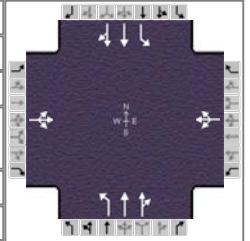


TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	TLS			Intersection	IL 53/Schweitzer Road			
Agency/Co.	Kimley-Horn			Jurisdiction	IDOT			
Date Performed	5/26/2015			Analysis Year	Existing (2015)			
Analysis Time Period	PM Peak Hour (4:15 PM)							
Project Description Elwood Truck Routing Study								
East/West Street: Schweitzer Road				North/South Street: IL Route 53				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	1	725	20	15	705	5		
Peak-Hour Factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86		
Hourly Flow Rate, HFR (veh/h)	1	843	23	17	819	5		
Percent Heavy Vehicles	2	--	--	2	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	2	0	1	2	0		
Configuration	LT		TR	L	T	TR		
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	10	5	1	20	5	25		
Peak-Hour Factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86		
Hourly Flow Rate, HFR (veh/h)	11	5	1	23	5	29		
Percent Heavy Vehicles	11	2	50	2	2	4		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	1	0	1	1	0		
Configuration		LTR		L		TR		
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	L	L		TR		LTR	
v (veh/h)	1	17	23		34		17	
C (m) (veh/h)	802	773	230		478		217	
v/c	0.00	0.02	0.10		0.07		0.08	
95% queue length	0.00	0.07	0.33		0.23		0.25	
Control Delay (s/veh)	9.5	9.8	22.4		13.1		23.0	
LOS	A	A	C		B		C	
Approach Delay (s/veh)	--	--	16.9			23.0		
Approach LOS	--	--	C			C		

TWO-WAY STOP CONTROL SUMMARY								
General Information					Site Information			
Analyst	TLS				Intersection	IL 53/Millsdale Road		
Agency/Co.	Kimley-Horn				Jurisdiction	IDOT		
Date Performed	5/26/2015				Analysis Year	Existing (2015)		
Analysis Time Period	PM Peak Hour (4:15 PM)							
Project Description Elwood Truck Routing Study								
East/West Street: Millsdale Road					North/South Street: IL Route 53			
Intersection Orientation: North-South					Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	15	615			680	55		
Peak-Hour Factor, PHF	0.87	0.87	1.00	1.00	0.87	0.87		
Hourly Flow Rate, HFR (veh/h)	17	706	0	0	781	63		
Percent Heavy Vehicles	8	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	1	2	0	0	2	1		
Configuration	L	T			T	R		
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	105		10					
Peak-Hour Factor, PHF	0.87	1.00	0.87	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	120	0	11	0	0	0		
Percent Heavy Vehicles	2	0	9	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration		LR						
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	17						131	
C (m) (veh/h)	751						320	
v/c	0.02						0.41	
95% queue length	0.07						1.92	
Control Delay (s/veh)	9.9						23.8	
LOS	A						C	
Approach Delay (s/veh)	--	--				23.8		
Approach LOS	--	--				C		

HCS 2010 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	May 26, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour (4:15 PM)	PHF	0.90
Intersection	IL 53/Manhattan/Arsenal	Analysis Year	Existing (2015)	Analysis Period	1> 16:15
File Name	Ex - PM - IL 53 - Manhattan.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	110	85	20	25	45	35	10	450	45	70	490	105

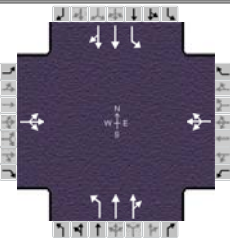
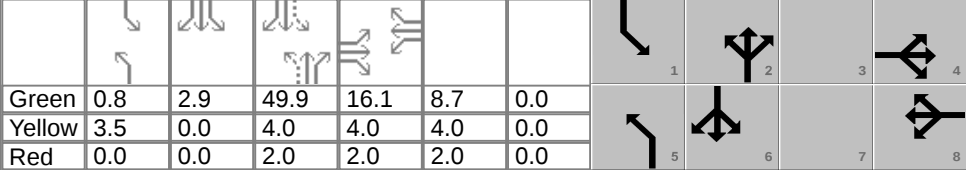
Signal Information														
Cycle, s	99.8	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	0.8	2.9	49.9	16.1	8.7	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	4.0	4.0	4.0	0.0				
				Red	0.0	0.0	2.0	2.0	2.0	0.0				
														
														
														
														
														

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	110	85	20	25	45	35	10	450	45	70	490	105
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	7			2			50			2		
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N _b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (AT)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (W), ft	12.0			12.0			12.0			11.0		
Turn Bay Length, ft	0			0			235			305		
Grade (P _g), %	0	0	0	0	0	0	0	0	0	0	0	0
Speed Limit, mi/h	50	50	50	50	50	50	55	55	55	55	55	55

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s		19.0		19.0	18.0	60.0	18.0	60.0
Yellow Change Interval (Y), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R _c), s	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Minimum Green (G _{min}), s	3	8	3	8	3	20	3	20
Start-Up Lost Time (I _t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (PT), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (Walk), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (PC), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

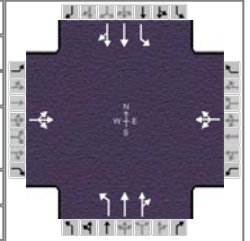
Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

HCS 2010 Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Kimley-Horn				Duration, h		0.25											
Analyst		TLS		Analysis Date		May 26, 2015		Area Type		Other									
Jurisdiction		IDOT		Time Period		PM Peak Hour (4:15 PM)		PHF		0.90									
Intersection		IL 53/Manhattan/Arsenal		Analysis Year		Existing (2015)		Analysis Period		1> 16:15									
File Name		Ex - PM - IL 53 - Manhattan.xus																	
Project Description		Elwood Truck Routing Study																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h				110	85	20	25	45	35	10	450	45	70	490	105				
Signal Information																			
Cycle, s	99.8	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	0.8	2.9	49.9	16.1	8.7	0.0													
Yellow	3.5	0.0	4.0	4.0	4.0	0.0													
Red	0.0	0.0	2.0	2.0	2.0	0.0													
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						12.0				12.0		1.1		4.0		1.1		4.0	
Phase Duration, s						22.1				14.7		4.3		55.9		7.2		58.8	
Change Period, (Y+R _c), s						6.0				6.0		3.5		6.0		3.5		6.0	
Max Allow Headway (MAH), s						5.9				6.0		3.9		11.0		3.9		11.0	
Queue Clearance Time (g _s), s						15.7				8.6		2.5		11.8		4.1		13.1	
Green Extension Time (g _e), s						0.5				0.4		0.0		38.1		0.1		37.2	
Phase Call Probability						1.00				0.96		0.27		1.00		0.88		1.00	
Max Out Probability						1.00				0.08		0.00		0.75		0.00		0.76	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16				
Adjusted Flow Rate (v), veh/h					239			117		11	279	271	78	340	321				
Adjusted Saturation Flow Rate (s), veh/h/ln					1704			1738		1206	1712	1657	1774	1792	1682				
Queue Service Time (g _s), s					13.7			6.6		0.5	9.7	9.8	2.1	11.0	11.1				
Cycle Queue Clearance Time (g _c), s					13.7			6.6		0.5	9.7	9.8	2.1	11.0	11.1				
Green Ratio (g/C)					0.16			0.09		0.51	0.50	0.50	0.55	0.53	0.53				
Capacity (c), veh/h					275			151		290	855	827	481	947	889				
Volume-to-Capacity Ratio (X)					0.869			0.774		0.038	0.326	0.328	0.162	0.359	0.361				
Available Capacity (c _a), veh/h					324			331		498	1029	996	735	1077	1011				
Back of Queue (Q), veh/ln (95th percentile)					11.5			6.1		0.2	6.3	6.2	1.3	7.3	7.0				
Queue Storage Ratio (RQ) (95th percentile)					0.00			0.00		0.04	0.00	0.00	0.11	0.00	0.00				
Uniform Delay (d ₁), s/veh					40.8			44.6		12.8	14.9	15.0	11.2	13.7	13.7				
Incremental Delay (d ₂), s/veh					22.5			16.3		0.1	1.0	1.1	0.2	1.1	1.1				
Initial Queue Delay (d ₃), s/veh					0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0				
Control Delay (d), s/veh					63.3			60.9		12.8	16.0	16.0	11.4	14.8	14.9				
Level of Service (LOS)					E			E		B	B	B	B	B	B				
Approach Delay, s/veh / LOS				63.3	E		60.9	E		15.9	B		14.4	B					
Intersection Delay, s/veh / LOS				25.3						C									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.9	C		2.9	C		2.1	B		2.1	B					
Bicycle LOS Score / LOS				0.9	A		0.7	A		1.0	A		1.1	A					

HCS 2010 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	May 26, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour (4:15 PM)	PHF	0.90
Intersection	IL 53/Manhattan/Arsenal	Analysis Year	Existing (2015)	Analysis Period	1> 16:15
File Name	Ex - PM - IL 53 - Manhattan.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	110	85	20	25	45	35	10	450	45	70	490	105

Signal Information														
Cycle, s	99.8	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	0.8	2.9	49.9	16.1	8.7	0.0				
				Yellow	3.5	0.0	4.0	4.0	4.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	2.0	2.0	2.0	0.0				

						
1	2	3	4	5	6	7
						
1	2	3	4	5	6	7

	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	0.935	1.000	1.000	0.980	1.000	0.667	0.901	1.000	0.980	0.943	1.000
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})		0.959			0.933		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.000			0.000			0.968			0.939	
Left-Turn Pedestrian Adjustment Factor (f_{LPB})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{RPB})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h		674			745		1206	3068		1774	2883	
Platoon Ratio (R_p)		1.00			1.00		1.00	1.00		1.00	1.00	
Proportion of Vehicles Arriving on Green (P)												
Incremental Delay Factor (k)		0.36			0.23		0.11	0.50	0.50	0.11	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		3.5		6.0	3.5	6.0	3.5	6.0
Green Ratio (g/C)		0.16		0.09	0.51	0.50	0.55	0.53
Permitted Saturation Flow Rate (s_p), veh/h/ln		0		0	524	0	854	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s		0.0		0.0	49.9	0.0	51.3	0.0
Permitted Service Time (g_u), s		0.0		0.0	39.7	0.0	40.1	0.0
Permitted Queue Service Time (g_{ps}), s					0.2		1.1	
Time to First Blockage (g_t), s		0.0		0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_s), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	2.107	0.00	2.107	0.00	1.389	0.00	1.389	0.00
Pedestrian F_s / F_{delay}	0.000	0.150	0.000	0.162	0.000	0.101	0.000	0.096
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	173.41	41.63		57.16	998.82	12.51	1057.11	11.09
Bicycle F_w / F_v	-3.64	0.39	-3.64	0.19	-3.64	0.46	-3.64	0.61

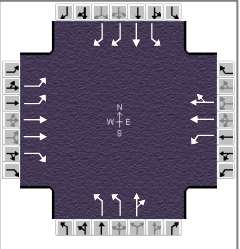
--- Messages ---

No errors or warnings exist.

