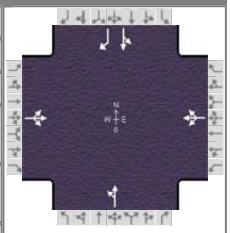
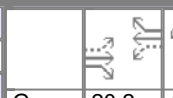
HCS 2010 Signalized Intersection Results Summary

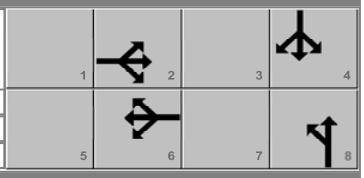
General Information				Intersection Information	
Agency	Kunzman Associates, Inc.			Duration, h	0.25
Analyst	BC	Analysis Date	1/18/2016	Area Type	Other
Jurisdiction	Riverside	Time Period	Morning Peak Hour	PHF	0.95
Intersection	La Cadena/Stephens-I-215	Analysis Year	OY (2017) With Project	Analysis Period	1> 7:00
File Name	AMOYW6I.xus				
Project Description	Center Street Warehouse - With Improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	43	292	60	180	167	9	32	63		44	177	42

Signal Information			
Cycle, s	57.1	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



							
Green	20.2	13.8	11.1	0.0	0.0	0.0	
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
Red	0.0	0.0	0.0	0.0	0.0	0.0	

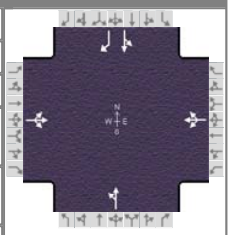
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		8.0		8.0		12.0		11.0
Phase Duration, s		24.2		24.2		15.1		17.8
Change Period, ($Y+R_c$), s		4.0		4.0		4.0		4.0
Max Allow Headway (*MAH*), s		3.3		3.3		3.1		3.1
Queue Clearance Time (g_s), s		13.3		18.6		4.7		8.3
Green Extension Time (g_e), s		1.8		1.6		0.1		0.5
Phase Call Probability		1.00		1.00		0.80		0.99
Max Out Probability		0.01		0.05		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h		416			375			100			233	44
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1750			1223			1814			1826	1563
Queue Service Time (g_s), s		0.0			5.3			2.7			6.3	1.3
Cycle Queue Clearance Time (g_c), s		11.3			16.6			2.7			6.3	1.3
Green Ratio (*g/C*)		0.35			0.35			0.19			0.24	0.24
Capacity (*c*), veh/h		687			527			354			442	378
Volume-to-Capacity Ratio (*X*)		0.605			0.712			0.283			0.526	0.117
Available Capacity (c_a), veh/h		979			748			953			959	821
Back of Queue (*Q*), veh/ln (50th percentile)		3.9			4.0			1.0			2.4	0.4
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00			0.00			0.00	0.00
Uniform Delay (d_1), s/veh		15.6			17.2			19.6			18.8	16.9
Incremental Delay (d_2), s/veh		0.3			0.7			0.2			0.4	0.1
Initial Queue Delay (d_3), s/veh		0.0			0.0			0.0			0.0	0.0
Control Delay (*d*), s/veh		15.9			17.9			19.7			19.2	16.9
Level of Service (LOS)		B			B			B			B	B
Approach Delay, s/veh / LOS	15.9	B		17.9	B		19.7	B		18.8	B	
Intersection Delay, s/veh / LOS	17.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.3	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.2	A	1.1	A	0.7	A	0.9	A

HCS 2010 Signalized Intersection Results Summary

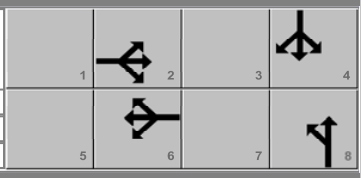
General Information				Intersection Information	
Agency	Kunzman Associates, Inc.			Duration, h	0.25
Analyst	BC	Analysis Date	1/18/2016	Area Type	Other
Jurisdiction	Riverside	Time Period	Evening Peak Hour	PHF	0.96
Intersection	La Cadena/Stephens-I-215	Analysis Year	OY (2017) With Project	Analysis Period	1> 7:00
File Name	PMOYW6I.xus				
Project Description	Center Street Warehouse - With Improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	64	248	66	87	97	5	31	158		68	366	52

