APPENDIX C

TRAFFIC ANALYSIS OUTPUT

HCS2000™ DETAILED REPORT

General Information

Analyst	Lori Keyser
Agency or Co.	TranSystems
Date Performed	3/28/2005
Time Period	AM Peak Hour

Site Information

Intersection	Lane/River & SR 84
Area Type	All other areas
Jurisdiction	
Analysis Year	Opening Year (2010)
Project ID	Existing intersection configurations

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	46	132	28	1	296	7	101	32	6	2	11	55
% Heavy vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 26.5	G =	G =	G =	G = 25.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		229			338			155			75	
Lane group capacity, c		710			820			606			702	
v/c ratio, X		0.32			0.41			0.26			0.11	
Total green ratio, g/C		0.44			0.44			0.43			0.43	
Uniform delay, d_1		10.9			11.4			11.1			10.4	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.11			0.11			0.11	
Incremental delay, d_2		0.3			0.3			0.2			0.1	

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	*Lori Keyser*	Intersection	*Lane/River & SR 84*
Agency or Co.	*TranSystems*	Area Type	*All other areas*
Date Performed	*3/28/2005*	Jurisdiction	
Time Period	*AM Peak Hour*	Analysis Year	*Design Year (2030)*
		Project ID	*Existing intersection configurations*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	69	196	42	2	440	10	151	47	8	3	17	82
% Heavy vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 27.5	G =	G =	G =	G = 24.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		342			502			229			113	
Lane group capacity, c		701			851			546			674	
v/c ratio, X		0.49			0.59			0.42			0.17	
Total green ratio, g/C		0.46			0.46			0.41			0.41	
Uniform delay, d_1		11.3			12.1			12.7			11.3	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.18			0.11			0.11	
Incremental delay, d_2		0.5			1.1			0.5			0.1	

HCS2000™ DETAILED REPORT

General Information

Analyst	Lori Keyser
Agency or Co.	TranSystems
Date Performed	3/28/2005
Time Period	PM Peak Hour

Site Information

Intersection	Lane/River & SR 84
Area Type	All other areas
Jurisdiction	
Analysis Year	Design Year (2030)
Project ID	Existing intersection configurations

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	85	452	124	3	192	15	49	15	3	22	60	92
% Heavy vehicles, %HV	2	2	2	2	2	2	2	2	2	2	2	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 32.5	G =	G =	G =	G = 19.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		734			233			74			193	
Lane group capacity, c		914			993			450			543	
v/c ratio, X		0.80			0.23			0.16			0.36	
Total green ratio, g/C		0.54			0.54			0.32			0.32	
Uniform delay, d_1		11.2			7.2			14.4			15.5	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.35			0.11			0.11			0.11	
Incremental delay, d_2		5.3			0.1			0.2			0.4	

Initial queue delay, d_3												
Control delay		16.4			7.3			14.6			15.9	
Lane group LOS		B			A			B			B	
Approach delay	16.4			7.3			14.6			15.9		
Approach LOS	B			A			B			B		
Intersection delay	14.5			$X_c = 0.64$			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information

lyst	Lori Keyser
gency or Co.	TranSystems
Date Performed	3/28/2005
Time Period	AM Peak Hour

Site Information

Intersection	Vrooman/Madison & SR 84
Area Type	All other areas
Jurisdiction	
Analysis Year	Opening Year (2010)
Project ID	Existing intersection configurations

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	3	83	109	135	131	83	61	133	38	81	155	20
% Heavy vehicles, %HV	0	2	0	0	2	0	0	0	0	2	0	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
al unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 27.5	G =	G =	G =	G = 24.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =

Duration of Analysis, T = 0.25

Cycle Length, C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		216			388			258			284	
Lane group capacity, c		795			672			652			636	
v/c ratio, X		0.27			0.58			0.40			0.45	
Total green ratio, g/C		0.46			0.46			0.41			0.41	
orm delay, d_1		10.1			12.0			12.5			12.8	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.17			0.11			0.11	
Incremental delay, d_2		0.2			1.2			0.4			0.5	

Initial queue delay, d_3												
Control delay		10.2			13.2			12.9			13.3	
Lane group LOS		B			B			B			B	
Approach delay	10.2			13.2			12.9			13.3		
Approach LOS	B			B			B			B		
Intersection delay	12.6			$X_c = 0.52$			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information

Analyst	Lori Keyser
Agency or Co.	TranSystems
Date Performed	3/28/2005
Time Period	PM Peak Hour

Site Information

Intersection	Vrooman/Madison & SR 84
Area Type	All other areas
Jurisdiction	
Analysis Year	Opening Year (2010)
Project ID	Existing intersection configurations

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	16	165	46	63	106	73	80	125	128	146	123	6
% Heavy vehicles, %HV	0	2	0	0	2	0	0	0	0	2	0	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 27.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =

Duration of Analysis, T = 0.25 | Cycle Length, C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		252			269			370			306	
Lane group capacity, c		738			654			694			561	
v/c ratio, X		0.34			0.41			0.53			0.55	
Total green ratio, g/C		0.42			0.42			0.45			0.45	
Uniform delay, d_1		11.9			12.3			11.9			12.0	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.11			0.14			0.15	
Incremental delay, d_2		0.3			0.4			0.8			1.1	