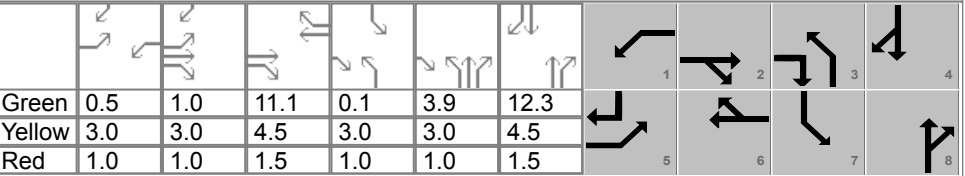
--- Comments ---

ALL-WAY STOP CONTROL ANALYSIS								
General Information					Site Information			
Analyst	TLS				Intersection	Laraway/Centerpoint		
Agency/Co.	Kimley-Horn				Jurisdiction	Joliet		
Date Performed	5/26/2015				Analysis Year	Existing (2015)		
Analysis Time Period	PM Peak Hour (3:00 PM)							
Project ID <i>Elwood Truck Routing Study</i>								
East/West Street: <i>Laraway Road</i>					North/South Street: <i>Centerpoint Way</i>			
Volume Adjustments and Site Characteristics								
Approach	Eastbound				Westbound			
Movement	L	T	R		L	T	R	
Volume (veh/h)	1	25	1		175	10	10	
%Thrus Left Lane								
Approach	Northbound				Southbound			
Movement	L	T	R		L	T	R	
Volume (veh/h)	1	20	245		60	25	1	
%Thrus Left Lane								
	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LT R		L TR		LTR	
PHF	0.79		0.79 0.79		0.79 0.79		0.79	
Flow Rate (veh/h)	33		233 12		1 335		107	
% Heavy Vehicles	74		79 50		2 63		31	
No. Lanes	1		2		2		1	
Geometry Group	4b		5		5		4b	
Duration, T	0.25							
Saturation Headway Adjustment Worksheet								
Prop. Left-Turns	0.0		0.9	0.0	1.0	0.0	0.7	
Prop. Right-Turns	0.0		0.0	1.0	0.0	0.9	0.0	
Prop. Heavy Vehicle	0.7		0.8	0.5	0.0	0.6	0.3	
hLT-adj	0.2	0.2	0.5	0.5	0.5	0.5	0.2	0.2
hRT-adj	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	1.2		1.8	0.2	0.5	0.4	0.7	
Departure Headway and Service Time								
hd, initial value (s)	3.20		3.20	3.20	3.20	3.20	3.20	
x, initial	0.03		0.21	0.01	0.00	0.30	0.10	
hd, final value (s)	7.83		7.82	6.14	6.33	6.22	6.89	
x, final value	0.07		0.51	0.02	0.00	0.58	0.20	
Move-up time, m (s)	2.3		2.3		2.3		2.3	
Service Time, t _s (s)	5.5		5.5	3.8	4.0	3.9	4.6	
Capacity and Level of Service								
	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	283		447	262	251	567	357	
Delay (s/veh)	11.13		18.25	8.97	9.04	17.10	11.36	
LOS	B		C	A	A	C	B	
Approach: Delay (s/veh)	11.13		17.80		17.08		11.36	
LOS	B		C		C		B	
Intersection Delay (s/veh)	16.20							
Intersection LOS	C							

HCS 2010 Signalized Intersection Input Data

General Information					Intersection Information							
Agency	Kimley-Horn				Duration, h	0.25						
Analyst	TLS		Analysis Date	Jun 1, 2015		Area Type	Other					
Jurisdiction	WCDOT		Time Period	Truck Peak Hour (1:15 PM)		PHF	0.94					
Intersection	Arsenal/Elwood Intermodal		Analysis Year	Existing (2015)		Analysis Period	1 > 13:15					
File Name	Ex - Tr - Arsenal - Elwood Intermodal.xus											
Project Description	Elwood Truck Routing Study											

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	125	25	0	10	40	5	180	85	15	1	125	95

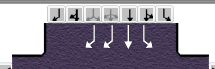
Signal Information														
Cycle, s	56.9	Reference Phase	2	Green	0.5	1.0	11.1	0.1	3.9	12.3	1	2	3	4
Offset, s	0	Reference Point	Begin	Yellow	3.0	3.0	4.5	3.0	3.0	4.5	5	6	7	8
Uncoordinated	Yes	Simult. Gap E/W	On	Red	1.0	1.0	1.5	1.0	1.0	1.5				
Force Mode	Fixed	Simult. Gap N/S	On											

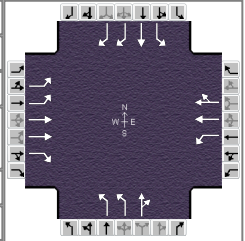
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	125	25	0	10	40	5	180	85	15	1	125	95
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	2000	1900	1900	1900	1900	1900	1900	1900	1900	2000	1900
Parking (N _m), man/h		None			None			None			None	
Heavy Vehicles (P _{HV}), %	80	9	88	55	15		91	91		100	98	88
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N _b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (AT)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (W), ft	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	265	0	460	520	0		435	0		220	0	275
Grade (P _g), %	0	0	0	0	0	0	0	0	0	0	0	0
Speed Limit, mi/h	50	50	50	55	55	55	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	30.0	45.0	15.0	45.0	30.0	45.0	15.0	45.0
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5
Minimum Green (G _{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (I _t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (PT), s	3.0	7.0	3.0	7.0	3.0	7.0	5.0	5.0
Recall Mode	Off	Off	Off	Off	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (Walk), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (PC), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	Kimley-Horn			Duration, h	0.25	
Analyst	TLS	Analysis Date	Jun 1, 2015	Area Type	Other	
Jurisdiction	WCDOT	Time Period	Truck Peak Hour (1:15 PM)	PHF	0.94	
Intersection	Arsenal/Elwood Intermodal	Analysis Year	Existing (2015)	Analysis Period	1> 13:15	
File Name	Ex - Tr - Arsenal - Elwood Intermodal.xus					
Project Description	Elwood Truck Routing Study					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	125	25	0	10	40	5	180	85	15	1	125	95

Signal Information											
Cycle, s	56.9	Reference Phase	2								
Offset, s	0	Reference Point	Begin								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	0.5	1.0	11.1	0.1	3.9	12.3	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	4.5	3.0	3.0	4.5	
				Red	1.0	1.0	1.5	1.0	1.0	1.5	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	4.0	2.0	4.0	2.0	3.0
Phase Duration, s	9.5	22.1	4.5	17.1	12.0	26.2	4.1	18.3
Change Period, (Y+R _c), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Allow Headway (MAH), s	3.9	11.0	3.9	11.0	4.0	6.6	6.0	6.6
Queue Clearance Time (g _s), s	5.8	2.3	2.5	2.7	7.7	6.5	2.1	8.8
Green Extension Time (g _e), s	0.4	1.8	0.0	1.8	0.7	3.5	0.0	3.5
Phase Call Probability	0.88	0.96	0.16	0.74	0.95	1.00	0.02	1.00
Max Out Probability	0.00	0.00	0.00	0.00	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	18	7	4	14
Adjusted Flow Rate (v), veh/h	133	27	0	11	24	24	191	106		1	133	101
Adjusted Saturation Flow Rate (s), veh/h/ln	976	1747	856	1167	1652	1589	920	969		905	1010	758
Queue Service Time (g_s), s	3.8	0.3	0.0	0.5	0.7	0.7	5.7	4.5		0.1	6.8	2.8
Cycle Queue Clearance Time (g_c), s	3.8	0.3	0.0	0.5	0.7	0.7	5.7	4.5		0.1	6.8	2.8
Green Ratio (g/C)	0.10	0.28	0.42	0.01	0.20	0.20	0.14	0.36		0.00	0.22	0.31
Capacity (c), veh/h	188	993	364	10	324	311	259	345		2	218	474
Volume-to-Capacity Ratio (X)	0.706	0.027	0.000	1.101	0.074	0.077	0.740	0.309		0.670	0.609	0.213
Available Capacity (c_a), veh/h	1027	2758	797	307	1304	1254	968	765		238	797	1343
Back of Queue (Q), veh/ln (95th percentile)	1.6	0.2	0.0	1.0	0.5	0.5	2.2	1.8		0.3	3.1	0.8
Queue Storage Ratio (RQ) (95th percentile)	0.36	0.00	0.00	0.10	0.00	0.00	0.33	0.00		0.09	0.00	0.18
Uniform Delay (d_1), s/veh	25.0	14.7	0.0	28.3	18.7	18.7	23.5	13.3		28.5	20.2	14.4
Incremental Delay (d_2), s/veh	4.8	0.0	0.0	165.7	0.4	0.5	4.1	2.3		330.4	5.8	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	29.8	14.8	0.0	194.0	19.1	19.2	27.6	15.6		358.9	25.9	14.9
Level of Service (LOS)	C	B		F	B	B	C	B		F	C	B
Approach Delay, s/veh / LOS	27.3	C		50.9	D		23.3	C		22.7	C	
Intersection Delay, s/veh / LOS	26.1						C					

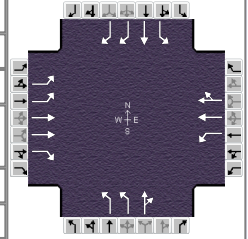
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.4	B	2.9	C	2.8	C	3.1	C
Bicycle LOS Score / LOS	0.6	A	0.5	A	1.0	A	0.9	A

HCS 2010 Signalized Intersection Intermediate Values

General Information

Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	Jun 1, 2015	Area Type	Other
Jurisdiction	WCDOT	Time Period	Truck Peak Hour (1:15 PM)	PHF	0.94
Intersection	Arsenal/Elwood Intermodal	Analysis Year	Existing (2015)	Analysis Period	1 > 13:15
File Name	Ex - Tr - Arsenal - Elwood Intermodal.xus				
Project Description	Elwood Truck Routing Study				

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	125	25	0	10	40	5	180	85	15	1	125	95

Signal Information

Cycle, s	56.9	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	0.5	1.0	11.1	0.1	3.9	12.3		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	4.5	3.0	3.0	4.5		
				Red	1.0	1.0	1.5	1.0	1.0	1.5		

	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.556	0.917	0.532	0.645	0.870	1.000	0.524	0.524	1.000	0.500	0.505	0.532
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	0.971	0.952	1.000	1.000	1.000	1.000	0.971	1.000	1.000	1.000	1.000	0.885
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.000			0.961			0.974			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{LPB})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{RPB})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1952	3494		1167	2888		1840	823		905	1010	
Platoon Ratio (R_p)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Proportion of Vehicles Arriving on Green (P)												
Incremental Delay Factor (k)	0.11	0.50		0.11	0.50	0.50	0.11	0.50		0.23	0.23	0.23

Signal Timing / Movement Groups

	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Green Ratio (g/C)	0.10	0.28	0.01	0.20	0.14	0.36	0.00	0.22
Permitted Saturation Flow Rate (s_p), veh/h/ln	0	0	0	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s								
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln		856						758
Protected Right Effective Green Time (g_R), s		8.0						5.5

Multimodal

	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.710	0.00	2.224	0.00	2.107	0.00	2.336	0.00
Pedestrian F_s / F_{delay}	0.000	0.107	0.000	0.117	0.000	0.099	0.000	0.115
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	567.62	14.58	391.79	18.38	710.54	11.82	431.60	17.48
Bicycle F_w / F_v	-3.64	0.13	-3.64	0.05	-3.64	0.49	-3.64	0.39

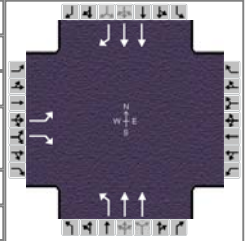
--- Messages ---

No errors or warnings exist.

