Green Ext Time (p_c), s			0.0	3.2		0.0		6.8				
Intersection Summary												
HCM 2010 Ctrl Delay			29.8									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 53: SR-73 NB Ramps & Bonita Canyon Dr 5/12/2014

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↖↗	↑↑	↖↗	↑		
Volume (veh/h)	959	139	563	931	584	124		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	1009	146	593	980	615	131		
Adj No. of Lanes	2	1	2	2	2	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1361	629	635	2341	635	292		
Arrive On Green	0.38	0.38	0.18	0.66	0.18	0.18		
Sat Flow, veh/h	3632	1636	3442	3632	3442	1583		
Grp Volume(v), veh/h	1009	146	593	980	615	131		
Grp Sat Flow(s),veh/h/ln	1770	1636	1721	1770	1721	1583		
Q Serve(g_s), s	16.0	3.9	11.0	8.4	11.5	4.8		
Cycle Q Clear(g_c), s	16.0	3.9	11.0	8.4	11.5	4.8		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1361	629	635	2341	635	292		
V/C Ratio(X)	0.74	0.23	0.93	0.42	0.97	0.45		
Avail Cap(c_a), veh/h	1361	629	635	2341	635	292		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.80	0.80	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	17.2	13.5	26.1	5.1	26.3	23.6		
Incr Delay (d2), s/veh	2.9	0.7	20.6	0.6	27.8	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.3	1.9	7.0	4.3	7.9	2.2		
LnGrp Delay(d),s/veh	20.2	14.2	46.7	5.7	54.1	24.6		
LnGrp LOS	C	B	D	A	D	C		
Approach Vol, veh/h	1155			1573	746			
Approach Delay, s/veh	19.4			21.2	48.9			
Approach LOS	B			C	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		16.0	18.0	31.0				49.0
Change Period (Y+Rc), s		4.0	6.0	6.0				* 6
Max Green Setting (Gmax), s		12.0	12.0	25.0				* 43
Max Q Clear Time (g_c+I1), s		13.5	13.0	18.0				10.4
Green Ext Time (p_c), s		0.0	0.0	4.7				10.9
Intersection Summary								
HCM 2010 Ctrl Delay			26.5					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 54: SR-73 SB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖	↑↑↑	↖	↗
Volume (veh/h)	881	187	33	1511	109	209
Number	4	14	3	8	5	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	927	197	35	1591	115	220
Adj No. of Lanes	2	1	2	3	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1126	520	219	2496	1001	461
Arrive On Green	0.32	0.32	0.06	0.49	0.29	0.29
Sat Flow, veh/h	3632	1634	3442	5253	3442	1583
Grp Volume(v), veh/h	927	197	35	1591	115	220
Grp Sat Flow(s),veh/h/ln	1770	1634	1721	1695	1721	1583
Q Serve(g_s), s	13.3	5.1	0.5	12.7	1.3	6.3
Cycle Q Clear(g_c), s	13.3	5.1	0.5	12.7	1.3	6.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1126	520	219	2496	1001	461
V/C Ratio(X)	0.82	0.38	0.16	0.64	0.11	0.48
Avail Cap(c_a), veh/h	1126	520	219	2496	1001	461
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.74	0.74	1.00	1.00
Uniform Delay (d), s/veh	17.3	14.5	24.4	10.4	14.3	16.1
Incr Delay (d2), s/veh	6.9	2.1	0.1	0.9	0.2	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	2.6	0.3	6.1	0.7	3.2
LnGrp Delay(d),s/veh	24.2	16.6	24.5	11.3	14.5	19.6
LnGrp LOS	C	B	C	B	B	B
Approach Vol, veh/h	1124			1626	335	
Approach Delay, s/veh	22.9			11.6	17.8	
Approach LOS	C			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		22.0	9.5	23.5				33.0
Change Period (Y+Rc), s		6.0	6.0	* 6				6.0
Max Green Setting (Gmax), s		16.0	3.5	* 17.5				27.0
Max Q Clear Time (g_c+I1), s		8.3	2.5	15.3				14.7
Green Ext Time (p_c), s		0.4	0.7	1.0				5.8

Intersection Summary















HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 62: Newport Coast Dr & SR-73 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	 		 			 		
Volume (veh/h)	417	83	1037	520	0	633		
Number	3	18	2	12	1	6		
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		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	0.0	186.3		
Adj Flow Rate, veh/h	439	87	1092	0	0	666		
Adj No. of Lanes	2	1	2	1	0	2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	0	2		
Cap, veh/h	666	306	1673	749	0	1673		
Arrive On Green	0.19	0.19	0.47	0.00	0.00	0.47		
Sat Flow, veh/h	3442	1583	3632	1583	0	3725		
Grp Volume(v), veh/h	439	87	1092	0	0	666		
Grp Sat Flow(s),veh/h/ln	1721	1583	1770	1583	0	1770		
Q Serve(g_s), s	4.2	1.7	8.5	0.0	0.0	4.4		
Cycle Q Clear(g_c), s	4.2	1.7	8.5	0.0	0.0	4.4		
Prop In Lane	1.00	1.00		1.00	0.00			
Lane Grp Cap(c), veh/h	666	306	1673	749	0	1673		
V/C Ratio(X)	0.66	0.28	0.65	0.00	0.00	0.40		
Avail Cap(c_a), veh/h	1532	705	1673	749	0	1673		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	13.4	12.4	7.2	0.0	0.0	6.2		
Incr Delay (d2), s/veh	0.4	0.2	2.0	0.0	0.0	0.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.1	0.7	4.6	0.0	0.0	2.3		
LnGrp Delay(d),s/veh	13.8	12.6	9.2	0.0	0.0	6.9		
LnGrp LOS	B	B	A			A		
Approach Vol, veh/h	526		1092			666		
Approach Delay, s/veh	13.6		9.2			6.9		
Approach LOS	B		A			A		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		32.0				32.0		13.0
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		17.0				17.0		16.0
Max Q Clear Time (g_c+I1), s		10.5				6.4		6.2
Green Ext Time (p_c), s		3.9				5.4		0.8
Intersection Summary								
HCM 2010 Ctrl Delay			9.5					
HCM 2010 LOS			A					





















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 69: MacArthur Blvd & I-405 NB Ramps

5/12/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	914	674	2105	392	159	1386		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	993	733	2288	426	173	1507		
Adj No. of Lanes	2	1	4	2	2	4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1606	739	2392	1033	197	2392		
Arrive On Green	0.47	0.47	0.37	0.37	0.37	0.37		
Sat Flow, veh/h	3442	1583	6669	2768	205	6669		
Grp Volume(v), veh/h	993	733	2288	426	173	1507		
Grp Sat Flow(s),veh/h/ln	1721	1583	1602	1384	102	1602		
Q Serve(g_s), s	16.2	34.5	26.1	8.5	1.9	14.5		
Cycle Q Clear(g_c), s	16.2	34.5	26.1	8.5	28.0	14.5		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	1606	739	2392	1033	197	2392		
V/C Ratio(X)	0.62	0.99	0.96	0.41	0.88	0.63		
Avail Cap(c_a), veh/h	1606	739	2392	1033	197	2392		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.50	0.50	1.00	1.00		
Uniform Delay (d), s/veh	15.0	19.9	22.9	17.4	37.5	19.3		
Incr Delay (d2), s/veh	0.7	31.0	6.3	0.6	38.5	1.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	7.7	21.2	12.5	3.3	2.8	6.6		
LnGrp Delay(d),s/veh	15.7	50.9	29.2	18.0	76.0	20.5		
LnGrp LOS	B	D	C	B	E	C		
Approach Vol, veh/h	1726		2714			1680		
Approach Delay, s/veh	30.7		27.4			26.2		
Approach LOS	C		C			C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		34.0				34.0		41.0
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		28.0				28.0		35.0
Max Q Clear Time (g_c+I1), s		28.1				30.0		36.5
Green Ext Time (p_c), s		0.0				0.0		0.0
Intersection Summary								
HCM 2010 Ctrl Delay			28.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 70: MacArthur Blvd & Airport Entrance/I-405 SB Ramps

5/12/2014



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	987	148	810	0	1628	447	156	1764	387
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln				186.3	190.0	186.3	0.0	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h				1073	161	0	0	1770	486	170	1917	421
Adj No. of Lanes				2	1	1	0	4	1	2	4	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	0	2	2	2	2	0
Cap, veh/h				1109	612	510	0	1922	471	612	3489	877
Arrive On Green				0.32	0.32	0.00	0.00	0.30	0.30	0.18	0.54	0.54
Sat Flow, veh/h				3442	1900	1583	0	6669	1570	3442	6408	1611
Grp Volume(v), veh/h				1073	161	0	0	1770	486	170	1917	421
Grp Sat Flow(s),veh/h/ln				1721	1900	1583	0	1602	1570	1721	1602	1611
Q Serve(g_s), s				27.6	5.6	0.0	0.0	24.0	27.0	3.8	17.5	14.5
Cycle Q Clear(g_c), s				27.6	5.6	0.0	0.0	24.0	27.0	3.8	17.5	14.5
Prop In Lane				1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1109	612	510	0	1922	471	612	3489	877
V/C Ratio(X)				0.97	0.26	0.00	0.00	0.92	1.03	0.28	0.55	0.48
Avail Cap(c_a), veh/h				1109	612	510	0	1922	471	612	3489	877
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh				30.0	22.6	0.0	0.0	30.5	31.5	32.0	13.3	12.6
Incr Delay (d2), s/veh				19.6	0.2	0.0	0.0	8.7	49.9	0.8	0.5	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				16.1	3.0	0.0	0.0	11.7	18.2	1.9	7.8	6.8
LnGrp Delay(d),s/veh				49.6	22.8	0.0	0.0	39.2	81.4	32.8	13.8	14.0
LnGrp LOS				D	C			D	F	C	B	B
Approach Vol, veh/h					1234			2256			2508	
Approach Delay, s/veh					46.1			48.3			15.1	
Approach LOS					D			D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	22.0	33.0				55.0		35.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	16.0	27.0				49.0		29.0				
Max Q Clear Time (g_c+I1), s	5.8	29.0				19.5		29.6				
Green Ext Time (p_c), s	0.3	0.0				28.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				34.0								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 75: Von Karmen Ave & I-405 HOV Ramps 5/12/2014