Signal Information			
Cycle, s	55.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.2	15.9	12.4	0.0	0.0	0.0	
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
Red	0.0	0.0	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		8.0		8.0		12.0		11.0
Phase Duration, s		19.2		19.2		16.4		19.9
Change Period, ($Y+R_c$), s		4.0		4.0		4.0		4.0
Max Allow Headway (*MAH*), s		3.2		3.2		3.0		3.1
Queue Clearance Time (g_s), s		14.0		8.7		7.2		15.0
Green Extension Time (g_e), s		1.2		1.2		0.3		0.9
Phase Call Probability		1.00		1.00		0.95		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h		394			197			197			452	54
Adjusted Saturation Flow Rate (*s*), veh/h/ln		1707			1298			1830			1830	1563
Queue Service Time (g_s), s		5.3			0.0			5.2			13.0	1.4
Cycle Queue Clearance Time (g_c), s		12.0			6.7			5.2			13.0	1.4
Green Ratio (*g/C*)		0.27			0.27			0.22			0.29	0.29
Capacity (*c*), veh/h		543			450			408			525	449
Volume-to-Capacity Ratio (*X*)		0.725			0.437			0.482			0.861	0.121
Available Capacity (c_a), veh/h		987			811			989			989	845
Back of Queue (*Q*), veh/ln (50th percentile)		4.2			1.9			2.0			5.0	0.4
Queue Storage Ratio (*RQ*) (50th percentile)		0.00			0.00			0.00			0.00	0.00
Uniform Delay (d_1), s/veh		18.9			16.7			18.8			18.7	14.6
Incremental Delay (d_2), s/veh		0.7			0.2			0.3			1.7	0.0
Initial Queue Delay (d_3), s/veh		0.0			0.0			0.0			0.0	0.0
Control Delay (*d*), s/veh		19.6			17.0			19.1			20.4	14.7
Level of Service (LOS)		B			B			B			C	B
Approach Delay, s/veh / LOS	19.6	B		17.0	B		19.1	B		19.8	B	
Intersection Delay, s/veh / LOS	19.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.3	B	2.1	B	2.1	B
Bicycle LOS Score / LOS	1.1	A	0.8	A	0.8	A	1.3	A

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	*BC*
Agency/Co.	*Kunzman Associates, Inc.*
Date Performed	*1/18/2016*
Analysis Time Period	*Morning Peak Hour*

Site Information

Intersection	*La Cadena/Highgrove-I-215 NB*
Jurisdiction	*City of Riverside*
Analysis Year	*OY (2017) With Project*

Project ID *Center Street Warehouse*

East/West Street: *Highgrove Place/I-215 FWY NB* North/South Street: *La Cadena Drive*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	*47*	*262*	*0*	*30*	*0*	*4*
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	*0*	*33*	*40*	*1*	*80*	*0*
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*LT*		*L*	*R*	*TR*		*LT*	
PHF	*0.89*		*0.89*	*0.89*	*0.89*		*0.89*	
Flow Rate (veh/h)	*346*		*33*	*4*	*81*		*90*	
% Heavy Vehicles	*3*		*3*	*3*	*3*		*3*	
No. Lanes	*1*		*2*		*1*		*1*	
Geometry Group	*4a*		*5*		*2*		*2*	
Duration, T	*0.25*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*0.2*		*1.0*	*0.0*	*0.0*		*0.0*	
Prop. Right-Turns	*0.0*		*0.0*	*1.0*	*0.5*		*0.0*	
Prop. Heavy Vehicle	*0.0*		*0.0*	*0.0*	*0.0*		*0.0*	
hLT-adj	*0.2*	*0.2*	*0.5*	*0.5*	*0.2*	*0.2*	*0.2*	*0.2*
hRT-adj	*-0.6*	*-0.6*	*-0.7*	*-0.7*	*-0.6*	*-0.6*	*-0.6*	*-0.6*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*0.1*		*0.6*	*-0.6*	*-0.3*		*0.1*	