--- Comments ---

HCS 2010 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	Jun 1, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	Truck Peak Hour (12:30 PM)	PHF	0.90
Intersection	Arsenal/Frontage	Analysis Year	Existing (2015)	Analysis Period	1> 12:30
File Name	Ex - Tr - Arsenal - Frontage.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5		35				75	415			370	80

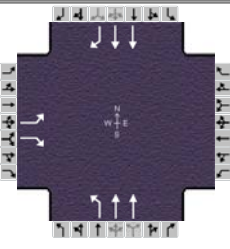
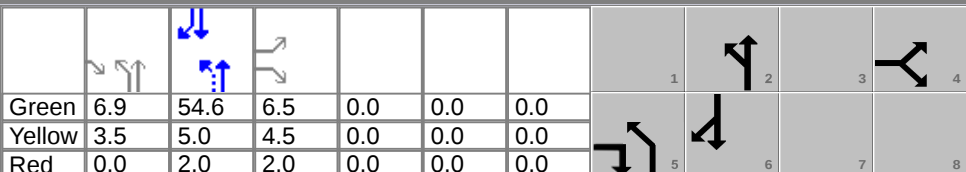
Signal Information											
Cycle, s	85.0	Reference Phase	2								
Offset, s	0	Reference Point	Begin								
Uncoordinated	No	Simult. Gap E/W	On	Green	6.9	54.6	6.5	0.0	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	5.0	4.5	0.0	0.0	0.0	
				Red	0.0	2.0	2.0	0.0	0.0	0.0	

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5		35				75	415			370	80
Initial Queue (Q _b), veh/h	0		0				0	0			0	0
Base Saturation Flow Rate (s _o), veh/h	1900		1900				1900	2000			2000	1900
Parking (N _m), man/h		None						None			None	
Heavy Vehicles (P _{HV}), %	33		68				58	84			81	84
Ped / Bike / RTOR, /h							0	0	0	0	0	0
Buses (N _b), buses/h	0		0				0	0			0	0
Arrival Type (AT)	3		3				3	4			4	3
Upstream Filtering (I)	1.00		1.00				1.00	1.00			1.00	1.00
Lane Width (W), ft	12.0		12.0				12.0	12.0			12.0	12.0
Turn Bay Length, ft	240		0				275	0			0	400
Grade (Pg), %	0		0				0	0			0	0
Speed Limit, mi/h	45		45				45	45			45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s		30.0			13.0	55.0		42.0
Yellow Change Interval (Y), s	4.0				3.5	5.0		5.0
Red Clearance Interval (R _c), s	1.0				0.0	2.0		2.0
Minimum Green (G _{min}), s	5				8	15		15
Start-Up Lost Time (I _t), s	2.0				2.0	2.0		2.0
Extension of Effective Green (e), s	2.0				2.0	2.0		2.0
Passage (PT), s	7.0				7.0	7.0		7.0
Recall Mode	Off				Off	Min		Min
Dual Entry	No				No	Yes		Yes
Walk (Walk), s	0.0				0.0	0.0		0.0
Pedestrian Clearance Time (PC), s	0.0				0.0	0.0		0.0

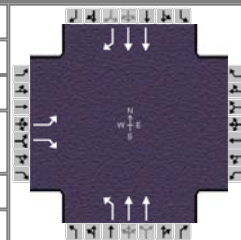
Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25				0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0				9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No				0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0				12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No		0.50				No		0.50	No		0.50

HCS 2010 Signalized Intersection Results Summary

General Information					Intersection Information															
Agency	Kimley-Horn				Duration, h		0.25													
Analyst	TLS		Analysis Date	Jun 1, 2015		Area Type		Other												
Jurisdiction	IDOT		Time Period	Truck Peak Hour (12:30 PM)		PHF		0.90												
Intersection	Arsenal/Frontage		Analysis Year	Existing (2015)		Analysis Period		1> 12:30												
File Name	Ex - Tr - Arsenal - Frontage.xus																			
Project Description	Elwood Truck Routing Study																			
Demand Information					EB			WB			NB			SB						
Approach Movement					L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h					5		35				75	415			370	80				
Signal Information																				
Cycle, s	85.0	Reference Phase	2																	
Offset, s	0	Reference Point	Begin																	
Uncoordinated	No	Simult. Gap E/W	On																	
Force Mode	Fixed	Simult. Gap N/S	On	Green	6.9	54.6	6.5	0.0	0.0	0.0										
				Yellow	3.5	5.0	4.5	0.0	0.0	0.0										
				Red	0.0	2.0	2.0	0.0	0.0	0.0										
Timer Results					EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase							4						5		2				6	
Case Number							9.0						1.0		4.0				7.3	
Phase Duration, s							13.0						10.4		72.0				61.6	
Change Period, (Y+R _c), s							6.5						3.5		7.0				7.0	
Max Allow Headway (MAH), s							6.2						8.0		0.0				0.0	
Queue Clearance Time (g _s), s							5.0						3.7							
Green Extension Time (g _e), s							0.2						0.8		0.0				0.0	
Phase Call Probability							0.65						0.86							
Max Out Probability							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					7		14				5	2			6	16				
Adjusted Flow Rate (v), veh/h					6		39				83	461			411	89				
Adjusted Saturation Flow Rate (s), veh/h/ln					1361		958				1145	1035			1052	875				
Queue Service Time (g _s), s					0.3		3.0				1.7	0.0			3.2	3.4				
Cycle Queue Clearance Time (g _c), s					0.3		3.0				1.7	0.0			3.2	3.4				
Green Ratio (g/C)					0.08		0.16				0.75	0.76			0.64	0.64				
Capacity (c), veh/h					104		151				556	1583			1352	562				
Volume-to-Capacity Ratio (X)					0.053		0.258				0.150	0.291			0.304	0.158				
Available Capacity (c _a), veh/h					376		343				821	1583			1352	562				
Back of Queue (Q), veh/ln (95th percentile)					0.2		1.3				0.5	0.2			1.0	1.0				
Queue Storage Ratio (RQ) (95th percentile)					0.03		0.00				0.10	0.00			0.00	0.16				
Uniform Delay (d ₁), s/veh					36.4		31.4				3.1	0.0			2.4	6.0				
Incremental Delay (d ₂), s/veh					0.5		1.9				0.6	0.5			0.6	0.6				
Initial Queue Delay (d ₃), s/veh					0.0		0.0				0.0	0.0			0.0	0.0				
Control Delay (d), s/veh					36.8		33.4				3.7	0.5			3.0	6.6				
Level of Service (LOS)					D		C				A	A			A	A				
Approach Delay, s/veh / LOS					33.8		C	0.0			1.0		A	3.6		A				
Intersection Delay, s/veh / LOS					3.5					A										
Multimodal Results					EB			WB			NB			SB						
Pedestrian LOS Score / LOS					2.9		C	2.9		C	0.6		A	2.2		B				
Bicycle LOS Score / LOS							F				0.9		A	0.9		A				

HCS 2010 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	Jun 1, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	Truck Peak Hour (12:30 PM)	PHF	0.90
Intersection	Arsenal/Frontage	Analysis Year	Existing (2015)	Analysis Period	1> 12:30
File Name	Ex - Tr - Arsenal - Frontage.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	5		35				75	415			370	80

Signal Information											
Cycle, s	85.0	Reference Phase	2								
Offset, s	0	Reference Point	Begin								
Uncoordinated	No	Simult. Gap E/W	On	Green	6.9	54.6	6.5	0.0	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	5.0	4.5	0.0	0.0	0.0	
				Red	0.0	2.0	2.0	0.0	0.0	0.0	

	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.752	1.000	0.595	0.000	0.000	0.000	0.633	0.543	1.000	1.000	0.552	0.543
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.952	1.000	1.000	0.952	1.000
Left-Turn Adjustment Factor (f_{LT})		0.000					0.952	0.000			1.000	
Right-Turn Adjustment Factor (f_{RT})		0.000						1.000			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{LPB})	1.000						1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{RPB})			1.000						1.000			1.000
Movement Saturation Flow Rate (s), veh/h		0					1145	2122			2157	
Platoon Ratio (R_p)		0.00					1.00	1.33			1.33	
Proportion of Vehicles Arriving on Green (P)												
Incremental Delay Factor (k)	0.23		0.23				0.50	0.50			0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		5.0			3.5	7.0		7.0
Green Ratio (g/C)		0.08			0.75	0.76		0.64
Permitted Saturation Flow Rate (s_p), veh/h/ln		1361			627	0		946
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								0
Permitted Effective Green Time (g_p), s		12.0			56.6	0.0		0.0
Permitted Service Time (g_u), s		0.0			51.4	0.0		0.0
Permitted Queue Service Time (g_{ps}), s					0.8			
Time to First Blockage (g_t), s		0.0			0.0	0.0		54.6
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln		958						0
Protected Right Effective Green Time (g_R), s		6.9						0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	2.107	0.00	2.107	0.00	0.000	0.00	1.557	0.00
Pedestrian F_s / F_{delay}	0.000	0.157	0.000	0.156	0.000	0.034	0.000	0.068
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b		50.33		48.71	1529.44	2.35	1285.16	5.43
Bicycle F_w / F_v	-3.64		-3.64		-3.64	0.45	-3.64	0.41

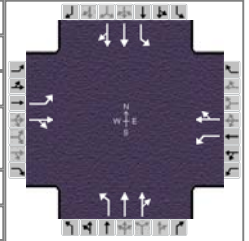
--- Messages ---

No errors or warnings exist.

--- Comments ---

HCS 2010 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	May 26, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	Truck Peak Hour (1:00 PM)	PHF	0.94
Intersection	IL 53/Laraway Road	Analysis Year	Existing (2015)	Analysis Period	1> 13:00
File Name	Ex - Tr - IL 53 - Laraway.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	230	60	20	95	35	50	30	240	65	40	410	275

Signal Information												
Cycle, s	88.8	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	2.5	0.4	40.9	6.2	5.3	10.0		
				Yellow	3.5	0.0	4.0	3.5	3.5	4.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	2.0	0.0	0.0	2.0		

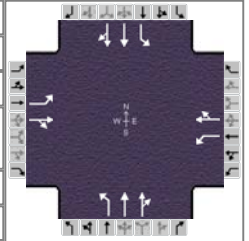
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	230	60	20	95	35	50	30	240	65	40	410	275
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h	None			None			None			None		
Heavy Vehicles (P_{HV}), %	81	68		6	36		71	21		16	47	
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (AT)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (W), ft	12.0	12.0		11.0	11.0		11.0	11.0		11.0	11.0	
Turn Bay Length, ft	200	0		215	0		130	0		350	0	
Grade (Pg), %	0	0	0	0	0	0	0	0	0	0	0	0
Speed Limit, mi/h	45	45	45	45	45	45	50	50	50	50	50	50

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	15.0	40.0	15.0	40.0	15.0	45.0	15.0	45.0
Yellow Change Interval (Y), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	10	3	10	4	20	4	20
Start-Up Lost Time (l_t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (PT), s	3.0	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (Walk), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (PC), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	May 26, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	Truck Peak Hour (1:00 PM)	PHF	0.94
Intersection	IL 53/Laraway Road	Analysis Year	Existing (2015)	Analysis Period	1> 13:00
File Name	Ex - Tr - IL 53 - Laraway.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	230	60	20	95	35	50	30	240	65	40	410	275