Initial queue delay, d_3												
Control delay		12.2			12.7			12.7			13.1	
Lane group LOS		B			B			B			B	
Approach delay	12.2			12.7			12.7			13.1		
Approach LOS	B			B			B			B		
Intersection delay	12.7			$X_c = 0.48$			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	3/28/2005	Jurisdiction	
Time Period	AM Peak Hour	Analysis Year	Design Year (2030)
		Project ID	Existing intersection configurations

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	5	124	162	200	195	124	91	198	57	121	231	29
% Heavy vehicles, %HV	0	2	0	0	2	0	0	0	0	2	0	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 29.5	G =	G =	G =	G = 22.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		324			577			384			423	
Lane group capacity, c		850			654			554			521	
v/c ratio, X		0.38			0.88			0.69			0.81	
Total green ratio, g/C		0.49			0.49			0.38			0.38	
Uniform delay, d_1		9.5			13.7			15.8			16.8	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.41			0.26			0.35	
Incremental delay, d_2		0.3			13.4			3.7			9.5	

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	3/28/2005	Jurisdiction	
Time Period	PM Peak Hour	Analysis Year	Design Year (2030)
		Project ID	Existing intersection configurations

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group		LTR			LTR			LTR			LTR	
Volume, V (vph)	16	165	46	63	106	73	80	125	128	146	123	6
% Heavy vehicles, %HV	0	2	0	0	2	0	0	0	0	2	0	2
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.0	G =	G =	G =	G = 27.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		252			269			370			306	
Lane group capacity, c		738			654			694			561	
v/c ratio, X		0.34			0.41			0.53			0.55	
Total green ratio, g/C		0.42			0.42			0.45			0.45	
Uniform delay, d_1		11.9			12.3			11.9			12.0	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.11			0.14			0.15	
Incremental delay, d_2		0.3			0.4			0.8			1.1	

HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	AM Peak Hour	Analysis Year	Opening Year (2010)
		Project ID	Vrooman Road High Level Bridge to Madison Ave

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	0	0	1	0
Lane group		LTR		L	TR		L	TR			LTR	
Volume, V (vph)	3	83	109	156	131	83	61	133	63	81	155	20
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0		2.0	2.0		2.0	2.0			2.0	
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type, AT		3		3	3		3	3			3	
Unit extension, UE		3.0		3.0	3.0		3.0	3.0			3.0	
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000			1.000	
Initial unmet demand, Q_b		0.0		0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0		12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 25.5	G =	G =	G =	G = 26.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		216		173	238		68	218			284	
Lane group capacity, c		745		502	761		484	799			699	
v/c ratio, X		0.29		0.34	0.31		0.14	0.27			0.41	

Total green ratio, g/C		0.43		0.43	0.43		0.44	0.44			0.44	
Uniform delay, d_1		11.3		11.6	11.4		10.0	10.6			11.4	
Progression factor, PF		1.000		1.000	1.000		1.000	1.000			1.000	
Delay calibration, k		0.11		0.11	0.11		0.11	0.11			0.11	
Incremental delay, d_2		0.2		0.4	0.2		0.1	0.2			0.4	
Initial queue delay, d_3												
Control delay		11.5		12.0	11.7		10.1	10.8			11.8	
Lane group LOS		B		B	B		B	B			B	
Approach delay	11.5			11.8			10.6			11.8		
Approach LOS	B			B			B			B		
Intersection delay	11.5			X_c = 0.38			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	PM Peak Hour	Analysis Year	Opening Year (2010)
		Project ID	Vrooman Road High Level Bridge to Madison Ave

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	0	0	1	0
Lane group		LTR		L	TR		L	TR			LTR	
Volume, V (vph)	16	165	46	88	106	73	80	125	149	146	123	6
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0		2.0	2.0		2.0	2.0			2.0	
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type, AT		3		3	3		3	3			3	
Unit extension, UE		3.0		3.0	3.0		3.0	3.0			3.0	
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000			1.000	
Initial unmet demand, Q_b		0.0		0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0		12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 23.5	G =	G =	G =	G = 28.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		252		98	199		89	305			306	
Lane group capacity, c		707		425	699		528	829			535	
v/c ratio, X		0.36		0.23	0.28		0.17	0.37			0.57	

Total green ratio, g/C		0.39		0.39	0.39		0.47	0.47			0.47	
Uniform delay, d_1		12.9		12.2	12.5		9.0	10.0			11.4	
Progression factor, PF		1.000		1.000	1.000		1.000	1.000			1.000	
Delay calibration, k		0.11		0.11	0.11		0.11	0.11			0.17	
Incremental delay, d_2		0.3		0.3	0.2		0.2	0.3			1.5	
Initial queue delay, d_3												
Control delay		13.2		12.5	12.7		9.1	10.3			12.8	
Lane group LOS		B		B	B		A	B			B	
Approach delay	13.2			12.6			10.0			12.8		
Approach LOS	B			B			B			B		
Intersection delay	12.0			X_c = 0.47			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	AM Peak Hour	Analysis Year	Design Year (2030)
		Project ID	Vrooman Road High Level Bridge to Madison Ave