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	280	62	965	94	276	21	298	418	25	1	11	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.99	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
Adj Sat Flow, veh/h/ln	190.0	190.0	190.0	190.0	190.0	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Adj Flow Rate, veh/h	295	65	1016	99	291	22	314	440	26	1	12	0
Adj No. of Lanes	0	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	0	0	2	0
Cap, veh/h	477	105	838	337	325	25	362	1404	442	2	319	101
Arrive On Green	0.32	0.32	0.32	0.19	0.19	0.19	0.20	0.28	0.28	0.00	0.06	0.00
Sat Flow, veh/h	1496	330	1615	1810	1745	132	1810	5085	1600	1810	5085	1615
Grp Volume(v), veh/h	360	0	1016	99	0	313	314	440	26	1	12	0
Grp Sat Flow(s),veh/h/ln	1825	0	1615	1810	0	1877	1810	1695	1600	1810	1695	1615
Q Serve(g_s), s	17.3	0.0	33.0	4.9	0.0	16.9	17.4	7.1	1.2	0.1	0.2	0.0
Cycle Q Clear(g_c), s	17.3	0.0	33.0	4.9	0.0	16.9	17.4	7.1	1.2	0.1	0.2	0.0
Prop In Lane	0.82		1.00	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	582	0	838	337	0	350	362	1404	442	2	319	101
V/C Ratio(X)	0.62	0.00	1.21	0.29	0.00	0.89	0.87	0.31	0.06	0.40	0.04	0.00
Avail Cap(c_a), veh/h	582	0	838	367	0	381	402	1891	595	87	933	296
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)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	0.0	24.9	36.2	0.0	41.1	40.1	29.7	27.6	51.6	45.6	0.0
Incr Delay (d2), s/veh	2.0	0.0	106.5	0.5	0.0	21.7	16.6	0.6	0.3	81.5	0.2	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	9.0	0.0	41.1	2.5	0.0	10.8	10.3	3.4	0.6	0.1	0.1	0.0
LnGrp Delay(d),s/veh	31.9	0.0	131.4	36.7	0.0	62.8	56.7	30.3	27.8	133.1	45.8	0.0
LnGrp LOS	C		F	D		E	E	C	C	F	D	
Approach Vol, veh/h		1376			412			780			13	
Approach Delay, s/veh		105.3			56.5			40.8			52.5	
Approach LOS		F			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.6	51.1		39.0	43.2	12.5		25.3				
Change Period (Y+Rc), s	4.5	6.0		6.0	6.0	*6		6.0				
Max Green Setting (Gmax), s	5.0	38.5		33.0	23.0	*19		21.0				
Max Q Clear Time (g_c+I1), s	2.1	9.1		35.0	19.4	2.2		18.9				
Green Ext Time (p_c), s	0.0	3.9		0.0	1.3	0.0		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			77.8									
HCM 2010 LOS			E									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 80: Jamboree Rd & I-405 NB On Ramp/I-405 NB Ramps

5/12/2014



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1505	0	944	0	2026	536	0	2232	1121
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				186.3	0.0	186.3	0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h				1584	0	0	0	2133	0	0	2349	0
Adj No. of Lanes				3	0	1	0	3	1	0	4	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	2	0	2	2
Cap, veh/h				1736	0	549	0	2299	716	0	2897	716
Arrive On Green				0.35	0.00	0.00	0.00	0.45	0.00	0.00	0.45	0.00
Sat Flow, veh/h				5003	0	1583	0	5253	1583	0	6669	1583
Grp Volume(v), veh/h				1584	0	0	0	2133	0	0	2349	0
Grp Sat Flow(s),veh/h/ln				1668	0	1583	0	1695	1583	0	1602	1583
Q Serve(g_s), s				18.1	0.0	0.0	0.0	23.6	0.0	0.0	18.9	0.0
Cycle Q Clear(g_c), s				18.1	0.0	0.0	0.0	23.6	0.0	0.0	18.9	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1736	0	549	0	2299	716	0	2897	716
V/C Ratio(X)				0.91	0.00	0.00	0.00	0.93	0.00	0.00	0.81	0.00
Avail Cap(c_a), veh/h				1759	0	557	0	2299	716	0	2897	716
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				18.6	0.0	0.0	0.0	15.4	0.0	0.0	14.2	0.0
Incr Delay (d2), s/veh				7.6	0.0	0.0	0.0	0.9	0.0	0.0	2.6	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
%ile BackOfQ(50%),veh/ln				9.4	0.0	0.0	0.0	11.1	0.0	0.0	8.8	0.0
LnGrp Delay(d),s/veh				26.3	0.0	0.0	0.0	16.3	0.0	0.0	16.7	0.0
LnGrp LOS				C				B			B	
Approach Vol, veh/h					1584			2133			2349	
Approach Delay, s/veh					26.3			16.3			16.7	
Approach LOS					C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		33.3				33.3		26.7				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		27.0				27.0		21.0				
Max Q Clear Time (g_c+I1), s		25.6				20.9		20.1				
Green Ext Time (p_c), s		1.4				6.0		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay				19.1								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 81: Jamboree Rd & I-405 SB Ramps 5/12/2014













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	878	0	1645	0	0	0	0	1201	798	0	3431	291
Number	7	4	14				5	2	12	3	8	18
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	0.0	186.3				0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h	896	0	1679				0	1226	0	0	3501	0
Adj No. of Lanes	2	0	3				0	3	2	0	4	1
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	977	0	0				0	0	0	0	3715	918
Arrive On Green	0.28	0.00	0.00				0.00	0.00	0.00	0.00	0.58	0.00
Sat Flow, veh/h	3442	896						0		0	6669	1583
Grp Volume(v), veh/h	896	42.9						0.0		0	3501	0
Grp Sat Flow(s),veh/h/ln	1721	D								0	1602	1583
Q Serve(g_s), s	22.2									0.0	44.5	0.0
Cycle Q Clear(g_c), s	22.2									0.0	44.5	0.0
Prop In Lane	1.00									0.00		1.00
Lane Grp Cap(c), veh/h	977									0	3715	918
V/C Ratio(X)	0.92									0.00	0.94	0.00
Avail Cap(c_a), veh/h	1018									0	3718	919
HCM Platoon Ratio	1.00									1.00	1.00	1.00
Upstream Filter(I)	1.00									0.00	0.41	0.00
Uniform Delay (d), s/veh	30.5									0.0	17.1	0.0
Incr Delay (d2), s/veh	12.5									0.0	2.7	0.0
Initial Q Delay(d3),s/veh	0.0									0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1									0.0	20.1	0.0
LnGrp Delay(d),s/veh	42.9									0.0	19.8	0.0
LnGrp LOS	D										B	
Approach Vol, veh/h											3501	
Approach Delay, s/veh											19.8	
Approach LOS											B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs							7	8				
Phs Duration (G+Y+Rc), s							30.9	57.0				
Change Period (Y+Rc), s							6.0	6.0				
Max Green Setting (Gmax), s							26.0	51.0				
Max Q Clear Time (g_c+I1), s							24.2	46.5				
Green Ext Time (p_c), s							0.8	4.5				
Intersection Summary												
HCM 2010 Ctrl Delay			24.5									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 46: SR-73 NB Off Ramp/SR-73 NB On Ramp & Bison Ave

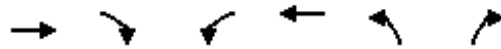
5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	728	0	0	819	807	135	0	45	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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			
Adj Sat Flow, veh/h/ln	186.3	186.3	0.0	0.0	186.3	186.3	186.3	0.0	186.3			
Adj Flow Rate, veh/h	27	766	0	0	862	849	142	0	47			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	54	1888	0	0	1515	674	918	0	743			
Arrive On Green	0.03	0.53	0.00	0.00	0.43	0.43	0.27	0.00	0.27			
Sat Flow, veh/h	1774	3632	0	0	3632	1574	3442	0	2787			
Grp Volume(v), veh/h	27	766	0	0	862	849	142	0	47			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1770	1574	1721	0	1393			
Q Serve(g_s), s	0.9	7.7	0.0	0.0	11.0	25.7	1.9	0.0	0.8			
Cycle Q Clear(g_c), s	0.9	7.7	0.0	0.0	11.0	25.7	1.9	0.0	0.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	54	1888	0	0	1515	674	918	0	743			
V/C Ratio(X)	0.50	0.41	0.00	0.00	0.57	1.26	0.15	0.00	0.06			
Avail Cap(c_a), veh/h	148	1888	0	0	1515	674	918	0	743			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.84	0.84	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.7	8.3	0.0	0.0	13.0	17.2	16.8	0.0	16.4			
Incr Delay (d2), s/veh	6.1	0.5	0.0	0.0	1.6	128.7	0.4	0.0	0.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.5	3.9	0.0	0.0	5.7	35.1	0.9	0.0	0.3			
LnGrp Delay(d),s/veh	34.7	8.9	0.0	0.0	14.5	145.8	17.2	0.0	16.6			
LnGrp LOS	C	A			B	F	B		B			
Approach Vol, veh/h		793			1711			189				
Approach Delay, s/veh		9.8			79.7			17.0				
Approach LOS		A			E			B				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		22.0		38.0			6.3	31.7				
Change Period (Y+Rc), s		6.0		6.0			4.5	6.0				
Max Green Setting (Gmax), s		16.0		32.0			5.0	22.5				
Max Q Clear Time (g_c+I1), s		3.9		9.7			2.9	27.7				
Green Ext Time (p_c), s		0.4		15.6			0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			54.7									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 47: SR-73 SB On Ramp/SR-73 SB Off Ramp & Bison Ave 5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑					↑↑		↑
Volume (veh/h)	0	353	159	290	664	0	0	0	0	377	0	266
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	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
Adj Sat Flow, veh/h/ln	0.0	186.3	193.7	186.3	186.3	0.0				186.3	0.0	193.7
Adj Flow Rate, veh/h	0	372	167	305	699	0				397	0	0
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	0	2
Cap, veh/h	0	1398	646	441	2206	0				530	0	253
Arrive On Green	0.00	0.40	0.40	0.13	0.62	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3632	1636	3442	3632	0				3442	0	1647
Grp Volume(v), veh/h	0	372	167	305	699	0				397	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1636	1721	1770	0				1721	0	1647
Q Serve(g_s), s	0.0	3.2	3.1	3.8	4.2	0.0				5.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.2	3.1	3.8	4.2	0.0				5.0	0.0	0.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1398	646	441	2206	0				530	0	253
V/C Ratio(X)	0.00	0.27	0.26	0.69	0.32	0.00				0.75	0.00	0.00
Avail Cap(c_a), veh/h	0	1398	646	498	2206	0				536	0	257
HCM Platoon Ratio	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	0.88	0.88	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.2	9.2	18.7	4.0	0.0				18.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	1.0	3.1	0.3	0.0				5.7	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
%ile BackOfQ(50%),veh/ln	0.0	1.6	1.6	2.0	2.0	0.0				2.7	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.7	10.1	21.8	4.3	0.0				23.9	0.0	0.0
LnGrp LOS		A	B	C	A					C		
Approach Vol, veh/h		539			1004						397	
Approach Delay, s/veh		9.8			9.6						23.9	
Approach LOS		A			A						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.3	23.8		10.9		34.1				
Change Period (Y+Rc), s			4.5	6.0		4.0		6.0				
Max Green Setting (Gmax), s			6.5	17.0		7.0		28.0				
Max Q Clear Time (g_c+I1), s			5.8	5.2		7.0		6.2				
Green Ext Time (p_c), s			0.1	5.6		0.0		7.6				
Intersection Summary												
HCM 2010 Ctrl Delay			12.6									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 53: SR-73 NB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↖↗	↑↑	↖↗	↗
Volume (veh/h)	1383	121	249	1065	235	47
Number	4	14	3	8	5	12
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
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	1456	127	262	1121	247	49
Adj No. of Lanes	2	1	2	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1825	845	355	2555	365	168
Arrive On Green	0.52	0.52	0.10	0.72	0.11	0.11
Sat Flow, veh/h	3632	1639	3442	3632	3442	1583
Grp Volume(v), veh/h	1456	127	262	1121	247	49
Grp Sat Flow(s),veh/h/ln	1770	1639	1721	1770	1721	1583
Q Serve(g_s), s	19.7	2.4	4.3	7.5	4.0	1.7
Cycle Q Clear(g_c), s	19.7	2.4	4.3	7.5	4.0	1.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1825	845	355	2555	365	168
V/C Ratio(X)	0.80	0.15	0.74	0.44	0.68	0.29
Avail Cap(c_a), veh/h	1825	845	355	2555	473	218
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.44	0.44	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	7.4	25.3	3.3	25.0	24.0
Incr Delay (d2), s/veh	1.7	0.2	7.0	0.5	2.5	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	1.1	2.4	3.8	2.0	0.8
LnGrp Delay(d),s/veh	13.3	7.6	32.3	3.8	27.6	24.9
LnGrp LOS	B	A	C	A	C	C
Approach Vol, veh/h	1583			1383	296	
Approach Delay, s/veh	12.8			9.2	27.1	
Approach LOS	B			A	C	

