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Appendix C HCM Analysis: Post Development without Improvements



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Priority Growth Areas Mobility Study

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Scenario 4 4 Post Development w/o Improvements AM Peak

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2025-04-24

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	109 Street and 100 Ave	Signalized	HCM 7th Edition	NWB Left	0.777	30.1	C
2	Jasper Avenue and 109 Street	Signalized	HCM 7th Edition	EB Right	1.115	87.2	F
3	104 Avenue and 109 Street	Signalized	HCM 7th Edition	NB Left	0.676	109.7	F
4	102 Avenue and 124 Street	Signalized	HCM 7th Edition	NWB Thru	0.719	83.0	F
5	Stony Plain Road and 124 Street	Signalized	HCM 7th Edition	EB Thru	0.662	72.1	E
6	107 Avenue and 124 Street	Signalized	HCM 7th Edition	NB Right	0.728	26.2	C
7	111 Avenue and 124 Street	Signalized	HCM 7th Edition	EB Right	0.628	28.5	C
8	118 Avenue and 124 Street	Signalized	HCM 7th Edition	EB Right	0.698	52.8	D
9	104 Avenue and 121 Street	Signalized	HCM 7th Edition	EB Left	0.455	31.9	C
10	104 Avenue and 116 Street	Signalized	HCM 7th Edition	NB Left	0.620	46.0	D
11	104 Avenue and 112 Street	Signalized	HCM 7th Edition	WB Left	0.488	35.6	D
12	Jasper Avenue and 121 Street	Signalized	HCM 7th Edition	NB Left	0.575	19.9	B
13	Jasper Avenue and 116 Street	Signalized	HCM 7th Edition	EB Right	0.883	55.5	E
14	100 Avenue and 116 Street	Signalized	HCM 7th Edition	EB Left	0.519	61.3	E
15	Stony Plain Road and 102 Avenue	Signalized	HCM 7th Edition	EB Left	0.564	19.1	B
16	Stony Plain Road and 142 Street	Signalized	HCM 7th Edition	WB Left	0.944	146.9	F
17	Stony Plain Road and 149 Street	Signalized	HCM 7th Edition	EB Left	0.585	41.6	D

18	Stony Plain Road and 156 Street	Signalized	HCM 7th Edition	WB Thru	0.660	71.5	E
19	Stony Plain Road and 158 Street	Signalized	HCM 7th Edition	NB Right	0.184	11.3	B
20	Stony Plain Road and 163 Street	Signalized	HCM 7th Edition	NB Thru	0.962	86.9	F
21	95 Avenue and 156 Street	Signalized	HCM 7th Edition	NB Left	0.557	42.7	D
22	87 Avenue and Meadowlark Road	Signalized	HCM 7th Edition	NB Left	0.617	38.0	D
23	109 Street and 82 Ave	Signalized	HCM 7th Edition	EB Left	0.748	30.9	C
24	109 Street and 83 Ave	Signalized	HCM 7th Edition	WB Thru	0.394	5.9	A
25	109 Street and 86 Ave	Two-way stop	HCM 7th Edition	WB Thru	0.533	342.2	F
26	109 Street and 87 Ave	Signalized	HCM 7th Edition	NB Left	0.489	36.3	D
27	109 Street and Walterdale Hill Road/Saskatchewan Drive	Signalized	HCM 7th Edition	SB Left	0.662	31.6	C
28	109 Street and 88 Ave SB	Signalized	HCM 7th Edition	SB Right	0.478	27.8	C
29	114 Street and 82 Ave	Signalized	HCM 7th Edition	EB Left	0.642	46.0	D
30	114 Street and 87 Ave	Signalized	HCM 7th Edition	WB Right	0.460	40.9	D
31	112 Street and 82 Ave	Signalized	HCM 7th Edition	EB Left	0.544	29.1	C
32	110 Street and 87 Ave	Signalized	HCM 7th Edition	SEB Thru	0.414	9.9	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: 109 Street and 100 Ave

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.777

Intersection Setup

Name	109 Street					109 Street				
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right	Left	Left	Thru	Right	Right
Lane Width [m]	3.66	3.66	3.30	3.66	3.30	3.00	3.66	3.00	3.66	3.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	55.00	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	109 Street					109 Street				
Base Volume Input [veh/h]	0	0	1006	0	65	97	0	1763	0	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	7	0	0	0	0	10
Total Hourly Volume [veh/h]	0	0	1006	0	58	97	0	1763	0	96
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	252	0	15	24	0	441	0	24
Total Analysis Volume [veh/h]	0	0	1006	0	58	97	0	1763	0	96
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	61					89				
v_di, Inbound Pedestrian Volume crossing th	61					89				
v_co, Outbound Pedestrian Volume along th	50					37				
v_ci, Inbound Pedestrian Volume along the l	50					36				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	ProtPerm	Permissiv	Overlap	Permissiv	Overlap
Signal Group	0	0	3	0	0	2	0	3	0	3
Auxiliary Signal Groups								2,3		2,3
Maximum Green [s]	0	0	42	0	0	10	0	42	0	42
Amber [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0
All red [s]	0.0	0.0	2.0	0.0	0.0	1.0	0.0	2.0	0.0	2.0
Walk [s]	0	0	10	0	0	0	0	10	0	10
Pedestrian Clearance [s]	0	0	14	0	0	0	0	14	0	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No					No		
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	0.0	0.0	2.0	0.0	3.0	0.0	3.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	47	0	0	14	0	47	0	47
Lead / Lag	-	-	-	-	-	Lead	-	-	-	-
Minimum Green [s]	0	0	24	0	0	7	0	24	0	24
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0
Minimum Recall			No			No		No		No
Maximum Recall			Yes			Yes		Yes		Yes
Pedestrian Recall			Yes			Yes		Yes		Yes

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	4.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	2.00	0.00	0.00
g_i, Effective Green Time [s]	42	42	10	56	56
g / C, Green / Cycle	0.42	0.42	0.10	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.22	0.22	0.06	0.40	0.40
s, saturation flow rate [veh/h]	3204	1595	1539	3076	1573
c, Capacity [veh/h]	1346	670	154	1723	881
d1, Uniform Delay [s]	21.60	21.63	43.22	16.12	16.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.48	2.98	18.00	2.55	4.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.53	0.63	0.71	0.72
d, Delay for Lane Group [s/veh]	23.08	24.61	61.23	18.67	21.09
Lane Group LOS	C	C	E	B	C
Critical Lane Group	No	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	6.28	6.56	3.05	10.11	10.98
50th-Percentile Queue Length [m/ln]	47.85	50.02	23.27	77.05	83.66
95th-Percentile Queue Length [veh/ln]	10.39	10.77	5.50	15.33	16.41
95th-Percentile Queue Length [m/ln]	79.17	82.04	41.89	116.79	125.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	23.53	0.00	24.61	61.23	0.00	19.40	0.00	21.09
Movement LOS			C		C	E		B		C
d_A, Approach Delay [s/veh]	23.59					21.56				
Approach LOS	C					C				
d_I, Intersection Delay [s/veh]	30.12									
Intersection LOS	C									
Intersection V/C	0.777									

Emissions

Vehicle Kilometers Traveled [km/h]	113.36	56.68	22.65	286.87	147.17
Stops [stops/h]	452.12	236.32	109.95	728.06	395.26
Fuel consumption [L/h]	33.54	17.42	9.20	61.29	33.11
CO [g/h]	619.34	321.61	169.80	1131.82	611.43
NOx [g/h]	120.50	62.57	33.04	220.21	118.96
VOC [g/h]	143.54	74.54	39.35	262.31	141.70

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m ² /ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m ² /ped]	9.54	9.49
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	3.092	3.052
Crosswalk LOS	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	840	1120
d_b, Bicycle Delay [s]	16.82	9.68
I_b,int, Bicycle LOS Score for Intersection	2.149	2.641
Bicycle LOS	B	B

Intersection Setup

Name	100 Ave					WB Bike Lane				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.66	3.66	3.20	3.66	3.20	3.66	3.66	3.66	1.50	3.66
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	95.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	100 Ave					WB Bike Lane				
Base Volume Input [veh/h]	0	0	551	0	226	0	0	0	14	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	23	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	551	0	203	0	0	0	13	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	138	0	51	0	0	0	3	0
Total Analysis Volume [veh/h]	0	0	551	0	203	0	0	0	13	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	37					89				
v_di, Inbound Pedestrian Volume crossing th	36					89				
v_co, Outbound Pedestrian Volume along th	61					89				
v_ci, Inbound Pedestrian Volume along the l	61					89				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					14				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	1	0	0	0	0	0	1	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	33	0	0	0	0	0	33	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	18	0	0	0	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No						No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	39	0	0	0	0	0	39	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	25	0	0	0	0	0	25	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall			Yes						Yes	
Maximum Recall			No						No	
Pedestrian Recall			Yes						Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	R
C, Calculated Cycle Length [s]	100	100	100
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00
g_i, Effective Green Time [s]	33	33	33
g / C, Green / Cycle	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.33	0.16	0.01
s, saturation flow rate [veh/h]	1683	1272	1373
c, Capacity [veh/h]	555	420	453
d1, Uniform Delay [s]	33.37	26.16	22.66
k, delay calibration	0.41	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	32.70	0.86	0.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.99	0.48	0.03
d, Delay for Lane Group [s/veh]	66.07	27.02	22.68
Lane Group LOS	E	C	C
Critical Lane Group	Yes	No	No
50th-Percentile Queue Length [veh/ln]	17.89	3.81	0.21
50th-Percentile Queue Length [m/ln]	136.32	29.03	1.59
95th-Percentile Queue Length [veh/ln]	24.83	6.86	0.38
95th-Percentile Queue Length [m/ln]	189.17	52.26	2.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	66.07	0.00	27.02	0.00	0.00	0.00	22.68	0.00
Movement LOS			E		C				C	
d_A, Approach Delay [s/veh]	55.56					22.68				
Approach LOS	E					C				
d_I, Intersection Delay [s/veh]	30.12									
Intersection LOS	C									
Intersection V/C	0.777									

Emissions

Vehicle Kilometers Traveled [km/h]	202.49	74.60	0.91
Stops [stops/h]	644.01	137.16	7.52
Fuel consumption [L/h]	61.75	14.40	0.48
CO [g/h]	1140.34	265.91	8.91
NOx [g/h]	221.87	51.74	1.73
VOC [g/h]	264.28	61.63	2.06

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	8.47
M_CW, Crosswalk Circulation Area [m²/ped]	17.63	5.31
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.354	1.750
Crosswalk LOS	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	660	660
d_b, Bicycle Delay [s]	22.45	22.60
I_b,int, Bicycle LOS Score for Intersection	2.842	1.560
Bicycle LOS	C	A

Intersection Setup

Name	100 Ave					EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration										
Turning Movement	Left	Thru	Thru	Right	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.20	3.20	3.66	3.66	3.20	3.66	1.50	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	50.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	100 Ave					EB Bike Lane				
Base Volume Input [veh/h]	69	234	0	0	68	0	43	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	7	0	0	0	0	0
Total Hourly Volume [veh/h]	69	234	0	0	68	0	43	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	59	0	0	17	0	11	0	0	0
Total Analysis Volume [veh/h]	69	234	0	0	68	0	43	0	0	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	50					36				
v_di, Inbound Pedestrian Volume crossing th	50					37				
v_co, Outbound Pedestrian Volume along th	89					36				
v_ci, Inbound Pedestrian Volume along the l	89					37				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					43				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Overlap	Permissiv	Permissiv	Protected	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	4	1	0	0	2	0	1	0	0	0
Auxiliary Signal Groups		1,4								
Maximum Green [s]	0	33	0	0	10	0	33	0	0	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	3.0	0.0	0.0	1.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	5	7	0	0	0	0	7	0	0	0
Pedestrian Clearance [s]	10	18	0	0	0	0	18	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No					No			
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	2.0	0.0	4.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	39	0	0	14	0	39	0	0	0
Lead / Lag	Lag	-	-	-	-	-	Lag	-	-	-
Minimum Green [s]	0	25	0	0	7	0	25	0	0	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0
Minimum Recall		Yes			No		Yes			
Maximum Recall		No			Yes		No			
Pedestrian Recall		Yes			Yes		Yes			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L
C, Calculated Cycle Length [s]	100	100	100	100
L, Total Lost Time per Cycle [s]	6.00	4.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	33	35	10	33
g / C, Green / Cycle	0.33	0.35	0.10	0.33
(v / s)_i Volume / Saturation Flow Rate	0.11	0.14	0.05	0.04
s, saturation flow rate [veh/h]	638	1683	1431	991
c, Capacity [veh/h]	72	555	143	327
d1, Uniform Delay [s]	50.00	26.07	42.52	23.46
k, delay calibration	0.11	0.11	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	39.79	0.51	10.90	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.96	0.42	0.48	0.13
d, Delay for Lane Group [s/veh]	89.79	26.58	53.42	23.64
Lane Group LOS	F	C	D	C
Critical Lane Group	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.51	4.34	2.01	0.72
50th-Percentile Queue Length [m/ln]	19.13	33.07	15.30	5.49
95th-Percentile Queue Length [veh/ln]	4.52	7.76	3.62	1.30
95th-Percentile Queue Length [m/ln]	34.43	59.10	27.55	9.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	89.79	26.58	0.00	0.00	53.42	0.00	23.64	0.00	0.00	0.00
Movement LOS	F	C			D		C			
d_A, Approach Delay [s/veh]	43.25					23.64				
Approach LOS	D					C				
d_I, Intersection Delay [s/veh]	30.12									
Intersection LOS	C									
Intersection V/C	0.777									

Emissions

Vehicle Kilometers Traveled [km/h]	12.03	40.79	11.85	3.28
Stops [stops/h]	90.36	156.23	72.31	25.96
Fuel consumption [L/h]	7.94	12.18	5.55	1.68
CO [g/h]	146.68	224.84	102.44	30.97
NOx [g/h]	28.54	43.75	19.93	6.03
VOC [g/h]	33.99	52.11	23.74	7.18

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	19.09	15.27
d_p, Pedestrian Delay [s]	36.98	36.98
I_p,int, Pedestrian LOS Score for Intersection	2.419	1.746
Crosswalk LOS	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	660	660
d_b, Bicycle Delay [s]	22.45	22.94
I_b,int, Bicycle LOS Score for Intersection	2.183	1.670
Bicycle LOS	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Jasper Avenue and 109 Street

Control Type:	Signalized	Delay (sec / veh):	87.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.115

Intersection Setup

Name	109 Street											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	2.80	2.80	3.00	3.00	3.00	3.00	3.20	3.40	3.20	3.00	3.40	3.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [m]	125.00	30.48	30.48	75.00	30.48	30.48	220.00	30.48	55.00	50.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			40.00		
Grade [%]	0.00			0.00			5.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	109 Street											
Base Volume Input [veh/h]	265	681	83	96	1174	49	140	969	682	148	419	113
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	8	0	0	5	0	0	68	0	0	11
Total Hourly Volume [veh/h]	265	681	75	96	1174	44	140	969	614	148	419	102
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	66	170	19	24	294	11	35	242	154	37	105	26
Total Analysis Volume [veh/h]	265	681	75	96	1174	44	140	969	614	148	419	102
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	114			129			114			129		
v_di, Inbound Pedestrian Volume crossing m	114			129			114			129		
v_co, Outbound Pedestrian Volume crossing	69			67			67			69		
v_ci, Inbound Pedestrian Volume crossing mi	69			67			67			69		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	70.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	5	1	0	0	1	0	2	4	0	3	4	0
Auxiliary Signal Groups	1,5	1,5										
Maximum Green [s]	9	30	0	0	30	0	6	38	0	6	38	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	19	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	0.0	3.0	0.0	1.0	4.0	0.0	1.0	4.0	0.0
Detector Location [m]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	5.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	12	35	0	0	35	0	9	44	0	9	44	0
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	25	0	0	25	0	5	26	0	5	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	Yes			Yes		No	No		No	No	
Maximum Recall	Yes	No			No		No	Yes		No	Yes	
Pedestrian Recall	Yes	Yes			Yes		Yes	Yes		Yes	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	4.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	3.00	3.00	3.00	3.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	42	42	30	30	30	30	47	38	38	45	38	38
g / C, Green / Cycle	0.42	0.42	0.30	0.30	0.30	0.30	0.47	0.38	0.38	0.45	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.40	0.22	0.06	0.16	0.26	0.27	0.19	0.38	0.66	0.31	0.13	0.09
s, saturation flow rate [veh/h]	668	3076	1184	599	3076	1556	721	2530	926	475	3204	1094
c, Capacity [veh/h]	283	1292	355	141	923	467	378	962	352	211	1218	416
d1, Uniform Delay [s]	33.08	21.60	25.92	45.86	33.16	33.39	16.35	31.00	27.92	21.05	22.11	20.76
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	39.54	1.54	1.35	23.43	11.05	21.38	2.78	30.93	346.52	17.84	0.77	1.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.94	0.53	0.21	0.68	0.87	0.89	0.37	1.01	1.74	0.70	0.34	0.25
d, Delay for Lane Group [s/veh]	72.63	23.14	27.27	69.30	44.21	54.77	19.13	61.93	374.44	38.89	22.88	22.17
Lane Group LOS	E	C	C	E	D	D	B	F	F	D	C	C
Critical Lane Group	No	Yes	No	No	No	Yes	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	7.33	6.04	1.44	3.30	10.40	12.10	2.15	15.21	41.19	2.88	3.64	1.77
50th-Percentile Queue Length [m/ln]	55.82	46.02	11.00	25.17	79.22	92.18	16.36	115.91	313.86	21.97	27.76	13.47
95th-Percentile Queue Length [veh/ln]	11.76	10.07	2.60	5.94	15.68	17.80	3.87	21.72	67.37	5.19	6.56	3.18
95th-Percentile Queue Length [m/ln]	89.64	76.73	19.80	45.30	119.52	135.65	29.45	165.52	513.38	39.55	49.96	24.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.63	23.14	27.27	69.30	47.54	54.77	19.13	61.93	374.44	38.89	22.88	22.17
Movement LOS	E	C	C	E	D	D	B	F	F	D	C	C
d_A, Approach Delay [s/veh]	36.29			49.37			169.82			26.32		
Approach LOS	D			D			F			C		
d_I, Intersection Delay [s/veh]	87.19											
Intersection LOS	F											
Intersection V/C	1.115											

Emissions

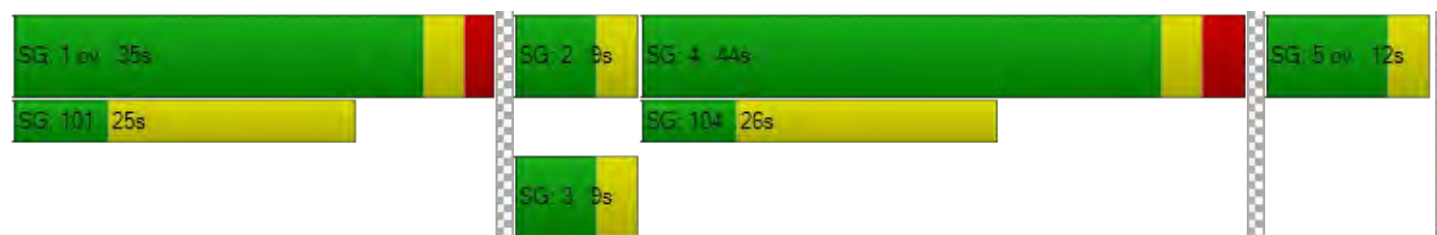
Vehicle Kilometers Traveled [km/h]	61.87	159.00	17.51	13.97	116.96	60.31	96.58	668.50	423.59	16.09	45.56	11.09
Stops [stops/h]	263.71	434.86	51.96	118.90	748.55	435.51	77.30	1095.22	1482.81	103.81	262.26	63.63
Fuel consumption [L/h]	26.63	37.02	4.41	9.12	55.29	32.99	12.99	134.39	250.63	7.63	15.98	3.83
CO [g/h]	491.66	683.67	81.38	168.42	1020.87	609.15	239.81	2481.67	4628.05	140.90	295.13	70.75
NOx [g/h]	95.66	133.02	15.83	32.77	198.63	118.52	46.66	482.84	900.45	27.41	57.42	13.76
VOC [g/h]	113.95	158.45	18.86	39.03	236.60	141.18	55.58	575.15	1072.59	32.65	68.40	16.40

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	0.93			5.04			9.82			8.65		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	3.128			2.924			3.100			2.856		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	840			600			760			760		
d_b, Bicycle Delay [s]	16.82			24.50			19.22			19.22		
I_b,int, Bicycle LOS Score for Intersection	2.409			2.285			3.037			2.121		
Bicycle LOS	B			B			C			B		

Sequence

Ring 1	1	2	4	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: 104 Avenue and 109 Street

Control Type:	Signalized	Delay (sec / veh):	109.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.66	3.60	3.60
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	0	0	1
Entry Pocket Length [m]	100.00	30.48	30.48	100.00	30.48	30.48	70.00	30.48	30.48	30.48	30.48	55.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	163	634	33	159	1218	12	89	706	231	0	256	197
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	3	0	0	1	0	0	23	0	0	20
Total Hourly Volume [veh/h]	163	634	30	159	1218	11	89	706	208	0	256	177
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	159	8	40	305	3	22	177	52	0	64	44
Total Analysis Volume [veh/h]	163	634	30	159	1218	11	89	706	208	0	256	177
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	49			49			49			49		
v_di, Inbound Pedestrian Volume crossing m	49			49			49			49		
v_co, Outbound Pedestrian Volume crossing	50			50			50			50		
v_ci, Inbound Pedestrian Volume crossing mi	50			50			50			50		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	4	0	3	4	0	1	5	0	0	2	0
Auxiliary Signal Groups												
Maximum Green [s]	8	40	0	8	40	0	7	71	0	0	68	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0
All red [s]	3.0	3.0	0.0	3.0	3.0	0.0	2.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	25	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	5.0	5.0	0.0	5.0	5.0	0.0	4.0	5.0	0.0	0.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	15	47	0	15	47	0	13	88	0	0	75	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	0	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No			No	
Maximum Recall	Yes	Yes		Yes	Yes		Yes	Yes			Yes	
Pedestrian Recall	No	Yes		No	Yes		No	Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	C	R
C, Calculated Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	6.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	8	40	40	8	40	40	7	81	81	68	68
g / C, Green / Cycle	0.05	0.27	0.27	0.05	0.27	0.27	0.05	0.54	0.54	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.11	0.15	0.15	0.11	0.27	0.27	0.06	0.28	0.29	0.09	0.13
s, saturation flow rate [veh/h]	1476	2951	1486	1476	2951	1537	1476	1683	1508	2951	1338
c, Capacity [veh/h]	79	787	396	79	787	410	69	909	814	1338	606
d1, Uniform Delay [s]	71.00	47.37	47.56	71.00	55.00	55.00	71.50	22.12	22.38	24.54	25.58
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	522.37	2.83	5.84	500.26	38.71	52.20	205.31	2.15	2.55	0.32	1.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	2.07	0.56	0.57	2.02	1.03	1.03	1.29	0.52	0.54	0.19	0.29
d, Delay for Lane Group [s/veh]	593.37	50.20	53.41	571.26	93.71	107.20	276.81	24.27	24.93	24.86	26.80
Lane Group LOS	F	D	D	F	F	F	F	C	C	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	14.46	7.42	8.00	13.98	19.05	21.38	6.59	11.30	10.62	2.84	4.21
50th-Percentile Queue Length [m/ln]	110.20	56.51	60.96	106.51	145.19	162.94	50.20	86.08	80.91	21.64	32.11
95th-Percentile Queue Length [veh/ln]	23.98	11.88	12.64	23.23	26.63	29.50	11.51	16.81	15.96	5.11	7.58
95th-Percentile Queue Length [m/ln]	182.69	90.55	96.30	177.03	202.89	224.79	87.73	128.08	121.63	38.96	57.76

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	593.37	51.19	53.41	571.26	98.26	107.20	276.81	24.48	24.93	0.00	24.86	26.80
Movement LOS	F	D	D	F	F	F	F	C	C		C	C
d_A, Approach Delay [s/veh]	158.13			152.52			46.96			25.65		
Approach LOS	F			F			D			C		
d_I, Intersection Delay [s/veh]	109.74											
Intersection LOS	F											
Intersection V/C	0.676											

Emissions

Vehicle Kilometers Traveled [km/h]	72.78	195.64	100.83	33.54	170.25	89.01	22.95	122.58	113.12	58.91	40.73
Stops [stops/h]	347.08	355.99	191.99	335.47	914.61	513.20	158.10	271.12	254.84	136.35	101.13
Fuel consumption [L/h]	89.20	43.54	23.19	80.67	94.96	54.82	24.70	26.63	24.90	13.57	9.80
CO [g/h]	1647.07	804.02	428.22	1489.60	1753.57	1012.27	456.17	491.73	459.83	250.50	180.92
NOx [g/h]	320.46	156.43	83.32	289.82	341.18	196.95	88.75	95.67	89.47	48.74	35.20
VOC [g/h]	381.72	186.34	99.24	345.23	406.41	234.60	105.72	113.96	106.57	58.06	41.93

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	6.43			7.09			9.99			9.67		
d_p, Pedestrian Delay [s]	64.40			64.40			64.40			64.40		
I_p,int, Pedestrian LOS Score for Intersectio	2.951			2.953			2.651			2.625		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	533			533			1080			907		
d_b, Bicycle Delay [s]	40.33			40.33			15.87			22.41		
I_b,int, Bicycle LOS Score for Intersection	2.016			2.324			2.406			1.933		
Bicycle LOS	B			B			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 102 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	83.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name										
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right	Left	Left	Thru	Right	Right
Lane Width [m]	3.40	3.66	3.40	3.66	3.40	3.66	3.66	3.60	3.66	3.60
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	10.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name										
Base Volume Input [veh/h]	393	0	241	0	2	0	0	414	0	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	7
Total Hourly Volume [veh/h]	393	0	241	0	2	0	0	414	0	69
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	98	0	60	0	1	0	0	104	0	17
Total Analysis Volume [veh/h]	393	0	241	0	2	0	0	414	0	69
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	5					25				
v_di, Inbound Pedestrian Volume crossing th	5					25				
v_co, Outbound Pedestrian Volume along th	3					13				
v_ci, Inbound Pedestrian Volume along the l	3					13				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	21.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Permissiv	Overlap	Permissiv	Overlap	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	1	0	1	0	1	0	0	1	0	3
Auxiliary Signal Groups	1,2		1,2		1,2					
Maximum Green [s]	32	0	32	0	32	0	0	32	0	26
Amber [s]	3.0	0.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0
All red [s]	2.0	0.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0
Walk [s]	7	0	7	0	7	0	0	7	0	7
Pedestrian Clearance [s]	18	0	18	0	18	0	0	18	0	15
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No					No		
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	3.0	0.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0
Detector Location [m]	1.0	0.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0
Detector Length [m]	5.0	0.0	5.0	0.0	5.0	0.0	0.0	5.0	0.0	5.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	37	0	37	0	37	0	0	37	0	31
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-
Minimum Green [s]	25	0	25	0	25	0	0	25	0	10
Vehicle Extension [s]	3.0	0.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0
Minimum Recall	Yes		Yes		Yes			Yes		
Maximum Recall	No		No		No			No		
Pedestrian Recall	Yes		Yes		Yes			Yes		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	44	44	44	32	32
g / C, Green / Cycle	0.44	0.44	0.44	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.18	0.24	0.16	0.14	0.15
s, saturation flow rate [veh/h]	1070	813	1529	1683	1602
c, Capacity [veh/h]	397	336	673	539	513
d1, Uniform Delay [s]	31.49	31.49	18.64	26.99	27.22
k, delay calibration	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.34	7.24	1.50	2.69	3.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.58	0.36	0.45	0.47
d, Delay for Lane Group [s/veh]	35.83	38.73	20.15	29.68	30.31
Lane Group LOS	D	D	C	C	C
Critical Lane Group	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.31	3.50	3.93	4.90	4.98
50th-Percentile Queue Length [m/ln]	25.20	26.70	29.93	37.35	37.92
95th-Percentile Queue Length [veh/ln]	5.95	6.31	7.07	8.53	8.64
95th-Percentile Queue Length [m/ln]	45.35	48.05	53.88	65.01	65.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.16	0.00	20.15	0.00	20.15	0.00	0.00	29.94	0.00	30.31
Movement LOS	D		C		C			C		C
d_A, Approach Delay [s/veh]	30.73					30.00				
Approach LOS	C					C				
d_I, Intersection Delay [s/veh]	82.96									
Intersection LOS	F									
Intersection V/C	0.719									

Emissions

Vehicle Kilometers Traveled [km/h]	28.91	28.91	35.75	103.80	103.80
Stops [stops/h]	119.04	126.13	141.41	176.44	179.17
Fuel consumption [L/h]	10.84	11.44	10.34	19.36	19.53
CO [g/h]	200.24	211.27	191.03	357.42	360.70
NOx [g/h]	38.96	41.10	37.17	69.54	70.18
VOC [g/h]	46.41	48.96	44.27	82.83	83.60

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m ² /ped]	0.00	12.62
M_CW, Crosswalk Circulation Area [m ² /ped]	0.00	21.61
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.724	2.473
Crosswalk LOS	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	880	640
d_b, Bicycle Delay [s]	15.68	23.12
I_b,int, Bicycle LOS Score for Intersection	2.084	1.964
Bicycle LOS	B	A

Intersection Setup										
Name						WB Bike Lane				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.60	3.66	3.66	3.60	3.60	3.66	3.66	3.66	1.20	3.66
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	35.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name						WB Bike Lane				
Base Volume Input [veh/h]	173	0	0	189	1027	0	0	0	12	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	103	0	0	0	0	0
Total Hourly Volume [veh/h]	173	0	0	189	924	0	0	0	11	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	0	0	47	231	0	0	0	3	0
Total Analysis Volume [veh/h]	173	0	0	189	924	0	0	0	11	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	13					3				
v_di, Inbound Pedestrian Volume crossing th	13					3				
v_co, Outbound Pedestrian Volume along th	5					25				
v_ci, Inbound Pedestrian Volume along the l	5					25				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					12				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	21.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Permissiv	Permissiv	Overlap	Overlap	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	3	0	0	3	2	0	0	0	4	0
Auxiliary Signal Groups	3,4			3,4	2,3,4					
Maximum Green [s]	26	0	0	26	7	0	0	0	15	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0
Walk [s]	7	0	0	7	0	0	0	0	7	0
Pedestrian Clearance [s]	15	0	0	15	0	0	0	0	13	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No					No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	31	0	0	31	12	0	0	0	20	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-
Minimum Green [s]	10	0	0	10	7	0	0	0	10	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall	No			No	No				No	
Maximum Recall	Yes			Yes	Yes				Yes	
Pedestrian Recall	No			No	No				No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	R
C, Calculated Cycle Length [s]	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	3.00
g_i, Effective Green Time [s]	46	53	15
g / C, Green / Cycle	0.46	0.53	0.15
(v / s)_i Volume / Saturation Flow Rate	0.32	0.37	0.01
s, saturation flow rate [veh/h]	1135	2513	1373
c, Capacity [veh/h]	571	1332	206
d1, Uniform Delay [s]	19.83	14.08	36.42
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	5.28	2.99	0.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.63	0.69	0.05
d, Delay for Lane Group [s/veh]	25.11	17.08	36.91
Lane Group LOS	C	B	D
Critical Lane Group	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	6.44	6.91	0.26
50th-Percentile Queue Length [m/ln]	49.07	52.64	1.96
95th-Percentile Queue Length [veh/ln]	10.60	11.22	0.46
95th-Percentile Queue Length [m/ln]	80.79	85.48	3.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	25.11	0.00	0.00	25.11	17.08	0.00	0.00	0.00	36.91	0.00
Movement LOS	C			C	B				D	
d_A, Approach Delay [s/veh]	19.34					36.91				
Approach LOS	B					D				
d_I, Intersection Delay [s/veh]	82.96									
Intersection LOS	F									
Intersection V/C	0.719									

Emissions

Vehicle Kilometers Traveled [km/h]	98.62	251.72	1.19
Stops [stops/h]	231.84	497.35	9.27
Fuel consumption [L/h]	21.59	47.26	0.63
CO [g/h]	398.62	872.76	11.71
NOx [g/h]	77.56	169.81	2.28
VOC [g/h]	92.38	202.27	2.71

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m ² /ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m ² /ped]	18.92	39.08
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	3.351	1.827
Crosswalk LOS	C	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	920	300
d_b, Bicycle Delay [s]	14.58	36.34
I_b,int, Bicycle LOS Score for Intersection	3.851	1.560
Bicycle LOS	D	A

Intersection Setup										
Name						EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration	Y					J				
Turning Movement	Left	Thru	Thru	Right	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.60	3.66	3.60	3.66	3.60	3.66	1.20	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	40.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name						EB Bike Lane				
Base Volume Input [veh/h]	0	0	395	0	45	0	52	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	5	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	395	0	40	0	52	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	99	0	10	0	13	0	0	0
Total Analysis Volume [veh/h]	0	0	395	0	40	0	52	0	0	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	3					13				
v_di, Inbound Pedestrian Volume crossing th	3					13				
v_co, Outbound Pedestrian Volume along th	3					13				
v_ci, Inbound Pedestrian Volume along the l	3					13				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					52				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	21.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	4	0	0	0	4	0	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	15	0	0	0	15	0	0	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	7	0	0	0	7	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No				No			
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	20	0	0	0	20	0	0	0
Lead / Lag	-	-	-	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	10	0	0	0	10	0	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Minimum Recall			No				No			
Maximum Recall			Yes				Yes			
Pedestrian Recall			No				No			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L
C, Calculated Cycle Length [s]	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	2.00
l2, Clearance Lost Time [s]	3.00	3.00
g_i, Effective Green Time [s]	15	15
g / C, Green / Cycle	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.27	0.08
s, saturation flow rate [veh/h]	1637	689
c, Capacity [veh/h]	246	73
d1, Uniform Delay [s]	42.50	50.00
k, delay calibration	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	363.40	45.36
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	1.77	0.71
d, Delay for Lane Group [s/veh]	405.90	95.36
Lane Group LOS	F	F
Critical Lane Group	Yes	No
50th-Percentile Queue Length [veh/ln]	30.84	2.21
50th-Percentile Queue Length [m/ln]	234.98	16.85
95th-Percentile Queue Length [veh/ln]	48.70	3.98
95th-Percentile Queue Length [m/ln]	371.13	30.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	405.90	0.00	405.90	0.00	95.36	0.00	0.00	0.00
Movement LOS			F		F		F			
d_A, Approach Delay [s/veh]	405.90					95.36				
Approach LOS	F					F				
d_I, Intersection Delay [s/veh]	82.96									
Intersection LOS	F									
Intersection V/C	0.719									

Emissions

Vehicle Kilometers Traveled [km/h]	68.28	5.77
Stops [stops/h]	1110.13	79.60
Fuel consumption [L/h]	159.16	6.15
CO [g/h]	2938.99	113.63
NOx [g/h]	571.82	22.11
VOC [g/h]	681.14	26.34

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	1181.58	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	192.16	23.05
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	1.982	1.752
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	300	300
d_b, Bicycle Delay [s]	36.13	37.09
I_b,int, Bicycle LOS Score for Intersection	2.286	1.560
Bicycle LOS	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Stony Plain Road and 124 Street

Control Type:	Signalized	Delay (sec / veh):	72.1
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.66	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	0	1	0	0
Entry Pocket Length [m]	105.00	30.48	50.00	50.00	30.48	30.48	30.48	30.48	30.48	25.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	75	558	39	50	582	3	0	500	195	4	131	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	4	0	0	0	0	0	20	0	0	3
Total Hourly Volume [veh/h]	75	558	35	50	582	3	0	500	175	4	131	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	140	9	13	146	1	0	125	44	1	33	7
Total Analysis Volume [veh/h]	75	558	35	50	582	3	0	500	175	4	131	28
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	57.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	3	0	1	3	0	0	6	0	5	7	0
Auxiliary Signal Groups												
Maximum Green [s]	9	35	0	9	35	0	0	43	0	11	59	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	5.0	0.0	2.0	5.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	13	42	0	13	42	0	0	49	0	16	65	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	0	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No			No		No	No	
Maximum Recall	Yes	Yes		Yes	Yes			Yes		Yes	Yes	
Pedestrian Recall	No	Yes		No	Yes			Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	6.00	5.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	0.00	5.00	5.00	4.00	3.00	4.00
g_i, Effective Green Time [s]	48	35	35	48	35	35	43	11	59
g / C, Green / Cycle	0.40	0.29	0.29	0.40	0.29	0.29	0.36	0.09	0.49
(v / s)_i Volume / Saturation Flow Rate	0.08	0.19	0.20	0.05	0.19	0.19	0.43	0.00	0.10
s, saturation flow rate [veh/h]	914	1550	1490	910	1550	1545	1581	1476	1618
c, Capacity [veh/h]	327	452	435	320	452	451	566	135	795
d1, Uniform Delay [s]	24.58	37.31	37.49	24.30	37.11	37.13	38.50	49.64	17.19
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.63	7.43	8.17	1.04	7.00	7.06	102.85	0.40	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.66	0.68	0.16	0.65	0.65	1.19	0.03	0.20
d, Delay for Lane Group [s/veh]	26.21	44.74	45.67	25.34	44.12	44.19	141.35	50.04	17.76
Lane Group LOS	C	D	D	C	D	D	F	D	B
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	1.50	8.60	8.55	0.98	8.34	8.34	32.47	0.12	2.60
50th-Percentile Queue Length [m/ln]	11.41	65.56	65.16	7.44	63.57	63.53	247.45	0.95	19.78
95th-Percentile Queue Length [veh/ln]	2.69	13.41	13.35	1.76	13.08	13.07	46.80	0.22	4.67
95th-Percentile Queue Length [m/ln]	20.53	102.21	101.70	13.38	99.66	99.62	356.61	1.71	35.60

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.21	45.17	45.67	25.34	44.15	44.19	0.00	141.35	141.35	50.04	17.76	17.76
Movement LOS	C	D	D	C	D	D		F	F	D	B	B
d_A, Approach Delay [s/veh]	43.07			42.67			141.35			18.55		
Approach LOS	D			D			F			B		
d_I, Intersection Delay [s/veh]	72.07											
Intersection LOS	E											
Intersection V/C	0.662											

Emissions

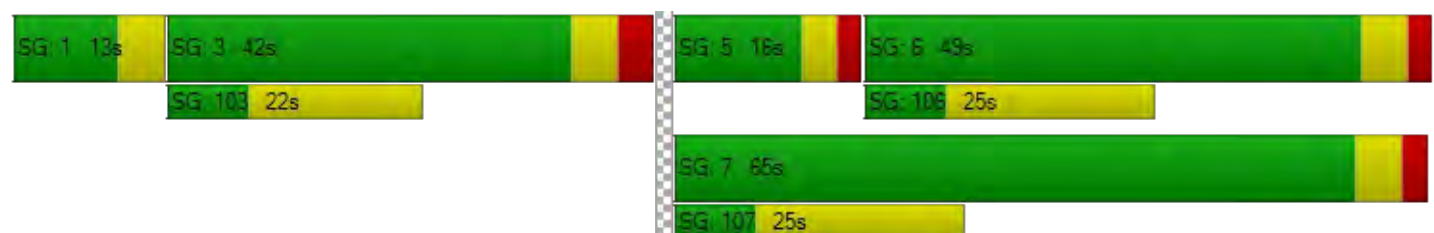
Vehicle Kilometers Traveled [km/h]	32.24	128.64	126.24	22.78	133.36	133.15	209.55	1.37	54.42
Stops [stops/h]	44.90	258.09	256.53	29.27	250.26	250.13	974.20	3.75	77.86
Fuel consumption [L/h]	5.59	28.34	28.10	3.80	28.25	28.23	115.28	0.37	9.10
CO [g/h]	103.20	523.37	518.83	70.17	521.65	521.24	2128.65	6.80	168.03
NOx [g/h]	20.08	101.83	100.95	13.65	101.49	101.41	414.16	1.32	32.69
VOC [g/h]	23.92	121.30	120.24	16.26	120.90	120.80	493.34	1.58	38.94

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	11.00	16.17	16.07	15.99
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.613	2.561	2.246	2.234
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	583	717	983
d_b, Bicycle Delay [s]	30.10	30.10	24.70	15.50
I_b,int, Bicycle LOS Score for Intersection	2.114	2.083	2.706	1.834
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	3	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: 107 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.728

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	0	0	1
Entry Pocket Length [m]	60.00	30.48	30.48	95.00	30.48	130.00	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	264	591	118	160	445	107	0	1506	220	0	556	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	4.00	2.00	2.00	5.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	12	0	0	11	0	0	22	0	0	7
Total Hourly Volume [veh/h]	264	591	106	160	445	96	0	1506	198	0	556	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	66	148	27	40	111	24	0	377	50	0	139	15
Total Analysis Volume [veh/h]	264	591	106	160	445	96	0	1506	198	0	556	59
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			7			7			12		
v_di, Inbound Pedestrian Volume crossing m	12			7			7			12		
v_co, Outbound Pedestrian Volume crossing	12			10			12			10		
v_ci, Inbound Pedestrian Volume crossing mi	12			10			12			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	67.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	1	0	4	1	0	0	2	0	0	2	0
Auxiliary Signal Groups												
Maximum Green [s]	10	32	0	10	32	0	0	45	0	0	45	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Detector Location [m]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	5.0	5.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	13	37	0	13	37	0	0	50	0	0	50	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	27	0	7	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	Yes		No	Yes			No			No	
Maximum Recall	Yes	No		Yes	No			Yes			Yes	
Pedestrian Recall	No	Yes		No	Yes			Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	R	C	R
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	40	27	27	38	27	27	50	50	50	50
g / C, Green / Cycle	0.40	0.27	0.27	0.38	0.27	0.27	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.24	0.19	0.19	0.15	0.15	0.15	0.43	0.13	0.16	0.04
s, saturation flow rate [veh/h]	1116	1870	1755	1047	1870	1746	3503	1567	3475	1589
c, Capacity [veh/h]	444	505	474	376	505	472	1751	783	1737	794
d1, Uniform Delay [s]	22.30	32.93	33.01	1.96	31.29	31.35	21.94	14.29	14.89	12.99
k, delay calibration	0.50	0.14	0.15	0.11	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.78	2.46	2.77	0.76	0.94	1.03	5.79	0.78	0.49	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.71	0.72	0.43	0.55	0.56	0.86	0.25	0.32	0.07
d, Delay for Lane Group [s/veh]	28.08	35.39	35.78	2.73	32.23	32.38	27.73	15.07	15.38	13.17
Lane Group LOS	C	D	D	A	C	C	C	B	B	B
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	4.97	8.02	7.66	0.08	5.80	5.50	15.88	2.65	3.74	0.71
50th-Percentile Queue Length [m/ln]	37.86	61.11	58.33	0.61	44.21	41.89	121.02	20.17	28.53	5.42
95th-Percentile Queue Length [veh/ln]	8.62	12.66	12.19	0.14	9.75	9.34	22.42	4.77	6.74	1.28
95th-Percentile Queue Length [m/ln]	65.71	96.50	92.91	1.09	74.32	71.20	170.82	36.31	51.36	9.76

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.08	35.54	35.78	2.73	32.28	32.38	0.00	27.73	15.07	0.00	15.38	13.17
Movement LOS	C	D	D	A	C	C		C	B		B	B
d_A, Approach Delay [s/veh]	33.52			25.55			26.26			15.17		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	26.17											
Intersection LOS	C											
Intersection V/C	0.728											

Emissions

Vehicle Kilometers Traveled [km/h]	120.27	163.02	154.50	141.42	245.99	232.19	360.13	47.35	159.75	16.95
Stops [stops/h]	178.86	288.70	275.60	2.87	208.89	197.92	1143.51	95.31	269.61	25.62
Fuel consumption [L/h]	21.17	31.74	30.23	13.86	35.00	33.08	92.09	8.94	27.84	2.79
CO [g/h]	390.85	586.14	558.22	255.87	646.29	610.91	1700.42	165.10	514.00	51.45
NOx [g/h]	76.04	114.04	108.61	49.78	125.75	118.86	330.84	32.12	100.01	10.01
VOC [g/h]	90.58	135.84	129.37	59.30	149.78	141.59	394.09	38.26	119.12	11.92

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	38.62			64.40			75.07			44.83		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.653			2.597			2.981			2.862		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	640			640			900			900		
d_b, Bicycle Delay [s]	23.12			23.12			15.13			15.13		
I_b,int, Bicycle LOS Score for Intersection	2.362			2.147			2.984			2.073		
Bicycle LOS	B			B			C			B		

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: 111 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	55.00	30.48	150.00	65.00	30.48	100.00	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	15.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	274	431	148	133	543	72	0	1459	94	42	809	53
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	9.00	2.00	2.00	4.00	2.00	2.00	5.00	2.00	2.00	8.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	15	0	0	7	0	0	9	0	0	5
Total Hourly Volume [veh/h]	274	431	133	133	543	65	0	1459	85	42	809	48
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	108	33	33	136	16	0	365	21	11	202	12
Total Analysis Volume [veh/h]	274	431	133	133	543	65	0	1459	85	42	809	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			9			9			8		
v_di, Inbound Pedestrian Volume crossing m	8			9			9			8		
v_co, Outbound Pedestrian Volume crossing	12			10			12			10		
v_ci, Inbound Pedestrian Volume crossing mi	12			10			12			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	11.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap
Signal Group	3	4	0	2	4	0	0	1	0	5	1	1	1
Auxiliary Signal Groups										1,5	1,5	1,5	
Maximum Green [s]	10	26	0	12	26	0	0	59	0	7	59	59	
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	4.0	0.0	4.0	4.0	4.0	
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7	
Pedestrian Clearance [s]	0	21	0	0	21	0	0	17	0	0	17	17	
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Rest In Walk		No			No			No			No		
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0	
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	0.0	3.0	0.0	2.0	3.0	3.0	
Detector Location [m]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector Length [m]	5.0	5.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Phasing & Timing: Pattern 1

Split [s]	13	31	0	15	31	0	0	43	0	11	43	43
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	0	24	0	7	24	24
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0
Minimum Recall	Yes	Yes		Yes	Yes			No		No	No	No
Maximum Recall	No	No		No	No			Yes		Yes	Yes	Yes
Pedestrian Recall	No	Yes		No	Yes			Yes		No	Yes	Yes

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	C	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	39	31	31	41	31	31	38	38	49	49	49
g / C, Green / Cycle	0.39	0.31	0.31	0.41	0.31	0.31	0.38	0.38	0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.27	0.17	0.17	0.13	0.17	0.17	0.30	0.29	0.27	0.20	0.20
s, saturation flow rate [veh/h]	1008	1765	1611	1026	1840	1764	3475	1767	1006	1620	1573
c, Capacity [veh/h]	384	547	499	408	570	547	1320	671	441	797	774
d1, Uniform Delay [s]	24.16	28.57	28.63	20.09	28.63	28.67	27.33	27.14	16.94	16.04	16.06
k, delay calibration	0.34	0.11	0.11	0.50	0.11	0.11	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.48	0.82	0.92	2.11	0.81	0.85	4.62	8.19	6.43	1.48	1.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.54	0.54	0.33	0.54	0.55	0.78	0.77	0.62	0.40	0.40
d, Delay for Lane Group [s/veh]	31.64	29.39	29.54	22.20	29.44	29.52	31.95	35.33	23.37	17.52	17.60
Lane Group LOS	C	C	C	C	C	C	C	D	C	B	B
Critical Lane Group	No	No	No	Yes	No	Yes	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.00	5.85	5.41	2.18	6.17	5.97	11.29	11.90	4.41	4.72	4.62
50th-Percentile Queue Length [m/ln]	38.07	44.54	41.22	16.63	47.03	45.49	86.04	90.67	33.60	35.93	35.24
95th-Percentile Queue Length [veh/ln]	8.66	9.81	9.22	3.93	10.25	9.98	16.80	17.56	7.85	8.28	8.15
95th-Percentile Queue Length [m/ln]	66.01	74.76	70.29	29.94	78.08	76.03	128.03	133.77	59.84	63.07	62.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.64	29.44	29.54	22.20	29.48	29.52	0.00	32.95	35.33	23.37	19.22	17.60
Movement LOS	C	C	C	C	C	C		C	D	C	B	B
d_A, Approach Delay [s/veh]	30.18			28.17			33.08			19.33		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	28.50											
Intersection LOS	C											
Intersection V/C	0.628											

Emissions

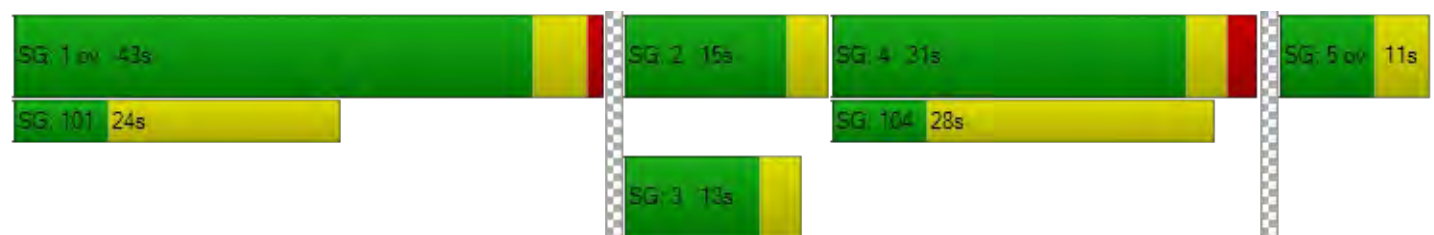
Vehicle Kilometers Traveled [km/h]	242.18	259.43	239.08	168.95	393.04	379.29	295.42	147.71	107.46	124.04	121.21
Stops [stops/h]	179.87	210.44	194.76	78.57	222.19	214.92	812.99	428.34	158.74	169.75	166.49
Fuel consumption [L/h]	33.76	36.05	33.27	20.11	49.40	47.70	71.68	37.67	18.72	19.88	19.46
CO [g/h]	623.32	665.67	614.40	371.38	912.15	880.82	1323.58	695.58	345.62	367.03	359.27
NOx [g/h]	121.27	129.52	119.54	72.26	177.47	171.38	257.52	135.33	67.25	71.41	69.90
VOC [g/h]	144.46	154.28	142.39	86.07	211.40	204.14	306.75	161.21	80.10	85.06	83.26

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	37.98			65.19			62.50			66.91		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.791			2.563			3.051			2.972		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	520			520			760			980		
d_b, Bicycle Delay [s]	27.38			27.38			19.22			13.01		
I_b,int, Bicycle LOS Score for Intersection	2.263			2.177			2.414			2.057		
Bicycle LOS	B			B			B			B		

Sequence

Ring 1	1	2	4	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: 118 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	52.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [m]	95.00	30.48	115.00	25.00	30.48	30.48	50.00	30.48	30.48	50.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	352	44	200	140	170	23	30	1532	405	44	811	108
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	20	0	0	2	0	0	41	0	0	11
Total Hourly Volume [veh/h]	352	44	180	140	170	21	30	1532	364	44	811	97
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	11	45	35	43	5	8	383	91	11	203	24
Total Analysis Volume [veh/h]	352	44	180	140	170	21	30	1532	364	44	811	97
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8			19			19			8		
v_di, Inbound Pedestrian Volume crossing m	8			19			19			8		
v_co, Outbound Pedestrian Volume crossing	12			10			12			10		
v_ci, Inbound Pedestrian Volume crossing mi	12			10			12			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	14.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap
Signal Group	2	3	3	0	3	0	0	1	0	4	1	1
Auxiliary Signal Groups	2,3	2,3	2,3							1,4	1,4	1,4
Maximum Green [s]	10	30	30	0	30	0	0	49	0	7	49	49
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0	0.0	4.0	0.0	4.0	4.0	4.0
All red [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Walk [s]	0	8	8	0	8	0	0	10	0	0	10	10
Pedestrian Clearance [s]	0	22	22	0	22	0	0	15	0	0	15	15
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.0	4.0	4.0	0.0	4.0	0.0	0.0	4.0	0.0	2.0	4.0	4.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	1.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	5.0	5.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	13	36	36	0	36	0	0	40	0	11	40	40
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	5	12	12	0	12	0	0	25	0	7	25	25
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0
Minimum Recall	No	No	No		No			Yes		No	Yes	Yes
Maximum Recall	Yes	Yes	Yes		Yes			No		Yes	No	No
Pedestrian Recall	No	No	No		No			Yes		No	Yes	Yes

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	4.00	4.00	4.00	4.00	4.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	43	43	30	30	34	34	34	45	45	45
g / C, Green / Cycle	0.43	0.43	0.30	0.30	0.34	0.34	0.34	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.12	0.10	0.05	0.36	0.37	0.08	0.17	0.17
s, saturation flow rate [veh/h]	2607	1623	1145	1825	611	3560	1655	547	3560	1756
c, Capacity [veh/h]	1077	698	293	548	199	1211	563	275	1602	790
d1, Uniform Delay [s]	18.46	18.85	37.09	27.36	32.96	33.00	33.00	21.76	18.22	18.28
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.81	1.22	5.49	1.75	1.59	42.73	65.80	1.24	0.68	1.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.32	0.48	0.35	0.15	1.06	1.09	0.16	0.38	0.38
d, Delay for Lane Group [s/veh]	19.27	20.06	42.58	29.11	34.56	75.73	98.80	23.00	18.90	19.69
Lane Group LOS	B	C	D	C	C	F	F	C	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.65	3.59	3.55	3.79	0.69	21.31	23.42	0.65	4.65	4.83
50th-Percentile Queue Length [m/ln]	20.18	27.34	27.08	28.87	5.25	162.37	178.43	4.97	35.45	36.78
95th-Percentile Queue Length [veh/ln]	4.77	6.46	6.40	6.82	1.24	29.98	33.23	1.17	8.19	8.43
95th-Percentile Queue Length [m/ln]	36.33	49.21	48.75	51.96	9.46	228.49	253.25	8.94	62.40	64.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.27	20.06	20.06	42.58	29.11	29.11	34.56	79.51	98.80	23.00	19.10	19.69
Movement LOS	B	C	C	D	C	C	C	E	F	C	B	B
d_A, Approach Delay [s/veh]	19.58			34.81			82.46			19.34		
Approach LOS	B			C			F			B		
d_I, Intersection Delay [s/veh]	52.85											
Intersection LOS	D											
Intersection V/C	0.698											

Emissions

Vehicle Kilometers Traveled [km/h]	447.14	284.54	9.66	13.17	8.85	377.69	181.36	11.77	161.87	80.99
Stops [stops/h]	190.72	129.17	127.96	136.39	24.83	1534.16	842.97	23.47	334.95	173.75
Fuel consumption [L/h]	52.05	33.43	8.38	8.60	2.20	145.06	82.97	2.43	31.73	16.20
CO [g/h]	961.11	617.36	154.76	158.73	40.57	2678.69	1532.16	44.80	585.86	299.06
NOx [g/h]	187.00	120.12	30.11	30.88	7.89	521.18	298.10	8.72	113.99	58.19
VOC [g/h]	222.75	143.08	35.87	36.79	9.40	620.81	355.09	10.38	135.78	69.31

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	12.0	12.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	32.14	54.94	35.80	61.17
d_p, Pedestrian Delay [s]	36.98	36.98	38.72	38.72
I_p,int, Pedestrian LOS Score for Intersectio	2.491	2.161	3.271	3.222
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	860	600	680	900
d_b, Bicycle Delay [s]	16.25	24.50	21.78	15.13
I_b,int, Bicycle LOS Score for Intersection	2.543	2.109	2.641	2.089
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: 104 Avenue and 121 Street

Control Type:	Signalized	Delay (sec / veh):	31.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.455