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	0	0	1	0
Lane group		LTR		L	TR		L	TR			LTR	
Volume, V (vph)	5	124	162	231	195	124	91	198	94	121	231	29
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0		2.0	2.0		2.0	2.0			2.0	
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type, AT		3		3	3		3	3			3	
Unit extension, UE		3.0		3.0	3.0		3.0	3.0			3.0	
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000			1.000	
Initial unmet demand, Q_b		0.0		0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0		12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 24.0	G =	G =	G =	G = 28.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		324		257	355		101	324			423	
Lane group capacity, c		699		379	716		436	844			610	
v/c ratio, X		0.46		0.68	0.50		0.23	0.38			0.69	

Total green ratio, g/C		0.40		0.40	0.40		0.47	0.47			0.47	
Uniform delay, d_1		13.3		14.8	13.5		9.6	10.4			12.6	
Progression factor, PF		1.000		1.000	1.000		1.000	1.000			1.000	
Delay calibration, k		0.11		0.25	0.11		0.11	0.11			0.26	
Incremental delay, d_2		0.5		4.8	0.5		0.3	0.3			3.4	
Initial queue delay, d_3												
Control delay		13.7		19.6	14.0		9.8	10.7			16.0	
Lane group LOS		B		B	B		A	B			B	
Approach delay	13.7			16.4			10.5			16.0		
Approach LOS	B			B			B			B		
Intersection delay	14.4			X_c = 0.69			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	PM Peak Hour	Analysis Year	Design Year (2030)
		Project ID	Vrooman Road High Level Bridge to Madison Ave

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	0	0	1	0
Lane group		LTR		L	TR		L	TR			LTR	
Volume, V (vph)	24	245	69	130	157	109	119	186	221	217	183	9
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0		2.0	2.0		2.0	2.0			2.0	
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0			2.0	
Arrival type, AT		3		3	3		3	3			3	
Unit extension, UE		3.0		3.0	3.0		3.0	3.0			3.0	
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000			1.000	
Initial unmet demand, Q_b		0.0		0.0	0.0		0.0	0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0		12.0	12.0		12.0	12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 18.5	G =	G =	G =	G = 33.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		376		144	295		132	453			454	
Lane group capacity, c		549		225	550		549	974			537	
v/c ratio, X		0.68		0.64	0.54		0.24	0.47			0.85	

Total green ratio, g/C		0.31		0.31	0.31		0.56	0.56			0.56	
Uniform delay, d_1		18.2		17.9	17.2		6.8	7.9			11.1	
Progression factor, PF		1.000		1.000	1.000		1.000	1.000			1.000	
Delay calibration, k		0.25		0.22	0.14		0.11	0.11			0.38	
Incremental delay, d_2		3.5		6.0	1.0		0.2	0.4			11.9	
Initial queue delay, d_3												
Control delay		21.7		23.9	18.2		7.0	8.3			23.0	
Lane group LOS		C		C	B		A	A			C	
Approach delay	21.7			20.1			8.0			23.0		
Approach LOS	C			C			A			C		
Intersection delay	17.3			X_c = 0.79			Intersection LOS			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Lori Keyser*	Intersection	*SR 84 & Lane/River*
Agency/Co.	*TranSystems*	Jurisdiction	
Date Performed	*1/16/2005*	Analysis Year	*2010*
Analysis Time Period	*AM Peak Hour*		

Project Description *Vrooman Road High Level Bridge to Madison Ave*

East/West Street: *SR 84* | North/South Street: *River Road/Lane Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	71	132	28	1	296	7
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	71	132	28	1	296	7
Proportion of heavy vehicles, P_{HV}	35	--	--	0	--	--
Median type	Undivided					
RT Channelized?			0			0
Lanes	1	1	0	0	1	0
Configuration	L		TR	LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	101	32	6	2	11	76
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	101	32	6	2	11	76
Proportion of heavy vehicles, P_{HV}	4	4	4	4	4	27
Percent grade (%)		0			0	
Flared approach		N			N	
Storage		0			0	
RT Channelized?			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	LTR		LTR			LTR	
Volume, v (vph)	71	1		139			89	
Capacity, c_m (vph)	1092	1432		345			612	
v/c ratio	0.07	0.00		0.40			0.15	
Queue length (95%)	0.21	0.00		1.89			0.51	
Control Delay (s/veh)	8.5	7.5		22.3			11.9	

LOS	A	A	C	B
Approach delay (s/veh)	--	--	22.3	11.9
Approach LOS	--	--	C	B

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	Lori Keyser
Agency/Co.	TranSystems
Date Performed	1/16/2005
Analysis Time Period	PM Peak Hour

Site Information

Intersection	SR 84 & Lane/River
Jurisdiction	
Analysis Year	2010

Project Description: Vrooman Road High Level Bridge to Madison Ave

East/West Street: SR 84 | North/South Street: River Road/Lane Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	78	304	83	2	130	10
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	78	304	83	2	130	10
Proportion of heavy vehicles, P_{HV}	27	--	--	0	--	--
Median type	Undivided					
RT Channelized?			0			0
Lanes	1	1	0	0	1	0
Configuration	L		TR	LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	33	10	2	15	41	87
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	33	10	2	15	41	87
Proportion of heavy vehicles, P_{HV}	4	4	4	4	4	29
Percent grade (%)	0			0		
Flared approach		N			N	
Storage		0			0	
RT Channelized?			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	LTR		LTR			LTR	
Volume, v (vph)	78	2		45			143	
Capacity, c_m (vph)	1303	1183		297			543	
v/c ratio	0.06	0.00		0.15			0.26	
Queue length (95%)	0.19	0.01		0.53			1.05	
Control Delay (s/veh)	7.9	8.0		19.3			14.0	