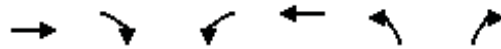
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.2	12.0	37.8				49.8
Change Period (Y+Rc), s		4.0	6.0	6.0				* 6
Max Green Setting (Gmax), s		8.0	6.0	30.0				* 42
Max Q Clear Time (g_c+I1), s		6.0	6.3	21.7				9.5
Green Ext Time (p_c), s		0.2	0.0	6.4				16.3

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 54: SR-73 SB Ramps & Bonita Canyon Dr 5/12/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↗	↑↑↑	↖↗	↗		
Volume (veh/h)	1226	629	101	1214	196	284		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	193.7	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	1291	662	106	1278	206	299		
Adj No. of Lanes	2	1	2	3	2	1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1327	613	201	2712	918	422		
Arrive On Green	0.38	0.38	0.12	1.00	0.27	0.27		
Sat Flow, veh/h	3632	1636	3442	5253	3442	1583		
Grp Volume(v), veh/h	1291	662	106	1278	206	299		
Grp Sat Flow(s),veh/h/ln	1770	1636	1721	1695	1721	1583		
Q Serve(g_s), s	21.5	22.5	1.7	0.0	2.8	10.2		
Cycle Q Clear(g_c), s	21.5	22.5	1.7	0.0	2.8	10.2		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1327	613	201	2712	918	422		
V/C Ratio(X)	0.97	1.08	0.53	0.47	0.22	0.71		
Avail Cap(c_a), veh/h	1327	613	201	2712	918	422		
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.89	0.89	1.00	1.00		
Uniform Delay (d), s/veh	18.4	18.8	25.7	0.0	17.2	19.9		
Incr Delay (d2), s/veh	19.0	59.6	1.2	0.5	0.6	9.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	13.9	20.2	0.9	0.1	1.4	5.6		
LnGrp Delay(d),s/veh	37.4	78.3	26.9	0.5	17.7	29.5		
LnGrp LOS	D	F	C	A	B	C		
Approach Vol, veh/h	1953			1384	505			
Approach Delay, s/veh	51.3			2.5	24.7			
Approach LOS	D			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		22.0	9.5	28.5				38.0
Change Period (Y+Rc), s		6.0	6.0	* 6				6.0
Max Green Setting (Gmax), s		16.0	3.5	* 22.5				32.0
Max Q Clear Time (g_c+I1), s		12.2	3.7	24.5				2.0
Green Ext Time (p_c), s		0.4	0.0	0.0				6.2
Intersection Summary								
HCM 2010 Ctrl Delay			30.2					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								













HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 62: Newport Coast Dr & SR-73 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	 		 			 		
Volume (veh/h)	238	39	781	170	0	762		
Number	3	18	2	12	1	6		
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		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	0.0	186.3		
Adj Flow Rate, veh/h	251	41	822	0	0	802		
Adj No. of Lanes	2	1	2	1	0	2		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	2	2	2	2	0	2		
Cap, veh/h	478	220	1787	799	0	1787		
Arrive On Green	0.14	0.14	0.50	0.00	0.00	0.50		
Sat Flow, veh/h	3442	1583	3632	1583	0	3725		
Grp Volume(v), veh/h	251	41	822	0	0	802		
Grp Sat Flow(s),veh/h/ln	1721	1583	1770	1583	0	1770		
Q Serve(g_s), s	2.3	0.8	5.0	0.0	0.0	4.9		
Cycle Q Clear(g_c), s	2.3	0.8	5.0	0.0	0.0	4.9		
Prop In Lane	1.00	1.00		1.00	0.00			
Lane Grp Cap(c), veh/h	478	220	1787	799	0	1787		
V/C Ratio(X)	0.53	0.19	0.46	0.00	0.00	0.45		
Avail Cap(c_a), veh/h	1635	752	1787	799	0	1787		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00		
Uniform Delay (d), s/veh	13.5	12.8	5.4	0.0	0.0	5.3		
Incr Delay (d2), s/veh	0.3	0.2	0.9	0.0	0.0	0.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	1.1	0.3	2.6	0.0	0.0	2.5		
LnGrp Delay(d),s/veh	13.8	13.0	6.2	0.0	0.0	6.2		
LnGrp LOS	B	B	A			A		
Approach Vol, veh/h	292		822			802		
Approach Delay, s/veh	13.7		6.2			6.2		
Approach LOS	B		A			A		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		34.3				34.3		10.7
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		17.0				17.0		16.0
Max Q Clear Time (g_c+I1), s		7.0				6.9		4.3
Green Ext Time (p_c), s		4.8				4.8		0.4
Intersection Summary								
HCM 2010 Ctrl Delay			7.3					
HCM 2010 LOS			A					





















HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 69: MacArthur Blvd & I-405 NB Ramps

5/12/2014

								
Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Volume (veh/h)	517	337	2183	1206	479	2105		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.99	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3		
Adj Flow Rate, veh/h	562	366	2373	1311	521	2288		
Adj No. of Lanes	2	1	4	2	2	4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	983	452	2962	1281	312	2962		
Arrive On Green	0.29	0.29	0.31	0.31	0.46	0.46		
Sat Flow, veh/h	3442	1583	6669	2772	76	6669		
Grp Volume(v), veh/h	562	366	2373	1311	521	2288		
Grp Sat Flow(s),veh/h/ln	1721	1583	1602	1386	38	1602		
Q Serve(g_s), s	6.6	10.2	16.2	22.0	5.8	14.2		
Cycle Q Clear(g_c), s	6.6	10.2	16.2	22.0	22.0	14.2		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	983	452	2962	1281	312	2962		
V/C Ratio(X)	0.57	0.81	0.80	1.02	1.67	0.77		
Avail Cap(c_a), veh/h	1157	532	2962	1281	312	2962		
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.21	0.21	1.00	1.00		
Uniform Delay (d), s/veh	14.5	15.8	14.4	16.4	23.7	10.7		
Incr Delay (d2), s/veh	0.5	7.9	0.5	18.0	315.6	2.0		
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	5.4	7.2	11.5	15.7	6.6		
LnGrp Delay(d),s/veh	15.0	23.7	14.9	34.4	339.3	12.7		
LnGrp LOS	B	C	B	F	F	B		
Approach Vol, veh/h	928		3684			2809		
Approach Delay, s/veh	18.5		21.9			73.3		
Approach LOS	B		C			E		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		30.4				30.4		19.6
Change Period (Y+Rc), s		6.0				6.0		6.0
Max Green Setting (Gmax), s		22.0				22.0		16.0
Max Q Clear Time (g_c+I1), s		24.0				24.0		12.2
Green Ext Time (p_c), s		0.0				0.0		1.4
Intersection Summary								
HCM 2010 Ctrl Delay			40.9					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 70: MacArthur Blvd & Airport Entrance/I-405 SB Ramps

5/12/2014



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	535	158	366	0	2990	682	468	1788	387
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		0.99	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
Adj Sat Flow, veh/h/ln				186.3	190.0	186.3	0.0	186.3	186.3	186.3	186.3	190.0
Adj Flow Rate, veh/h				582	172	0	0	3250	741	509	1943	421
Adj No. of Lanes				2	1	1	0	4	1	2	4	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	0	2	0	2	2	2	2	0
Cap, veh/h				585	323	269	0	3140	772	551	4550	1144
Arrive On Green				0.17	0.17	0.00	0.00	0.49	0.49	0.32	1.00	1.00
Sat Flow, veh/h				3442	1900	1583	0	6669	1575	3442	6408	1612
Grp Volume(v), veh/h				582	172	0	0	3250	741	509	1943	421
Grp Sat Flow(s),veh/h/ln				1721	1900	1583	0	1602	1575	1721	1602	1612
Q Serve(g_s), s				16.9	8.3	0.0	0.0	49.0	45.3	14.3	0.0	0.0
Cycle Q Clear(g_c), s				16.9	8.3	0.0	0.0	49.0	45.3	14.3	0.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				585	323	269	0	3140	772	551	4550	1144
V/C Ratio(X)				0.99	0.53	0.00	0.00	1.04	0.96	0.92	0.43	0.37
Avail Cap(c_a), veh/h				585	323	269	0	3140	772	551	4550	1144
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)				1.00	1.00	0.00	0.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh				41.5	37.9	0.0	0.0	25.5	24.6	33.4	0.0	0.0
Incr Delay (d2), s/veh				35.8	1.7	0.0	0.0	26.0	24.0	16.6	0.2	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.9	4.5	0.0	0.0	27.3	24.7	7.9	0.1	0.2
LnGrp Delay(d),s/veh				77.2	39.6	0.0	0.0	51.5	48.5	50.0	0.2	0.6
LnGrp LOS				E	D			F	D	D	A	A
Approach Vol, veh/h					754			3991			2873	
Approach Delay, s/veh					68.6			51.0			9.1	
Approach LOS					E			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	22.0	55.0				77.0		23.0				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	16.0	49.0				71.0		17.0				
Max Q Clear Time (g_c+I1), s	16.3	51.0				2.0		18.9				
Green Ext Time (p_c), s	0.0	0.0				68.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				36.9								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 75: Von Karmen Ave & I-405 HOV Ramps 5/12/2014