Signal Information											
Cycle, s	88.8	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	2.5	0.4	40.9	6.2	5.3	10.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	4.0	3.5	3.5	4.0	
				Red	1.0	0.0	2.0	0.0	0.0	2.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	4.0	2.0	4.0
Phase Duration, s	18.5	24.8	9.7	16.0	7.0	46.9	7.4	47.4
Change Period, (Y+R _c), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (MAH), s	4.0	5.0	4.0	5.0	3.9	11.2	3.9	11.2
Queue Clearance Time (g _s), s	17.0	8.0	6.6	8.1	4.5	7.9	4.4	22.7
Green Extension Time (g _e), s	0.0	0.9	0.1	0.9	0.0	28.7	0.0	18.7
Phase Call Probability	1.00	1.00	0.92	1.00	0.55	1.00	0.65	1.00
Max Out Probability	1.00	0.00	0.01	0.00	0.00	0.76	0.00	0.89

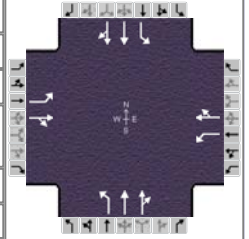
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	245	85		101	90		32	166	159	43	389	340
Adjusted Saturation Flow Rate (s), veh/h/ln	1000	1082		1707	1263		1058	1570	1456	1560	1293	1119
Queue Service Time (g _s), s	15.0	6.0		4.6	6.1		2.5	5.6	5.9	2.4	20.4	20.7
Cycle Queue Clearance Time (g _c), s	15.0	6.0		4.6	6.1		2.5	5.6	5.9	2.4	20.4	20.7
Green Ratio (g/C)	0.30	0.21		0.18	0.11		0.03	0.46	0.46	0.03	0.47	0.47
Capacity (c), veh/h	282	229		341	142		30	724	671	51	602	521
Volume-to-Capacity Ratio (X)	0.867	0.371		0.296	0.636		1.077	0.229	0.237	0.836	0.646	0.652
Available Capacity (c _a), veh/h	282	487		511	569		179	795	738	263	655	567
Back of Queue (Q), veh/ln (95th percentile)	5.1	2.8		3.3	3.7		2.6	3.4	3.3	2.3	10.2	9.3
Queue Storage Ratio (RQ) (95th percentile)	1.58	0.00		0.42	0.00		1.13	0.00	0.00	0.21	0.00	0.00
Uniform Delay (d ₁), s/veh	30.7	29.9		31.6	37.7		43.2	14.4	14.5	42.7	18.1	18.2
Incremental Delay (d ₂), s/veh	23.6	1.4		0.5	6.6		98.9	0.7	0.8	28.1	5.3	6.2
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	54.3	31.4		32.1	44.3		142.1	15.2	15.3	70.9	23.4	24.4
Level of Service (LOS)	D	C		C	D		F	B	B	E	C	C
Approach Delay, s/veh / LOS	48.4		D	37.8		D	26.6		C	26.5		C
Intersection Delay, s/veh / LOS	32.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.8	A	0.8	A	1.1	A

HCS 2010 Signalized Intersection Intermediate Values

General Information

Agency	Kimley-Horn		
Analyst	TLS	Analysis Date	May 26, 2015
Jurisdiction	IDOT	Time Period	Truck Peak Hour (1:00 PM)
Intersection	IL 53/Laraway Road	Analysis Year	Existing (2015)
File Name	Ex - Tr - IL 53 - Laraway.xus		
Project Description	Elwood Truck Routing Study		



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	230	60	20	95	35	50	30	240	65	40	410	275

Signal Information

Cycle, s	88.8	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	2.5	0.4	40.9	6.2	5.3	10.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	4.0	3.5	3.5	4.0		
				Red	1.0	0.0	2.0	0.0	0.0	2.0		

	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.552	0.595	1.000	0.943	0.735	1.000	0.585	0.826	1.000	0.862	0.680	1.000
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.957			0.904			0.927			0.866	
Left-Turn Pedestrian Adjustment Factor (f_{LPB})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{RPB})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1000	812		1707	520		1058	2407		1560	1515	
Platoon Ratio (R_p)	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Proportion of Vehicles Arriving on Green (P)												
Incremental Delay Factor (k)	0.40	0.15		0.11	0.15		0.11	0.50	0.50	0.11	0.50	0.50

Signal Timing / Movement Groups

	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.30	0.21	0.18	0.11	0.03	0.46	0.03	0.47
Permitted Saturation Flow Rate (s_p), veh/h/ln	733	0	1258	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	12.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	3.9	0.0	10.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	3.9		0.0					
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal

	EB		WB		NB		SB	
Pedestrian F_w / F_v	2.107	0.00	2.107	0.00	1.557	0.00	1.557	0.00
Pedestrian F_s / F_{delay}	0.000	0.133	0.000	0.143	0.000	0.103	0.000	0.102
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	423.92	27.58	224.94	34.98	921.74	12.91	931.27	12.68
Bicycle F_w / F_v	-3.64	0.54	-3.64	0.32	-3.64	0.29	-3.64	0.64

--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

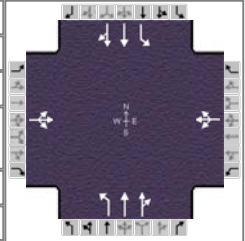
--- Comments ---

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	TLS			Intersection	IL 53/Schweitzer Road			
Agency/Co.	Kimley-Horn			Jurisdiction	IDOT			
Date Performed	5/26/2015			Analysis Year	Existing (2015)			
Analysis Time Period	Truck Peak Hour (9:15 AM)							
Project Description Elwood Truck Routing Study								
East/West Street: Schweitzer Road				North/South Street: IL Route 53				
Intersection Orientation: North-South				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	1	315	10	5	305	15		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR (veh/h)	1	350	11	5	338	16		
Percent Heavy Vehicles	2	--	--	14	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	2	0	1	2	0		
Configuration	LT		TR	L	T	TR		
Upstream Signal		0			0			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	15	1	1	5	5	15		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR (veh/h)	16	1	1	5	5	16		
Percent Heavy Vehicles	36	2	2	17	33	15		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	1	0	1	1	0		
Configuration		LTR		L		TR		
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	L	L		TR		LTR	
v (veh/h)	1	5	5		21		18	
C (m) (veh/h)	1201	1112	476		647		446	
v/c	0.00	0.00	0.01		0.03		0.04	
95% queue length	0.00	0.01	0.03		0.10		0.13	
Control Delay (s/veh)	8.0	8.3	12.6		10.8		13.4	
LOS	A	A	B		B		B	
Approach Delay (s/veh)	--	--	11.1			13.4		
Approach LOS	--	--	B			B		

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	TLS			Intersection	IL 53/Millsdale Road		
Agency/Co.	Kimley-Horn			Jurisdiction	IDOT		
Date Performed	5/26/2015			Analysis Year	Existing (2015)		
Analysis Time Period	Truck Peak Hour (9:15 AM)						
Project Description Elwood Truck Routing Study							
East/West Street: Millsdale Road				North/South Street: IL Route 53			
Intersection Orientation: North-South				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	5	285			270	35	
Peak-Hour Factor, PHF	0.90	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	5	316	0	0	300	38	
Percent Heavy Vehicles	2	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	1	2	0	0	2	1	
Configuration	L	T			T	R	
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	25		1				
Peak-Hour Factor, PHF	0.90	1.00	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	27	0	1	0	0	0	
Percent Heavy Vehicles	4	0	2	0	0	0	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11 12
Lane Configuration	L						LR
v (veh/h)	5						28
C (m) (veh/h)	1218						592
v/c	0.00						0.05
95% queue length	0.01						0.15
Control Delay (s/veh)	8.0						11.4
LOS	A						B
Approach Delay (s/veh)	--	--				11.4	
Approach LOS	--	--				B	

HCS 2010 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	May 26, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	Truck Peak Hour (9:15 AM)	PHF	0.88
Intersection	IL 53/Manhattan/Arsenal	Analysis Year	Existing (2015)	Analysis Period	1> 9:15
File Name	Ex - Tr - IL 53 - Manhattan.xus				
Project Description	Elwood Truck Routing Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	55	20	10	30	20	25	5	180	20	20	200	40

Signal Information														
Cycle, s	55.5	Reference Phase	2											
Offset, s	0	Reference Point	End											
Uncoordinated	Yes	Simult. Gap E/W	On	Green	0.3	0.6	21.0	6.2	5.9	0.0				
				Yellow	3.5	0.0	4.0	4.0	4.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	2.0	2.0	2.0	0.0				

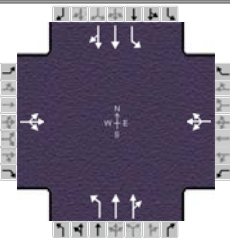
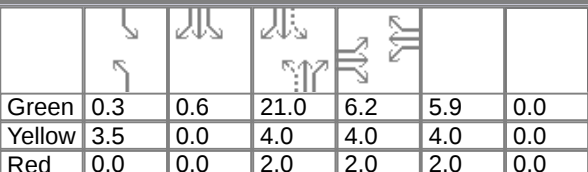
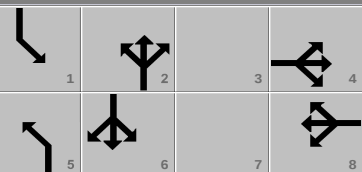
														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	55	20	10	30	20	25	5	180	20	20	200	40
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	16			10			80			29		
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N _b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (AT)	3	3	3	3	3	3	3	3	3	3	3	3
Upstream Filtering (I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (W), ft	12.0			12.0			12.0			11.0		
Turn Bay Length, ft	0			0			235			305		
Grade (P _g), %	0	0	0	0	0	0	0	0	0	0	0	0
Speed Limit, mi/h	50	50	50	50	50	50	55	55	55	55	55	55

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s		19.0		19.0	18.0	60.0	18.0	60.0
Yellow Change Interval (Y), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R _c), s	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Minimum Green (G _{min}), s	3	8	3	8	3	20	3	20
Start-Up Lost Time (I _t), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (PT), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (Walk), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (PC), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