LOS	A	A	C	B
Approach delay (s/veh)	--	--	19.3	14.0
Approach LOS	--	--	C	B

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	Lori Keyser	Intersection	SR 84 & Lane/River
Agency/Co.	TranSystems	Jurisdiction	
Date Performed	1/16/2005	Analysis Year	2030
Analysis Time Period	AM Peak Hour		

Project Description: Vrooman Road High Level Bridge to Madison Ave

East/West Street: SR 84 | North/South Street: River Road/Lane Road

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	106	196	42	2	440	10
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	106	196	42	2	440	10
Proportion of heavy vehicles, P_{HV}	35	--	--	0	--	--
Median type	Undivided					
RT Channelized?			0			0
Lanes	1	1	0	0	1	0
Configuration	L		TR	LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	151	47	8	3	17	113
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	151	47	8	3	17	113
Proportion of heavy vehicles, P_{HV}	4	4	4	4	4	27
Percent grade (%)		0			0	
Flared approach		N			N	
Storage		0			0	
RT Channelized?			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	LTR		LTR			LTR	
Volume, v (vph)	106	2		206			133	
Capacity, c_m (vph)	956	1341		187			467	
v/c ratio	0.11	0.00		1.10			0.28	
Queue length (95%)	0.37	0.00		10.06			1.16	
Control Delay (s/veh)	9.2	7.7		147.4			15.7	

LOS	A	A	F	C
Approach delay (s/veh)	--	--	147.4	15.7
Approach LOS	--	--	F	C

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Lori Keyser*
Agency/Co.	*TranSystems*
Date Performed	*1/16/2005*
Analysis Time Period	*PM Peak Hour*

Site Information

Intersection	*SR 84 & Lane/River*
Jurisdiction	
Analysis Year	*2030*

Project Description *Vrooman Road High Level Bridge to Madison Ave*

East/West Street: *SR 84* | North/South Street: *River Road/Lane Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	116	452	124	3	192	15
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	116	452	124	3	192	15
Proportion of heavy vehicles, P_{HV}	27	--	--	0	--	--
Median type	Undivided					
RT Channelized?			0			0
Lanes	1	1	0	0	1	0
Configuration	L		TR	LTR		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	49	15	3	22	60	129
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate (veh/h)	49	15	3	22	60	129
Proportion of heavy vehicles, P_{HV}	4	4	4	4	4	29
Percent grade (%)		0			0	
Flared approach		N			N	
Storage		0			0	
RT Channelized?			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	LTR		LTR			LTR	
Volume, v (vph)	116	3		67			211	
Capacity, c_m (vph)	1229	1007		144			381	
v/c ratio	0.09	0.00		0.47			0.55	
Queue length (95%)	0.31	0.01		2.14			3.23	
Control Delay (s/veh)	8.2	8.6		50.1			25.6	

LOS	A	A	F	D
Approach delay (s/veh)	--	--	50.1	25.6
Approach LOS	--	--	F	D

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	SR 84 & Lane/River
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2030
		Project ID	Vrooman Road High Level Bridge to Madison Ave

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	TR			LTR			LTR			LTR	
Volume, V (vph)	106	196	42	2	440	10	151	47	8	3	17	113
% Heavy vehicles, %HV	27	3	3	3	3	3	4	4	4	4	4	29
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0			2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0			2.0			2.0			2.0	
Arrival type, AT	3	3			3			3			3	
Unit extension, UE	3.0	3.0			3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 28.0	G =	G =	G =	G = 24.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	118	265			502			229			148	
Lane group capacity, c	280	838			858			518			534	
v/c ratio, X	0.42	0.32			0.59			0.44			0.28	
Total green ratio, g/C	0.47	0.47			0.47			0.40			0.40	

Uniform delay, d_1	10.6	10.0			11.7			13.1			12.1	
Progression factor, PF	1.000	1.000			1.000			1.000			1.000	
Delay calibration, k	0.11	0.11			0.18			0.11			0.11	
Incremental delay, d_2	1.0	0.2			1.0			0.6			0.3	
Initial queue delay, d_3												
Control delay	11.6	10.2			12.8			13.7			12.4	
Lane group LOS	B	B			B			B			B	
Approach delay	10.7				12.8			13.7			12.4	
Approach LOS	B				B			B			B	
Intersection delay	12.3				$X_c = 0.52$			Intersection LOS			B	

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Date Performed	1/16/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2030
		Project ID	Vrooman Road High Level Bridge to Madison Ave

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	TR			LTR			LTR			LTR	
Volume, V (vph)	116	452	124	3	192	15	49	15	3	22	60	129
% Heavy vehicles, %HV	27	3	3	3	3	3	4	4	4	4	4	29
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0			2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0			2.0			2.0			2.0	
Arrival type, AT	3	3			3			3			3	
Unit extension, UE	3.0	3.0			3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 29.0	G =	G =	G =	G = 23.0	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	129	640			233			74			234	
Lane group capacity, c	449	863			879			516			545	
v/c ratio, X	0.29	0.74			0.27			0.14			0.43	
Total green ratio, g/C	0.48	0.48			0.48			0.38			0.38	