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	238	208	11	136	0	819	106	123	34	272	265
Number	7	4	14	3	8	18	5	2	12	1	6	16
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		0.98
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
Adj Sat Flow, veh/h/ln	190.0	190.0	190.0	190.0	190.0	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Adj Flow Rate, veh/h	21	251	219	12	143	0	862	112	129	36	286	279
Adj No. of Lanes	0	1	1	1	1	0	1	3	1	1	3	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	0	0	2	0
Cap, veh/h	21	247	956	136	142	0	814	2882	911	53	678	211
Arrive On Green	0.14	0.14	0.14	0.08	0.08	0.00	0.45	0.57	0.57	0.03	0.13	0.13
Sat Flow, veh/h	146	1747	1615	1810	1900	0	1810	5085	1608	1810	5085	1585
Grp Volume(v), veh/h	272	0	219	12	143	0	862	112	129	36	286	279
Grp Sat Flow(s),veh/h/ln	1893	0	1615	1810	1900	0	1810	1695	1608	1810	1695	1585
Q Serve(g_s), s	17.0	0.0	0.0	0.7	9.0	0.0	54.0	1.2	4.5	2.4	6.2	16.0
Cycle Q Clear(g_c), s	17.0	0.0	0.0	0.7	9.0	0.0	54.0	1.2	4.5	2.4	6.2	16.0
Prop In Lane	0.08		1.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	0	956	136	143	0	814	2882	911	53	678	211
V/C Ratio(X)	1.01	0.00	0.23	0.09	1.00	0.00	1.06	0.04	0.14	0.68	0.42	1.32
Avail Cap(c_a), veh/h	268	0	956	136	143	0	814	2882	911	100	678	211
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)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	0.0	11.6	51.7	55.5	0.0	33.0	11.5	12.2	57.7	47.8	52.0
Incr Delay (d2), s/veh	58.7	0.0	0.1	0.3	76.3	0.0	48.2	0.0	0.3	14.5	1.9	173.4
Initial Q Delay(d3),s/veh	0.1	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	13.2	0.0	3.4	0.4	7.7	0.0	37.8	0.6	2.1	1.4	3.0	17.2
LnGrp Delay(d),s/veh	110.3	0.0	11.7	52.0	131.8	0.0	81.2	11.5	12.6	72.2	49.7	225.4
LnGrp LOS	F		B	D	F		F	B	B	E	D	F
Approach Vol, veh/h		491			155			1103			601	
Approach Delay, s/veh		66.3			125.6			66.1			132.6	
Approach LOS		E			F			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	74.0		23.0	60.0	22.0		15.0				
Change Period (Y+Rc), s	4.5	6.0		6.0	6.0	* 6		6.0				
Max Green Setting (Gmax), s	6.6	64.9		17.0	54.0	* 16		9.0				
Max Q Clear Time (g_c+I1), s	4.4	6.5		19.0	56.0	18.0		11.0				
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			87.1									
HCM 2010 LOS			F									
Notes												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 80: Jamboree Rd & I-405 NB On Ramp/I-405 NB Ramps

5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1017	0	404	0	3155	752	0	2196	999
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				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
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				186.3	0.0	186.3	0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h				1071	0	0	0	3321	0	0	2312	0
Adj No. of Lanes				3	0	1	0	3	1	0	4	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	2	0	2	2
Cap, veh/h				1056	0	334	0	3334	1038	0	4201	1038
Arrive On Green				0.21	0.00	0.00	0.00	0.66	0.00	0.00	0.66	0.00
Sat Flow, veh/h				5003	0	1583	0	5253	1583	0	6669	1583
Grp Volume(v), veh/h				1071	0	0	0	3321	0	0	2312	0
Grp Sat Flow(s),veh/h/ln				1668	0	1583	0	1695	1583	0	1602	1583
Q Serve(g_s), s				19.0	0.0	0.0	0.0	58.4	0.0	0.0	17.5	0.0
Cycle Q Clear(g_c), s				19.0	0.0	0.0	0.0	58.4	0.0	0.0	17.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1056	0	334	0	3334	1038	0	4201	1038
V/C Ratio(X)				1.01	0.00	0.00	0.00	1.00	0.00	0.00	0.55	0.00
Avail Cap(c_a), veh/h				1056	0	334	0	3334	1038	0	4201	1038
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	0.00	0.09	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				35.5	0.0	0.0	0.0	15.4	0.0	0.0	8.4	0.0
Incr Delay (d2), s/veh				31.2	0.0	0.0	0.0	3.9	0.0	0.0	0.5	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
%ile BackOfQ(50%),veh/ln				11.8	0.0	0.0	0.0	28.0	0.0	0.0	7.7	0.0
LnGrp Delay(d),s/veh				66.7	0.0	0.0	0.0	19.3	0.0	0.0	8.9	0.0
LnGrp LOS				F				B			A	
Approach Vol, veh/h					1071			3321			2312	
Approach Delay, s/veh					66.7			19.3			8.9	
Approach LOS					E			B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		65.0				65.0		25.0				
Change Period (Y+Rc), s		6.0				6.0		6.0				
Max Green Setting (Gmax), s		59.0				59.0		19.0				
Max Q Clear Time (g_c+I1), s		60.4				19.5		21.0				
Green Ext Time (p_c), s		0.0				39.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				23.3								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary Newport Beach LUE Amendment TIA (JN:08911)
 81: Jamboree Rd & I-405 SB Ramps 5/12/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	929	0	993	0	0	0	0	2085	1386	0	2515	795
Number	7	4	14				5	2	12	3	8	18
Initial Q (Qb), veh	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
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	0.0	186.3				0.0	186.3	186.3	0.0	186.3	186.3
Adj Flow Rate, veh/h	948	0	1013				0	2128	0	0	2566	0
Adj No. of Lanes	2	0	3				0	3	2	0	4	1
Peak Hour Factor	0.98	0.98	0.98				0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	2				0	2	2	0	2	2
Cap, veh/h	1100	0	0				0	0	0	0	3175	785
Arrive On Green	0.32	0.00	0.00				0.00	0.00	0.00	0.00	0.50	0.00
Sat Flow, veh/h	3442	948						0		0	6669	1583
Grp Volume(v), veh/h	948	26.4						0.0		0	2566	0
Grp Sat Flow(s),veh/h/ln	1721	C								0	1602	1583
Q Serve(g_s), s	16.8									0.0	21.9	0.0
Cycle Q Clear(g_c), s	16.8									0.0	21.9	0.0
Prop In Lane	1.00									0.00		1.00
Lane Grp Cap(c), veh/h	1100									0	3175	785
V/C Ratio(X)	0.86									0.00	0.81	0.00
Avail Cap(c_a), veh/h	1274									0	3260	806
HCM Platoon Ratio	1.00									1.00	1.00	1.00
Upstream Filter(I)	1.00									0.00	0.65	0.00
Uniform Delay (d), s/veh	20.7									0.0	13.8	0.0
Incr Delay (d2), s/veh	5.6									0.0	1.0	0.0
Initial Q Delay(d3),s/veh	0.0									0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8									0.0	9.8	0.0
LnGrp Delay(d),s/veh	26.4									0.0	14.8	0.0
LnGrp LOS	C											B
Approach Vol, veh/h											2566	
Approach Delay, s/veh											14.8	
Approach LOS											B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs							7	8				
Phs Duration (G+Y+Rc), s							26.7	38.1				
Change Period (Y+Rc), s							6.0	6.0				
Max Green Setting (Gmax), s							24.0	33.0				
Max Q Clear Time (g_c+I1), s							18.8	23.9				
Green Ext Time (p_c), s							1.9	8.3				
Intersection Summary												
HCM 2010 Ctrl Delay			17.9									
HCM 2010 LOS			B									

APPENDIX 5.2

HCM 2010 Version
General Plan LUE Amendment (Alternative Project)
Freeway Mainline Analysis Worksheets

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13257	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	75.0 mph
FFS (measured)	75.0 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})	2450 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	51.7 mph	x f _p)	
D = v _p / S	47.4 pc/mi/ln	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	12688	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] 0.980	
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	6	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
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})	2345	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	54.8	x f _p)	
D = v _p / S	42.8	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	13107	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2422	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	52.7	mph	x f _p)
D = v _p / S	46.0	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6722	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	1845	pc/h/ln	
x f _p)			
S	65.2	mph	
D = v _p / S	28.3	pc/mi/ln	
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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8389	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	2302 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	55.9 mph	x f _p)	
D = v _p / S	41.2 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description *City of Newport Beach LUE Amendment TIA (JN08911)*

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs			
Volume, V	7276	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0		mph
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1997	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	62.6	S	mph
D = v _p / S	31.9	D = v _p / S	pc/mi/ln
LOS	D	Required Number of Lanes, N	

Glossary

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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4276	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Rolling
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	939 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0 mph	x f _p)	
D = v _p / S	13.4 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs			
Volume, V	4178	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1147 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	mph
D = v _p / S	16.4 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	8636	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2370	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	54.1	mph	x f _p)
D = v _p / S	43.8	pc/mi/ln	S
LOS	E		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4417	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	970	pc/h/ln	Design LOS
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	13.9	pc/mi/ln	S
LOS	B		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs				
Volume, V	4453	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	2
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments				
f _p	1.00		E _R	1.2
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS		
Lane Width	ft	f _{LW}		mph
Rt-Side Lat. Clearance	ft	f _{LC}		mph
Number of Lanes, N	4	TRD Adjustment		mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0	mph
FFS (measured)	70.0			
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} x f _p)	1222	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	mph
D = v _p / S	17.5	pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6381	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1179 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	mph
D = v _p / S	16.8 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	3392	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00		E _R 1.2
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] 0.980
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})	940	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	13.4	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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	3343	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	927 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	mph
D = v _p / S	13.2 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description *City of Newport Beach LUE Amendment TIA (JN08911)*

 Oper.(LOS)

 Des.(N)

 Planning Data

Flow Inputs

Volume, V	2551	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	3	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

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})	943	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	70.0	mph	x f _p)
D = v _p / S	13.5	pc/mi/ln	S
LOS	B		D = v _p / S
			Required Number of Lanes, N

Glossary

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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13995	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	3103 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	28.0 mph	S	mph
D = v _p / S	110.9 pc/mi/ln	D = v _p / S	pc/mi/ln
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
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	13802	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2550	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	48.9	mph	x f _p)
D = v _p / S	52.2	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	I-405 to SR-73
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9608	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2663	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	45.2	x f _p)	
D = v _p / S	59.0	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	9397	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	2605 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	47.1 mph	x f _p)	
D = v _p / S	55.3 pc/mi/ln	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8322	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	2307 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	55.8 mph	S	mph
D = v _p / S	41.4 pc/mi/ln	D = v _p / S	pc/mi/ln
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			

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs

Volume, V	6273	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	4
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980

Speed Inputs

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	3	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	70.0 mph		
Base free-flow Speed, BFFS	mph		

LOS and Performance Measures

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})	2318 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	55.5 mph	x f _p)	
D = v _p / S	41.8 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary

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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	10962	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	2431	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	52.4	x f _p)	
D = v _p / S	46.4	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	11131	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	75.0
FFS (measured)	75.0	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} x f _p)	2057 pc/h/ln	Design LOS	
S	62.6 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	32.8 pc/mi/ln	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	11494	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	7	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1820	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.5	x f _p)	
D = v _p / S	27.8	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	11429	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	7	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1810	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.7	x f _p)	
D = v _p / S	27.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	6617	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1467	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.2	x f _p)	
D = v _p / S	21.2	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-55 to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	12044	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2226	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	57.8	mph	x f _p)
D = v _p / S	38.5	pc/mi/ln	S
LOS	E		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11427	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0		mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2112	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	60.4	x f _p)	
D = v _p / S	35.0	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10404	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1922	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.0	x f _p)	
D = v _p / S	30.1	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 SB	From/To	n/o SR-55		
Agency or Company	Urban Crossroads, Inc.	Jurisdiction	Caltrans				
Date Performed	05/07/2014	Analysis Year	GP LUE Amendment				
Analysis Time Period	PM Peak Hour		Alternative				
Project Description City of Newport Beach LUE Amendment TIA (JN08911)							
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data			
Flow Inputs							
Volume, V	5622	veh/h	Peak-Hour Factor, PHF	0.92			
AADT		veh/day	%Trucks and Buses, P _T	2			
Peak-Hr Prop. of AADT, K			%RVs, P _R	0			
Peak-Hr Direction Prop, D			General Terrain:	Level			
DDHV = AADT x K x D		veh/h	Grade % Length	mi			
				Up/Down %			
Calculate Flow Adjustments							
f _p	1.00		E _R	1.2			
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990			
Speed Inputs				Calc Speed Adj and FFS			
Lane Width		ft	f _{LW}		mph		
Rt-Side Lat. Clearance		ft	f _{LC}		mph		
Number of Lanes, N	4		TRD Adjustment		mph		
Total Ramp Density, TRD		ramps/mi	FFS	70.0	mph		
FFS (measured)	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})	1543	pc/h/ln	Design LOS				
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})		pc/h/ln		
S	68.6	mph	x f _p)				
D = v _p / S	22.5	pc/mi/ln	S		mph		
LOS	C		D = v _p / S		pc/mi/ln		
				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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description *City of Newport Beach LUE Amendment TIA (JN08911)*