HCS 2010 Signalized Intersection Results Summary

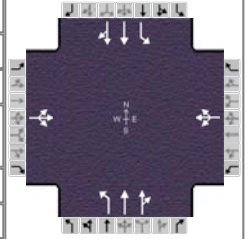
General Information						Intersection Information													
Agency		Kimley-Horn				Duration, h		0.25											
Analyst		TLS		Analysis Date		May 26, 2015		Area Type		Other									
Jurisdiction		IDOT		Time Period		Truck Peak Hour (9:15 AM)		PHF		0.88									
Intersection		IL 53/Manhattan/Arsenal		Analysis Year		Existing (2015)		Analysis Period		1> 9:15									
File Name		Ex - Tr - IL 53 - Manhattan.xus																	
Project Description		Elwood Truck Routing Study																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h				55	20	10	30	20	25	5	180	20	20	200	40				
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	0.3	0.6	21.0	6.2	5.9	0.0													
Yellow	3.5	0.0	4.0	4.0	4.0	0.0													
Red	0.0	0.0	2.0	2.0	2.0	0.0													
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						12.0				12.0		1.1		4.0		1.1		4.0	
Phase Duration, s						12.2				11.9		3.8		27.0		4.4		27.7	
Change Period, (Y+R _c), s						6.0				6.0		3.5		6.0		3.5		6.0	
Max Allow Headway (MAH), s						5.9				6.0		3.9		11.0		3.9		11.0	
Queue Clearance Time (g _s), s						5.3				4.8		2.2		4.9		2.6		5.7	
Green Extension Time (g _e), s						0.4				0.4		0.0		16.1		0.0		16.0	
Phase Call Probability						0.77				0.73		0.08		1.00		0.30		1.00	
Max Out Probability						0.01				0.01		0.00		0.08		0.00		0.09	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16				
Adjusted Flow Rate (v), veh/h					97			85		6	114	113	23	138	134				
Adjusted Saturation Flow Rate (s), veh/h/ln					1555			1599		1005	1484	1432	1403	1462	1378				
Queue Service Time (g _s), s					3.3			2.8		0.2	2.9	2.9	0.6	3.5	3.7				
Cycle Queue Clearance Time (g _c), s					3.3			2.8		0.2	2.9	2.9	0.6	3.5	3.7				
Green Ratio (g/C)					0.11			0.11		0.38	0.38	0.38	0.40	0.39	0.39				
Capacity (c), veh/h					174			169		315	563	543	449	571	538				
Volume-to-Capacity Ratio (X)					0.556			0.505		0.018	0.203	0.208	0.051	0.242	0.250				
Available Capacity (c _a), veh/h					532			548		636	1605	1549	881	1581	1490				
Back of Queue (Q), veh/ln (95th percentile)					2.3			2.0		0.1	1.5	1.5	0.2	1.8	1.7				
Queue Storage Ratio (RQ) (95th percentile)					0.00			0.00		0.02	0.00	0.00	0.03	0.00	0.00				
Uniform Delay (d ₁), s/veh					23.3			23.4		10.8	11.6	11.6	10.4	11.4	11.4				
Incremental Delay (d ₂), s/veh					5.8			4.9		0.0	0.8	0.9	0.0	1.0	1.1				
Initial Queue Delay (d ₃), s/veh					0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0				
Control Delay (d), s/veh					29.2			28.4		10.8	12.4	12.5	10.4	12.4	12.5				
Level of Service (LOS)					C			C		B	B	B	B	B	B				
Approach Delay, s/veh / LOS				29.2	C		28.4	C		12.4	B		12.3	B					
Intersection Delay, s/veh / LOS				16.6						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.8	C		2.8	C		2.1	B		2.1	B					
Bicycle LOS Score / LOS				0.6	A		0.6	A		0.7	A		0.7	A					

HCS 2010 Signalized Intersection Intermediate Values

General Information

Agency	Kimley-Horn			Duration, h	0.25
Analyst	TLS	Analysis Date	May 26, 2015	Area Type	Other
Jurisdiction	IDOT	Time Period	Truck Peak Hour (9:15 AM)	PHF	0.88
Intersection	IL 53/Manhattan/Arsenal	Analysis Year	Existing (2015)	Analysis Period	1 > 9:15
File Name	Ex - Tr - IL 53 - Manhattan.xus				
Project Description	Elwood Truck Routing Study				

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	55	20	10	30	20	25	5	180	20	20	200	40

Signal Information

Cycle, s	55.5	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	0.3	0.6	21.0	6.2	5.9	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	4.0	4.0	4.0	0.0		
				Red	0.0	0.0	2.0	2.0	2.0	0.0		

	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	1.000	0.862	1.000	1.000	0.909	1.000	0.556	0.781	1.000	0.775	0.769	1.000
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})		0.949			0.926		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.000			0.000			0.965			0.943	
Left-Turn Pedestrian Adjustment Factor (f_{LPB})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{RPB})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h		366			426		1005	2631		1403	2381	
Platoon Ratio (R_p)		1.00			1.00		1.00	1.00		1.00	1.00	
Proportion of Vehicles Arriving on Green (P)												
Incremental Delay Factor (k)		0.23			0.23		0.11	0.50	0.50	0.11	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)		3.5		6.0	3.5	6.0	3.5	6.0
Green Ratio (g/C)		0.11		0.11	0.38	0.38	0.40	0.39
Permitted Saturation Flow Rate (s_p), veh/h/ln		0		0	624	0	908	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s		0.0		0.0	21.0	0.0	21.0	0.0
Permitted Service Time (g_u), s		0.0		0.0	16.0	0.0	18.1	0.0
Permitted Queue Service Time (g_{ps}), s					0.0		0.1	
Time to First Blockage (g_t), s		0.0		0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_s), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	2.107	0.00	2.107	0.00	1.389	0.00	1.389	0.00
Pedestrian F_s / F_{delay}	0.000	0.124	0.000	0.143	0.000	0.095	0.000	0.094
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	211.04	22.19	-252.40	35.18	758.22	10.69	781.14	10.30
Bicycle F_w / F_v	-3.64	0.16	-3.64	0.14	-3.64	0.19	-3.64	0.24

--- Messages ---

No errors or warnings exist.

--- Comments ---

ALL-WAY STOP CONTROL ANALYSIS

General Information				Site Information			
Analyst	TLS			Intersection	Laraway/Centerpoint		
Agency/Co.	Kimley-Horn			Jurisdiction	Joliet		
Date Performed	5/26/2015			Analysis Year	Existing (2015)		
Analysis Time Period	Truck Peak Hour (1:15 PM)						
Project ID <i>Elwood Truck Routing Study</i>							
East/West Street: <i>Laraway Road</i>				North/South Street: <i>Centerpoint Way</i>			
Volume Adjustments and Site Characteristics							
Approach	Eastbound			Westbound			
Movement	L	T	R	L	T	R	
Volume (veh/h)	1	55	5	260	55	50	
%Thrus Left Lane							
Approach	Northbound			Southbound			
Movement	L	T	R	L	T	R	
Volume (veh/h)	1	10	240	60	20	1	
%Thrus Left Lane							
	Eastbound		Westbound		Northbound		Southbound
	L1	L2	L1	L2	L1	L2	L1 L2
Configuration	LTR		LT R		L TR		LTR
PHF	0.91		0.91 0.91		0.91 0.91		0.91
Flow Rate (veh/h)	66		345 54		1 273		87
% Heavy Vehicles	87		81 82		2 70		73
No. Lanes	1		2		2		1
Geometry Group	4b		5		5		4b
Duration, T	0.25						
Saturation Headway Adjustment Worksheet							
Prop. Left-Turns	0.0		0.8	0.0	1.0	0.0	0.7
Prop. Right-Turns	0.1		0.0	1.0	0.0	1.0	0.0
Prop. Heavy Vehicle	0.9		0.8	0.8	0.0	0.7	0.7
hLT-adj	0.2	0.2	0.5	0.5	0.5	0.5	0.2 0.2
hRT-adj	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6 -0.6
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7 1.7
hadj, computed	1.4		1.8	0.7	0.5	0.5	1.4
Departure Headway and Service Time							
hd, initial value (s)	3.20		3.20	3.20	3.20	3.20	3.20
x, initial	0.06		0.31	0.05	0.00	0.24	0.08
hd, final value (s)	8.22		7.78	6.68	7.00	6.98	8.28
x, final value	0.15		0.75	0.10	0.00	0.53	0.20
Move-up time, m (s)	2.3		2.3		2.3		2.3
Service Time, t _s (s)	5.9		5.5	4.4	4.7	4.7	6.0
Capacity and Level of Service							
	Eastbound		Westbound		Northbound		Southbound
	L1	L2	L1	L2	L1	L2	L1 L2
Capacity (veh/h)	316		457 304		251 499		337
Delay (s/veh)	12.37		29.99 10.12		9.72 17.27		13.04
LOS	B		D B		A C		B
Approach: Delay (s/veh)	12.37		27.30		17.24		13.04
LOS	B		D		C		B
Intersection Delay (s/veh)	21.27						
Intersection LOS	C						

TRAFFIC COUNT DATA

Study Name Elwood Intermodal Port Road/Arsenal
Start Date Wednesday, March 18, 2015

Report Summary

Time Period	Class.	Eastbound						Westbound						Northbound						Southbound						Total
		U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	
Morning Peak	Lights	0	194	41	83	318	160	0	2	74	8	84	50	0	48	27	7	82	94	0	2	9	38	49	229	533
Specified Period	%	0%	82%	95%	34%	60%	51%	0%	40%	99%	89%	94%	88%	0%	32%	29%	58%	32%	28%	0%	100%	11%	43%	28%	67%	51%
6:00 AM - 9:00 AM	Mediums	0	23	1	56	80	12	0	3	0	1	4	5	0	6	24	4	34	83	0	0	24	6	30	48	148
One Hour Peak	%	0%	10%	2%	23%	15%	4%	0%	60%	0%	11%	4%	9%	0%	4%	26%	33%	13%	25%	0%	0%	29%	7%	17%	14%	14%
6:15 AM - 7:15 AM	Articulated Trucks	0	21	1	108	130	143	0	0	1	0	1	2	0	98	42	1	141	157	0	0	49	44	93	63	365
	%	0%	9%	2%	44%	25%	45%	0%	0%	1%	0%	1%	4%	0%	64%	45%	8%	55%	47%	0%	0%	60%	50%	54%	19%	35%
	Total	0	238	43	247	528	315	0	5	75	9	89	57	0	152	93	12	257	334	0	2	82	88	172	340	1046
	PHF	0.00	0.73	0.72	0.89	0.80	0.93	0	1	0.94	0	0.86	0.75	0	1	1	1	1	0.92	0	1	1	0.79	0.88	0.70	0.85
	% HV	0%	18%	5%	66%	50%	30%	0%	60%	1%	11%	9%	5%	0%	68%	71%	42%	25%	32%	0%	0%	89%	57%	16%	33%	49%
			18%	5%	66%				60%	2%					68%	68%					0%	89%	57%			
Evening Peak	Lights	0	48	106	65	219	279	0	2	35	1	38	119	0	134	8	11	153	72	0	2	5	110	117	57	527
Specified Period	%	0%	40%	93%	29%	48%	45%	0%	40%	100%	14%	81%	86%	0%	36%	7%	48%	30%	21%	0%	100%	5%	51%	36%	23%	39%
3:00 PM - 6:00 PM	Mediums	0	8	2	24	34	65	0	3	0	2	5	10	0	34	44	8	86	64	0	0	37	31	68	54	193
One Hour Peak	%	0%	7%	2%	11%	7%	10%	0%	60%	0%	29%	11%	7%	0%	9%	37%	35%	17%	19%	0%	0%	34%	14%	21%	22%	14%
4:00 PM - 5:00 PM	Articulated Trucks	0	63	6	138	207	278	0	0	0	4	4	10	0	204	67	4	275	204	0	0	66	74	140	134	626
	%	0%	53%	5%	61%	45%	45%	0%	0%	0%	57%	9%	7%	0%	55%	56%	17%	54%	60%	0%	0%	61%	34%	43%	55%	47%
	Total	0	119	114	227	460	622	0	5	35	7	47	139	0	372	119	23	514	340	0	2	108	215	325	245	1346
	PHF	0.00	0.93	0.71	0.96	0.90	0.88	0	1	0.88	0	0.84	0.74	0	1	1	1	1	0.90	0	0	1	0.84	0.80	0.88	0.88
	% HV	0%	60%	7%	71%	34%	46%	0%	60%	0%	86%	3%	10%	0%	64%	93%	52%	38%	25%	0%	0%	95%	49%	24%	18%	61%
			60%	7%	71%				60%	14%					64%	87%					0%	95%	49%			
Truck Peak	Lights	0	24	21	32	77	64	0	5	35	0	40	26	0	17	4	5	26	40	0	0	3	12	15	28	158
Specified Period	%	0%	20%	91%	12%	18%	20%	0%	45%	92%	0%	77%	68%	0%	9%	5%	36%	9%	10%	0%	0%	2%	12%	7%	13%	16%
5:00 AM - 6:00 PM	Mediums	0	11	1	41	53	35	0	6	2	2	10	7	0	16	16	5	37	81	0	1	34	17	52	29	152
One Hour Peak	%	0%	9%	4%	15%	13%	11%	0%	55%	5%	67%	19%	18%	0%	9%	19%	36%	13%	20%	0%	100%	27%	18%	23%	14%	16%
1:15 PM - 2:15 PM	Articulated Trucks	0	88	1	198	287	216	0	0	1	1	2	5	0	147	66	4	217	286	0	0	88	68	156	155	662
	%	0%	72%	4%	73%	69%	69%	0%	0%	3%	33%	4%	13%	0%	82%	77%	29%	78%	70%	0%	0%	70%	70%	70%	73%	68%
	Total	0	123	23	271	417	315	0	11	38	3	52	38	0	180	86	14	280	407	0	1	125	97	223	212	972
	PHF	0.00	0.81	0.82	0.90	0.94	0.85	0	1	0.79	0	0.76	0.95	0	1	1	1	1	0.97	0	0	1	0.90	0.87	0.84	0.94
	% HV	0%	80%	9%	88%	43%	32%	0%	55%	8%	100%	5%	4%	0%	91%	95%	64%	29%	42%	0%	100%	98%	88%	23%	22%	84%
			80%	9%	88%				55%	15%					91%	91%					100%	98%	88%			