Uniform delay, d_1	9.3	12.5			9.2			12.1			13.7	
Progression factor, PF	1.000	1.000			1.000			1.000			1.000	
Delay calibration, k	0.11	0.30			0.11			0.11			0.11	
Incremental delay, d_2	0.4	3.5			0.2			0.1			0.5	
Initial queue delay, d_3												
Control delay	9.7	16.0			9.3			12.2			14.2	
Lane group LOS	A	B			A			B			B	
Approach delay	14.9				9.3			12.2			14.2	
Approach LOS	B				A			B			B	
Intersection delay	13.6				$X_c = 0.60$			Intersection LOS			B	

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Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2030
		Project ID	Vrooman Road High Level Bridge to Madison Ave 3-phase

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	TR			LTR			LTR			LTR	
Volume, V (vph)	106	196	42	2	440	10	151	47	8	3	17	113
% Heavy vehicles, %HV	27	3	3	3	3	3	4	4	4	4	4	29
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0			2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0			2.0			2.0			2.0	
Arrival type, AT	3	3			3			3			3	
Unit extension, UE	3.0	3.0			3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	NB Only	07	08
Timing	G = 21.5	G =	G =	G =	G = 13.0	G = 13.5	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	118	265			502			229			148	
Lane group capacity, c	169	644			659			394			291	
v/c ratio, X	0.70	0.41			0.76			0.58			0.51	

Total green ratio, g/C	0.36	0.36			0.36			0.22			0.22	
Uniform delay, d_1	16.5	14.5			17.0			20.7			20.7	
Progression factor, PF	1.000	1.000			1.000			1.000			1.000	
Delay calibration, k	0.26	0.11			0.31			0.17			0.12	
Incremental delay, d_2	12.0	0.4			5.2			2.2			1.5	
Initial queue delay, d_3												
Control delay	28.5	14.9			22.2			22.9			22.2	
Lane group LOS	C	B			C			C			C	
Approach delay	19.1				22.2			22.9			22.2	
Approach LOS	B				C			C			C	
Intersection delay	21.4				X_c = 0.64			Intersection LOS			C	

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	SR 84 & Lane/River
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/16/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2030
		Project ID	Vrooman Road High Level Bridge to Madison Ave 3-phase

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	TR			LTR			LTR			LTR	
Volume, V (vph)	116	452	124	3	192	15	49	15	3	22	60	129
% Heavy vehicles, %HV	27	3	3	3	3	3	4	4	4	4	4	29
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0			2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0			2.0			2.0			2.0	
Arrival type, AT	3	3			3			3			3	
Unit extension, UE	3.0	3.0			3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	SB Only	NB Only	07	08
Timing	G = 24.5	G =	G =	G =	G = 14.5	G = 8.0	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	129	640			233			74			234	
Lane group capacity, c	364	729			742			234			351	
v/c ratio, X	0.35	0.88			0.31			0.32			0.67	

Total green ratio, g/C	0.41	0.41			0.41			0.13			0.24	
Uniform delay, d_1	12.3	16.4			12.0			23.5			20.6	
Progression factor, PF	1.000	1.000			1.000			1.000			1.000	
Delay calibration, k	0.11	0.40			0.11			0.11			0.24	
Incremental delay, d_2	0.6	11.8			0.2			0.8			4.8	
Initial queue delay, d_3												
Control delay	12.9	28.2			12.3			24.3			25.3	
Lane group LOS	B	C			B			C			C	
Approach delay	25.6				12.3			24.3			25.3	
Approach LOS	C				B			C			C	
Intersection delay	23.1				X_c = 0.72			Intersection LOS			C	

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	SR 84 & Vrooman/Lane
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2010
		Project ID	High Level Bridge w/ Vrooman Road relocation to Lane

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	LTR		L	LTR		L	LTR		L	LTR	
Volume, V (vph)	32	154	161	123	302	38	195	39	24	14	32	44
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = ~~28.5~~	G =	G =	G =	G = ~~23.5~~	G =	G =	G =
	Y = 4 20.5	Y =	Y =	Y =	Y = 4 25.5	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		386			515			287			101	
Lane group capacity, c		789			722			527			655	
v/c ratio, X		0.49			0.71			0.54			0.15	

Total green ratio, g/C		0.47			0.47			0.39			0.39	
Uniform delay, d_1		10.8			12.5			14.1			11.8	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.28			0.14			0.11	
Incremental delay, d_2		0.5			3.3			1.2			0.1	
Initial queue delay, d_3												
Control delay		11.3			15.8			15.3			11.9	
Lane group LOS		B			B			B			B	
Approach delay	11.3	11.9		15.8	12.0		15.3	11.8		11.9	10.4	
Approach LOS	B			B			B			B		
Intersection delay	14.0	11.8		X_c = 0.64			Intersection LOS			B		

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Date Performed	1/17/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2010
		Project ID	High Level Bridge w/ Vrooman Road relocation to Lane

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	LTR		L	LTR		L	LTR		L	LTR	
Volume, V (vph)	17	371	140	50	132	20	205	62	87	55	37	50
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = ~~26.5~~	G =	G =	G =	G = ~~25.5~~	G =	G =	G =
	Y = 4 ~~28.5~~	Y =	Y =	Y =	Y = 4 ~~23.5~~	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		587			225			394			158	
Lane group capacity, c		800			680			587			611	
v/c ratio, X		0.73			0.33			0.67			0.26	