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs			
Volume, V	7801	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	2141 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	59.7 mph	x f _p)	
D = v _p / S	35.8 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA		Highway/Direction of Travel	SR-73 SB			
Agency or Company	Urban Crossroads, Inc.		From/To	n/o Bonita Canyon Dr.			
Date Performed	05/07/2014		Jurisdiction	Caltrans			
Analysis Time Period	PM Peak Hour		Analysis Year	GP LUE Amendment Alternative			
Project Description City of Newport Beach LUE Amendment TIA (JN08911)							
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data			
Flow Inputs							
Volume, V	3869	veh/h	Peak-Hour Factor, PHF	0.92			
AADT		veh/day	%Trucks and Buses, P _T	2			
Peak-Hr Prop. of AADT, K			%RVs, P _R	0			
Peak-Hr Direction Prop, D			General Terrain:	Level			
DDHV = AADT x K x D		veh/h	Grade % Length	mi			
			Up/Down %				
Calculate Flow Adjustments							
f _p	1.00		E _R	1.2			
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990			
Speed Inputs			Calc Speed Adj and FFS				
Lane Width		ft	f _{LW}	mph			
Rt-Side Lat. Clearance		ft	f _{LC}	mph			
Number of Lanes, N	5		TRD Adjustment	mph			
Total Ramp Density, TRD		ramps/mi	FFS	70.0	mph		
FFS (measured)	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})	849	pc/h/ln	Design LOS				
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})				
S	70.0	mph	x f _p)				
D = v _p / S	12.1	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	IA	Highway/Direction of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs			
Volume, V	4109	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1128 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	mph
D = v _p / S	16.1 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o SR-55
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
		<input type="checkbox"/> Planning Data	
Flow Inputs			
Volume, V	7699	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	2113	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	60.3	mph	x f _p)
D = v _p / S	35.0	pc/mi/ln	S
LOS	E		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	s/o Jamboree Rd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8242	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	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})	2262	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	56.9	x f _p)	
D = v _p / S	39.7	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	From/To	n/o Bonita Canyon Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4997	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			2
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1097	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	15.7	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-73 NB
Agency or Company	Urban Crossroads	From/To	Bonita Canyon to Newport Coast
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description <i>City of Newport Beach LUE Amendment TIA (JN08911)</i>		
<input checked="" type="checkbox"/> Oper.(LOS)	<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data

Flow Inputs				
Volume, V	4909	veh/h	Peak-Hour Factor, PHF	0.92
AADT		veh/day	%Trucks and Buses, P _T	2
Peak-Hr Prop. of AADT, K			%RVs, P _R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments				
f _p	1.00		E _R	1.2
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990

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	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} x f _p)	1347	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	69.7	mph	S	mph
D = v _p / S	19.3	pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8385	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
Up/Down %			
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	70.0		
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} x f _p)	1549 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	68.6 mph	S	mph
D = v _p / S	22.6 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	MacArthur Blvd. to I-405
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8242	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	6	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	mph
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1523	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.8	x f _p)	
D = v _p / S	22.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5502	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1525	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	68.8	mph	x f _p)
D = v _p / S	22.2	pc/mi/ln	S
LOS	C		D = v _p / S
			pc/mi/ln
			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	IA	Highway/Direction of Travel	SR-55 SB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4858	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1347 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	69.7 mph	S	mph
D = v _p / S	19.3 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Dyer Rd. to MacArthur Blvd.
Date Performed	05/07/2014	Jurisdiction	Caltransq
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	11619	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	5	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	2576 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	48.0 mph	S	mph
D = v _p / S	53.6 pc/mi/ln	D = v _p / S	pc/mi/ln
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
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	SR-73 to Mesa Dr.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7659	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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})	2123 pc/h/ln	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	60.1 mph	x f _p)	
D = v _p / S	35.3 pc/mi/ln	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	Mesa Dr. to 22nd/Victoria Av.
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6765	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 4
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	4	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0 mph
FFS (measured)	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} x f _p)	1875 pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	64.7 mph	S	mph
D = v _p / S	29.0 pc/mi/ln	D = v _p / S	pc/mi/ln
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	IA	Highway/Direction of Travel	SR-55 NB
Agency or Company	Urban Crossroads, Inc.	From/To	22nd St./Victoria Av. to End
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative
Project Description City of Newport Beach LUE Amendment TIA (JN08911)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	4937	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			%RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.92
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft	f _{LW}	mph
Rt-Side Lat. Clearance	ft	f _{LC}	mph
Number of Lanes, N	3	TRD Adjustment	mph
Total Ramp Density, TRD	ramps/mi	FFS	70.0
FFS (measured)	70.0	mph	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})	1825	pc/h/ln	
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	65.5	mph	x f _p)
D = v _p / S	27.9	pc/mi/ln	S
LOS	D		D = v _p / S
			pc/mi/ln
			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			

APPENDIX 5.3

HCM 2010 Version
General Plan LUE Amendment (Alternative Project)
Freeway Ramp Analysis Worksheets

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 10801 Ramp Volume, V _R 1922 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10801	0.92	Level	4	0	0.980	1.00	11975
Ramp	1922	0.92	Level	4	0	0.980	1.00	2131
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4068 pc/h V ₃ or V _{av34} 2756 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = 4180 pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	9580	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	7449	Exhibit 13-8	9600	No
				V _R	2131	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	4068	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 8.7 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.555 (Exhibit 13-12) S _R = 54.5 mph (Exhibit 13-12) S ₀ = 70.2 mph (Exhibit 13-12) S = 62.3 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">2</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">1400</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">9523</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">594</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	2	Acceleration Lane Length, L _A	1400	Deceleration Lane Length L _D		Freeway Volume, V _F	9523	Ramp Volume, V _R	594	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	2																	
Acceleration Lane Length, L _A	1400																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	9523																	
Ramp Volume, V _R	594																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9523	0.92	Level	4	0	0.980	1.00	10558
Ramp	594	0.92	Level	4	0	0.980	1.00	659
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1684 pc/h V ₃ or V _{av34} = 3187 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3223 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8717	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3882	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 14.8 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.246 (Exhibit 13-11) S _R = 63.1 mph (Exhibit 13-11) S ₀ = 62.8 mph (Exhibit 13-11) S = 62.9 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1389 Freeway Volume, V _F 8444 Ramp Volume, V _R 2528 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 50.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1250 ft V _D = 294 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8444	0.92	Level	4	0	0.980	1.00	9362
Ramp	2528	0.92	Level	4	0	0.980	1.00	2803
UpStream								
DownStream	294	0.92	Level	4	0	0.980	1.00	326

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4022 pc/h V ₃ or V _{av34} 1734 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	7490	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4687	Exhibit 13-8	9600	No
				V _R	2803	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	4022	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.9 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.485 (Exhibit 13-12) S _R = 56.4 mph (Exhibit 13-12) S ₀ = 73.9 mph (Exhibit 13-12) S = 63.4 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1250 ft V _u = 2528 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 260 Deceleration Lane Length L _D 260 Freeway Volume, V _F 6883 Ramp Volume, V _R 294 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6883	0.92	Level	4	0	0.980	1.00	7631
Ramp	294	0.92	Level	4	0	0.980	1.00	326
UpStream	2528	0.92	Level	0	0	1.000	1.00	2748
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.177 using Equation (Exhibit 13-6) V ₁₂ = 966 pc/h V ₃ or V _{av34} = 2245 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2182 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5783	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2508	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.3 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.353 (Exhibit 13-11) S _R = 60.1 mph (Exhibit 13-11) S ₀ = 65.9 mph (Exhibit 13-11) S = 63.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	260	<input type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L _D		
L _{up} = ft	Freeway Volume, V _F	6883	L _{down} = 1115 ft
V _u = veh/h	Ramp Volume, V _R	294	V _D = 766 veh/h
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6883	0.92	Level	4	0	0.980	1.00	7631
Ramp	294	0.92	Level	4	0	0.980	1.00	326
UpStream								
DownStream	766	0.92	Level	0	0	1.000	1.00	833

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.177 using Equation (Exhibit 13-6)
 V₁₂ = 966 pc/h
 V₃ or V_{av34} = 2245 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V_{12/2}? Yes No
 If Yes, V_{12a} = 2182 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V_{12/2}? Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5783	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2508	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 23.3 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.353 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = 65.9 mph (Exhibit 13-11)
 S = 63.3 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	General Plan LUE Amendment

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	100	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1115 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 294 veh/h	Freeway Volume, V _F	7085	V _D = veh/h
	Ramp Volume, V _R	766	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7085	0.92	Level	4	0	0.980	1.00	7855
Ramp	766	0.92	Level	4	0	0.980	1.00	849
UpStream	294	0.92	Level	0	0	1.000	1.00	320
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

L_{EQ} =

P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1174 pc/h

V₃ or V_{av34} = 2221 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2246 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

L_{EQ} =

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6466	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3095	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 23.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.338 (Exhibit 13-11)

S_R = 60.5 mph (Exhibit 13-11)

S₀ = 65.7 mph (Exhibit 13-11)

S = 63.1 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1360 ft V _u = 1995 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 1500 Deceleration Lane Length L _D 1500 Freeway Volume, V _F 8946 Ramp Volume, V _R 528 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8946	0.92	Level	4	0	0.980	1.00	9918
Ramp	528	0.92	Level	4	0	0.980	1.00	585
UpStream	1995	0.92	Level	0	0	1.000	1.00	2168
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.145 using Equation (Exhibit 13-6) V ₁₂ = 1073 pc/h V ₃ or V _{av34} = 3172 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2967 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8003	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3552	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.5 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.337 (Exhibit 13-11) S _R = 60.6 mph (Exhibit 13-11) S ₀ = 63.8 mph (Exhibit 13-11) S = 62.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 10336 Ramp Volume, V _R 1995 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1360 ft V _D = 528 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	10336	0.92	Level	4	0	0.980	1.00	11459
Ramp	1995	0.92	Level	4	0	0.980	1.00	2212
UpStream								
DownStream	528	0.92	Level	4	0	0.980	1.00	585

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 5245 pc/h V ₃ or V _{av34} 1961 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?
		Exhibit 13-8	9600	
V _{FO}		Exhibit 13-8	9600	No
			9600	No
			2100	Yes