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	0	0	1	0	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	40.00	30.48	30.48	30.48	45.00	30.48	30.48	55.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	106	38	170	160	15	37	444	13	6	169	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	4	0	0	2	0	0	1	0	0	3
Total Hourly Volume [veh/h]	0	106	34	170	160	13	37	444	12	6	169	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	27	9	43	40	3	9	111	3	2	42	6
Total Analysis Volume [veh/h]	0	106	34	170	160	13	37	444	12	6	169	22
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	6	0	5	7	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	26	0	12	42	0	9	51	0	9	51	0
Amber [s]	0.0	4.0	0.0	4.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	15	0	0	15	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	5.0	0.0	2.0	5.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	33	0	16	49	0	14	57	0	14	57	0
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		No	No		No	No		No	No	
Maximum Recall		Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	5.00	6.00	5.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	0.00	5.00	5.00	3.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	26	26	42	42	42	9	51	9	51	51
g / C, Green / Cycle	0.22	0.22	0.35	0.35	0.35	0.08	0.43	0.08	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.14	0.10	0.01	0.03	0.27	0.00	0.10	0.02
s, saturation flow rate [veh/h]	1550	1292	1241	1550	1287	1476	1671	1476	1683	1313
c, Capacity [veh/h]	366	280	454	543	451	111	710	111	715	558
d1, Uniform Delay [s]	39.52	37.71	28.88	28.27	25.58	52.66	27.29	51.55	22.05	20.15
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.99	0.89	2.35	1.38	0.12	7.95	4.43	0.93	0.78	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.12	0.37	0.29	0.03	0.33	0.64	0.05	0.24	0.04
d, Delay for Lane Group [s/veh]	41.51	38.60	31.23	29.65	25.70	60.61	31.71	52.48	22.83	20.28
Lane Group LOS	D	D	C	C	C	E	C	D	C	C
Critical Lane Group	Yes	No	Yes	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.84	0.88	3.90	3.55	0.26	1.30	11.06	0.20	3.20	0.38
50th-Percentile Queue Length [m/ln]	21.64	6.68	29.68	27.06	1.99	9.93	84.24	1.50	24.42	2.92
95th-Percentile Queue Length [veh/ln]	5.11	1.58	7.01	6.39	0.47	2.35	16.51	0.35	5.77	0.69
95th-Percentile Queue Length [m/ln]	38.95	12.02	53.43	48.70	3.57	17.88	125.80	2.70	43.95	5.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.51	41.51	38.60	31.23	29.65	25.70	60.61	31.71	31.71	52.48	22.83	20.28
Movement LOS	D	D	D	C	C	C	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	40.81			30.28			33.88			23.45		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	31.90											
Intersection LOS	C											
Intersection V/C	0.455											

Emissions

Vehicle Kilometers Traveled [km/h]	37.75	12.11	40.65	38.26	3.11	12.66	156.07	3.80	106.89	13.92
Stops [stops/h]	85.20	26.29	116.87	106.52	7.82	39.10	331.67	5.90	96.12	11.50
Fuel consumption [L/h]	8.89	2.75	10.58	9.68	0.73	3.81	33.43	0.74	15.30	1.93
CO [g/h]	164.20	50.83	195.35	178.82	13.45	70.34	617.29	13.59	282.50	35.56
NOx [g/h]	31.95	9.89	38.01	34.79	2.62	13.69	120.10	2.64	54.96	6.92
VOC [g/h]	38.06	11.78	45.27	41.44	3.12	16.30	143.06	3.15	65.47	8.24

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	16.50	15.89	17.22	16.61
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.068	2.277	2.184	2.546
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	433	700	850	850
d_b, Bicycle Delay [s]	36.82	25.35	19.84	19.84
I_b,int, Bicycle LOS Score for Intersection	1.797	2.129	2.375	1.890
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	3	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 104 Avenue and 116 Street

Control Type:	Signalized	Delay (sec / veh):	46.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.620

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [m]	20.00	30.48	30.48	70.00	30.48	30.48	75.00	30.48	40.00	115.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	88	319	7	89	434	16	47	793	427	77	316	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	2	0	0	43	0	0	6
Total Hourly Volume [veh/h]	88	319	6	89	434	14	47	793	384	77	316	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	80	2	22	109	4	12	198	96	19	79	14
Total Analysis Volume [veh/h]	88	319	6	89	434	14	47	793	384	77	316	56
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	6	0	5	7	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	34	0	17	54	0	10	37	0	10	37	0
Amber [s]	0.0	4.0	0.0	3.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	20	0	0	20	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			Yes			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	5.0	0.0	1.0	5.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	41	0	20	61	0	16	43	0	16	43	0
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		No	No		No	No		No	No	
Maximum Recall		Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	5.00	0.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	34	34	34	54	54	54	10	37	37	10	37	37
g / C, Green / Cycle	0.28	0.28	0.28	0.45	0.45	0.45	0.08	0.31	0.31	0.08	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.11	0.08	0.28	0.01	0.03	0.25	0.29	0.05	0.11	0.12
s, saturation flow rate [veh/h]	833	1550	1535	1125	1550	1364	1476	3204	1333	1476	1683	1558
c, Capacity [veh/h]	104	439	435	510	698	614	123	988	411	123	519	480
d1, Uniform Delay [s]	58.42	34.43	34.46	19.79	25.21	18.33	52.07	38.14	39.24	53.19	32.35	32.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	53.64	2.39	2.44	0.74	4.15	0.07	8.77	6.88	30.59	21.68	1.98	2.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.85	0.37	0.37	0.17	0.62	0.02	0.38	0.80	0.93	0.63	0.37	0.38
d, Delay for Lane Group [s/veh]	112.05	36.83	36.90	20.53	29.36	18.40	60.84	45.02	69.82	74.88	34.33	34.79
Lane Group LOS	F	D	D	C	C	B	E	D	E	E	C	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.22	4.11	4.09	1.56	10.09	0.23	1.64	11.55	14.05	2.99	4.58	4.46
50th-Percentile Queue Length [m/ln]	32.19	31.29	31.20	11.92	76.86	1.75	12.50	87.98	107.10	22.75	34.92	34.01
95th-Percentile Queue Length [veh/ln]	7.60	7.39	7.37	2.82	15.30	0.41	2.95	17.12	20.20	5.37	8.09	7.93
95th-Percentile Queue Length [m/ln]	57.88	56.31	56.16	21.45	116.55	3.15	22.50	130.45	153.95	40.94	61.68	60.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	112.05	36.86	36.90	20.53	29.36	18.40	60.84	45.02	69.82	74.88	34.51	34.79
Movement LOS	F	D	D	C	C	B	E	D	E	E	C	C
d_A, Approach Delay [s/veh]	52.88			27.61			53.41			41.47		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	46.00											
Intersection LOS	D											
Intersection V/C	0.620											

Emissions

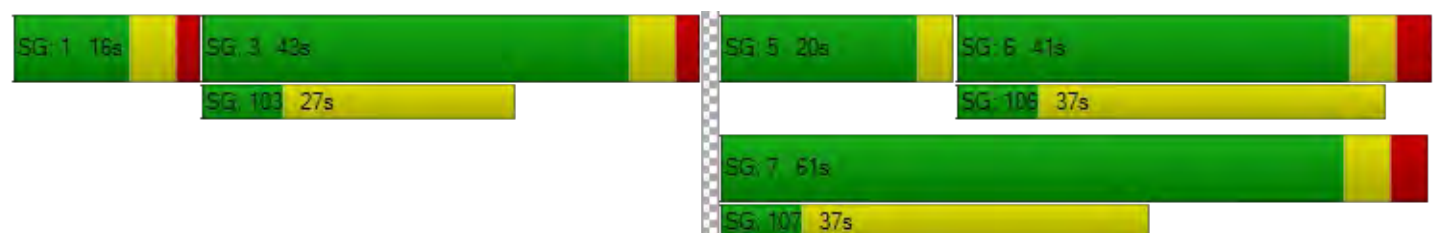
Vehicle Kilometers Traveled [km/h]	42.89	79.38	79.03	19.49	95.03	3.07	29.73	501.57	242.88	37.75	92.91	89.47
Stops [stops/h]	126.74	123.17	122.82	46.92	302.60	6.88	49.22	692.77	421.64	89.55	137.49	133.91
Fuel consumption [L/h]	14.52	14.94	14.88	4.31	25.64	0.64	6.14	90.76	53.22	10.04	16.94	16.41
CO [g/h]	268.10	275.79	274.83	79.67	473.53	11.90	113.29	1675.97	982.72	185.42	312.72	302.97
NOx [g/h]	52.16	53.66	53.47	15.50	92.13	2.32	22.04	326.08	191.20	36.08	60.84	58.95
VOC [g/h]	62.14	63.92	63.69	18.46	109.75	2.76	26.26	388.42	227.76	42.97	72.48	70.22

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	3.63			15.43			16.78			17.86		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.588			2.512			2.937			2.632		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	567			900			617			617		
d_b, Bicycle Delay [s]	30.82			18.15			28.70			28.70		
I_b,int, Bicycle LOS Score for Intersection	1.901			2.449			2.605			1.935		
Bicycle LOS	A			B			B			A		

Sequence

Ring 1	1	3	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 11: 104 Avenue and 112 Street

Control Type:	Signalized	Delay (sec / veh):	35.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.80	3.80	3.80	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.00	40.00	30.48	30.48	75.00	30.48	30.48	60.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	40.00			40.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	58	105	140	75	142	6	12	907	32	56	426	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	14	0	0	1	0	0	3	0	0	3
Total Hourly Volume [veh/h]	58	105	126	75	142	5	12	907	29	56	426	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	26	32	19	36	1	3	227	7	14	107	6
Total Analysis Volume [veh/h]	58	105	126	75	142	5	12	907	29	56	426	24
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	46.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	5	0	0	5	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	48	0	0	48	0	10	45	0	10	45	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	25	0	0	15	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	54	0	0	54	0	15	51	0	15	51	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		Yes			Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes			Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	5.00	6.00	6.00	5.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	3.00	4.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	48	48	48	48	10	45	45	10	45	45
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.08	0.38	0.38	0.08	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.05	0.17	0.07	0.10	0.01	0.28	0.28	0.04	0.13	0.14
s, saturation flow rate [veh/h]	1076	1370	1005	1537	1476	1683	1652	1476	1683	1631
c, Capacity [veh/h]	404	548	323	615	123	631	620	123	631	612
d1, Uniform Delay [s]	29.33	25.98	35.35	23.88	50.83	32.53	32.63	52.40	27.08	27.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.74	2.37	1.68	0.92	1.58	7.82	8.17	11.67	1.59	1.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.42	0.23	0.24	0.10	0.75	0.75	0.46	0.36	0.37
d, Delay for Lane Group [s/veh]	30.08	28.36	37.03	24.80	52.41	40.36	40.80	64.07	28.67	28.84
Lane Group LOS	C	C	D	C	D	D	D	E	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.31	5.18	1.93	2.98	0.39	13.06	13.01	2.01	4.97	4.92
50th-Percentile Queue Length [m/ln]	9.99	39.49	14.71	22.68	2.96	99.55	99.10	15.29	37.85	37.48
95th-Percentile Queue Length [veh/ln]	2.36	8.91	3.47	5.36	0.70	18.99	18.92	3.61	8.62	8.56
95th-Percentile Queue Length [m/ln]	17.98	67.93	26.48	40.82	5.32	144.72	144.17	27.52	65.70	65.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.08	28.36	28.36	37.03	24.80	24.80	52.41	40.57	40.80	64.07	28.75	28.84
Movement LOS	C	C	C	D	C	C	D	D	D	E	C	C
d_A, Approach Delay [s/veh]	28.70			28.93			40.73			32.67		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	35.55											
Intersection LOS	D											
Intersection V/C	0.488											

Emissions

Vehicle Kilometers Traveled [km/h]	16.45	65.53	7.19	14.10	5.88	230.70	228.19	5.91	23.93	23.58
Stops [stops/h]	39.33	155.45	57.91	89.29	11.64	391.92	390.17	60.20	149.00	147.57
Fuel consumption [L/h]	3.65	14.23	3.73	5.58	1.31	45.37	45.09	4.68	10.62	10.52
CO [g/h]	67.46	262.70	68.94	103.13	24.10	837.79	832.65	86.36	196.19	194.19
NOx [g/h]	13.13	51.11	13.41	20.07	4.69	163.00	162.00	16.80	38.17	37.78
VOC [g/h]	15.63	60.88	15.98	23.90	5.59	194.16	192.98	20.01	45.47	45.01

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	14.04			14.15			17.22			14.27		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.117			2.054			2.691			2.754		
Crosswalk LOS	B			B			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			800			750			750		
d_b, Bicycle Delay [s]	21.60			21.60			23.44			23.44		
I_b,int, Bicycle LOS Score for Intersection	2.060			1.928			2.344			1.980		
Bicycle LOS	B			A			B			A		

Sequence

Ring 1	1	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Jasper Avenue and 121 Street

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

Intersection Setup

Name														
Approach	Northbound							Southbound						
Lane Configuration														
Turning Movement	Left	Left	Thru	Thru	Thru	Right	Right	Left	Left	Thru	Thru	Thru	Right	Right
Lane Width [m]	3.60	3.66	3.66	3.66	3.60	3.66	3.60	3.60	3.66	3.66	3.66	3.66	3.66	3.60
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	35.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00							50.00						
Grade [%]	0.00							0.00						
Curb Present	Yes							Yes						
Crosswalk	Yes							Yes						

Volumes

Name														
Base Volume Input [veh/h]	117	0	0	0	62	0	27	90	0	0	0	0	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	3	0	0	0	0	0	0	2
Total Hourly Volume [veh/h]	117	0	0	0	62	0	24	90	0	0	0	0	0	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	0	0	0	16	0	6	23	0	0	0	0	0	4
Total Analysis Volume [veh/h]	117	0	0	0	62	0	24	90	0	0	0	0	0	14
Presence of On-Street Parking	No						No	No						No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12							6						
v_di, Inbound Pedestrian Volume crossing th	12							6						
v_co, Outbound Pedestrian Volume along th	12							6						
v_ci, Inbound Pedestrian Volume along the l	12							6						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	0	2	0	0	2	0	0	0	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	0	28	0	0	28	0	0	0	0	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	10	0	0	10	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	8	0	0	8	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk					No			No						
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	34	0	0	34	0	0	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	Lag	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	15	0	0	15	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall					No			No						
Maximum Recall					Yes			Yes						
Pedestrian Recall					Yes			Yes						

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C
C, Calculated Cycle Length [s]	102	102	102
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28
g / C, Green / Cycle	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.09	0.05	0.11
s, saturation flow rate [veh/h]	1273	1581	915
c, Capacity [veh/h]	244	434	317
d1, Uniform Delay [s]	41.89	28.39	34.41
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	6.60	1.02	2.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.20	0.33
d, Delay for Lane Group [s/veh]	48.49	29.41	37.16
Lane Group LOS	D	C	D
Critical Lane Group	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.22	1.73	2.45
50th-Percentile Queue Length [m/ln]	24.56	13.15	18.68
95th-Percentile Queue Length [veh/ln]	5.80	3.11	4.41
95th-Percentile Queue Length [m/ln]	44.20	23.67	33.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.49	0.00	0.00	0.00	29.41	0.00	29.41	37.16	0.00	0.00	0.00	0.00	0.00	37.16
Movement LOS	D				C		C	D						D
d_A, Approach Delay [s/veh]	40.41							37.16						
Approach LOS	D							D						
d_I, Intersection Delay [s/veh]	19.94													
Intersection LOS	B													
Intersection V/C	0.575													

Emissions

Vehicle Kilometers Traveled [km/h]	14.35	10.55	24.52
Stops [stops/h]	113.74	60.91	86.54
Fuel consumption [L/h]	8.29	4.32	7.25
CO [g/h]	153.01	79.73	133.89
NOx [g/h]	29.77	15.51	26.05
VOC [g/h]	35.46	18.48	31.03

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	656.67	1315.55
M_CW, Crosswalk Circulation Area [m²/ped]	60.79	104.26
d_p, Pedestrian Delay [s]	37.96	37.96
I_p,int, Pedestrian LOS Score for Intersectio	1.826	1.834
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	490	490
d_b, Bicycle Delay [s]	29.06	29.06
I_b,int, Bicycle LOS Score for Intersection	1.900	1.735
Bicycle LOS	A	A

Intersection Setup

Name														
Approach	Eastbound							Westbound						
Lane Configuration														
Turning Movement	Left	Left	Left	Thru	Right	Right	Right	Left	Left	Left	Thru	Right	Right	Right
Lane Width [m]	3.60	3.66	3.66	3.60	3.66	3.66	3.66	3.66	3.66	3.66	3.60	3.66	3.66	3.60
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00							50.00						
Grade [%]	0.00							0.00						
Curb Present	Yes							Yes						
Crosswalk	Yes							Yes						

Volumes

Name														
Base Volume Input [veh/h]	3	0	0	1468	0	0	0	0	0	0	539	0	0	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Hourly Volume [veh/h]	3	0	0	1468	0	0	0	0	0	0	539	0	0	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	0	367	0	0	0	0	0	0	135	0	0	10
Total Analysis Volume [veh/h]	3	0	0	1468	0	0	0	0	0	0	539	0	0	40
Presence of On-Street Parking	No						No	No						No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1							20						
v_di, Inbound Pedestrian Volume crossing th	1							20						
v_co, Outbound Pedestrian Volume along th	12							6						
v_ci, Inbound Pedestrian Volume along the l	12							6						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	1	0	0	0	0	0	0	1	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	62	0	0	0	0	0	0	62	0	0	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	10	0	0	0	0	0	0	10	0	0	0
Pedestrian Clearance [s]	0	0	0	15	0	0	0	0	0	0	15	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No							No			
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	68	0	0	0	0	0	0	68	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	25	0	0	0	0	0	0	25	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Minimum Recall				Yes							Yes			
Maximum Recall				No							No			
Pedestrian Recall				Yes							Yes			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C
C, Calculated Cycle Length [s]	102	102	102	102
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	62	62	62	62
g / C, Green / Cycle	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.46	0.46	0.17	0.18
s, saturation flow rate [veh/h]	1668	1519	1669	1630
c, Capacity [veh/h]	1049	923	1015	991
d1, Uniform Delay [s]	14.56	14.56	9.49	9.54
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.56	5.83	0.71	0.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.76	0.29	0.29
d, Delay for Lane Group [s/veh]	19.11	20.39	10.19	10.29
Lane Group LOS	B	C	B	B
Critical Lane Group	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	13.01	12.14	3.06	3.09
50th-Percentile Queue Length [m/ln]	99.17	92.52	23.34	23.51
95th-Percentile Queue Length [veh/ln]	18.93	17.86	5.51	5.55
95th-Percentile Queue Length [m/ln]	144.26	136.07	42.02	42.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.11	0.00	0.00	19.72	0.00	0.00	0.00	0.00	0.00	0.00	10.24	0.00	0.00	10.29
Movement LOS	B			B							B			B
d_A, Approach Delay [s/veh]	19.72								10.24					
Approach LOS	B								B					
d_I, Intersection Delay [s/veh]	19.94													
Intersection LOS	B													
Intersection V/C	0.575													

Emissions

Vehicle Kilometers Traveled [km/h]	279.27	254.29	159.85	159.85
Stops [stops/h]	459.35	428.55	108.12	108.89
Fuel consumption [L/h]	48.21	44.82	19.91	19.95
CO [g/h]	890.27	827.65	367.62	368.31
NOx [g/h]	173.21	161.03	71.52	71.66
VOC [g/h]	206.33	191.82	85.20	85.36

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m ² /ped]	145.26	0.00
M_CW, Crosswalk Circulation Area [m ² /ped]	682.44	35.17
d_p, Pedestrian Delay [s]	37.96	37.96
I_p,int, Pedestrian LOS Score for Intersectio	2.842	2.815
Crosswalk LOS	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1216	1216
d_b, Bicycle Delay [s]	7.84	7.84
I_b,int, Bicycle LOS Score for Intersection	2.773	2.041
Bicycle LOS	C	B

Intersection Setup

Name														
Approach	Northeastbound							Southwestbound						
Lane Configuration														
Turning Movement	Left	Thru	Thru	Thru	Right	Right	Right	Left	Left	Thru	Thru	Right	Right	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00							50.00						
Grade [%]	0.00							0.00						
Curb Present														
Crosswalk	Yes							Yes						

Volumes

Name														
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Presence of On-Street Parking														
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12							6						
v_di, Inbound Pedestrian Volume crossing th	12							6						
v_co, Outbound Pedestrian Volume along th	12							6						
v_ci, Inbound Pedestrian Volume along the l	12							6						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk														
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall														
Maximum Recall														
Pedestrian Recall														

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

[illegible]

Lane Group Results

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS														
d_A, Approach Delay [s/veh]	0.00							0.00						
Approach LOS	A							A						
d_I, Intersection Delay [s/veh]	19.94													
Intersection LOS	B													
Intersection V/C	0.575													

Emissions

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	663.73	1315.55
M_CW, Crosswalk Circulation Area [m²/ped]	32.43	65.25
d_p, Pedestrian Delay [s]	37.96	37.96
I_p,int, Pedestrian LOS Score for Intersectio	1.427	1.427
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0
d_b, Bicycle Delay [s]	51.00	51.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.132
Bicycle LOS	D	D

Intersection Setup														
Name	Northbound Bike Lane							Southbound Bike Lane						
Approach	Northwestbound							Southeastbound						
Lane Configuration														
Turning Movement	Left	Left	Left	Thru	Thru	Right	Right2	Left3	Left2	Left	Thru	Thru	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	2.00	3.66	3.66	3.66	3.66	3.66	3.66	2.00	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00							30.00						
Grade [%]	0.00							0.00						
Curb Present	No							No						
Crosswalk	Yes							Yes						

Volumes

Name	Northbound Bike Lane							Southbound Bike Lane						
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Presence of On-Street Parking	No						No	No						No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12							6						
v_di, Inbound Pedestrian Volume crossing th	12							6						
v_co, Outbound Pedestrian Volume along th	20							1						
v_ci, Inbound Pedestrian Volume along the l	20							1						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	0	0	2	0	0	0	0	0	0	2	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	0	0	28	0	0	0	0	0	0	28	0
Amber [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	10	0	0	0	0	0	0	10	0
Pedestrian Clearance [s]	0	0	0	0	0	8	0	0	0	0	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Rest In Walk						No							No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	0	34	0	0	0	0	0	0	34	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	0	15	0	0	0	0	0	0	15	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall						No							No	
Maximum Recall						Yes							Yes	
Pedestrian Recall						Yes							Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	R	C
C, Calculated Cycle Length [s]	102	102
L, Total Lost Time per Cycle [s]	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00
g_i, Effective Green Time [s]	28	28
g / C, Green / Cycle	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00
s, saturation flow rate [veh/h]	1373	1616
c, Capacity [veh/h]	377	444
d1, Uniform Delay [s]	0.00	0.00
k, delay calibration	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.00	0.00
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00
Lane Group LOS	A	A
Critical Lane Group	No	No
50th-Percentile Queue Length [veh/ln]	0.00	0.00
50th-Percentile Queue Length [m/ln]	0.00	0.00
95th-Percentile Queue Length [veh/ln]	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS						A							A	
d_A, Approach Delay [s/veh]	0.00							0.00						
Approach LOS	A							A						
d_I, Intersection Delay [s/veh]	19.94													
Intersection LOS	B													
Intersection V/C	0.575													

Emissions

Vehicle Kilometers Traveled [km/h]	0.00	0.00
Stops [stops/h]	0.00	0.00
Fuel consumption [L/h]	0.00	0.00
CO [g/h]	0.00	0.00
NOx [g/h]	0.00	0.00
VOC [g/h]	0.00	0.00

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	32.43	65.25
d_p, Pedestrian Delay [s]	37.96	37.96
I_p,int, Pedestrian LOS Score for Intersectio	1.427	1.427
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	490	490
d_b, Bicycle Delay [s]	29.06	29.06
I_b,int, Bicycle LOS Score for Intersection	1.560	1.560
Bicycle LOS	A	A

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Jasper Avenue and 116 Street

Control Type:	Signalized	Delay (sec / veh):	55.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.883

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	60.00	30.48	60.00	40.00	30.48	30.48	70.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	149	320	68	222	556	39	37	1518	291	25	560	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	7	0	0	4	0	0	29	0	0	2
Total Hourly Volume [veh/h]	149	320	61	222	556	35	37	1518	262	25	560	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	80	15	56	139	9	9	380	66	6	140	4
Total Analysis Volume [veh/h]	149	320	61	222	556	35	37	1518	262	25	560	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			22			22			10		
v_di, Inbound Pedestrian Volume crossing m	10			22			22			10		
v_co, Outbound Pedestrian Volume crossing	10			27			10			27		
v_ci, Inbound Pedestrian Volume crossing mi	10			27			10			27		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	54.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	4	0	2	4	0	0	1	0	5	1	0
Auxiliary Signal Groups												
Maximum Green [s]	7	30	0	7	30	0	0	50	0	5	50	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Walk [s]	0	10	0	0	10	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	13	0	0	13	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	0.0	3.0	0.0	2.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	5.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	10	35	0	10	35	0	0	55	0	9	55	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	7	23	0	7	23	0	0	20	0	5	20	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No			Yes			Yes	
Maximum Recall	No	Yes		No	Yes			No			No	
Pedestrian Recall	Yes	Yes		Yes	Yes			Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	38	30	40	30	30	50	50	50	50	50	50
g / C, Green / Cycle	0.38	0.30	0.40	0.30	0.30	0.50	0.50	0.50	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.16	0.23	0.21	0.18	0.18	0.05	0.53	0.56	0.10	0.17	0.17
s, saturation flow rate [veh/h]	924	1631	1042	1683	1638	746	1683	1593	240	1683	1659
c, Capacity [veh/h]	342	489	328	505	491	352	841	796	72	841	830
d1, Uniform Delay [s]	19.99	31.97	26.90	29.78	29.83	20.53	25.00	25.00	50.00	15.10	15.12
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.99	11.60	10.65	5.02	5.24	0.60	49.64	66.57	12.73	1.12	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.78	0.68	0.59	0.60	0.11	1.06	1.11	0.35	0.34	0.35
d, Delay for Lane Group [s/veh]	23.99	43.57	37.55	34.80	35.07	21.13	74.64	91.57	62.73	16.22	16.26
Lane Group LOS	C	D	D	C	D	C	F	F	E	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.54	9.79	4.51	6.70	6.59	0.62	30.04	32.18	0.88	4.10	4.07
50th-Percentile Queue Length [m/ln]	19.39	74.57	34.37	51.02	50.25	4.72	228.93	245.22	6.67	31.22	31.01
95th-Percentile Queue Length [veh/ln]	4.58	14.92	7.99	10.94	10.81	1.12	40.98	44.91	1.58	7.37	7.33
95th-Percentile Queue Length [m/ln]	34.90	113.66	60.91	83.36	82.34	8.50	312.30	342.19	12.01	56.19	55.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.99	43.57	43.57	37.55	34.92	35.07	21.13	81.58	91.57	62.73	16.24	16.26
Movement LOS	C	D	D	D	C	D	C	F	F	E	B	B
d_A, Approach Delay [s/veh]	38.07			35.65			81.79			18.17		
Approach LOS	D			D			F			B		
d_I, Intersection Delay [s/veh]	55.48											
Intersection LOS	E											
Intersection V/C	0.883											

Emissions

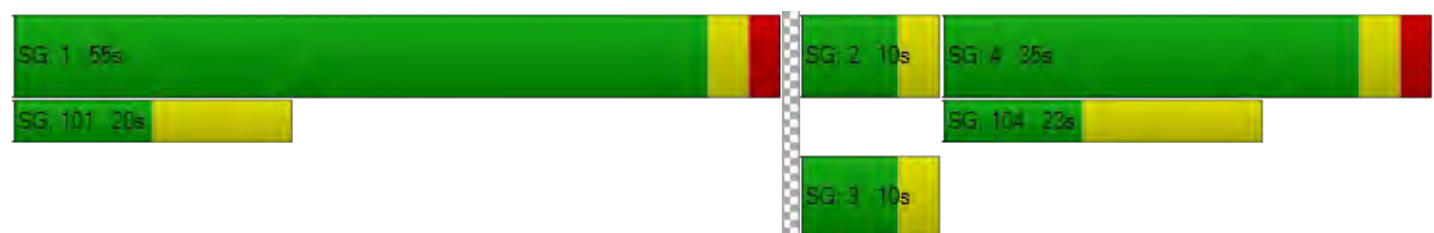
Vehicle Kilometers Traveled [km/h]	34.93	89.32	22.44	30.17	29.56	2.85	69.02	68.14	4.09	47.39	46.97
Stops [stops/h]	91.60	352.29	162.39	241.04	237.41	22.32	1081.54	1158.51	31.53	147.49	146.50
Fuel consumption [L/h]	8.13	29.19	12.20	16.28	16.04	1.37	82.32	94.84	2.30	11.44	11.35
CO [g/h]	150.15	538.99	225.23	300.61	296.16	25.37	1520.15	1751.23	42.55	211.21	209.65
NOx [g/h]	29.21	104.87	43.82	58.49	57.62	4.94	295.77	340.73	8.28	41.09	40.79
VOC [g/h]	34.80	124.92	52.20	69.67	68.64	5.88	352.31	405.86	9.86	48.95	48.59

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0			14.0			14.0			14.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	44.15			29.38			37.55			76.41		
d_p, Pedestrian Delay [s]	36.98			36.98			36.98			36.98		
I_p,int, Pedestrian LOS Score for Intersectio	2.534			2.493			2.931			2.893		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			600			1000			1000		
d_b, Bicycle Delay [s]	24.50			24.50			12.50			12.50		
I_b,int, Bicycle LOS Score for Intersection	2.446			2.234			3.083			2.058		
Bicycle LOS	B			B			C			B		

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: 100 Avenue and 116 StreetControl Type:
Analysis Method:
Analysis Period:Signalized
HCM 7th Edition
15 minutesDelay (sec / veh):
Level Of Service:
Volume to Capacity (v/c):61.3
E
0.519**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	70.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	1
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	0.00	100.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			3.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	7	3	8	275	7	551	455	818	13	4	635	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	55	0	0	1	0	0	8
Total Hourly Volume [veh/h]	7	3	7	275	7	496	455	818	12	4	635	75
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	2	69	2	124	114	205	3	1	159	19
Total Analysis Volume [veh/h]	7	3	7	275	7	496	455	818	12	4	635	75
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	22			17			17			22		
v_di, Inbound Pedestrian Volume crossing m	22			17			17			22		
v_co, Outbound Pedestrian Volume crossing	16			39			16			39		
v_ci, Inbound Pedestrian Volume crossing mi	16			39			16			39		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap	Overlap	Permiss	Permiss	Permiss
Signal Group	0	2	0	2	2	3	3	1	1	0	1	0
Auxiliary Signal Groups						2,3	1,3	1,3	1,3			
Maximum Green [s]	0	36	0	36	36	21	21	30	30	0	30	0
Amber [s]	0.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Walk [s]	0	7	0	7	7	5	5	10	10	0	10	0
Pedestrian Clearance [s]	0	18	0	18	18	10	10	15	15	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	3.0	3.0	1.0	1.0	3.0	3.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0	0.0	5.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	41	0	41	41	24	24	35	35	0	35	0
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	25	0	25	25	7	7	25	25	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall		No			No	No	No	Yes	Yes		Yes	
Maximum Recall		Yes			Yes	Yes	Yes	No	No		No	
Pedestrian Recall		Yes			Yes	Yes	Yes	Yes	Yes		Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C	C	R
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	0.00	0.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	36	36	62	54	54	30	30	30
g / C, Green / Cycle	0.36	0.36	0.62	0.54	0.54	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.02	0.24	0.32	0.76	0.51	0.20	0.20	0.05
s, saturation flow rate [veh/h]	699	1177	1573	789	1339	1497	1702	1466
c, Capacity [veh/h]	302	495	975	461	723	486	511	440
d1, Uniform Delay [s]	22.05	29.01	10.49	18.84	21.79	29.38	30.61	25.71
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	4.70	1.90	146.87	23.73	5.76	6.71	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.57	0.51	1.29	0.95	0.62	0.67	0.17
d, Delay for Lane Group [s/veh]	22.40	33.72	12.39	165.71	45.52	35.14	37.33	26.55
Lane Group LOS	C	C	B	F	D	D	D	C
Critical Lane Group	No	No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	0.28	6.43	6.01	25.55	18.73	6.66	7.96	1.40
50th-Percentile Queue Length [m/ln]	2.17	48.99	45.79	194.68	142.74	50.75	60.66	10.69
95th-Percentile Queue Length [veh/ln]	0.51	10.59	10.03	40.07	25.83	10.89	12.59	2.52
95th-Percentile Queue Length [m/ln]	3.90	80.68	76.43	305.33	196.83	83.00	95.92	19.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.40	22.40	22.40	33.72	33.72	12.39	165.71	66.26	45.52	35.14	36.31	26.55
Movement LOS	C	C	C	C	C	B	F	E	D	D	D	C
d_A, Approach Delay [s/veh]	22.40			20.12			101.28			35.28		
Approach LOS	C			C			F			D		
d_I, Intersection Delay [s/veh]	61.34											
Intersection LOS	E											
Intersection V/C	0.519											

Emissions

Vehicle Kilometers Traveled [km/h]	0.82	66.11	116.28	93.93	108.52	46.70	53.01	11.70
Stops [stops/h]	10.25	231.45	216.35	919.77	674.37	239.76	286.60	50.48
Fuel consumption [L/h]	0.60	18.81	20.65	105.66	49.60	17.92	21.24	3.78
CO [g/h]	11.11	347.26	381.34	1951.06	915.94	330.93	392.22	69.80
NOx [g/h]	2.16	67.56	74.20	379.61	178.21	64.39	76.31	13.58
VOC [g/h]	2.57	80.48	88.38	452.18	212.28	76.70	90.90	16.18

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	43.96	10.30	0.83	17.34
d_p, Pedestrian Delay [s]	36.98	36.98	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	1.745	2.921	2.773	3.075
Crosswalk LOS	A	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	720	720	1080	600
d_b, Bicycle Delay [s]	20.48	20.48	10.58	24.50
I_b,int, Bicycle LOS Score for Intersection	1.589	2.934	2.621	2.155
Bicycle LOS	A	C	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 15: Stony Plain Road and 102 Avenue

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.66	3.40	3.40	3.40	3.40	3.66
No. of Lanes in Entry Pocket	0	1	0	0	1	0
Entry Pocket Length [m]	30.48	45.00	30.48	30.48	75.00	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	252	531	1353	938	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	25	0	0	0	0
Total Hourly Volume [veh/h]	0	227	531	1353	938	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	57	133	338	235	0
Total Analysis Volume [veh/h]	0	227	531	1353	938	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		10	
v_di, Inbound Pedestrian Volume crossing m	0		0		10	
v_co, Outbound Pedestrian Volume crossing	10		10		10	
v_ci, Inbound Pedestrian Volume crossing mi	10		10		10	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	60.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Overlap	Overlap	Permissive
Signal Group	0	1	1	2	3	0
Auxiliary Signal Groups				1,2	2,3	
Maximum Green [s]	0	39	39	49	14	0
Amber [s]	0.0	4.0	4.0	4.0	3.0	0.0
All red [s]	0.0	2.0	2.0	3.0	2.0	0.0
Walk [s]	0	7	7	7	7	0
Pedestrian Clearance [s]	0	10	10	20	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No	No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	4.0	5.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	74.7	74.7	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	1.8	1.8	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	45	45	56	19	0
Lead / Lag	-	-	Lag	-	-	-
Minimum Green [s]	0	5	5	10	10	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0
Minimum Recall		No	No	No	No	
Maximum Recall		Yes	Yes	Yes	Yes	
Pedestrian Recall		Yes	Yes	Yes	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	R	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	6.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	2.00	3.00
g_i, Effective Green Time [s]	39	39	94	70
g / C, Green / Cycle	0.33	0.33	0.78	0.58
(v / s)_i Volume / Saturation Flow Rate	0.08	0.30	0.38	0.18
s, saturation flow rate [veh/h]	2813	1781	3560	5094
c, Capacity [veh/h]	914	579	2789	2971
d1, Uniform Delay [s]	29.74	38.95	4.54	12.77
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.65	21.78	0.61	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.25	0.92	0.49	0.32
d, Delay for Lane Group [s/veh]	30.39	60.73	5.15	13.05
Lane Group LOS	C	E	A	B
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	2.50	18.31	4.92	4.28
50th-Percentile Queue Length [m/ln]	19.04	139.49	37.46	32.58
95th-Percentile Queue Length [veh/ln]	4.50	25.32	8.55	7.67
95th-Percentile Queue Length [m/ln]	34.27	192.96	65.16	58.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	30.39	60.73	5.15	13.05	0.00
Movement LOS		C	E	A	B	
d_A, Approach Delay [s/veh]	30.39		20.82		13.05	
Approach LOS	C		C		B	
d_I, Intersection Delay [s/veh]			19.14			
Intersection LOS			B			
Intersection V/C			0.564			

Emissions

Vehicle Kilometers Traveled [km/h]	102.88	125.10	318.75	531.03
Stops [stops/h]	149.89	549.18	294.93	384.81
Fuel consumption [L/h]	18.46	49.06	42.31	68.59
CO [g/h]	340.95	905.94	781.32	1266.48
NOx [g/h]	66.34	176.26	152.02	246.41
VOC [g/h]	79.02	209.96	181.08	293.52

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	50.68
M_CW, Crosswalk Circulation Area [m²/ped]	57.81	0.00	62.91
d_p, Pedestrian Delay [s]	49.50	0.00	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.253	0.000	2.776
Crosswalk LOS	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	650	1567	1167
d_b, Bicycle Delay [s]	27.34	2.82	10.42
I_b,int, Bicycle LOS Score for Intersection	1.560	3.114	2.076
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 16: Stony Plain Road and 142 Street

Control Type:	Signalized	Delay (sec / veh):	146.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.944

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
No. of Lanes in Entry Pocket	0	0	1	0	0	2	1	0	0	0	0	1
Entry Pocket Length [m]	30.48	30.48	5.00	30.48	30.48	90.00	110.00	30.48	30.48	30.48	30.48	105.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	35.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	103	1023	1236	31	420	31	65	617	13	513	666	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	124	0	0	3	0	0	1	0	0	1
Total Hourly Volume [veh/h]	103	1023	1112	31	420	28	65	617	12	513	666	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	256	278	8	105	7	16	154	3	128	167	3
Total Analysis Volume [veh/h]	103	1023	1112	31	420	28	65	617	12	513	666	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			20			20			20		
v_di, Inbound Pedestrian Volume crossing m	20			20			20			20		
v_co, Outbound Pedestrian Volume crossing	20			20			20			20		
v_ci, Inbound Pedestrian Volume crossing mi	20			20			20			20		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	89.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	6	0	5	7	0	1	2	0	1	2	0
Auxiliary Signal Groups												
Maximum Green [s]	0	43	0	10	57	0	8	36	0	8	36	0
Amber [s]	0.0	4.0	0.0	4.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	5.0	0.0	2.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	50	0	14	64	0	13	43	0	13	43	0
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		No	No		No	No		No	No	
Maximum Recall		Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	L	C	R	L	C	C	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	5.00	0.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	43	43	43	57	57	57	8	36	36	8	36	36
g / C, Green / Cycle	0.36	0.36	0.36	0.48	0.48	0.48	0.07	0.30	0.30	0.07	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.43	0.37	0.40	0.06	0.13	0.02	0.04	0.17	0.17	0.15	0.36	0.01
s, saturation flow rate [veh/h]	1278	1567	2813	494	3279	1523	1640	1870	1854	3459	1870	1405
c, Capacity [veh/h]	494	562	1008	255	1558	723	109	561	556	231	561	422
d1, Uniform Delay [s]	41.93	38.50	38.50	25.19	18.97	16.83	54.42	35.37	35.38	56.00	42.00	29.60
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	72.79	46.58	60.91	0.98	0.43	0.10	21.57	4.04	4.10	565.04	101.17	0.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	1.11	1.03	1.10	0.12	0.27	0.04	0.59	0.56	0.56	2.22	1.19	0.02
d, Delay for Lane Group [s/veh]	114.72	85.08	99.41	26.17	19.39	16.93	75.99	39.41	39.48	621.04	143.17	29.71
Lane Group LOS	F	F	F	C	B	B	E	D	D	F	F	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	24.86	23.42	23.03	0.53	3.60	0.44	2.56	8.37	8.33	21.58	32.12	0.22
50th-Percentile Queue Length [m/ln]	189.42	178.47	175.47	4.03	27.44	3.32	19.53	63.79	63.48	164.40	244.72	1.66
95th-Percentile Queue Length [veh/ln]	35.33	32.07	32.96	0.95	6.48	0.78	4.61	13.12	13.06	34.64	45.96	0.39
95th-Percentile Queue Length [m/ln]	269.20	244.36	251.17	7.26	49.39	5.97	35.15	99.95	99.55	263.98	350.24	2.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	114.72	97.92	99.41	26.17	19.39	16.93	75.99	39.44	39.48	621.04	143.17	29.71
Movement LOS	F	F	F	C	B	B	E	D	D	F	F	C
d_A, Approach Delay [s/veh]	99.44			19.69			42.87			348.40		
Approach LOS	F			B			D			F		
d_I, Intersection Delay [s/veh]	146.95											
Intersection LOS	F											
Intersection V/C	0.944											

Emissions

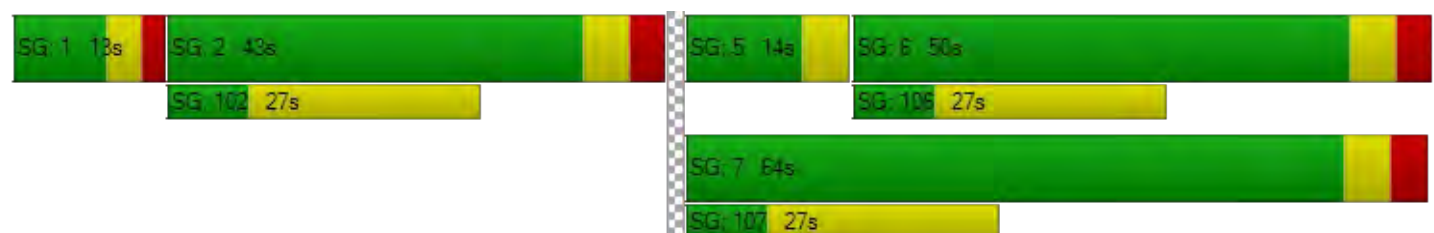
Vehicle Kilometers Traveled [km/h]	168.91	179.35	343.94	12.08	163.65	10.91	10.03	48.70	48.40	120.86	156.90	2.36
Stops [stops/h]	745.75	702.65	1381.65	15.88	216.04	13.06	76.87	251.14	249.93	1294.52	963.47	6.53
Fuel consumption [L/h]	81.05	70.83	148.86	2.13	26.69	1.70	6.48	19.84	19.75	285.90	109.98	0.60
CO [g/h]	1496.72	1307.86	2748.83	39.34	492.86	31.32	119.73	366.41	364.61	5279.31	2030.86	11.07
NOx [g/h]	291.21	254.46	534.82	7.65	95.89	6.09	23.29	71.29	70.94	1027.16	395.13	2.15
VOC [g/h]	346.88	303.11	637.07	9.12	114.23	7.26	27.75	84.92	84.50	1223.53	470.67	2.57

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	30.88			31.25			21.79			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	3.137			2.840			2.670			3.069		
Crosswalk LOS	C			C			B			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	717			950			600			600		
d_b, Bicycle Delay [s]	24.70			16.54			29.40			29.40		
I_b,int, Bicycle LOS Score for Intersection	3.508			1.957			2.133			3.523		
Bicycle LOS	D			A			B			D		

Sequence

Ring 1	1	2	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 17: Stony Plain Road and 149 Street

Control Type:	Signalized	Delay (sec / veh):	41.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [m]	90.00	30.48	30.48	65.00	30.48	75.00	50.00	30.48	0.00	110.00	30.48	75.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	60.00			60.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	45	827	111	11	644	65	100	472	46	57	500	264
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	11	0	0	7	0	0	5	0	0	26
Total Hourly Volume [veh/h]	45	827	100	11	644	58	100	472	41	57	500	238
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	207	25	3	161	15	25	118	10	14	125	60
Total Analysis Volume [veh/h]	45	827	100	11	644	58	100	472	41	57	500	238
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			10			10			10		
v_di, Inbound Pedestrian Volume crossing m	10			10			10			10		
v_co, Outbound Pedestrian Volume crossing	10			10			10			10		
v_ci, Inbound Pedestrian Volume crossing mi	10			10			10			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	44.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	7	0	5	6	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	8	51	0	11	37	0	11	37	0
Amber [s]	0.0	4.0	0.0	3.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	5.0	0.0	1.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	47	0	11	58	0	18	44	0	18	44	0
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		No	No		No	No		No	No	
Maximum Recall		Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	5.00	0.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	40	40	40	51	51	51	11	37	37	11	37	37
g / C, Green / Cycle	0.33	0.33	0.33	0.43	0.43	0.43	0.09	0.31	0.31	0.09	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.25	0.06	0.01	0.20	0.04	0.06	0.25	0.03	0.02	0.27	0.15
s, saturation flow rate [veh/h]	739	3279	1589	786	3279	1552	1640	1870	1589	3186	1870	1589
c, Capacity [veh/h]	190	1093	530	286	1394	660	150	577	490	292	577	490
d1, Uniform Delay [s]	43.36	35.66	28.46	23.06	24.69	20.59	52.72	38.40	29.46	50.41	39.18	33.76
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.91	4.90	0.79	0.25	1.10	0.26	20.88	12.25	0.34	1.49	16.07	3.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.24	0.76	0.19	0.04	0.46	0.09	0.67	0.82	0.08	0.20	0.87	0.49
d, Delay for Lane Group [s/veh]	46.28	40.56	29.25	23.31	25.79	20.85	73.60	50.65	29.80	51.90	55.25	37.18
Lane Group LOS	D	D	C	C	C	C	E	D	C	D	E	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.32	11.25	2.14	0.20	6.61	1.01	3.78	14.67	0.89	0.85	16.31	6.10
50th-Percentile Queue Length [m/ln]	10.03	85.76	16.34	1.50	50.34	7.68	28.83	111.76	6.80	6.51	124.26	46.47
95th-Percentile Queue Length [veh/ln]	2.37	16.76	3.86	0.35	10.82	1.82	6.81	20.95	1.61	1.54	22.93	10.15
95th-Percentile Queue Length [m/ln]	18.05	127.68	29.41	2.70	82.45	13.83	51.90	159.62	12.24	11.71	174.72	77.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.28	40.56	29.25	23.31	25.79	20.85	73.60	50.65	29.80	51.90	55.25	37.18
Movement LOS	D	D	C	C	C	C	E	D	C	D	E	D
d_A, Approach Delay [s/veh]	39.66			25.35			53.00			49.60		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	41.56											
Intersection LOS	D											
Intersection V/C	0.585											

Emissions

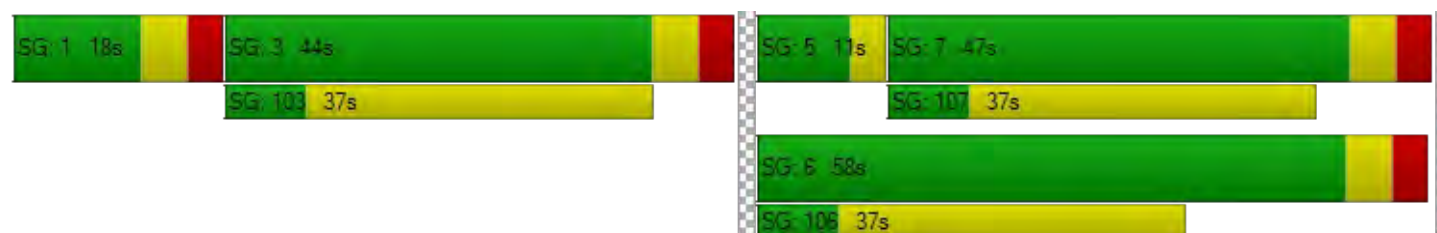
Vehicle Kilometers Traveled [km/h]	11.30	207.72	25.12	2.30	134.50	12.11	23.80	112.35	9.76	20.54	180.17	85.76
Stops [stops/h]	39.47	675.24	64.33	5.90	396.34	30.25	113.52	440.01	26.77	51.24	489.20	182.94
Fuel consumption [L/h]	3.86	65.71	6.52	0.59	37.29	2.96	10.48	38.97	2.47	5.38	49.39	19.08
CO [g/h]	71.31	1213.45	120.31	10.86	688.67	54.70	193.52	719.67	45.62	99.38	912.06	352.30
NOx [g/h]	13.88	236.09	23.41	2.11	133.99	10.64	37.65	140.02	8.88	19.34	177.45	68.54
VOC [g/h]	16.53	281.23	27.88	2.52	159.61	12.68	44.85	166.79	10.57	23.03	211.38	81.65

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			92.53			0.00			65.98		
M_CW, Crosswalk Circulation Area [m²/ped]	58.06			35.13			54.21			54.98		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.832			2.863			2.513			2.645		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	667			850			617			617		
d_b, Bicycle Delay [s]	26.67			19.84			28.70			28.70		
I_b,int, Bicycle LOS Score for Intersection	2.371			2.154			2.579			2.914		
Bicycle LOS	B			B			B			C		

Sequence

Ring 1	1	3	5	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Stony Plain Road and 156 Street

Control Type:	Signalized	Delay (sec / veh):	71.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.660

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.50	3.50	3.66	3.50	3.50	3.50	3.50	3.50	3.66	3.50	3.50
No. of Lanes in Entry Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	7.50	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	265	87	0	86	192	271	278	36	0	636	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	9	0	0	19	0	0	4	0	0	10
Total Hourly Volume [veh/h]	0	265	78	0	86	173	271	278	36	0	636	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	66	20	0	22	43	68	70	9	0	159	23
Total Analysis Volume [veh/h]	0	265	78	0	86	173	271	278	36	0	636	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			20			20			20		
v_di, Inbound Pedestrian Volume crossing m	20			20			20			20		
v_co, Outbound Pedestrian Volume crossing	20			20			20			20		
v_ci, Inbound Pedestrian Volume crossing mi	20			20			20			20		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	20.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	5	0	0	5	0	1	2	0	0	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	52	0	0	52	0	12	57	0	0	41	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	4.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	57	0	0	57	0	16	63	0	0	47	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	0	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No		No	No			No	
Maximum Recall		Yes			Yes		Yes	Yes			Yes	
Pedestrian Recall		Yes			Yes		No	Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	52	52	52	52	57	57	41
g / C, Green / Cycle	0.43	0.43	0.43	0.43	0.48	0.48	0.34
(v / s)_i Volume / Saturation Flow Rate	0.15	0.05	0.05	0.11	0.28	0.17	0.40
s, saturation flow rate [veh/h]	1722	1589	1722	1516	952	1822	1814
c, Capacity [veh/h]	746	689	746	657	291	866	620
d1, Uniform Delay [s]	22.77	20.26	20.28	21.62	35.70	19.98	39.50
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.33	0.31	0.98	37.85	1.18	93.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.11	0.12	0.26	0.93	0.36	1.17
d, Delay for Lane Group [s/veh]	24.09	20.59	20.59	22.60	73.56	21.16	133.03
Lane Group LOS	C	C	C	C	E	C	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	5.27	1.37	1.51	3.28	7.79	5.81	34.00
50th-Percentile Queue Length [m/ln]	40.17	10.46	11.50	24.96	59.34	44.27	259.07
95th-Percentile Queue Length [veh/ln]	9.04	2.47	2.72	5.90	12.36	9.76	48.24
95th-Percentile Queue Length [m/ln]	68.86	18.83	20.70	44.93	94.21	74.39	367.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	24.09	20.59	0.00	20.59	22.60	73.56	21.16	21.16	0.00	133.03	133.03
Movement LOS		C	C		C	C	E	C	C		F	F
d_A, Approach Delay [s/veh]	23.30			21.93			45.43			133.03		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	71.53											
Intersection LOS	E											
Intersection V/C	0.660											

Emissions

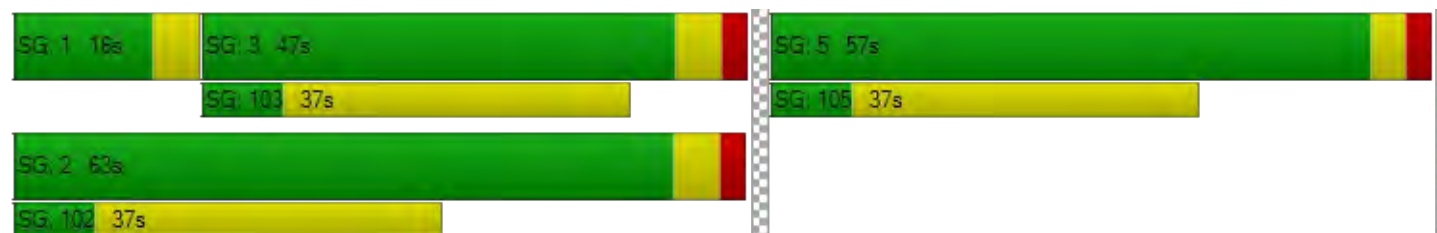
Vehicle Kilometers Traveled [km/h]	54.29	15.98	10.93	21.99	28.33	32.82	420.42
Stops [stops/h]	158.14	41.18	45.28	98.27	233.61	174.30	1019.96
Fuel consumption [L/h]	13.63	3.68	3.42	7.31	23.29	12.15	137.27
CO [g/h]	251.69	67.98	63.16	134.95	430.03	224.37	2534.73
NOx [g/h]	48.97	13.23	12.29	26.26	83.67	43.65	493.17
VOC [g/h]	58.33	15.75	14.64	31.28	99.66	52.00	587.45

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	23.51	9.20	19.06	24.81
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.215	2.427	2.437	2.299
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	867	867	950	683
d_b, Bicycle Delay [s]	19.27	19.27	16.54	26.00
I_b,int, Bicycle LOS Score for Intersection	2.140	2.018	2.531	2.774
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 19: Stony Plain Road and 158 Street**

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.184

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+ +			+ +		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	32	14	51	5	2	21	18	334	17	21	398	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	70.00	2.00	10.00	2.00	2.00	2.00	2.00	12.00	35.00	5.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	5	0	0	2	0	0	2	0	0	1
Total Hourly Volume [veh/h]	32	14	46	5	2	19	18	334	15	21	398	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	4	12	1	1	5	5	84	4	5	100	2
Total Analysis Volume [veh/h]	32	14	46	5	2	19	18	334	15	21	398	7
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	5			0			0			5		
v_di, Inbound Pedestrian Volume crossing m	5			0			0			5		
v_co, Outbound Pedestrian Volume crossing	5			5			5			5		
v_ci, Inbound Pedestrian Volume crossing mi	5			5			5			5		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	8.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	2	0	0	1	0	0	1	0
Auxiliary Signal Groups												
Maximum Green [s]	0	23	0	0	23	0	0	47	0	0	47	0
Amber [s]	0.0	5.0	0.0	0.0	5.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	9	0	0	9	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	28	0	0	28	0	0	37	0	0	37	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	21	0	0	21	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		Yes			Yes			No			No	
Pedestrian Recall		No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	C
C, Calculated Cycle Length [s]	65	65	65	65	65	65
L, Total Lost Time per Cycle [s]	5.00	5.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	23	31	31	31	31
g / C, Green / Cycle	0.35	0.35	0.48	0.48	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.06	0.02	0.12	0.11	0.12	0.12
s, saturation flow rate [veh/h]	1569	1586	1650	1540	1772	1664
c, Capacity [veh/h]	630	627	848	735	906	793
d1, Uniform Delay [s]	14.34	13.79	10.00	10.04	10.11	10.14
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	0.12	0.62	0.77	0.64	0.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.04	0.23	0.24	0.24	0.26
d, Delay for Lane Group [s/veh]	14.83	13.91	10.62	10.81	10.75	10.93
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.93	0.25	1.55	1.45	1.80	1.69
50th-Percentile Queue Length [m/ln]	7.12	1.92	11.79	11.04	13.72	12.90
95th-Percentile Queue Length [veh/ln]	1.68	0.45	2.78	2.61	3.24	3.05
95th-Percentile Queue Length [m/ln]	12.82	3.46	21.22	19.87	24.69	23.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.83	14.83	14.83	13.91	13.91	13.91	10.62	10.71	10.81	10.75	10.84	10.93
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	14.83			13.91			10.71			10.83		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	11.28											
Intersection LOS	B											
Intersection V/C	0.184											