Study Name Arsenal Rd. at Frontage Rd.
Start Date Wednesday, March 18, 2015

Report Summary

Time Period	Class.	Eastbound					Northbound					Southbound					Total
		U	L	R	I	O	U	L	T	I	O	U	T	R	I	O	
Morning Peak	Lights	0	5	8	13	207	1	154	328	483	108	0	99	53	152	333	648
Specified Period	%	0%	100%	42%	54%	78%	100%	88%	59%	66%	45%	0%	45%	58%	49%	59%	61%
6:00 AM - 9:00 AM	Mediums	0	0	0	0	7	0	4	80	84	11	0	11	3	14	80	98
One Hour Peak	%	0%	0%	0%	0%	3%	0%	2%	14%	11%	5%	0%	5%	3%	5%	14%	9%
6:00 AM - 7:00 AM	Articulated Trucks	0	0	11	11	53	0	17	150	167	120	0	109	36	145	150	323
	%	0%	0%	58%	46%	20%	0%	10%	27%	23%	50%	0%	50%	39%	47%	27%	30%
	Total	0	5	19	24	267	1	175	558	734	239	0	219	92	311	563	1069
	PHF	0.00	0.63	0.43	0.50	0.82	0	1	1	1	0.88	0	1	0.88	0.86	0.83	0.84
	% HV	0%	0%	58%	2%	25%	0%	12%	41%	69%	22%	0%	55%	42%	29%	53%	39%
Evening Peak	Lights	0	11	65	76	235	0	179	214	393	309	0	244	56	300	225	769
Specified Period	%	0%	100%	79%	82%	79%	0%	92%	46%	60%	48%	0%	43%	55%	45%	47%	54%
3:00 PM - 6:00 PM	Mediums	0	0	0	0	15	0	1	25	26	63	0	63	14	77	25	103
One Hour Peak	%	0%	0%	0%	0%	5%	0%	1%	5%	4%	10%	0%	11%	14%	11%	5%	7%
4:00 PM - 5:00 PM	Articulated Trucks	0	0	17	17	46	0	14	224	238	278	0	261	32	293	224	548
	%	0%	0%	21%	18%	16%	0%	7%	48%	36%	43%	0%	46%	31%	44%	47%	39%
	Total	0	11	82	93	296	0	194	463	657	650	0	568	102	670	474	1420
	PHF	0.00	0.69	0.79	0.78	0.56	0	0	1	1	0.90	0	1	0.94	0.92	0.83	0.79
	% HV	0%	0%	21%	7%	21%	0%	8%	54%	46%	46%	0%	57%	45%	47%	33%	46%
Truck Peak	Lights	0	2	12	14	45	0	32	67	99	81	0	69	13	82	69	195
Specified Period	%	0%	67%	32%	35%	29%	0%	42%	16%	20%	20%	0%	19%	16%	18%	17%	20%
5:00 AM - 6:00 PM	Mediums	0	1	3	4	11	0	6	45	51	47	0	44	5	49	46	104
One Hour Peak	%	0%	33%	8%	10%	7%	0%	8%	11%	10%	11%	0%	12%	6%	11%	11%	11%
12:30 PM - 1:30 PM	Articulated Trucks	0	0	22	22	100	0	39	301	340	281	0	259	61	320	301	682
	%	0%	0%	59%	55%	64%	0%	51%	73%	69%	69%	0%	70%	77%	71%	72%	70%
	Total	0	3	37	40	156	0	77	413	490	409	0	372	79	451	416	981
	PHF	0.00	0.38	0.71	0.71	0.87	0	1	1	1	0.83	0	1	0.76	0.81	0.95	0.90
	% HV	0%	33%	68%	4%	16%	0%	58%	84%	50%	42%	0%	81%	84%	46%	42%	80%

Study Name IL-53 at Laraway
Start Date Wednesday, March 18, 2015

Report Summary

		Eastbound						Westbound						Northbound						Southbound						Total
Time Period	Class.	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	
Morning Peak	Lights	0	44	25	2	71	120	0	106	17	69	192	264	0	20	451	142	613	466	0	97	358	83	538	564	1414
Specified Period	%	0%	27%	45%	9%	30%	45%	0%	93%	52%	95%	87%	87%	0%	80%	94%	98%	94%	85%	0%	92%	87%	40%	75%	79%	77%
6:00 AM - 9:00 AM	Mediums	0	17	0	6	23	52	0	6	5	0	11	4	0	0	8	0	8	38	0	4	26	47	77	25	119
One Hour Peak	%	0%	11%	0%	27%	10%	20%	0%	5%	15%	0%	5%	1%	0%	0%	2%	0%	1%	7%	0%	4%	6%	23%	11%	4%	7%
6:30 AM - 7:30 AM	Articulated Trucks	0	100	30	14	144	92	0	2	11	4	17	37	0	5	21	3	29	43	0	4	27	76	107	125	297
	%	0%	62%	55%	64%	61%	35%	0%	2%	33%	5%	8%	12%	0%	20%	4%	2%	4%	8%	0%	4%	7%	37%	15%	18%	16%
	Total	0	161	55	22	238	264	0	114	33	73	220	305	0	25	480	145	650	547	0	105	411	206	722	714	1830
	PHF	0.00	0.89	0.76	0.69	0.88	0.78	0	1	0.69	1	0.76	0.88	0	0	1	1	1	0.68	0	1	1	0.86	0.76	0.87	0.82
	% HV	0%	73%	55%	91%	13%	14%	0%	7%	48%	5%	12%	17%	0%	20%	6%	2%	36%	30%	0%	8%	13%	60%	39%	39%	23%
			73%	65%					7%	19%					20%	5%					8%	29%				
Evening Peak	Lights	0	83	40	7	130	57	0	133	11	94	238	258	0	4	460	145	609	700	0	73	560	42	675	637	1652
Specified Period	%	0%	35%	70%	33%	41%	29%	0%	93%	61%	94%	91%	89%	0%	19%	90%	97%	89%	91%	0%	88%	92%	26%	79%	75%	78%
3:00 PM - 6:00 PM	Mediums	0	49	3	5	57	44	0	9	3	3	15	10	0	7	21	5	33	31	0	2	17	34	53	73	158
One Hour Peak	%	0%	21%	5%	24%	18%	22%	0%	6%	17%	3%	6%	3%	0%	33%	4%	3%	5%	4%	0%	2%	3%	21%	6%	9%	7%
4:00 PM - 5:00 PM	Articulated Trucks	0	106	14	9	129	98	0	1	4	3	8	22	0	10	31	0	41	40	0	8	30	84	122	140	300
	%	0%	45%	25%	43%	41%	49%	0%	1%	22%	3%	3%	8%	0%	48%	6%	0%	6%	5%	0%	10%	5%	53%	14%	16%	14%
	Total	0	238	57	21	316	199	0	143	18	100	261	290	0	21	512	150	683	771	0	83	607	160	850	850	2110
	PHF	0.00	0.94	0.68	0.48	0.92	0.84	0	1	0.90	1	0.91	0.82	0	1	1	1	1	0.84	0	1	1	0.77	0.86	0.86	0.88
	% HV	0%	65%	30%	67%	15%	9%	0%	7%	39%	6%	12%	14%	0%	81%	10%	3%	32%	37%	0%	12%	8%	74%	40%	40%	22%
			65%	40%					7%	11%					81%	9%					12%	22%				
Truck Peak	Lights	0	44	24	2	70	66	0	89	15	41	145	114	1	8	185	58	252	413	1	32	321	43	397	271	864
Specified Period	%	0%	19%	39%	10%	22%	19%	0%	94%	41%	82%	80%	69%	100%	29%	77%	88%	75%	79%	100%	84%	78%	16%	55%	52%	56%
5:00 AM - 6:00 PM	Mediums	0	29	8	4	41	39	0	3	4	4	11	18	0	3	19	6	28	27	0	4	20	32	56	52	136
One Hour Peak	%	0%	13%	13%	20%	13%	11%	0%	3%	11%	8%	6%	11%	0%	11%	8%	9%	8%	5%	0%	11%	5%	12%	8%	10%	9%
1:00 PM - 2:00 PM	Articulated Trucks	0	159	30	14	203	236	0	3	18	5	26	34	0	17	37	2	56	85	0	2	68	201	271	201	556
	%	0%	69%	48%	70%	65%	69%	0%	3%	49%	10%	14%	20%	0%	61%	15%	3%	17%	16%	0%	5%	17%	73%	37%	38%	36%
	Total	0	232	62	20	314	341	0	95	37	50	182	166	1	28	241	66	336	525	1	38	409	276	724	524	1556
	PHF	0.00	0.89	0.70	0.71	0.89	0.95	0	1	0.84	1	0.86	0.92	0	1	1	1	1	0.92	0	1	1	0.92	0.94	0.92	0.94
	% HV	0%	81%	61%	90%	20%	22%	0%	6%	59%	18%	12%	11%	0%	71%	23%	12%	22%	34%	0%	16%	22%	84%	47%	34%	44%
			81%	68%					6%	36%					71%	21%					16%	47%				