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V ₁₂	5245	Exhibit 13-8	4400:All Yes

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 35.9 (pc/mi/ln) LOS = F (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.562 (Exhibit 13-12) S _R = 54.3 mph (Exhibit 13-12) S ₀ = 73.0 mph (Exhibit 13-12) S = 61.0 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	0	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L _D		
	Freeway Volume, V _F	8946	
L _{up} = 1035 ft	Ramp Volume, V _R	1133	L _{down} = ft
	Freeway Free-Flow Speed, S _{FF}	70.0	
V _u = 520 veh/h	Ramp Free-Flow Speed, S _{FR}	40.0	V _D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8946	0.92	Level	4	0	0.980	1.00	9918
Ramp	1133	0.92	Level	4	0	0.980	1.00	1256
UpStream	520	0.92	Level	4	0	0.980	1.00	577
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} =
 P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1550 pc/h

V₃ or V_{av34} = 2934 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2967 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8674	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	4223	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 28.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.467 (Exhibit 13-11)

S_R = 56.9 mph (Exhibit 13-11)

S₀ = 63.8 mph (Exhibit 13-11)

S = 60.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	275	<input type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L _D		
L _{up} = ft	Freeway Volume, V _F	8525	L _{down} = 1035 ft
V _u = veh/h	Ramp Volume, V _R	520	V _D = 1133 veh/h
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8525	0.92	Level	4	0	0.980	1.00	9452
Ramp	520	0.92	Level	4	0	0.980	1.00	577
UpStream								
DownStream	1133	0.92	Level	4	0	0.980	1.00	1256

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.146 using Equation (Exhibit 13-6)
 V₁₂ = 1013 pc/h
 V₃ or V_{av34} = 2969 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2780 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7529	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3357	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 29.7 (pc/mi/ln)
 LOS = D (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.416 (Exhibit 13-11)
 S_R = 58.3 mph (Exhibit 13-11)
 S₀ = 64.3 mph (Exhibit 13-11)
 S = 61.5 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1245 ft V _u = 2467 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 8525 Ramp Volume, V _R 520 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8525	0.92	Level	4	0	0.980	1.00	9452
Ramp	520	0.92	Level	4	0	0.980	1.00	577
UpStream	2467	0.92	Level	4	0	0.980	1.00	2735
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.146 using Equation (Exhibit 13-6)
 V₁₂ = 1013 pc/h
 V₃ or V_{av34} = 2969 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2780 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7529	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3357	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.7 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.416 (Exhibit 13-11) S _R = 58.3 mph (Exhibit 13-11) S ₀ = 64.3 mph (Exhibit 13-11) S = 61.5 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 NB		Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp	
Date Performed	05/07/2014	Jurisdiction	Caltrans		Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Ramp Number of Lanes, N	2	Acceleration Lane Length, L _A		L _{down} =	1245 ft
L _{up} =	ft	Deceleration Lane Length L _D	425	Freeway Volume, V _F	10699	Freeway Free-Flow Speed, S _{FF}	70.0	V _D =	520 veh/h
V _u =	veh/h	Ramp Volume, V _R	2467	Ramp Free-Flow Speed, S _{FR}	40.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	10699	0.92	Level	4	0	0.980	1.00	11862	
Ramp	2467	0.92	Level	4	0	0.980	1.00	2735	
UpStream									
DownStream	520	0.92	Level	0	0	1.000	1.00	565	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 4491 pc/h V ₃ or V _{av34} 2499 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	9490	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	6755	Exhibit 13-8	9600	No
					V _R	2735	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	4491	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 31.4 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.609 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	52.9 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	70.9 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.1 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">290</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">4146</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">130</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	290	Deceleration Lane Length L _D		Freeway Volume, V _F	4146	Ramp Volume, V _R	130	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	290																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	4146																	
Ramp Volume, V _R	130																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4146	0.92	Level	2	0	0.990	1.00	4552
Ramp	130	0.92	Level	2	0	0.990	1.00	143
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.200 using Equation (Exhibit 13-6)
 V₁₂ = 910 pc/h
 V₃ or V_{av34} = 1821 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 1820 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4695	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	1963	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 18.9 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.326 (Exhibit 13-11)
 S_R = 60.9 mph (Exhibit 13-11)
 S₀ = 66.9 mph (Exhibit 13-11)
 S = 64.2 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 175 Freeway Volume, V _F 4276 Ramp Volume, V _R 318 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4276	0.92	Level	2	0	0.990	1.00	4694
Ramp	318	0.92	Level	2	0	0.990	1.00	349
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2039 pc/h V ₃ or V _{av34} 1093 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)			

Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4225	Exhibit 13-8	9600	No
			V _{FO} = V _F - V _R	3876	Exhibit 13-8	9600	No		
			V _R	349	Exhibit 13-10	2000	No		

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	2039	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 20.2 (pc/mi/ln) LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)		D _S = 0.524 (Exhibit 13-12) S _R = 55.3 mph (Exhibit 13-12) S ₀ = 76.4 mph (Exhibit 13-12) S = 64.5 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	275	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3958	$L_{down} =$ ft
	Ramp Volume, V_R	220	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3958	0.92	Level	2	0	0.990	1.00	4345
Ramp	220	0.92	Level	2	0	0.990	1.00	242
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.188 using Equation (Exhibit 13-6) $P_{FM} =$ 636 pc/h $V_{12} =$ 1377 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 1356 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3632	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1598	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 16.1 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

$M_S =$ 0.318 (Exhibit 13-11) $S_R =$ 61.1 mph (Exhibit 13-11) $S_0 =$ 68.1 mph (Exhibit 13-11) $S =$ 64.8 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	0	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4178	V _D = veh/h
	Ramp Volume, V _R	279	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4178	0.92	Level	2	0	0.990	1.00	4587
Ramp	279	0.92	Level	2	0	0.990	1.00	306
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2173 pc/h V ₃ or V _{av34} 1207 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
		Exhibit 13-8		
V _{FO}				
		V _F	4587	Exhibit 13-8 9600 No
		V _{FO} = V _F - V _R	4281	Exhibit 13-8 9600 No
		V _R	306	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8		V ₁₂	2173	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)
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Speed Determination

M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.521 (Exhibit 13-12) S _R = 55.4 mph (Exhibit 13-12) S ₀ = 76.0 mph (Exhibit 13-12) S = 64.6 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	165	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
L_{up} = ft	Freeway Volume, V_F	3899	L_{down} = ft
V_u = veh/h	Ramp Volume, V_R	231	V_D = veh/h
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3899	0.92	Level	2	0	0.990	1.00	4280
Ramp	231	0.92	Level	2	0	0.990	1.00	254
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.186 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.186 using Equation (Exhibit 13-6)

$V_{12} =$ 796 pc/h

V_3 or $V_{av34} =$ 1742 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1712 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4534	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1966	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 19.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.339 (Exhibit 13-11)

$S_R =$ 60.5 mph (Exhibit 13-11)

$S_0 =$ 67.2 mph (Exhibit 13-11)

$S =$ 64.1 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	140	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4417	V _D = veh/h
	Ramp Volume, V _R	672	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4417	0.92	Level	2	0	0.990	1.00	4849
Ramp	672	0.92	Level	2	0	0.990	1.00	738
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =	using Equation (Exhibit 13-6)			L _{EQ} =	0.436 using Equation (Exhibit 13-7)		
P _{FM} =	pc/h			P _{FD} =	2319 pc/h		
V ₁₂ =	pc/h (Equation 13-14 or 13-17)			V ₁₂ =	1023 pc/h (Equation 13-14 or 13-17)		
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			V ₃ or V _{av34}	1023 pc/h (Equation 13-14 or 13-17)		
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)		

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4365	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	3627	Exhibit 13-8	9600	No
				V _R	738	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2319	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R = (pc/mi/ln)		D _R = 22.9 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
M _S = (Exhibit 13-11)		D _S = 0.559 (Exhibit 13-12)	
S _R = mph (Exhibit 13-11)		S _R = 54.3 mph (Exhibit 13-12)	
S ₀ = mph (Exhibit 13-11)		S ₀ = 76.7 mph (Exhibit 13-12)	
S = mph (Exhibit 13-13)		S = 62.9 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	245	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3715	$L_{down} =$ ft
	Ramp Volume, V_R	702	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3715	0.92	Level	2	0	0.990	1.00	4078
Ramp	702	0.92	Level	2	0	0.990	1.00	771
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.121 using Equation (Exhibit 13-6)

$P_{FM} =$ 0.121 using Equation (Exhibit 13-6)

$V_{12} =$ 386 pc/h

V_3 or V_{av34} 1397 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1272 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ (Equation 13-12 or 13-13)

$P_{FD} =$ using Equation (Exhibit 13-7)

$V_{12} =$ pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3952	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2043	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 19.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.331 (Exhibit 13-11)

$S_R =$ 60.7 mph (Exhibit 13-11)

$S_0 =$ 68.4 mph (Exhibit 13-11)

$S =$ 64.2 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	1250	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4453	$V_D =$ veh/h
	Ramp Volume, V_R	738	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4453	0.92	Level	2	0	0.990	1.00	4889
Ramp	738	0.92	Level	2	0	0.990	1.00	810
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$L_{EQ} =$	$V_{12} =$	$L_{EQ} =$	$V_{12} =$
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)	$P_{FD} =$	2588 pc/h	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)
$V_{12} =$	pc/h	$V_{12} =$	1150 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	2588 pc/h	$V_{12} =$	1150 pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1150 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1150 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1150 pc/h (Equation 13-14 or 13-17)
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	4889	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	4079	Exhibit 13-8	9600	No
				V_R	810	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2588	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R =$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	$D_R =$
$D_R =$ (pc/mi/ln)		$D_R =$ 15.3 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = B (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)	$D_S =$ 0.566 (Exhibit 13-12)	$M_S =$ (Exhibit 13-11)	$D_S =$ 0.566 (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-11)	$S_R =$ 54.2 mph (Exhibit 13-12)	$S_R =$ mph (Exhibit 13-11)	$S_R =$ 54.2 mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-11)	$S_0 =$ 76.2 mph (Exhibit 13-12)	$S_0 =$ mph (Exhibit 13-11)	$S_0 =$ 76.2 mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)	$S =$ 62.7 mph (Exhibit 13-13)	$S =$ mph (Exhibit 13-13)	$S =$ 62.7 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4401	$V_D =$ veh/h
	Ramp Volume, V_R	468	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4401	0.92	Level	2	0	0.990	1.00	4832
Ramp	468	0.92	Level	2	0	0.990	1.00	514
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}		Estimation of v_{12}	
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ 0.436 using Equation (Exhibit 13-7) $P_{FD} =$ $V_{12} =$ 2397 pc/h V_3 or V_{av34} 1217 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)		

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}	V_F	4832	Exhibit 13-8 9600 No
	$V_{FO} = V_F - V_R$	4318	Exhibit 13-8 9600 No
	V_R	514	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	2397	Exhibit 13-8 4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 24.9 (pc/mi/ln) LOS = C (Exhibit 13-2)
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Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_s =$ 0.539 (Exhibit 13-12) $S_R =$ 54.9 mph (Exhibit 13-12) $S_0 =$ 75.9 mph (Exhibit 13-12) $S =$ 63.8 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 1500 Freeway Volume, V _F 9054 Ramp Volume, V _R 1029 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9054	0.92	Level	4	0	0.980	1.00	10038
Ramp	1029	0.92	Level	4	0	0.980	1.00	1141
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2932 pc/h V ₃ or V _{av34} 2549 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3212 pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?		
		Exhibit 13-8				
V _{FO}		V _F	8031	Exhibit 13-8	9600	No
		V _{FO} = V _F - V _R	6890	Exhibit 13-8	9600	No
		V _R	1141	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?