Emissions

Vehicle Kilometers Traveled [km/h]	8.51	2.79	94.45	86.78	29.00	26.80
Stops [stops/h]	51.77	13.98	85.67	80.23	99.71	93.74
Fuel consumption [L/h]	3.02	0.86	12.47	11.52	6.83	6.37
CO [g/h]	55.81	15.83	230.33	212.71	126.11	117.71
NOx [g/h]	10.86	3.08	44.81	41.39	24.54	22.90
VOC [g/h]	12.93	3.67	53.38	49.30	29.23	27.28

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	13.0
M_corner, Corner Circulation Area [m²/ped]	54.50	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	127.37	132.97	0.00	237.31
d_p, Pedestrian Delay [s]	24.12	24.12	0.00	20.80
I_p,int, Pedestrian LOS Score for Intersectio	1.806	1.763	0.000	2.325
Crosswalk LOS	A	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	708	708	954	954
d_b, Bicycle Delay [s]	13.57	13.57	8.89	8.89
I_b,int, Bicycle LOS Score for Intersection	1.720	1.606	1.864	1.912
Bicycle LOS	A	A	A	A

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 20: Stony Plain Road and 163 Street

Control Type:	Signalized	Delay (sec / veh):	86.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.962

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	45.00	30.48	30.00	60.00	30.48	30.48	40.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	732	610	242	18	114	258	15	98	6	72	991	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	7.00	6.00	10.00	5.00	4.00	2.00	10.00	2.00	7.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	24	0	0	26	0	0	1	0	0	2
Total Hourly Volume [veh/h]	732	610	218	18	114	232	15	98	5	72	991	21
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	183	153	55	5	29	58	4	25	1	18	248	5
Total Analysis Volume [veh/h]	732	610	218	18	114	232	15	98	5	72	991	21
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12			5			3			10		
v_di, Inbound Pedestrian Volume crossing m	10			3			5			12		
v_co, Outbound Pedestrian Volume crossing	5			5			5			7		
v_ci, Inbound Pedestrian Volume crossing mi	5			7			5			5		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	100.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	3	0	0	3	0	0	1	0	0	1	0
Auxiliary Signal Groups												
Maximum Green [s]	23	47	0	0	47	0	0	48	0	0	48	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	16	0	0	16	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	2.0	0.0	0.0	2.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	26	51	0	0	51	0	0	53	0	0	53	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	7	24	0	0	24	0	0	26	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No			No			Yes			Yes	
Maximum Recall	Yes	Yes			Yes			No			No	
Pedestrian Recall	No	No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Calculated Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	73	47	47	47	47	48	48	48	48	48	48
g / C, Green / Cycle	0.56	0.36	0.36	0.36	0.36	0.37	0.37	0.37	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.57	0.49	0.03	0.06	0.15	0.03	0.03	0.03	0.06	0.28	0.28
s, saturation flow rate [veh/h]	1280	1706	619	1825	1554	557	1750	1719	1233	1840	1825
c, Capacity [veh/h]	758	617	56	660	562	119	646	635	468	679	674
d1, Uniform Delay [s]	27.63	41.50	65.00	28.26	31.11	52.36	26.65	26.66	30.56	35.72	35.73
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	25.41	164.85	14.70	0.57	2.24	2.16	0.24	0.25	0.70	7.37	7.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.97	1.34	0.32	0.17	0.41	0.13	0.08	0.08	0.15	0.75	0.75
d, Delay for Lane Group [s/veh]	53.05	206.35	79.70	28.83	33.35	54.52	26.89	26.91	31.26	43.09	43.18
Lane Group LOS	D	F	E	C	C	D	C	C	C	D	D
Critical Lane Group	Yes	Yes	No	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	21.38	47.68	0.82	2.55	5.83	0.52	1.10	1.10	1.70	15.31	15.22
50th-Percentile Queue Length [m/ln]	162.93	363.32	6.28	19.44	44.43	3.96	8.37	8.35	12.98	116.66	115.96
95th-Percentile Queue Length [veh/ln]	28.97	70.42	1.48	4.59	9.79	0.93	1.98	1.97	3.07	21.73	21.62
95th-Percentile Queue Length [m/ln]	220.72	536.63	11.31	34.99	74.60	7.12	15.07	15.03	23.37	165.56	164.71

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.05	206.35	206.35	79.70	28.83	33.35	54.52	26.90	26.91	31.26	43.13	43.18
Movement LOS	D	F	F	E	C	C	D	C	C	C	D	D
d_A, Approach Delay [s/veh]	134.42			34.22			30.41			42.34		
Approach LOS	F			C			C			D		
d_I, Intersection Delay [s/veh]	86.90											
Intersection LOS	F											
Intersection V/C	0.962											

Emissions

Vehicle Kilometers Traveled [km/h]	119.73	135.43	2.60	16.47	33.53	3.68	12.65	12.61	6.50	45.83	45.50
Stops [stops/h]	592.11	1320.35	22.84	70.65	161.46	14.38	30.42	30.34	47.18	423.97	421.43
Fuel consumption [L/h]	54.58	174.09	1.86	5.68	12.77	1.30	2.96	2.95	3.41	30.72	30.55
CO [g/h]	1007.89	3214.73	34.43	104.96	235.83	24.05	54.57	54.39	62.97	567.35	564.14
NOx [g/h]	196.10	625.47	6.70	20.42	45.88	4.68	10.62	10.58	12.25	110.38	109.76
VOC [g/h]	233.59	745.05	7.98	24.32	54.66	5.57	12.65	12.60	14.59	131.49	130.74

Other Modes

g_Walk,mi, Effective Walk Time [s]	4.0	4.0	4.0	4.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	14.56	22.80	0.00	0.00
d_p, Pedestrian Delay [s]	61.06	61.06	61.06	61.06
I_p,int, Pedestrian LOS Score for Intersectio	2.738	2.474	3.282	2.642
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	723	723	738	738
d_b, Bicycle Delay [s]	26.50	26.50	25.86	25.86
I_b,int, Bicycle LOS Score for Intersection	4.173	2.203	1.658	2.456
Bicycle LOS	D	B	A	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 21: 95 Avenue and 156 Street

Control Type:	Signalized	Delay (sec / veh):	42.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.557

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	75.00	30.48	30.48	75.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	227	182	134	44	203	92	36	342	45	68	293	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	13	0	0	9	0	0	5	0	0	3
Total Hourly Volume [veh/h]	227	182	121	44	203	83	36	342	40	68	293	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	46	30	11	51	21	9	86	10	17	73	7
Total Analysis Volume [veh/h]	227	182	121	44	203	83	36	342	40	68	293	28
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			20			20			20		
v_di, Inbound Pedestrian Volume crossing m	20			20			20			20		
v_co, Outbound Pedestrian Volume crossing	20			20			20			20		
v_ci, Inbound Pedestrian Volume crossing mi	20			20			20			20		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	40.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	2	3	0	1	5	0	7	9	0	7	9	0
Auxiliary Signal Groups												
Maximum Green [s]	22	47	0	12	37	0	7	36	0	7	36	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	27	52	0	17	42	0	10	41	0	10	41	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	0.00	3.00	0.00	3.00
g_i, Effective Green Time [s]	22	47	12	37	46	36	46	36
g / C, Green / Cycle	0.18	0.39	0.10	0.31	0.38	0.30	0.38	0.30
(v / s)_i Volume / Saturation Flow Rate	0.14	0.18	0.03	0.16	0.03	0.23	0.06	0.19
s, saturation flow rate [veh/h]	1640	1723	1640	1756	1160	1677	1112	1684
c, Capacity [veh/h]	301	675	164	541	357	503	307	505
d1, Uniform Delay [s]	46.44	26.94	49.94	34.29	25.02	38.08	26.55	36.32
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.08	2.15	3.97	3.66	0.56	10.32	1.66	5.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.45	0.27	0.53	0.10	0.76	0.22	0.64
d, Delay for Lane Group [s/veh]	62.53	29.10	53.91	37.95	25.58	48.39	28.21	42.31
Lane Group LOS	E	C	D	D	C	D	C	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	7.74	6.78	1.40	7.43	0.70	11.53	1.39	8.93
50th-Percentile Queue Length [m/ln]	59.00	51.67	10.71	56.58	5.37	87.89	10.61	68.06
95th-Percentile Queue Length [veh/ln]	12.31	11.05	2.53	11.89	1.27	17.10	2.51	13.83
95th-Percentile Queue Length [m/ln]	93.77	84.21	19.27	90.64	9.66	130.33	19.09	105.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	62.53	29.10	29.10	53.91	37.95	37.95	25.58	48.39	48.39	28.21	42.31	42.31
Movement LOS	E	C	C	D	D	D	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	43.42			40.08			46.43			39.85		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	42.68											
Intersection LOS	D											
Intersection V/C	0.557											

Emissions

Vehicle Kilometers Traveled [km/h]	57.37	76.57	14.95	97.18	10.30	109.28	23.38	110.38
Stops [stops/h]	232.29	203.43	42.15	222.77	21.14	346.02	41.75	267.94
Fuel consumption [L/h]	21.60	18.64	4.20	22.60	2.16	32.40	4.64	26.97
CO [g/h]	398.88	344.20	77.46	417.39	39.95	598.25	85.66	498.10
NOx [g/h]	77.61	66.97	15.07	81.21	7.77	116.40	16.67	96.91
VOC [g/h]	92.44	79.77	17.95	96.73	9.26	138.65	19.85	115.44

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	27.39	28.62	22.48	19.59
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.292	2.181	2.413	2.379
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	783	617	600	600
d_b, Bicycle Delay [s]	22.20	28.70	29.40	29.40
I_b,int, Bicycle LOS Score for Intersection	2.456	2.119	2.258	2.206
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	3	7	9	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 22: 87 Avenue and Meadowlark Road**

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [m]	65.00	30.48	25.00	85.00	30.48	30.48	135.00	30.48	30.48	75.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	236	374	770	32	219	13	149	601	91	163	213	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	77	0	0	1	0	0	9	0	0	2
Total Hourly Volume [veh/h]	236	374	693	32	219	12	149	601	82	163	213	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	94	173	8	55	3	37	150	21	41	53	4
Total Analysis Volume [veh/h]	236	374	693	32	219	12	149	601	82	163	213	15
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	115.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	5	1	4	7	0	1	3	1	1	3	0
Auxiliary Signal Groups			1,4,5,7									
Maximum Green [s]	21	48	7	7	33	0	7	34	7	7	34	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	4.0	4.0	4.0	0.0
All red [s]	3.0	3.0	0.0	2.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	5.0	5.0	2.0	4.0	5.0	0.0	2.0	5.0	2.0	2.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	28	55	11	13	40	0	11	41	11	11	41	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	8	5	5	10	0	5	10	5	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes	No	No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	4.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	2.00	4.00	5.00	5.00	0.00	5.00	5.00	0.00	5.00	5.00
g_i, Effective Green Time [s]	21	48	62	7	33	33	45	34	34	45	34	34
g / C, Green / Cycle	0.18	0.40	0.52	0.06	0.28	0.28	0.38	0.28	0.28	0.38	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.14	0.11	0.45	0.04	0.07	0.07	0.12	0.19	0.19	0.17	0.07	0.07
s, saturation flow rate [veh/h]	1640	3560	1532	751	1722	1675	1278	1870	1754	962	1722	1663
c, Capacity [veh/h]	287	1424	792	91	474	460	509	530	497	323	488	471
d1, Uniform Delay [s]	47.70	24.14	18.77	57.56	33.81	33.86	25.77	37.88	38.08	27.98	33.02	33.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.60	0.45	12.97	10.28	1.23	1.30	1.46	6.28	7.11	5.56	1.13	1.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.82	0.26	0.88	0.35	0.24	0.25	0.29	0.66	0.67	0.51	0.24	0.24
d, Delay for Lane Group [s/veh]	70.30	24.58	31.75	67.84	35.04	35.16	27.23	44.16	45.19	33.54	34.15	34.27
Lane Group LOS	E	C	C	E	D	D	C	D	D	C	C	C
Critical Lane Group	Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.57	3.66	14.61	1.23	2.80	2.79	3.12	9.90	9.64	3.71	2.73	2.70
50th-Percentile Queue Length [m/ln]	65.34	27.85	111.32	9.38	21.35	21.24	23.75	75.46	73.47	28.27	20.82	20.59
95th-Percentile Queue Length [veh/ln]	13.38	6.58	20.88	2.21	5.04	5.02	5.61	15.06	14.73	6.68	4.92	4.86
95th-Percentile Queue Length [m/ln]	101.93	50.13	159.08	16.88	38.44	38.24	42.75	114.78	112.27	50.89	37.47	37.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	70.30	24.58	31.75	67.84	35.10	35.16	27.23	44.59	45.19	33.54	34.21	34.27
Movement LOS	E	C	C	E	D	D	C	D	D	C	C	C
d_A, Approach Delay [s/veh]	36.68			39.08			41.54			33.93		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	37.97											
Intersection LOS	D											
Intersection V/C	0.617											

Emissions

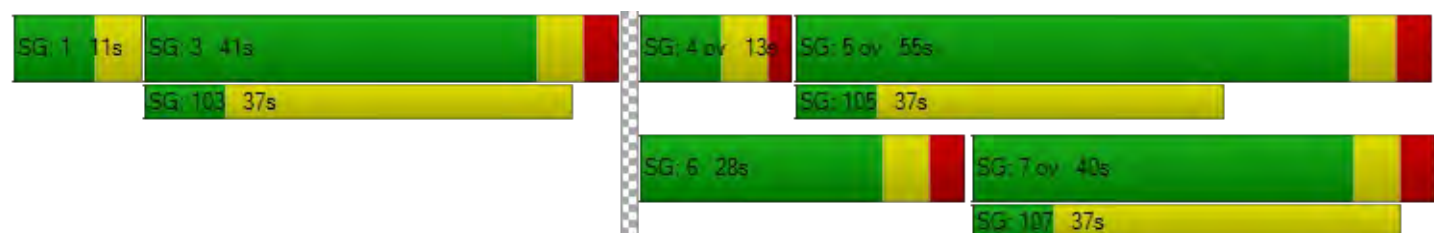
Vehicle Kilometers Traveled [km/h]	42.30	67.03	124.20	7.24	26.25	26.03	57.30	134.06	128.61	44.66	31.46	31.00
Stops [stops/h]	257.23	219.31	438.26	36.91	84.07	83.64	93.51	297.08	289.24	111.30	81.97	81.06
Fuel consumption [L/h]	22.57	18.38	38.60	3.19	7.51	7.47	10.67	31.27	30.37	10.96	7.85	7.75
CO [g/h]	416.83	339.39	712.69	58.89	138.77	137.89	197.11	577.51	560.73	202.31	145.02	143.19
NOx [g/h]	81.10	66.03	138.66	11.46	27.00	26.83	38.35	112.36	109.10	39.36	28.22	27.86
VOC [g/h]	96.61	78.66	165.17	13.65	32.16	31.96	45.68	133.84	129.95	46.89	33.61	33.19

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	15.30			16.51			17.95			0.00		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.958			2.541			2.590			2.725		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	800			550			567			567		
d_b, Bicycle Delay [s]	21.60			31.54			30.82			30.82		
I_b,int, Bicycle LOS Score for Intersection	2.698			1.777			2.253			1.884		
Bicycle LOS	B			A			B			A		

Sequence

Ring 1	1	3	4	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 23: 109 Street and 82 AveControl Type:
Analysis Method:
Analysis Period:Signalized
HCM 7th Edition
15 minutesDelay (sec / veh): 30.9
Level Of Service: C
Volume to Capacity (v/c): 0.748**Intersection Setup**

Name	109 Street			109 Street			82 Ave			82 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.00	3.20	4.20	3.50	3.50	3.50	3.20	3.20	5.50	3.00	3.00	3.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [m]	100.00	30.48	30.48	70.00	30.48	30.48	50.00	30.48	30.48	50.00	30.48	15.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	109 Street			109 Street			82 Ave			82 Ave		
Base Volume Input [veh/h]	426	1553	112	76	805	58	55	516	78	74	744	239
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	11	0	0	6	0	0	8	0	0	24
Total Hourly Volume [veh/h]	426	1553	101	76	805	52	55	516	70	74	744	215
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	107	388	25	19	201	13	14	129	18	19	186	54
Total Analysis Volume [veh/h]	426	1553	101	76	805	52	55	516	70	74	744	215
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	21			31			20			31		
v_di, Inbound Pedestrian Volume crossing m	20			31			21			31		
v_co, Outbound Pedestrian Volume crossing	28			26			25			27		
v_ci, Inbound Pedestrian Volume crossing mi	27			25			26			28		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	16			1			3			4		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	68.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	1	0	6	7	0	2	4	0	3	4	0
Auxiliary Signal Groups												
Maximum Green [s]	15	50	0	15	50	0	15	50	0	15	50	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	23	57	0	10	44	0	9	33	0	9	33	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	26	0	7	5	0	6	28	0	6	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	Yes		No	Yes			No			No	
Maximum Recall	Yes	No		Yes	No			No			No	
Pedestrian Recall	No	No		No	No			Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	62	52	52	62	39	39	28	28	28	28	28	28
g / C, Green / Cycle	0.62	0.52	0.52	0.62	0.39	0.39	0.28	0.28	0.28	0.28	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.48	0.48	0.07	0.17	0.18	0.18	0.11	0.17	0.18	0.10	0.24	0.17
s, saturation flow rate [veh/h]	889	3204	1414	443	3204	1614	522	1683	1653	707	3076	1264
c, Capacity [veh/h]	581	1666	735	258	1250	629	89	471	463	148	861	354
d1, Uniform Delay [s]	13.33	22.35	12.36	20.59	22.61	22.68	49.47	31.37	31.52	44.45	34.19	30.73
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.00	10.91	0.39	2.90	1.19	2.42	6.68	1.34	1.44	2.58	2.74	1.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.73	0.93	0.14	0.29	0.45	0.46	0.61	0.62	0.63	0.50	0.86	0.61
d, Delay for Lane Group [s/veh]	21.33	33.27	12.75	23.49	23.80	25.10	56.15	32.72	32.96	47.03	36.93	32.42
Lane Group LOS	C	C	B	C	C	C	E	C	C	D	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.78	18.20	1.21	0.82	5.03	5.37	1.53	6.22	6.27	1.94	8.84	4.59
50th-Percentile Queue Length [m/ln]	44.05	138.66	9.19	6.21	38.36	40.95	11.68	47.40	47.81	14.75	67.36	34.96
95th-Percentile Queue Length [veh/ln]	9.72	25.19	2.17	1.47	8.71	9.18	2.76	10.31	10.38	3.48	13.72	8.10
95th-Percentile Queue Length [m/ln]	74.10	191.97	16.55	11.18	66.40	69.92	21.02	78.57	79.11	26.55	104.52	61.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.33	33.27	12.75	23.49	24.18	25.10	56.15	32.82	32.96	47.03	36.93	32.42
Movement LOS	C	C	B	C	C	C	E	C	C	D	D	C
d_A, Approach Delay [s/veh]	29.83			24.18			34.84			36.71		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	30.91											
Intersection LOS	C											
Intersection V/C	0.748											

Emissions

Vehicle Kilometers Traveled [km/h]	133.06	485.09	31.55	8.38	62.54	31.97	31.73	168.83	169.28	12.51	125.81	36.36
Stops [stops/h]	208.11	1310.20	43.43	29.36	362.47	193.46	55.17	223.94	225.86	69.68	636.49	165.17
Fuel consumption [L/h]	24.33	115.34	4.97	2.83	24.48	12.99	6.64	28.46	28.62	5.01	43.64	11.60
CO [g/h]	449.25	2129.87	91.74	52.28	451.99	239.79	122.53	525.54	528.52	92.48	805.89	214.12
NOx [g/h]	87.41	414.40	17.85	10.17	87.94	46.65	23.84	102.25	102.83	17.99	156.80	41.66
VOC [g/h]	104.12	493.62	21.26	12.12	104.75	55.57	28.40	121.80	122.49	21.43	186.77	49.62

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	23.53			19.66			0.00			32.41		
M_CW, Crosswalk Circulation Area [m²/ped]	34.43			16.21			20.85			23.08		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	3.159			3.013			2.944			2.787		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1040			780			560			560		
d_b, Bicycle Delay [s]	11.61			18.61			25.96			25.97		
I_b,int, Bicycle LOS Score for Intersection	3.285			2.076			2.095			2.432		
Bicycle LOS	C			B			B			B		

Sequence

Ring 1	6	1	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 24: 109 Street and 83 Ave

Control Type:	Signalized	Delay (sec / veh):	5.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.394

Intersection Setup

Name	109 Street					109 Street				
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right2	Left	Left	Thru	Right	Right
Lane Width [m]	3.66	3.66	3.20	3.66	4.20	3.66	3.66	3.50	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	35.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	109 Street					109 Street				
Base Volume Input [veh/h]	0	0	1043	0	11	0	0	582	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	1	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	1043	0	10	0	0	582	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	261	0	3	0	0	146	0	0
Total Analysis Volume [veh/h]	0	0	1043	0	10	0	0	582	0	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	16					10				
v_di, Inbound Pedestrian Volume crossing th	30					1				
v_co, Outbound Pedestrian Volume along th	13					8				
v_ci, Inbound Pedestrian Volume along the l	13					8				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	19					1				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	1	0	0	0	0	1	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	100	0	0	0	0	100	0	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Walk [s]	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	0	10	0	0	0	0	10	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			Yes					Yes		
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	68	0	0	0	0	68	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	30	0	0	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Minimum Recall			Yes					Yes		
Maximum Recall			No					No		
Pedestrian Recall			No					No		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C
C, Calculated Cycle Length [s]	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00
g_i, Effective Green Time [s]	81	81	81
g / C, Green / Cycle	0.81	0.81	0.81
(v / s)_i Volume / Saturation Flow Rate	0.33	0.01	0.18
s, saturation flow rate [veh/h]	3204	1422	3204
c, Capacity [veh/h]	2586	1147	2586
d1, Uniform Delay [s]	2.76	1.88	2.28
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	0.47	0.01	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.01	0.23
d, Delay for Lane Group [s/veh]	3.23	1.89	2.48
Lane Group LOS	A	A	A
Critical Lane Group	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.03	0.03	0.93
50th-Percentile Queue Length [m/ln]	15.50	0.22	7.09
95th-Percentile Queue Length [veh/ln]	3.66	0.05	1.68
95th-Percentile Queue Length [m/ln]	27.91	0.39	12.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	3.23	0.00	1.89	0.00	0.00	2.48	0.00	0.00
Movement LOS			A		A			A		
d_A, Approach Delay [s/veh]	3.22					2.48				
Approach LOS	A					A				
d_I, Intersection Delay [s/veh]	5.90									
Intersection LOS	A									
Intersection V/C	0.394									

Emissions

Vehicle Kilometers Traveled [km/h]	115.02	1.10	184.01
Stops [stops/h]	146.50	1.03	67.01
Fuel consumption [L/h]	16.83	0.14	20.12
CO [g/h]	310.76	2.63	371.59
NOx [g/h]	60.46	0.51	72.30
VOC [g/h]	72.02	0.61	86.12

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	42.64
M_CW, Crosswalk Circulation Area [m²/ped]	31.83	136.78
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.742	2.546
Crosswalk LOS	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1280	1280
d_b, Bicycle Delay [s]	6.54	6.48
I_b,int, Bicycle LOS Score for Intersection	2.429	2.040
Bicycle LOS	B	B

Intersection Setup

Name	83 Ave					WB Bike Lane				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left2	Left	Thru	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	5.00	3.66	3.66	3.66	1.50	1.50
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	40.00					30.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	83 Ave					WB Bike Lane				
Base Volume Input [veh/h]	0	0	0	0	44	0	0	0	110	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	33	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	11	0	0	0	110	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	3	0	0	0	28	0
Total Analysis Volume [veh/h]	0	0	0	0	11	0	0	0	110	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8					13				
v_di, Inbound Pedestrian Volume crossing th	8					13				
v_co, Outbound Pedestrian Volume along th	30					1				
v_ci, Inbound Pedestrian Volume along the l	16					10				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					110				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	0	0	2	0	0	0	2	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	0	0	29	0	0	0	29	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	22	0	0	0	22	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk					No				No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	32	0	0	0	32	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	29	0	0	0	29	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall					No				No	
Maximum Recall					No				No	
Pedestrian Recall					No				No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	R	C
C, Calculated Cycle Length [s]	100	100
L, Total Lost Time per Cycle [s]	3.00	3.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00
l2, Clearance Lost Time [s]	1.00	1.00
g_i, Effective Green Time [s]	12	12
g / C, Green / Cycle	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07
s, saturation flow rate [veh/h]	1321	1616
c, Capacity [veh/h]	163	199
d1, Uniform Delay [s]	38.73	41.26
k, delay calibration	0.04	0.04
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.06	0.89
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.55
d, Delay for Lane Group [s/veh]	38.80	42.15
Lane Group LOS	D	D
Critical Lane Group	No	Yes
50th-Percentile Queue Length [veh/ln]	0.24	2.65
50th-Percentile Queue Length [m/ln]	1.86	20.17
95th-Percentile Queue Length [veh/ln]	0.44	4.76
95th-Percentile Queue Length [m/ln]	3.34	36.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	38.80	0.00	0.00	0.00	42.15	0.00
Movement LOS					D				D	
d_A, Approach Delay [s/veh]	38.80					42.15				
Approach LOS	D					D				
d_I, Intersection Delay [s/veh]	5.90									
Intersection LOS	A									
Intersection V/C	0.394									

Emissions

Vehicle Kilometers Traveled [km/h]	1.40	8.03
Stops [stops/h]	8.77	95.28
Fuel consumption [L/h]	0.60	5.30
CO [g/h]	11.14	97.90
NOx [g/h]	2.17	19.05
VOC [g/h]	2.58	22.69

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	24.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	63.57	66.64
d_p, Pedestrian Delay [s]	39.61	28.88
I_p,int, Pedestrian LOS Score for Intersectio	1.511	1.745
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	580	580
d_b, Bicycle Delay [s]	25.21	26.67
I_b,int, Bicycle LOS Score for Intersection	1.560	1.741
Bicycle LOS	A	A

Intersection Setup

Name	83 Avenue					EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration						1				
Turning Movement	Left	Thru	Thru	Right	Right	Left2	Left	Thru	Right	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	1.50	1.50	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					30.00				
Grade [%]	0.00					0.00				
Curb Present						Yes				
Crosswalk	Yes					Yes				

Volumes

Name	83 Avenue					EB Bike Lane				
Base Volume Input [veh/h]	0	0	0	0	0	0	14	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	14	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	4	0	0	0
Total Analysis Volume [veh/h]	0	0	0	0	0	0	14	0	0	0
Presence of On-Street Parking						No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	13					8				
v_di, Inbound Pedestrian Volume crossing th	13					8				
v_co, Outbound Pedestrian Volume along th	13					8				
v_ci, Inbound Pedestrian Volume along the l	13					8				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					14				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	51.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	0	0	0	0	2	0	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	0	0	0	0	29	0	0	0
Amber [s]	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	22	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk							No			
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	0	0	32	0	0	0
Lead / Lag	-	-	-	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	0	0	29	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall							No			
Maximum Recall							No			
Pedestrian Recall							No			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L
C, Calculated Cycle Length [s]		100
L, Total Lost Time per Cycle [s]		3.00
l1_p, Permitted Start-Up Lost Time [s]		0.00
l2, Clearance Lost Time [s]		1.00
g_i, Effective Green Time [s]		12
g / C, Green / Cycle		0.12
(v / s)_i Volume / Saturation Flow Rate		0.01
s, saturation flow rate [veh/h]		1539
c, Capacity [veh/h]		189
d1, Uniform Delay [s]		38.80
k, delay calibration		0.04
l, Upstream Filtering Factor		1.00
d2, Incremental Delay [s]		0.06
d3, Initial Queue Delay [s]		0.00
Rp, platoon ratio		1.00
PF, progression factor		1.00

Lane Group Results

X, volume / capacity		0.07
d, Delay for Lane Group [s/veh]		38.86
Lane Group LOS		D
Critical Lane Group		No
50th-Percentile Queue Length [veh/ln]		0.31
50th-Percentile Queue Length [m/ln]		2.39
95th-Percentile Queue Length [veh/ln]		0.57
95th-Percentile Queue Length [m/ln]		4.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	38.86	0.00	0.00	0.00
Movement LOS							D			
d_A, Approach Delay [s/veh]	0.00						38.86			
Approach LOS	A						D			
d_I, Intersection Delay [s/veh]	5.90									
Intersection LOS	A									
Intersection V/C	0.394									

Emissions

Vehicle Kilometers Traveled [km/h]		1.77
Stops [stops/h]		11.31
Fuel consumption [L/h]		0.72
CO [g/h]		13.34
NOx [g/h]		2.60
VOC [g/h]		3.09

Other Modes

g_Walk,mi, Effective Walk Time [s]	24.0	24.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	76.26	108.69
d_p, Pedestrian Delay [s]	28.88	28.88
I_p,int, Pedestrian LOS Score for Intersectio	1.427	1.745
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	580
d_b, Bicycle Delay [s]	50.00	25.38
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560
Bicycle LOS	D	A

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 25: 109 Street and 86 Ave

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 342.2
Level Of Service: F
Volume to Capacity (v/c): 0.533

Intersection Setup

Name	109 Street			109 Street			86 Ave			86 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.20	4.20	3.50	3.50	3.50	3.66	3.66	3.66	3.00	3.00	3.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	40.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	109 Street			109 Street			86 Ave			86 Ave		
Base Volume Input [veh/h]	0	1776	24	19	927	67	0	0	0	1	8	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1776	24	19	927	67	0	0	0	1	8	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	444	6	5	232	17	0	0	0	0	2	23
Total Analysis Volume [veh/h]	0	1776	24	19	927	67	0	0	0	1	8	91
Pedestrian Volume [ped/h]	0			0			26			10		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance				No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.02	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.05	0.53	0.33
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	15.85	0.00	0.00	0.00	0.00	0.00	288.49	342.19	115.22
Movement LOS		A	A	C	A	A				F	F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	5.54	5.54	5.54
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	0.24	0.12	0.00	0.00	0.00	0.00	42.19	42.19	42.19
d_A, Approach Delay [s/veh]	0.00			0.30			0.00			135.11		
Approach LOS	A			A			A			F		
d_I, Intersection Delay [s/veh]	4.74											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 26: 109 Street and 87 Ave

Control Type:	Signalized	Delay (sec / veh):	36.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.489

Intersection Setup

Name	109 Street				109 Street				87 Ave			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [m]	3.20	3.66	3.20	4.00	3.66	3.66	3.60	4.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	1
Entry Pocket Length [m]	80.00	30.48	30.48	35.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	45.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00				50.00				50.00			
Grade [%]	0.00				0.00				0.00			
Curb Present	Yes				Yes				Yes			
Crosswalk	Yes				No				Yes			

Volumes

Name	109 Street				109 Street				87 Ave			
Base Volume Input [veh/h]	686	1171	0	10	0	0	833	231	267	0	0	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	1	0	0	0	23	0	0	0	16
Total Hourly Volume [veh/h]	686	1171	0	9	0	0	833	208	267	0	0	144
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	172	293	0	2	0	0	208	52	67	0	0	36
Total Analysis Volume [veh/h]	686	1171	0	9	0	0	833	208	267	0	0	144
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	53				0				13			
v_di, Inbound Pedestrian Volume crossing th	52				0				14			
v_co, Outbound Pedestrian Volume along th	16				14				52			
v_ci, Inbound Pedestrian Volume along the l	16				13				53			
v_ab, Corner Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	25				6				5			

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	1	0	3	0	0	1	0	0	0	3	2
Auxiliary Signal Groups	1,2	1,2		1,3								
Maximum Green [s]	30	59	0	26	0	0	59	0	0	0	26	30
Amber [s]	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	3.0
All red [s]	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	2.0
Walk [s]	0	8	0	7	0	0	8	0	0	0	7	0
Pedestrian Clearance [s]	0	16	0	19	0	0	16	0	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No					No				No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	3.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	35	34	0	31	0	0	34	0	0	0	31	35
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	24	0	26	0	0	24	0	0	0	26	5
Vehicle Extension [s]	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No	Yes		No			Yes				No	
Maximum Recall	Yes	No		No			No				No	
Pedestrian Recall	No	No		Yes			No				Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	C	L	C	R
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	64	64	60	29	29	26	26	26
g / C, Green / Cycle	0.64	0.64	0.60	0.29	0.29	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.61	0.37	0.01	0.22	0.23	0.11	0.12	0.12
s, saturation flow rate [veh/h]	1132	3204	1441	3204	1507	1210	1108	1239
c, Capacity [veh/h]	657	2051	866	929	437	362	360	322
d1, Uniform Delay [s]	27.90	10.21	8.05	32.17	32.74	32.46	32.49	30.44
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	47.39	1.16	0.02	5.45	13.80	0.62	0.63	0.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.04	0.57	0.01	0.75	0.79	0.37	0.37	0.45
d, Delay for Lane Group [s/veh]	75.29	11.37	8.07	37.63	46.55	33.08	33.13	31.42
Lane Group LOS	F	B	A	D	D	C	C	C
Critical Lane Group	Yes	No	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	16.50	6.85	0.08	8.14	9.24	2.79	2.79	2.91
50th-Percentile Queue Length [m/ln]	125.75	52.21	0.60	62.03	70.44	21.26	21.29	22.16
95th-Percentile Queue Length [veh/ln]	23.99	11.14	0.14	12.82	14.23	5.02	5.03	5.24
95th-Percentile Queue Length [m/ln]	182.81	84.92	1.09	97.68	108.44	38.27	38.32	39.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	75.29	11.37	0.00	8.07	0.00	0.00	39.11	46.55	33.11	0.00	33.13	31.42
Movement LOS	F	B		A			D	D	C		C	C
d_A, Approach Delay [s/veh]	34.86				40.60				32.51			
Approach LOS	C				D				C			
d_I, Intersection Delay [s/veh]	36.25											
Intersection LOS	D											
Intersection V/C	0.489											

Emissions

Vehicle Kilometers Traveled [km/h]	72.47	123.71	0.95	71.86	35.93	26.35	26.35	28.42
Stops [stops/h]	594.08	493.32	2.85	586.11	332.80	100.46	100.58	104.72
Fuel consumption [L/h]	60.00	33.10	0.21	40.10	23.33	8.16	8.17	8.54
CO [g/h]	1107.98	611.15	3.89	740.44	430.72	150.73	150.86	157.66
NOx [g/h]	215.57	118.91	0.76	144.06	83.80	29.33	29.35	30.67
VOC [g/h]	256.79	141.64	0.90	171.60	99.82	34.93	34.96	36.54

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [m²/ped]	21.08	214.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	11.36	0.00	22.69
d_p, Pedestrian Delay [s]	39.61	0.00	38.72
I_p,int, Pedestrian LOS Score for Intersectio	3.044	0.000	2.633
Crosswalk LOS	C	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1280	580	520
d_b, Bicycle Delay [s]	6.56	25.28	27.45
I_b,int, Bicycle LOS Score for Intersection	3.100	2.145	2.264
Bicycle LOS	C	B	B

Intersection Setup								
Name	87 Ave							
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [m]	3.50	3.66	3.50	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	10.00	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00				50.00			
Grade [%]	0.00				0.00			
Curb Present	Yes							
Crosswalk	Yes				No			

Volumes

Name	87 Ave							
Base Volume Input [veh/h]	20	0	0	65	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00							
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	7	0	0	0	0
Total Hourly Volume [veh/h]	20	0	0	58	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	0	15	0	0	0	0
Total Analysis Volume [veh/h]	20	0	0	58	0	0	0	0
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	16				0			
v_di, Inbound Pedestrian Volume crossing th	16				0			
v_co, Outbound Pedestrian Volume along th	0				0			
v_ci, Inbound Pedestrian Volume along the l	0				0			
v_ab, Corner Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	3	0	0	0	0	0	0	0
Auxiliary Signal Groups								
Maximum Green [s]	26	0	0	0	0	0	0	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	19	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No							
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	31	0	0	0	0	0	0	0
Lead / Lag	Lag	-	-	-	-	-	-	-
Minimum Green [s]	26	0	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No							
Maximum Recall	No							
Pedestrian Recall	Yes							

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	
C, Calculated Cycle Length [s]	100	100	
L, Total Lost Time per Cycle [s]	5.00	5.00	
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	
l2, Clearance Lost Time [s]	3.00	3.00	
g_i, Effective Green Time [s]	26	26	
g / C, Green / Cycle	0.26	0.26	
(v / s)_i Volume / Saturation Flow Rate	0.02	0.04	
s, saturation flow rate [veh/h]	1036	1431	
c, Capacity [veh/h]	204	372	
d1, Uniform Delay [s]	38.86	28.54	
k, delay calibration	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	0.21	0.19	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.10	0.16	
d, Delay for Lane Group [s/veh]	39.07	28.73	
Lane Group LOS	D	C	
Critical Lane Group	No	No	
50th-Percentile Queue Length [veh/ln]	0.46	1.12	
50th-Percentile Queue Length [m/ln]	3.49	8.53	
95th-Percentile Queue Length [veh/ln]	0.82	2.01	
95th-Percentile Queue Length [m/ln]	6.28	15.35	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.07	0.00	0.00	28.73	0.00	0.00	0.00	0.00
Movement LOS	D			C				
d_A, Approach Delay [s/veh]	31.38				0.00			
Approach LOS	C				A			
d_I, Intersection Delay [s/veh]	36.25							
Intersection LOS	D							
Intersection V/C	0.489							

Emissions

Vehicle Kilometers Traveled [km/h]	0.73	2.11	
Stops [stops/h]	16.49	40.29	
Fuel consumption [L/h]	0.82	1.86	
CO [g/h]	15.18	34.36	
NOx [g/h]	2.95	6.69	
VOC [g/h]	3.52	7.96	

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	43.42	0.00
d_p, Pedestrian Delay [s]	38.72	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.973	0.000
Crosswalk LOS	A	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	520	0
d_b, Bicycle Delay [s]	27.38	50.00
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132
Bicycle LOS	A	D

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 27: 109 Street and Walterdale Hill Road/Saskatchewan Drive

Control Type:	Signalized	Delay (sec / veh):	31.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Right	Right	Left2	Left	Thru	Thru	Right	Right2	Left	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.50	3.50	3.66	3.66	3.50	3.50	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	50.00	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				Yes			Yes					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	26	773	0	0	1252	251	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	25	0	0	0
Total Hourly Volume [veh/h]	0	0	0	26	773	0	0	1252	251	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	7	193	0	0	313	63	0	0	0
Total Analysis Volume [veh/h]	0	0	0	26	773	0	0	1252	251	0	0	0
Presence of On-Street Parking				No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			16			30			16		
v_di, Inbound Pedestrian Volume crossing m	0			16			30			16		
v_co, Outbound Pedestrian Volume crossing	11			30			11			0		
v_ci, Inbound Pedestrian Volume crossing mi	11			30			11			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			5			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	90.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	0	0	2	2	0	0	1	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	27	27	0	0	55	0	0	0	0
Amber [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	7	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	0	0	20	20	0	0	16	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk												
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	32	32	0	0	61	0	0	0	0
Lead / Lag	-	-	-	Lead	Lead	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	27	27	0	0	23	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Minimum Recall					No			Yes				
Maximum Recall					Yes			No				
Pedestrian Recall					No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	
C, Calculated Cycle Length [s]		100	100	
L, Total Lost Time per Cycle [s]		5.00	6.00	
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	
l2, Clearance Lost Time [s]		3.00	4.00	
g_i, Effective Green Time [s]		27	56	
g / C, Green / Cycle		0.27	0.56	
(v / s)_i Volume / Saturation Flow Rate		0.26	0.40	
s, saturation flow rate [veh/h]		3113	3713	
c, Capacity [veh/h]		840	2087	
d1, Uniform Delay [s]		35.85	15.86	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		21.15	2.18	
d3, Initial Queue Delay [s]		0.00	0.00	
Rp, platoon ratio		1.00	1.00	
PF, progression factor		1.00	1.00	

Lane Group Results

X, volume / capacity		0.95	0.72	
d, Delay for Lane Group [s/veh]		56.99	18.04	
Lane Group LOS		E	B	
Critical Lane Group		Yes	Yes	
50th-Percentile Queue Length [veh/ln]		11.79	8.05	
50th-Percentile Queue Length [m/ln]		89.84	61.37	
95th-Percentile Queue Length [veh/ln]		17.42	12.71	
95th-Percentile Queue Length [m/ln]		132.76	96.83	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	56.99	56.99	0.00	0.00	18.04	18.04	0.00	0.00	0.00
Movement LOS				E	E			B	B			
d_A, Approach Delay [s/veh]	0.00			56.99			18.04			0.00		
Approach LOS	A			E			B			A		
d_I, Intersection Delay [s/veh]	31.56											
Intersection LOS	C											
Intersection V/C	0.662											

Emissions

Vehicle Kilometers Traveled [km/h]		143.51	80.96	
Stops [stops/h]		848.93	869.74	
Fuel consumption [L/h]		67.77	48.10	
CO [g/h]		1251.46	888.23	
NOx [g/h]		243.49	172.82	
VOC [g/h]		290.04	205.86	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	56.26	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	36.46	22.61	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.249	2.123	2.715	2.428
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	540	1100	0
d_b, Bicycle Delay [s]	50.00	26.66	10.15	50.00
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	1.560	4.132
Bicycle LOS	D	A	A	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 28: 109 Street and 88 Ave SB

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

Intersection Setup

Name	109 Street		109 Street		88 Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.50	3.50	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		2.00		0.00	
Curb Present			Yes			
Crosswalk	Yes		Yes		Yes	

Volumes

Name	109 Street		109 Street		88 Ave	
Base Volume Input [veh/h]	0	0	1043	180	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	18	0	0
Total Hourly Volume [veh/h]	0	0	1043	162	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	261	41	0	0
Total Analysis Volume [veh/h]	0	0	1043	162	0	0
Presence of On-Street Parking			No	No		
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	30		16		30	
v_di, Inbound Pedestrian Volume crossing m	30		16		30	
v_co, Outbound Pedestrian Volume crossing	16		3		2	
v_ci, Inbound Pedestrian Volume crossing mi	16		2		3	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		2		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	90.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	0	0	1	3	0	0
Auxiliary Signal Groups						
Maximum Green [s]	0	0	55	7	0	0
Amber [s]	0.0	0.0	3.0	3.0	0.0	0.0
All red [s]	0.0	0.0	3.0	2.0	0.0	0.0
Walk [s]	0	0	7	5	0	0
Pedestrian Clearance [s]	0	0	16	10	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	4.0	3.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	61	14	0	0
Lead / Lag	-	-	-	-	-	-
Minimum Green [s]	0	0	23	10	0	0
Vehicle Extension [s]	0.0	0.0	3.0	3.0	0.0	0.0
Minimum Recall			Yes			
Maximum Recall			No			
Pedestrian Recall			No			

Exclusive Pedestrian Phase

Pedestrian Signal Group	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		C	C	
C, Calculated Cycle Length [s]		100	100	
L, Total Lost Time per Cycle [s]		6.00	6.00	
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	
l2, Clearance Lost Time [s]		4.00	4.00	
g_i, Effective Green Time [s]		57	57	
g / C, Green / Cycle		0.57	0.57	
(v / s)_i Volume / Saturation Flow Rate		0.45	0.48	
s, saturation flow rate [veh/h]		1329	1261	
c, Capacity [veh/h]		753	714	
d1, Uniform Delay [s]		17.18	17.99	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		8.72	11.66	
d3, Initial Queue Delay [s]		0.00	0.00	
Rp, platoon ratio		1.00	1.00	
PF, progression factor		1.00	1.00	

Lane Group Results

X, volume / capacity		0.80	0.84	
d, Delay for Lane Group [s/veh]		25.90	29.65	
Lane Group LOS		C	C	
Critical Lane Group		No	Yes	
50th-Percentile Queue Length [veh/ln]		11.84	12.81	
50th-Percentile Queue Length [m/ln]		90.25	97.58	
95th-Percentile Queue Length [veh/ln]		17.49	18.67	
95th-Percentile Queue Length [m/ln]		133.26	142.30	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	27.49	29.65	0.00	0.00
Movement LOS			C	C		
d_A, Approach Delay [s/veh]	0.00		27.78		0.00	
Approach LOS	A		C		A	
d_I, Intersection Delay [s/veh]	27.78					
Intersection LOS	C					
Intersection V/C	0.478					

Emissions

Vehicle Kilometers Traveled [km/h]		208.46	208.46	
Stops [stops/h]		426.38	461.00	
Fuel consumption [L/h]		41.42	43.94	
CO [g/h]		764.84	811.31	
NOx [g/h]		148.81	157.85	
VOC [g/h]		177.26	188.03	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	53.95
M_CW, Crosswalk Circulation Area [m²/ped]	21.74	36.46	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.296	2.363	1.610
Crosswalk LOS	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1100	0
d_b, Bicycle Delay [s]	50.00	10.14	50.00
I_b,int, Bicycle LOS Score for Intersection	4.132	2.569	4.132
Bicycle LOS	D	B	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 29: 114 Street and 82 Ave

Control Type:	Signalized	Delay (sec / veh):	46.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name	114 Street			114 Street			University Ave			82 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.70	3.60	3.66	3.60	3.60	4.00	3.60	3.60	3.66	3.66	3.66
No. of Lanes in Entry Pocket	2	0	1	0	0	1	1	0	1	2	0	0
Entry Pocket Length [m]	170.00	30.48	2.00	30.48	30.48	105.00	95.00	30.48	95.00	100.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	114 Street			114 Street			University Ave			82 Ave		
Base Volume Input [veh/h]	870	546	170	0	294	40	46	347	566	153	423	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	17	0	0	4	0	0	0	0	0	2
Total Hourly Volume [veh/h]	870	546	153	0	294	36	46	347	566	153	423	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	218	137	38	0	74	9	12	87	142	38	106	4
Total Analysis Volume [veh/h]	870	546	153	0	294	36	46	347	566	153	423	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			2			2			2		
v_di, Inbound Pedestrian Volume crossing m	2			2			2			2		
v_co, Outbound Pedestrian Volume crossing	18			0			0			18		
v_ci, Inbound Pedestrian Volume crossing mi	18			0			0			18		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	158
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Overlap	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	2	1	0	0	1	2	3	6	2	5	4	0
Auxiliary Signal Groups		1,2				1,2			2,6			
Maximum Green [s]	60	27	0	0	27	60	10	38	60	16	38	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	3.0	3.0	0.0	0.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0	0.0
Walk [s]	0	9	0	0	9	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	22	0	0	22	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	66	33	0	0	33	66	17	36	66	23	36	0
Lead / Lag	Lag	-	-	-	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	10	27	0	0	27	10	7	29	10	7	29	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
Minimum Recall	No	Yes			Yes	No	No	No	No	No	No	
Maximum Recall	No	No			No	No	No	Yes	No	No	Yes	
Pedestrian Recall	No	No			No	No	No	No	No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	R	L	C	R	L	C	C
C, Calculated Cycle Length [s]	161	161	161	161	161	161	161	161	161	161	161
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	0.00	4.00	4.00	0.00	5.00	5.00	0.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	60	93	27	27	93	6	38	104	10	42	42
g / C, Green / Cycle	0.37	0.58	0.17	0.17	0.58	0.04	0.24	0.65	0.06	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.36	0.17	0.11	0.09	0.03	0.03	0.12	0.24	0.05	0.14	0.14
s, saturation flow rate [veh/h]	2398	3204	1431	3204	1318	1535	2951	2329	3113	1550	1530
c, Capacity [veh/h]	908	1849	240	537	760	59	696	1503	196	403	398
d1, Uniform Delay [s]	51.81	17.37	62.53	61.48	14.82	76.76	53.33	13.38	74.40	51.43	51.45
k, delay calibration	0.11	0.11	0.15	0.11	0.11	0.11	0.50	0.11	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.16	0.09	3.93	0.87	0.03	18.96	2.54	0.16	6.60	5.26	5.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.96	0.30	0.64	0.55	0.05	0.77	0.50	0.38	0.78	0.55	0.55
d, Delay for Lane Group [s/veh]	58.97	17.46	66.46	62.35	14.84	95.72	55.87	13.54	81.00	56.69	56.81
Lane Group LOS	E	B	E	E	B	F	E	B	F	E	E
Critical Lane Group	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	18.45	5.28	6.14	5.62	0.60	2.21	6.39	4.86	3.32	8.35	8.27
50th-Percentile Queue Length [m/ln]	140.55	40.23	46.78	42.81	4.55	16.87	48.70	37.04	25.29	63.65	63.05
95th-Percentile Queue Length [veh/ln]	25.49	9.05	10.20	9.50	1.07	3.99	10.54	8.48	5.97	13.09	12.99
95th-Percentile Queue Length [m/ln]	194.23	68.94	77.75	72.43	8.18	30.37	80.29	64.59	45.52	99.77	99.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	58.97	17.46	66.46	0.00	62.35	14.84	95.72	55.87	13.54	81.00	56.75	56.81
Movement LOS	E	B	E		E	B	F	E	B	F	E	E
d_A, Approach Delay [s/veh]	45.25			57.17			32.80			63.02		
Approach LOS	D			E			C			E		
d_I, Intersection Delay [s/veh]	45.98											
Intersection LOS	D											
Intersection V/C	0.642											

Emissions

Vehicle Kilometers Traveled [km/h]	246.27	154.55	43.31	67.96	8.32	15.12	114.09	186.10	25.38	36.61	36.22
Stops [stops/h]	824.55	236.00	137.23	251.13	13.33	49.49	285.67	217.27	148.34	186.70	184.95
Fuel consumption [L/h]	81.44	27.34	15.03	26.22	1.50	5.94	32.20	28.48	15.29	17.31	17.15
CO [g/h]	1503.85	504.89	277.55	484.14	27.74	109.69	594.51	525.96	282.30	319.62	316.63
NOx [g/h]	292.59	98.23	54.00	94.20	5.40	21.34	115.67	102.33	54.93	62.19	61.60
VOC [g/h]	348.53	117.01	64.32	112.20	6.43	25.42	137.78	121.90	65.43	74.07	73.38

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			13.0		
M_corner, Corner Circulation Area [m²/ped]	19.89			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	0.00			229.86			0.00			21.98		
d_p, Pedestrian Delay [s]	69.91			69.91			0.00			68.06		
I_p,int, Pedestrian LOS Score for Intersectio	2.965			2.524			0.000			2.669		
Crosswalk LOS	C			B			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1155			335			360			360		
d_b, Bicycle Delay [s]	14.38			55.80			54.14			54.14		
I_b,int, Bicycle LOS Score for Intersection	2.868			1.835			2.351			2.050		
Bicycle LOS	C			A			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	6	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 30: 114 Street and 87 Ave

Control Type:	Signalized	Delay (sec / veh):	40.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.460

Intersection Setup

Name	114 Street			114 Street			87 Ave			87 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	4.00	3.70	4.00	4.00	4.00	4.00	3.70	3.70	3.70	3.70	3.70	3.80
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	80.00	30.48	30.48	30.48	30.48	40.00	35.00	30.48	30.48	85.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	114 Street			114 Street			87 Ave			87 Ave		
Base Volume Input [veh/h]	299	141	148	19	28	24	71	280	302	61	575	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	15	0	0	2	0	0	30	0	0	9
Total Hourly Volume [veh/h]	299	141	133	19	28	22	71	280	272	61	575	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	35	33	5	7	6	18	70	68	15	144	19
Total Analysis Volume [veh/h]	299	141	133	19	28	22	71	280	272	61	575	77
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	65			42			42			65		
v_di, Inbound Pedestrian Volume crossing m	65			42			42			65		
v_co, Outbound Pedestrian Volume crossing	70			133			70			133		
v_ci, Inbound Pedestrian Volume crossing mi	70			133			70			133		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	60.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Overlap	Overlap	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	2	3	3	0	3	0	4	1	0	5	6	0
Auxiliary Signal Groups		2,3	2,3									
Maximum Green [s]	25	24	24	0	24	0	10	43	0	10	43	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	17	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	3.0	0.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	28	29	29	0	29	0	13	30	0	13	30	0
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	24	24	0	24	0	7	24	0	7	24	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	Yes		No	Yes	
Maximum Recall	Yes	Yes	Yes		Yes		No	No		Yes	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.00	0.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	25	52	52	24	24	24	38	29	29	38	25	25
g / C, Green / Cycle	0.25	0.52	0.52	0.24	0.24	0.24	0.38	0.29	0.29	0.38	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.18	0.08	0.10	0.02	0.01	0.02	0.07	0.17	0.22	0.07	0.20	0.22
s, saturation flow rate [veh/h]	1667	1683	1323	937	1750	1368	963	1683	1222	927	1683	1450
c, Capacity [veh/h]	417	875	688	228	420	328	322	486	353	297	421	363
d1, Uniform Delay [s]	34.27	12.57	12.81	35.43	29.30	29.41	22.58	30.36	32.56	22.32	35.04	36.08
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.24	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.16	0.39	0.63	0.71	0.27	0.45	0.76	4.92	15.03	1.57	14.00	25.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.72	0.16	0.19	0.08	0.06	0.08	0.22	0.58	0.77	0.21	0.79	0.88
d, Delay for Lane Group [s/veh]	44.43	12.97	13.43	36.14	29.58	29.86	23.35	35.29	47.58	23.88	49.05	61.24
Lane Group LOS	D	B	B	D	C	C	C	D	D	C	D	E
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	7.70	1.70	1.66	0.44	0.50	0.50	1.13	6.31	7.35	1.04	9.05	9.87
50th-Percentile Queue Length [m/ln]	58.66	12.93	12.63	3.33	3.79	3.80	8.61	48.09	56.04	7.89	68.95	75.25
95th-Percentile Queue Length [veh/ln]	12.25	3.05	2.98	0.79	0.90	0.90	2.03	10.43	11.80	1.86	13.98	15.03
95th-Percentile Queue Length [m/ln]	93.33	23.27	22.73	6.00	6.83	6.84	15.50	79.49	89.93	14.20	106.54	114.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.43	12.97	13.43	36.14	29.60	29.86	23.35	35.29	47.58	23.88	54.19	61.24
Movement LOS	D	B	B	D	C	C	C	D	D	C	D	E
d_A, Approach Delay [s/veh]	29.49			31.49			39.29			52.36		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	40.89											
Intersection LOS	D											
Intersection V/C	0.460											

Emissions

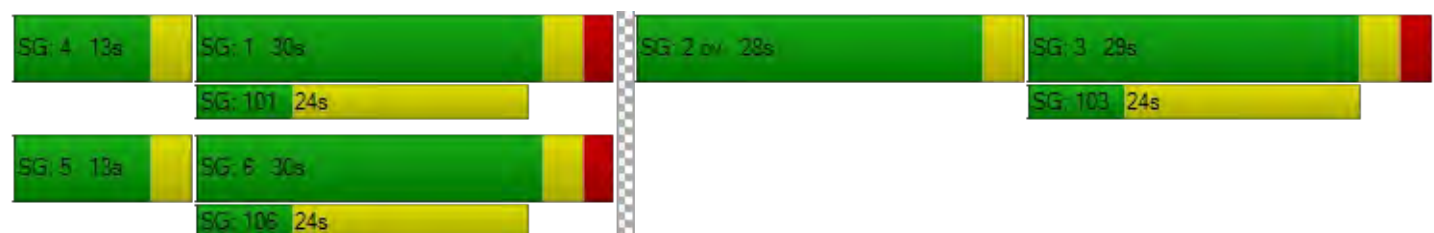
Vehicle Kilometers Traveled [km/h]	141.78	66.86	63.06	3.78	5.03	4.92	19.13	75.43	73.27	28.13	153.22	147.40
Stops [stops/h]	277.13	61.08	59.67	15.74	17.93	17.95	40.67	227.21	264.76	37.26	325.75	355.50
Fuel consumption [L/h]	29.94	9.14	8.72	1.24	1.46	1.44	4.01	19.88	22.88	4.63	34.44	37.08
CO [g/h]	552.84	168.78	160.93	22.93	26.89	26.59	74.03	367.17	422.49	85.57	635.95	684.69
NOx [g/h]	107.56	32.84	31.31	4.46	5.23	5.17	14.40	71.44	82.20	16.65	123.73	133.21
VOC [g/h]	128.13	39.12	37.30	5.31	6.23	6.16	17.16	85.09	97.92	19.83	147.39	158.68