Total green ratio, g/C		0.44			0.44			0.43			0.43	
Uniform delay, d_1		13.8			11.0			13.9			11.1	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.29			0.11			0.24			0.11	
Incremental delay, d_2		3.5			0.3			3.0			0.2	
Initial queue delay, d_3												
Control delay		17.4			11.2			16.9			11.4	
Lane group LOS		B			B			B			B	
Approach delay	17.4	13.7		11.2	9.3		16.9	13.4		11.4	11.8	
Approach LOS	B			B	A		B			B		
Intersection delay	15.5	12.7		X_c = 0.70			Intersection LOS			B		

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Date Performed	1/17/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2030
		Project ID	High Level Bridge w/ Vrooman Road relocation to Lane

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	1	1	0	0	1	0	0	1	0
Lane group	L	TR		L	TR			LTR			LTR	
Volume, V (vph)	48	229	239	183	448	57	289	57	36	20	47	66
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival type, AT	3	3		3	3			3			3	
Unit extension, UE	3.0	3.0		3.0	3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000		1.000	1.000			1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = ~~26.5~~	G =	G =	G =	G = ~~25.5~~	G =	G =	G =
	Y = 4 28.0	Y =	Y =	Y =	Y = 4 24.0	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	53	520		203	561			424			147	
Lane group capacity, c	220	775		252	825			560			696	
	0.24	0.67		0.81	0.68			0.76			0.21	

v/c ratio, X												
Total green ratio, g/C	0.44	0.44		0.44	0.44			0.43			0.43	
Uniform delay, d_1	10.5	13.3		14.5	13.4			14.6			10.9	
Progression factor, PF	1.000	1.000		1.000	1.000			1.000			1.000	
Delay calibration, k	0.11	0.24		0.35	0.25			0.31			0.11	
Incremental delay, d_2	0.6	2.3		17.2	2.3			5.9			0.2	
Initial queue delay, d_3												
Control delay	11.0	15.6		31.7	15.7			20.5			11.0	
Lane group LOS	B	B		C	B			C			B	
Approach delay	15.1 13.4			19.9 15.8			20.5 15.5			11.0 11.7		
Approach LOS	B			B			C B			B		
Intersection delay	17.9 14.7			X_c = 0.78			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	SR 84 & Vrooman/Lane
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2030
		Project ID	High Level Bridge w/ Vrooman Road relocation to Lane

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	1	1	0	1	1	0	1	1	0
Lane group	L	TR		L	TR		L	TR		L	TR	
Volume, V (vph)	25	551	207	75	196	30	305	92	129	82	55	74
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type, AT	3	3		3	3		3	3		3	3	
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NS Perm	06	07	08
Timing	G = 31.5	G =	G =	G =	G = 20.5	G =	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	28	842		83	251		339	245		91	143	
Lane group capacity, c	590	957		127	978		432	592		351	593	
	0.05	0.88		0.65	0.26		0.78	0.41		0.26	0.24	

v/c ratio, X												
Total green ratio, g/C	0.52	0.52		0.52	0.52		0.34	0.34		0.34	0.34	
Uniform delay, d_1	6.9	12.6		10.3	7.8		17.8	15.1		14.3	14.2	
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Delay calibration, k	0.11	0.41		0.23	0.11		0.33	0.11		0.11	0.11	
Incremental delay, d_2	0.0	9.5		11.4	0.1		9.2	0.5		0.4	0.2	
Initial queue delay, d_3												
Control delay	7.0	22.1		21.7	8.0		27.0	15.6		14.7	14.4	
Lane group LOS	A	C		C	A		C	B		B	B	
Approach delay	21.6			11.4			22.2			14.5		
Approach LOS	C			B			C			B		
Intersection delay	19.3			X_c = 0.84			Intersection LOS			B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2010
		Project ID	Low Level Bridge on Existing Vrooman with additional trucks

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	LTR		L	LTR		L	LTR		L	LTR	
Volume, V (vph)	3	83	109	156	131	83	61	133	63	81	155	20
% Heavy vehicles, %HV	33	4	3	14	4	3	7	3	38	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = ~~22.0~~	G =	G =	G =	G = ~~14.0~~	G = ~~12.0~~	G =	G =
	Y = 4 17.5	Y =	Y =	Y =	Y = 4 15.5	Y = 4 15.0	Y =	Y =
Duration of Analysis, T = 0.25					Cycle Length, C = 60.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		216			411			286			284	
Lane group capacity, c		617			474			358			360	
v/c ratio, X		0.35			0.87			0.80			0.79	

Total green ratio, g/C		0.37			0.37			0.23			0.20	
Uniform delay, d_1		13.8			17.6			21.7			22.8	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.40			0.34			0.34	
Incremental delay, d_2		0.3			15.6			12.1			11.2	
Initial queue delay, d_3												
Control delay		14.2			33.2			33.8			34.0	
Lane group LOS		B			C			C			C	
Approach delay	~~14.2~~ 17.8			~~33.2~~ 20.2			~~33.8~~ 20.2			~~34.0~~ 19.1		
Approach LOS	B			C			C			C		
Intersection delay	~~30.1~~ 19.5			X_c = 0.83			Intersection LOS			~~C~~ B		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2010
		Project ID	Low Level Bridge on Existing Vrooman with additional trucks