	Actual	Max Desirable	Violation?	
				V ₁₂

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 0.4 (pc/mi/ln) LOS = A (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.466 (Exhibit 13-12) S _R = 57.0 mph (Exhibit 13-12) S ₀ = 71.3 mph (Exhibit 13-12) S = 64.8 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table style="width: 100%;"> <tr> <td>Freeway Number of Lanes, N</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: center;">1400</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: center;">8359</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: center;">1137</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: center;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: center;">40.0</td> </tr> </table>	Freeway Number of Lanes, N	5	Ramp Number of Lanes, N	2	Acceleration Lane Length, L_A	1400	Deceleration Lane Length L_D		Freeway Volume, V_F	8359	Ramp Volume, V_R	1137	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N	5																	
Ramp Number of Lanes, N	2																	
Acceleration Lane Length, L_A	1400																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	8359																	
Ramp Volume, V_R	1137																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	40.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	8359	0.92	Level	4	0	0.980	1.00	9268
Ramp	1137	0.92	Level	4	0	0.980	1.00	1261
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v_{12}

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ 0.209 using Equation (Exhibit 13-6) $P_{FM} =$ 1415 pc/h $V_{12} =$ 2676 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} 2676 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ 2707 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	8029	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	3968	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 15.2 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

$M_S =$ 0.263 (Exhibit 13-11) $S_R =$ 62.6 mph (Exhibit 13-11) $S_0 =$ 64.5 mph (Exhibit 13-11) $S =$ 63.6 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 SB						
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp						
Date Performed	05/07/2014	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative						
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off						
$L_{up} =$ ft	Ramp Number of Lanes, N	2	$L_{down} =$	1250 ft					
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$	787 veh/h					
	Deceleration Lane Length L_D	1389							
	Freeway Volume, V_F	7848							
	Ramp Volume, V_R	1915							
	Freeway Free-Flow Speed, S_{FF}	70.0							
	Ramp Free-Flow Speed, S_{FR}	50.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	7848	0.92	Level	4	0	0.980	1.00	8701	
Ramp	1915	0.92	Level	4	0	0.980	1.00	2123	
UpStream									
DownStream	787	0.92	Level	4	0	0.980	1.00	873	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$	(Equation 13-6 or 13-7)			$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$	(Equation 13-12 or 13-13)		
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.260 using Equation (Exhibit 13-7)			
$V_{12} =$	pc/h				$V_{12} =$	3381 pc/h			
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	1790 pc/h (Equation 13-14 or 13-17)			
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6961	Exhibit 13-8	9600	No
					$V_{FO} = V_F - V_R$	4838	Exhibit 13-8	9600	No
					V_R	2123	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8			V_{12}	3381	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 4.4 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.424 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 58.1 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 73.7 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 65.2 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1250 ft V _u = 1915 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 260 Deceleration Lane Length L _D Freeway Volume, V _F 6519 Ramp Volume, V _R 787 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6519	0.92	Level	4	0	0.980	1.00	7228
Ramp	787	0.92	Level	4	0	0.980	1.00	873
UpStream	1915	0.92	Level	0	0	1.000	1.00	2082
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 0.109 using Equation (Exhibit 13-6)
 V₁₂ = 573 pc/h
 V₃ or V_{av34} = 2352 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = 2110 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? Yes No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6150	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2983	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 26.7 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.382 (Exhibit 13-11)
 S_R = 59.3 mph (Exhibit 13-11)
 S₀ = 66.1 mph (Exhibit 13-11)
 S = 62.6 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 260 Deceleration Lane Length L _D 260 Freeway Volume, V _F 6519 Ramp Volume, V _R 787 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1115 ft V _D = 1329 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6519	0.92	Level	4	0	0.980	1.00	7228
Ramp	787	0.92	Level	4	0	0.980	1.00	873
UpStream								
DownStream	1329	0.92	Level	0	0	1.000	1.00	1445

Merge Areas	Diverge Areas
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Estimation of v₁₂

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.109 using Equation (Exhibit 13-6) V ₁₂ = 573 pc/h V ₃ or V _{av34} = 2352 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2110 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}	6150	Exhibit 13-8	No
		V _F	Exhibit 13-8
		V _{FO} = V _F - V _R	Exhibit 13-8
		V _R	Exhibit 13-10

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V _{R12}	2983	Exhibit 13-8	4600:All
			No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
-------------------------------------------	-------------------------------------------

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 26.7 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

M _S = 0.382 (Exhibit 13-11) S _R = 59.3 mph (Exhibit 13-11) S ₀ = 66.1 mph (Exhibit 13-11) S = 62.6 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	2	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	100	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1115 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 787 veh/h	Freeway Volume, V _F	7054	V _D = veh/h
	Ramp Volume, V _R	1329	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7054	0.92	Level	4	0	0.980	1.00	7821
Ramp	1329	0.92	Level	4	0	0.980	1.00	1473
UpStream	787	0.92	Level	0	0	1.000	1.00	855
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)

L_{EQ} = 0.209 using Equation (Exhibit 13-6)

P_{FM} = 0.209 using Equation (Exhibit 13-6)

V₁₂ = 1169 pc/h

V₃ or V_{av34} = 2212 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2237 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)

L_{EQ} = using Equation (Exhibit 13-7)

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7066	Exhibit 13-8	No	V _F	Exhibit 13-8		
				V _{FO} = V _F - V _R	Exhibit 13-8		
				V _R	Exhibit 13-10		

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3710	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 28.3 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination

Speed Determination

M _S = 0.411 (Exhibit 13-11) S _R = 58.5 mph (Exhibit 13-11) S ₀ = 65.8 mph (Exhibit 13-11) S = 61.7 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = 1360 ft	Deceleration Lane Length L _D		L _{down} = ft
V _u = 948 veh/h	Freeway Volume, V _F	8453	V _D = veh/h
	Ramp Volume, V _R	1657	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8453	0.92	Level	4	0	0.980	1.00	9372
Ramp	1657	0.92	Level	4	0	0.980	1.00	1837
UpStream	948	0.92	Level	0	0	1.000	1.00	1030
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

	$V_{12} = V_F (P_{FM})$
L _{EQ} =	(Equation 13-6 or 13-7)
P _{FM} =	-0.012 using Equation (Exhibit 13-6)
V ₁₂ =	-80 pc/h
V ₃ or V _{av34}	3476 pc/h (Equation 13-14 or 13-17)
Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V _{12a} =	2748 pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L _{EQ} =	(Equation 13-12 or 13-13)
P _{FD} =	using Equation (Exhibit 13-7)
V ₁₂ =	pc/h
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	8709	Exhibit 13-8	No	V _F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V _R		Exhibit 13-10	

Capacity Checks

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	4585	Exhibit 13-8 4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
D _R = 31.0 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D _R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M _S = 0.583 (Exhibit 13-11)
S _R = 53.7 mph (Exhibit 13-11)
S ₀ = 64.4 mph (Exhibit 13-11)
S = 58.3 mph (Exhibit 13-13)

Speed Determination

D _s = (Exhibit 13-12)
S _R = mph (Exhibit 13-12)
S ₀ = mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	IA	Freeway/Dir of Travel	I-405 NB		Agency or Company	Urban Crossroads, Inc.	Junction	MacArthur Blvd. Off-Ramp	
Date Performed	05/07/2014	Jurisdiction	Caltrans		Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative	
Project Description City of Newport Beach LUE Amendment TIA (JN08911)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 5					Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1					<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D 1500					L _{down} = 1360 ft			
V _u = veh/h	Freeway Volume, V _F 9312					V _D = 1657 veh/h			
	Ramp Volume, V _R 948								
	Freeway Free-Flow Speed, S _{FF} 70.0								
	Ramp Free-Flow Speed, S _{FR} 40.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	9312	0.92	Level	4	0	0.980	1.00	10324	
Ramp	948	0.92	Level	4	0	0.980	1.00	1051	
UpStream									
DownStream	1657	0.92	Level	4	0	0.980	1.00	1837	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4194 pc/h V ₃ or V _{av34} 2033 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8260	Exhibit 13-8	9600	No
					V _{FO} = V _F - V _R	7209	Exhibit 13-8	9600	No
					V _R	1051	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	4194	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 26.8 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.458 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 57.2 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 72.8 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 63.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{up} = 1035 ft V _u = 745 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A 0 Deceleration Lane Length L _D Freeway Volume, V _F 7789 Ramp Volume, V _R 1000 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7789	0.92	Level	4	0	0.980	1.00	8636
Ramp	1000	0.92	Level	4	0	0.980	1.00	1109
UpStream	745	0.92	Level	4	0	0.980	1.00	826
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = 0.209 using Equation (Exhibit 13-6) V ₁₂ = 1282 pc/h V ₃ or V _{av34} = 2427 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2454 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	7245	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3563	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.4 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.339 (Exhibit 13-11) S _R = 60.5 mph (Exhibit 13-11) S ₀ = 65.2 mph (Exhibit 13-11) S = 62.8 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (D)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 7183 Ramp Volume, V _R 745 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1035 ft V _D = 1000 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7183	0.92	Level	4	0	0.980	1.00	7964
Ramp	745	0.92	Level	4	0	0.980	1.00	826
UpStream								
DownStream	1000	0.92	Level	4	0	0.980	1.00	1109

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.115 using Equation (Exhibit 13-6) V ₁₂ = 652 pc/h V ₃ or V _{av34} = 2521 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2278 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6521	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3104	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.6 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.391 (Exhibit 13-11) S _R = 59.0 mph (Exhibit 13-11) S ₀ = 65.7 mph (Exhibit 13-11) S = 62.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Loop On-Ramp (U)
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1245 ft V _u = 1404 veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 275 Deceleration Lane Length L _D 275 Freeway Volume, V _F 7183 Ramp Volume, V _R 745 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7183	0.92	Level	4	0	0.980	1.00	7964
Ramp	745	0.92	Level	4	0	0.980	1.00	826
UpStream	1404	0.92	Level	4	0	0.980	1.00	1557
DownStream								

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.115 using Equation (Exhibit 13-6) V ₁₂ = 652 pc/h V ₃ or V _{av34} = 2521 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2278 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	6521	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	3104	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.6 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = 0.391 (Exhibit 13-11) S _R = 59.0 mph (Exhibit 13-11) S ₀ = 65.7 mph (Exhibit 13-11) S = 62.3 mph (Exhibit 13-13)	D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	IA	Freeway/Dir of Travel	I-405 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Jamboree Rd. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 425 Freeway Volume, V _F 8462 Ramp Volume, V _R 1404 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 40.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1245 ft V _D = 745 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	8462	0.92	Level	4	0	0.980	1.00	9382
Ramp	1404	0.92	Level	4	0	0.980	1.00	1557
UpStream								
DownStream	745	0.92	Level	0	0	1.000	1.00	810