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			106.99			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	5.53			4.55			16.67			8.35		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.551			2.409			2.661			2.581		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1040			480			500			500		
d_b, Bicycle Delay [s]	11.52			28.88			28.13			28.13		
I_b,int, Bicycle LOS Score for Intersection	2.045			1.618			2.098			2.155		
Bicycle LOS	B			A			B			B		

Sequence

Ring 1	4	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 31: 112 Street and 82 Ave

Control Type:	Signalized	Delay (sec / veh):	29.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

Intersection Setup

Name	112 Street			112 Street			82 Ave			82 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	4.50	4.50	3.50	3.66	3.50	3.50	3.50	3.66	3.66	3.50	3.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	65.00	30.48	30.48	85.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	112 Street			112 Street			82 Ave			82 Ave		
Base Volume Input [veh/h]	0	95	18	219	0	81	112	405	0	0	426	556
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	8	0	0	0	0	0	56
Total Hourly Volume [veh/h]	0	95	16	219	0	73	112	405	0	0	426	500
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	24	4	55	0	18	28	101	0	0	107	125
Total Analysis Volume [veh/h]	0	95	16	219	0	73	112	405	0	0	426	500
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	54			27			26			54		
v_di, Inbound Pedestrian Volume crossing m	54			26			27			54		
v_co, Outbound Pedestrian Volume crossing	17			26			17			26		
v_ci, Inbound Pedestrian Volume crossing mi	17			26			17			26		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	46.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	2	0	0	3	1	0	0	1	0
Auxiliary Signal Groups												
Maximum Green [s]	0	60	0	60	0	0	19	46	0	0	46	0
Amber [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	8	0	8	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	23	0	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	8.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	37	0	37	0	0	24	39	0	0	39	0
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	23	0	23	0	0	7	25	0	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No		No			No	Yes			Yes	
Maximum Recall		Yes		Yes			No	No			No	
Pedestrian Recall		No		No			No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	R	L	C	C	C
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	32	32	32	9	44	44	44
g / C, Green / Cycle	0.32	0.32	0.32	0.09	0.44	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.05	0.07	0.13	0.25	0.36
s, saturation flow rate [veh/h]	1676	1956	1359	1603	3204	1683	1380
c, Capacity [veh/h]	536	562	435	140	1419	745	611
d1, Uniform Delay [s]	24.76	31.64	24.36	44.80	17.76	20.77	24.33
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.87	2.03	0.83	10.16	0.51	3.17	11.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.21	0.39	0.17	0.80	0.29	0.57	0.82
d, Delay for Lane Group [s/veh]	25.63	33.67	25.20	54.97	18.27	23.94	35.92
Lane Group LOS	C	C	C	D	B	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.03	2.36	1.33	3.10	3.00	7.80	11.79
50th-Percentile Queue Length [m/ln]	15.45	18.02	10.12	23.59	22.88	59.44	89.83
95th-Percentile Queue Length [veh/ln]	3.65	4.26	2.39	5.57	5.41	12.38	17.42
95th-Percentile Queue Length [m/ln]	27.80	32.43	18.22	42.47	41.19	94.34	132.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	25.63	25.63	33.67	0.00	25.20	54.97	18.27	0.00	0.00	23.94	35.92
Movement LOS		C	C	C		C	D	B			C	D
d_A, Approach Delay [s/veh]	25.63			31.55			26.22			30.41		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	29.13											
Intersection LOS	C											
Intersection V/C	0.544											

Emissions

Vehicle Kilometers Traveled [km/h]	10.94	48.02	16.01	31.99	115.68	245.79	288.49
Stops [stops/h]	72.97	170.23	47.81	111.47	216.23	280.82	424.39
Fuel consumption [L/h]	4.87	14.07	4.01	10.29	21.56	37.54	50.80
CO [g/h]	89.93	259.75	74.09	189.94	398.04	693.25	938.10
NOx [g/h]	17.50	50.54	14.41	36.95	77.44	134.88	182.52
VOC [g/h]	20.84	60.20	17.17	44.02	92.25	160.67	217.41

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	12.0	12.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	28.42	3.99	27.03	9.44
d_p, Pedestrian Delay [s]	39.61	39.61	38.72	38.72
I_p,int, Pedestrian LOS Score for Intersectio	1.545	2.531	2.511	2.936
Crosswalk LOS	A	B	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	480	480	680	680
d_b, Bicycle Delay [s]	28.88	28.88	21.78	21.78
I_b,int, Bicycle LOS Score for Intersection	1.746	1.560	1.986	2.370
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 32: 110 Street and 87 Ave

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.414

Intersection Setup

Name	110 Street									
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left	Thru	Thru	Right	Right
Lane Width [m]	4.50	3.66	3.66	4.50	4.50	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes									
Crosswalk	Yes					Yes				

Volumes

Name	110 Street									
Base Volume Input [veh/h]	4	0	0	67	79	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	75	0	0	0	0	0
Total Hourly Volume [veh/h]	4	0	0	67	4	0	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	0	17	1	0	0	0	0	0
Total Analysis Volume [veh/h]	4	0	0	67	4	0	0	0	0	0
Presence of On-Street Parking	No				No					
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	43					10				
v_di, Inbound Pedestrian Volume crossing th	7					3				
v_co, Outbound Pedestrian Volume along th	11					5				
v_ci, Inbound Pedestrian Volume along the l	3					5				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	7.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	0	2	0	0	0	0	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	0	22	0	0	0	0	0	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	7	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	15	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No						
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	25	0	0	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	22	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall				No						
Maximum Recall				No						
Pedestrian Recall				No						

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	
C, Calculated Cycle Length [s]	100	
L, Total Lost Time per Cycle [s]	3.00	
l1_p, Permitted Start-Up Lost Time [s]	2.00	
l2, Clearance Lost Time [s]	1.00	
g_i, Effective Green Time [s]	9	
g / C, Green / Cycle	0.09	
(v / s)_i Volume / Saturation Flow Rate	0.07	
s, saturation flow rate [veh/h]	1084	
c, Capacity [veh/h]	133	
d1, Uniform Delay [s]	43.52	
k, delay calibration	0.11	
l, Upstream Filtering Factor	1.00	
d2, Incremental Delay [s]	3.67	
d3, Initial Queue Delay [s]	0.00	
Rp, platoon ratio	1.00	
PF, progression factor	1.00	

Lane Group Results

X, volume / capacity	0.56	
d, Delay for Lane Group [s/veh]	47.19	
Lane Group LOS	D	
Critical Lane Group	Yes	
50th-Percentile Queue Length [veh/ln]	1.94	
50th-Percentile Queue Length [m/ln]	14.76	
95th-Percentile Queue Length [veh/ln]	3.49	
95th-Percentile Queue Length [m/ln]	26.57	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.19	0.00	0.00	47.19	47.19	0.00	0.00	0.00	0.00	0.00
Movement LOS	D			D	D					
d_A, Approach Delay [s/veh]	47.19					0.00				
Approach LOS	D					A				
d_I, Intersection Delay [s/veh]	9.86									
Intersection LOS	A									
Intersection V/C	0.414									

Emissions

Vehicle Kilometers Traveled [km/h]	5.50	
Stops [stops/h]	69.74	
Fuel consumption [L/h]	3.95	
CO [g/h]	72.89	
NOx [g/h]	14.18	
VOC [g/h]	16.89	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	19.0
M_corner, Corner Circulation Area [m²/ped]	0.00	123.77
M_CW, Crosswalk Circulation Area [m²/ped]	19.05	41.23
d_p, Pedestrian Delay [s]	39.61	32.81
I_p,int, Pedestrian LOS Score for Intersectio	1.626	1.669
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	0
d_b, Bicycle Delay [s]	30.42	50.00
I_b,int, Bicycle LOS Score for Intersection	1.918	4.132
Bicycle LOS	A	D

Intersection Setup

Name	87 Ave					87 Ave				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right	Left	Left	Thru	Right	Right
Lane Width [m]	3.50	3.66	3.50	3.66	3.66	3.66	3.66	3.50	3.66	3.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	7.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					30.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	87 Ave					87 Ave				
Base Volume Input [veh/h]	13	0	350	0	0	0	0	580	0	148
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	15
Total Hourly Volume [veh/h]	13	0	350	0	0	0	0	580	0	133
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	88	0	0	0	0	145	0	33
Total Analysis Volume [veh/h]	13	0	350	0	0	0	0	580	0	133
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	24					3				
v_di, Inbound Pedestrian Volume crossing th	4					11				
v_co, Outbound Pedestrian Volume along th	21					3				
v_ci, Inbound Pedestrian Volume along the l	8					10				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	7.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	1	0	0	0	0	1	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	80	0	0	0	0	80	0	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Walk [s]	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	0	15	0	0	0	0	15	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			Yes					Yes		
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	75	0	0	0	0	75	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	25	0	0	0	0	25	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Minimum Recall			No					No		
Maximum Recall			No					No		
Pedestrian Recall			Yes					Yes		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	R
C, Calculated Cycle Length [s]	100	100	100	100
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	83	83	83	83
g / C, Green / Cycle	0.83	0.83	0.83	0.83
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.34	0.10
s, saturation flow rate [veh/h]	1565	1532	1683	1363
c, Capacity [veh/h]	1341	1274	1400	1134
d1, Uniform Delay [s]	1.59	1.60	2.16	1.56
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	0.23	0.91	0.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.14	0.41	0.12
d, Delay for Lane Group [s/veh]	1.81	1.83	3.06	1.78
Lane Group LOS	A	A	A	A
Critical Lane Group	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.44	0.43	2.37	0.40
50th-Percentile Queue Length [m/ln]	3.36	3.24	18.09	3.07
95th-Percentile Queue Length [veh/ln]	0.79	0.77	4.27	0.72
95th-Percentile Queue Length [m/ln]	6.05	5.83	32.56	5.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.81	0.00	1.82	0.00	0.00	0.00	0.00	3.06	0.00	1.78
Movement LOS	A		A					A		A
d_A, Approach Delay [s/veh]	1.82					2.82				
Approach LOS	A					A				
d_I, Intersection Delay [s/veh]	9.86									
Intersection LOS	A									
Intersection V/C	0.414									

Emissions

Vehicle Kilometers Traveled [km/h]	44.44	42.26	114.47	26.25
Stops [stops/h]	15.87	15.31	85.45	14.50
Fuel consumption [L/h]	4.84	4.61	15.76	3.44
CO [g/h]	89.43	85.18	291.04	63.54
NOx [g/h]	17.40	16.57	56.63	12.36
VOC [g/h]	20.73	19.74	67.45	14.73

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m ² /ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m ² /ped]	46.66	99.76
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.269	2.332
Crosswalk LOS	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1400	1400
d_b, Bicycle Delay [s]	4.50	4.50
I_b,int, Bicycle LOS Score for Intersection	1.859	2.761
Bicycle LOS	A	C

Intersection Setup

Name	NB Bike Lane					SB Bike Lane				
Approach	Northeastbound					Southeastbound				
Lane Configuration	↵					↱				
Turning Movement	Left2	Left	Thru	Right	Right	Left2	Left	Thru	Thru	Right
Lane Width [m]	3.66	1.50	3.66	3.66	3.66	3.66	3.66	3.66	1.50	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00					30.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	NB Bike Lane					SB Bike Lane				
Base Volume Input [veh/h]	0	11	0	0	0	0	0	0	110	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	11	0	0	0	0	0	0	110	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	3	0	0	0	0	0	0	28	0
Total Analysis Volume [veh/h]	0	11	0	0	0	0	0	0	110	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	8					5				
v_di, Inbound Pedestrian Volume crossing th	21					5				
v_co, Outbound Pedestrian Volume along th	7					4				
v_ci, Inbound Pedestrian Volume along the l	43					24				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	11					110				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	7.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	2	0	0	0	0	0	0	2	0
Auxiliary Signal Groups										
Maximum Green [s]	0	22	0	0	0	0	0	0	22	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No							No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	25	0	0	0	0	0	0	25	0
Lead / Lag	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	22	0	0	0	0	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall		No							No	
Maximum Recall		No							No	
Pedestrian Recall		No							No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C
C, Calculated Cycle Length [s]	100	100
L, Total Lost Time per Cycle [s]	3.00	3.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00
l2, Clearance Lost Time [s]	1.00	1.00
g_i, Effective Green Time [s]	9	9
g / C, Green / Cycle	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.01	0.07
s, saturation flow rate [veh/h]	1148	1616
c, Capacity [veh/h]	75	142
d1, Uniform Delay [s]	42.50	44.61
k, delay calibration	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.88	8.57
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.15	0.77
d, Delay for Lane Group [s/veh]	43.38	53.18
Lane Group LOS	D	D
Critical Lane Group	No	No
50th-Percentile Queue Length [veh/ln]	0.28	3.05
50th-Percentile Queue Length [m/ln]	2.11	23.24
95th-Percentile Queue Length [veh/ln]	0.50	5.49
95th-Percentile Queue Length [m/ln]	3.80	41.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	43.38	0.00	0.00	0.00	0.00	0.00	0.00	53.18	0.00
Movement LOS		D							D	
d_A, Approach Delay [s/veh]	43.38					53.18				
Approach LOS	D					D				
d_I, Intersection Delay [s/veh]	9.86									
Intersection LOS	A									
Intersection V/C	0.414									

Emissions

Vehicle Kilometers Traveled [km/h]	0.81	4.24
Stops [stops/h]	9.96	109.81
Fuel consumption [L/h]	0.55	5.90
CO [g/h]	10.07	108.93
NOx [g/h]	1.96	21.19
VOC [g/h]	2.33	25.25

Other Modes

g_Walk,mi, Effective Walk Time [s]	19.0	19.0
M_corner, Corner Circulation Area [m²/ped]	35.51	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	47.11	128.92
d_p, Pedestrian Delay [s]	32.81	32.81
I_p,int, Pedestrian LOS Score for Intersectio	1.749	1.764
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	440
d_b, Bicycle Delay [s]	30.59	32.19
I_b,int, Bicycle LOS Score for Intersection	1.560	1.741
Bicycle LOS	A	A

Sequence

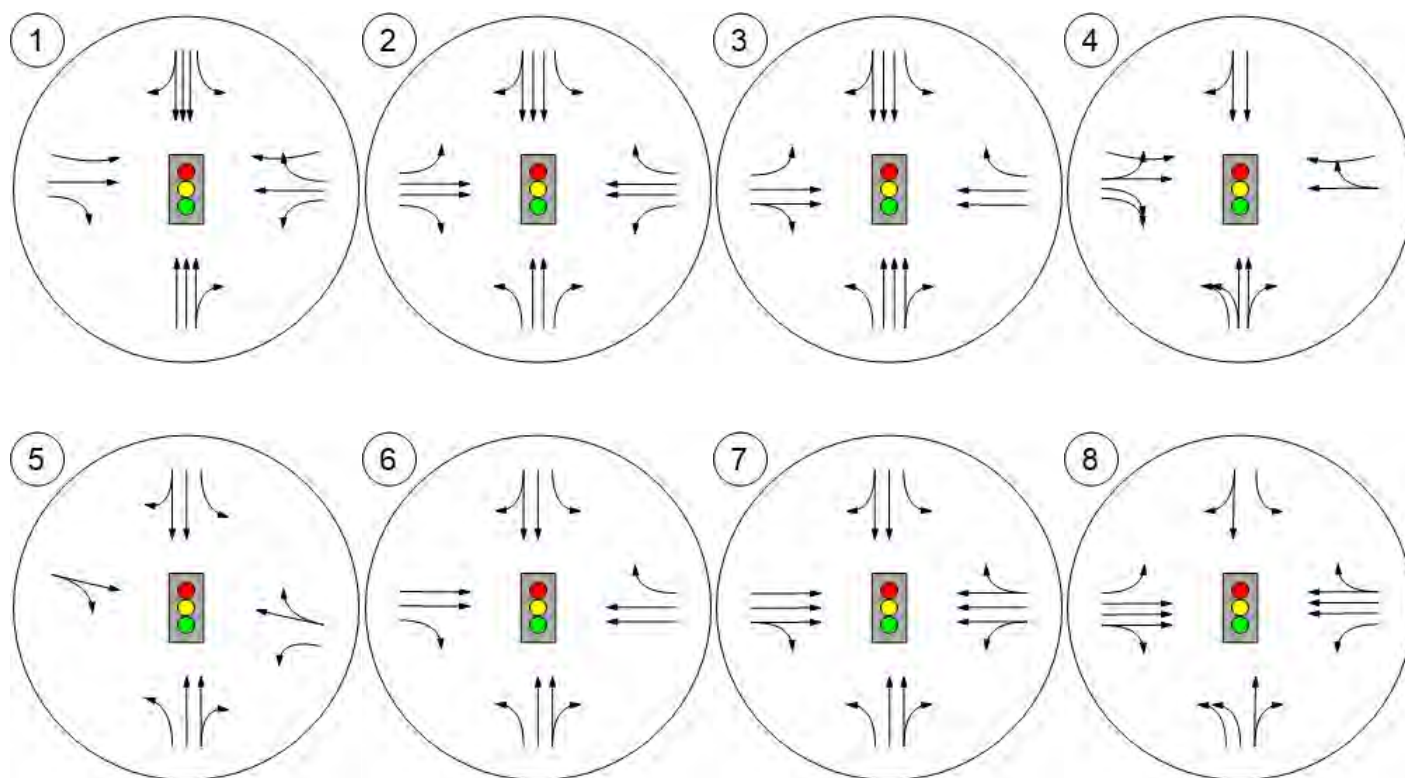
Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



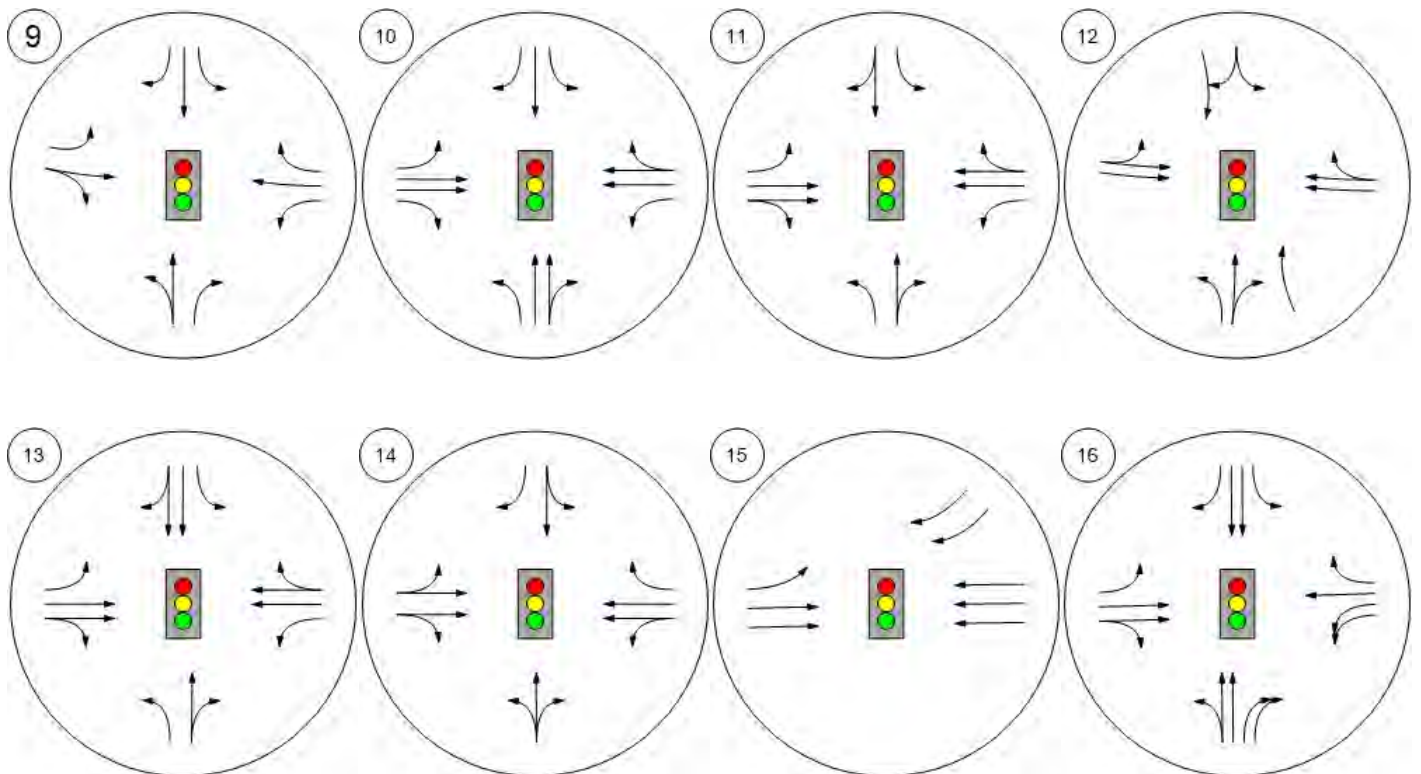
Study Intersections



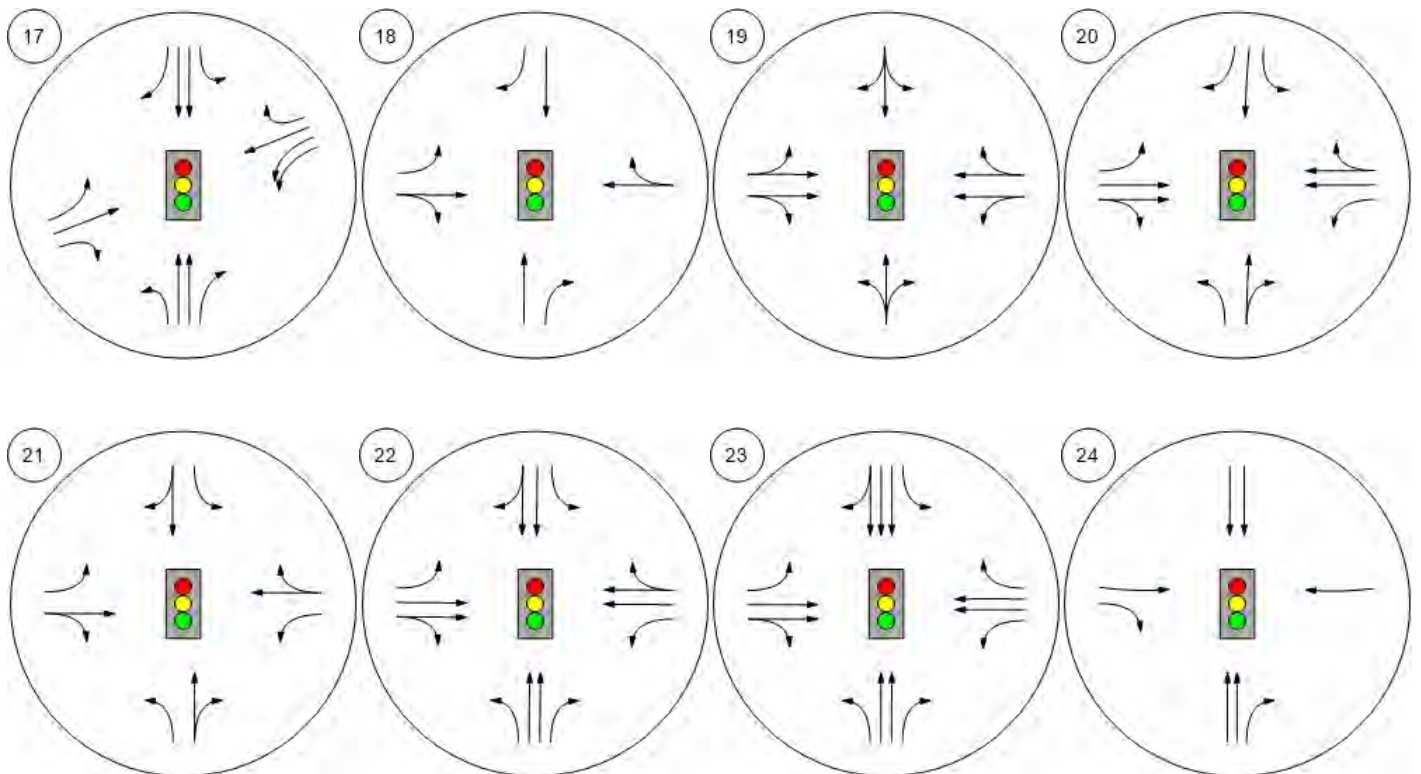
Lane Configuration and Traffic Control



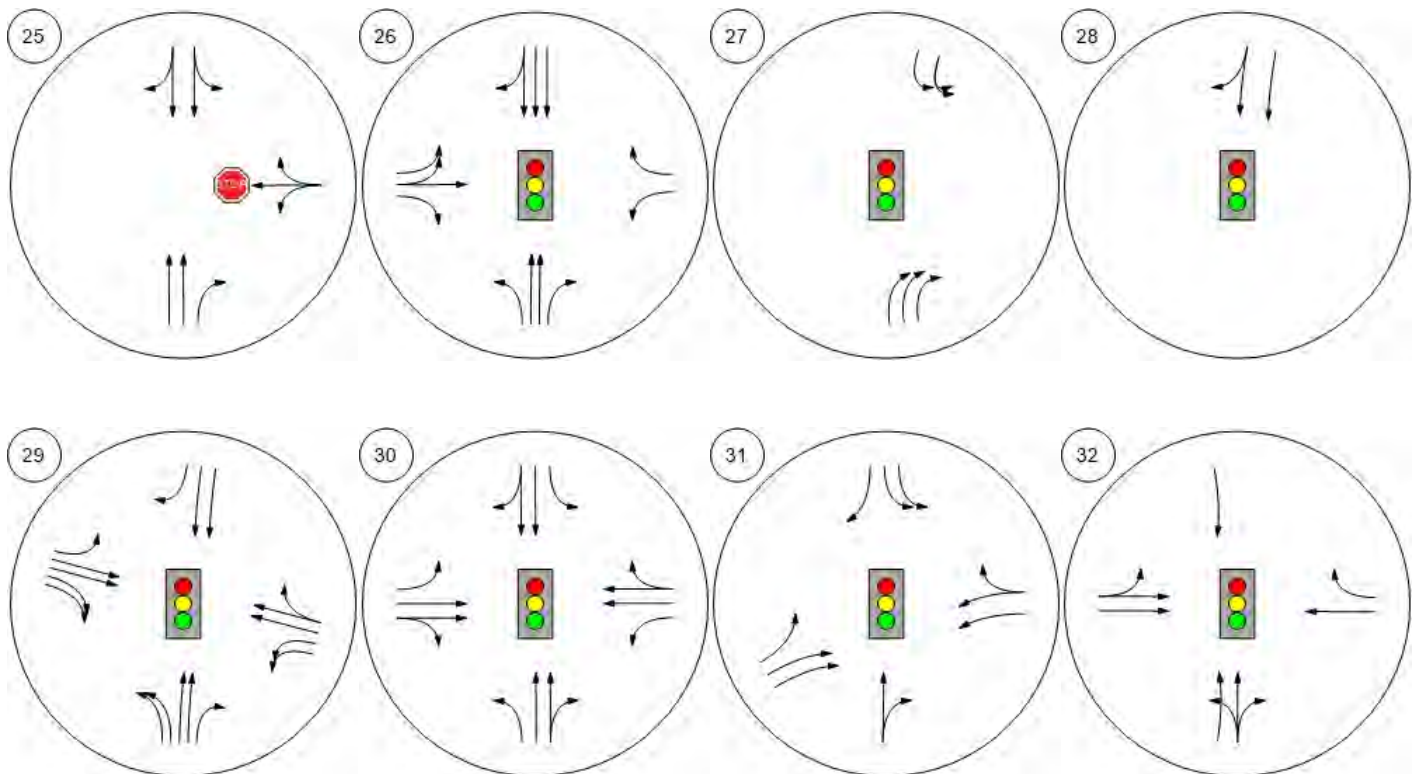
Lane Configuration and Traffic Control



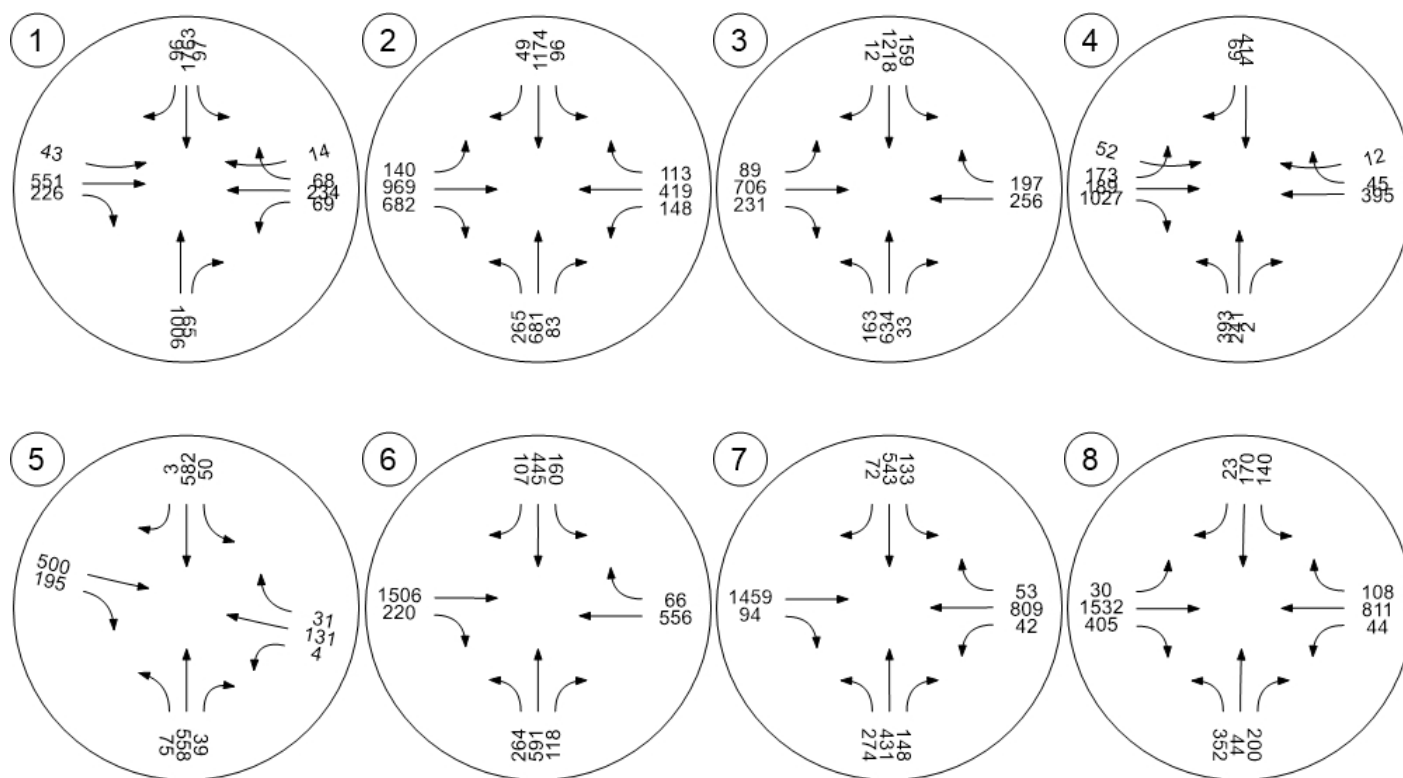
Lane Configuration and Traffic Control



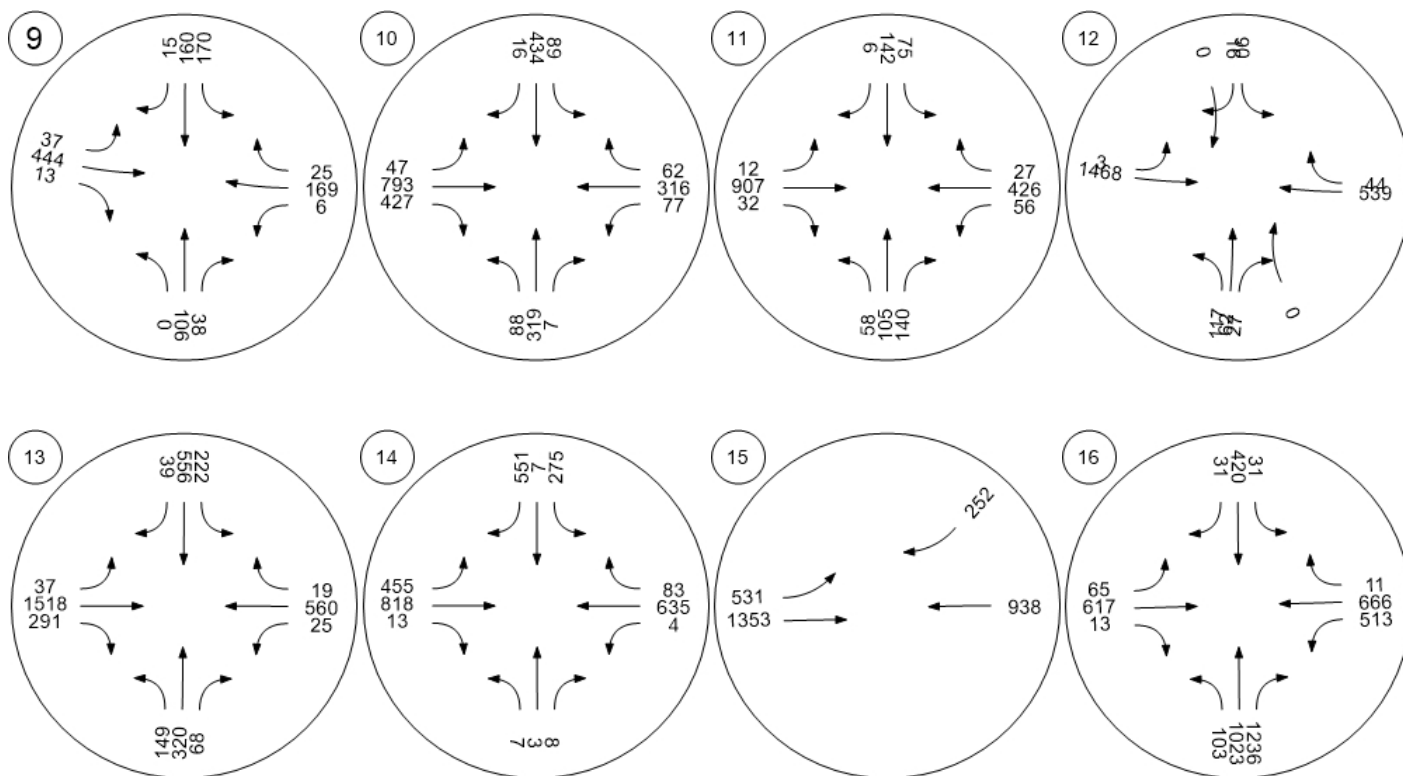
Lane Configuration and Traffic Control



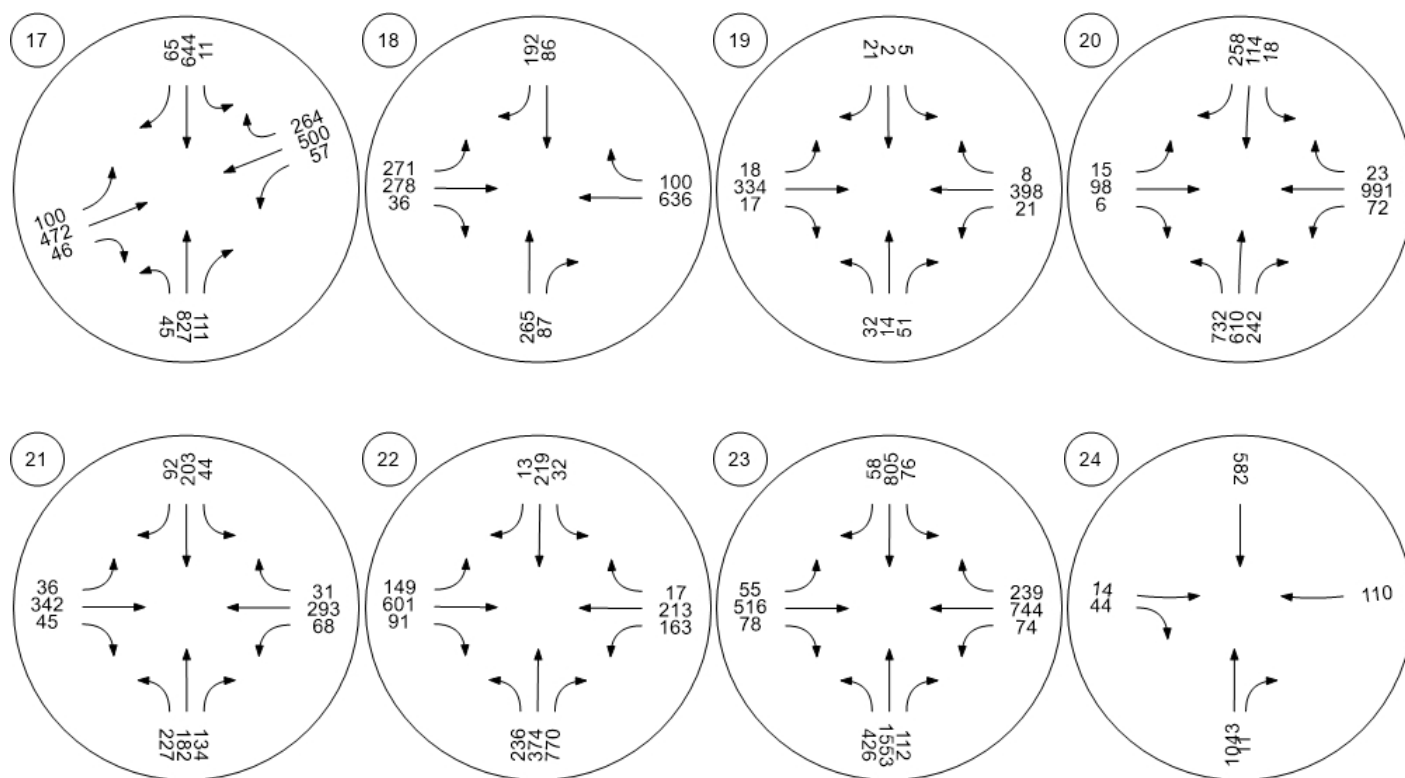
Traffic Volume - Base Volume



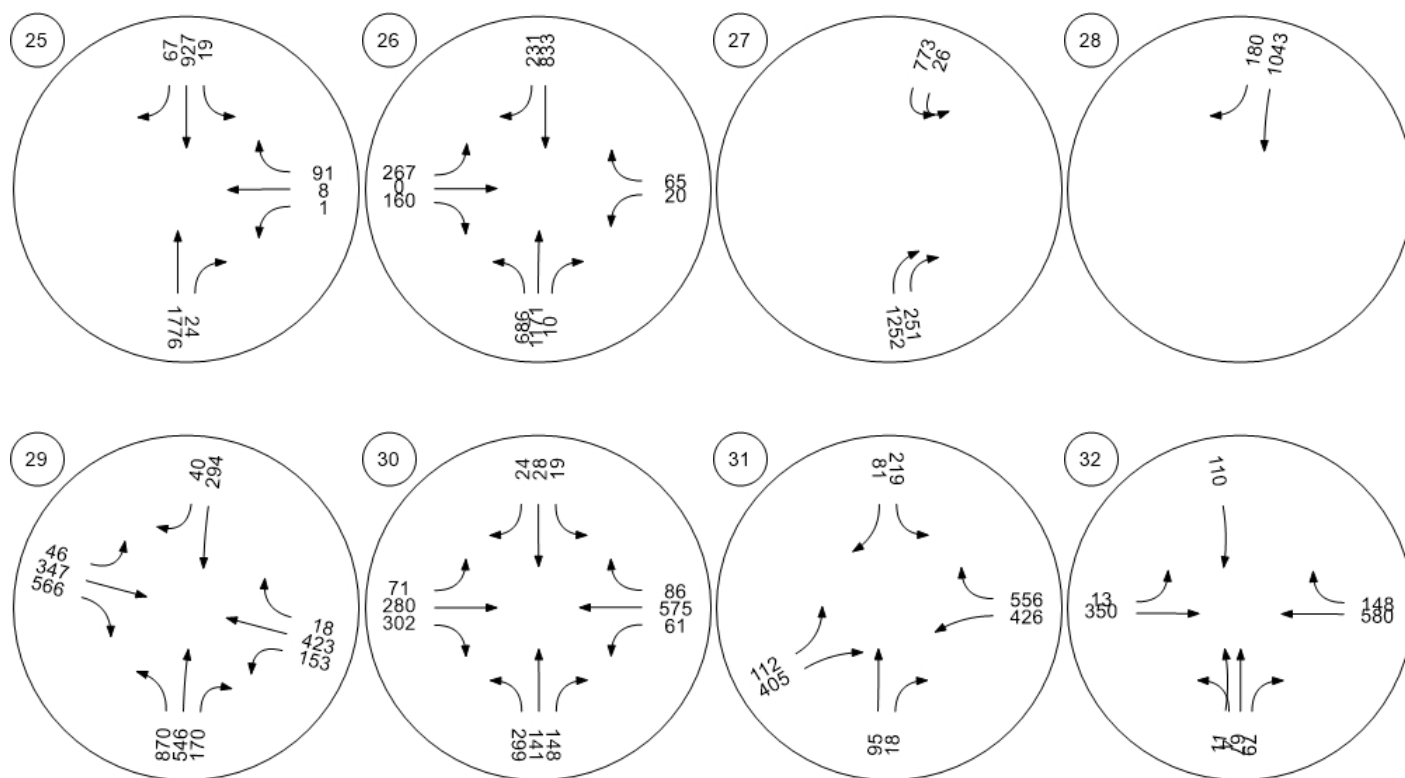
Traffic Volume - Base Volume



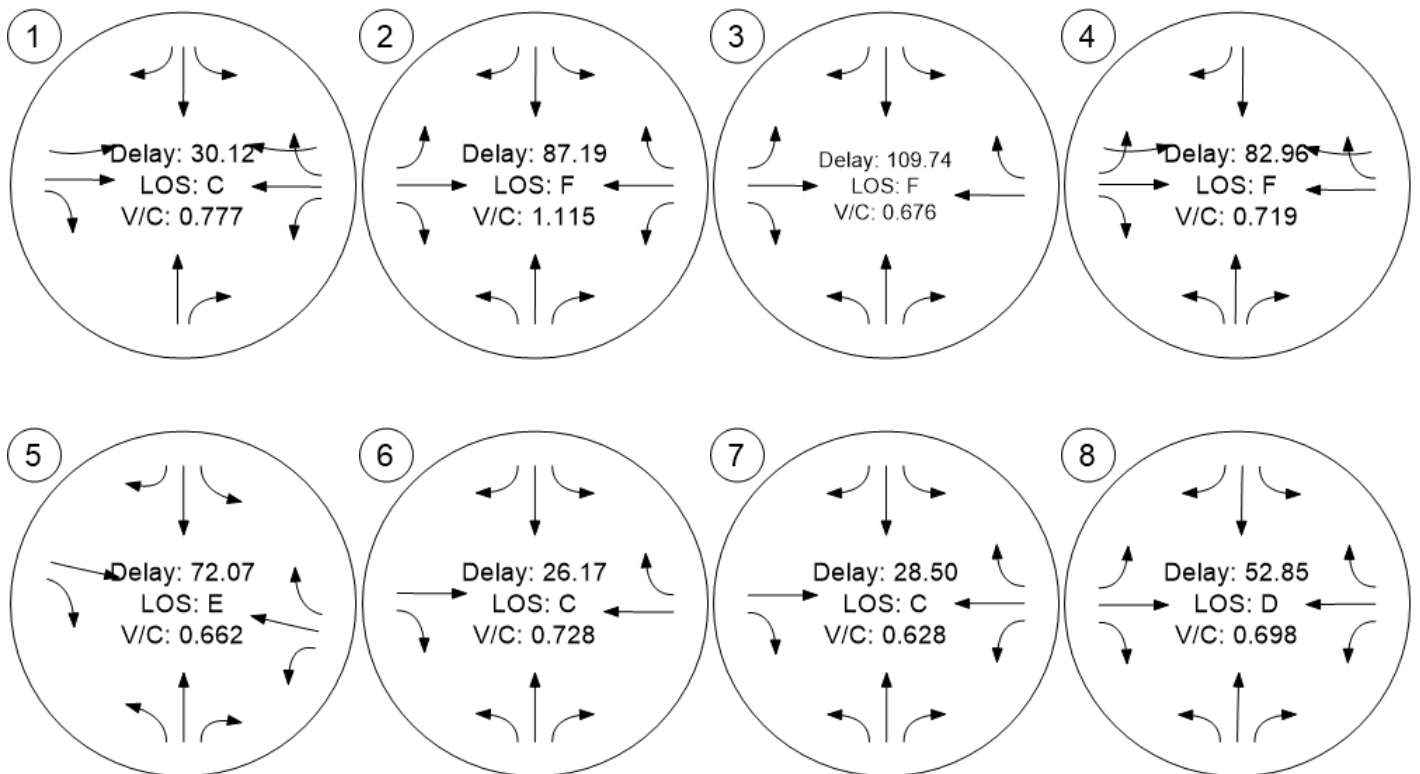
Traffic Volume - Base Volume



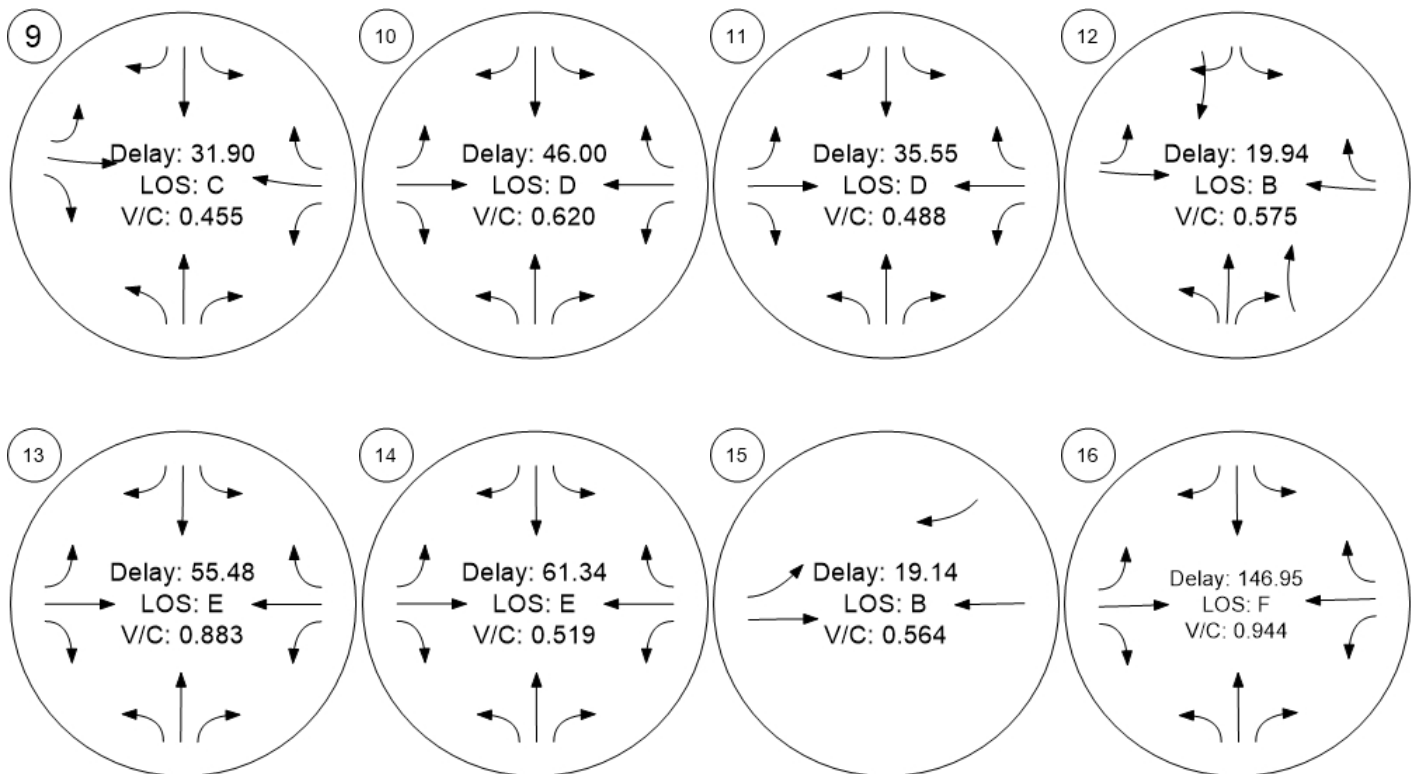
Traffic Volume - Base Volume



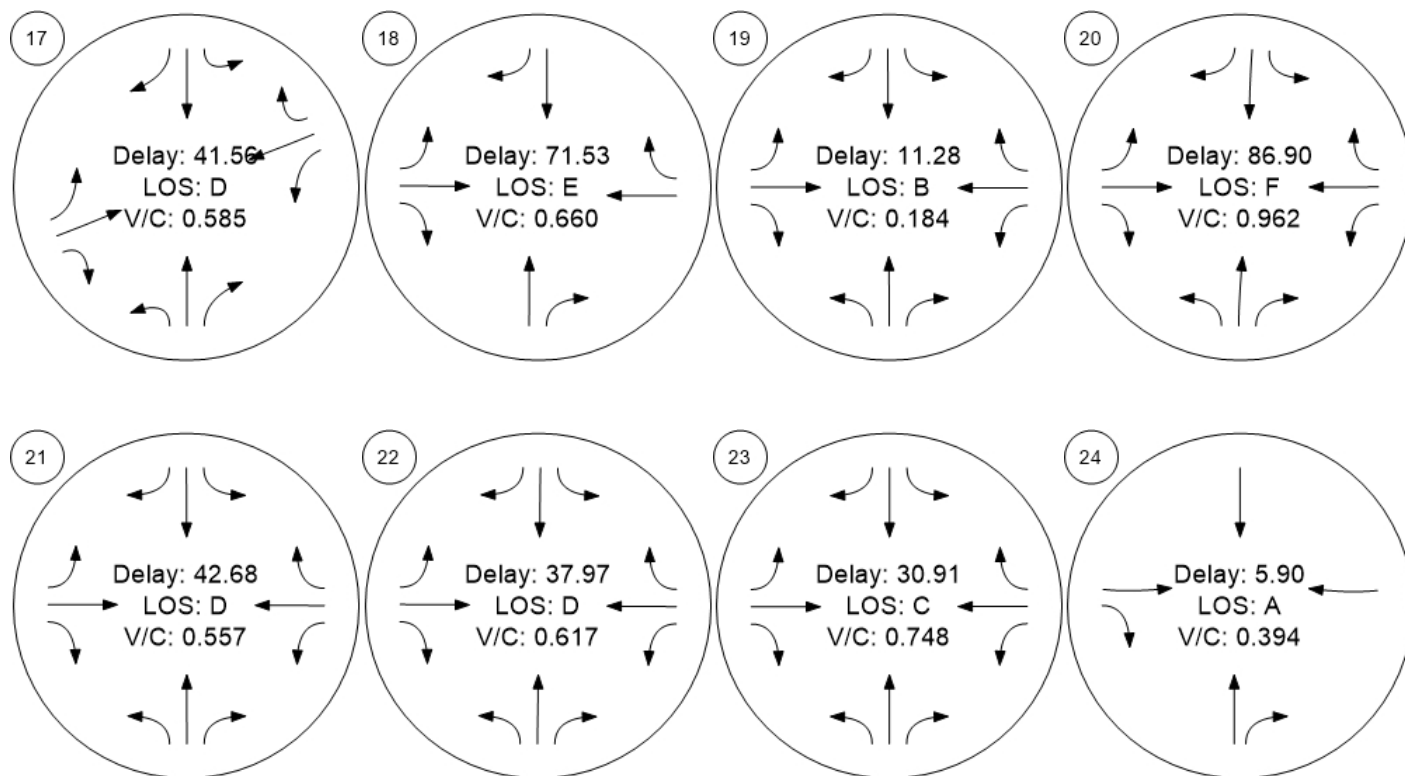
Traffic Conditions



Traffic Conditions



Traffic Conditions



Traffic Conditions

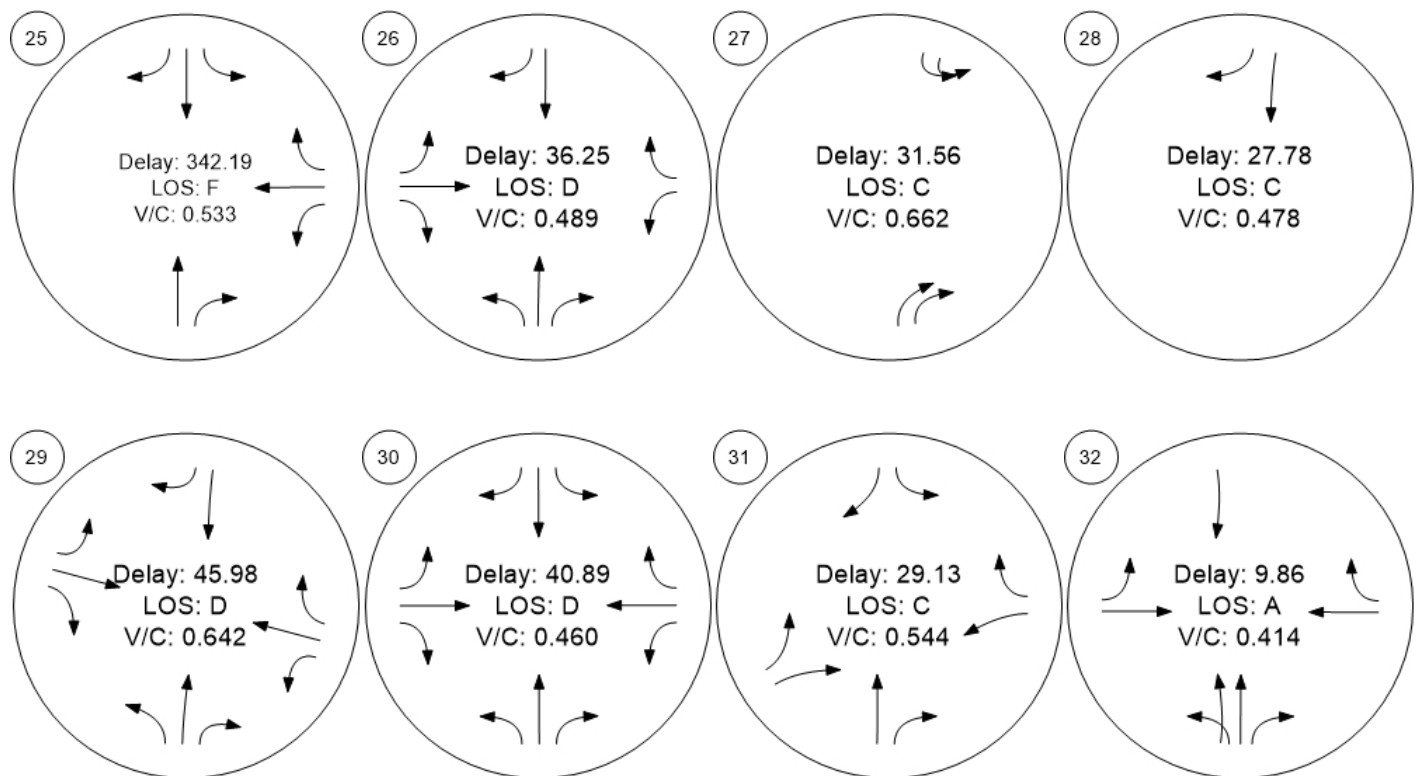


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Priority Growth Areas Mobility Study