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	LTR		L	LTR		L	LTR		L	LTR	
Volume, V (vph)	16	165	46	88	106	73	80	125	149	146	123	6
% Heavy vehicles, %HV	0	2	2	30	1	0	1	2	14	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = ~~17.0~~	G =	G =	G =	G = ~~18.0~~	G = ~~13.0~~	G =	G =
	Y = 4 15.5	Y =	Y =	Y =	Y = 4 18.5	Y = 4 14.0	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		252			297			394			306	
Lane group capacity, c		498			365			473			388	
v/c ratio, X		0.51			0.81			0.83			0.79	

Total green ratio, g/C		0.28			0.28			0.30			0.22	
Uniform delay, d_1		18.0			20.0			19.6			22.2	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.35			0.37			0.34	
Incremental delay, d_2		0.8			13.2			12.1			10.5	
Initial queue delay, d_3												
Control delay		18.8			33.2			31.7			32.7	
Lane group LOS		B			C			C			C	
Approach delay		~~18.8~~ 19.6			~~33.2~~ 19.9			~~31.7~~ 19.7			~~32.7~~ 19.9	
Approach LOS		B			~~C~~ B			~~C~~ B			~~C~~ B	
Intersection delay		~~29.7~~ 19.8			X_c = 0.81			Intersection LOS			~~C~~ B	

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2030
		Project ID	Low Level Bridge on Existing Vrooman with addtional trucks

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	0	1	1	0
Lane group	L	LTR		L	TR		L	TR		L	TR	
Volume, V (vph)	5	124	162	231	195	124	91	198	94	121	231	29
% Heavy vehicles, %HV	33	4	3	14	4	3	7	3	38	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type, AT		3		3	3		3	3		3	3	
Unit extension, UE		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = 21.05	G =	G =	G =	G = 15.0	G = 12.0115	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		324		257	355		101	324		134	289	
Lane group capacity, c		588		272	604		401	376		347	365	
		0.55		0.94	0.59		0.25	0.86		0.39	0.79	

v/c ratio, X												
Total green ratio, g/C		0.35		0.35	0.35		0.25	0.25		0.20	0.20	
Uniform delay, d_1		15.7		18.9	16.0		18.0	21.5		20.8	22.8	
Progression factor, PF		1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Delay calibration, k		0.15		0.46	0.18		0.11	0.39		0.11	0.34	
Incremental delay, d_2		1.1		39.8	1.5		0.3	18.1		0.7	11.3	
Initial queue delay, d_3												
Control delay		16.8		58.7	17.5		18.3	39.6		21.5	34.1	
Lane group LOS		B		E	B		B	D		C	C	
Approach delay	16.8 16.1			34.8 34.3			34.6			30.1 33.1		
Approach LOS	B			C			C			C		
Intersection delay	30.4 30.8			X_c = 0.88			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2030
		Project ID	Low Level Bridge on Existing Vrooman with additional trucks

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	1	1	0	1	1	0	1	1	0
Lane group	L	TR		L	TR		L	TR		L	TR	
Volume, V (vph)	24	245	69	130	157	109	119	186	221	217	183	9
% Heavy vehicles, %HV	0	2	2	30	1	0	1	2	14	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type, AT	3	3		3	3		3	3		3	3	
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = 18.0	G =	G =	G =	G = 19.5	G = 10.5	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =

Duration of Analysis, T = 0.25

Cycle Length, C = 60.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	27	349		144	295		132	453		241	213	
Lane group capacity, c	253	540		160	532		552	497		304	323	
	0.11	0.65		0.90	0.55		0.24	0.91		0.79	0.66	

v/c ratio, X												
Total green ratio, g/C	0.30	0.30		0.30	0.30		0.32	0.32		0.17	0.17	
Uniform delay, d_1	15.2	18.2		20.1	17.6		14.8	19.4		23.7	23.1	
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Delay calibration, k	0.11	0.22		0.42	0.15		0.11	0.43		0.34	0.23	
Incremental delay, d_2	0.2	2.7		43.5	1.3		0.2	21.0		13.4	4.9	
Initial queue delay, d_3												
Control delay	15.4	20.9		63.6	18.9		15.0	40.5		37.1	28.0	
Lane group LOS	B	C		E	B		B	D		D	C	
Approach delay	20.5			33.6			34.7			32.8		
Approach LOS	C			C			C			C		
Intersection delay	31.1			X_c = 0.88			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2010
		Project ID	Low Level Bridge on Existing Vrooman Alignment

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	LTR		L	LTR		L	LTR		L	LTR	
Volume, V (vph)	3	83	109	135	131	83	61	133	38	81	155	20
% Heavy vehicles, %HV	33	4	3	1	4	3	7	3	0	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = ~~21.0~~	G =	G =	G =	G = ~~13.5~~	G = ~~13.5~~	G =	G =
	Y = 4 17.0	Y =	Y =	Y =	Y = 4 15.5	Y = 4 15.5	Y =	Y =
Duration of Analysis, T = 0.25					Cycle Length, C = 60.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		216			388			258			284	
Lane group capacity, c		589			490			378			405	
v/c ratio, X		0.37			0.79			0.68			0.70	
Total green ratio, g/C		0.35			0.35			0.22			0.22	