Study Name I-53 at Schweitzer
Start Date Wednesday, March 18, 2015

Report Summary

Time Period	Class.	Eastbound						Westbound						Northbound						Southbound						Total
		U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	
Morning Peak	Lights	0	3	2	2	7	9	0	8	0	19	27	25	0	1	564	16	581	457	0	7	447	8	462	586	1077
Specified Period	%	0%	100%	100%	67%	88%	75%	0%	80%	0%	90%	87%	96%	0%	100%	95%	100%	95%	91%	0%	88%	91%	73%	91%	95%	93%
6:00 AM - 9:00 AM	Mediums	0	0	0	1	1	2	0	2	0	1	3	1	0	0	11	0	11	25	0	1	22	2	25	12	40
One Hour Peak	%	0%	0%	0%	33%	13%	17%	0%	20%	0%	5%	10%	4%	0%	0%	2%	0%	2%	5%	0%	13%	4%	18%	5%	2%	3%
6:15 AM - 7:15 AM	Articulated Trucks	0	0	0	0	0	1	0	0	0	1	1	0	0	0	20	0	20	21	0	0	21	1	22	21	43
	%	0%	0%	0%	0%	0%	8%	0%	0%	0%	5%	3%	0%	0%	0%	3%	0%	3%	4%	0%	0%	4%	9%	4%	3%	4%
	Total	0	3	2	3	8	12	0	10	0	21	31	26	0	1	595	16	612	503	0	8	490	11	509	619	1160
	PHF	0.00	0.38	0.25	0.38	0.50	0.60	0	1	0.00	1	0.60	0.65	0	0	1	1	1	0.73	0	1	1	0.69	0.74	0.88	0.82
	% HV	0%	0%	0%	33%	1%	1%	0%	20%	0%	10%	3%	2%	0%	0%	5%	0%	53%	43%	0%	13%	9%	27%	44%	53%	7%
Evening Peak	Lights	0	8	6	1	15	9	0	19	4	22	45	41	0	1	656	20	677	686	0	15	666	4	685	686	1422
Specified Period	%	0%	89%	100%	50%	88%	100%	0%	100%	100%	96%	98%	100%	0%	100%	90%	100%	91%	94%	0%	100%	94%	100%	94%	90%	93%
3:00 PM - 6:00 PM	Mediums	0	1	0	1	2	0	0	0	0	1	1	0	0	0	29	0	29	22	0	0	21	0	21	31	53
One Hour Peak	%	0%	11%	0%	50%	12%	0%	0%	0%	0%	4%	2%	0%	0%	0%	4%	0%	4%	3%	0%	0%	3%	0%	3%	4%	3%
4:15 PM - 5:15 PM	Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	42	20	0	0	20	0	20	42	62
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	6%	3%	0%	0%	3%	0%	3%	6%	4%
	Total	0	9	6	2	17	9	0	19	4	23	46	41	0	1	727	20	748	728	0	15	707	4	726	759	1537
	PHF	0.00	0.38	0.38	0.50	0.53	0.32	0	1	0.50	1	0.82	0.85	0	0	1	1	1	0.87	0	1	1	0.25	0.86	0.86	0.86
	% HV	0%	11%	0%	50%	1%	1%	0%	0%	0%	4%	3%	3%	0%	0%	10%	0%	49%	47%	0%	0%	6%	0%	47%	49%	7%
Truck Peak	Lights	0	9	1	1	11	14	0	5	2	11	18	15	0	1	252	8	261	226	1	6	220	11	238	273	528
Specified Period	%	0%	64%	100%	100%	69%	70%	0%	83%	67%	85%	82%	94%	0%	100%	81%	100%	81%	72%	100%	86%	72%	69%	72%	80%	76%
3:00 PM - 6:00 PM	Mediums	0	4	0	0	4	5	0	1	1	1	3	1	0	0	14	0	14	31	0	1	30	4	35	19	56
One Hour Peak	%	0%	29%	0%	0%	25%	25%	0%	17%	33%	8%	14%	6%	0%	0%	4%	0%	4%	10%	0%	14%	10%	25%	11%	6%	8%
9:15 AM - 10:15 AM	Articulated Trucks	0	1	0	0	1	1	0	0	0	1	1	0	0	0	47	0	47	57	0	0	57	1	58	49	107
	%	0%	7%	0%	0%	6%	5%	0%	0%	0%	8%	5%	0%	0%	0%	15%	0%	15%	18%	0%	0%	19%	6%	18%	14%	15%
	Total	0	14	1	1	16	20	0	6	3	13	22	16	0	1	313	8	322	314	1	7	307	16	331	341	691
	PHF	0.00	0.70	0.25	0.25	0.67	0.63	0	1	0.25	1	0.79	0.67	0	0	1	1	1	0.82	0	0	1	0.80	0.83	0.95	0.90
	% HV	0%	36%	0%	0%	2%	3%	0%	17%	33%	15%	3%	2%	0%	0%	19%	0%	47%	45%	0%	14%	28%	31%	48%	49%	24%

Study Name IL-53 at Millsdale
Start Date Wednesday, March 18, 2015

Report Summary

Time Period	Class.	Eastbound					Northbound					Southbound					Total
		U	L	R	I	O	U	L	T	I	O	U	T	R	I	O	
Morning Peak	Lights	0	22	4	26	144	0	12	532	544	323	0	319	132	451	554	1021
Specified Period	%	0%	100%	80%	96%	97%	0%	100%	97%	97%	89%	0%	90%	96%	91%	97%	95%
6:00 AM - 9:00 AM	Mediums	0	0	1	1	5	0	0	9	9	20	0	19	5	24	9	34
One Hour Peak	%	0%	0%	20%	4%	3%	0%	0%	2%	2%	6%	0%	5%	4%	5%	2%	3%
6:00 AM - 7:00 AM	Articulated Trucks	0	0	0	0	0	0	0	7	7	18	0	18	0	18	7	25
	%	0%	0%	0%	0%	0%	0%	0%	1%	1%	5%	0%	5%	0%	4%	1%	2%
	Total	0	22	5	27	149	0	12	548	560	361	0	356	137	493	570	1080
	PHF	0.00	0.69	0.42	0.68	0.76	0	1	1	1	0.81	0	1	0.76	0.79	0.85	0.82
	% HV	0%	0%	20%	3%	14%	0%	0%	3%	52%	33%	0%	10%	4%	46%	53%	5%
Evening Peak	Lights	0	104	10	114	65	1	11	552	564	651	0	640	54	694	656	1372
Specified Period	%	0%	99%	91%	98%	96%	100%	92%	90%	90%	94%	0%	94%	96%	95%	91%	93%
3:00 PM - 6:00 PM	Mediums	0	1	0	1	3	0	1	26	27	17	0	17	2	19	27	47
One Hour Peak	%	0%	1%	0%	1%	4%	0%	8%	4%	4%	2%	0%	3%	4%	3%	4%	3%
4:15 PM - 5:15 PM	Articulated Trucks	0	0	1	1	0	0	0	38	38	22	0	21	0	21	38	60
	%	0%	0%	9%	1%	0%	0%	0%	6%	6%	3%	0%	3%	0%	3%	5%	4%
	Total	0	105	11	116	68	1	12	616	629	690	0	678	56	734	721	1479
	PHF	0.00	0.77	0.92	0.78	0.71	0	1	1	1	0.92	0	1	0.74	0.90	0.85	0.87
	% HV	0%	1%	9%	8%	5%	0%	8%	10%	43%	47%	0%	6%	4%	50%	49%	7%
Truck Peak	Lights	0	26	1	27	36	0	4	220	224	192	0	191	32	223	246	474
Specified Period	%	0%	96%	100%	96%	97%	0%	100%	78%	78%	71%	0%	70%	97%	73%	79%	77%
5:00 AM - 6:00 PM	Mediums	0	1	0	1	1	0	0	14	14	24	0	24	1	25	15	40
One Hour Peak	%	0%	4%	0%	4%	3%	0%	0%	5%	5%	9%	0%	9%	3%	8%	5%	6%
9:15 AM - 10:15 AM	Articulated Trucks	0	0	0	0	0	0	0	49	49	56	0	56	0	56	49	105
	%	0%	0%	0%	0%	0%	0%	0%	17%	17%	21%	0%	21%	0%	18%	16%	17%
	Total	0	27	1	28	37	0	4	283	287	272	0	271	33	304	310	619
	PHF	0.00	0.68	0.25	0.64	0.62	0	0	1	1	0.85	0	1	0.69	0.86	0.92	0.90
	% HV	0%	4%	0%	5%	6%	0%	0%	22%	46%	44%	0%	30%	3%	49%	50%	23%

Study Name IL 53/Manhattan Road
 Start Date Wednesday, March 18, 2015

Report Summary

Time Period	Class.	Eastbound						Westbound						Northbound						Southbound						Total
		U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	
Morning Peak	Lights	0	108	32	7	147	107	0	25	60	56	141	84	0	9	330	20	359	296	0	32	264	38	334	494	981
Specified Period	%	0%	96%	94%	78%	95%	96%	0%	96%	97%	100%	98%	97%	0%	82%	95%	100%	94%	88%	0%	97%	88%	97%	90%	96%	93%
6:00 AM - 9:00 AM	Mediums	0	3	2	2	7	4	0	0	2	0	2	3	0	1	5	0	6	15	0	1	13	1	15	8	30
One Hour Peak	%	0%	3%	6%	22%	5%	4%	0%	0%	3%	0%	1%	3%	0%	9%	1%	0%	2%	4%	0%	3%	4%	3%	4%	2%	3%
6:15 AM - 7:15 AM	Articulated Trucks	0	1	0	0	1	1	0	1	0	0	1	0	0	1	14	0	15	24	0	0	23	0	23	15	40
	%	0%	1%	0%	0%	1%	1%	0%	4%	0%	0%	1%	0%	0%	9%	4%	0%	4%	7%	0%	0%	8%	0%	6%	3%	4%
	Total	0	112	34	9	155	112	0	26	62	56	144	87	0	11	349	20	380	335	0	33	300	39	372	517	1051
	PHF	0.00	0.88	0.77	0.56	0.88	0.85	0	1	0.74	1	0.86	0.91	0	1	1	1	1	0.76	0	1	1	0.75	0.78	0.83	0.82
	% HV	0%	4%	6%	22%	15%	11%	0%	4%	3%	0%	14%	8%	0%	18%	5%	0%	36%	32%	0%	3%	12%	3%	35%	49%	7%
				5%						2%					18%	5%					3%	11%				
Evening Peak	Lights	0	105	82	11	198	152	0	26	45	36	107	193	0	6	405	42	453	498	0	69	461	101	631	546	1389
Specified Period	%	0%	95%	98%	55%	93%	94%	0%	96%	100%	97%	98%	98%	0%	50%	89%	95%	88%	92%	0%	100%	94%	96%	95%	90%	92%
3:00 PM - 6:00 PM	Mediums	0	3	2	9	14	6	0	1	0	1	2	2	0	4	20	0	24	21	0	0	11	2	13	24	53
One Hour Peak	%	0%	3%	2%	45%	7%	4%	0%	4%	0%	3%	2%	1%	0%	33%	4%	0%	5%	4%	0%	0%	2%	2%	2%	4%	4%
4:15 PM - 5:15 PM	Articulated Trucks	0	2	0	0	2	4	0	0	0	0	0	2	0	2	32	2	36	20	0	0	20	2	22	34	60
	%	0%	2%	0%	0%	1%	2%	0%	0%	0%	0%	0%	1%	0%	17%	7%	5%	7%	4%	0%	0%	4%	2%	3%	6%	4%
	Total	0	110	84	20	214	162	0	27	45	37	109	197	0	12	457	44	513	539	0	69	492	105	666	604	1502
	PHF	0.00	0.79	0.88	0.71	0.86	0.86	0	1	0.66	1	0.74	0.91	0	1	1	1	1	0.92	0	1	1	0.91	0.91	0.79	0.90
	% HV	0%	5%	2%	45%	14%	11%	0%	4%	0%	3%	7%	13%	0%	50%	11%	5%	34%	36%	0%	0%	6%	4%	44%	40%	8%
				7%						2%					50%	11%					0%	6%				
Truck Peak	Lights	0	51	17	4	72	58	0	23	19	23	65	49	0	1	127	17	145	157	0	15	130	38	183	201	465
Specified Period	%	0%	91%	89%	36%	84%	87%	0%	82%	90%	100%	90%	83%	0%	20%	71%	89%	71%	66%	0%	71%	66%	93%	70%	78%	75%
6:00 AM - 6:00 PM	Mediums	0	2	1	7	10	9	0	4	2	0	6	9	0	4	12	2	18	28	0	6	17	3	26	14	60
One Hour Peak	%	0%	4%	5%	64%	12%	13%	0%	14%	10%	0%	8%	15%	0%	80%	7%	11%	9%	12%	0%	29%	9%	7%	10%	5%	10%
9:15 AM - 10:15 AM	Articulated Trucks	0	3	1	0	4	0	0	1	0	0	1	1	0	0	41	0	41	52	0	0	51	0	51	44	97
	%	0%	5%	5%	0%	5%	0%	0%	4%	0%	0%	1%	2%	0%	0%	23%	0%	20%	22%	0%	0%	26%	0%	20%	17%	16%
	Total	0	56	19	11	86	67	0	28	21	23	72	59	0	5	180	19	204	237	0	21	198	41	260	259	622
	PHF	0.00	0.70	0.68	0.55	0.90	0.70	0	1	0.75	1	0.86	0.74	0	1	1	1	1	0.79	0	1	1	0.64	0.80	0.88	0.88
	% HV	0%	9%	11%	64%	14%	11%	0%	18%	10%	0%	12%	9%	0%	80%	29%	11%	33%	38%	0%	29%	34%	7%	42%	42%	25%
				16%						10%					80%	28%					29%	30%				