Vistro File: Z:\...\Z0016285 PGA Primary Model.vistro

Scenario 5 5 Post Development w/o Improvements PM Peak

Report File: Z:\...\Post Development wo Improvements PM Peak.pdf

2025-04-24

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	109 Street and 100 Ave	Signalized	HCM 7th Edition	NWB Thru	0.618	36.4	D
2	Jasper Avenue and 109 Street	Signalized	HCM 7th Edition	WB Thru	0.898	73.1	E
3	104 Avenue and 109 Street	Signalized	HCM 7th Edition	NB Left	0.700	60.8	E
4	102 Avenue and 124 Street	Signalized	HCM 7th Edition	NWB Thru	0.710	110.3	F
5	Stony Plain Road and 124 Street	Signalized	HCM 7th Edition	WB Left	0.637	38.7	D
6	107 Avenue and 124 Street	Signalized	HCM 7th Edition	SB Thru	0.851	44.5	D
7	111 Avenue and 124 Street	Signalized	HCM 7th Edition	WB Left	0.680	39.5	D
8	118 Avenue and 124 Street	Signalized	HCM 7th Edition	EB Right	0.593	38.4	D
9	104 Avenue and 121 Street	Signalized	HCM 7th Edition	EB Left	0.496	38.0	D
10	104 Avenue and 116 Street	Signalized	HCM 7th Edition	WB Right	0.785	71.0	E
11	104 Avenue and 112 Street	Signalized	HCM 7th Edition	WB Left	0.404	35.7	D
12	Jasper Avenue and 121 Street	Signalized	HCM 7th Edition	NB Left	0.639	40.5	D
13	Jasper Avenue and 116 Street	Signalized	HCM 7th Edition	EB Left	0.688	47.9	D
14	100 Avenue and 116 Street	Signalized	HCM 7th Edition	EB Left	0.682	56.5	E
15	Stony Plain Road and 102 Avenue	Signalized	HCM 7th Edition	WB Thru	0.518	23.4	C
16	Stony Plain Road and 142 Street	Signalized	HCM 7th Edition	SB Thru	0.904	91.5	F
17	Stony Plain Road and 149 Street	Signalized	HCM 7th Edition	WB Thru	0.687	54.5	D

18	Stony Plain Road and 156 Street	Signalized	HCM 7th Edition	WB Thru	0.598	29.9	C
19	Stony Plain Road and 158 Street	Signalized	HCM 7th Edition	WB Right	0.241	12.3	B
20	Stony Plain Road and 163 Street	Signalized	HCM 7th Edition	NB Left	0.609	50.6	D
21	95 Avenue and 156 Street	Signalized	HCM 7th Edition	NB Left	0.471	37.5	D
22	87 Avenue and Meadowlark Road	Signalized	HCM 7th Edition	WB Left	0.628	47.3	D
23	109 Street and 82 Ave	Signalized	HCM 7th Edition	WB Left	0.828	47.5	D
24	109 Street and 83 Ave	Signalized	HCM 7th Edition	SEB Left	0.324	9.1	A
25	109 Street and 86 Ave	Two-way stop	HCM 7th Edition	WB Thru	3.266	2,145.2	F
26	109 Street and 87 Ave	Signalized	HCM 7th Edition	NB Left	0.869	42.8	D
27	109 Street and Walterdale Hill Road/Saskatchewan Drive	Signalized	HCM 7th Edition	EB Right	0.460	28.5	C
28	109 Street and 88 Ave SB	Signalized	HCM 7th Edition	SB Right	0.631	61.4	E
29	114 Street and 82 Ave	Signalized	HCM 7th Edition	SB Thru	0.652	72.0	E
30	114 Street and 87 Ave	Signalized	HCM 7th Edition	EB Thru	0.830	97.9	F
31	112 Street and 82 Ave	Signalized	HCM 7th Edition	WB Right	0.719	48.5	D
32	110 Street and 87 Ave	Signalized	HCM 7th Edition	NEB Left	0.263	10.6	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: 109 Street and 100 Ave

Control Type:	Signalized	Delay (sec / veh):	36.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

Intersection Setup

Name	109 Street					109 Street				
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right	Left	Left	Thru	Right	Right
Lane Width [m]	3.66	3.66	3.30	3.66	3.30	3.00	3.66	3.00	3.66	3.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	55.00	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	109 Street					109 Street				
Base Volume Input [veh/h]	0	0	591	0	22	49	0	1425	0	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	2	0	0	0	0	19
Total Hourly Volume [veh/h]	0	0	591	0	20	49	0	1425	0	185
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	148	0	5	12	0	356	0	46
Total Analysis Volume [veh/h]	0	0	591	0	20	49	0	1425	0	185
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	85					60				
v_di, Inbound Pedestrian Volume crossing th	85					60				
v_co, Outbound Pedestrian Volume along th	86					28				
v_ci, Inbound Pedestrian Volume along the l	86					28				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	ProtPerm	Permissiv	Overlap	Permissiv	Overlap
Signal Group	0	0	3	0	0	2	0	3	0	3
Auxiliary Signal Groups								2,3		2,3
Maximum Green [s]	0	0	31	0	0	15	0	31	0	31
Amber [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0
All red [s]	0.0	0.0	2.0	0.0	0.0	1.0	0.0	2.0	0.0	2.0
Walk [s]	0	0	10	0	0	0	0	10	0	10
Pedestrian Clearance [s]	0	0	14	0	0	0	0	14	0	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No					No		
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	0.0	0.0	2.0	0.0	3.0	0.0	3.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	0	36	0	0	19	0	36	0	36
Lead / Lag	-	-	-	-	-	Lead	-	-	-	-
Minimum Green [s]	0	0	24	0	0	7	0	24	0	24
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0
Minimum Recall			No			No		No		No
Maximum Recall			Yes			Yes		Yes		Yes
Pedestrian Recall			No			No		No		No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	4.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	2.00	0.00	0.00
g_i, Effective Green Time [s]	31	31	26	61	61
g / C, Green / Cycle	0.28	0.28	0.24	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.13	0.13	0.03	0.35	0.35
s, saturation flow rate [veh/h]	3204	1576	1539	3076	1522
c, Capacity [veh/h]	909	447	361	1705	844
d1, Uniform Delay [s]	32.34	32.42	33.30	16.80	16.81
k, delay calibration	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.60	3.32	0.78	1.79	3.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.46	0.14	0.63	0.63
d, Delay for Lane Group [s/veh]	33.94	35.74	34.08	18.59	20.40
Lane Group LOS	C	D	C	B	C
Critical Lane Group	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.63	4.85	1.11	9.27	9.61
50th-Percentile Queue Length [m/ln]	35.29	36.98	8.48	70.63	73.23
95th-Percentile Queue Length [veh/ln]	8.16	8.47	2.00	14.26	14.69
95th-Percentile Queue Length [m/ln]	62.18	64.50	15.26	108.68	111.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	34.50	0.00	35.74	34.08	0.00	19.03	0.00	20.40
Movement LOS			C		D	C		B		C
d_A, Approach Delay [s/veh]	34.54					19.63				
Approach LOS	C					B				
d_I, Intersection Delay [s/veh]	36.41									
Intersection LOS	D									
Intersection V/C	0.618									

Emissions

Vehicle Kilometers Traveled [km/h]	65.10	32.55	11.44	251.36	124.54
Stops [stops/h]	303.11	158.81	36.41	606.71	314.53
Fuel consumption [L/h]	23.64	12.27	3.19	52.95	27.29
CO [g/h]	436.56	226.51	58.94	977.67	503.87
NOx [g/h]	84.94	44.07	11.47	190.22	98.03
VOC [g/h]	101.18	52.50	13.66	226.58	116.78

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m ² /ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m ² /ped]	8.23	12.75
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.891	2.968
Crosswalk LOS	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	564	909
d_b, Bicycle Delay [s]	28.37	16.36
I_b,int, Bicycle LOS Score for Intersection	1.897	2.483
Bicycle LOS	A	B

Intersection Setup

Name	100 Ave					WB Bike Lane				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.66	3.66	3.20	3.66	3.20	3.66	3.66	3.66	1.50	3.66
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	95.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	100 Ave					WB Bike Lane				
Base Volume Input [veh/h]	0	0	198	0	88	0	0	0	52	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	9	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	198	0	79	0	0	0	47	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	50	0	20	0	0	0	12	0
Total Analysis Volume [veh/h]	0	0	198	0	79	0	0	0	47	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	28					86				
v_di, Inbound Pedestrian Volume crossing th	28					86				
v_co, Outbound Pedestrian Volume along th	85					60				
v_ci, Inbound Pedestrian Volume along the l	85					60				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					52				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	1	0	0	0	0	0	1	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	36	0	0	0	0	0	36	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	18	0	0	0	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No						No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	0	42	0	0	0	0	0	42	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	25	0	0	0	0	0	25	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall			Yes						Yes	
Maximum Recall			No						No	
Pedestrian Recall			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	R
C, Calculated Cycle Length [s]	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00
g_i, Effective Green Time [s]	25	25	25
g / C, Green / Cycle	0.23	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.12	0.07	0.03
s, saturation flow rate [veh/h]	1683	1110	1373
c, Capacity [veh/h]	383	252	312
d1, Uniform Delay [s]	37.20	34.74	33.99
k, delay calibration	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	1.08	0.70	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.31	0.15
d, Delay for Lane Group [s/veh]	38.28	35.44	34.21
Lane Group LOS	D	D	C
Critical Lane Group	No	No	No
50th-Percentile Queue Length [veh/ln]	4.75	1.78	1.03
50th-Percentile Queue Length [m/ln]	36.23	13.55	7.81
95th-Percentile Queue Length [veh/ln]	8.33	3.20	1.85
95th-Percentile Queue Length [m/ln]	63.48	24.39	14.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	38.28	0.00	35.44	0.00	0.00	0.00	34.21	0.00
Movement LOS			D		D				C	
d_A, Approach Delay [s/veh]	37.47					34.21				
Approach LOS	D					C				
d_I, Intersection Delay [s/veh]	36.41									
Intersection LOS	D									
Intersection V/C	0.618									

Emissions

Vehicle Kilometers Traveled [km/h]	72.76	29.03	3.29
Stops [stops/h]	155.61	58.19	33.56
Fuel consumption [L/h]	16.25	6.22	2.30
CO [g/h]	300.12	114.94	42.55
NOx [g/h]	58.39	22.36	8.28
VOC [g/h]	69.55	26.64	9.86

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	10.54
M_CW, Crosswalk Circulation Area [m²/ped]	13.71	4.97
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.332	1.766
Crosswalk LOS	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	655	655
d_b, Bicycle Delay [s]	24.89	25.56
I_b,int, Bicycle LOS Score for Intersection	2.032	1.560
Bicycle LOS	B	A

Intersection Setup										
Name	100 Ave					EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration										
Turning Movement	Left	Thru	Thru	Right	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.20	3.20	3.66	3.66	3.20	3.66	1.50	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	50.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	100 Ave					EB Bike Lane				
Base Volume Input [veh/h]	132	609	0	0	66	0	17	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	7	0	0	0	0	0
Total Hourly Volume [veh/h]	132	609	0	0	66	0	17	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	152	0	0	17	0	4	0	0	0
Total Analysis Volume [veh/h]	132	609	0	0	66	0	17	0	0	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	86					28				
v_di, Inbound Pedestrian Volume crossing th	86					28				
v_co, Outbound Pedestrian Volume along th	86					28				
v_ci, Inbound Pedestrian Volume along the l	86					28				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					17				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Permissiv	Permissiv	Protected	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	4	1	0	0	2	0	1	0	0	0
Auxiliary Signal Groups	1,4	1,4								
Maximum Green [s]	10	36	0	0	15	0	36	0	0	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	3.0	0.0	0.0	1.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	5	7	0	0	0	0	7	0	0	0
Pedestrian Clearance [s]	10	18	0	0	0	0	18	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No					No			
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.0	4.0	0.0	0.0	2.0	0.0	4.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	13	42	0	0	19	0	42	0	0	0
Lead / Lag	Lag	-	-	-	-	-	Lag	-	-	-
Minimum Green [s]	7	25	0	0	7	0	25	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0
Minimum Recall	No	Yes			No		Yes			
Maximum Recall	Yes	No			Yes		No			
Pedestrian Recall	No	No			No		No			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L
C, Calculated Cycle Length [s]	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	38	38	26	25
g / C, Green / Cycle	0.35	0.35	0.24	0.23
(v / s)_i Volume / Saturation Flow Rate	0.11	0.36	0.05	0.02
s, saturation flow rate [veh/h]	1169	1683	1431	956
c, Capacity [veh/h]	397	582	335	218
d1, Uniform Delay [s]	26.32	35.99	33.80	33.42
k, delay calibration	0.11	0.50	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.49	50.02	1.31	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	1.05	0.20	0.08
d, Delay for Lane Group [s/veh]	26.81	86.01	35.11	33.57
Lane Group LOS	C	F	D	C
Critical Lane Group	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.51	23.25	1.54	0.37
50th-Percentile Queue Length [m/ln]	19.11	177.19	11.70	2.80
95th-Percentile Queue Length [veh/ln]	4.51	32.15	2.76	0.66
95th-Percentile Queue Length [m/ln]	34.40	245.00	21.07	5.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.81	86.01	0.00	0.00	35.11	0.00	33.57	0.00	0.00	0.00
Movement LOS	C	F			D		C			
d_A, Approach Delay [s/veh]	72.16					33.57				
Approach LOS	E					C				
d_I, Intersection Delay [s/veh]	36.41									
Intersection LOS	D									
Intersection V/C	0.618									

Emissions

Vehicle Kilometers Traveled [km/h]	23.01	106.15	11.50	1.30
Stops [stops/h]	82.09	761.01	50.27	12.01
Fuel consumption [L/h]	6.76	67.51	4.01	0.83
CO [g/h]	124.76	1246.70	73.99	15.37
NOx [g/h]	24.27	242.56	14.40	2.99
VOC [g/h]	28.91	288.93	17.15	3.56

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	10.73	11.83
d_p, Pedestrian Delay [s]	41.89	41.89
I_p,int, Pedestrian LOS Score for Intersection	2.422	1.757
Crosswalk LOS	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	891	655
d_b, Bicycle Delay [s]	16.91	25.10
I_b,int, Bicycle LOS Score for Intersection	2.903	1.670
Bicycle LOS	C	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Jasper Avenue and 109 Street

Control Type:	Signalized	Delay (sec / veh):	73.1
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.898

Intersection Setup

Name	109 Street											
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	2.80	2.80	3.00	3.00	3.00	3.00	3.20	3.40	3.20	3.00	3.40	3.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [m]	125.00	30.48	30.48	75.00	30.48	30.48	220.00	30.48	55.00	50.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			40.00		
Grade [%]	0.00			0.00			5.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	109 Street											
Base Volume Input [veh/h]	186	439	90	68	1104	170	141	795	368	179	1367	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	9	0	0	17	0	0	37	0	0	17
Total Hourly Volume [veh/h]	186	439	81	68	1104	153	141	795	331	179	1367	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	110	20	17	276	38	35	199	83	45	342	39
Total Analysis Volume [veh/h]	186	439	81	68	1104	153	141	795	331	179	1367	157
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	145			250			145			250		
v_di, Inbound Pedestrian Volume crossing m	145			250			145			250		
v_co, Outbound Pedestrian Volume crossing	111			113			113			111		
v_ci, Inbound Pedestrian Volume crossing mi	111			113			113			111		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	73.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	5	1	0	0	1	0	2	4	0	3	4	0
Auxiliary Signal Groups	1,5	1,5										
Maximum Green [s]	12	34	0	0	34	0	8	39	0	8	39	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	19	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	0.0	3.0	0.0	1.0	4.0	0.0	1.0	4.0	0.0
Detector Location [m]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	5.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	15	39	0	0	39	0	11	45	0	11	45	0
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	25	0	0	25	0	5	26	0	5	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	Yes			Yes		No	No		No	No	
Maximum Recall	Yes	No			No		No	Yes		No	Yes	
Pedestrian Recall	Yes	Yes			Yes		Yes	Yes		Yes	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	4.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	3.00	3.00	3.00	3.00	0.00	4.00	4.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	49	49	34	34	34	34	50	39	39	48	39	39
g / C, Green / Cycle	0.45	0.45	0.31	0.31	0.31	0.31	0.45	0.35	0.35	0.44	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.27	0.14	0.08	0.10	0.27	0.31	0.33	0.31	0.37	0.28	0.43	0.15
s, saturation flow rate [veh/h]	688	3076	1077	713	3076	1361	427	2530	893	640	3204	1037
c, Capacity [veh/h]	285	1370	333	207	951	421	196	897	317	245	1136	368
d1, Uniform Delay [s]	25.06	19.73	27.90	39.04	36.14	37.78	26.02	33.41	31.84	23.16	35.50	25.87
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.15	0.62	1.73	4.19	11.87	40.75	20.12	12.54	62.77	17.46	100.03	3.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.65	0.32	0.24	0.33	0.89	0.99	0.72	0.89	1.04	0.73	1.20	0.43
d, Delay for Lane Group [s/veh]	36.21	20.35	29.63	43.23	48.02	78.53	46.15	45.95	94.61	40.62	135.53	29.47
Lane Group LOS	D	C	C	D	D	E	D	D	F	D	F	C
Critical Lane Group	No	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.85	3.71	1.72	1.86	12.10	15.63	3.28	11.29	12.91	3.86	30.81	3.39
50th-Percentile Queue Length [m/ln]	29.30	28.23	13.14	14.18	92.20	119.08	24.97	86.06	98.41	29.40	234.75	25.86
95th-Percentile Queue Length [veh/ln]	6.92	6.67	3.10	3.35	17.80	22.11	5.90	16.81	19.34	6.94	44.85	6.11
95th-Percentile Queue Length [m/ln]	52.74	50.82	23.66	25.53	135.67	168.48	44.95	128.06	147.37	52.91	341.74	46.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.21	20.35	29.63	43.23	55.27	78.53	46.15	45.95	94.61	40.62	135.53	29.47
Movement LOS	D	C	C	D	E	E	D	D	F	D	F	C
d_A, Approach Delay [s/veh]	25.59			57.34			58.69			115.78		
Approach LOS	C			E			E			F		
d_I, Intersection Delay [s/veh]	73.10											
Intersection LOS	E											
Intersection V/C	0.898											

Emissions

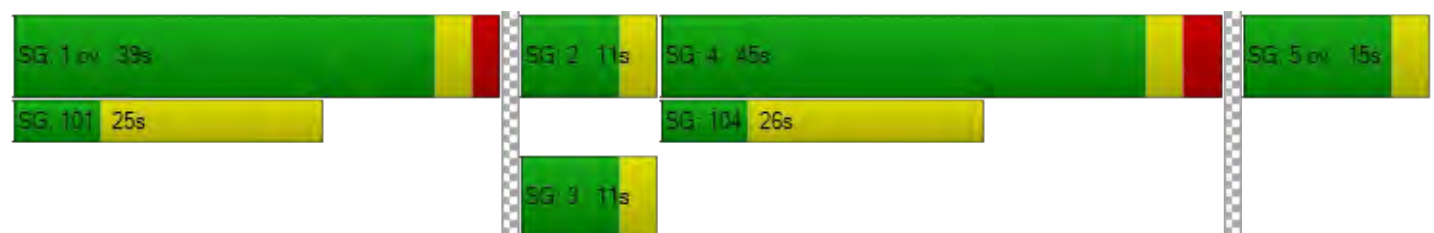
Vehicle Kilometers Traveled [km/h]	43.43	102.50	18.91	9.90	122.50	60.44	97.27	548.46	228.35	19.46	148.64	17.07
Stops [stops/h]	125.85	242.52	56.44	60.91	792.00	511.43	107.25	739.25	422.66	126.25	2016.50	111.05
Fuel consumption [L/h]	12.14	22.07	4.91	4.57	60.55	42.34	16.67	96.91	55.33	9.48	187.40	6.97
CO [g/h]	224.22	407.59	90.74	84.43	1118.12	781.91	307.88	1789.46	1021.68	175.01	3460.52	128.67
NOx [g/h]	43.62	79.30	17.66	16.43	217.55	152.13	59.90	348.16	198.78	34.05	673.29	25.03
VOC [g/h]	51.96	94.46	21.03	19.57	259.14	181.21	71.35	414.72	236.78	40.56	802.01	29.82

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	2.34			1.97			4.01			4.91		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.048			2.914			3.111			2.943		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	891			618			709			709		
d_b, Bicycle Delay [s]	16.91			26.25			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.149			2.298			2.635			2.979		
Bicycle LOS	B			B			B			C		

Sequence

Ring 1	1	2	4	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: 104 Avenue and 109 Street

Control Type:	Signalized	Delay (sec / veh):	60.8
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.66	3.60	3.60
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	0	0	1
Entry Pocket Length [m]	100.00	30.48	30.48	100.00	30.48	30.48	70.00	30.48	30.48	30.48	30.48	55.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	152	1121	28	101	1023	44	55	372	110	0	661	438
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	3	0	0	4	0	0	11	0	0	44
Total Hourly Volume [veh/h]	152	1121	25	101	1023	40	55	372	99	0	661	394
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	280	6	25	256	10	14	93	25	0	165	99
Total Analysis Volume [veh/h]	152	1121	25	101	1023	40	55	372	99	0	661	394
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	50			50			50			50		
v_di, Inbound Pedestrian Volume crossing m	50			50			50			50		
v_co, Outbound Pedestrian Volume crossing	50			50			50			50		
v_ci, Inbound Pedestrian Volume crossing mi	50			50			50			50		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	4	0	3	4	0	1	5	0	0	2	0
Auxiliary Signal Groups												
Maximum Green [s]	17	48	0	17	48	0	13	74	0	0	55	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0
All red [s]	3.0	3.0	0.0	3.0	3.0	0.0	2.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	25	0	0	25	0	0	25	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	5.0	5.0	0.0	5.0	5.0	0.0	4.0	5.0	0.0	0.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	24	55	0	24	55	0	19	81	0	0	62	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	0	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No			No	
Maximum Recall	Yes	Yes		Yes	Yes		Yes	Yes			Yes	
Pedestrian Recall	No	Yes		No	Yes		No	Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	C	R
C, Calculated Cycle Length [s]	160	160	160	160	160	160	160	160	160	160	160
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	6.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	17	48	48	17	48	48	13	74	74	55	55
g / C, Green / Cycle	0.11	0.30	0.30	0.11	0.30	0.30	0.08	0.46	0.46	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.10	0.26	0.26	0.07	0.24	0.24	0.04	0.14	0.15	0.22	0.30
s, saturation flow rate [veh/h]	1476	2951	1520	1476	2951	1499	1476	1683	1514	2951	1306
c, Capacity [veh/h]	157	885	456	157	885	450	120	778	700	1015	449
d1, Uniform Delay [s]	71.24	52.66	52.81	68.60	51.42	51.66	70.14	27.00	27.22	44.40	47.55
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	64.11	10.14	18.59	18.59	7.19	14.15	12.11	1.04	1.24	3.25	20.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.97	0.85	0.86	0.64	0.79	0.80	0.46	0.31	0.33	0.65	0.88
d, Delay for Lane Group [s/veh]	135.35	62.80	71.40	87.19	58.61	65.81	82.25	28.04	28.47	47.65	68.43
Lane Group LOS	F	E	E	F	E	E	F	C	C	D	E
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.03	15.52	17.23	4.80	13.85	15.20	2.57	6.16	5.88	11.63	16.87
50th-Percentile Queue Length [m/ln]	68.79	118.28	131.27	36.57	105.52	115.80	19.57	46.94	44.84	88.62	128.54
95th-Percentile Queue Length [veh/ln]	13.95	21.98	24.03	8.39	19.95	21.59	4.62	10.23	9.86	17.22	23.60
95th-Percentile Queue Length [m/ln]	106.34	167.51	183.14	63.94	152.02	164.51	35.23	77.95	75.15	131.24	179.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	135.35	65.61	71.40	87.19	60.88	65.81	82.25	28.19	28.47	0.00	47.65	68.43
Movement LOS	F	E	E	F	E	E	F	C	C		D	E
d_A, Approach Delay [s/veh]	73.89			63.33			33.89			55.41		
Approach LOS	E			E			C			E		
d_I, Intersection Delay [s/veh]	60.82											
Intersection LOS	E											
Intersection V/C	0.700											

Emissions

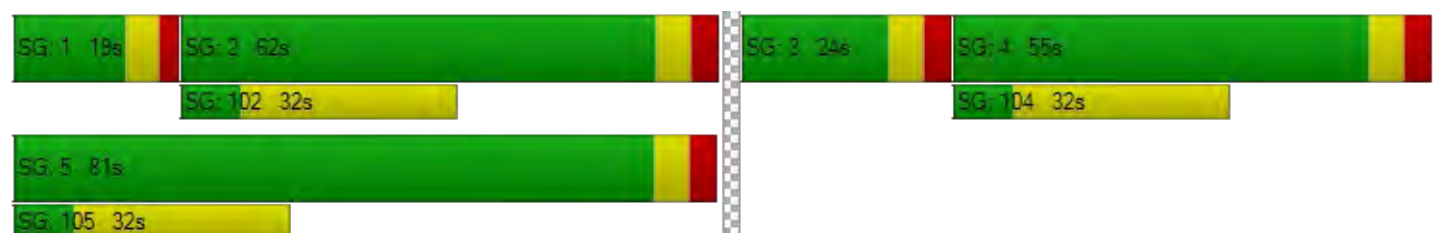
Vehicle Kilometers Traveled [km/h]	67.87	336.76	174.92	21.31	147.96	76.28	14.18	62.51	58.95	152.11	90.67
Stops [stops/h]	203.12	698.48	387.61	107.97	623.13	341.92	57.79	138.59	132.40	523.37	379.55
Fuel consumption [L/h]	26.86	84.19	46.88	11.23	59.72	33.26	6.13	14.29	13.59	50.47	37.91
CO [g/h]	495.97	1554.65	865.72	207.40	1102.78	614.11	113.19	263.91	250.97	931.98	700.00
NOx [g/h]	96.50	302.48	168.44	40.35	214.56	119.48	22.02	51.35	48.83	181.33	136.19
VOC [g/h]	114.95	360.31	200.64	48.07	255.58	142.33	26.23	61.16	58.17	215.99	162.23

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	7.64			2.45			8.86			9.11		
d_p, Pedestrian Delay [s]	69.38			69.38			69.38			69.38		
I_p,int, Pedestrian LOS Score for Intersectio	2.977			3.028			2.624			2.713		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			600			925			688		
d_b, Bicycle Delay [s]	39.20			39.20			23.11			34.45		
I_b,int, Bicycle LOS Score for Intersection	2.275			2.202			2.003			2.466		
Bicycle LOS	B			B			B			B		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 102 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	110.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name										
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right	Left	Left	Thru	Right	Right
Lane Width [m]	3.40	3.66	3.40	3.66	3.40	3.66	3.66	3.60	3.66	3.60
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name										
Base Volume Input [veh/h]	1326	0	304	0	4	0	0	376	0	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	10
Total Hourly Volume [veh/h]	1326	0	304	0	4	0	0	376	0	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	332	0	76	0	1	0	0	94	0	23
Total Analysis Volume [veh/h]	1326	0	304	0	4	0	0	376	0	91
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	12					23				
v_di, Inbound Pedestrian Volume crossing th	7					23				
v_co, Outbound Pedestrian Volume along th	6					7				
v_ci, Inbound Pedestrian Volume along the l	3					7				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	91.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Permissiv	Overlap	Permissiv	Overlap	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	1	0	1	0	1	0	0	1	0	0
Auxiliary Signal Groups	1,2		1,2		1,2					
Maximum Green [s]	32	0	32	0	32	0	0	32	0	0
Amber [s]	3.0	0.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	2.0	0.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Walk [s]	7	0	7	0	7	0	0	7	0	0
Pedestrian Clearance [s]	18	0	18	0	18	0	0	18	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No					No		
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Detector Location [m]	1.0	0.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Detector Length [m]	5.0	0.0	5.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	37	0	37	0	37	0	0	37	0	0
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-
Minimum Green [s]	25	0	25	0	25	0	0	25	0	0
Vehicle Extension [s]	3.0	0.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Minimum Recall	Yes		Yes		Yes			Yes		
Maximum Recall	No		No		No			No		
Pedestrian Recall	Yes		Yes		Yes			Yes		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	64	64	64	32	32
g / C, Green / Cycle	0.58	0.58	0.58	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.53	0.63	0.20	0.14	0.15
s, saturation flow rate [veh/h]	1242	1045	1528	1683	1575
c, Capacity [veh/h]	644	588	889	490	458
d1, Uniform Delay [s]	31.31	29.62	12.05	32.11	32.47
k, delay calibration	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	43.07	77.80	1.07	3.31	4.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.03	1.13	0.35	0.48	0.51
d, Delay for Lane Group [s/veh]	74.38	107.42	13.12	35.42	36.48
Lane Group LOS	F	F	B	D	D
Critical Lane Group	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	18.32	21.83	4.06	5.53	5.65
50th-Percentile Queue Length [m/ln]	139.58	166.34	30.95	42.13	43.03
95th-Percentile Queue Length [veh/ln]	25.92	32.29	7.31	9.38	9.54
95th-Percentile Queue Length [m/ln]	197.50	246.02	55.72	71.51	72.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	90.90	0.00	13.12	0.00	13.12	0.00	0.00	35.82	0.00	36.48
Movement LOS	F		B		B			D		D
d_A, Approach Delay [s/veh]	76.24						35.95			
Approach LOS	E						D			
d_I, Intersection Delay [s/veh]	110.32									
Intersection LOS	F									
Intersection V/C	0.710									

Emissions

Vehicle Kilometers Traveled [km/h]	97.54	97.54	45.31	100.36	100.36
Stops [stops/h]	599.46	714.40	132.94	180.94	184.80
Fuel consumption [L/h]	60.71	80.16	10.41	19.98	20.26
CO [g/h]	1121.07	1480.15	192.15	368.90	374.04
NOx [g/h]	218.12	287.98	37.38	71.77	72.77
VOC [g/h]	259.82	343.04	44.53	85.50	86.69

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	16.31
M_CW, Crosswalk Circulation Area [m²/ped]	0.10	15.66
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.830	2.440
Crosswalk LOS	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1164	582
d_b, Bicycle Delay [s]	9.62	27.65
I_b,int, Bicycle LOS Score for Intersection	2.908	1.953
Bicycle LOS	C	A

Intersection Setup										
Name						WB Bike Lane				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.60	3.66	3.66	3.60	3.60	3.66	3.66	3.66	1.20	3.66
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	35.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name						WB Bike Lane				
Base Volume Input [veh/h]	5	0	0	198	570	0	0	0	60	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	57	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	0	198	513	0	0	0	54	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	0	50	128	0	0	0	14	0
Total Analysis Volume [veh/h]	5	0	0	198	513	0	0	0	54	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	7					9				
v_di, Inbound Pedestrian Volume crossing th	7					9				
v_co, Outbound Pedestrian Volume along th	7					23				
v_ci, Inbound Pedestrian Volume along the l	12					23				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					60				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	91.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Permissiv	Permissiv	Overlap	Overlap	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	3	0	0	3	2	0	0	0	4	0
Auxiliary Signal Groups	3,4			3,4	2,3,4					
Maximum Green [s]	16	0	0	16	27	0	0	0	15	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0
Walk [s]	7	0	0	7	0	0	0	0	7	0
Pedestrian Clearance [s]	14	0	0	14	0	0	0	0	13	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No					No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	21	0	0	21	32	0	0	0	20	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-
Minimum Green [s]	10	0	0	10	7	0	0	0	10	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall	No			No	No				No	
Maximum Recall	Yes			Yes	Yes				Yes	
Pedestrian Recall	No			No	No				No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	R
C, Calculated Cycle Length [s]	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	3.00
g_i, Effective Green Time [s]	36	63	15
g / C, Green / Cycle	0.33	0.57	0.14
(v / s)_i Volume / Saturation Flow Rate	0.13	0.20	0.04
s, saturation flow rate [veh/h]	1566	2510	1373
c, Capacity [veh/h]	545	1438	187
d1, Uniform Delay [s]	28.34	10.20	42.70
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	1.95	0.69	3.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.36	0.29
d, Delay for Lane Group [s/veh]	30.29	10.89	46.55
Lane Group LOS	C	B	D
Critical Lane Group	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.36	2.95	1.52
50th-Percentile Queue Length [m/ln]	33.25	22.46	11.57
95th-Percentile Queue Length [veh/ln]	7.79	5.31	2.73
95th-Percentile Queue Length [m/ln]	59.36	40.43	20.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.29	0.00	0.00	30.29	10.89	0.00	0.00	0.00	46.55	0.00
Movement LOS	C			C	B				D	
d_A, Approach Delay [s/veh]	16.39					46.55				
Approach LOS	B					D				
d_I, Intersection Delay [s/veh]	110.32									
Intersection LOS	F									
Intersection V/C	0.710									

Emissions

Vehicle Kilometers Traveled [km/h]	58.78	148.55	5.86
Stops [stops/h]	142.82	192.95	49.70
Fuel consumption [L/h]	13.53	22.77	3.61
CO [g/h]	249.90	420.39	66.64
NOx [g/h]	48.62	81.79	12.97
VOC [g/h]	57.92	97.43	15.45

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	24.27	27.36
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	3.313	1.794
Crosswalk LOS	C	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	655	273
d_b, Bicycle Delay [s]	24.89	42.29
I_b,int, Bicycle LOS Score for Intersection	2.835	1.560
Bicycle LOS	C	A

Intersection Setup										
Name						EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration	Y					J				
Turning Movement	Left	Thru	Thru	Right	Right	Left2	Left	Thru	Right	Right2
Lane Width [m]	3.60	3.66	3.60	3.66	3.60	3.66	1.20	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	40.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name						EB Bike Lane				
Base Volume Input [veh/h]	0	0	261	0	165	0	16	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	17	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	261	0	148	0	16	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	65	0	37	0	4	0	0	0
Total Analysis Volume [veh/h]	0	0	261	0	148	0	16	0	0	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	3					7				
v_di, Inbound Pedestrian Volume crossing th	6					7				
v_co, Outbound Pedestrian Volume along th	9					7				
v_ci, Inbound Pedestrian Volume along the l	9					7				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					16				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	91.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	4	0	0	0	4	0	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	15	0	0	0	15	0	0	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	0	7	0	0	0	7	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0	13	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No				No			
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	20	0	0	0	20	0	0	0
Lead / Lag	-	-	-	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	10	0	0	0	10	0	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Minimum Recall			No				No			
Maximum Recall			Yes				Yes			
Pedestrian Recall			No				No			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L
C, Calculated Cycle Length [s]	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	2.00
l2, Clearance Lost Time [s]	3.00	3.00
g_i, Effective Green Time [s]	15	15
g / C, Green / Cycle	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.27	0.02
s, saturation flow rate [veh/h]	1514	693
c, Capacity [veh/h]	206	66
d1, Uniform Delay [s]	47.50	55.00
k, delay calibration	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	458.58	8.50
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	1.98	0.24
d, Delay for Lane Group [s/veh]	506.08	63.50
Lane Group LOS	F	E
Critical Lane Group	Yes	No
50th-Percentile Queue Length [veh/ln]	31.97	0.60
50th-Percentile Queue Length [m/ln]	243.60	4.56
95th-Percentile Queue Length [veh/ln]	50.86	1.08
95th-Percentile Queue Length [m/ln]	387.55	8.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	506.08	0.00	506.08	0.00	63.50	0.00	0.00	0.00
Movement LOS			F		F		E			
d_A, Approach Delay [s/veh]	506.08					63.50				
Approach LOS	F					E				
d_I, Intersection Delay [s/veh]	110.32									
Intersection LOS	F									
Intersection V/C	0.710									

Emissions

Vehicle Kilometers Traveled [km/h]	64.20	1.77
Stops [stops/h]	1046.23	19.57
Fuel consumption [L/h]	181.24	1.39
CO [g/h]	3346.63	25.67
NOx [g/h]	651.13	5.00
VOC [g/h]	775.61	5.95

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	523.87	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	115.08	10.84
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.002	1.763
Crosswalk LOS	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	273	273
d_b, Bicycle Delay [s]	41.02	41.35
I_b,int, Bicycle LOS Score for Intersection	2.263	1.560
Bicycle LOS	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Stony Plain Road and 124 Street

Control Type:	Signalized	Delay (sec / veh):	38.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.66	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	1	0	1	1	0	0	0	0	0	1	0	0
Entry Pocket Length [m]	105.00	30.48	50.00	50.00	30.48	30.48	30.48	30.48	30.48	25.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	154	500	95	203	391	12	0	238	81	36	442	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	10	0	0	1	0	0	8	0	0	12
Total Hourly Volume [veh/h]	154	500	85	203	391	11	0	238	73	36	442	105
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	125	21	51	98	3	0	60	18	9	111	26
Total Analysis Volume [veh/h]	154	500	85	203	391	11	0	238	73	36	442	105
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	57.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	3	0	1	3	0	0	6	0	5	7	0
Auxiliary Signal Groups												
Maximum Green [s]	15	35	0	15	35	0	0	36	0	12	53	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	5.0	0.0	2.0	5.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	19	42	0	19	42	0	0	42	0	17	59	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	0	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No			No		No	No	
Maximum Recall	Yes	Yes		Yes	Yes			Yes		Yes	Yes	
Pedestrian Recall	No	Yes		No	Yes			Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	6.00	5.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	0.00	5.00	5.00	4.00	3.00	4.00
g_i, Effective Green Time [s]	54	35	35	54	35	35	36	12	53
g / C, Green / Cycle	0.45	0.29	0.29	0.45	0.29	0.29	0.30	0.10	0.44
(v / s)_i Volume / Saturation Flow Rate	0.14	0.19	0.20	0.21	0.13	0.13	0.20	0.02	0.34
s, saturation flow rate [veh/h]	1071	1550	1409	977	1550	1522	1584	1476	1610
c, Capacity [veh/h]	472	452	411	390	452	444	475	148	711
d1, Uniform Delay [s]	21.10	37.32	37.75	23.71	34.61	34.66	36.58	49.81	28.33
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.84	7.45	9.33	4.91	3.17	3.29	6.86	3.89	7.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.33	0.66	0.69	0.52	0.45	0.45	0.65	0.24	0.77
d, Delay for Lane Group [s/veh]	22.94	44.77	47.09	28.63	37.78	37.95	43.44	53.70	36.17
Lane Group LOS	C	D	D	C	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.89	8.61	8.47	4.16	5.20	5.17	8.80	1.16	14.54
50th-Percentile Queue Length [m/ln]	22.01	65.64	64.52	31.67	39.60	39.41	67.06	8.83	110.77
95th-Percentile Queue Length [veh/ln]	5.20	13.43	13.24	7.48	8.94	8.90	13.67	2.08	20.79
95th-Percentile Queue Length [m/ln]	39.62	102.32	100.88	57.01	68.08	67.82	104.13	15.89	158.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.94	45.70	47.09	28.63	37.86	37.95	0.00	43.44	43.44	53.70	36.17	36.17
Movement LOS	C	D	D	C	D	D		D	D	D	D	D
d_A, Approach Delay [s/veh]	41.11			34.76			43.44			37.25		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	38.71											
Intersection LOS	D											
Intersection V/C	0.637											

Emissions

Vehicle Kilometers Traveled [km/h]	66.19	128.76	122.68	92.48	91.95	91.19	96.55	12.32	187.21
Stops [stops/h]	86.67	258.43	254.02	124.70	155.89	155.14	264.01	34.75	436.11
Fuel consumption [L/h]	10.96	28.38	27.72	16.07	18.12	18.01	25.52	3.44	42.83
CO [g/h]	202.44	524.02	511.93	296.79	334.58	332.52	471.16	63.54	790.95
NOx [g/h]	39.39	101.95	99.60	57.74	65.10	64.70	91.67	12.36	153.89
VOC [g/h]	46.92	121.45	118.64	68.78	77.54	77.06	109.20	14.73	183.31

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	14.59	13.46	14.88	12.96
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.582	2.562	2.276	2.441
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	583	600	883
d_b, Bicycle Delay [s]	30.10	30.10	29.40	18.70
I_b,int, Bicycle LOS Score for Intersection	2.178	2.060	2.086	2.541
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	3	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: 107 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	44.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	1
Entry Pocket Length [m]	60.00	30.48	30.48	95.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	184	660	94	169	585	89	0	888	462	0	1457	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	9	0	0	9	0	0	46	0	0	12
Total Hourly Volume [veh/h]	184	660	85	169	585	80	0	888	416	0	1457	108
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	46	165	21	42	146	20	0	222	104	0	364	27
Total Analysis Volume [veh/h]	184	660	85	169	585	80	0	888	416	0	1457	108
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	29			35			35			29		
v_di, Inbound Pedestrian Volume crossing m	29			35			35			29		
v_co, Outbound Pedestrian Volume crossing	28			19			28			19		
v_ci, Inbound Pedestrian Volume crossing mi	28			19			28			19		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	80.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	1	0	4	1	0	0	2	0	0	2	0
Auxiliary Signal Groups												
Maximum Green [s]	13	41	0	13	41	0	0	49	0	0	49	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Detector Location [m]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	5.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	16	40	0	16	40	0	0	54	0	0	54	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	27	0	7	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall	No	Yes		No	Yes			No			No	
Maximum Recall	Yes	No		Yes	No			Yes			Yes	
Pedestrian Recall	No	Yes		No	Yes			Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	R	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	4.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	51	35	35	49	35	49	49	49	49
g / C, Green / Cycle	0.46	0.32	0.32	0.45	0.32	0.45	0.45	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.18	0.20	0.21	0.17	0.37	0.25	0.27	0.42	0.07
s, saturation flow rate [veh/h]	1048	1870	1769	1020	1813	3532	1530	3503	1589
c, Capacity [veh/h]	338	595	563	425	577	1573	681	1561	708
d1, Uniform Delay [s]	23.79	32.09	32.21	2.30	37.50	22.59	22.91	28.96	18.15
k, delay calibration	0.50	0.11	0.12	0.11	0.43	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.15	1.21	1.41	0.60	85.17	1.47	4.05	11.67	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.54	0.64	0.65	0.40	1.15	0.56	0.61	0.93	0.15
d, Delay for Lane Group [s/veh]	29.94	33.30	33.62	2.91	122.67	24.07	26.96	40.63	18.60
Lane Group LOS	C	C	C	A	F	C	C	D	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.34	8.74	8.45	0.07	28.80	8.63	8.66	20.00	1.71
50th-Percentile Queue Length [m/ln]	25.45	66.58	64.41	0.54	219.45	65.78	66.00	152.44	13.06
95th-Percentile Queue Length [veh/ln]	6.01	13.58	13.22	0.13	41.11	13.45	13.49	27.34	3.08
95th-Percentile Queue Length [m/ln]	45.80	103.52	100.74	0.97	313.23	102.50	102.78	208.33	23.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.94	33.44	33.62	2.91	122.67	122.67	0.00	24.07	26.96	0.00	40.63	18.60
Movement LOS	C	C	C	A	F	F		C	C		D	B
d_A, Approach Delay [s/veh]	32.76			98.40			24.99			39.11		
Approach LOS	C			F			C			D		
d_I, Intersection Delay [s/veh]	44.54											
Intersection LOS	D											
Intersection V/C	0.851											

Emissions

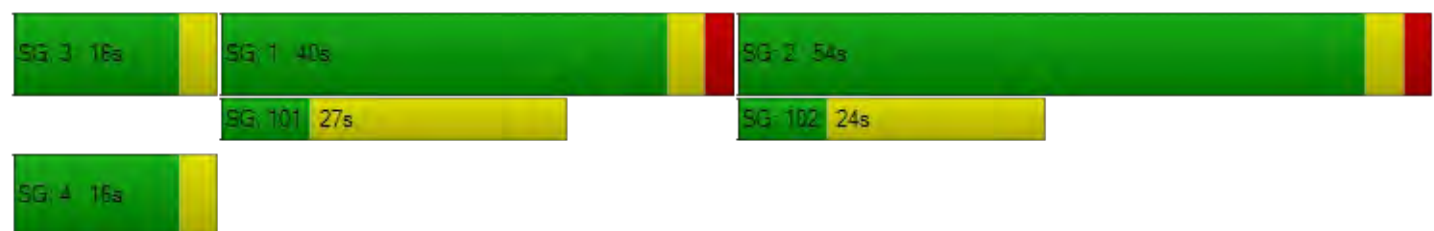
Vehicle Kilometers Traveled [km/h]	83.82	173.11	166.29	149.38	587.78	212.34	99.48	418.64	31.03
Stops [stops/h]	109.29	285.95	276.63	2.33	942.51	565.03	283.47	1309.41	56.08
Fuel consumption [L/h]	14.67	32.63	31.48	14.64	139.90	49.34	24.46	114.80	5.76
CO [g/h]	270.90	602.57	581.30	270.39	2583.32	911.10	451.71	2119.81	106.33
NOx [g/h]	52.71	117.24	113.10	52.61	502.62	177.27	87.89	412.44	20.69
VOC [g/h]	62.78	139.65	134.72	62.67	598.71	211.16	104.69	491.29	24.64

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	4.10			27.02			14.05			16.64		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.723			2.563			3.085			2.954		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	636			636			891			891		
d_b, Bicycle Delay [s]	25.57			25.57			16.91			16.91		
I_b,int, Bicycle LOS Score for Intersection	2.333			2.951			2.673			2.861		
Bicycle LOS	B			C			B			C		

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: 111 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.680

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	55.00	30.48	150.00	65.00	30.48	100.00	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	1	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	15.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	181	508	126	202	646	88	5	1042	197	123	1661	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	4.00	2.00	2.00	6.00	2.00	2.00	4.00	2.00	2.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	13	0	0	9	0	0	20	0	0	12
Total Hourly Volume [veh/h]	181	508	113	202	646	79	5	1042	177	123	1661	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	127	28	51	162	20	1	261	44	31	415	27
Total Analysis Volume [veh/h]	181	508	113	202	646	79	5	1042	177	123	1661	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	11			13			13			11		
v_di, Inbound Pedestrian Volume crossing m	11			13			13			11		
v_co, Outbound Pedestrian Volume crossing	10			15			10			15		
v_ci, Inbound Pedestrian Volume crossing mi	10			15			10			15		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	17.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap
Signal Group	3	4	0	2	6	0	0	1	0	5	1	1
Auxiliary Signal Groups										1,5	1,5	1,5
Maximum Green [s]	15	30	0	10	30	0	0	69	0	7	69	69
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	4.0	0.0	4.0	4.0	4.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	21	0	0	21	0	0	17	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	0.0	3.0	0.0	2.0	3.0	3.0
Detector Location [m]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	5.0	5.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	18	35	0	13	35	0	0	46	0	11	46	46
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	7	10	0	7	10	0	0	24	0	7	24	24
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0
Minimum Recall	Yes	Yes		Yes	Yes			No		No	No	No
Maximum Recall	No	No		No	No			Yes		Yes	Yes	Yes
Pedestrian Recall	No	Yes		No	No			Yes		No	Yes	Yes

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	C	C	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	41	28	28	41	28	28	48	48	48	59	59	59
g / C, Green / Cycle	0.37	0.26	0.26	0.37	0.25	0.25	0.44	0.44	0.44	0.54	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.18	0.17	0.18	0.28	0.20	0.21	0.25	0.25	0.25	0.56	0.40	0.40
s, saturation flow rate [veh/h]	1018	1840	1707	717	1810	1728	1731	1674	1537	1030	1674	1622
c, Capacity [veh/h]	338	470	436	379	458	437	787	729	669	508	896	868
d1, Uniform Delay [s]	26.71	36.90	37.00	26.19	38.57	38.65	22.87	23.28	23.35	20.76	19.73	19.80
k, delay calibration	0.18	0.17	0.18	0.50	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.19	2.74	3.17	5.31	3.42	3.72	2.69	3.18	3.53	81.75	5.56	5.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.54	0.68	0.69	0.53	0.81	0.81	0.54	0.57	0.57	1.13	0.74	0.75
d, Delay for Lane Group [s/veh]	28.90	39.64	40.17	31.50	42.00	42.38	25.56	26.46	26.88	102.51	25.28	25.65
Lane Group LOS	C	D	D	C	D	D	C	C	C	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	3.47	8.04	7.63	4.25	9.68	9.36	8.56	8.50	7.95	19.45	13.84	13.59
50th-Percentile Queue Length [m/ln]	26.47	61.29	58.11	32.41	73.74	71.35	65.22	64.73	60.59	148.19	105.49	103.59
95th-Percentile Queue Length [veh/ln]	6.25	12.70	12.15	7.64	14.78	14.38	13.36	13.28	12.58	29.17	19.95	19.64
95th-Percentile Queue Length [m/ln]	47.64	96.74	92.62	58.19	112.61	109.59	101.78	101.16	95.83	222.27	151.99	149.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.90	39.84	40.17	31.50	42.16	42.38	25.56	26.18	26.88	102.51	46.42	25.65
Movement LOS	C	D	D	C	D	D	C	C	C	F	D	C
d_A, Approach Delay [s/veh]	37.42			39.86			26.28			48.89		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	39.55											
Intersection LOS	D											
Intersection V/C	0.680											

Emissions

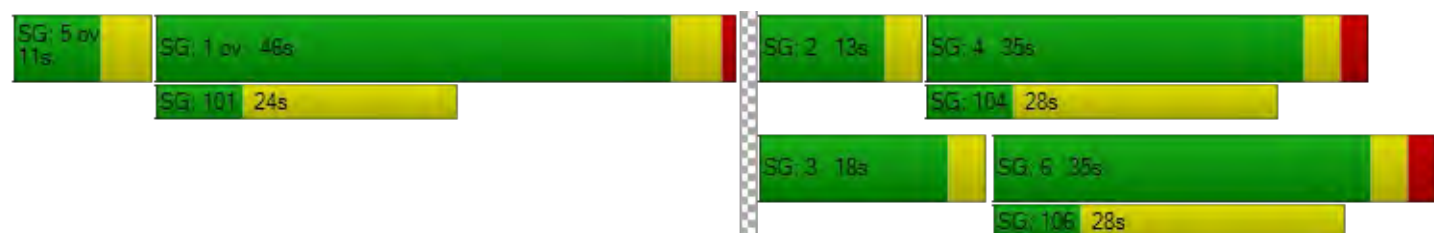
Vehicle Kilometers Traveled [km/h]	159.98	282.99	265.91	256.60	469.31	451.64	122.76	118.63	109.90	225.57	261.55	254.79
Stops [stops/h]	113.68	263.25	249.58	139.21	316.69	306.46	280.12	278.03	260.22	636.45	453.08	444.92
Fuel consumption [L/h]	21.80	42.61	40.21	32.44	63.71	61.45	26.39	25.95	24.22	81.13	48.03	47.05
CO [g/h]	402.58	786.76	742.46	599.00	1176.42	1134.76	487.22	479.18	447.30	1498.18	886.96	868.89
NOx [g/h]	78.33	153.07	144.46	116.54	228.89	220.78	94.80	93.23	87.03	291.49	172.57	169.05
VOC [g/h]	93.30	182.34	172.07	138.82	272.65	262.99	112.92	111.06	103.67	347.22	205.56	201.37

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	0.00			33.36			40.26			43.42		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.246			2.646			3.095			3.109		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	545			545			745			945		
d_b, Bicycle Delay [s]	29.09			29.09			21.64			15.29		
I_b,int, Bicycle LOS Score for Intersection	2.232			2.332			2.244			2.606		
Bicycle LOS	B			B			B			B		

Sequence

Ring 1	5	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	3	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: 118 Avenue and 124 Street

Control Type:	Signalized	Delay (sec / veh):	38.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [m]	95.00	30.48	115.00	25.00	30.48	30.48	50.00	30.48	30.48	50.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	401	38	220	87	36	37	25	925	512	115	1426	171
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	22	0	0	4	0	0	51	0	0	17
Total Hourly Volume [veh/h]	401	38	198	87	36	33	25	925	461	115	1426	154
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	100	10	50	22	9	8	6	231	115	29	357	39
Total Analysis Volume [veh/h]	401	38	198	87	36	33	25	925	461	115	1426	154
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	19			26			26			19		
v_di, Inbound Pedestrian Volume crossing m	19			26			26			19		
v_co, Outbound Pedestrian Volume crossing	20			16			20			16		
v_ci, Inbound Pedestrian Volume crossing mi	20			16			20			16		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap
Signal Group	2	3	3	0	3	0	0	1	0	4	1	1
Auxiliary Signal Groups	2,3	2,3	2,3							1,4	1,4	1,4
Maximum Green [s]	20	30	30	0	30	0	0	52	0	7	52	52
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0	0.0	4.0	0.0	4.0	4.0	4.0
All red [s]	0.0	3.0	3.0	0.0	3.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Walk [s]	0	8	8	0	8	0	0	10	0	0	10	10
Pedestrian Clearance [s]	0	22	22	0	22	0	0	15	0	0	15	15
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.0	4.0	4.0	0.0	4.0	0.0	0.0	4.0	0.0	2.0	4.0	4.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	1.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	5.0	5.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	23	36	36	0	36	0	0	40	0	11	40	40
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	5	12	12	0	12	0	0	25	0	7	25	25
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0
Minimum Recall	No	No	No		No			Yes		No	Yes	Yes
Maximum Recall	Yes	Yes	Yes		Yes			No		Yes	No	No
Pedestrian Recall	No	No	No		No			Yes		No	Yes	Yes

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	4.00	4.00	4.00	4.00	4.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	53	53	30	30	34	34	34	45	45	45
g / C, Green / Cycle	0.48	0.48	0.27	0.27	0.31	0.31	0.31	0.41	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.14	0.15	0.08	0.04	0.08	0.26	0.31	0.17	0.30	0.30
s, saturation flow rate [veh/h]	2932	1596	1116	1672	324	3560	1487	668	3560	1755
c, Capacity [veh/h]	1466	769	254	456	80	1101	460	256	1457	718
d1, Uniform Delay [s]	16.76	17.33	41.18	30.34	53.58	35.47	38.00	26.23	27.27	27.44
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.46	1.03	3.64	0.70	9.94	7.78	42.79	5.60	3.15	6.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.31	0.34	0.15	0.31	0.84	1.00	0.45	0.72	0.73
d, Delay for Lane Group [s/veh]	17.22	18.37	44.82	31.05	63.52	43.25	80.79	31.82	30.42	33.99
Lane Group LOS	B	B	D	C	E	D	F	C	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.02	3.79	2.38	1.48	0.91	12.55	17.55	2.26	11.95	12.69
50th-Percentile Queue Length [m/ln]	23.01	28.91	18.10	11.26	6.94	95.61	133.75	17.20	91.04	96.68
95th-Percentile Queue Length [veh/ln]	5.44	6.83	4.28	2.66	1.64	18.36	24.48	4.06	17.62	18.53
95th-Percentile Queue Length [m/ln]	41.42	52.04	32.59	20.26	12.50	139.88	186.50	30.96	134.23	141.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.22	18.37	18.37	44.82	31.05	31.05	63.52	43.25	80.79	31.82	31.35	33.99
Movement LOS	B	B	B	D	C	C	E	D	F	C	C	C
d_A, Approach Delay [s/veh]	17.64			38.73			55.87			31.63		
Approach LOS	B			D			E			C		
d_I, Intersection Delay [s/veh]	38.40											
Intersection LOS	D											
Intersection V/C	0.593											

Emissions

Vehicle Kilometers Traveled [km/h]	509.38	299.79	6.00	4.76	7.37	272.75	135.93	30.76	281.71	140.88
Stops [stops/h]	197.66	124.16	77.76	48.35	29.82	821.28	574.43	73.88	781.99	415.25
Fuel consumption [L/h]	58.22	34.65	5.32	3.19	2.59	75.19	54.51	7.40	69.03	36.51
CO [g/h]	1075.06	639.79	98.22	58.86	47.89	1388.38	1006.49	136.69	1274.62	674.18
NOx [g/h]	209.17	124.48	19.11	11.45	9.32	270.13	195.83	26.60	248.00	131.17
VOC [g/h]	249.16	148.28	22.76	13.64	11.10	321.77	233.26	31.68	295.41	156.25

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	12.0	12.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	7.01	23.06	22.62	23.67
d_p, Pedestrian Delay [s]	41.89	41.89	43.65	43.65
I_p,int, Pedestrian LOS Score for Intersection	2.557	2.121	3.321	3.175
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	964	545	618	818
d_b, Bicycle Delay [s]	14.77	29.09	26.25	19.20
I_b,int, Bicycle LOS Score for Intersection	2.647	1.824	2.364	2.501
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: 104 Avenue and 121 Street