Departure Headway and Service Time

hd, initial value (s)	*3.20*		*3.20*	*3.20*	*3.20*		*3.20*	
x, initial	*0.31*		*0.03*	*0.00*	*0.07*		*0.08*	
hd, final value (s)	*4.58*		*5.80*	*4.59*	*4.68*		*4.99*	
x, final value	*0.44*		*0.05*	*0.01*	*0.11*		*0.12*	
Move-up time, m (s)	*2.0*		*2.3*		*2.0*		*2.0*	
Service Time, t_s (s)	*2.6*		*3.5*	*2.3*	*2.7*		*3.0*	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	*596*		*283*	*254*	*331*		*340*	
Delay (s/veh)	*11.12*		*8.83*	*7.32*	*8.23*		*8.70*	
LOS	*B*		*A*	*A*	*A*		*A*	
Approach: Delay (s/veh)	*11.12*		*8.67*		*8.23*		*8.70*	
LOS	*B*		*A*		*A*		*A*	
Intersection Delay (s/veh)	*10.14*							
Intersection LOS	*B*							

 HCS+™ Version 5.5 Generated: 11/11/2016 1:33 PM

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	*BC*
Agency/Co.	*Kunzman Associates, Inc.*
Date Performed	*1/18/2016*
Analysis Time Period	*Evening Peak Hour*

Site Information

Intersection	*La Cadena/Highgrove-I-215 NB*
Jurisdiction	*City of Riverside*
Analysis Year	*OY (2017) With Project*

Project ID *Center Street Warehouse*

East/West Street: *Highgrove Place/I-215 FWY NB* North/South Street: *La Cadena Drive*

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	*27*	*264*	*0*	*20*	*0*	*3*
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	*0*	*98*	*68*	*1*	*159*	*0*
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	*LT*		*L*	*R*	*TR*		*LT*	
PHF	*0.91*		*0.91*	*0.91*	*0.91*		*0.91*	
Flow Rate (veh/h)	*319*		*21*	*3*	*181*		*175*	
% Heavy Vehicles	*3*		*3*	*3*	*3*		*3*	
No. Lanes	*1*		*2*		*1*		*1*	
Geometry Group	*4a*		*5*		*2*		*2*	
Duration, T	*0.25*							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	*0.1*		*1.0*	*0.0*	*0.0*		*0.0*	
Prop. Right-Turns	*0.0*		*0.0*	*1.0*	*0.4*		*0.0*	
Prop. Heavy Vehicle	*0.0*		*0.0*	*0.0*	*0.0*		*0.0*	
hLT-adj	*0.2*	*0.2*	*0.5*	*0.5*	*0.2*	*0.2*	*0.2*	*0.2*
hRT-adj	*-0.6*	*-0.6*	*-0.7*	*-0.7*	*-0.6*	*-0.6*	*-0.6*	*-0.6*
hHV-adj	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*	*1.7*
hadj, computed	*0.1*		*0.6*	*-0.6*	*-0.2*		*0.1*	