Study Name Centerpoint at Laraway
Start Date Wednesday, March 18, 2015

Report Summary

Time Period	Class.	Eastbound						Westbound						Northbound						Southbound						Total
		U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	
Morning Peak	Lights	0	0	2	0	2	6	0	44	6	20	70	31	0	0	2	20	22	48	0	9	4	0	13	22	107
Specified Period	%	0%	0%	4%	0%	3%	9%	0%	21%	9%	29%	20%	12%	0%	0%	18%	13%	14%	21%	0%	16%	29%	0%	18%	28%	17%
6:00 AM - 9:00 AM	Mediums	0	0	0	1	1	1	0	31	0	19	50	40	0	0	1	23	24	35	0	17	3	1	21	20	96
One Hour Peak	%	0%	0%	0%	50%	2%	1%	0%	15%	0%	28%	15%	15%	0%	0%	9%	15%	15%	16%	0%	30%	21%	100%	30%	25%	15%
8:30 AM - 9:30 AM	Articulated Trucks	0	1	54	1	56	60	0	133	60	29	222	192	0	0	8	108	116	141	0	30	7	0	37	38	431
	%	0%	100%	96%	50%	95%	90%	0%	64%	91%	43%	65%	73%	0%	0%	73%	72%	72%	63%	0%	54%	50%	0%	52%	48%	68%
	Total	0	1	56	2	59	67	0	208	66	68	342	263	0	0	11	151	162	224	0	56	14	1	71	80	634
	PHF	0.00	0.25	0.52	0.50	0.53	0.80	0	1	0.79	1	0.90	0.78	0	0	1	1	1	0.89	0	1	1	0.25	0.89	0.87	0.94
	% HV	0%	100%	96%	100%	9%	11%	0%	79%	91%	71%	54%	41%	0%	0%	82%	87%	26%	35%	0%	84%	71%	100%	11%	13%	83%
				97%						82%	71%					86%						82%				
Evening Peak	Lights	0	1	5	1	7	4	0	36	2	4	42	146	0	1	1	96	98	48	0	45	11	1	57	6	204
Specified Period	%	0%	100%	20%	100%	26%	33%	0%	20%	22%	50%	22%	44%	0%	100%	6%	39%	37%	24%	0%	78%	48%	50%	68%	21%	36%
3:00 PM - 6:00 PM	Mediums	0	0	2	0	2	1	0	22	0	1	23	48	0	0	6	42	48	27	0	4	5	1	10	7	83
One Hour Peak	%	0%	0%	8%	0%	7%	8%	0%	13%	0%	13%	12%	15%	0%	0%	33%	17%	18%	13%	0%	7%	22%	50%	12%	25%	15%
3:00 PM - 4:00 PM	Articulated Trucks	0	0	18	0	18	7	0	118	7	3	128	136	1	0	11	109	121	126	1	9	7	0	17	15	284
	%	0%	0%	72%	0%	67%	58%	0%	67%	78%	38%	66%	41%	100%	0%	61%	44%	45%	63%	100%	16%	30%	0%	20%	54%	50%
	Total	0	1	25	1	27	12	0	176	9	8	193	330	1	1	18	247	267	201	1	58	23	2	84	28	571
	PHF	0.00	0.25	0.78	0.25	0.75	0.43	0	1	0.56	0	0.72	0.84	0	0	1	1	1	0.81	0	1	1	0.25	0.70	0.54	0.79
	% HV	0%	0%	80%	0%	5%	2%	0%	80%	78%	50%	34%	58%	100%	0%	94%	61%	47%	35%	100%	22%	52%	50%	15%	5%	64%
				74%						79%	50%					63%						31%				
Truck Peak	Lights	0	1	3	4	8	0	1	60	0	9	70	89	0	0	4	70	74	70	0	15	6	0	21	14	173
Specified Period	%	0%	100%	5%	100%	13%	0%	100%	23%	0%	18%	19%	25%	0%	0%	36%	29%	30%	25%	0%	25%	33%	0%	27%	23%	23%
5:00 AM - 6:00 PM	Mediums	0	0	1	0	1	1	0	27	1	23	51	54	0	0	3	34	37	31	0	19	4	0	23	26	112
One Hour Peak	%	0%	0%	2%	0%	2%	2%	0%	10%	2%	46%	14%	15%	0%	0%	27%	14%	15%	11%	0%	32%	22%	0%	29%	42%	15%
1:15 PM - 2:15 PM	Articulated Trucks	0	0	52	0	52	54	0	175	54	18	247	212	0	0	4	134	138	183	0	26	8	0	34	22	471
	%	0%	0%	93%	0%	85%	98%	0%	67%	98%	36%	67%	60%	0%	0%	36%	56%	55%	64%	0%	43%	44%	0%	44%	35%	62%
	Total	0	1	56	4	61	55	1	262	55	50	368	355	0	0	11	238	249	284	0	60	18	0	78	62	756
	PHF	0.00	0.25	0.74	0.50	0.73	0.81	0	1	0.81	1	0.96	0.78	0	0	1	1	1	0.92	0	1	1	0.00	0.89	0.82	0.91
	% HV	0%	0%	95%	0%	8%	7%	0%	77%	100%	82%	49%	47%	0%	0%	64%	71%	33%	38%	0%	75%	67%	0%	10%	8%	77%
				87%						81%	82%					70%						73%				

QUEUE OBSERVATION DATA

Study Name Queue Observations - West Leg of IL 53/Larway Road
Start Date Wednesday, May 20, 2015

Queue Observations

Morning Peak				Truck Peak				Evening Peak			
Time	Trucks	Cars	Distance	Time	Trucks	Cars	Distance	Time	Trucks	Cars	Distance
6:30	3	3	315	13:00				16:00	0	0	0
6:31	0	0	0	13:01				16:01	0	0	0
6:32	2	2	210	13:02				16:02	2	0	160
6:33	3	3	315	13:03				16:03	0	0	0
6:34	2	2	210	13:04				16:04	2	3	235
6:35	1	0	80	13:05				16:05	2	0	160
6:36	3	3	315	13:06				16:06	5	0	400
6:37	1	0	80	13:07				16:07	0	0	0
6:38	0	0	0	13:08				16:08	4	0	320
6:39	2	2	210	13:09	5	1	425	16:09	1	0	80
6:40	3	0	240	13:10	8	3	715	16:10	0	0	0
6:41	3	2	290	13:11	3	1	265	16:11	2	2	210
6:42	4	0	320	13:12	5	1	425	16:12	2	2	210
6:43	0	0	0	13:13	5	0	400	16:13	3	3	315
6:44	1	1	105	13:14	1	0	80	16:14	5	3	475
6:45	0	0	0	13:15	2	0	160	16:15	8	0	640
6:46	2	3	235	13:16	1	0	80	16:16	3	0	240
6:47	1	0	80	13:17	1	0	80	16:17	7	0	560
6:48	2	1	185	13:18	2	0	160	16:18	0	0	0
6:49	1	0	80	13:19	1	1	105	16:19	4	0	320
6:50	3	1	265	13:20	5	2	450	16:20	1	0	80
6:51	0	0	0	13:21	1	0	80	16:21	4	0	320
6:52	0	1	25	13:22	2	0	160	16:22	4	0	320
6:53	1	0	80	13:23	2	0	160	16:23	0	11	275
6:54	1	0	80	13:24	0	1	25	16:24	0	3	75
6:55	4	0	320	13:25	7	0	560	16:25	0	1	25
6:56	6	0	480	13:26	1	0	80	16:26	3	2	290
6:57	4	0	320	13:27	1	0	80	16:27	0	1	25
6:58	7	1	585	13:28	0	0	0	16:28	2	0	160
6:59	1	0	80	13:29	6	1	505	16:29	2	0	160
7:00	2	0	160	13:30	2	0	160	16:30	3	3	315
7:01	1	1	105	13:31	1	0	80	16:31	0	4	100
7:02	0	0	0	13:32	0	0	0	16:32	3	0	240
7:03	2	1	185	13:33	3	1	265	16:33	6	0	480
7:04	0	0	0	13:34	3	0	240	16:34	4	2	370
7:05	3	1	265	13:35	4	1	345	16:35	0	2	50
7:06	0	0	0	13:36	7	2	610	16:36	1	0	80
7:07	5	1	425	13:37	3	0	240	16:37	1	0	80
7:08	0	0	0	13:38	8	0	640	16:38	2	0	160
7:09	2	0	160	13:39	3	0	240	16:39	0	1	25
7:10	2	2	210	13:40	6	0	480	16:40	1	3	155
7:11	2	0	160	13:41	3	0	240	16:41	1	1	105
7:12	2	1	185	13:42	2	0	160	16:42	0	0	0
7:13	6	1	505	13:43	3	2	290	16:43	2	2	210
7:14	4	0	320	13:44	1	1	105	16:44	4	1	345
7:15	6	0	480	13:45	2	1	185	16:45	4	1	345
7:16	8	0	640	13:46	1	1	105	16:46	0	0	0
7:17	2	0	160	13:47	2	0	160	16:47	1	0	80
7:18	1	0	80	13:48	2	3	235	16:48	0	0	0
7:19	1	2	130	13:49	3	0	240	16:49	4	0	320
7:20	0	0	0	13:50	3	0	240	16:50	1	1	105
7:21	0	1	25	13:51	3	0	240	16:51	2	0	160
7:22	1	0	80	13:52	3	0	240	16:52	0	0	0
7:23	5	1	425	13:53	3	0	240	16:53	2	0	160
7:24	3	0	240	13:54	6	0	480	16:54	0	0	0
7:25	1	0	80	13:55	2	0	160	16:55	0	0	0
7:26	4	1	345	13:56	2	0	160	16:56	2	0	160
7:27	0	0	0	13:57	4	1	345	16:57	2	0	160
7:28	3	0	240	13:58	3	0	240	16:58	2	0	160
7:29	0	0	0	13:59	5	0	400	16:59	1	0	80

Based upon field observations and industry accepted values, cars and trucks in the queue were assumed to occupy 25 and 80 feet, respectively.

Queue Summary

Morning Peak			
	Morning	Truck	Evening
Minimum	0	0	0
Maximum	640	715	640
Average	185	250	175
95th %-tile	481	585	475



Kimley»Horn

1001 Warrenville Road | Suite 350 | Lisle, IL | 60532
630-487-5550