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.496

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	0	0	1	0	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	40.00	30.48	30.48	30.48	45.00	30.48	30.48	55.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	197	36	75	257	50	39	203	9	30	512	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	4	0	0	5	0	0	1	0	0	7
Total Hourly Volume [veh/h]	0	197	32	75	257	45	39	203	8	30	512	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	49	8	19	64	11	10	51	2	8	128	16
Total Analysis Volume [veh/h]	0	197	32	75	257	45	39	203	8	30	512	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	116.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	6	0	5	7	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	29	0	13	48	0	10	44	0	10	44	0
Amber [s]	0.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	3.0	0.0	3.0	3.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	15	0	0	15	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	5.0	0.0	4.0	5.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	36	0	19	55	0	15	50	0	15	50	0
Lead / Lag	-	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No		No	No		No	No		No	No	
Maximum Recall		Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	R	L	C	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	5.00	6.00	5.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	5.00	5.00	0.00	5.00	5.00	3.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	48	48	48	10	44	10	44	44
g / C, Green / Cycle	0.24	0.24	0.40	0.40	0.40	0.08	0.37	0.08	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.13	0.02	0.06	0.17	0.03	0.03	0.13	0.02	0.30	0.05
s, saturation flow rate [veh/h]	1550	1306	1192	1550	1305	1476	1664	1476	1683	1294
c, Capacity [veh/h]	405	316	447	620	522	123	610	123	617	474
d1, Uniform Delay [s]	39.53	35.29	23.54	25.89	22.30	51.78	27.56	51.46	34.59	25.16
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.15	0.64	0.81	2.04	0.32	6.65	1.55	4.65	12.25	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.10	0.17	0.41	0.09	0.32	0.35	0.24	0.83	0.13
d, Delay for Lane Group [s/veh]	43.67	35.94	24.35	27.93	22.63	58.43	29.11	56.12	46.84	25.73
Lane Group LOS	D	D	C	C	C	E	C	E	D	C
Critical Lane Group	No	No	No	Yes	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.51	0.79	1.45	5.61	0.84	1.33	4.66	1.00	15.48	1.25
50th-Percentile Queue Length [m/ln]	41.98	6.00	11.04	42.74	6.40	10.16	35.48	7.66	117.94	9.55
95th-Percentile Queue Length [veh/ln]	9.36	1.42	2.61	9.49	1.51	2.40	8.19	1.81	21.93	2.26
95th-Percentile Queue Length [m/ln]	71.31	10.80	19.88	72.34	11.52	18.29	62.44	13.78	167.10	17.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.67	43.67	35.94	24.35	27.93	22.63	58.43	29.11	29.11	56.12	46.84	25.73
Movement LOS	D	D	D	C	C	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	42.59			26.59			33.69			45.13		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	37.99											
Intersection LOS	D											
Intersection V/C	0.496											

Emissions

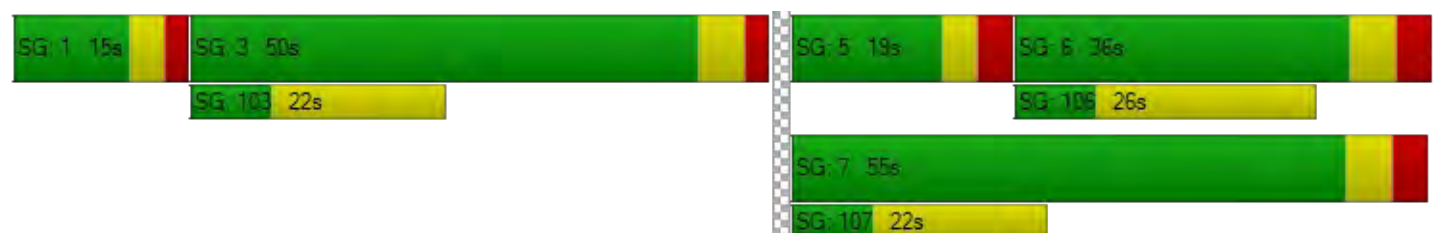
Vehicle Kilometers Traveled [km/h]	70.16	11.40	17.93	61.45	10.76	13.35	72.22	18.98	323.84	39.22
Stops [stops/h]	165.27	23.63	43.47	168.28	25.20	40.01	139.67	30.15	464.31	37.60
Fuel consumption [L/h]	17.01	2.50	4.09	15.15	2.37	3.92	14.74	3.78	59.70	5.80
CO [g/h]	314.09	46.17	75.50	279.78	43.83	72.44	272.11	69.77	1102.41	107.16
NOx [g/h]	61.11	8.98	14.69	54.44	8.53	14.09	52.94	13.57	214.49	20.85
VOC [g/h]	72.79	10.70	17.50	64.84	10.16	16.79	63.06	16.17	255.50	24.84

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	16.65	14.32	16.24	17.14
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.138	2.325	2.229	2.538
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	483	800	733	733
d_b, Bicycle Delay [s]	34.50	21.60	24.07	24.07
I_b,int, Bicycle LOS Score for Intersection	1.944	2.190	1.974	2.568
Bicycle LOS	A	B	A	B

Sequence

Ring 1	1	3	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 104 Avenue and 116 Street

Control Type:	Signalized	Delay (sec / veh):	71.0
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Entry Pocket Length [m]	20.00	30.48	30.48	70.00	30.48	30.48	75.00	30.48	40.00	115.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	98	310	29	81	566	8	143	341	162	72	513	350
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	3	0	0	1	0	0	16	0	0	35
Total Hourly Volume [veh/h]	98	310	26	81	566	7	143	341	146	72	513	315
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	78	7	20	142	2	36	85	37	18	128	79
Total Analysis Volume [veh/h]	98	310	26	81	566	7	143	341	146	72	513	315
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	45.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	9	0	7	6	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	10	40	0	17	47	0	17	34	0	17	34	0
Amber [s]	3.0	4.0	0.0	3.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	30	30	0	0	20	0	0	20	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	5.0	0.0	1.0	5.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	13	47	0	20	54	0	23	40	0	23	40	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	4	4	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Calculated Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	6.00	6.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	0.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	60	40	40	60	47	47	17	34	34	17	34	34
g / C, Green / Cycle	0.46	0.31	0.31	0.46	0.36	0.36	0.13	0.26	0.26	0.13	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.11	0.07	0.37	0.01	0.10	0.11	0.11	0.05	0.26	0.28
s, saturation flow rate [veh/h]	888	1550	1489	1101	1550	1347	1476	3204	1316	1476	1683	1371
c, Capacity [veh/h]	215	477	458	504	560	487	193	838	344	193	440	359
d1, Uniform Delay [s]	29.30	34.98	35.07	20.48	41.50	26.63	54.38	39.67	39.47	51.63	48.00	48.00
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.85	2.07	2.22	0.68	40.51	0.05	22.35	1.47	3.80	5.44	43.73	69.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.46	0.36	0.36	0.16	1.01	0.01	0.74	0.41	0.42	0.37	1.00	1.08
d, Delay for Lane Group [s/veh]	36.16	37.05	37.30	21.16	82.01	26.68	76.73	41.13	43.27	57.07	91.73	117.79
Lane Group LOS	D	D	D	C	F	C	E	D	D	E	F	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.14	4.48	4.42	1.51	23.97	0.15	5.70	4.70	4.22	2.45	19.49	18.47
50th-Percentile Queue Length [m/ln]	16.32	34.11	33.66	11.51	182.65	1.13	43.47	35.81	32.17	18.64	148.54	140.77
95th-Percentile Queue Length [veh/ln]	3.86	7.95	7.86	2.72	32.23	0.27	9.62	8.25	7.59	4.40	26.79	26.68
95th-Percentile Queue Length [m/ln]	29.38	60.55	59.92	20.72	245.57	2.04	73.32	62.90	57.85	33.54	204.15	203.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.16	37.16	37.30	21.16	82.01	26.68	76.73	41.13	43.27	57.07	95.35	117.79
Movement LOS	D	D	D	C	F	C	E	D	D	E	F	F
d_A, Approach Delay [s/veh]	36.94			73.88			49.71			100.14		
Approach LOS	D			E			D			F		
d_I, Intersection Delay [s/veh]	70.97											
Intersection LOS	E											
Intersection V/C	0.785											

Emissions

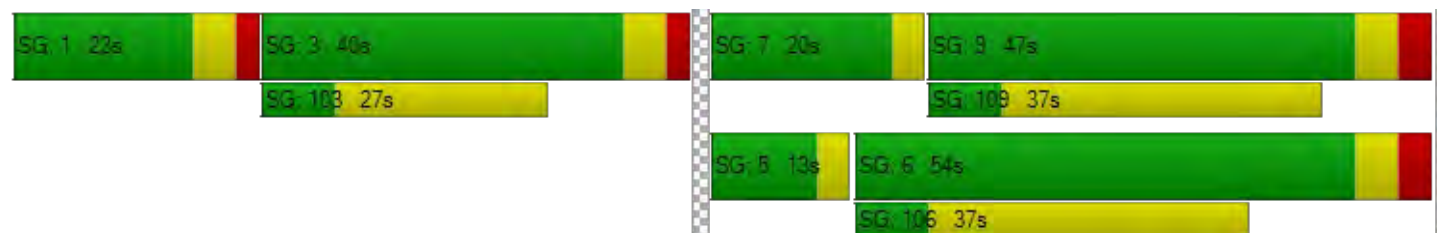
Vehicle Kilometers Traveled [km/h]	47.77	82.66	81.11	17.74	123.94	1.53	90.45	215.68	92.35	35.30	216.52	189.42
Stops [stops/h]	59.31	123.95	122.32	41.83	663.78	4.12	157.97	260.26	116.92	67.73	539.82	511.60
Fuel consumption [L/h]	8.60	15.48	15.24	3.95	62.43	0.38	20.60	37.16	16.28	8.04	63.91	64.55
CO [g/h]	158.89	285.94	281.46	72.87	1152.87	7.06	380.41	686.25	300.54	148.52	1180.19	1191.94
NOx [g/h]	30.91	55.63	54.76	14.18	224.31	1.37	74.01	133.52	58.47	28.90	229.62	231.91
VOC [g/h]	36.82	66.27	65.23	16.89	267.19	1.64	88.16	159.04	69.65	34.42	273.52	276.24

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	10.69			5.37			16.45			16.01		
d_p, Pedestrian Delay [s]	54.47			54.47			54.47			54.47		
I_p,int, Pedestrian LOS Score for Intersectio	2.572			2.613			2.759			2.684		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	615			723			523			523		
d_b, Bicycle Delay [s]	31.15			26.50			35.45			35.45		
I_b,int, Bicycle LOS Score for Intersection	1.920			2.640			2.093			2.331		
Bicycle LOS	A			B			B			B		

Sequence

Ring 1	1	3	7	9	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	5	6	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 11: 104 Avenue and 112 Street

Control Type:	Signalized	Delay (sec / veh):	35.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.404

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.80	3.80	3.80	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.00	40.00	30.48	30.48	75.00	30.48	30.48	60.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	40.00			40.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	168	116	35	17	94	18	5	447	60	46	671	55
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	4	0	0	2	0	0	6	0	0	6
Total Hourly Volume [veh/h]	168	116	31	17	94	16	5	447	54	46	671	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	29	8	4	24	4	1	112	14	12	168	12
Total Analysis Volume [veh/h]	168	116	31	17	94	16	5	447	54	46	671	49
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	46.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	5	0	0	5	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	44	0	0	44	0	20	49	0	20	49	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	25	0	0	15	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	50	0	0	50	0	25	55	0	25	55	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		Yes			Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall		Yes			Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	5.00	6.00	6.00	5.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00	3.00	4.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	44	44	44	44	20	49	49	20	49	49
g / C, Green / Cycle	0.34	0.34	0.34	0.34	0.15	0.38	0.38	0.15	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.15	0.10	0.02	0.07	0.00	0.15	0.16	0.03	0.22	0.22
s, saturation flow rate [veh/h]	1102	1471	1071	1495	1476	1683	1580	1476	1683	1617
c, Capacity [veh/h]	354	498	323	506	227	634	596	227	634	609
d1, Uniform Delay [s]	40.81	31.60	37.19	30.71	46.70	29.72	29.91	48.04	32.20	32.36
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.52	1.51	0.31	0.99	0.18	1.88	2.12	2.00	3.75	4.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.30	0.05	0.22	0.02	0.40	0.41	0.20	0.57	0.58
d, Delay for Lane Group [s/veh]	45.33	33.11	37.50	31.69	46.87	31.61	32.03	50.04	35.95	36.41
Lane Group LOS	D	C	D	C	D	C	C	D	D	D
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	5.14	3.68	0.45	2.66	0.15	6.19	6.07	1.44	9.75	9.62
50th-Percentile Queue Length [m/ln]	39.16	28.02	3.43	20.27	1.14	47.17	46.29	10.96	74.32	73.27
95th-Percentile Queue Length [veh/ln]	8.86	6.62	0.81	4.79	0.27	10.27	10.12	2.59	14.87	14.70
95th-Percentile Queue Length [m/ln]	67.49	50.43	6.17	36.49	2.06	78.26	77.09	19.72	113.35	112.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.33	33.11	33.11	37.50	31.69	31.69	46.87	31.79	32.03	50.04	36.16	36.41
Movement LOS	D	C	C	D	C	C	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	39.63			32.47			31.96			37.01		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	35.67											
Intersection LOS	D											
Intersection V/C	0.404											

Emissions

Vehicle Kilometers Traveled [km/h]	47.66	41.70	1.63	10.55	2.45	124.61	121.02	4.86	38.44	37.57
Stops [stops/h]	142.32	101.82	12.46	73.67	4.15	171.42	168.23	39.82	270.08	266.28
Fuel consumption [L/h]	12.96	9.63	0.84	4.86	0.51	21.89	21.38	3.13	19.80	19.53
CO [g/h]	239.36	177.88	15.56	89.77	9.36	404.21	394.74	57.76	365.61	360.62
NOx [g/h]	46.57	34.61	3.03	17.47	1.82	78.64	76.80	11.24	71.14	70.16
VOC [g/h]	55.47	41.23	3.61	20.80	2.17	93.68	91.49	13.39	84.73	83.58

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	11.55			11.64			13.20			16.10		
d_p, Pedestrian Delay [s]	54.47			54.47			54.47			54.47		
I_p,int, Pedestrian LOS Score for Intersectio	2.103			2.043			2.841			2.607		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	677			677			754			754		
d_b, Bicycle Delay [s]	28.45			28.45			25.23			25.23		
I_b,int, Bicycle LOS Score for Intersection	2.086			1.772			1.982			2.197		
Bicycle LOS	B			A			A			B		

Sequence

Ring 1	1	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Jasper Avenue and 121 Street

Control Type:	Signalized	Delay (sec / veh):	40.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.639

Intersection Setup

Name														
Approach	Northbound							Southbound						
Lane Configuration														
Turning Movement	Left	Left	Thru	Thru	Thru	Right	Right	Left	Left	Thru	Thru	Thru	Right	Right
Lane Width [m]	3.60	3.66	3.66	3.66	3.60	3.66	3.60	3.60	3.66	3.66	3.66	3.66	3.66	3.60
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	35.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00							50.00						
Grade [%]	0.00							0.00						
Curb Present	Yes							Yes						
Crosswalk	Yes							Yes						

Volumes

Name														
Base Volume Input [veh/h]	281	0	0	0	63	0	32	86	0	0	0	0	0	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	3	0	0	0	0	0	0	3
Total Hourly Volume [veh/h]	281	0	0	0	63	0	29	86	0	0	0	0	0	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	0	0	0	16	0	7	22	0	0	0	0	0	6
Total Analysis Volume [veh/h]	281	0	0	0	63	0	29	86	0	0	0	0	0	23
Presence of On-Street Parking	No						No	No						No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	17							26						
v_di, Inbound Pedestrian Volume crossing th	17							26						
v_co, Outbound Pedestrian Volume along th	17							26						
v_ci, Inbound Pedestrian Volume along the l	17							26						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	0	2	0	0	2	0	0	0	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	0	28	0	0	28	0	0	0	0	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	10	0	0	10	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	8	0	0	8	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk					No			No						
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	34	0	0	34	0	0	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	Lag	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	15	0	0	15	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall					No			No						
Maximum Recall					Yes			Yes						
Pedestrian Recall					Yes			Yes						

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C
C, Calculated Cycle Length [s]	112	112	112
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28
g / C, Green / Cycle	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.22	0.06	0.12
s, saturation flow rate [veh/h]	1275	1545	882
c, Capacity [veh/h]	203	386	278
d1, Uniform Delay [s]	51.83	33.50	40.28
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	199.56	1.45	4.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.38	0.24	0.39
d, Delay for Lane Group [s/veh]	251.38	34.95	44.39
Lane Group LOS	F	C	D
Critical Lane Group	Yes	No	No
50th-Percentile Queue Length [veh/ln]	17.00	2.15	3.00
50th-Percentile Queue Length [m/ln]	129.53	16.39	22.87
95th-Percentile Queue Length [veh/ln]	27.64	3.87	5.40
95th-Percentile Queue Length [m/ln]	210.65	29.51	41.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	251.38	0.00	0.00	0.00	34.95	0.00	34.95	44.39	0.00	0.00	0.00	0.00	0.00	44.39
Movement LOS	F				C		C	D						D
d_A, Approach Delay [s/veh]	198.00							44.39						
Approach LOS	F							D						
d_I, Intersection Delay [s/veh]	40.50													
Intersection LOS	D													
Intersection V/C	0.639													

Emissions

Vehicle Kilometers Traveled [km/h]	34.46	11.28	25.69
Stops [stops/h]	546.39	69.15	96.47
Fuel consumption [L/h]	69.94	5.10	8.34
CO [g/h]	1291.46	94.20	153.92
NOx [g/h]	251.27	18.33	29.95
VOC [g/h]	299.31	21.83	35.67

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	462.60	301.61
M_CW, Crosswalk Circulation Area [m²/ped]	38.94	18.58
d_p, Pedestrian Delay [s]	42.88	42.88
I_p,int, Pedestrian LOS Score for Intersectio	1.917	1.874
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	446	446
d_b, Bicycle Delay [s]	33.79	33.79
I_b,int, Bicycle LOS Score for Intersection	2.180	1.744
Bicycle LOS	B	A

Intersection Setup														
Name														
Approach	Eastbound							Westbound						
Lane Configuration														
Turning Movement	Left	Left	Left	Thru	Right	Right	Right	Left	Left	Left	Thru	Right	Right	Right
Lane Width [m]	3.60	3.66	3.66	3.60	3.66	3.66	3.66	3.66	3.66	3.66	3.60	3.66	3.66	3.60
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00							50.00						
Grade [%]	0.00							0.00						
Curb Present	Yes							Yes						
Crosswalk	Yes							Yes						

Volumes

Name														
Base Volume Input [veh/h]	13	0	0	799	0	0	0	0	0	0	1331	0	0	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	5.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Total Hourly Volume [veh/h]	13	0	0	799	0	0	0	0	0	0	1331	0	0	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	0	200	0	0	0	0	0	0	333	0	0	15
Total Analysis Volume [veh/h]	13	0	0	799	0	0	0	0	0	0	1331	0	0	59
Presence of On-Street Parking	No						No	No						No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0							35						
v_di, Inbound Pedestrian Volume crossing th	0							35						
v_co, Outbound Pedestrian Volume along th	17							26						
v_ci, Inbound Pedestrian Volume along the l	17							26						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	1	0	0	0	0	0	0	1	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	72	0	0	0	0	0	0	72	0	0	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	10	0	0	0	0	0	0	10	0	0	0
Pedestrian Clearance [s]	0	0	0	15	0	0	0	0	0	0	15	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No							No			
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	78	0	0	0	0	0	0	78	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	25	0	0	0	0	0	0	25	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
Minimum Recall				Yes							Yes			
Maximum Recall				No							No			
Pedestrian Recall				Yes							Yes			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C
C, Calculated Cycle Length [s]	112	112	112	112
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	72	72	72	72
g / C, Green / Cycle	0.64	0.64	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.27	0.26	0.41	0.42
s, saturation flow rate [veh/h]	1570	1495	1683	1658
c, Capacity [veh/h]	1043	961	1082	1066
d1, Uniform Delay [s]	9.57	9.71	12.17	12.30
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.14	1.30	2.93	3.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.41	0.64	0.65
d, Delay for Lane Group [s/veh]	10.71	11.02	15.10	15.40
Lane Group LOS	B	B	B	B
Critical Lane Group	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.89	4.75	10.56	10.70
50th-Percentile Queue Length [m/ln]	37.29	36.17	80.50	81.57
95th-Percentile Queue Length [veh/ln]	8.52	8.32	15.90	16.07
95th-Percentile Queue Length [m/ln]	64.94	63.40	121.12	122.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.71	0.00	0.00	10.86	0.00	0.00	0.00	0.00	0.00	0.00	15.24	0.00	0.00	15.40
Movement LOS	B			B							B			B
d_A, Approach Delay [s/veh]	10.86							15.25						
Approach LOS	B							B						
d_I, Intersection Delay [s/veh]	40.50													
Intersection LOS	D													
Intersection V/C	0.639													

Emissions

Vehicle Kilometers Traveled [km/h]	151.06	143.47	383.74	383.74
Stops [stops/h]	157.31	152.59	339.58	344.07
Fuel consumption [L/h]	21.34	20.43	52.22	52.47
CO [g/h]	394.03	377.27	964.18	968.98
NOx [g/h]	76.66	73.40	187.60	188.53
VOC [g/h]	91.32	87.43	223.46	224.57

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	110.28	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	17.73
d_p, Pedestrian Delay [s]	42.88	42.88
I_p,int, Pedestrian LOS Score for Intersectio	3.157	2.856
Crosswalk LOS	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1286	1286
d_b, Bicycle Delay [s]	7.14	7.14
I_b,int, Bicycle LOS Score for Intersection	2.230	2.712
Bicycle LOS	B	B

Intersection Setup														
Name														
Approach	Northeastbound							Southwestbound						
Lane Configuration														
Turning Movement	Left	Thru	Thru	Thru	Right	Right	Right	Left	Left	Thru	Thru	Right	Right	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00							50.00						
Grade [%]	0.00							0.00						
Curb Present														
Crosswalk	Yes							Yes						

Volumes

Name														
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Presence of On-Street Parking														
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	17							26						
v_di, Inbound Pedestrian Volume crossing th	17							26						
v_co, Outbound Pedestrian Volume along th	17							26						
v_ci, Inbound Pedestrian Volume along the l	17							26						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk														
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall														
Maximum Recall														
Pedestrian Recall														

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

[illegible]

Lane Group Results

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS														
d_A, Approach Delay [s/veh]	0.00							0.00						
Approach LOS	A							A						
d_I, Intersection Delay [s/veh]	40.50													
Intersection LOS	D													
Intersection V/C	0.639													

Emissions

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	467.58	301.61
M_CW, Crosswalk Circulation Area [m²/ped]	20.71	13.41
d_p, Pedestrian Delay [s]	42.88	42.88
I_p,int, Pedestrian LOS Score for Intersectio	1.431	1.431
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0
d_b, Bicycle Delay [s]	56.00	56.00
I_b,int, Bicycle LOS Score for Intersection	4.132	4.132
Bicycle LOS	D	D

Intersection Setup

Name	Northbound Bike Lane							Southbound Bike Lane						
Approach	Northwestbound							Southeastbound						
Lane Configuration														
Turning Movement	Left	Left	Left	Thru	Thru	Right	Right2	Left3	Left2	Left	Thru	Thru	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	2.00	3.66	3.66	3.66	3.66	3.66	3.66	2.00	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00							30.00						
Grade [%]	0.00							0.00						
Curb Present	No							No						
Crosswalk	Yes							Yes						

Volumes

Name	Northbound Bike Lane							Southbound Bike Lane						
Base Volume Input [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00													
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Analysis Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Presence of On-Street Parking	No						No	No						No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	17							26						
v_di, Inbound Pedestrian Volume crossing th	17							26						
v_co, Outbound Pedestrian Volume along th	35							0						
v_ci, Inbound Pedestrian Volume along the l	35							0						
v_ab, Corner Pedestrian Volume [ped/h]	0							0						
Bicycle Volume [bicycles/h]	0							0						

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	0	0	0	0	0	2	0	0	0	0	0	0	2	0
Auxiliary Signal Groups														
Maximum Green [s]	0	0	0	0	0	28	0	0	0	0	0	0	28	0
Amber [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	0	10	0	0	0	0	0	0	10	0
Pedestrian Clearance [s]	0	0	0	0	0	8	0	0	0	0	0	0	8	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Rest In Walk						No							No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	0	34	0	0	0	0	0	0	34	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	0	15	0	0	0	0	0	0	15	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall						No							No	
Maximum Recall						Yes							Yes	
Pedestrian Recall						Yes							Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	R	C
C, Calculated Cycle Length [s]	112	112
L, Total Lost Time per Cycle [s]	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00
g_i, Effective Green Time [s]	28	28
g / C, Green / Cycle	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00
s, saturation flow rate [veh/h]	1373	1616
c, Capacity [veh/h]	343	404
d1, Uniform Delay [s]	0.00	0.00
k, delay calibration	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.00	0.00
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00
Lane Group LOS	A	A
Critical Lane Group	No	No
50th-Percentile Queue Length [veh/ln]	0.00	0.00
50th-Percentile Queue Length [m/ln]	0.00	0.00
95th-Percentile Queue Length [veh/ln]	0.00	0.00
95th-Percentile Queue Length [m/ln]	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS						A							A	
d_A, Approach Delay [s/veh]	0.00							0.00						
Approach LOS	A							A						
d_I, Intersection Delay [s/veh]	40.50													
Intersection LOS	D													
Intersection V/C	0.639													

Emissions

Vehicle Kilometers Traveled [km/h]	0.00	0.00
Stops [stops/h]	0.00	0.00
Fuel consumption [L/h]	0.00	0.00
CO [g/h]	0.00	0.00
NOx [g/h]	0.00	0.00
VOC [g/h]	0.00	0.00

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	20.71	13.41
d_p, Pedestrian Delay [s]	42.88	42.88
I_p,int, Pedestrian LOS Score for Intersectio	1.431	1.431
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	446	446
d_b, Bicycle Delay [s]	33.79	33.79
I_b,int, Bicycle LOS Score for Intersection	1.560	1.560
Bicycle LOS	A	A

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Jasper Avenue and 116 Street

Control Type:	Signalized	Delay (sec / veh):	47.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	60.00	30.48	60.00	40.00	30.48	30.48	70.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	179	405	50	125	341	125	74	978	121	157	1472	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	5	0	0	13	0	0	12	0	0	4
Total Hourly Volume [veh/h]	179	405	45	125	341	112	74	978	109	157	1472	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	101	11	31	85	28	19	245	27	39	368	9
Total Analysis Volume [veh/h]	179	405	45	125	341	112	74	978	109	157	1472	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			25			25			20		
v_di, Inbound Pedestrian Volume crossing m	20			25			25			20		
v_co, Outbound Pedestrian Volume crossing	20			72			20			72		
v_ci, Inbound Pedestrian Volume crossing mi	20			72			20			72		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	60.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap
Signal Group	3	4	0	2	4	0	0	1	0	5	1	1
Auxiliary Signal Groups										1,5	1,5	1,5
Maximum Green [s]	7	38	0	7	38	0	0	42	0	7	42	42
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0
Walk [s]	0	10	0	0	10	0	0	10	0	0	10	10
Pedestrian Clearance [s]	0	13	0	0	13	0	0	10	0	0	10	10
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	0.0	3.0	0.0	1.0	3.0	3.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	1.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	5.0	5.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	10	43	0	10	43	0	0	47	0	10	47	47
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	7	23	0	7	23	0	0	20	0	7	20	20
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	3.0
Minimum Recall	No	No		No	No			Yes		No	Yes	Yes
Maximum Recall	No	Yes		No	Yes			No		No	No	No
Pedestrian Recall	Yes	Yes		Yes	Yes			Yes		Yes	Yes	Yes

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	0.00	0.00	0.00
g_i, Effective Green Time [s]	46	38	48	38	38	42	42	42	8	52	52
g / C, Green / Cycle	0.42	0.35	0.44	0.35	0.35	0.38	0.38	0.38	0.07	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.18	0.27	0.13	0.14	0.14	0.24	0.33	0.33	0.13	0.45	0.46
s, saturation flow rate [veh/h]	976	1647	972	1683	1505	312	1683	1612	1177	1683	1652
c, Capacity [veh/h]	409	569	311	581	520	65	643	616	168	796	781
d1, Uniform Delay [s]	13.65	32.42	22.86	27.38	27.56	55.00	31.30	31.43	17.25	27.76	28.10
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.38	10.74	3.85	2.08	2.48	151.25	14.08	15.27	54.68	21.88	24.61
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.79	0.40	0.40	0.42	1.13	0.86	0.87	0.94	0.95	0.96
d, Delay for Lane Group [s/veh]	17.03	43.17	26.70	29.46	30.04	206.25	45.38	46.70	71.93	49.65	52.72
Lane Group LOS	B	D	C	C	C	F	D	D	E	D	D
Critical Lane Group	No	Yes	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.59	12.27	2.27	4.99	4.71	4.56	15.65	15.36	4.84	22.93	23.57
50th-Percentile Queue Length [m/ln]	19.75	93.46	17.29	38.04	35.93	34.73	119.23	117.04	36.86	174.72	179.63
95th-Percentile Queue Length [veh/ln]	4.66	18.01	4.08	8.66	8.28	8.20	22.13	21.79	8.44	30.78	31.54
95th-Percentile Queue Length [m/ln]	35.55	137.23	31.12	65.96	63.06	62.52	168.67	166.02	64.35	234.56	240.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.03	43.17	43.17	26.70	29.64	30.04	206.25	45.96	46.70	71.93	51.14	52.72
Movement LOS	B	D	D	C	C	C	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	35.73			29.08			56.24			53.13		
Approach LOS	D			C			E			D		
d_I, Intersection Delay [s/veh]	47.87											
Intersection LOS	D											
Intersection V/C	0.688											

Emissions

Vehicle Kilometers Traveled [km/h]	41.96	105.49	12.63	23.73	22.06	5.70	42.59	41.17	25.68	123.65	123.13
Stops [stops/h]	84.82	401.42	74.26	163.38	154.30	149.17	512.10	502.70	158.33	750.41	771.48
Fuel consumption [L/h]	8.24	34.00	5.44	11.25	10.61	15.64	34.86	34.41	14.69	57.51	59.59
CO [g/h]	152.22	627.90	100.43	207.74	195.91	288.87	643.74	635.45	271.30	1062.01	1100.40
NOx [g/h]	29.62	122.17	19.54	40.42	38.12	56.20	125.25	123.63	52.78	206.63	214.10
VOC [g/h]	35.28	145.52	23.28	48.15	45.40	66.95	149.19	147.27	62.88	246.13	255.03

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0			14.0			14.0			14.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	31.28			8.55			25.02			36.44		
d_p, Pedestrian Delay [s]	41.89			41.89			41.89			41.89		
I_p,int, Pedestrian LOS Score for Intersectio	2.468			2.542			3.008			2.947		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	691			691			764			945		
d_b, Bicycle Delay [s]	23.56			23.56			21.02			15.29		
I_b,int, Bicycle LOS Score for Intersection	2.606			2.047			2.527			2.937		
Bicycle LOS	B			B			B			C		

Sequence

Ring 1	1	2	4	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 14: 100 Avenue and 116 Street

Control Type:	Signalized	Delay (sec / veh):	56.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.682

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	70.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	1	0	0	1
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00	0.00	0.00	100.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			3.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	26	26	9	141	3	454	505	420	35	8	965	98
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	45	0	0	4	0	0	10
Total Hourly Volume [veh/h]	26	26	8	141	3	409	505	420	31	8	965	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	7	2	35	1	102	126	105	8	2	241	22
Total Analysis Volume [veh/h]	26	26	8	141	3	409	505	420	31	8	965	88
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	22			28			28			22		
v_di, Inbound Pedestrian Volume crossing m	22			28			28			22		
v_co, Outbound Pedestrian Volume crossing	26			39			26			39		
v_ci, Inbound Pedestrian Volume crossing mi	26			39			26			39		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Overlap	Overlap	Overlap	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	2	3	3	1	1	0	1	0
Auxiliary Signal Groups						2,3	1,3	1,3	1,3			
Maximum Green [s]	0	33	0	0	33	18	18	46	46	0	46	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	10	10	0	10	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	15	15	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	1.0	1.0	3.0	3.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	1.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0	0.0	5.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	38	0	0	38	21	21	51	51	0	51	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	25	0	0	25	7	7	25	25	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Minimum Recall		No			No	No	No	Yes	Yes		Yes	
Maximum Recall		Yes			Yes	Yes	Yes	No	No		No	
Pedestrian Recall		Yes			Yes	Yes	Yes	Yes	Yes		Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C	C	C	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	0.00	0.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	33	33	56	67	67	46	46	46
g / C, Green / Cycle	0.30	0.30	0.51	0.61	0.61	0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	0.26	0.93	0.34	0.27	0.27	0.06
s, saturation flow rate [veh/h]	990	1234	1556	546	1323	1860	1702	1501
c, Capacity [veh/h]	344	435	791	377	806	811	712	627
d1, Uniform Delay [s]	28.28	31.42	17.85	20.74	12.75	25.57	25.61	19.71
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.10	2.03	2.41	169.40	2.80	3.65	4.62	0.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	0.33	0.52	1.34	0.56	0.63	0.65	0.14
d, Delay for Lane Group [s/veh]	29.39	33.46	20.26	190.14	15.55	29.21	30.24	20.18
Lane Group LOS	C	C	C	F	B	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.25	3.34	7.17	22.40	6.79	11.18	10.40	1.46
50th-Percentile Queue Length [m/ln]	9.53	25.45	54.67	170.66	51.76	85.23	79.27	11.16
95th-Percentile Queue Length [veh/ln]	2.25	6.01	11.57	36.48	11.07	16.67	15.69	2.64
95th-Percentile Queue Length [m/ln]	17.15	45.81	88.15	277.98	84.34	127.02	119.58	20.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.39	29.39	29.39	33.46	33.46	20.26	190.14	15.55	15.55	29.21	29.71	20.18
Movement LOS	C	C	C	C	C	C	F	B	B	C	C	C
d_A, Approach Delay [s/veh]	29.39			23.69			107.78			28.91		
Approach LOS	C			C			F			C		
d_I, Intersection Delay [s/veh]	56.49											
Intersection LOS	E											
Intersection V/C	0.682											

Emissions

Vehicle Kilometers Traveled [km/h]	2.90	33.76	95.88	79.56	71.05	79.32	72.51	13.73
Stops [stops/h]	40.93	109.31	234.82	732.97	222.32	366.04	340.48	47.93
Fuel consumption [L/h]	2.55	9.38	20.77	97.96	17.15	27.20	25.36	3.75
CO [g/h]	47.13	173.12	383.57	1808.98	316.69	502.21	468.27	69.23
NOx [g/h]	9.17	33.68	74.63	351.96	61.62	97.71	91.11	13.47
VOC [g/h]	10.92	40.12	88.90	419.25	73.40	116.39	108.53	16.05

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	22.14	8.43	1.55	21.72
d_p, Pedestrian Delay [s]	41.89	41.89	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	1.789	2.848	2.790	2.856
Crosswalk LOS	A	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	600	600	1218	836
d_b, Bicycle Delay [s]	26.95	26.95	8.40	18.62
I_b,int, Bicycle LOS Score for Intersection	1.660	2.546	2.352	2.443
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 15: Stony Plain Road and 102 Avenue**

Control Type:	Signalized	Delay (sec / veh):	23.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.518

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [m]	3.66	3.40	3.40	3.40	3.40	3.66
No. of Lanes in Entry Pocket	0	1	0	0	1	0
Entry Pocket Length [m]	30.48	45.00	30.48	30.48	75.00	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	Yes		Yes		Yes	
Crosswalk	Yes		No		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	706	362	525	1488	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	71	0	0	0	0
Total Hourly Volume [veh/h]	0	635	362	525	1488	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	159	91	131	372	0
Total Analysis Volume [veh/h]	0	635	362	525	1488	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		10	
v_di, Inbound Pedestrian Volume crossing m	0		0		10	
v_co, Outbound Pedestrian Volume crossing	10		10		10	
v_ci, Inbound Pedestrian Volume crossing mi	10		10		10	
v_ab, Corner Pedestrian Volume [ped/h]	10		10		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Overlap	Overlap	Permissive
Signal Group	0	1	1	2	3	0
Auxiliary Signal Groups				1,2	2,3	
Maximum Green [s]	0	59	59	19	14	0
Amber [s]	0.0	4.0	4.0	4.0	3.0	0.0
All red [s]	0.0	2.0	2.0	3.0	2.0	0.0
Walk [s]	0	7	7	7	7	0
Pedestrian Clearance [s]	0	10	10	20	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No	No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	4.0	4.0	5.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	65	65	26	19	0
Lead / Lag	-	-	Lag	-	-	-
Minimum Green [s]	0	5	5	10	10	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0
Minimum Recall		No	No	No	No	
Maximum Recall		Yes	Yes	Yes	Yes	
Pedestrian Recall		Yes	Yes	Yes	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	R	L	C	C
C, Calculated Cycle Length [s]	110	110	110	110
L, Total Lost Time per Cycle [s]	6.00	6.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	4.00	2.00	3.00
g_i, Effective Green Time [s]	59	59	84	40
g / C, Green / Cycle	0.54	0.54	0.76	0.36
(v / s)_i Volume / Saturation Flow Rate	0.23	0.20	0.15	0.29
s, saturation flow rate [veh/h]	2813	1781	3560	5094
c, Capacity [veh/h]	1509	955	2719	1852
d1, Uniform Delay [s]	15.27	14.84	3.60	31.46
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.86	1.15	0.16	3.81
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.38	0.19	0.80
d, Delay for Lane Group [s/veh]	16.13	15.98	3.76	35.27
Lane Group LOS	B	B	A	D
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.79	5.41	1.38	12.22
50th-Percentile Queue Length [m/ln]	36.48	41.21	10.52	93.13
95th-Percentile Queue Length [veh/ln]	8.38	9.22	2.49	17.96
95th-Percentile Queue Length [m/ln]	63.83	70.27	18.94	136.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	16.13	15.98	3.76	35.27	0.00
Movement LOS		B	B	A	D	
d_A, Approach Delay [s/veh]	16.13		8.75		35.27	
Approach LOS	B		A		D	
d_I, Intersection Delay [s/veh]	23.42					
Intersection LOS	C					
Intersection V/C	0.518					

Emissions

Vehicle Kilometers Traveled [km/h]	287.79	85.28	123.68	842.41
Stops [stops/h]	313.37	176.99	90.37	1200.00
Fuel consumption [L/h]	42.30	16.54	15.32	147.50
CO [g/h]	781.16	305.46	282.84	2723.60
NOx [g/h]	151.99	59.43	55.03	529.91
VOC [g/h]	181.04	70.79	65.55	631.22

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	50.96
M_CW, Crosswalk Circulation Area [m²/ped]	63.08	0.00	68.64
d_p, Pedestrian Delay [s]	44.55	0.00	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.410	0.000	2.716
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1073	1527	727
d_b, Bicycle Delay [s]	11.82	3.07	22.27
I_b,int, Bicycle LOS Score for Intersection	1.560	2.291	2.378
Bicycle LOS	A	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 16: Stony Plain Road and 142 Street

Control Type:	Signalized	Delay (sec / veh):	91.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.904

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
No. of Lanes in Entry Pocket	0	0	1	0	0	2	1	0	0	0	0	1
Entry Pocket Length [m]	30.48	30.48	5.00	30.48	30.48	90.00	110.00	30.48	30.48	30.48	30.48	105.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	35.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	14	661	358	10	928	6	75	519	32	1405	730	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	36	0	0	1	0	0	3	0	0	6
Total Hourly Volume [veh/h]	14	661	322	10	928	5	75	519	29	1405	730	53
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	165	81	3	232	1	19	130	7	351	183	13
Total Analysis Volume [veh/h]	14	661	322	10	928	5	75	519	29	1405	730	53
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			20			20			20		
v_di, Inbound Pedestrian Volume crossing m	20			20			20			20		
v_co, Outbound Pedestrian Volume crossing	20			20			20			20		
v_ci, Inbound Pedestrian Volume crossing mi	20			20			20			20		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	48.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	9	0	0	8	0	1	5	0	2	3	0
Auxiliary Signal Groups												
Maximum Green [s]	7	48	0	0	37	0	11	30	0	63	83	0
Amber [s]	4.0	4.0	0.0	0.0	4.0	0.0	3.0	4.0	0.0	3.0	3.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	3.0	0.0	2.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	5.0	0.0	0.0	5.0	0.0	3.0	5.0	0.0	3.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	11	55	0	0	44	0	16	37	0	68	89	0
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	0	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No			No		No	No		No	No	
Maximum Recall	Yes	Yes			Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes			Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	L	C	R	L	C	C	L	C	R
C, Calculated Cycle Length [s]	160	160	160	160	160	160	160	160	160	160	160	160
L, Total Lost Time per Cycle [s]	7.00	7.00	7.00	7.00	7.00	7.00	5.00	7.00	7.00	5.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	5.00	5.00	5.00	3.00	5.00	5.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	48	48	48	37	37	37	11	30	30	63	83	83
g / C, Green / Cycle	0.30	0.30	0.30	0.23	0.23	0.23	0.07	0.19	0.19	0.39	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.28	0.23	0.11	0.02	0.28	0.00	0.05	0.14	0.15	0.41	0.37	0.04
s, saturation flow rate [veh/h]	1128	1567	2813	569	3279	1452	1640	1968	1819	3459	1968	1430
c, Capacity [veh/h]	282	470	844	53	758	336	113	369	341	1362	1021	742
d1, Uniform Delay [s]	47.87	50.62	44.27	79.00	61.50	47.43	72.70	61.69	61.81	48.50	29.45	19.22
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	97.20	10.60	1.31	7.59	112.31	0.08	26.89	14.19	15.82	32.91	4.28	0.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	1.14	0.75	0.38	0.19	1.22	0.01	0.67	0.77	0.78	1.03	0.71	0.07
d, Delay for Lane Group [s/veh]	145.07	61.22	45.58	86.59	173.81	47.51	99.60	75.88	77.63	81.41	33.73	19.41
Lane Group LOS	F	E	D	F	F	D	F	E	E	F	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	17.10	14.25	5.28	0.53	27.23	0.16	3.86	12.43	11.78	33.19	22.63	1.05
50th-Percentile Queue Length [m/ln]	130.31	108.58	40.21	4.02	207.53	1.25	29.45	94.75	89.73	252.94	172.43	8.03
95th-Percentile Queue Length [veh/ln]	25.79	20.44	9.04	0.95	39.89	0.30	6.96	18.22	17.40	43.66	30.43	1.90
95th-Percentile Queue Length [m/ln]	196.53	155.75	68.91	7.24	303.94	2.25	53.01	138.82	132.62	332.66	231.88	14.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	145.07	100.22	45.58	86.59	173.81	47.51	99.60	76.67	77.63	81.41	33.73	19.41
Movement LOS	F	F	D	F	F	D	F	E	E	F	C	B
d_A, Approach Delay [s/veh]	83.20			172.21			79.48			64.00		
Approach LOS	F			F			E			E		
d_I, Intersection Delay [s/veh]	91.54											
Intersection LOS	F											
Intersection V/C	0.904											

Emissions

Vehicle Kilometers Traveled [km/h]	99.42	109.35	99.59	3.90	361.58	1.95	11.58	43.74	40.86	331.00	171.98	12.49
Stops [stops/h]	384.78	320.60	237.45	11.88	1225.56	3.69	86.96	279.78	264.96	1493.74	509.14	23.70
Fuel consumption [L/h]	54.01	34.27	26.11	1.30	186.12	0.45	8.81	26.99	25.66	153.10	46.75	2.51
CO [g/h]	997.24	632.75	482.06	24.08	3436.77	8.33	162.60	498.47	473.76	2827.15	863.25	46.39
NOx [g/h]	194.03	123.11	93.79	4.69	668.67	1.62	31.64	96.98	92.18	550.06	167.96	9.03
VOC [g/h]	231.12	146.65	111.72	5.58	796.50	1.93	37.68	115.52	109.80	655.22	200.07	10.75

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	17.86			16.98			5.29			3.76		
d_p, Pedestrian Delay [s]	71.25			71.25			71.25			71.25		
I_p,int, Pedestrian LOS Score for Intersectio	3.031			2.875			2.800			3.089		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	600			463			375			1038		
d_b, Bicycle Delay [s]	39.20			47.28			52.81			18.53		
I_b,int, Bicycle LOS Score for Intersection	2.412			2.338			2.076			5.180		
Bicycle LOS	B			B			B			F		

Sequence

Ring 1	2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	1	3	9	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 17: Stony Plain Road and 149 Street**

Control Type:	Signalized	Delay (sec / veh):	54.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [m]	90.00	30.48	30.48	65.00	30.48	75.00	50.00	30.48	0.00	110.00	30.48	75.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	60.00			60.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	53	696	340	24	1059	89	109	281	85	274	482	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	34	0	0	9	0	0	9	0	0	7
Total Hourly Volume [veh/h]	53	696	306	24	1059	80	109	281	76	274	482	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	174	77	6	265	20	27	70	19	69	121	17
Total Analysis Volume [veh/h]	53	696	306	24	1059	80	109	281	76	274	482	66
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			10			10			10		
v_di, Inbound Pedestrian Volume crossing m	10			10			10			10		
v_co, Outbound Pedestrian Volume crossing	10			10			10			10		
v_ci, Inbound Pedestrian Volume crossing mi	10			10			10			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	92.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	7	0	5	7	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	7	34	0	7	34	0	12	22	0	12	22	0
Amber [s]	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	19	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	5.0	0.0	2.0	5.0	0.0	5.0	5.0	0.0	5.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	11	41	0	11	41	0	19	29	0	19	29	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
C, Calculated Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	4.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	5.00	5.00	0.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	45	34	34	45	34	34	12	22	22	12	22	22
g / C, Green / Cycle	0.45	0.34	0.34	0.45	0.34	0.34	0.12	0.22	0.22	0.12	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.07	0.21	0.19	0.03	0.32	0.05	0.07	0.15	0.05	0.09	0.26	0.04
s, saturation flow rate [veh/h]	723	3279	1589	778	3279	1543	1640	1870	1589	3186	1870	1589
c, Capacity [veh/h]	275	1115	540	355	1115	525	197	411	350	382	411	350
d1, Uniform Delay [s]	21.18	27.65	26.97	17.00	32.17	22.93	41.48	35.80	31.95	42.36	39.00	31.74
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	2.64	4.25	0.37	17.30	0.62	10.77	8.88	1.42	10.97	100.24	1.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.19	0.62	0.57	0.07	0.95	0.15	0.55	0.68	0.22	0.72	1.17	0.19
d, Delay for Lane Group [s/veh]	22.74	30.29	31.23	17.37	49.47	23.55	52.25	44.68	33.37	53.34	139.24	32.93
Lane Group LOS	C	C	C	B	D	C	D	D	C	D	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.78	7.09	6.37	0.33	14.50	1.36	3.10	7.21	1.63	3.81	21.34	1.41
50th-Percentile Queue Length [m/ln]	5.94	54.01	48.53	2.52	110.51	10.39	23.63	54.94	12.45	29.01	162.58	10.71
95th-Percentile Queue Length [veh/ln]	1.40	11.45	10.51	0.59	20.75	2.45	5.58	11.61	2.94	6.85	31.45	2.53
95th-Percentile Queue Length [m/ln]	10.69	87.28	80.06	4.53	158.10	18.70	42.53	88.49	22.41	52.22	239.67	19.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.74	30.29	31.23	17.37	49.47	23.55	52.25	44.68	33.37	53.34	139.24	32.93
Movement LOS	C	C	C	B	D	C	D	D	C	D	F	C
d_A, Approach Delay [s/veh]	30.18			47.02			44.60			102.07		
Approach LOS	C			D			D			F		
d_I, Intersection Delay [s/veh]	54.54											
Intersection LOS	D											
Intersection V/C	0.687											

Emissions

Vehicle Kilometers Traveled [km/h]	13.31	174.81	76.86	5.01	221.18	16.71	25.95	66.89	18.09	98.73	173.68	23.78
Stops [stops/h]	28.07	510.33	229.25	11.88	1044.17	49.08	111.62	259.55	58.81	274.11	768.11	50.61
Fuel consumption [L/h]	2.99	47.93	21.45	1.14	93.32	4.49	9.36	21.86	4.99	26.80	85.45	5.07
CO [g/h]	55.26	885.02	396.11	21.07	1723.15	82.91	172.82	403.59	92.22	494.87	1577.83	93.67
NOx [g/h]	10.75	172.19	77.07	4.10	335.26	16.13	33.62	78.52	17.94	96.28	306.99	18.22
VOC [g/h]	12.81	205.11	91.80	4.88	399.36	19.22	40.05	93.54	21.37	114.69	365.68	21.71

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			93.10			0.00			66.55		
M_CW, Crosswalk Circulation Area [m²/ped]	66.89			66.74			67.33			49.33		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.925			2.884			2.462			2.620		
Crosswalk LOS	C			C			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	680			680			440			440		
d_b, Bicycle Delay [s]	21.78			21.78			30.42			30.42		
I_b,int, Bicycle LOS Score for Intersection	2.458			2.527			2.343			2.927		
Bicycle LOS	B			B			B			C		

Sequence

Ring 1	1	3	5	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 18: Stony Plain Road and 156 Street

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.50	3.50	3.66	3.50	3.50	3.50	3.50	3.50	3.66	3.50	3.50
No. of Lanes in Entry Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	7.50	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	193	82	0	276	146	237	258	25	0	642	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	8	0	0	15	0	0	3	0	0	3
Total Hourly Volume [veh/h]	0	193	74	0	276	131	237	258	25	0	642	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	48	19	0	69	33	59	65	6	0	161	7
Total Analysis Volume [veh/h]	0	193	74	0	276	131	237	258	25	0	642	29
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			20			20			20		
v_di, Inbound Pedestrian Volume crossing m	20			20			20			20		
v_co, Outbound Pedestrian Volume crossing	20			20			20			20		
v_ci, Inbound Pedestrian Volume crossing mi	20			20			20			20		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	5	0	0	5	0	1	2	0	0	3	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	10	69	0	0	55	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	4.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	2.0	4.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	45	0	0	45	0	14	75	0	0	61	0
Lead / Lag	-	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	0	10	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No		No	No			No	
Maximum Recall		Yes			Yes		Yes	Yes			Yes	
Pedestrian Recall		Yes			Yes		No	Yes			Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	0.00	4.00	4.00
g_i, Effective Green Time [s]	40	40	40	40	69	69	55
g / C, Green / Cycle	0.33	0.33	0.33	0.33	0.58	0.58	0.46
(v / s)_i Volume / Saturation Flow Rate	0.11	0.05	0.16	0.09	0.26	0.15	0.36
s, saturation flow rate [veh/h]	1722	1589	1722	1494	918	1835	1852
c, Capacity [veh/h]	574	530	574	498	379	1055	849
d1, Uniform Delay [s]	30.03	27.97	31.76	29.06	20.90	12.81	27.61
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.58	0.55	2.87	1.28	7.55	0.62	7.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.14	0.48	0.26	0.62	0.27	0.79
d, Delay for Lane Group [s/veh]	31.61	28.52	34.62	30.35	28.45	13.44	35.04
Lane Group LOS	C	C	C	C	C	B	D
Critical Lane Group	No	No	Yes	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	4.44	1.58	6.80	2.93	3.91	3.94	17.67
50th-Percentile Queue Length [m/ln]	33.87	12.03	51.79	22.34	29.78	30.04	134.61
95th-Percentile Queue Length [veh/ln]	7.90	2.84	11.07	5.28	7.04	7.10	24.56
95th-Percentile Queue Length [m/ln]	60.21	21.65	84.38	40.21	53.61	54.07	187.14

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	31.61	28.52	0.00	34.62	30.35	28.45	13.44	13.44	0.00	35.04	35.04
Movement LOS		C	C		C	C	C	B	B		D	D
d_A, Approach Delay [s/veh]	30.75			33.25			20.28			35.04		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	29.92											
Intersection LOS	C											
Intersection V/C	0.598											

Emissions

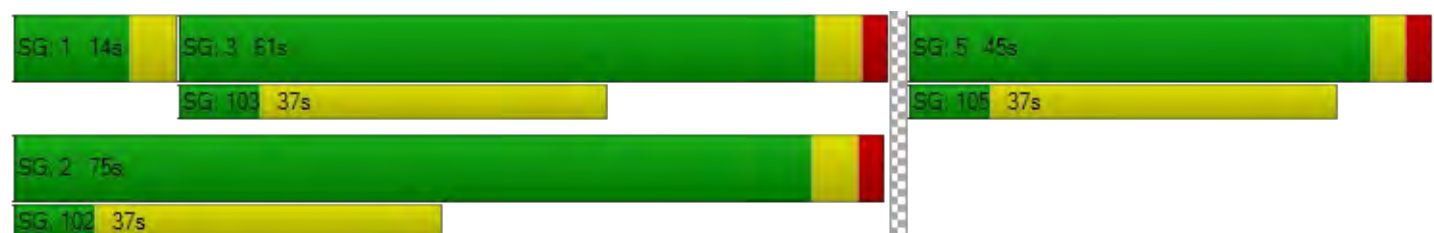
Vehicle Kilometers Traveled [km/h]	39.54	15.16	35.09	16.65	24.78	29.58	388.57
Stops [stops/h]	133.34	47.35	203.92	87.95	117.25	118.26	529.97
Fuel consumption [L/h]	11.45	4.13	15.27	6.62	10.18	8.40	66.97
CO [g/h]	211.47	76.26	282.03	122.24	188.01	155.06	1236.62
NOx [g/h]	41.14	14.84	54.87	23.78	36.58	30.17	240.60
VOC [g/h]	49.01	17.67	65.36	28.33	43.57	35.94	286.60

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	24.55	13.51	21.72	25.07
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.225	2.433	2.399	2.245
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	667	667	1150	917
d_b, Bicycle Delay [s]	26.67	26.67	10.84	17.60
I_b,int, Bicycle LOS Score for Intersection	2.013	2.256	2.423	2.672
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report**Intersection 19: Stony Plain Road and 158 Street**

Control Type:

Signalized

Delay (sec / veh):

12.3

Analysis Method:

HCM 7th Edition

Level Of Service:

B

Analysis Period:

15 minutes

Volume to Capacity (v/c):

0.241

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name												
Base Volume Input [veh/h]	36	18	66	6	9	35	20	314	15	46	516	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	60.00	2.00	8.00	2.00	2.00	2.00	2.00	6.00	20.00	2.00	2.00	10.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	7	0	0	4	0	0	2	0	0	1
Total Hourly Volume [veh/h]	36	18	59	6	9	31	20	314	13	46	516	9
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	5	15	2	2	8	5	79	3	12	129	2
Total Analysis Volume [veh/h]	36	18	59	6	9	31	20	314	13	46	516	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10			0			0			10		
v_di, Inbound Pedestrian Volume crossing m	10			0			0			10		
v_co, Outbound Pedestrian Volume crossing	10			10			10			10		
v_ci, Inbound Pedestrian Volume crossing mi	10			10			10			10		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	36.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	0	2	0	0	1	0	0	1	0
Auxiliary Signal Groups												
Maximum Green [s]	0	23	0	0	23	0	0	42	0	0	42	0
Amber [s]	0.0	5.0	0.0	0.0	5.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	9	0	0	9	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	10	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Detector Location [m]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	5.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	28	0	0	28	0	0	32	0	0	32	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	21	0	0	21	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No			No			Yes			Yes	
Maximum Recall		Yes			Yes			No			No	
Pedestrian Recall		No			No			No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	C	C	C
C, Calculated Cycle Length [s]	60	60	60	60	60	60
L, Total Lost Time per Cycle [s]	5.00	5.00	6.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	23	26	26	26	26
g / C, Green / Cycle	0.38	0.38	0.43	0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.11	0.10	0.17	0.16
s, saturation flow rate [veh/h]	1564	1628	1705	1621	1740	1691
c, Capacity [veh/h]	679	692	805	703	823	733
d1, Uniform Delay [s]	12.22	11.73	10.70	10.74	11.42	11.53
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.53	0.19	0.64	0.80	1.20	1.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	0.07	0.22	0.24	0.36	0.38
d, Delay for Lane Group [s/veh]	12.75	11.92	11.34	11.54	12.63	13.02
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.99	0.38	1.45	1.37	2.54	2.47
50th-Percentile Queue Length [m/ln]	7.54	2.92	11.02	10.42	19.34	18.83
95th-Percentile Queue Length [veh/ln]	1.78	0.69	2.60	2.46	4.57	4.45
95th-Percentile Queue Length [m/ln]	13.56	5.25	19.83	18.75	34.81	33.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.75	12.75	12.75	11.92	11.92	11.92	11.34	11.44	11.54	12.63	12.83	13.02
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	12.75			11.92			11.43			12.82		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	12.33											
Intersection LOS	B											
Intersection V/C	0.241											