Departure Headway and Service Time

hd, initial value (s)	*3.20*		*3.20*	*3.20*	*3.20*		*3.20*	
x, initial	*0.28*		*0.02*	*0.00*	*0.16*		*0.16*	
hd, final value (s)	*5.04*		*6.39*	*5.17*	*4.88*		*5.12*	
x, final value	*0.45*		*0.04*	*0.00*	*0.25*		*0.25*	
Move-up time, m (s)	*2.0*		*2.3*		*2.0*		*2.0*	
Service Time, t_s (s)	*3.0*		*4.1*	*2.9*	*2.9*		*3.1*	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	*569*		*271*	*253*	*431*		*425*	
Delay (s/veh)	*12.05*		*9.33*	*7.89*	*9.45*		*9.81*	
LOS	*B*		*A*	*A*	*A*		*A*	
Approach: Delay (s/veh)	*12.05*		*9.15*		*9.45*		*9.81*	
LOS	*B*		*A*		*A*		*A*	
Intersection Delay (s/veh)	*10.72*							
Intersection LOS	*B*							

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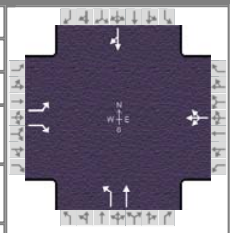
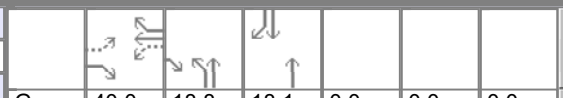
HCS 2010 Signalized Intersection Results Summary

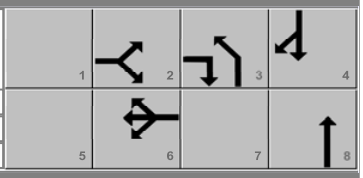
General Information				Intersection Information	
Agency	Kunzman Associates, Inc.			Duration, h	0.25
Analyst	BC	Analysis Date	1/18/2016	Area Type	Other
Jurisdiction	Riverside	Time Period	Morning Peak Hour	PHF	0.90
Intersection	Iowa Avenue-I-215 NB Ran	Analysis Year	OY (2017) With Project	Analysis Period	1> 7:00
File Name	AMOYW9I.xus				
Project Description	Center Street Warehouse				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	95		823	0	0	0	297	482			14	241

Signal Information			
Cycle, s	88.9	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



							
Green	40.0	18.8	18.1	0.0	0.0	0.0	
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
Red	0.0	0.0	0.0	0.0	0.0	0.0	

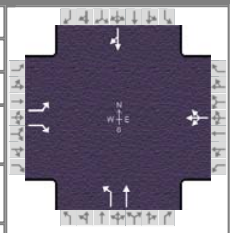
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6	3	8		4
Case Number		5.0		8.0	2.0	4.0		8.3
Phase Duration, s		44.0		44.0	22.8	44.9		22.1
Change Period, ($Y+R_c$), s		4.0		4.0	4.0	4.0		4.0
Max Allow Headway (*MAH*), s		3.3		0.0	3.1	3.1		3.1
Queue Clearance Time (g_s), s		42.0			18.2	21.6		17.5
Green Extension Time (g_e), s		0.0		0.0	0.6	1.6		0.6
Phase Call Probability		1.00			1.00	1.00		1.00
Max Out Probability		1.00			0.00	0.02		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5		12	1	6	16	3	8			4	14
Adjusted Flow Rate (*v*), veh/h	106		914		0		330	536			283	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757		1563		0		1757	1845			1576	
Queue Service Time (g_s), s	3.1		40.0		0.0		16.2	19.6			15.5	
Cycle Queue Clearance Time (g_c), s	3.1		40.0		0.0		16.2	19.6			15.5	
Green Ratio (*g/C*)	0.45		0.66				0.21	0.46			0.20	
Capacity (*c*), veh/h	871		1034				372	849			321	
Volume-to-Capacity Ratio (*X*)	0.121		0.884		0.000		0.887	0.631			0.883	
Available Capacity (c_a), veh/h	871		1034				790	849			709	
Back of Queue (*Q*), veh/ln (50th percentile)	1.2		14.1		0.0		6.9	8.0			6.0	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00		0.00		0.00		0.00	0.00			0.00	
Uniform Delay (d_1), s/veh	14.3		12.3				34.0	18.3			34.4	
Incremental Delay (d_2), s/veh	0.0		8.9		0.0		2.9	1.2			3.2	
Initial Queue Delay (d_3), s/veh	0.0		0.0		0.0		0.0	0.0			0.0	
Control Delay (*d*), s/veh	14.3		21.2				36.9	19.4			37.6	
Level of Service (LOS)	B		C				D	B			D	
Approach Delay, s/veh / LOS	20.5		C	0.0			26.1		C	37.6		D
Intersection Delay, s/veh / LOS	25.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	1.4	A	2.3	B
Bicycle LOS Score / LOS		F	0.5	A	1.9	A	1.0	A