Uniform delay, d_1		14.5			17.5			21.3			21.4	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.11			0.34			0.25			0.27	
Incremental delay, d_2		0.4			8.6			5.0			5.4	
Initial queue delay, d_3												
Control delay		14.9			26.2			26.3			26.8	
Lane group LOS		B			C			C			C	
Approach delay	14.9	18.3		26.2	18.9		26.3	18.8		26.8	18.6	
Approach LOS	B			C	B		C	B		C	B	
Intersection delay	24.2	18.7		X_c = 0.74			Intersection LOS			C	B	

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2010
		Project ID	Low Level Bridge on Existing Vrooman Alignment

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	L	LTR		L	LTR		L	LTR		L	LTR	
Volume, V (vph)	16	165	46	63	106	73	80	125	128	146	123	6
% Heavy vehicles, %HV	0	2	2	4	1	0	1	2	0	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = 15.5	G =	G =	G =	G = 17.5	G = 15.0	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

NO change

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		252			269			370			306	
Lane group capacity, c		455			384			489			447	
v/c ratio, X		0.55			0.70			0.76			0.68	
Total green ratio, g/C		0.26			0.26			0.29			0.25	

Uniform delay, d_1		19.3			20.1			19.3			20.4	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.15			0.27			0.31			0.25	
Incremental delay, d_2		1.5			5.6			6.7			4.3	
Initial queue delay, d_3												
Control delay		20.7			25.8			26.0			24.7	
Lane group LOS		C			C			C			C	
Approach delay	20.7		19.6	25.8		19.1	26.0		19.0	24.7		18.9
Approach LOS	C		B	C		B	C		B	C		B
Intersection delay	24.5		19.1	X_c = 0.72			Intersection LOS			C		B

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	AM Peak	Analysis Year	2030
		Project ID	Low Level Bridge on Existing Vrooman Alignment

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	0	1	0	1	1	0	1	1	0	1	1	0
Lane group	L	LTR		L	TR		L	TR		L	TR	
Volume, V (vph)	5	124	162	200	195	124	91	198	57	121	231	29
% Heavy vehicles, %HV	33	4	3	1	4	3	7	3	0	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e		2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type, AT		3		3	3		3	3		3	3	
Unit extension, UE		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I		1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B		0		0	0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = 20.0	G =	G =	G =	G = 14.5	G = 13.5	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

No change

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		324		222	355		101	283		134	289	
Lane group capacity, c		560		283	576		387	412		391	410	
v/c ratio, X		0.58		0.78	0.62		0.26	0.69		0.34	0.70	

Total green ratio, g/C		0.33		0.33	0.33		0.24	0.24		0.22	0.22	
Uniform delay, d_1		16.5		18.1	16.8		18.4	20.7		19.5	21.4	
Progression factor, PF		1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Delay calibration, k		0.17		0.33	0.20		0.11	0.26		0.11	0.27	
Incremental delay, d_2		1.5		13.5	2.0		0.4	4.7		0.5	5.4	
Initial queue delay, d_3												
Control delay		18.0		31.5	18.8		18.8	25.4		20.1	26.9	
Lane group LOS		B		C	B		B	C		C	C	
Approach delay	18.0 17.7			23.7 24.9			23.7			24.7		
Approach LOS	B			C			C			C		
Intersection delay	22.9 23.2			X_c = 0.73			Intersection LOS			C		

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HCS2000™ DETAILED REPORT

General Information		Site Information	
Analyst	Lori Keyser	Intersection	Vrooman/Madison & SR 84
Agency or Co.	TranSystems	Area Type	All other areas
Date Performed	1/17/2005	Jurisdiction	
Time Period	PM Peak	Analysis Year	2030
		Project ID	Low Level Bridge on Existing Vrooman Alignment

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_1	1	1	0	1	1	0	1	1	0	1	1	0
Lane group	L	TR		L	TR		L	TR		L	TR	
Volume, V (vph)	24	245	69	93	157	109	119	186	190	217	183	9
% Heavy vehicles, %HV	0	2	2	4	1	0	1	2	0	4	2	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	A	A	A	A	A	A	A	A	A	A	A	A
Start-up lost time, l_1	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of effective green, e	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival type, AT	3	3		3	3		3	3		3	3	
Unit extension, UE	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Filtering/metering, I	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	10	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0		0	0		0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EW Perm	02	03	04	NB Only	SB Only	07	08
Timing	G = 15.5	G =	G =	G =	G = 18.5	G = 14.0	G =	G =
	Y = 4	Y =	Y =	Y =	Y = 4	Y = 4	Y =	Y =
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	27	349		103	295		132	418		241	213	
Lane group capacity, c	198	465		148	458		524	509		405	431	
v/c ratio, X	0.14	0.75		0.70	0.64		0.25	0.82		0.60	0.49	

Total green ratio, g/C	0.26	0.26		0.26	0.26		0.31	0.31		0.23	0.23	
Uniform delay, d_1	17.1	20.5		20.1	19.8		15.6	19.2		20.5	19.9	
Progression factor, PF	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Delay calibration, k	0.11	0.31		0.26	0.22		0.11	0.36		0.18	0.11	
Incremental delay, d_2	0.3	6.7		13.3	3.1		0.3	10.4		2.4	0.9	
Initial queue delay, d_3												
Control delay	17.4	27.2		33.5	22.9		15.8	29.6		22.9	20.8	
Lane group LOS	B	C		C	C		B	C		C	C	
Approach delay	26.5			25.6			26.3			21.9		
Approach LOS	C			C			C			C		
Intersection delay	25.1			X_c = 0.73			Intersection LOS			C		

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