Emissions

Vehicle Kilometers Traveled [km/h]	10.46	4.93	88.92	82.43	38.38	36.41
Stops [stops/h]	59.34	22.98	86.75	82.04	152.26	148.24
Fuel consumption [L/h]	3.44	1.41	11.98	11.17	9.92	9.58
CO [g/h]	63.45	25.98	221.21	206.21	183.12	176.88
NOx [g/h]	12.35	5.06	43.04	40.12	35.63	34.42
VOC [g/h]	14.71	6.02	51.27	47.79	42.44	40.99

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	0.0	13.0
M_corner, Corner Circulation Area [m²/ped]	26.74	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	63.81	71.44	0.00	126.96
d_p, Pedestrian Delay [s]	21.68	21.68	0.00	18.41
I_p,int, Pedestrian LOS Score for Intersectio	1.867	1.779	0.000	2.357
Crosswalk LOS	A	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	767	767	867	867
d_b, Bicycle Delay [s]	11.41	11.41	9.63	9.63
I_b,int, Bicycle LOS Score for Intersection	1.758	1.642	1.848	2.032
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 20: Stony Plain Road and 163 Street

Control Type:	Signalized	Delay (sec / veh):	50.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.609

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	45.00	30.48	30.00	60.00	30.48	30.48	40.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	345	200	190	38	429	235	54	281	39	73	848	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	7.00	15.00	6.00	4.00	7.00	7.00	2.00	12.00	4.00	5.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	19	0	0	24	0	0	4	0	0	3
Total Hourly Volume [veh/h]	345	200	171	38	429	211	54	281	35	73	848	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	50	43	10	107	53	14	70	9	18	212	8
Total Analysis Volume [veh/h]	345	200	171	38	429	211	54	281	35	73	848	30
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	17			11			7			15		
v_di, Inbound Pedestrian Volume crossing m	15			7			11			17		
v_co, Outbound Pedestrian Volume crossing	12			18			14			10		
v_ci, Inbound Pedestrian Volume crossing mi	14			10			12			18		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	2	3	0	0	3	0	0	1	0	4	1	0
Auxiliary Signal Groups												
Maximum Green [s]	10	33	0	0	33	0	0	55	0	7	55	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	16	0	0	16	0	0	16	0	0	16	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	2.0	0.0	0.0	2.0	0.0	0.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	13	37	0	0	37	0	0	60	0	10	60	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	7	24	0	0	24	0	0	26	0	7	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No			No			Yes		Yes	Yes	
Maximum Recall	Yes	Yes			Yes			No		No	No	
Pedestrian Recall	No	No			No			No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	3.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	46	33	33	33	33	55	55	55	65	55	55
g / C, Green / Cycle	0.38	0.28	0.28	0.28	0.28	0.46	0.46	0.46	0.54	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.34	0.22	0.04	0.24	0.14	0.09	0.09	0.09	0.07	0.24	0.24
s, saturation flow rate [veh/h]	1018	1699	901	1810	1533	602	1795	1719	1059	1840	1813
c, Capacity [veh/h]	303	467	110	498	422	223	823	788	608	843	831
d1, Uniform Delay [s]	49.34	40.35	55.86	41.33	36.46	35.12	19.33	19.36	13.38	23.16	23.18
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	94.04	13.04	8.36	17.59	4.20	2.57	0.53	0.56	0.40	2.32	2.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.14	0.79	0.34	0.86	0.50	0.24	0.19	0.20	0.12	0.52	0.53
d, Delay for Lane Group [s/veh]	143.38	53.39	64.22	58.93	40.65	37.69	19.85	19.93	13.79	25.49	25.55
Lane Group LOS	F	D	E	E	D	D	B	B	B	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	14.38	11.77	1.39	14.37	5.67	1.43	2.78	2.72	1.01	9.33	9.24
50th-Percentile Queue Length [m/ln]	109.57	89.70	10.58	109.51	43.21	10.88	21.15	20.72	7.71	71.11	70.38
95th-Percentile Queue Length [veh/ln]	22.30	17.40	2.50	20.59	9.58	2.57	5.00	4.90	1.82	14.34	14.22
95th-Percentile Queue Length [m/ln]	169.91	132.58	19.04	156.89	72.97	19.59	38.06	37.30	13.87	109.29	108.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	143.38	53.39	53.39	64.22	58.93	40.65	37.69	19.88	19.93	13.79	25.52	25.55
Movement LOS	F	D	D	E	E	D	D	B	B	B	C	C
d_A, Approach Delay [s/veh]	96.75			53.54			22.49			24.62		
Approach LOS	F			D			C			C		
d_I, Intersection Delay [s/veh]	50.57											
Intersection LOS	D											
Intersection V/C	0.609											

Emissions

Vehicle Kilometers Traveled [km/h]	56.43	60.68	5.49	62.00	30.49	13.24	39.21	38.28	6.59	39.86	39.38
Stops [stops/h]	431.38	353.15	41.65	431.15	170.12	42.85	83.25	81.59	30.34	279.97	277.10
Fuel consumption [L/h]	53.14	28.95	3.34	35.04	13.32	3.79	8.04	7.87	2.08	18.74	18.55
CO [g/h]	981.33	534.63	61.61	647.06	246.05	69.96	148.54	145.30	38.46	346.10	342.55
NOx [g/h]	190.93	104.02	11.99	125.89	47.87	13.61	28.90	28.27	7.48	67.34	66.65
VOC [g/h]	227.43	123.91	14.28	149.96	57.02	16.21	34.43	33.67	8.91	80.21	79.39

Other Modes

g_Walk,mi, Effective Walk Time [s]	4.0	4.0	4.0	4.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	7.69	5.54	0.00	0.00
d_p, Pedestrian Delay [s]	56.07	56.07	56.07	56.07
I_p,int, Pedestrian LOS Score for Intersectio	2.548	2.510	2.907	2.672
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	550	550	917	917
d_b, Bicycle Delay [s]	31.54	31.54	17.60	17.60
I_b,int, Bicycle LOS Score for Intersection	2.772	2.718	1.868	2.347
Bicycle LOS	C	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 21: 95 Avenue and 156 Street

Control Type:	Signalized	Delay (sec / veh):	37.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.471

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	75.00	30.48	30.48	75.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	93	166	113	71	222	70	78	310	66	85	329	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	11	0	0	7	0	0	7	0	0	1
Total Hourly Volume [veh/h]	93	166	102	71	222	63	78	310	59	85	329	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	42	26	18	56	16	20	78	15	21	82	3
Total Analysis Volume [veh/h]	93	166	102	71	222	63	78	310	59	85	329	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20			20			20			20		
v_di, Inbound Pedestrian Volume crossing m	20			20			20			20		
v_co, Outbound Pedestrian Volume crossing	20			20			20			20		
v_ci, Inbound Pedestrian Volume crossing mi	20			20			20			20		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	3	0	1	3	0	5	7	0	5	7	0
Auxiliary Signal Groups												
Maximum Green [s]	14	33	0	14	33	0	10	45	0	10	45	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	29	0	0	29	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	19	38	0	19	38	0	13	50	0	13	50	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes		No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	3.00	5.00	3.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	0.00	3.00	0.00	3.00
g_i, Effective Green Time [s]	14	33	14	33	58	45	58	45
g / C, Green / Cycle	0.12	0.28	0.12	0.28	0.48	0.38	0.48	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.16	0.04	0.16	0.07	0.22	0.08	0.20
s, saturation flow rate [veh/h]	1640	1719	1640	1779	1155	1658	1132	1710
c, Capacity [veh/h]	191	473	191	489	485	622	453	641
d1, Uniform Delay [s]	49.63	37.36	48.93	37.55	18.37	30.15	18.99	29.23
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.57	4.86	5.44	5.00	0.71	4.13	0.91	3.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.49	0.57	0.37	0.58	0.16	0.59	0.19	0.53
d, Delay for Lane Group [s/veh]	58.20	42.22	54.38	42.55	19.08	34.28	19.90	32.33
Lane Group LOS	E	D	D	D	B	C	B	C
Critical Lane Group	Yes	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	3.07	7.38	2.26	7.89	1.27	9.21	1.40	8.12
50th-Percentile Queue Length [m/ln]	23.39	56.23	17.20	60.08	9.65	70.18	10.64	61.88
95th-Percentile Queue Length [veh/ln]	5.53	11.84	4.06	12.49	2.28	14.19	2.51	12.80
95th-Percentile Queue Length [m/ln]	42.10	90.18	30.96	95.18	17.36	108.11	19.15	97.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	58.20	42.22	42.22	54.38	42.55	42.55	19.08	34.28	34.28	19.90	32.33	32.33
Movement LOS	E	D	D	D	D	D	B	C	C	B	C	C
d_A, Approach Delay [s/veh]	46.34			44.91			31.63			29.84		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	37.47											
Intersection LOS	D											
Intersection V/C	0.471											

Emissions

Vehicle Kilometers Traveled [km/h]	23.50	67.73	24.07	96.63	22.31	105.56	29.23	116.57
Stops [stops/h]	92.09	221.40	67.71	236.55	37.98	276.30	41.88	243.64
Fuel consumption [L/h]	8.47	20.13	6.78	23.84	4.12	25.99	5.02	25.00
CO [g/h]	156.43	371.64	125.25	440.24	76.10	479.84	92.76	461.63
NOx [g/h]	30.43	72.31	24.37	85.65	14.81	93.36	18.05	89.82
VOC [g/h]	36.25	86.13	29.03	102.03	17.64	111.21	21.50	106.99

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	25.68	28.55	24.00	21.03
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.268	2.215	2.394	2.378
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	550	550	750	750
d_b, Bicycle Delay [s]	31.54	31.54	23.44	23.44
I_b,int, Bicycle LOS Score for Intersection	2.173	2.159	2.309	2.261
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	3	5	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 22: 87 Avenue and Meadowlark Road

Control Type:	Signalized	Delay (sec / veh):	47.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [m]	65.00	30.48	25.00	85.00	30.48	30.48	135.00	30.48	30.48	75.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	62	394	330	22	234	77	66	450	379	435	408	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	33	0	0	8	0	0	38	0	0	3
Total Hourly Volume [veh/h]	62	394	297	22	234	69	66	450	341	435	408	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	99	74	6	59	17	17	113	85	109	102	7
Total Analysis Volume [veh/h]	62	394	297	22	234	69	66	450	341	435	408	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	35			35			35			35		
v_di, Inbound Pedestrian Volume crossing m	35			35			35			35		
v_co, Outbound Pedestrian Volume crossing	35			35			35			35		
v_ci, Inbound Pedestrian Volume crossing mi	35			35			35			35		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	5	7	1	5	7	0	1	4	0	2	3	0
Auxiliary Signal Groups			1,7									
Maximum Green [s]	11	33	10	11	33	0	10	35	0	17	42	0
Amber [s]	4.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	2.0	3.0	0.0	2.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	30	0	0	30	0	0	30	0	0	30	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	5.0	2.0	4.0	5.0	0.0	2.0	5.0	0.0	2.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	17	40	14	17	40	0	14	42	0	21	49	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	5	5	10	0	5	10	0	5	10	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Pedestrian Recall	No	Yes	No	No	Yes		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	C
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	6.00	7.00	4.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	5.00	0.00	4.00	5.00	5.00	0.00	5.00	5.00	0.00	5.00	5.00
g_i, Effective Green Time [s]	11	33	50	11	33	33	56	35	35	56	42	42
g / C, Green / Cycle	0.09	0.28	0.42	0.09	0.28	0.28	0.47	0.29	0.29	0.47	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.04	0.11	0.19	0.01	0.09	0.10	0.06	0.23	0.24	0.41	0.13	0.13
s, saturation flow rate [veh/h]	1640	3560	1529	1640	1722	1528	1131	1870	1497	1057	1722	1671
c, Capacity [veh/h]	150	979	636	150	474	420	526	545	436	426	603	585
d1, Uniform Delay [s]	51.45	35.46	25.11	50.18	34.65	34.92	18.32	38.96	39.84	36.97	29.05	29.09
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.15	1.23	2.46	2.04	1.84	2.32	0.49	10.55	17.26	49.14	1.70	1.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.41	0.40	0.47	0.15	0.33	0.35	0.13	0.78	0.84	1.02	0.36	0.37
d, Delay for Lane Group [s/veh]	59.60	36.69	27.57	52.22	36.49	37.24	18.81	49.51	57.11	86.11	30.74	30.86
Lane Group LOS	E	D	C	D	D	D	B	D	E	F	C	C
Critical Lane Group	Yes	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.10	4.87	6.47	0.70	3.86	3.75	1.09	12.98	12.11	14.12	4.99	4.90
50th-Percentile Queue Length [m/ln]	16.02	37.12	49.26	5.30	29.38	28.60	8.30	98.88	92.25	107.62	38.03	37.37
95th-Percentile Queue Length [veh/ln]	3.78	8.49	10.64	1.25	6.94	6.76	1.96	18.88	17.81	20.60	8.66	8.54
95th-Percentile Queue Length [m/ln]	28.84	64.70	81.04	9.53	52.88	51.47	14.94	143.90	135.73	156.95	65.95	65.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.60	36.69	27.57	52.22	36.74	37.24	18.81	49.93	57.11	86.11	30.80	30.86
Movement LOS	E	D	C	D	D	D	B	D	E	F	C	C
d_A, Approach Delay [s/veh]	34.98			37.90			50.39			58.49		
Approach LOS	C			D			D			E		
d_I, Intersection Delay [s/veh]	47.31											
Intersection LOS	D											
Intersection V/C	0.628											

Emissions

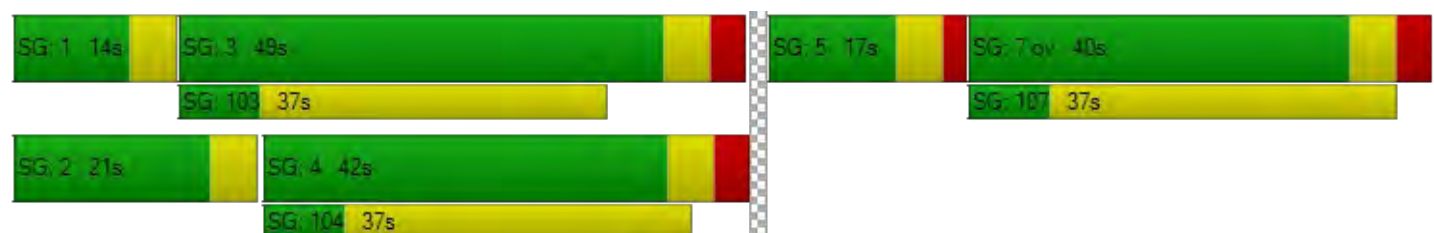
Vehicle Kilometers Traveled [km/h]	11.11	70.61	53.23	4.98	35.06	33.52	25.38	163.51	140.69	119.17	60.07	58.83
Stops [stops/h]	63.07	292.27	193.95	20.85	115.66	112.59	32.67	389.30	363.18	423.71	149.74	147.12
Fuel consumption [L/h]	5.32	24.41	15.72	1.83	10.28	9.96	4.10	40.50	37.63	49.69	14.27	14.00
CO [g/h]	98.20	450.76	290.32	33.72	189.89	183.98	75.78	747.92	694.79	917.65	263.45	258.55
NOx [g/h]	19.11	87.70	56.49	6.56	36.95	35.80	14.74	145.52	135.18	178.54	51.26	50.30
VOC [g/h]	22.76	104.47	67.28	7.82	44.01	42.64	17.56	173.34	161.02	212.67	61.06	59.92

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	7.25			16.76			16.56			10.64		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	3.013			2.525			2.659			2.656		
Crosswalk LOS	C			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	550			550			583			700		
d_b, Bicycle Delay [s]	31.54			31.54			30.10			25.35		
I_b,int, Bicycle LOS Score for Intersection	2.208			1.834			2.298			2.279		
Bicycle LOS	B			A			B			B		

Sequence

Ring 1	1	3	5	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 23: 109 Street and 82 Ave

Control Type:	Signalized	Delay (sec / veh):	47.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.828

Intersection Setup

Name	109 Street			109 Street			82 Ave			82 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.00	3.20	4.20	3.50	3.50	3.50	3.20	3.20	5.50	3.00	3.00	3.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [m]	100.00	30.48	30.48	70.00	30.48	30.48	50.00	30.48	30.48	50.00	30.48	15.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	109 Street			109 Street			82 Ave			82 Ave		
Base Volume Input [veh/h]	205	899	169	239	1769	76	115	595	342	204	556	156
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	17	0	0	8	0	0	34	0	0	16
Total Hourly Volume [veh/h]	205	899	152	239	1769	68	115	595	308	204	556	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	225	38	60	442	17	29	149	77	51	139	35
Total Analysis Volume [veh/h]	205	899	152	239	1769	68	115	595	308	204	556	140
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	73			93			72			93		
v_di, Inbound Pedestrian Volume crossing m	72			93			73			93		
v_co, Outbound Pedestrian Volume crossing	56			76			75			55		
v_ci, Inbound Pedestrian Volume crossing mi	55			75			76			56		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	7			17			7			12		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	55.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	5	1	0	6	7	0	2	4	0	3	4	0
Auxiliary Signal Groups												
Maximum Green [s]	15	50	0	15	50	0	15	50	0	15	50	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	19	0	0	19	0	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	13	46	0	15	48	0	9	40	0	9	40	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	26	0	7	26	0	6	28	0	6	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	Yes		No	Yes		No	No		No	No	
Maximum Recall	Yes	No		Yes	No		Yes	No		Yes	No	
Pedestrian Recall	No	No		No	No		No	Yes		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	C	L	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	0.00	3.00	3.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	56	41	41	56	43	43	44	35	35	42	35	35
g / C, Green / Cycle	0.51	0.37	0.37	0.51	0.39	0.39	0.40	0.32	0.32	0.38	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.43	0.28	0.11	0.32	0.38	0.39	0.14	0.28	0.32	0.29	0.18	0.13
s, saturation flow rate [veh/h]	478	3204	1334	743	3204	1620	822	1683	1376	701	3076	1113
c, Capacity [veh/h]	253	1194	497	355	1253	633	322	535	438	194	979	354
d1, Uniform Delay [s]	28.40	30.08	24.10	21.60	32.80	33.26	22.83	35.45	37.34	43.07	31.21	28.47
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.17	0.23	0.19	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	23.82	4.41	1.58	9.82	18.60	33.10	3.07	7.16	27.05	54.21	0.52	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	0.81	0.75	0.31	0.67	0.97	0.99	0.36	0.88	0.99	1.05	0.57	0.40
d, Delay for Lane Group [s/veh]	52.22	34.49	25.69	31.42	51.40	66.35	25.91	42.61	64.40	97.27	31.73	29.19
Lane Group LOS	D	C	C	C	D	E	C	D	E	F	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	4.53	10.87	2.97	4.36	18.50	21.82	2.18	12.71	14.63	6.28	6.24	2.90
50th-Percentile Queue Length [m/ln]	34.50	82.87	22.61	33.20	140.93	166.29	16.63	96.86	111.48	47.82	47.55	22.14
95th-Percentile Queue Length [veh/ln]	8.02	16.28	5.34	7.78	25.55	29.48	3.93	18.56	20.90	10.69	10.34	5.23
95th-Percentile Queue Length [m/ln]	61.09	124.08	40.70	59.29	194.68	224.66	29.94	141.42	159.28	81.45	78.77	39.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.22	34.49	25.69	31.42	56.12	66.35	25.91	47.22	64.40	97.27	31.73	29.19
Movement LOS	D	C	C	C	E	E	C	D	E	F	C	C
d_A, Approach Delay [s/veh]	36.32			53.61			50.01			46.19		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	47.50											
Intersection LOS	D											
Intersection V/C	0.828											

Emissions

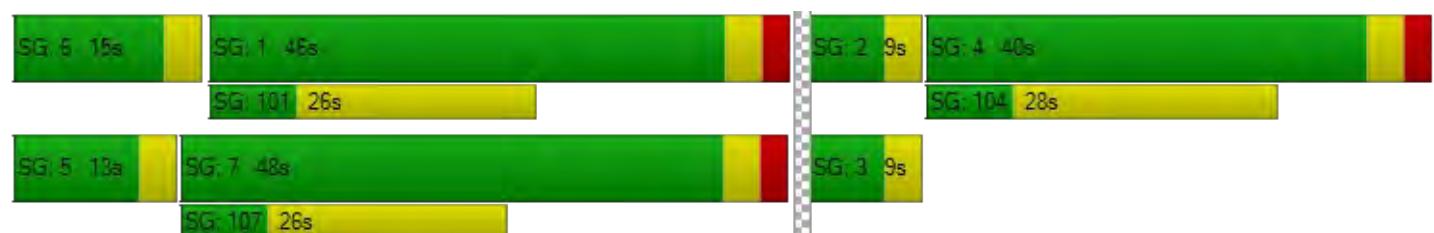
Vehicle Kilometers Traveled [km/h]	64.03	280.81	47.48	26.36	133.54	69.05	66.35	270.74	250.27	34.50	94.02	23.67
Stops [stops/h]	148.17	711.80	97.11	142.61	1210.59	714.19	71.44	416.02	478.80	205.38	408.47	95.07
Fuel consumption [L/h]	17.66	66.57	9.70	11.49	87.80	54.59	10.21	50.49	56.07	21.89	29.42	7.02
CO [g/h]	326.13	1229.26	179.18	212.20	1621.36	1008.03	188.54	932.39	1035.33	404.21	543.32	129.68
NOx [g/h]	63.45	239.17	34.86	41.29	315.46	196.13	36.68	181.41	201.44	78.64	105.71	25.23
VOC [g/h]	75.58	284.89	41.53	49.18	375.77	233.62	43.70	216.09	239.95	93.68	125.92	30.06

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	7.10			4.78			0.00			11.09		
M_CW, Crosswalk Circulation Area [m²/ped]	5.25			5.71			7.24			7.56		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.242			3.076			2.859			2.876		
Crosswalk LOS	C			C			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	745			782			636			636		
d_b, Bicycle Delay [s]	21.72			20.58			25.66			25.72		
I_b,int, Bicycle LOS Score for Intersection	2.610			2.706			2.428			2.315		
Bicycle LOS	B			B			B			B		

Sequence

Ring 1	6	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 24: 109 Street and 83 Ave

Control Type:	Signalized	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.324

Intersection Setup

Name	109 Street					109 Street				
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right2	Left	Left	Thru	Right	Right
Lane Width [m]	3.66	3.66	3.20	3.66	4.20	3.66	3.66	3.50	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	35.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	109 Street					109 Street				
Base Volume Input [veh/h]	0	0	860	0	33	0	0	1272	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	3	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	860	0	30	0	0	1272	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	215	0	8	0	0	318	0	0
Total Analysis Volume [veh/h]	0	0	860	0	30	0	0	1272	0	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20					17				
v_di, Inbound Pedestrian Volume crossing th	14					17				
v_co, Outbound Pedestrian Volume along th	20					20				
v_ci, Inbound Pedestrian Volume along the l	20					20				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	7					6				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	29.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	1	0	0	0	0	1	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	100	0	0	0	0	100	0	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Walk [s]	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	0	10	0	0	0	0	10	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			Yes					Yes		
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	78	0	0	0	0	78	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	30	0	0	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Minimum Recall			Yes					Yes		
Maximum Recall			No					No		
Pedestrian Recall			No					No		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C
C, Calculated Cycle Length [s]	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	76
g / C, Green / Cycle	0.69	0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.27	0.02	0.28
s, saturation flow rate [veh/h]	3204	1410	4584
c, Capacity [veh/h]	2207	971	3158
d1, Uniform Delay [s]	7.28	5.43	7.37
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	0.06	0.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.39	0.03	0.40
d, Delay for Lane Group [s/veh]	7.80	5.49	7.75
Lane Group LOS	A	A	A
Critical Lane Group	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.01	0.22	3.96
50th-Percentile Queue Length [m/ln]	30.59	1.65	30.18
95th-Percentile Queue Length [veh/ln]	7.22	0.39	7.13
95th-Percentile Queue Length [m/ln]	55.05	2.97	54.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	7.80	0.00	5.49	0.00	0.00	7.75	0.00	0.00
Movement LOS			A		A			A		
d_A, Approach Delay [s/veh]	7.72					7.75				
Approach LOS	A					A				
d_I, Intersection Delay [s/veh]	9.14									
Intersection LOS	A									
Intersection V/C	0.324									

Emissions

Vehicle Kilometers Traveled [km/h]	94.84	3.31	402.16
Stops [stops/h]	262.73	7.09	388.88
Fuel consumption [L/h]	20.08	0.60	54.59
CO [g/h]	370.86	11.10	1007.96
NOx [g/h]	72.16	2.16	196.11
VOC [g/h]	85.95	2.57	233.60

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	14.30
M_CW, Crosswalk Circulation Area [m²/ped]	37.82	40.15
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.853	2.740
Crosswalk LOS	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1345	1345
d_b, Bicycle Delay [s]	5.91	5.91
I_b,int, Bicycle LOS Score for Intersection	2.296	2.259
Bicycle LOS	B	B

Intersection Setup

Name	83 Ave					WB Bike Lane				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left2	Left	Thru	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	5.00	3.66	3.66	3.66	1.50	1.50
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	40.00					30.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	83 Ave					WB Bike Lane				
Base Volume Input [veh/h]	0	0	0	0	130	0	0	0	27	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	98	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	32	0	0	0	27	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	8	0	0	0	7	0
Total Analysis Volume [veh/h]	0	0	0	0	32	0	0	0	27	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20					20				
v_di, Inbound Pedestrian Volume crossing th	20					14				
v_co, Outbound Pedestrian Volume along th	14					17				
v_ci, Inbound Pedestrian Volume along the l	20					17				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					27				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	29.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	0	0	2	0	0	0	2	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	0	0	29	0	0	0	29	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	7	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	22	0	0	0	22	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk					No				No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	32	0	0	0	32	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	0	29	0	0	0	29	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall					No				No	
Maximum Recall					No				No	
Pedestrian Recall					No				No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	R	C
C, Calculated Cycle Length [s]	110	110
L, Total Lost Time per Cycle [s]	3.00	3.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00
l2, Clearance Lost Time [s]	1.00	1.00
g_i, Effective Green Time [s]	27	27
g / C, Green / Cycle	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02
s, saturation flow rate [veh/h]	1426	1616
c, Capacity [veh/h]	353	400
d1, Uniform Delay [s]	31.83	31.67
k, delay calibration	0.04	0.04
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.04	0.03
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.07
d, Delay for Lane Group [s/veh]	31.87	31.70
Lane Group LOS	C	C
Critical Lane Group	No	No
50th-Percentile Queue Length [veh/ln]	0.67	0.57
50th-Percentile Queue Length [m/ln]	5.10	4.34
95th-Percentile Queue Length [veh/ln]	1.21	1.03
95th-Percentile Queue Length [m/ln]	9.19	7.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	31.87	0.00	0.00	0.00	31.70	0.00
Movement LOS					C				C	
d_A, Approach Delay [s/veh]	31.87					31.70				
Approach LOS	C					C				
d_I, Intersection Delay [s/veh]	9.14									
Intersection LOS	A									
Intersection V/C	0.324									

Emissions

Vehicle Kilometers Traveled [km/h]	4.08	1.97
Stops [stops/h]	21.92	18.64
Fuel consumption [L/h]	1.53	1.05
CO [g/h]	28.30	19.31
NOx [g/h]	5.51	3.76
VOC [g/h]	6.56	4.48

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	24.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	22.90	46.10
d_p, Pedestrian Delay [s]	44.55	33.62
I_p,int, Pedestrian LOS Score for Intersectio	1.677	1.743
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	527	527
d_b, Bicycle Delay [s]	29.82	30.23
I_b,int, Bicycle LOS Score for Intersection	1.560	1.604
Bicycle LOS	A	A

Intersection Setup

Name	83 Avenue					EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration						1				
Turning Movement	Left	Thru	Thru	Right	Right	Left2	Left	Thru	Right	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	1.50	1.50	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					30.00				
Grade [%]	0.00					0.00				
Curb Present						Yes				
Crosswalk	Yes					Yes				

Volumes

Name	83 Avenue					EB Bike Lane				
Base Volume Input [veh/h]	0	0	0	0	0	0	72	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	0	0	0	72	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	0	18	0	0	0
Total Analysis Volume [veh/h]	0	0	0	0	0	0	72	0	0	0
Presence of On-Street Parking						No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	20					20				
v_di, Inbound Pedestrian Volume crossing th	20					20				
v_co, Outbound Pedestrian Volume along th	14					20				
v_ci, Inbound Pedestrian Volume along the l	20					20				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					72				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	29.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	0	0	0	0	2	0	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	0	0	0	0	29	0	0	0
Amber [s]	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	22	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk							No			
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	0	0	0	32	0	0	0
Lead / Lag	-	-	-	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	0	0	29	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall							No			
Maximum Recall							No			
Pedestrian Recall							No			

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L
C, Calculated Cycle Length [s]		110
L, Total Lost Time per Cycle [s]		3.00
l1_p, Permitted Start-Up Lost Time [s]		0.00
l2, Clearance Lost Time [s]		1.00
g_i, Effective Green Time [s]		27
g / C, Green / Cycle		0.25
(v / s)_i Volume / Saturation Flow Rate		0.05
s, saturation flow rate [veh/h]		1539
c, Capacity [veh/h]		381
d1, Uniform Delay [s]		32.67
k, delay calibration		0.04
l, Upstream Filtering Factor		1.00
d2, Incremental Delay [s]		0.09
d3, Initial Queue Delay [s]		0.00
Rp, platoon ratio		1.00
PF, progression factor		1.00

Lane Group Results

X, volume / capacity		0.19
d, Delay for Lane Group [s/veh]		32.76
Lane Group LOS		C
Critical Lane Group		Yes
50th-Percentile Queue Length [veh/ln]		1.57
50th-Percentile Queue Length [m/ln]		11.95
95th-Percentile Queue Length [veh/ln]		2.82
95th-Percentile Queue Length [m/ln]		21.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	0.00	32.76	0.00	0.00	0.00
Movement LOS							C			
d_A, Approach Delay [s/veh]	0.00						32.76			
Approach LOS	A						C			
d_I, Intersection Delay [s/veh]	9.14									
Intersection LOS	A									
Intersection V/C	0.324									

Emissions

Vehicle Kilometers Traveled [km/h]		9.12
Stops [stops/h]		51.32
Fuel consumption [L/h]		3.32
CO [g/h]		61.35
NOx [g/h]		11.94
VOC [g/h]		14.22

Other Modes

g_Walk,mi, Effective Walk Time [s]	24.0	24.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	41.22	39.11
d_p, Pedestrian Delay [s]	33.62	33.62
I_p,int, Pedestrian LOS Score for Intersectio	1.455	1.743
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	527
d_b, Bicycle Delay [s]	55.00	30.94
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560
Bicycle LOS	D	A

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 25: 109 Street and 86 Ave

Control Type: Two-way stop
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 2,145.2
Level Of Service: F
Volume to Capacity (v/c): 3.266

Intersection Setup

Name	109 Street			109 Street			86 Ave			86 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.20	4.20	3.50	3.50	3.50	3.66	3.66	3.66	3.00	3.00	3.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	40.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	109 Street			109 Street			86 Ave			86 Ave		
Base Volume Input [veh/h]	0	1129	40	54	2032	51	0	0	0	2	15	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1129	40	54	2032	51	0	0	0	2	15	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	282	10	14	508	13	0	0	0	1	4	9
Total Analysis Volume [veh/h]	0	1129	40	54	2032	51	0	0	0	2	15	36
Pedestrian Volume [ped/h]	0			0			65			82		

Intersection Settings												
Priority Scheme	Free			Free			Stop			Stop		
Flared Lane										No		
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance										No		
Number of Storage Spaces in Median	0			0			0			0		
Movement, Approach, & Intersection Results												
V/C, Movement V/C Ratio	0.00	0.01	0.00	0.11	0.02	0.00	0.00	0.00	0.00	0.05	3.27	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.14	0.00	0.00	0.00	0.00	0.00	1452.06	2145.21	1372.40
Movement LOS		A	A	B	A	A				F	F	F
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.09	0.03	0.00	0.00	0.00	0.00	7.38	7.38	7.38
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	0.71	0.24	0.00	0.00	0.00	0.00	56.26	56.26	56.26
d_A, Approach Delay [s/veh]	0.00			0.31			0.00			1594.12		
Approach LOS	A			A			A			F		
d_I, Intersection Delay [s/veh]	25.35											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 26: 109 Street and 87 Ave

Control Type:	Signalized	Delay (sec / veh):	42.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.869

Intersection Setup

Name	109 Street				109 Street				87 Ave			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left	Thru	Thru	Right	Left	Left	Thru	Right	Left	Left	Thru	Right
Lane Width [m]	3.20	3.66	3.20	4.00	3.66	3.66	3.60	4.50	3.50	3.50	3.50	3.50
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	1
Entry Pocket Length [m]	80.00	30.48	30.48	35.00	30.48	30.48	30.48	30.48	30.48	30.48	30.48	45.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00				50.00				50.00			
Grade [%]	0.00				0.00				0.00			
Curb Present	Yes				Yes				Yes			
Crosswalk	Yes				No				Yes			

Volumes

Name	109 Street				109 Street				87 Ave			
Base Volume Input [veh/h]	350	806	0	9	0	0	1835	175	532	0	72	243
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	1	0	0	0	18	0	0	0	24
Total Hourly Volume [veh/h]	350	806	0	8	0	0	1835	157	532	0	72	219
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	202	0	2	0	0	459	39	133	0	18	55
Total Analysis Volume [veh/h]	350	806	0	8	0	0	1835	157	532	0	72	219
Presence of On-Street Parking	No			No	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	106				0				51			
v_di, Inbound Pedestrian Volume crossing th	105				0				51			
v_co, Outbound Pedestrian Volume along th	41				51				105			
v_ci, Inbound Pedestrian Volume along the l	40				51				106			
v_ab, Corner Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	19				25				9			

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	3.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Overlap	Overlap	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	2	1	0	3	0	0	1	0	0	0	3	2
Auxiliary Signal Groups	1,2	1,2		1,3								
Maximum Green [s]	30	59	0	26	0	0	59	0	0	0	26	30
Amber [s]	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	3.0
All red [s]	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	2.0
Walk [s]	0	8	0	7	0	0	8	0	0	0	7	0
Pedestrian Clearance [s]	0	16	0	19	0	0	16	0	0	0	19	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No					No				No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	3.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	15	64	0	31	0	0	64	0	0	0	31	15
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	24	0	26	0	0	24	0	0	0	26	5
Vehicle Extension [s]	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No	Yes		No			Yes				No	
Maximum Recall	Yes	No		No			No				No	
Pedestrian Recall	No	No		Yes			No				Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	C	L	C	R
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	74	74	90	59	59	26	26	26
g / C, Green / Cycle	0.67	0.67	0.82	0.54	0.54	0.24	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.67	0.25	0.01	0.41	0.41	0.26	0.30	0.21
s, saturation flow rate [veh/h]	519	3204	1410	3204	1616	1086	1082	1031
c, Capacity [veh/h]	319	2156	1156	1719	867	303	314	244
d1, Uniform Delay [s]	42.06	7.87	1.83	20.19	20.07	44.87	45.22	37.87
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.48	0.50	0.35
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	78.62	0.50	0.01	3.44	6.40	35.52	58.59	28.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.10	0.37	0.01	0.77	0.77	0.93	1.03	0.90
d, Delay for Lane Group [s/veh]	120.68	8.37	1.84	23.63	26.47	80.39	103.82	65.99
Lane Group LOS	F	A	A	C	C	F	F	E
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.79	3.95	0.02	13.56	14.20	10.74	13.78	7.18
50th-Percentile Queue Length [m/ln]	74.61	30.13	0.19	103.33	108.22	81.84	105.02	54.71
95th-Percentile Queue Length [veh/ln]	15.94	7.12	0.04	19.60	20.38	16.12	20.20	11.57
95th-Percentile Queue Length [m/ln]	121.45	54.24	0.34	149.35	155.32	122.80	153.94	88.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	120.68	8.37	0.00	1.84	0.00	0.00	24.42	26.47	91.33	0.00	103.82	65.99
Movement LOS	F	A		A			C	C	F		F	E
d_A, Approach Delay [s/veh]	42.09				24.58				85.76			
Approach LOS	D				C				F			
d_I, Intersection Delay [s/veh]	42.79											
Intersection LOS	D											
Intersection V/C	0.869											

Emissions

Vehicle Kilometers Traveled [km/h]	36.98	85.15	0.85	137.51	68.75	55.42	63.79	43.22
Stops [stops/h]	320.45	258.83	0.80	887.62	464.80	351.51	451.06	234.96
Fuel consumption [L/h]	43.24	19.10	0.11	57.17	30.51	30.54	42.03	20.51
CO [g/h]	798.39	352.77	2.03	1055.70	563.31	563.99	776.14	378.81
NOx [g/h]	155.34	68.64	0.39	205.40	109.60	109.73	151.01	73.70
VOC [g/h]	185.03	81.76	0.47	244.67	130.55	130.71	179.88	87.79

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [m²/ped]	8.38	54.73	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	3.92	0.00	5.91
d_p, Pedestrian Delay [s]	44.55	0.00	43.65
I_p,int, Pedestrian LOS Score for Intersectio	3.165	0.000	2.664
Crosswalk LOS	C	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1345	1073	473
d_b, Bicycle Delay [s]	5.95	11.97	32.22
I_b,int, Bicycle LOS Score for Intersection	2.521	2.665	2.957
Bicycle LOS	B	B	C

Intersection Setup

Name	87 Ave							
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right	Left	Thru	Right	Right
Lane Width [m]	3.50	3.66	3.50	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	10.00	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00				50.00			
Grade [%]	0.00				0.00			
Curb Present	Yes							
Crosswalk	Yes				No			

Volumes

Name	87 Ave							
Base Volume Input [veh/h]	59	0	0	197	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00							
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	20	0	0	0	0
Total Hourly Volume [veh/h]	59	0	0	177	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	0	0	44	0	0	0	0
Total Analysis Volume [veh/h]	59	0	0	177	0	0	0	0
Presence of On-Street Parking	No			No				
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	40				0			
v_di, Inbound Pedestrian Volume crossing th	41				0			
v_co, Outbound Pedestrian Volume along th	0				0			
v_ci, Inbound Pedestrian Volume along the l	0				0			
v_ab, Corner Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	3.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	3	0	0	0	0	0	0	0
Auxiliary Signal Groups								
Maximum Green [s]	26	0	0	0	0	0	0	0
Amber [s]	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	7	0	0	0	0	0	0	0
Pedestrian Clearance [s]	19	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No							
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	31	0	0	0	0	0	0	0
Lead / Lag	Lag	-	-	-	-	-	-	-
Minimum Green [s]	26	0	0	0	0	0	0	0
Vehicle Extension [s]	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall	No							
Maximum Recall	No							
Pedestrian Recall	Yes							

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	
C, Calculated Cycle Length [s]	110	110	
L, Total Lost Time per Cycle [s]	5.00	5.00	
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	
l2, Clearance Lost Time [s]	3.00	3.00	
g_i, Effective Green Time [s]	26	26	
g / C, Green / Cycle	0.24	0.24	
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	
s, saturation flow rate [veh/h]	979	1431	
c, Capacity [veh/h]	65	338	
d1, Uniform Delay [s]	55.00	36.60	
k, delay calibration	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	31.69	1.26	
d3, Initial Queue Delay [s]	0.00	0.00	
Rp, platoon ratio	1.00	1.00	
PF, progression factor	1.00	1.00	

Lane Group Results

X, volume / capacity	0.90	0.52	
d, Delay for Lane Group [s/veh]	86.69	37.86	
Lane Group LOS	F	D	
Critical Lane Group	No	No	
50th-Percentile Queue Length [veh/ln]	2.24	4.35	
50th-Percentile Queue Length [m/ln]	17.06	33.16	
95th-Percentile Queue Length [veh/ln]	4.03	7.77	
95th-Percentile Queue Length [m/ln]	30.71	59.23	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	86.69	0.00	0.00	37.86	0.00	0.00	0.00	0.00
Movement LOS	F			D				
d_A, Approach Delay [s/veh]	50.06				0.00			
Approach LOS	D				A			
d_I, Intersection Delay [s/veh]	42.79							
Intersection LOS	D							
Intersection V/C	0.869							

Emissions

Vehicle Kilometers Traveled [km/h]	2.14	6.43	
Stops [stops/h]	73.27	142.43	
Fuel consumption [L/h]	4.79	7.08	
CO [g/h]	88.40	130.75	
NOx [g/h]	17.20	25.44	
VOC [g/h]	20.49	30.30	

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	0.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	15.43	0.00
d_p, Pedestrian Delay [s]	43.65	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.045	0.000
Crosswalk LOS	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	473	0
d_b, Bicycle Delay [s]	32.07	55.00
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132
Bicycle LOS	A	D

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 27: 109 Street and Walterdale Hill Road/Saskatchewan Drive

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.460

Intersection Setup

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration				↑↑			↑↑↗					
Turning Movement	Left	Right	Right	Left2	Left	Thru	Thru	Right	Right2	Left	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.50	3.50	3.66	3.66	3.50	3.50	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.00	30.48	30.48	30.48	30.48	50.00	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				Yes			Yes					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	47	457	0	0	1163	372	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	37	0	0	0
Total Hourly Volume [veh/h]	0	0	0	47	457	0	0	1163	372	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	12	114	0	0	291	93	0	0	0
Total Analysis Volume [veh/h]	0	0	0	47	457	0	0	1163	372	0	0	0
Presence of On-Street Parking				No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			27			46			26		
v_di, Inbound Pedestrian Volume crossing m	0			26			46			27		
v_co, Outbound Pedestrian Volume crossing	22			46			23			0		
v_ci, Inbound Pedestrian Volume crossing mi	23			46			22			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			7			10			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	105.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Overlap	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	0	0	2	2	0	0	1	0	0	0	0
Auxiliary Signal Groups				2,3	2,3							
Maximum Green [s]	0	0	0	27	27	0	0	55	0	0	0	0
Amber [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	7	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	0	0	20	20	0	0	16	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk												
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	0	0	32	32	0	0	59	0	0	0	0
Lead / Lag	-	-	-	Lead	Lead	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	7	7	0	0	23	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Minimum Recall				No	No			Yes				
Maximum Recall				Yes	Yes			No				
Pedestrian Recall				No	No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	
C, Calculated Cycle Length [s]		110	110	
L, Total Lost Time per Cycle [s]		5.00	6.00	
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	
l2, Clearance Lost Time [s]		0.00	4.00	
g_i, Effective Green Time [s]		46	53	
g / C, Green / Cycle		0.42	0.48	
(v / s)_i Volume / Saturation Flow Rate		0.17	0.41	
s, saturation flow rate [veh/h]		2952	3699	
c, Capacity [veh/h]		1227	1791	
d1, Uniform Delay [s]		22.64	24.55	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		1.02	5.54	
d3, Initial Queue Delay [s]		0.00	0.00	
Rp, platoon ratio		1.00	1.00	
PF, progression factor		1.00	1.00	

Lane Group Results

X, volume / capacity		0.41	0.86	
d, Delay for Lane Group [s/veh]		23.66	30.09	
Lane Group LOS		C	C	
Critical Lane Group		Yes	Yes	
50th-Percentile Queue Length [veh/ln]		4.71	11.92	
50th-Percentile Queue Length [m/ln]		35.90	90.84	
95th-Percentile Queue Length [veh/ln]		8.27	17.58	
95th-Percentile Queue Length [m/ln]		63.03	133.99	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	23.66	23.66	0.00	0.00	30.09	30.09	0.00	0.00	0.00
Movement LOS				C	C			C	C			
d_A, Approach Delay [s/veh]	0.00			23.66			30.09			0.00		
Approach LOS	A			C			C			A		
d_I, Intersection Delay [s/veh]	28.50											
Intersection LOS	C											
Intersection V/C	0.460											

Emissions

Vehicle Kilometers Traveled [km/h]		90.53	82.68	
Stops [stops/h]		308.38	1170.48	
Fuel consumption [L/h]		24.72	69.70	
CO [g/h]		456.40	1287.09	
NOx [g/h]		88.80	250.42	
VOC [g/h]		105.77	298.30	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	34.55	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	19.87	13.31	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.162	1.979	2.736	2.394
Crosswalk LOS	B	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	836	964	0
d_b, Bicycle Delay [s]	55.00	18.68	14.84	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	1.560	4.132
Bicycle LOS	D	A	A	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 28: 109 Street and 88 Ave SBControl Type:
Analysis Method:
Analysis Period:Signalized
HCM 7th Edition
15 minutesDelay (sec / veh): 61.4
Level Of Service: E
Volume to Capacity (v/c): 0.631**Intersection Setup**

Name	109 Street		109 Street		88 Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.50	3.50	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			Yes			
Crosswalk	Yes		Yes		Yes	

Volumes

Name	109 Street		109 Street		88 Ave	
Base Volume Input [veh/h]	0	0	2010	91	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	9	0	0
Total Hourly Volume [veh/h]	0	0	2010	82	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	503	21	0	0
Total Analysis Volume [veh/h]	0	0	2010	82	0	0
Presence of On-Street Parking			No	No		
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	46		27		46	
v_di, Inbound Pedestrian Volume crossing m	46		26		46	
v_co, Outbound Pedestrian Volume crossing	26		27		27	
v_ci, Inbound Pedestrian Volume crossing mi	27		27		27	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		3		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	105.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Overlap	Overlap	Permissive	Permissive
Signal Group	0	0	3	3	0	0
Auxiliary Signal Groups			1,3	1,3		
Maximum Green [s]	0	0	7	7	0	0
Amber [s]	0.0	0.0	3.0	3.0	0.0	0.0
All red [s]	0.0	0.0	2.0	2.0	0.0	0.0
Walk [s]	0	0	5	5	0	0
Pedestrian Clearance [s]	0	0	10	10	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk						
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	3.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	0	12	12	0	0
Lead / Lag	-	-	-	-	-	-
Minimum Green [s]	0	0	7	7	0	0
Vehicle Extension [s]	0.0	0.0	3.0	3.0	0.0	0.0
Minimum Recall			No	No		
Maximum Recall			Yes	Yes		
Pedestrian Recall			No	No		

Exclusive Pedestrian Phase

Pedestrian Signal Group	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		C	C	
C, Calculated Cycle Length [s]		110	110	
L, Total Lost Time per Cycle [s]		5.00	5.00	
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	
l2, Clearance Lost Time [s]		0.00	0.00	
g_i, Effective Green Time [s]		66	66	
g / C, Green / Cycle		0.60	0.60	
(v / s)_i Volume / Saturation Flow Rate		0.62	0.63	
s, saturation flow rate [veh/h]		1683	1657	
c, Capacity [veh/h]		1013	998	
d1, Uniform Delay [s]		21.88	21.88	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		36.86	42.09	
d3, Initial Queue Delay [s]		0.00	0.00	
Rp, platoon ratio		1.00	1.00	
PF, progression factor		1.00	1.00	

Lane Group Results

X, volume / capacity		1.03	1.05	
d, Delay for Lane Group [s/veh]		58.74	63.97	
Lane Group LOS		F	F	
Critical Lane Group		Yes	Yes	
50th-Percentile Queue Length [veh/ln]		33.84	34.76	
50th-Percentile Queue Length [m/ln]		257.88	264.89	
95th-Percentile Queue Length [veh/ln]		44.59	46.27	
95th-Percentile Queue Length [m/ln]		339.77	352.59	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	61.25	63.97	0.00	0.00
Movement LOS			E	E		
d_A, Approach Delay [s/veh]	0.00		61.35		0.00	
Approach LOS	A		E		A	
d_I, Intersection Delay [s/veh]	61.35					
Intersection LOS	E					
Intersection V/C	0.631					

Emissions

Vehicle Kilometers Traveled [km/h]		361.90	361.90	
Stops [stops/h]		1107.59	1137.68	
Fuel consumption [L/h]		106.60	111.49	
CO [g/h]		1968.51	2058.76	
NOx [g/h]		383.00	400.56	
VOC [g/h]		456.22	477.14	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	22.44
M_CW, Crosswalk Circulation Area [m²/ped]	12.78	19.87	3.52
d_p, Pedestrian Delay [s]	44.55	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.626	2.798	1.525
Crosswalk LOS	B	C	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1200	0
d_b, Bicycle Delay [s]	55.00	8.81	55.00
I_b,int, Bicycle LOS Score for Intersection	4.132	3.293	4.132
Bicycle LOS	D	C	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 29: 114 Street and 82 Ave

Control Type:	Signalized	Delay (sec / veh):	72.0
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

Intersection Setup

Name	114 Street			114 Street			University Ave			82 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.50	3.70	3.60	3.66	3.60	3.60	4.00	3.60	3.60	3.66	3.66	3.66
No. of Lanes in Entry Pocket	2	0	1	0	0	1	1	0	1	2	0	0
Entry Pocket Length [m]	170.00	30.48	2.00	30.48	30.48	105.00	95.00	30.48	95.00	100.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	114 Street			114 Street			University Ave			82 Ave		
Base Volume Input [veh/h]	624	314	149	0	722	33	17	206	648	289	217	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	15	0	0	3	0	0	0	0	0	2
Total Hourly Volume [veh/h]	624	314	134	0	722	30	17	206	648	289	217	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	79	34	0	181	8	4	52	162	72	54	4
Total Analysis Volume [veh/h]	624	314	134	0	722	30	17	206	648	289	217	14
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	4			2			3			2		
v_di, Inbound Pedestrian Volume crossing m	3			2			4			2		
v_co, Outbound Pedestrian Volume crossing	13			0			0			13		
v_ci, Inbound Pedestrian Volume crossing mi	13			0			0			13		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	142
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Semi-actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Protecte	Overlap	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	2	1	0	0	1	2	3	6	2	5	4	0
Auxiliary Signal Groups		1,2				1,2			2,6			
Maximum Green [s]	44	27	0	0	27	44	10	38	44	16	38	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	3.0	3.0	0.0	0.0	3.0	3.0	4.0	4.0	3.0	4.0	4.0	0.0
Walk [s]	0	9	0	0	9	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	22	0	0	22	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	4.0	4.0	0.0	0.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	50	33	0	0	33	50	17	36	50	23	36	0
Lead / Lag	Lag	-	-	-	-	-	Lead	-	-	Lag	-	-
Minimum Green [s]	10	27	0	0	27	10	7	29	10	7	29	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
Minimum Recall	No	Yes			Yes	No	No	No	No	No	No	
Maximum Recall	No	No			No	No	No	Yes	No	No	Yes	
Pedestrian Recall	No	No			No	No	No	No	No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	R	L	C	R	L	C	C
C, Calculated Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	6.00	6.00	6.00	6.00	6.00	7.00	7.00	7.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	4.00	0.00	4.00	4.00	0.00	5.00	5.00	0.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	43	76	27	27	76	4	38	87	16	50	50
g / C, Green / Cycle	0.29	0.51	0.18	0.18	0.51	0.02	0.25	0.58	0.11	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.26	0.10	0.09	0.23	0.02	0.01	0.07	0.28	0.09	0.08	0.08
s, saturation flow rate [veh/h]	2411	3204	1431	3204	1318	1535	2951	2326	3113	1550	1517
c, Capacity [veh/h]	707	1627	258	578	669	37	749	1352	327	519	508
d1, Uniform Delay [s]	53.32	20.12	55.51	61.38	18.57	72.12	44.83	18.19	66.11	35.83	35.84
k, delay calibration	0.11	0.11	0.11	0.14	0.11	0.11	0.50	0.11	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.84	0.06	1.62	116.64	0.03	8.72	0.91	0.26	7.88	1.00	1.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.19	0.52	1.25	0.04	0.46	0.28	0.48	0.88	0.22	0.23
d, Delay for Lane Group [s/veh]	57.16	20.18	57.13	178.01	18.60	80.84	45.73	18.46	74.00	36.83	36.87
Lane Group LOS	E	C	E	F	B	F	D	B	E	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	11.87	3.07	4.72	20.35	0.54	0.74	3.21	6.55	5.82	3.26	3.21
50th-Percentile Queue Length [m/ln]	90.42	23.37	36.00	155.03	4.14	5.62	24.45	49.93	44.36	24.84	24.46
95th-Percentile Queue Length [veh/ln]	17.51	5.52	8.29	30.81	0.98	1.33	5.77	10.75	9.78	5.87	5.78
95th-Percentile Queue Length [m/ln]	133.46	42.07	63.17	234.79	7.46	10.11	44.00	81.92	74.52	44.71	44.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	57.16	20.18	57.13	0.00	178.01	18.60	80.84	45.73	18.46	74.00	36.85	36.87
Movement LOS	E	C	E		F	B	F	D	B	E	D	D
d_A, Approach Delay [s/veh]	46.32			171.65			26.13			57.50		
Approach LOS	D			F			C			E		
d_I, Intersection Delay [s/veh]	71.97											
Intersection LOS	E											
Intersection V/C	0.652											

Emissions

Vehicle Kilometers Traveled [km/h]	176.63	88.88	37.93	166.89	6.93	5.59	67.73	213.06	47.95	19.32	19.00
Stops [stops/h]	570.37	147.45	113.56	978.01	13.07	17.71	154.21	314.98	279.86	78.35	77.16
Fuel consumption [L/h]	57.07	16.64	12.05	136.80	1.38	1.99	17.16	36.55	27.31	6.90	6.79
CO [g/h]	1053.90	307.36	222.56	2526.17	25.53	36.70	316.88	674.93	504.31	127.41	125.41
NOx [g/h]	205.05	59.80	43.30	491.50	4.97	7.14	61.65	131.32	98.12	24.79	24.40
VOC [g/h]	244.25	71.23	51.58	585.46	5.92	8.51	73.44	156.42	116.88	29.53	29.06

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			0.0			13.0		
M_corner, Corner Circulation Area [m²/ped]	25.15			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	0.00			248.68			0.00			35.17		
d_p, Pedestrian Delay [s]	64.30			64.30			0.00			62.46		
I_p,int, Pedestrian LOS Score for Intersectio	2.965			2.551			0.000			2.626		
Crosswalk LOS	C			B			F			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1028			361			387			387		
d_b, Bicycle Delay [s]	17.68			50.33			48.70			48.70		
I_b,int, Bicycle LOS Score for Intersection	2.456			2.182			2.278			1.990		
Bicycle LOS	B			B			B			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	6	5	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 30: 114 Street and 87 Ave

Control Type:	Signalized	Delay (sec / veh):	97.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.830

Intersection Setup

Name	114 Street			114 Street			87 Ave			87 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	4.00	3.70	4.00	4.00	4.00	4.00	3.70	3.70	3.70	3.70	3.70	3.80
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	80.00	30.48	30.48	30.48	30.48	40.00	35.00	30.48	30.48	85.00	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	114 Street			114 Street			87 Ave			87 Ave		
Base Volume Input [veh/h]	309	82	154	60	84	54	48	948	349	85	832	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	15	0	0	5	0	0	35	0	0	4
Total Hourly Volume [veh/h]	309	82	139	60	84	49	48	948	314	85	832	34
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	77	21	35	15	21	12	12	237	79	21	208	9
Total Analysis Volume [veh/h]	309	82	139	60	84	49	48	948	314	85	832	34
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	83			85			84			82		
v_di, Inbound Pedestrian Volume crossing m	82			84			85			83		
v_co, Outbound Pedestrian Volume crossing	62			192			62			192		
v_ci, Inbound Pedestrian Volume crossing mi	62			192			62			192		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	44.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	ProtPer	Overlap	Overlap	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	2	3	3	0	3	0	4	1	0	5	6	0
Auxiliary Signal Groups		2,3	2,3									
Maximum Green [s]	25	24	24	0	24	0	10	43	0	10	43	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	17	17	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.0	3.0	3.0	0.0	3.0	0.0	1.0	3.0	0.0	1.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	23	29	29	0	29	0	10	48	0	10	48	0
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	24	24	0	24	0	7	24	0	7	24	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	Yes		No	Yes	
Maximum Recall	Yes	Yes	Yes		Yes		No	No		Yes	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.00	0.00	0.00	3.00	3.00	3.00	0.00	3.00	3.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	20	47	47	24	24	24	53	45	45	53	43	43
g / C, Green / Cycle	0.18	0.43	0.43	0.22	0.22	0.22	0.48	0.41	0.41	0.48	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.19	0.05	0.11	0.06	0.04	0.05	0.07	0.56	0.24	0.16	0.26	0.26
s, saturation flow rate [veh/h]	1667	1683	1265	940	1750	1249	730	1683	1299	543	1683	1624
c, Capacity [veh/h]	303	719	540	189	382	272	321	681	526	197	658	635
d1, Uniform Delay [s]	45.00	18.96	20.27	44.37	34.98	35.46	18.09	32.74	24.97	25.34	27.54	27.75
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.23	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	56.78	0.32	1.15	4.39	1.02	2.06	0.46	185.31	4.94	6.80	5.20	5.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	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 Group Results