HCS 2010 Signalized Intersection Results Summary

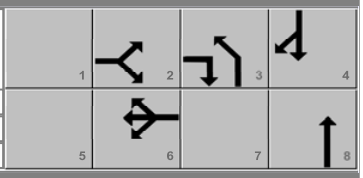
General Information				Intersection Information	
Agency	Kunzman Associates, Inc.			Duration, h	0.25
Analyst	BC	Analysis Date	1/18/2016	Area Type	Other
Jurisdiction	Riverside	Time Period	Evening Peak Hour	PHF	0.88
Intersection	Iowa Avenue-I-215 NB Ran	Analysis Year	OY (2017) With Project	Analysis Period	1> 7:00
File Name	PMOYW9I.xus				
Project Description	Center Street Warehouse - With Improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	126		804	0	0	0	345	640			22	330

Signal Information			
Cycle, s	90.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.0	25.1	38.4	0.0	0.0	0.0	
Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
Red	0.0	0.0	0.0	0.0	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		5.0		8.0		10.0		12.0
Phase Duration, s		19.0		19.0		42.4		29.1
Change Period, (*Y*+*Rc*), s		4.0		4.0		4.0		4.0
Max Allow Headway (*MAH*), s		3.3		0.0		3.1		3.3
Queue Clearance Time (g_s), s		17.0				35.9		24.2
Green Extension Time (g_e), s		0.0		0.0		2.4		0.8
Phase Call Probability		1.00				1.00		1.00
Max Out Probability		1.00				0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5		12	1	6	16	3	8			4	14
Adjusted Flow Rate (*v*), veh/h	143		914		0		392	727			400	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757		1563		0		1757	1845			1578	
Queue Service Time (g_s), s	6.7		15.0		0.0		15.0	33.9			22.2	
Cycle Queue Clearance Time (g_c), s	6.7		15.0		0.0		15.0	33.9			22.2	
Green Ratio (*g*/*C*)	0.17		0.59				0.42	0.42			0.28	
Capacity (*c*), veh/h	370		922				746	783			438	
Volume-to-Capacity Ratio (*X*)	0.387		0.991		0.000		0.526	0.929			0.913	
Available Capacity (c_a), veh/h	370		922				1358	1426			697	
Back of Queue (*Q*), veh/ln (50th percentile)	2.8		22.8		0.0		5.8	14.3			9.0	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00		0.00		0.00		0.00	0.00			0.00	
Uniform Delay (d_1), s/veh	34.3		18.3				19.3	24.8			31.7	
Incremental Delay (d_2), s/veh	0.2		27.2		0.0		0.2	2.7			7.8	
Initial Queue Delay (d_3), s/veh	0.0		0.0		0.0		0.0	0.0			0.0	
Control Delay (*d*), s/veh	34.6		45.5				19.5	27.5			39.5	
Level of Service (LOS)	C		D				B	C			D	
Approach Delay, s/veh / LOS	44.0		D	0.0			24.7		C	39.5		D
Intersection Delay, s/veh / LOS	34.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.3	B	2.1	B	1.4	A	2.3	B
Bicycle LOS Score / LOS		F	0.5	A	2.3	B	1.1	A