Merge Areas	Diverge Areas
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Estimation of v ₁₂	Estimation of v ₁₂
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$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3104 pc/h V ₃ or V _{av34} 2201 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity		LOS F?		
V _{FO}		V _F	7506	Exhibit 13-8	9600	No
		V _{FO} = V _F - V _R	5949	Exhibit 13-8	9600	No
		V _R	1557	Exhibit 13-10	4200	No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V ₁₂	3104	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 19.4 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination	Speed Determination
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M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D _S = 0.503 (Exhibit 13-12) S _R = 55.9 mph (Exhibit 13-12) S ₀ = 72.1 mph (Exhibit 13-12) S = 64.4 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	175	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	3869	$V_D =$ veh/h
	Ramp Volume, V_R	500	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3869	0.92	Level	2	0	0.990	1.00	4247
Ramp	500	0.92	Level	2	0	0.990	1.00	549
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v_{12}	Estimation of v_{12}
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ pc/h $V_{12} =$ pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ 0.436 using Equation (Exhibit 13-7) $P_{FD} =$ 1976 pc/h $V_{12} =$ 923 pc/h (Equation 13-14 or 13-17) V_3 or V_{av34} pc/h Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8	
	V_F	3823	Exhibit 13-8 9600 No
	$V_{FO} = V_F - V_R$	3274	Exhibit 13-8 9600 No
		V_R	549 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
V_{R12}	Exhibit 13-8		V_{12}	1976	Exhibit 13-8 4400:All No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 19.7 (pc/mi/ln) LOS = B (Exhibit 13-2)
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Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_s =$ 0.542 (Exhibit 13-12) $S_R =$ 54.8 mph (Exhibit 13-12) $S_0 =$ 76.8 mph (Exhibit 13-12) $S =$ 63.6 mph (Exhibit 13-13)
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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4109	$V_D =$ veh/h
	Ramp Volume, V_R	562	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4109	0.92	Level	2	0	0.990	1.00	4511
Ramp	562	0.92	Level	2	0	0.990	1.00	617
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$L_{EQ} =$	$V_{12} =$	$L_{EQ} =$	$V_{12} =$
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)	$P_{FD} =$	2315 pc/h	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)
$V_{12} =$	pc/h	$V_{12} =$	1098 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	1098 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	2315 pc/h
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1098 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1098 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1098 pc/h (Equation 13-14 or 13-17)
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	4511	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	3894	Exhibit 13-8	9600	No
				V_R	617	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2315	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 24.2 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = C (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.549 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 54.6 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 76.4 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 63.4 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 SB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	165	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	3547	$L_{down} =$ ft
	Ramp Volume, V_R	341	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3547	0.92	Level	2	0	0.990	1.00	3894
Ramp	341	0.92	Level	2	0	0.990	1.00	374
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $L_{EQ} =$ 0.171 using Equation (Exhibit 13-6)
 $P_{FM} =$ 666 pc/h
 $V_{12} =$ 1614 pc/h (Equation 13-14 or 13-17)
 V_3 or V_{av34} 1614 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No
 If Yes, $V_{12a} =$ 1557 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $L_{EQ} =$ using Equation (Exhibit 13-7)
 $P_{FD} =$ pc/h
 $V_{12} =$ pc/h (Equation 13-14 or 13-17)
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4268	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1931	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ 19.3 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.338 (Exhibit 13-11)
 $S_R =$ 60.5 mph (Exhibit 13-11)
 $S_0 =$ 67.6 mph (Exhibit 13-11)
 $S =$ 64.2 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bison Av. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L _{up} = ft	Deceleration Lane Length L _D	140	L _{down} = ft
V _u = veh/h	Freeway Volume, V _F	4997	V _D = veh/h
	Ramp Volume, V _R	180	
	Freeway Free-Flow Speed, S _{FF}	70.0	
	Ramp Free-Flow Speed, S _{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4997	0.92	Level	2	0	0.990	1.00	5486
Ramp	180	0.92	Level	2	0	0.990	1.00	198
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v₁₂				Estimation of v₁₂			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
L _{EQ} =				L _{EQ} =			
P _{FM} =				P _{FD} =			
V ₁₂ =				V ₁₂ =			
V ₃ or V _{av34}				V ₃ or V _{av34}			
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =				If Yes, V _{12a} =			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}		Exhibit 13-8		V _F	4938	Exhibit 13-8	9600	No
				V _{FO} = V _F - V _R	4740	Exhibit 13-8	9600	No
				V _R	198	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8		V ₁₂	2265	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D	
D _R =	(pc/mi/ln)	D _R =	22.5 (pc/mi/ln)
LOS =	(Exhibit 13-2)	LOS =	C (Exhibit 13-2)

Speed Determination		Speed Determination	
M _S =	(Exhibit 13-11)	D _S =	0.511 (Exhibit 13-12)
S _R =	mph (Exhibit 13-11)	S _R =	55.7 mph (Exhibit 13-12)
S ₀ =	mph (Exhibit 13-11)	S ₀ =	75.5 mph (Exhibit 13-12)
S =	mph (Exhibit 13-13)	S =	64.9 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Loop On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A	245	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
	Deceleration Lane Length L_D		
$L_{up} =$ ft	Freeway Volume, V_F	4627	$L_{down} =$ ft
	Ramp Volume, V_R	370	
$V_u =$ veh/h	Freeway Free-Flow Speed, S_{FF}	70.0	$V_D =$ veh/h
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4627	0.92	Level	2	0	0.990	1.00	5080
Ramp	370	0.92	Level	2	0	0.990	1.00	406
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

$L_{EQ} =$ 0.167 using Equation (Exhibit 13-6)

$P_{FM} =$ 662 pc/h

$V_{12} =$ 1650 pc/h (Equation 13-14 or 13-17)

V_3 or V_{av34} 1650 pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ 1585 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

$L_{EQ} =$ using Equation (Exhibit 13-7)

$P_{FD} =$ pc/h

$V_{12} =$ pc/h (Equation 13-14 or 13-17)

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or $V_{av34} > 2,700$ pc/h? Yes No

Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No

If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	4369	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1991	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$ 19.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$ (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ 0.330 (Exhibit 13-11)

$S_R =$ 60.8 mph (Exhibit 13-11)

$S_0 =$ 67.5 mph (Exhibit 13-11)

$S =$ 64.3 mph (Exhibit 13-13)

$D_s =$ (Exhibit 13-12)

$S_R =$ mph (Exhibit 13-12)

$S_0 =$ mph (Exhibit 13-12)

$S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Bonita Cyn. Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	1250	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	4909	$V_D =$ veh/h
	Ramp Volume, V_R	282	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4909	0.92	Level	2	0	0.990	1.00	5389
Ramp	282	0.92	Level	2	0	0.990	1.00	310
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$L_{EQ} =$	$V_{12} =$	$L_{EQ} =$	$V_{12} =$
$P_{FM} =$	using Equation (Exhibit 13-6)	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)	$P_{FD} =$	2524 pc/h	$P_{FD} =$	0.436 using Equation (Exhibit 13-7)
$V_{12} =$	pc/h	$V_{12} =$	1432 pc/h (Equation 13-14 or 13-17)	$V_{12} =$	2524 pc/h	$V_{12} =$	1432 pc/h (Equation 13-14 or 13-17)
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1432 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1432 pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34}	1432 pc/h (Equation 13-14 or 13-17)
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	5389	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	5079	Exhibit 13-8	9600	No
				V_R	310	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2524	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)		Level of Service Determination (if not F)	
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$		$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$ (pc/mi/ln)		$D_R =$ 14.7 (pc/mi/ln)	
LOS = (Exhibit 13-2)		LOS = B (Exhibit 13-2)	

Speed Determination		Speed Determination	
$M_S =$ (Exhibit 13-11)		$D_S =$ 0.521 (Exhibit 13-12)	
$S_R =$ mph (Exhibit 13-11)		$S_R =$ 55.4 mph (Exhibit 13-12)	
$S_0 =$ mph (Exhibit 13-11)		$S_0 =$ 75.1 mph (Exhibit 13-12)	
$S =$ mph (Exhibit 13-13)		$S =$ 64.4 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. On-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">4</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">1250</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">4739</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">170</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">30.0</td> </tr> </table>	Freeway Number of Lanes, N	4	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	1250	Deceleration Lane Length L _D		Freeway Volume, V _F	4739	Ramp Volume, V _R	170	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	4																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	1250																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	4739																	
Ramp Volume, V _R	170																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	30.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	4739	0.92	Level	2	0	0.990	1.00	5203
Ramp	170	0.92	Level	2	0	0.990	1.00	187
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v₁₂

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
(Equation 13-6 or 13-7)

L_{EQ} =

P_{FM} = 0.194 using Equation (Exhibit 13-6)

V₁₂ = 1012 pc/h

V₃ or V_{av34} = 2095 pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = 2081 pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$
(Equation 13-12 or 13-13)

L_{EQ} =

P_{FD} = using Equation (Exhibit 13-7)

V₁₂ = pc/h

V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)

Is V₃ or V_{av34} > 2,700 pc/h? Yes No

Is V₃ or V_{av34} > 1.5 * V₁₂/2 Yes No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	5390	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V _{R12}	2268	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8	

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 15.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

Speed Determination

M_S = 0.284 (Exhibit 13-11)

S_R = 62.1 mph (Exhibit 13-11)

S₀ = 66.2 mph (Exhibit 13-11)

S = 64.4 mph (Exhibit 13-13)

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S₀ = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	IA	Freeway/Dir of Travel	SR-73 NB
Agency or Company	Urban Crossroads, Inc.	Junction	Newport Coast Dr. Off-Ramp
Date Performed	05/07/2014	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	GP LUE Amendment Alternative

Project Description City of Newport Beach LUE Amendment TIA (JN08911)

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length L_D	0	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, V_F	5014	$V_D =$ veh/h
	Ramp Volume, V_R	275	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5014	0.92	Level	2	0	0.990	1.00	5504
Ramp	275	0.92	Level	2	0	0.990	1.00	302
UpStream								
DownStream								

Merge Areas				Diverge Areas			
Estimation of v_{12}				Estimation of v_{12}			
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
$L_{EQ} =$ using Equation (Exhibit 13-6)				$L_{EQ} =$ 0.436 using Equation (Exhibit 13-7)			
$P_{FM} =$ pc/h				$P_{FD} =$ 2570 pc/h			
$V_{12} =$ pc/h (Equation 13-14 or 13-17)				$V_{12} =$ 1467 pc/h (Equation 13-14 or 13-17)			
Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)			

Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V_{FO}		Exhibit 13-8		V_F	5504	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	5202	Exhibit 13-8	9600	No
				V_R	302	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V_{R12}		Exhibit 13-8		V_{12}	2570	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 26.4 (pc/mi/ln) LOS = C (Exhibit 13-2)

Speed Determination	Speed Determination
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_s =$ 0.520 (Exhibit 13-12) $S_R =$ 55.4 mph (Exhibit 13-12) $S_0 =$ 75.0 mph (Exhibit 13-12) $S =$ 64.4 mph (Exhibit 13-13)