X, volume / capacity	1.02	0.11	0.26	0.32	0.18	0.24	0.15	1.39	0.60	0.43	0.66	0.68
d, Delay for Lane Group [s/veh]	101.78	19.29	21.42	48.77	36.00	37.52	18.55	218.06	29.92	32.13	32.74	33.48
Lane Group LOS	F	B	C	D	D	D	B	F	C	C	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	12.95	1.32	2.45	1.74	1.59	1.59	0.68	52.50	6.85	1.53	10.18	10.18
50th-Percentile Queue Length [m/ln]	98.71	10.06	18.65	13.29	12.13	12.13	5.17	400.03	52.23	11.65	77.54	77.56
95th-Percentile Queue Length [veh/ln]	19.05	2.38	4.41	3.14	2.87	2.86	1.22	78.68	11.15	2.75	15.41	15.41
95th-Percentile Queue Length [m/ln]	145.15	18.11	33.57	23.92	21.83	21.83	9.31	599.57	84.95	20.97	117.40	117.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	101.78	19.29	21.42	48.77	36.29	37.52	18.55	218.06	29.92	32.13	33.09	33.48
Movement LOS	F	B	C	D	D	D	B	F	C	C	C	C
d_A, Approach Delay [s/veh]	67.94			40.48			165.65			33.02		
Approach LOS	E			D			F			C		
d_I, Intersection Delay [s/veh]	97.93											
Intersection LOS	F											
Intersection V/C	0.830											

Emissions

Vehicle Kilometers Traveled [km/h]	146.52	38.88	65.91	11.94	13.55	12.93	12.93	255.37	84.58	39.19	201.03	198.26
Stops [stops/h]	423.97	43.20	80.10	57.08	52.09	52.09	22.22	1718.09	224.34	50.04	333.03	333.12
Fuel consumption [L/h]	47.67	5.89	10.36	4.67	4.34	4.28	2.41	222.05	20.32	6.96	37.59	37.42
CO [g/h]	880.32	108.70	191.32	86.25	80.22	78.96	44.59	4100.21	375.16	128.43	694.16	691.06
NOx [g/h]	171.28	21.15	37.22	16.78	15.61	15.36	8.67	797.75	72.99	24.99	135.06	134.46
VOC [g/h]	204.02	25.19	44.34	19.99	18.59	18.30	10.33	950.26	86.95	29.77	160.88	160.16

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			66.58			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	4.08			3.01			7.03			5.08		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.597			2.418			2.872			2.828		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	855			436			782			782		
d_b, Bicycle Delay [s]	18.04			33.62			20.40			20.40		
I_b,int, Bicycle LOS Score for Intersection	2.009			1.723			3.779			2.347		
Bicycle LOS	B			A			D			B		

Sequence

Ring 1	4	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 31: 112 Street and 82 Ave

Control Type:	Signalized	Delay (sec / veh):	48.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.719

Intersection Setup

Name	112 Street			112 Street			82 Ave			82 Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	4.50	4.50	3.50	3.66	3.50	3.50	3.50	3.66	3.66	3.50	3.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	65.00	30.48	30.48	85.00	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes			Yes			Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	112 Street			112 Street			82 Ave			82 Ave		
Base Volume Input [veh/h]	0	42	19	837	0	148	69	286	0	0	364	420
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	2	0	0	15	0	0	0	0	0	42
Total Hourly Volume [veh/h]	0	42	17	837	0	133	69	286	0	0	364	378
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	11	4	209	0	33	17	72	0	0	91	95
Total Analysis Volume [veh/h]	0	42	17	837	0	133	69	286	0	0	364	378
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	56			27			27			56		
v_di, Inbound Pedestrian Volume crossing m	56			27			27			56		
v_co, Outbound Pedestrian Volume crossing	16			36			16			36		
v_ci, Inbound Pedestrian Volume crossing mi	16			36			16			36		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	37.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	2	0	2	0	0	3	1	0	0	1	0
Auxiliary Signal Groups												
Maximum Green [s]	0	60	0	60	0	0	19	46	0	0	46	0
Amber [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
Walk [s]	0	8	0	8	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	23	0	23	0	0	0	18	0	0	18	0
Delayed Vehicle Green [s]	0.0	8.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	65	0	65	0	0	15	30	0	0	30	0
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-
Minimum Green [s]	0	23	0	23	0	0	7	25	0	0	25	0
Vehicle Extension [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0
Minimum Recall		No		No			No	Yes			Yes	
Maximum Recall		Yes		Yes			No	No			No	
Pedestrian Recall		No		No			No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	R	L	C	C	C
C, Calculated Cycle Length [s]	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	60	60	60	6	29	29	29
g / C, Green / Cycle	0.55	0.55	0.55	0.06	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.04	0.39	0.10	0.04	0.09	0.22	0.29
s, saturation flow rate [veh/h]	1631	2157	1388	1603	3204	1683	1312
c, Capacity [veh/h]	890	1161	757	91	837	440	343
d1, Uniform Delay [s]	11.79	21.76	12.53	51.11	32.96	38.31	40.64
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	3.88	0.51	11.86	1.11	16.29	79.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.72	0.18	0.76	0.34	0.83	1.10
d, Delay for Lane Group [s/veh]	11.93	25.65	13.03	62.96	34.08	54.60	119.85
Lane Group LOS	B	C	B	E	C	D	F
Critical Lane Group	No	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.71	8.90	1.71	2.17	3.21	11.10	16.65
50th-Percentile Queue Length [m/ln]	5.38	67.84	13.05	16.52	24.47	84.62	126.84
95th-Percentile Queue Length [veh/ln]	1.27	13.80	3.08	3.90	5.78	16.57	24.68
95th-Percentile Queue Length [m/ln]	9.69	105.13	23.49	29.74	44.04	126.26	188.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	11.93	11.93	25.65	0.00	13.03	62.96	34.08	0.00	0.00	54.60	119.85
Movement LOS		B	B	C		B	E	C			D	F
d_A, Approach Delay [s/veh]	11.93			23.92			39.69			87.84		
Approach LOS	B			C			D			F		
d_I, Intersection Delay [s/veh]	48.53											
Intersection LOS	D											
Intersection V/C	0.719											

Emissions

Vehicle Kilometers Traveled [km/h]	5.82	183.51	29.16	19.71	81.69	210.02	218.10
Stops [stops/h]	23.11	582.76	56.06	70.96	210.16	363.43	544.77
Fuel consumption [L/h]	1.61	47.07	5.37	6.81	19.99	43.44	67.86
CO [g/h]	29.81	869.16	99.11	125.81	369.20	802.22	1253.17
NOx [g/h]	5.80	169.11	19.28	24.48	71.83	156.08	243.82
VOC [g/h]	6.91	201.44	22.97	29.16	85.57	185.92	290.43

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	12.0	12.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	27.43	5.24	21.25	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	43.65	43.65
I_p,int, Pedestrian LOS Score for Intersectio	1.497	2.637	2.484	3.876
Crosswalk LOS	A	B	B	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	945	945	455	455
d_b, Bicycle Delay [s]	15.29	15.29	32.84	32.84
I_b,int, Bicycle LOS Score for Intersection	1.660	1.560	1.852	2.206
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 32: 110 Street and 87 Ave

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.263

Intersection Setup

Name	110 Street									
Approach	Northbound					Southbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Thru	Right	Left	Thru	Thru	Right	Right
Lane Width [m]	4.50	3.66	3.66	4.50	4.50	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes									
Crosswalk	Yes					Yes				

Volumes

Name	110 Street									
Base Volume Input [veh/h]	10	0	0	41	69	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	66	0	0	0	0	0
Total Hourly Volume [veh/h]	10	0	0	41	3	0	0	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	0	10	1	0	0	0	0	0
Total Analysis Volume [veh/h]	10	0	0	41	3	0	0	0	0	0
Presence of On-Street Parking	No				No					
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	15					15				
v_di, Inbound Pedestrian Volume crossing th	15					15				
v_co, Outbound Pedestrian Volume along th	15					15				
v_ci, Inbound Pedestrian Volume along the l	15					15				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	0	2	0	0	0	0	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	0	22	0	0	0	0	0	0
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	0	0	7	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	15	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No						
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	0	0	25	0	0	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	0	22	0	0	0	0	0	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Minimum Recall				No						
Maximum Recall				No						
Pedestrian Recall				No						

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	
C, Calculated Cycle Length [s]	110	
L, Total Lost Time per Cycle [s]	3.00	
l1_p, Permitted Start-Up Lost Time [s]	2.00	
l2, Clearance Lost Time [s]	1.00	
g_i, Effective Green Time [s]	21	
g / C, Green / Cycle	0.19	
(v / s)_i Volume / Saturation Flow Rate	0.03	
s, saturation flow rate [veh/h]	1642	
c, Capacity [veh/h]	360	
d1, Uniform Delay [s]	36.76	
k, delay calibration	0.11	
l, Upstream Filtering Factor	1.00	
d2, Incremental Delay [s]	0.19	
d3, Initial Queue Delay [s]	0.00	
Rp, platoon ratio	1.00	
PF, progression factor	1.00	

Lane Group Results

X, volume / capacity	0.15	
d, Delay for Lane Group [s/veh]	36.96	
Lane Group LOS	D	
Critical Lane Group	No	
50th-Percentile Queue Length [veh/ln]	1.26	
50th-Percentile Queue Length [m/ln]	9.59	
95th-Percentile Queue Length [veh/ln]	2.27	
95th-Percentile Queue Length [m/ln]	17.27	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.96	0.00	0.00	36.96	36.96	0.00	0.00	0.00	0.00	0.00
Movement LOS	D			D	D					
d_A, Approach Delay [s/veh]	36.96					0.00				
Approach LOS	D					A				
d_I, Intersection Delay [s/veh]	10.62									
Intersection LOS	B									
Intersection V/C	0.263									

Emissions

Vehicle Kilometers Traveled [km/h]	3.96	
Stops [stops/h]	41.20	
Fuel consumption [L/h]	2.34	
CO [g/h]	43.28	
NOx [g/h]	8.42	
VOC [g/h]	10.03	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	45.81
M_CW, Crosswalk Circulation Area [m²/ped]	29.29	5.04
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	1.600	1.602
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	0
d_b, Bicycle Delay [s]	35.20	55.00
I_b,int, Bicycle LOS Score for Intersection	1.868	4.132
Bicycle LOS	A	D

Intersection Setup

Name	87 Ave					87 Ave				
Approach	Eastbound					Westbound				
Lane Configuration										
Turning Movement	Left	Left	Thru	Right	Right	Left	Left	Thru	Right	Right
Lane Width [m]	3.50	3.66	3.50	3.66	3.66	3.66	3.66	3.50	3.66	3.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	1
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	7.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00					30.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	87 Ave					87 Ave				
Base Volume Input [veh/h]	16	0	553	0	0	0	0	265	0	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	9
Total Hourly Volume [veh/h]	16	0	553	0	0	0	0	265	0	79
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	138	0	0	0	0	66	0	20
Total Analysis Volume [veh/h]	16	0	553	0	0	0	0	265	0	79
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	15					15				
v_di, Inbound Pedestrian Volume crossing th	15					15				
v_co, Outbound Pedestrian Volume along th	15					15				
v_ci, Inbound Pedestrian Volume along the l	15					15				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	0					0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	0	1	0	0	0	0	1	0	0
Auxiliary Signal Groups										
Maximum Green [s]	0	0	80	0	0	0	0	80	0	0
Amber [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
All red [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
Walk [s]	0	0	7	0	0	0	0	7	0	0
Pedestrian Clearance [s]	0	0	15	0	0	0	0	15	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk			No					No		
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	0	85	0	0	0	0	85	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	25	0	0	0	0	25	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0
Minimum Recall			No					No		
Maximum Recall			No					No		
Pedestrian Recall			Yes					Yes		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	C	R
C, Calculated Cycle Length [s]	110	110	110	110
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	81	81	81	81
g / C, Green / Cycle	0.73	0.73	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.18	0.18	0.16	0.06
s, saturation flow rate [veh/h]	1640	1532	1683	1345
c, Capacity [veh/h]	1235	1121	1232	985
d1, Uniform Delay [s]	4.79	4.81	4.69	4.19
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.46	0.52	0.40	0.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.24	0.22	0.08
d, Delay for Lane Group [s/veh]	5.25	5.33	5.09	4.35
Lane Group LOS	A	A	A	A
Critical Lane Group	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	2.03	1.91	1.96	0.53
50th-Percentile Queue Length [m/ln]	15.46	14.53	14.93	4.03
95th-Percentile Queue Length [veh/ln]	3.65	3.43	3.53	0.95
95th-Percentile Queue Length [m/ln]	27.83	26.16	26.87	7.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.25	0.00	5.29	0.00	0.00	0.00	0.00	5.09	0.00	4.35
Movement LOS	A		A					A		A
d_A, Approach Delay [s/veh]	5.29					4.92				
Approach LOS	A					A				
d_I, Intersection Delay [s/veh]	10.62									
Intersection LOS	B									
Intersection V/C	0.263									

Emissions

Vehicle Kilometers Traveled [km/h]	70.47	65.43	52.30	15.59
Stops [stops/h]	66.41	62.42	64.12	17.32
Fuel consumption [L/h]	9.39	8.75	7.82	2.27
CO [g/h]	173.35	161.58	144.35	41.94
NOx [g/h]	33.73	31.44	28.09	8.16
VOC [g/h]	40.18	37.45	33.46	9.72

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	38.90	42.29
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.248	2.301
Crosswalk LOS	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1455	1455
d_b, Bicycle Delay [s]	4.09	4.09
I_b,int, Bicycle LOS Score for Intersection	2.029	2.142
Bicycle LOS	B	B

Intersection Setup										
Name	NB Bike Lane					SB Bike Lane				
Approach	Northeastbound					Southeastbound				
Lane Configuration	↵					↱				
Turning Movement	Left2	Left	Thru	Right	Right	Left2	Left	Thru	Thru	Right
Lane Width [m]	3.66	1.50	3.66	3.66	3.66	3.66	3.66	3.66	1.50	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	30.00					30.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name	NB Bike Lane					SB Bike Lane				
Base Volume Input [veh/h]	0	98	0	0	0	0	0	0	25	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00									
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	98	0	0	0	0	0	0	25	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	25	0	0	0	0	0	0	6	0
Total Analysis Volume [veh/h]	0	98	0	0	0	0	0	0	25	0
Presence of On-Street Parking	No				No	No				No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	15					15				
v_di, Inbound Pedestrian Volume crossing th	15					15				
v_co, Outbound Pedestrian Volume along th	15					15				
v_ci, Inbound Pedestrian Volume along the l	15					15				
v_ab, Corner Pedestrian Volume [ped/h]	0					0				
Bicycle Volume [bicycles/h]	98					25				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 2
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing (Basic)

Control Type	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	0	2	0	0	0	0	0	0	2	0
Auxiliary Signal Groups										
Maximum Green [s]	0	22	0	0	0	0	0	0	22	0
Amber [s]	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No							No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Advanced Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 2

Split [s]	0	25	0	0	0	0	0	0	25	0
Lead / Lag	-	Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	22	0	0	0	0	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0
Minimum Recall		No							No	
Maximum Recall		No							No	
Pedestrian Recall		No							No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C
C, Calculated Cycle Length [s]	110	110
L, Total Lost Time per Cycle [s]	3.00	3.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00
l2, Clearance Lost Time [s]	1.00	1.00
g_i, Effective Green Time [s]	21	21
g / C, Green / Cycle	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.08	0.02
s, saturation flow rate [veh/h]	1177	1616
c, Capacity [veh/h]	246	316
d1, Uniform Delay [s]	39.48	36.18
k, delay calibration	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	1.04	0.11
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.08
d, Delay for Lane Group [s/veh]	40.52	36.28
Lane Group LOS	D	D
Critical Lane Group	Yes	No
50th-Percentile Queue Length [veh/ln]	2.48	0.57
50th-Percentile Queue Length [m/ln]	18.87	4.37
95th-Percentile Queue Length [veh/ln]	4.46	1.03
95th-Percentile Queue Length [m/ln]	33.97	7.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	40.52	0.00	0.00	0.00	0.00	0.00	0.00	36.28	0.00
Movement LOS		D							D	
d_A, Approach Delay [s/veh]	40.52					36.28				
Approach LOS	D					D				
d_I, Intersection Delay [s/veh]	10.62									
Intersection LOS	B									
Intersection V/C	0.263									

Emissions

Vehicle Kilometers Traveled [km/h]	7.23	0.96
Stops [stops/h]	81.04	18.79
Fuel consumption [L/h]	4.58	0.97
CO [g/h]	84.55	17.83
NOx [g/h]	16.45	3.47
VOC [g/h]	19.59	4.13

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	45.21	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	23.95	0.00
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	1.762	1.901
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	400	400
d_b, Bicycle Delay [s]	37.01	35.65
I_b,int, Bicycle LOS Score for Intersection	1.560	1.601
Bicycle LOS	A	A

Sequence

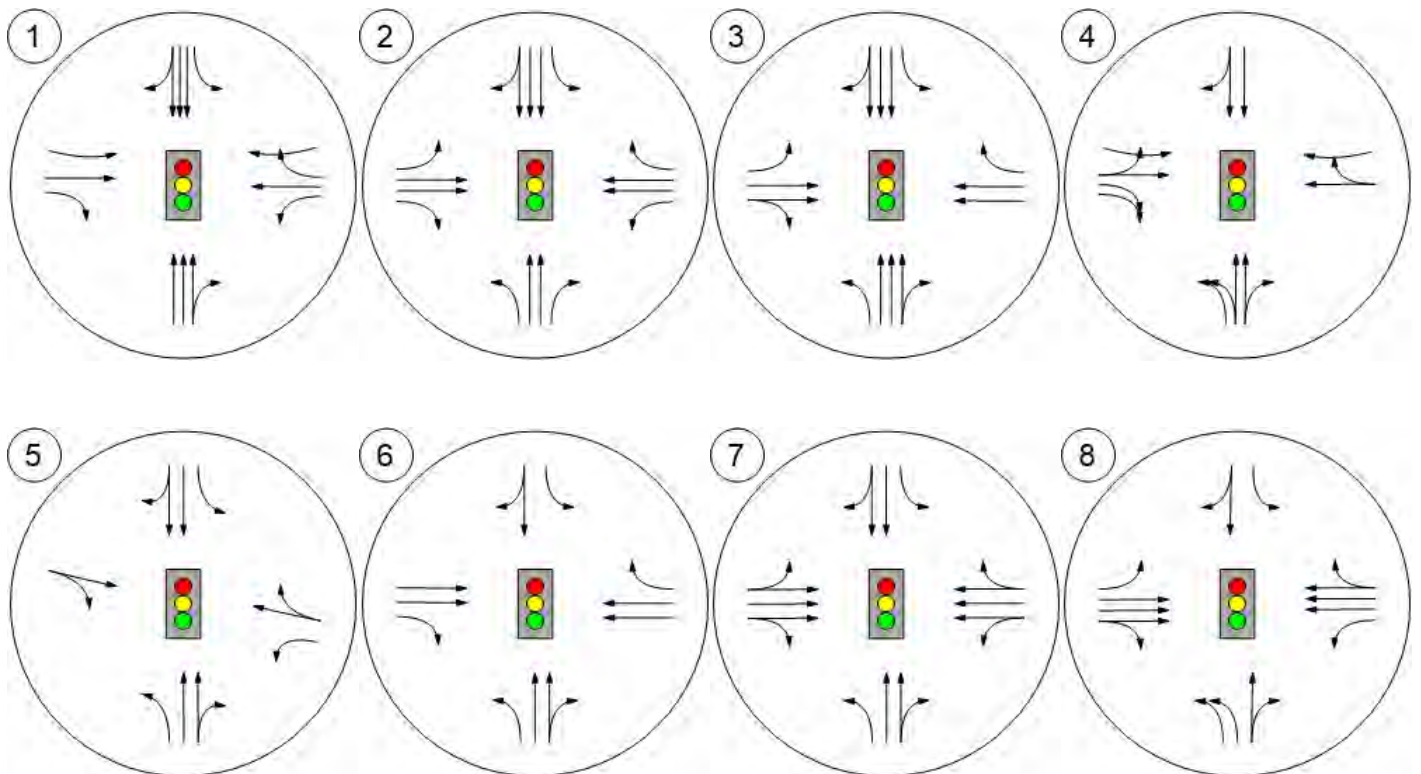
Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



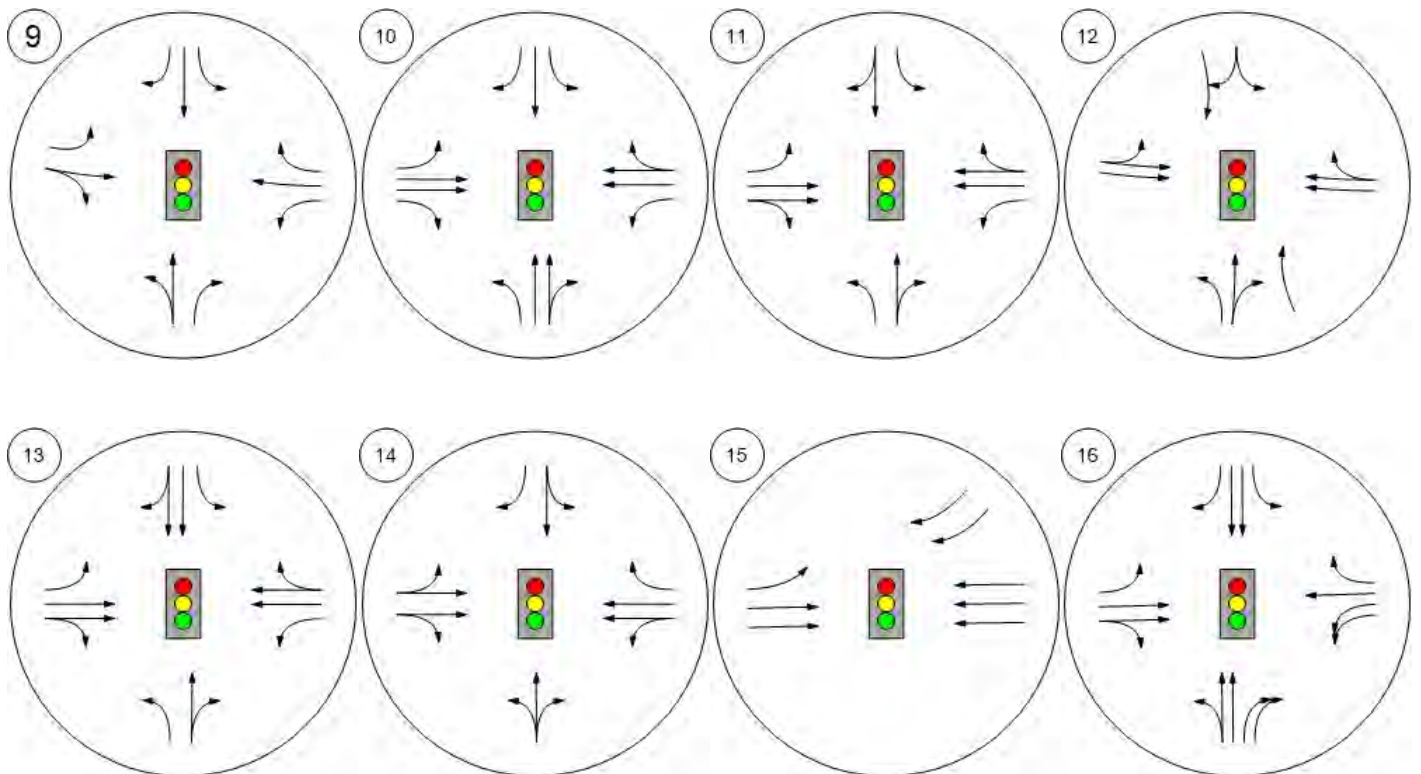
Study Intersections



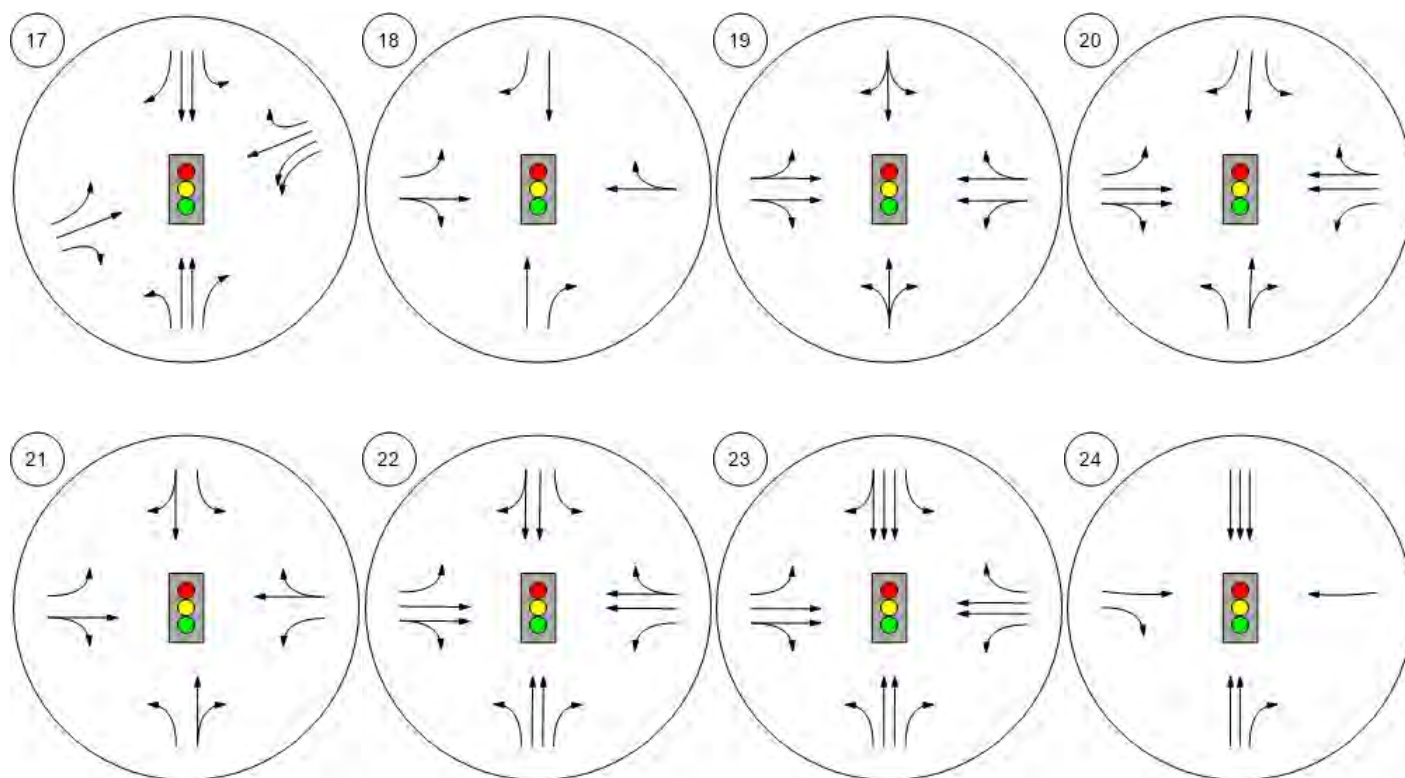
Lane Configuration and Traffic Control



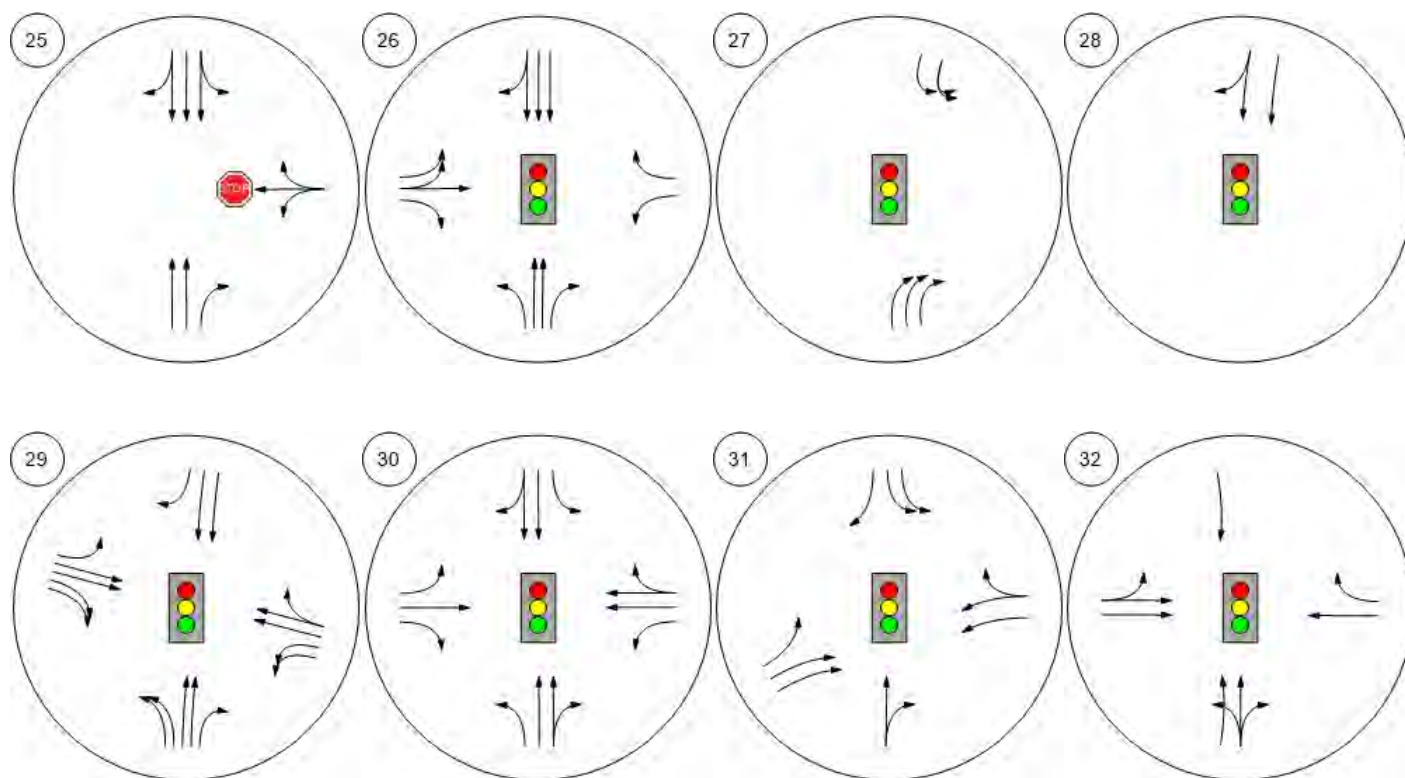
Lane Configuration and Traffic Control



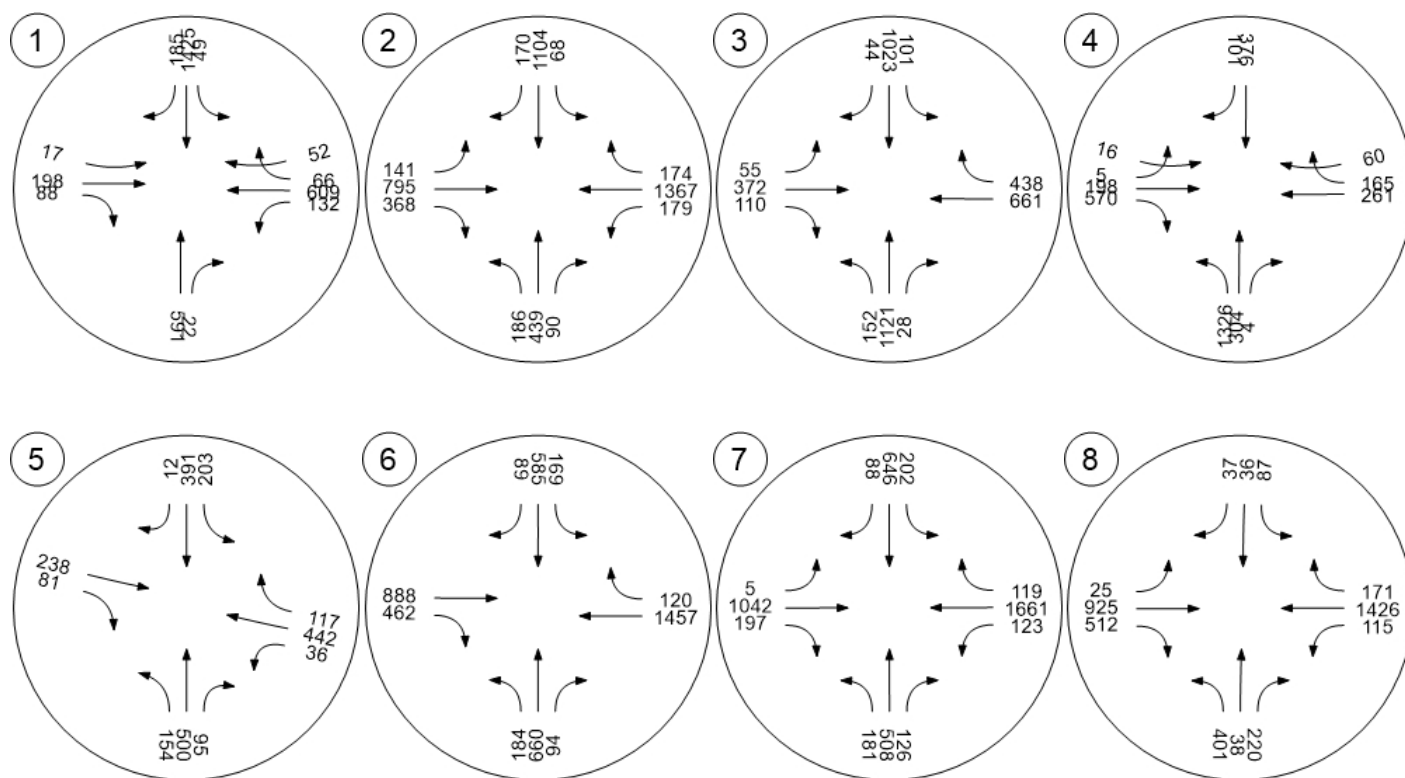
Lane Configuration and Traffic Control



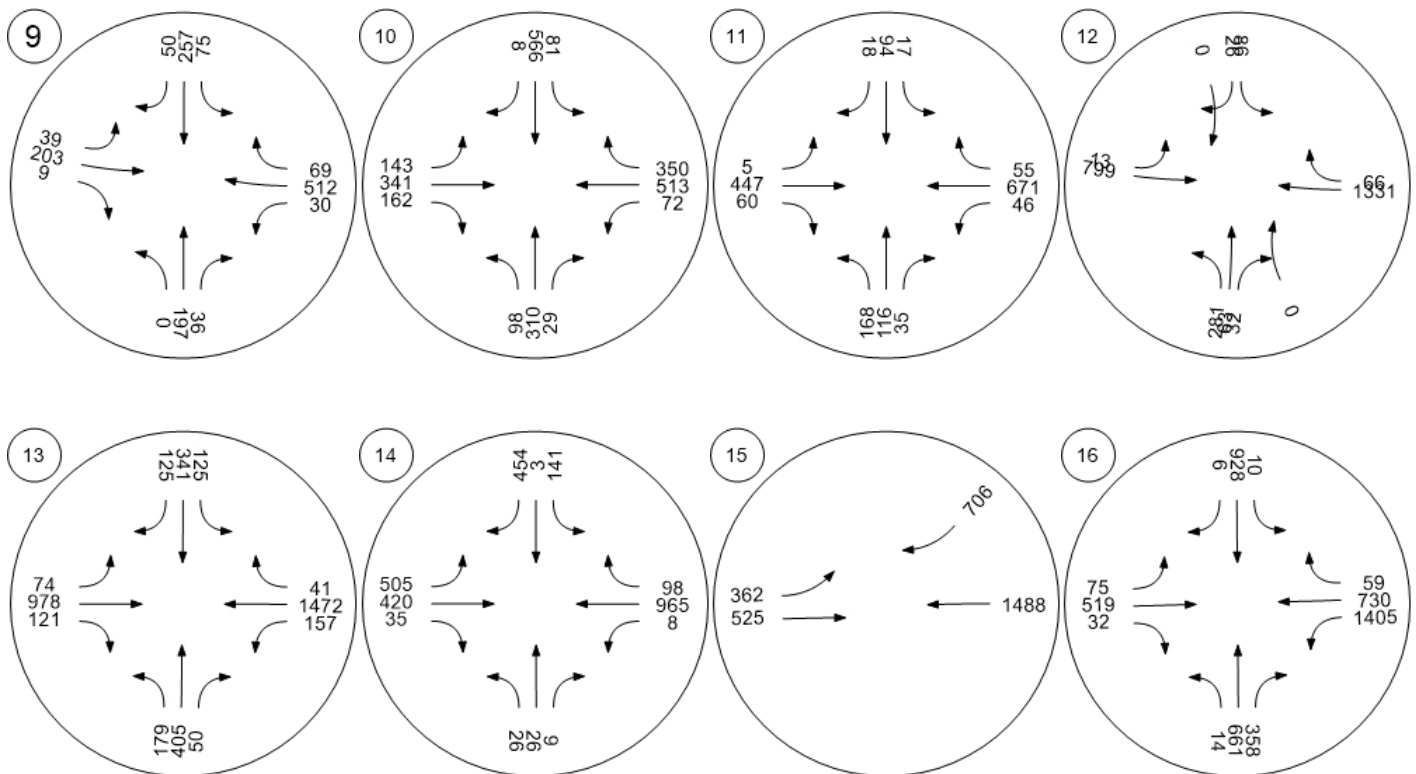
Lane Configuration and Traffic Control



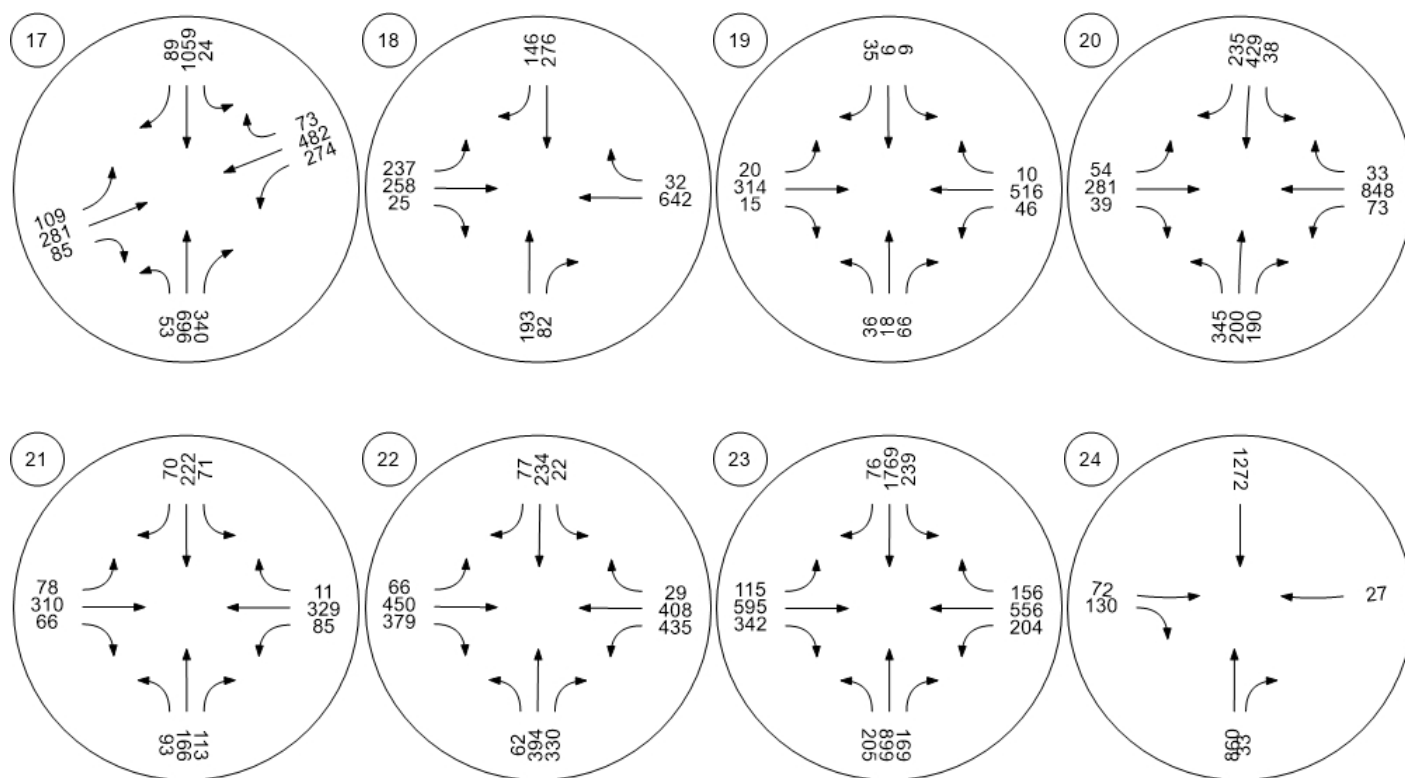
Traffic Volume - Base Volume



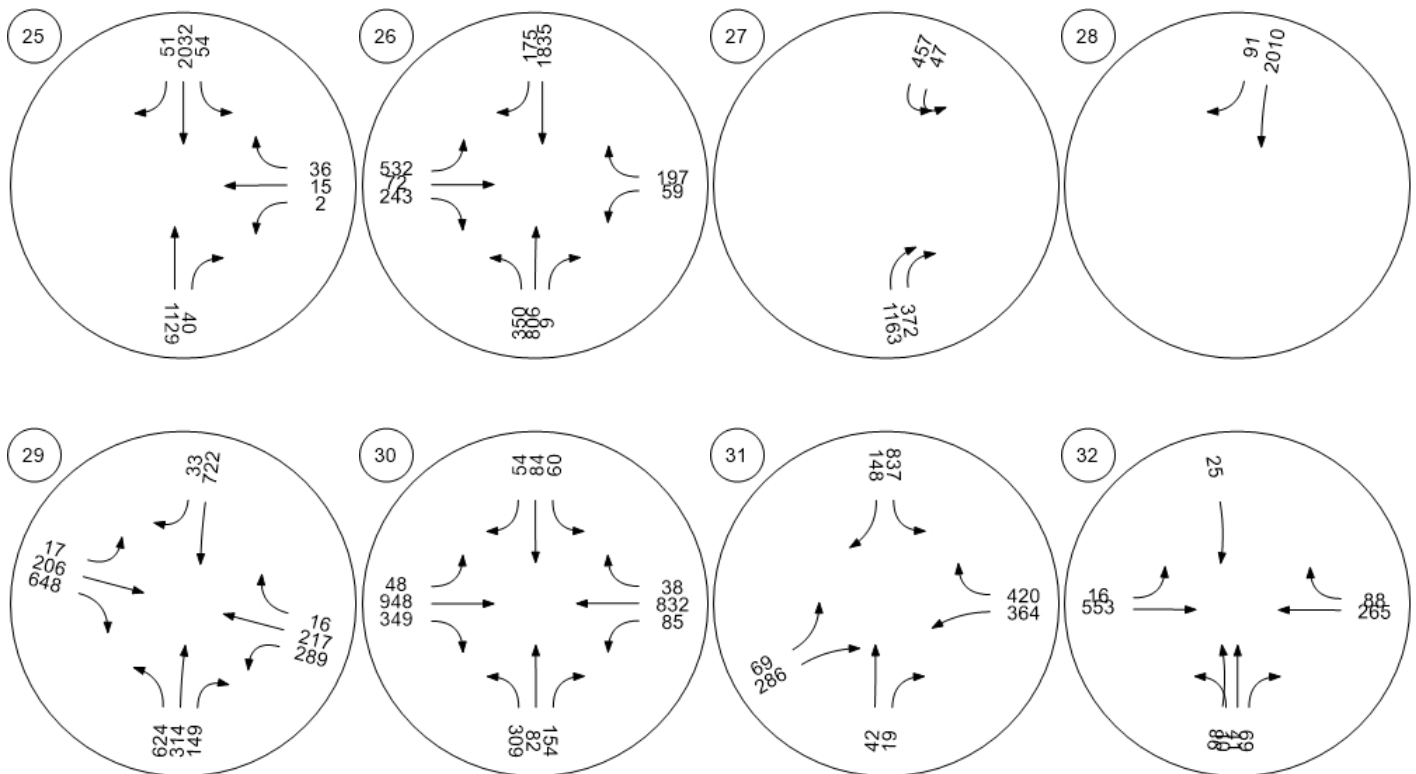
Traffic Volume - Base Volume



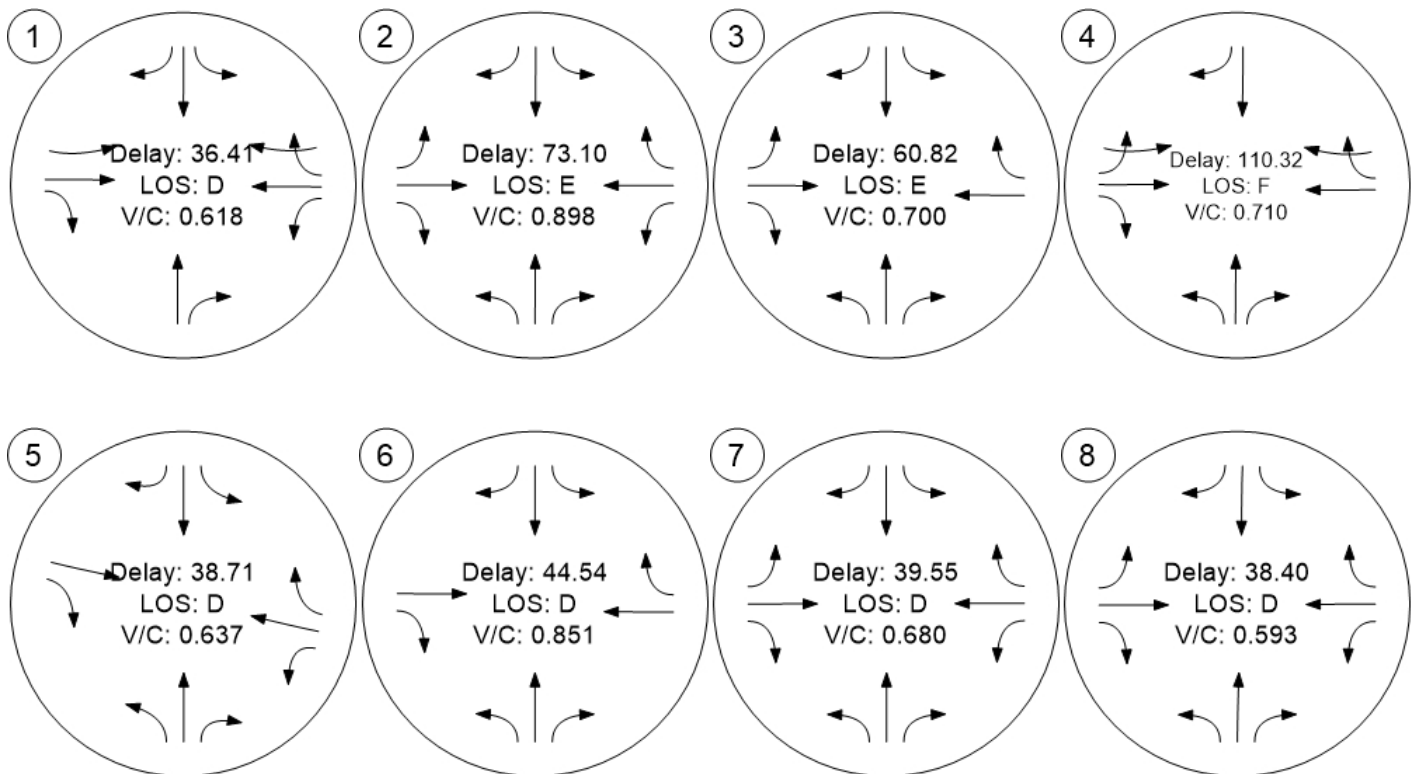
Traffic Volume - Base Volume



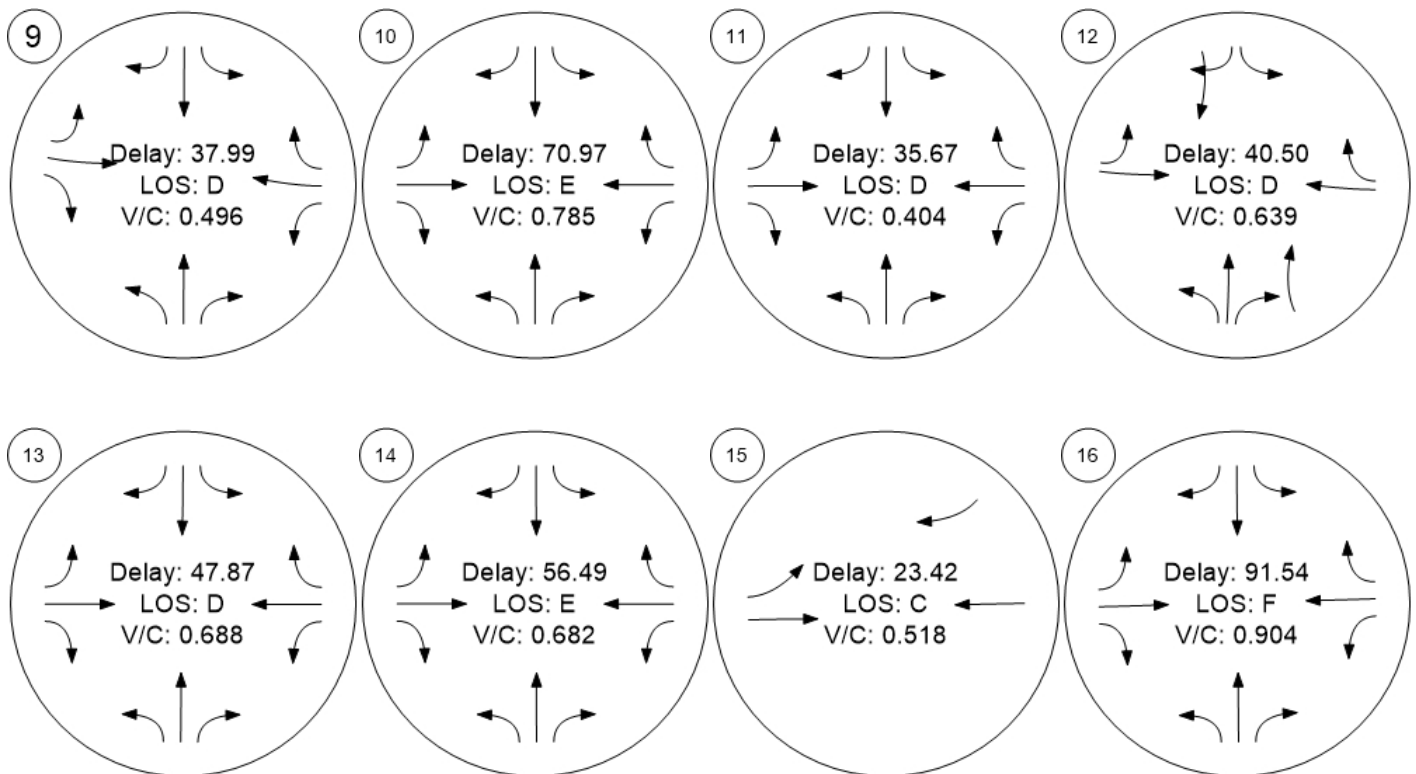
Traffic Volume - Base Volume



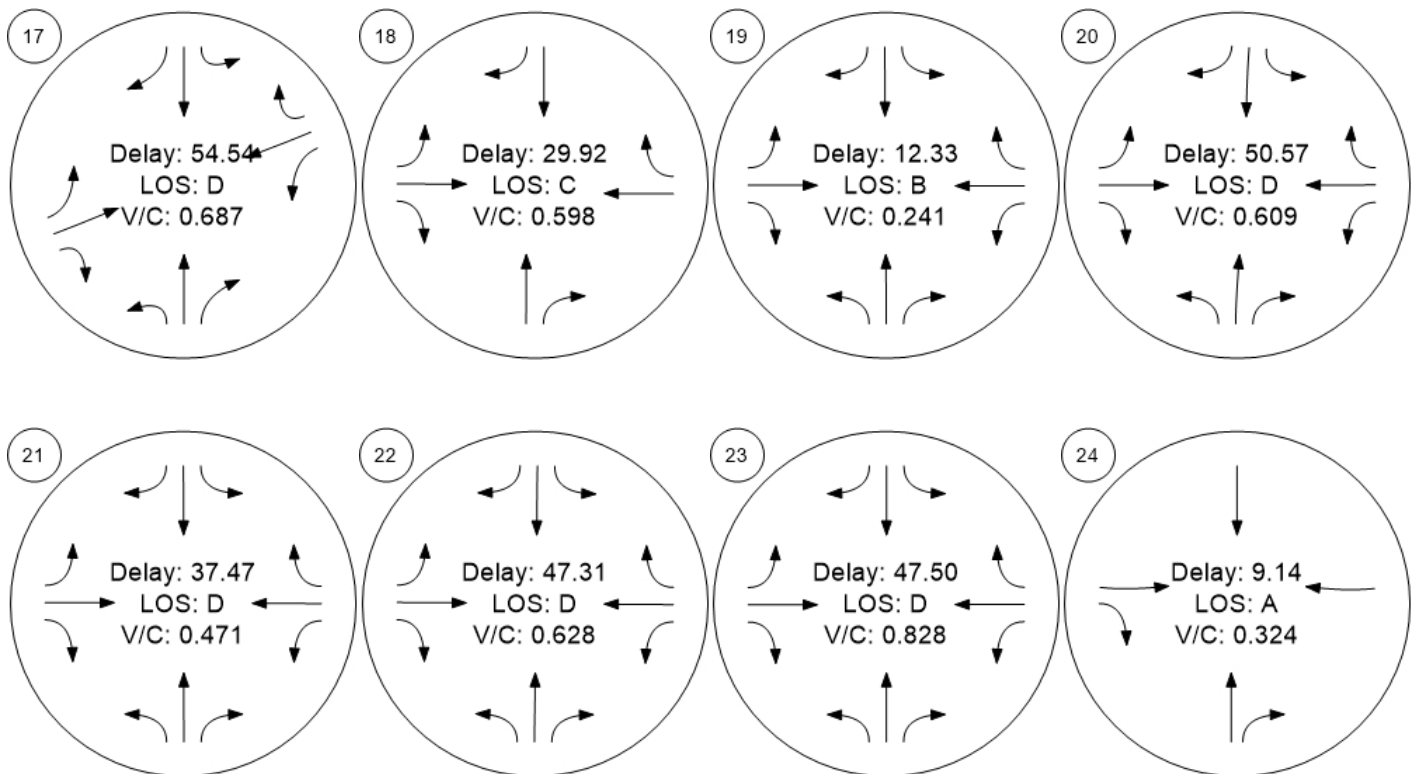
Traffic Conditions



Traffic Conditions



Traffic Conditions



Traffic Conditions

